



**MEKELLE UNIVERSITY**

**SCHOOL OF GRADUATE STUDIES**

**Faculty of Dry land Agriculture and Natural Resources**

**Department of Cooperatives**



**March 2008**

**ANALYSIS OF THE ROLE OF COOPERATIVES IN AGRICULTURAL  
INPUT OUT PUT MARKETING  
IN EASTERN ZONE, TIGRAY REGION**

**By**

**JEMAL MAHMUD**

**A Thesis**

**Submitted in Partial Fulfillment of the Requirements for the Masters of  
Science Degree  
In Cooperative Marketing**

**Major Advisor: Dr. G. B. Pillai (Professor)**

**Co-advisor: Dr. Brehanu G/Medhin**

# DECLARATION

This is to certify that this thesis entitled "Analysis of the Role of Cooperatives in Agricultural Input/Output Marketing in Eastern Tigray Zone, Tigray Region, Ethiopia" submitted in partial fulfillment of the requirements for the award of the degree of M.Sc, in Cooperatives Marketing to the School of Graduate Studies, Mekelle University, through the Department of Cooperatives, done by Mr. Jemal Mahmud Alemayehu, Id. No. GR17/98 is an authentic work carried out by him under my guidance. The matter embodied in this project work has not been submitted earlier for award of any degree or diploma to the best of my knowledge and belief.

Name of the student \_\_\_\_\_ Signature and Date \_\_\_\_\_

Name of the supervisor \_\_\_\_\_ Signature and Date \_\_\_\_\_

Name of the supervisor \_\_\_\_\_ Signature and Date \_\_\_\_\_

# **TABLE OF CONTENT**

<b>ABSTRACT .....</b>	<b>VIII</b>
<b>ACKNOWLEDGEMENTS .....</b>	<b>X</b>
<b>ACRONYMS.....</b>	<b>XII</b>
<b>LIST OF TABLES.....</b>	<b>XIII</b>
<b>LIST OF FIGURES.....</b>	<b>XV</b>
<b>CHAPTER I</b>	
<b>INTRODUCTION .....</b>	<b>1</b>
<b>1.1 GENERAL .....</b>	<b>1</b>
<b>1.2 STATEMENT OF THE PROBLEM .....</b>	<b>3</b>
<b>1.2 PURPOSE OF THE STUDY/SIGNIFICANCE OF THE STUDY .....</b>	<b>6</b>
<b>1.4 OBJECTIVES.....</b>	<b>7</b>
<b>1.3 HYPOTHESIS .....</b>	<b>8</b>
<b>1.5 LIMITATIONS OF THE STUDY .....</b>	<b>9</b>
<b>CHAPTER II</b>	
<b>LITERATURE REVIEW .....</b>	<b>10</b>
<b>2.1 BASIC CONCEPTS AND DEFINITIONS OF COOPERATIVES: .....</b>	<b>10</b>
<b>2.1.1 PRINCIPLES COOPERATIVES .....</b>	<b>12</b>
<i>2.1. 2 Classification/ types of cooperatives .....</i>	<i>12</i>
<i>2.1.3 The Cooperative Sector in Ethiopia .....</i>	<i>14</i>
<i>2.1.3.1 Traditional Farmer's Organizations.....</i>	<i>15</i>
<i>2.1.3.2 Modern Cooperatives Movement.....</i>	<i>15</i>
<b>2.2 BASIC CONCEPTS AND DEFINITION OF AGRICULTURAL MARKETING .....</b>	<b>18</b>
<b>2.3 EMPIRICAL STUDIES ON AGRICULTURAL MARKETING AND COOPERATIVES .....</b>	<b>19</b>
<i>2.3.1 Performances of Agricultural Marketing in Ethiopia .....</i>	<i>19</i>
<i>2.3.2 Empirical Studies of Cooperatives .....</i>	<i>21</i>
<i>2.3.3 Empirical Studies Conducted in Ethiopia .....</i>	<i>22</i>
<i>2.3.3.1 Study on Scope of Services.....</i>	<i>22</i>
<i>2.3.3.2 Study on Performances of Cooperatives.....</i>	<i>23</i>
<i>2.3.3.3 Study on Membership and Members' Participation.....</i>	<i>23</i>
<i>2.3.4. Empirical Study on Econometric Models/Tobit Model.....</i>	<i>24</i>
<b>CHAPTER III</b>	
<b>MATERIALS AND METHODS.....</b>	<b>27</b>
<b>3.1 SITE SELECTIONS AND DESCRIPTION OF THE STUDY AREA .....</b>	<b>27</b>
<i>3.1.1 Location and Physical Features of the Study Area .....</i>	<i>27</i>
<i>3.1.2 Demographic Features of the Study Area .....</i>	<i>28</i>
<i>3.1.3 Economic Activities of the Study Areas .....</i>	<i>29</i>
<i>3.1.4 Agricultural extension and Infrastructure of the Study Area .....</i>	<i>30</i>

3.1.5 Marketing and credit services of the Study Area.....	31
3.1.6 Cooperatives Sector in the Study Areas .....	32
<b>3.2 SAMPLING METHODS .....</b>	<b>36</b>
<b>3.3 DATA COLLECTION PROCEDURES AND SOURCES .....</b>	<b>38</b>
<b>3.4 METHOD OF DATA ANALYSIS .....</b>	<b>39</b>
3.4.1 Functional and Organizational performances.....	40
3.4.2 Financial Performances/ Ratio analysis .....	40
3.4.2.1 Liquidity Ratio.....	40
3.4.2.2 Financial Leverage Management Ratio.....	41
3.4.2.3 Profitability Ratio.....	41
3.4.3 Descriptive and Econometrics Analysis .....	42
3.4.3.1 The Tobit Model.....	42
3.4.3.2 The Specification of The Tobit Model.....	45
<b>3.5 DEFINITION OF VARIABLES.....</b>	<b>48</b>
3.5.1 Dependent Variable.....	49
3.5.2 The Independent Variables.....	50

## CHAPTER IV

<b>RESULTS AND DISCUSSION.....</b>	<b>57</b>
<b>4.1 PERFORMANCES OF MPCSS .....</b>	<b>57</b>
4.1.1 Functional Performances of Cooperatives in the Study Area.....	57
4.1.1.1 Food Grain Procurement and Distribution.....	58
4.1.1.2 Fertilizer and Seed Distribution.....	59
4.1.1.3 Credit Provision.....	61
4.1.2 Organizational Performances .....	62
4.1.2.1 Capital and Membership in MPCSS.....	62
4.1.2.2 GENERAL MEETINGS, BODS AND EMPLOYEES .....	64
4.1.3 Financial Performances (Ratio Analysis) .....	65
4.1.3.1 Liquidity Ratio.....	65
4.1.3.2 Financial Leverage Management Analysis.....	67
4.1.3.3 Profitability Ratio.....	68
<b>4.2 MEMBERS' PARTICIPATION.....</b>	<b>70</b>
<b>4.2.1 DESCRIPTIVE ANALYSIS.....</b>	<b>70</b>
4.2.1.1 Participation in Cooperatives Affairs .....	70
4.2.1. 2 Demographic Characteristics .....	72
4.2.1.2.1 Family Size.....	72
4.2.1.2.2 Sex.....	72
4.2.1.2.3 Age.....	73
4.2.1.2.4 Level of Education.....	74
4.2.1.3 Farming Characteristics .....	75
4.2.1.3.1 Farm Land Size.....	75
4.2.1.3.2 Crop Production.....	76
4.2.1.3.3 Soil Fertility status.....	77
4.2.1.3.4 Livestock Production.....	78
4.2.1.3.5 Farm Experiences.....	78
4.2.1.4 Income and Expenditure Characteristics .....	79

4.2.1.4.1 <i>On-Farm Income</i> .....	79
4.2.1.4.2 <i>Off-Farm Income</i> .....	80
4.2.1.4.3 <i>Annual Income</i> .....	81
4.2.1.4.4 <i>Expenditure</i> .....	81
4.2.1.5 <i>Farmers' Institutional Environment</i> .....	82
4.2.1.5.1 <i>Access to Input and Credit</i> .....	82
4.2.1.5.2 <i>Distance from the Extension Services and Local market</i> .....	83
4.2.1.5.3 <i>Alternative Market Opportunities</i> .....	85
4.2.1.6 <i>Membership Characters</i> .....	85
4.2.1.6.1 <i>Share Contribution</i> .....	85
4.2.1.6.2 <i>Membership Duration and status</i> .....	86
4.2.1.7 <i>Perception of Members</i> .....	87
4.2.1.7.1 <i>Perception of Role Performance of Cooperatives</i> .....	87
4.2.1.7.2 <i>Perception of Members' on Transparency and Accountability</i> .....	88
4.2.1.7.3 <i>Perceived Agricultural Input/Output Prices</i> .....	90
4.2.1.7.4 <i>Perception of Members' Satisfaction</i> .....	91
<b>4.2.2 ECONOMETRICS MODEL ANALYSIS /TOBIT</b> .....	<b>92</b>
4.2.2.1 <i>Determinants of Probability of Members' Participation</i> .....	92
4.2.2.2 <i>Effects of Changes of the Significant Variables on the Index of Participatory</i> .....	101
<b>4.3 PROBLEMS OF COOPERATIVES</b> .....	<b>105</b>
4.3.1 <i>Organizational/ Internal Problems</i> .....	105
4.3.2 <i>External Problems</i> .....	107
4.4.3 <i>Infrastructural Development Problems</i> .....	109
<b>4.4 SUMMARY OF MEMBERS' SUGGESTIONS</b> .....	<b>112</b>
<b>CHAPTER V</b>	
<b>CONCLUSION AND RECOMMENDATION</b> .....	<b>116</b>
<b>5.1 CONCLUSIONS</b> .....	<b>116</b>
<b>5.2 RECOMMENDATIONS</b> .....	<b>121</b>
<b>5.3 IMPLICATION FOR FUTURE RESEARCH</b> .....	<b>125</b>
<b>REFERENCES</b> .....	<b>126</b>
<b>APPENDICES</b> .....	<b>132</b>

**ANALYSIS OF THE ROLE OF COOPERATIVES IN AGRICULTURAL  
INPUT OUT PUT MARKETING  
IN EASTERN ZONE, TIGRAY REGION**

**ABSTRACT**

Ethiopia is among the poorest countries in the world where agriculture is the major source of living for more than 83 per cent of its people. Besides, the sector is the dominant one in the national economy. But agricultural performance in production and productivity is poor to bring sustainable changes in the living standards of the rural community. Among others, underdeveloped agricultural marketing system is a major factor responsible for the poor performance of the sector.

The overall objective of the study is to analyze role and functions of MPCs in agricultural input/output marketing in Eastern Tigray Zone of Ethiopia. In order to see the role of cooperatives, it was preferred to give emphasis on evaluating their overall performances and members' participation as well as perceived problems in using the available services. Simple percentage analysis, ratio analysis, descriptive and econometrics model were employed to identify determining factors of the role of cooperatives in performing their activities as well as participation of the members. Therefore, two districts and seven MPCs were selected at random from Eastern Tigray Zone for the study. A total of 162 member households of cooperatives were considered for this study and were included in the econometric model. In addition, secondary data obtained from relevant institutions were used.

The result of performance of MPCs was presented organizing into three categories such as functional, organizational and financial performances. The result shows that MPCs in Saesi-

Tsaeda-Imba are functioning better in food grain distribution, input supply and credit provision than MPCSSs in Atsiby Womberta. MPCSSs in the two districts provided both medium term and short term loans for fertilizer and seed, and household package programs. With regard to organizational performances, the cooperatives have their own working procedures and systems, by-laws, employees and boards, and working areas. Ratios were analyzed taking the five years financial data (2002 and 2006). The liquidity analysis, financial leverage and profitability ratio showed that the over all performance of cooperatives under investigation were weak or below the desirable level. T-test and result showed significant difference in the age, Livestock ownership, crop production, annual income, expenditure, input purchased, share capital contribution between the mean of two sample groups at less than 10 per cent probability level, and Chi-square test result: sex, access to input/credit, membership, educational status, and so on showed that significant differences between the two sample groups at less than 10 per cent probability level.

Econometric software called "Limdep" was employed to estimate the Tobit model to identify factors influencing the participation (intensity of participation). Probability of participation appeared to be significantly and positively influenced by education status, sex, number of paid up share capital, off-income, livestock owned, access to input credit, membership status, access to alternative marketing and members' satisfaction; while the influence of members' age, off-farm income and access to alternative market had inverse relationship and significant to determine participation. Perceived role performance, perception of members' on transparency, expenditure, on-farm income, annual income, input purchased, perception on input/output prices, etc. were not significantly related to the dependent variable. Moreover, perceived problems and members' suggestions were also identified sufficiently to analyze role of cooperatives such as internal/organizational, external and infrastructure related problems. Performance of cooperatives



and members' participation were used as key factors to analyze cooperatives' role in agricultural input/output marketing in the study area. The policy implication is that Government, NGOs and other stakeholders need to give emphasis on improving individual, organizational and institutional capacity of cooperatives.

# ACKNOWLEDGEMENTS

Several individuals and organizations deserve acknowledgement for their contributions to the study. My foremost appreciation and thanks goes to my major advisor, Prof. G. B. Pillai for his close supervision and professional advice and encouragement during the research work. My heart-felt thanks also go to my co-advisor, Dr. Berhanu G/Medihin for his valuable comments and professional advice throughout the course of the research work.

I would like to thank the ILRI/IPMS, for sponsoring my study; with special thank to Dr. Berhanu G/Medihin, Dr. G/Medihin W/Wahid and Atsiby Womberta staff members for their encouragement and moral support, which significantly contributed to my study. I am also indebted to ILRI/IPMS people in Addis Ababa, Atsiby and Mekelle for their immediate response to my request of fund.

I would like to express my gratitude to all my instructors: Dr. G. Veerakumeran, Dr. C. Pitchie, Dr. Grish Kumar, Dr. Radha Krishna, Dr. Dayandahna, Dr. Fitsum Hagos, and Pro. Nikira for the genuine and successful advices they have been offering and their effort to share their knowledge and experiences in the field of agricultural marketing and cooperatives.

I am indebted to Ato G/Hiwot Hailemariam, Ato Zaid W/Gebriel, Ato Amha Mulugeta, Ato Kebede Manjur, Ato Alema W/Mariam, Ato Redwan Mustefa, Ato Nega (AAU), Ato Issayas G/Hiwot and all my class mates for their valuable comments, encouragement and advice during the course of my study. My special thanks are given to my wife, W/ro Rahimetu Kahisay for her assistance in typing part of my Thesis and for her valuable encouragement throughout the study period. Finally, I would like to acknowledge all individuals who assisted me in the course of my study.

# ACRONYMS

<b>ADLI:</b>	Agricultural Development Led Industrialization
<b>AISE</b>	Agricultural Input Supply Enterprise
<b>APM</b>	Active Participant Member
<b>BoARD:</b>	Bureau of Agricultural and Rural Development
<b>BoD:</b>	Board of Directors
<b>BoFED:</b>	Bureau of Finance and Economic Development
<b>CBE</b>	Commercial Bank of Ethiopia
<b>CSA:</b>	Central Statistics Agency
<b>DA</b>	Development Agent
<b>DARDO</b>	District Agriculture and Rural Development Office
<b>DCPD</b>	District Cooperatives Promotion Department
<b>DECSI</b>	Dedebit Credit and Saving Cooperatives
<b>EU</b>	European Union
<b>FCA:</b>	Federal Cooperatives Agency
<b>FAO:</b>	Food and Agricultural organization
<b>GA</b>	General Assembly
<b>GDP</b>	Gross Domestic Product
<b>HH</b>	Household
<b>ICA:</b>	International Cooperatives Alliance
<b>ILO:</b>	International Labour Organization
<b>ILRI</b>	International Livestock Research Institution
<b>IPMS</b>	Improving Productivity and Market Success

<b>LPM</b>	Linear Probability Model
<b>MC</b>	Management Committee
<b>MoARD</b>	Ministry of Agriculture and Rural Development
<b>MoA</b>	Ministry of Agriculture
<b>MoFED:</b>	Ministry of Finance and Economic Development
<b>MPCSS:</b>	Multi-Purpose Cooperative Societies
<b>NGOs:</b>	Non-Governmental Organizations
<b>PA</b>	Peasant Association
<b>PPM</b>	Passive Participant Member
<b>RUFIP</b>	Rural Financial Intermediation Program
<b>RuSACCOs</b>	Rural Saving and Credit Cooperatives
<b>SACCO</b>	Saving and Credit Cooperative
<b>SPSS:</b>	Statistical Package for Social Science
<b>TCPO:</b>	Tigray Cooperatives Promotion Office
<b>TGE</b>	Transitional Government of Ethiopia
<b>TLU</b>	Tropical Livestock Unit
<b>UNDP</b>	United Nations Development Program
<b>VOCA</b>	Voluntary Overseas Cooperative Alliance
<b>WUA</b>	Water Users Association

# LIST OF TABLES

TABLE 1 NO OF COOPERATIVE UNIONS BY REGION .....	18
TABLE 2 THE LIVESTOCK POPULATION IN THE STUDY AREA.....	31
TABLE 3. RANDOMLY SELECTED MPCSS, TOTAL MEMBERSHIP AND SAMPLE SIZES.....	37
TABLE 4 TOTAL VOLUME OF FOOD GRAIN, FERTILIZER, SEED AND PESTICIDE DISTRIBUTED THROUGH COOPERATIVES IN QUINTAL.....	61
TABLE 5 STATISTICS OF COOPERATIVES IN THE STUDY DISTRICTS IN EASTERN ZONE OF TIGRAY REGION.....	64
TABLE 6 RATIO OF LIQUIDITY, DEBT TO TOTAL ASSET AND RETURN ON TOTAL ASSETS IN THE STUDY AREA.....	69
TABLE 7 DISTRIBUTION OF MEMBERS' PARTICIPATION IN COOPERATIVES AFFAIRS .....	71
TABLE 8 FAMILY SIZE, SEX AND AGE OF THE MEMBERS .....	74
TABLE 9 LITERACY STATUS OF HOUSEHOLD HEAD .....	75
TABLE 10 DISTRIBUTION OF LAND USE SYSTEM OF SAMPLE RESPONDENTS .....	76
TABLE 11 TYPES OF CROPS AND PRODUCTION IN KG IN THE YEAR 2006.....	77
TABLE 12 FERTILITY STATUS OF MEMBERS' FARM LAND AND LIVESTOCK OWNERSHIP STATUS OF RESPONDENTS.....	78
TABLE 13 DISTRIBUTION OF SAMPLE MEMBERS' FARM EXPERIENCES.....	79
TABLE 14 SOURCES OF ON-FARM INCOME OF SAMPLE RESPONDENTS .....	80

TABLE 15 DISTRIBUTION OF ON-FARM INCOME AND SOURCES OF THE ON-FARM INCOME .....	81
TABLE 16 DISTRIBUTION OF RESPONDENTS TO ACCESS OF INPUT AND LOAN, INPUT PURCHASED...83.	
TABLE 17 MEMBERS' LOCATION FROM LOCAL MARKET AND EXTENSION SERVICES.....	84
TABLE 18 DISTRIBUTION OF RESPONDENTS IN ACCESSING ALTERNATIVE MARKETING OPPORTUNITIES .....	85
TABLE 19 DISTRIBUTION OF DURATION OF MEMBERSHIP, SHARE CONTRIBUTION AND MEMBERSHIP STATUS.....	86
TABLE 20 DISTRIBUTION OF MEMBERS PERCEPTION ON THE ROLE PERFORMANCE OF COOPERATIVES .....	88
TABLE 21 PERCEPTION OF MEMBERS ON TRANSPARENCY AND ACCOUNTABILITY OF COOPS.....	90
TABLE 22 DISTRIBUTION OF PERCEIVED PRICES OF AGRICULTURAL INPUT/OUTPUT.....	91
TABLE 23 DISTRIBUTION OF PERCEPTION OF MEMBERS' SATISFACTION ON THE SERVICES RENDERED THROUGH COOPERATIVES .....	92
TABLE 24 VARIANCE INFLATION FACTOR FOR CONTINUOUS VARIABLES.....	93
TABLE 25 MAXIMUM LIKELIHOOD ESTIMATES OF TOBIT MODEL.....	100
TABLE 26 THE EFFECT OF CHANGE IN THE SIGNIFICANT EXPLANATORY VARIABLES ON THE INTENSITY OF PARTICIPATION.....	104
TABLE 27 ORGANIZATIONAL/INTERNAL PROBLEMS OF COOPERATIVE.....	107
TABLE 28 EXTERNAL PROBLEMS OF COOPERATIVE.....	109

TABLE 29	INFRASTRUCTURE DEVELOPMENT PROBLEMS.....	110
TABLE 30	DISTRIBUTION OF MEMBERS' SUGGESTION.....	115

## LIST OF FIGURES

FIG. 1	MAP OF EASTERN TIGRAY ZONE, TIGRAY REGIONAL NATIONAL STATE, ETHIOPIA.....	34
FIG 2	MAP OF ATSIBY WOMBERTA AND SAESI-TSAEDA-IMBA.....	35
FIG 3	CONCEPTUAL FRAME WORK AND RELATIONSHIP OF THE DEPENDENT AND INDEPENDENT VARIABLES.....	56
FIG 4	LIQUIDITY RATIO ANALYSIS .....	66
FIG 5	DEBT TO TOTAL ASSET RATIO ANALYSIS IN THE STUDY AREA.....	68





# CHAPTER I

## INTRODUCTION

### 1.1 General

Ethiopia has a total area of 1.222 million square kilometers and has more than 75 million population (CSA, 2005), of which 85 per cent of the population is engaged in agriculture. The agricultural sector is the primary source of food supply, which is characterized by fragmented small farms operated by household farming families. Moreover, subsistence agriculture usually involving farmers working on very small land holdings dominates the economy. Ethiopia has an agrarian economy where agriculture constitutes about 45 per cent of the GDP, followed by 43 per cent from the service sector, and 12 per cent from the industrial sector (FAO, 2005).

Tigray, the northernmost region of Ethiopia, bordering Sudan and Eritrea, Amhara and Afar regions in west, north, south and east respectively, has a cultivated area of about 800 000 ha (BoARD, 2003). Total population of the region is estimated to be 4.3 million as of July, 2006. the region is classified as a food-deficit area due to its semi-arid climate and high population density (FAO, 2005). Agriculture, being the mainstay of the population of Tigray, has been practiced for several years without any improvement in its productivity.

Co-operation as a way of life has been and continues to be a tradition in finding the solution to the socio-economic problems of the people in Ethiopia. Examples of such cooperation can be found everywhere in the working of mutual aid institutions such as Equb, Eddir, Wonfel or Jigii,

Senbete and many others. The traditional cooperation among the rural community was a ground to the flourishing of modern cooperation in early 1960s, realizing that these traditional institutions failed to meet the requirements of credit services and equipment needed for productive purposes in full. In all circumstances the program for cooperative development was, therefore, formulated and had been included in the second Five-year Development plan (1962-67) of the country (Zerihun, 1998).

The Derg regime established an extensive network of socialist agricultural cooperatives throughout Ethiopia by organizing the peasants. There was virtually no member participation. Instead, party agents and political activists largely ran these cooperative systems (Dessaegn, 1994). Corruption and mismanagement were so prevalent in the service cooperatives, which handled the purchase of consumer goods for rural communities, which basic goods such as soap, salt, sugar and paraffin oil were generally in desperately short supply in the cooperative shops.

The existing government abolished the command economy and introduced economic and political liberalization, including steps to promote the development of democratically governed, market oriented, member owned cooperatives; and professionalism in the management of cooperatives. In addition, the government has placed a high priority on food security and self-sufficiency. Cooperatives are promoted as part of Ethiopian rural and agricultural development strategies, within the national macroeconomic policy framework of agricultural development led industrialization (ADLI).

Within the above context, cooperative promotion office/bureaus have been established at regional and Federal level to launch the extension of on-going cooperative development effort to benefit small scale farmers and to promote the spirit of self help community organization: as an integral part of farming communities development. Consequently, several agricultural cooperatives

(Primary and Secondary) have been established in many parts of the country, not only to benefit members, but also benefit rural communities.

Inline with these realities, the research attempted to analyze the role and functions of cooperatives in agricultural input output marketing through evaluating their performances, analyzing members' participation and identifying the constraints of cooperatives. Besides, in the research, an attempt was made find out issues which require further research and investigations so that other researchers can easily come up with outstanding recommendations to enhance cooperatives' contribution in the economic development of the country.

## **1.2 Statement of the Problem**

In Sub-Saharan countries, like Ethiopia, where the small-scale farming dominates the overall national economy, agricultural production and productivity is very poor. The entire agriculture of the country is characterized by limited use of improved input and backward cultural practices, and depends on rain. Besides, the agricultural productivity continued to be poor and failed to meet the food demand of the ever-growing population. The factors attributing for poor productivity are recurrent droughts, environmental degradation, poor infrastructure in quality and quantity, and backward cultural practices. Considerable loss also occurs to the produce due to poor practices of post harvest handling and limited use of appropriate post harvest technologies (MoFED, 2005).

Moreover, due to the weakness of markets, characterized by high transaction costs, high risk, and inadequate communications and transport infrastructure, people living in food deficit areas continue to face famine and food insecurity while producers in surplus regions endure unattractively low producer prices (Eleni *et al.*, 2004). This shows that the agricultural sector in the country can produce food to meet the needs of the people provided that the sector makes

efforts to conserve the rain water for irrigation, introduce improved agricultural inputs and improving the marketing infrastructure in Ethiopia.

Ethiopia began transforming its agriculture in the mid-1990s after the existing government formulated a development strategy centered on agriculture. The strategy which is known as the Agricultural Development Led Industrialization (ADLI) sets out agriculture as a primary stimulus to generate increased output, employment and income for the people, and as the springboard for the development of the other sectors of the economy (Samuel, 2006). Depending on this strategy, the government has given emphasis to the development and promotion of cooperatives to facilitate agricultural marketing activities. Promotion of cooperatives has then significant contribution in enhancing rural development through supplying agricultural inputs and marketing farmers' produces.

Cooperative is a special group of people with mutual interest to solve their individual problems through common efforts and ultimately attaining economic and social empowerment to the group members and the community. The prime objective of cooperatives is to solve problems that individuals failed to address independently. Accordingly, cooperatives are involving in input/output marketing activities, credit provision and providing other services to the members.

According to the 2005's Tigray Cooperatives Promotion Office report, the total number of primary cooperative societies is 1309, of which 582 primary cooperative societies are Multi-Purpose Cooperative Societies having total number of membership about 338,242 members (93.79 percent of the total members of different kinds of cooperative societies) (TCPO, 2005). About 555 MPCs are registered at the regional and district level promotional offices (TCPO, 2005). From the above data, it is possible to say that the agricultural multipurpose cooperatives have wider base in membership. This is so because the MPCs used to provide diversified

services to members such as marketing agricultural produces, supply and distribute agricultural input (fertilizer, seeds and agro-chemicals), credit service provision, other services like tractor, grinding mill service, storage services etc.

However, there should be clear understanding on the bottlenecks in implementing the agricultural input/output marketing activities by cooperative societies. With the tremendous growth in size and operations and complexity of agricultural marketing, cooperatives are facing a big challenge from both their members and management, and the competitors. It is found that agricultural cooperatives have had limitations by meeting efficiently the needs of their farmer members. Thus, the major challenge facing the agricultural cooperatives is how to operate and meet the needs of the members efficiently and effectively keeping in mind the basic principles of cooperation.

Another constraint being faced by cooperatives in playing their role is their limitation to keep continues the members' patron on their undertakings. The farmer members are expected to be loyal to cooperatives and vice versa. But it is apparently known that if cooperatives fail to meet members' demand or members do not get any definite benefits from the existing cooperatives, they do not keep on their membership or cease to participate in the activities of the cooperatives. This is so because the farmer members' participation can only be enhanced based on concrete or tangible benefits. As a result, it is very often complained that participation of members in the cooperatives is very poor. So, the evaluation of performance of Multi-Purpose Cooperative Societies (MPCSs), the participation of members and identification of problems facing cooperatives are critical areas, which had to be studied in order to see whether MPCSs really are playing their role in the study area.

In line with the above reality, the research/study attempted to come up with possible solutions and recommendations after having clear understanding upon the situation by giving due emphasis to answer the following research questions:

- What are the major business activities in which cooperatives are engaged with regard to input/output marketing?
- What is the performance of the Multi-Purpose Cooperative societies in their business activities?
- To what extent the members participate in the Multi-Cooperative Societies?
- What are the main constraints of the agricultural marketing cooperatives which impede in achieving their objectives?

## **1.2 Purpose of the Study/Significance of the Study**

With the background described above and collected literature related to the study, it was observed that no in-depth study has been attempted to evaluate the role of cooperatives in agricultural marketing development (Multi-Purpose Cooperative Societies) in Eastern Tigray Zone. Government's policies and strategies, perception of the community towards cooperatives, NGOs and government intervention and interference, all had significant contribution in enhancing and/or retarding the movement for the last three decades. In due course, it was too difficult to conclude that the stakeholders had proper understanding on the values and principles of cooperation to coordinate their efforts. Thus the study is hoped to help policy makers and implementers understand issues related to cooperatives development, values, principles and their challenges as well. In general, the result of the study is helpful for promoters, policy makers, promotional and regulatory institutions and the beneficiaries to use

in designing strategies and coordinating efforts to improve performances and members' participation in MPCSSs.

In the study, an attempt was made to identify some important and policy relevant variables in MPCSSs performances, members' participation and decision on using available services. The Government can direct their effort towards manipulating these variables at the desired level of proportion in such a way to improve performances and participation of member farmers to patron the services rendered through the cooperatives.

Institutions and/or individuals who are interested to know socio-economic characteristics of the area especially agricultural and cooperatives related in the study district can use the document as a reference. Besides, it would be a useful reference for researchers and other personnel interested in the area of study. Therefore, it was hoped that, results from this study would have practical use mainly to the study area and similar other areas, and can serve as a base for any further studies to be conducted in other areas.

## **1.4 Objectives**

### **■ General objective**

The general objective of the study is to assess the role and functions of the Multi-Purpose Cooperative Societies in the Eastern Tigray Zone of Ethiopia.

## ■ Specific Objectives of the Study

1. To evaluate the performance of MPCS in agricultural input/output marketing activities
2. To study the participation of members in the MPCS of Eastern Zone.
3. To identify problems of MPCS affecting the performances of cooperatives.
4. To offer suggestions to improve the performance of the MPCS.

## 1.3 Hypothesis

- Members' participation in the Multi-Purpose Cooperative Societies (MPCSs) is adequate to enhance cooperatives play their role in the course serving community.
- Members' participation in the MPCSs is significantly associated with their annual income
- Members' participation in the MPCSs is significantly associated with access to credit/input.
- Members' participation in the MPCSs is significantly associated with the perception of members on the role performances of cooperatives.



## **1.5 Limitations of the Study**

Among the several areas in the country where cooperative movement is high, the study area is the front-liner in the set up and organization of agricultural cooperatives. The reason for the study to be confined in the two districts is that the prevailing resource limitation does not allow encompassing other areas in the zone.

The first objective of this study focuses on the performances of cooperatives which require financial statements of the cooperatives. However, some cooperatives in the two districts were not audited in yearly bases due to shortage of auditors in the zone and district offices. Cooperatives that were properly audited for the year 2002 - 2006 were selected to meet the first objective of the study. Besides, the study included the agricultural input/output activities carried out within the years of 2002-2006. However, the secondary data collected might not be adequate due to poor documentation in the cooperatives societies.

By comprising the required budget and time, a total of 162 farmers were interviewed to meet the second, third and fourth objectives of the study. All sample respondents were members of seven multi-purpose cooperative societies. These cooperatives primarily supply farm inputs especially fertilizer through credit to the members/farmers. Though they failed to achieve, the cooperatives also set as objective to purchase farmers' produce during harvest period. As a result, the study focuses on the analysis their performances and factors influencing members' participation in cooperatives. Due to budget and time limitation the study covered only seven cooperative societies.

# CHAPTER II

## LITERATURE REVIEW

### **2.1 Basic Concepts and Definitions of Cooperatives:**

The purpose of this chapter is to review previous study of cooperatives, local and international, focusing on investigating the evolution of the movement and some general concepts and practices. As to the researcher's knowledge no in-depth empirical study has been conducted on the Multi-Purpose Cooperative Societies in Eastern Zone of Tigray Region. Therefore, the study intends to fill the gap and the review on relevant literature is presented in this chapter.

Cooperation has been the very basis of human civilization. The inter-dependence and the mutual help among human beings have been the basis of social life (Krishna swami, 1992). However, modern type of co-operative enterprise has its origins in the 19<sup>th</sup> century and has become one of the most ever-present example forms of business/economic enterprise.

The first modern cooperative, the Rochdale society, was established in England in 1844. It started with 28 members who purchased one share each of stock. The members consisted of craftsmen such as weavers or shoemakers. The members decided to join to work together, sell their products under one roof, and use a part of earnings to purchase supplies in quantity at economical price, another portion of the earnings would be reinvested in growth of the society, and the remainder would be returned to the individual member in the form of refunds(Chukwu, 1990).

Cooperative movement in Germany evolved in response to the economic crisis. Both farmers and town dwellers were on the verge of starvation in 1846 (Kebebew, 1978). In agricultural area of western Germany, the disastrous year of 1846, inspired Fredrick Wilhelm Raiffeisan, to take

some action to alleviate the problem of hunger. He believed that farmers could improve their condition by eliminating moneylenders and middlemen. The government formed a local committee in Raiffeisan district that is responsible for the initiation of an agricultural credit society. Co-operatives exist in all countries of the world and operate under diverse political systems: from communism to capitalism. Most writers and authors agreed in the motivation to form co-operatives having three particular aspects:

- The need for protection against exploitation by economic forces too strong for the individual to withstand alone
- The impulse for self-improvement by making the best use of often scarce resources
- The concern to secure the best possible return from whatever form of economic activity within which the individual engages whether as a producer, intermediary or consumer.

Different authors defined cooperatives in different ways and meanings. For instance, Center for Cooperatives (2002) defined cooperative as a private business organization that is owned and controlled by the people who use its products, supplies or services. Although cooperatives vary in type and membership size, all were formed to meet the specific objectives of members, and are structured to adapt to members' changing needs. Chukwu (1990) Contemplate cooperative as a democratically controlled business i.e. it is owned and controlled by the members and gives benefit to the members. However, the International Cooperatives alliance (ICA) defined cooperative in 1995 as an autonomous association of persons united voluntarily to meet their common economic, social and cultural needs and aspirations through a jointly owned and democratically controlled enterprise (ICA, 1995). The statement is often supplemented with the distinguishing features of seven principles adopted by ICA. Moreover, according to the 1995

statement, cooperatives function based on the values of self-help, self-responsibility, democracy, equality, equity, and solidarity. In the tradition of their founders, cooperative members believe in the ethical values of honesty, openness, social responsibility, and caring for others (ICA, 1995).

### **2.1.1 Principles Cooperatives**

There are seven basic principles of cooperatives that govern cooperatives. The principles define cooperative organizations, give them strength and basis and rationale for their public support. Cooperatives are the only business organizations owned by the people who use, controlled by the people who use it and the benefits generated by the cooperative accrue to its users on the basis of their patrons. These interests are commonly referred as to the cornerstone to the contemporary cooperative principles. The different principles that govern cooperatives include:

- Voluntary and Open Membership
- Democratic Member control
- Member Economic Participation
- Autonomy and Independence
- Education, Training and Information
- Cooperation among Cooperatives
- Concern for Community

### **2.1. 2 Classification/ types of cooperatives**

Chukwu (1990) presented different criteria of classifying cooperatives that have been adopted by different authors and some of the criteria for classification are summarized as follows. One of the classifying criteria is the area of operation. Urban cooperatives are those operating in the urban

areas. There are housing, credit and saving etc. cooperatives operating in the urban area of our country. Rural cooperatives are those operating in the rural areas. Most of the cooperatives in Ethiopia fall in this category. There are grains, livestock, dairy, coffee etc marketing cooperatives in different rural areas of the country (Chukwu, 1990).

Cooperatives can also be classified based on their organizational level. The smallest individuals set up in the cooperative organizational level are primary cooperatives. They usually cover a limited area of operation. They have individual person as a member. The working capital is obtained from paid up shares of each member. The other organizationally form is secondary cooperatives that strive to meet the interest member cooperatives. The working capital is collected from paid up shares of the constituent primary cooperatives. The third layers in the organizational set up are the tertiary cooperatives. These types of cooperatives usually formed by the secondary cooperatives and the working capital are obtained from paid up shares of the constituent secondary cooperatives (Chukwu, 1990).

The other classification criterion of cooperatives is the sector in which the cooperatives engaged. Cooperatives that engaged in the agriculture sector are classified as agricultural cooperatives. There are many agricultural cooperatives operating in the different sub sector of the agricultural economy: dairy, fishery, coffee, grain, input purchasing, etc.... Industrial cooperatives (small scale industry) engaged in the industry sector. These types of cooperatives include handicraft cooperatives and other metal and woodwork cooperatives. Service cooperatives are those engaged in the service sector of the economy. They usually engaged in the banking, insurance, transport, health, electricity etc (Chukwu, 1990).

The number of operation in which the cooperative engaged is another classification criterion of cooperatives. There are single purpose cooperatives, which have only one field of activity (one

purpose e.g. marketing). There are also multi-purpose cooperatives, which have more than one field of activity (two or more purpose e.g. credit and marketing).

**Multi-Purpose Cooperative Societies:** refer to multipurpose cooperatives unlike single purpose cooperative undertake diversified activities. Multipurpose cooperatives, which functions on the basis of a fully integrated framework of activities, planned according to member's requirements identified at the grass root level, taking the socio-economic life of the farmer members in its totality (Chukwu, 1990).

### **2.1.3 The Cooperative Sector in Ethiopia**

The inter-dependence and the mutual help among human beings have been the basis of social life. Since the beginning of human society individuals have found advantage in working together and helping one another; first in foraging, then in hunting, later in agriculture and still in manufacture (Krishnaswami, 1992).

Cooperation is an age-old tradition that runs through the history of Ethiopian society. For centuries, the spirit of self-help has been an integral part of farming communities. However, despite the existence of 19147 various types of cooperatives in Ethiopia, with a membership of 4.076 million, smallholder farmers are still continued to be under-served, exploited and marginalized (Appendix VII). Since 1991, Ethiopia has been undergoing major political and economic changes. The authoritarian centrally planned and controlled economy of the previous two decades is being replaced by free-market economic development. In line with the government's plan to privatize business, NGOs' funding is helping to restructure these cooperatives to become farmer owned and controlled, democratic and transparent (FCA, 2005).

### **2.1.3.1 Traditional Farmer's organizations**

In Ethiopia farmer's organizations have a long history. The traditional forms of farmer's organizations were not formal types rather they were informal. These organizations vary from place to place according to the culture and economic activities of the area where they undertake their activities. The traditional self-help groups may be classified into two main categories. These are: work groups whose members help each other in rotation or jointly carry out farming activities like (Jigie, Wonfel) and rotating saving and credit type association whose members make regular contributions to a revolving loan fund (Iquib). However, these traditional organizations have not yet been developed to the modern cooperatives or any other kind of business organization (Zerihun, 1998).

### **2.1.3.2 Modern Cooperatives Movement**

Over 40 years have been counted since the modern farmer's cooperatives came into existence in Ethiopia. The first period to the emergence of modern cooperative societies was during the Emperor Haileselesie ruling period in 1961. During the imperial ruling period, modern cooperatives in the agriculture sector came in to existence mainly to undertake commercial agricultural production for export purposes.

During this time the first cooperative legal action was made and it is known by Decree number 44/1961. The main reasons for this decree was the increase in number of unemployment, the fast increase of migration from rural area to urban, the increase in number of students who drop out of their education, and finally the disarmament of the military without proper compensation and pension. Cooperative movement in Ethiopia was started in the 1960s with the launching of the comprehensive agricultural development projects such as the Chilalo Agricultural Development Unit (CADU) (Zerihun, 1998).

Accordingly, the first cooperatives' proclamation known as proclamation number 241/1964 was put in place. Based on this proclamation 158 cooperatives were established with 33, 400 members and 9, 970, 600 Birr total capital. However, the focus was only on potential areas for agricultural production in order to enhance the production of economically important crops/cash crop for export and as a result, land ownership was basic criterion for membership. In most part of the country few landlords owned the land. So from the very beginning, it failed to meet the demand of the marginalized group of farmers. Commercial farmers were encouraged to become members of the cooperatives (Zerihun, 1998).

In 1974, the Military junta overthrown Emperor Haileselesie government and established a socialist type of government. The government proclaimed cooperative organization proclamation in 1978: proclamation number 138/1978. During this era, tremendous efforts were done to promote agricultural service cooperatives as well as producers cooperative societies. However, cooperatives' movement used to suffer from a loss of credibility in the eyes of their members and the public in general because of the political ideology of the then existing government. Up to 1990 there were 10,524 different types of cooperatives with 4,529,259 members and capital of Birr 465,467,428 throughout the country. From these cooperatives 80 percent were rural cooperatives. At that time the then existing government gave due attention for the cooperatives (Zerihun, 1998).

Even though the military government issued a proclamation to promote and support cooperatives, its main target was to promote the socialist ideology through out the rural Ethiopia using cooperative as a means of attaining its objectives. The members were forced to form or join in to cooperatives. Dessalegn (1994) revealed that MoA auditors investigated more than 24 million Birr was misappropriated by the management committee and employees of MPCs. That was



almost the tip of the iceberg, given that audits were carried out on fewer than 25 percent of cooperatives. The members lacked tangible benefits and there was no role to play for members hence sense of ownership gradually degraded (Dessaegn, 1994).

The existing government has shown its commitment for farmer's co-operative promotion since it came in to power in 1991. Initially the Government enacted agricultural co-operative proclamation incorporating the internationally accepted principles. The intension was both to reorganize organize farmer's co-operatives, which can work in the free market economy. The government continued its effort to promote various types of co-operatives through out the country and introduced co-operatives proclamation No. 147/1998. Since then different agricultural and non agricultural co-operatives have been organized and established (FCA, 2005).

Since the enactment of the new act, liberalizing the cooperative movement from direct government control, the movement has witnessed a number of challenges. Where as some of the challenges offer excellent opportunities for the cooperative movement to develop into strong commercial enterprises. Among the challenges, stiff competition, hangover of the past or lack of commitment, globalization and government attitude towards subsidy are the major ones. Hence, democratization of the movement, a change of government role from direct control to advisory role, the legal framework, dividend earnings can be considered as opportunities for the better performances of cooperatives. The 1998 proclamation has created favorable condition for the promotion of cooperatives into higher-level business organization or unions by pooling their resources together. For example, the details advanced forms of existing cooperatives information presented in the table 1 (FCA, 2005).

**Table 1 No of cooperative unions by region**

Region	No of Unions	No of Primaries	Membership			Capital in Mil. Birr
			Male	Female	Total	
Tigray	20	160	86514	30159	116673	5.11
Beneshangul	1	8	21157	273	2430	0.13
Addis Ababa	3	165	0	-	8012	1.74
Oromiya	43	1163	462807	50854	513661	37.73
SNNP	13	273	183163	14243	197406	15.35
Amhara	26	483	430726	45435	476161	24.22
Total	106	2252	1165367	140964	1314343	84.28

Source: Federal Cooperatives Agency, 2005

## 2.2 Basic concepts and definition of Agricultural Marketing

Agricultural input and output marketing plays an active and critical role in economic development. Any improvement in the agricultural marketing system is a means of stimulating agricultural and economic development at national and regional level. Failure to develop the agricultural marketing system is likely to negate most, if not all, efforts to increase agricultural production and productivity. Sustainable food security cannot be achieved without giving due consideration to the development of markets. The food security action needs to be integrated with market development.

**Marketing:** Even though there is no universally accepted definition, most frequently there is no problem in defining marketing which is assumed to include all activities involved in the production, and flow of goods and services from point of production to consumers. Marketing encompasses all activities of exchange conducted by producers and middlemen in commerce for the purpose of satisfying consumer demand. Kotler defines marketing as the set of human activities directed at facilitating and consummating exchanges (Kotler, 2003). American Marketing Association defines marketing as the performance of business activities

directed towards, and incidental to the flow of goods and services from producer to customer or user (Kotler, 2003).

**Marketing Channels:** are sets of interdependent organizations involved in the process of making a product or services available for use or consumption. Marketing channel decisions are among the most critical decisions facing management (Kotler, 2003).

**Agricultural Marketing:** Agricultural marketing is the performance of all business activities involved in the flow of food products and services from the point of initial agricultural production until they are in the hands of consumers. Agricultural marketing also includes the selling to farmers of supplies needed for production. Farm marketing is the connecting link between farm producers and consumers. This link involves physical distribution and economic exchanges.

**Agricultural input:** can be categorized into two types: consumable and capital inputs. The former include manures and fertilizers, seeds, insecticides, pesticides, diesel oil and electricity. On the other hand, capital inputs include tractors, trailers, harvesters and threshers; pump sets, and other implements (Singh, 2002). Agricultural inputs are used to be available for market to improve production and productivity of the agricultural sector.

**Agricultural Output:** agricultural product means any product or commodity, raw or processed, that is marketed for human consumption (excluding water, salt and additives) or animal feed.

## **2.3 Empirical Studies on Agricultural Marketing and Cooperatives**

### **2.3.1 Performances of Agricultural Marketing in Ethiopia**

A well-functioning agricultural market is an important element of agricultural development program. It could enable farmers to get a fair proportion of consumers' price, enhance farm

income and, consequently, allow the process of agricultural intensification to deepen further with a positive impact on poverty reduction. The weak performance of the agricultural markets (both input and output markets) in Ethiopia has been recognized in various studies as a major impediment to growth in the agricultural sector and the overall economy (Dawit, 2004).

With an inefficient marketing system, the surplus resulting from increased production benefits neither the farmers nor the country (Eleni *et al.*, 2004). This is so because the agricultural markets in Ethiopia are highly influenced by the production system itself. Samuel identified that a sustainable utilization of modern farm inputs (agricultural intensification) is a function of financial incentives to farmers, affordability and availability of modern farm inputs. Moreover, production (environmental) and market risks are affecting sustainable technology adoption in Ethiopian agriculture (Samuel, 2006).

Gebremeskel also recognized that most of the agricultural production is undertaken by small scale producers scattered all over the country, engaged in different agricultural enterprises without specialization, and with limited marketable surplus. Therefore, the scattered produce in small quantity needs to be collected and assembled, graded, and transported from one market level to another. Thus, the marketing system is characterized with a long chain with many intermediaries (Gebremeskel, 2002).

Gebremeskel analyzed that with adequate amount and distribution of rainfall, the country can produce enough amount of food that can feed its population both in the surplus and deficit areas provided that the surplus produce in the potential areas is effectively moved to the deficit areas (Gebremeskel, 2002). However, due to weakness of markets, characterized by high transaction costs, high risk, and inadequate communications and transport infrastructure, people living in food deficit areas continue to face famine and food insecurity while producers in surplus regions

endure unattractively low producer prices (Eleni *et al.*, 2004). This shows that the Ethiopian agricultural sector can produce food to meet the needs of the people provided that the sector makes efforts to conserve the rainwater for irrigation and improving the marketing infrastructure in Ethiopia. This is particularly important as the country is following a policy of agriculture led-industrialization and economic development where the agricultural sector is expected to produce surplus that can move to the other sectors of the economy.

### **2.3.2 Empirical Studies of Cooperatives**

The cooperative movement is significant both in terms of membership and impact. The United Nations estimated in 1994 that the livelihoods of nearly 3 billion people, or half of the world's population, were made secure by cooperative enterprises. Nearly 800 million individuals are members of cooperatives. They provide an estimated 100 million jobs. They are economically significant in a large number of countries providing foodstuffs, financial services as well as the provision of services to consumers (ILO, 2005). Cooperatives have created over 13.8 million jobs in India, with 92 per cent of the jobs created through self-employment in the workers' cooperatives. In Japan, the consumer cooperative movement provided 58,281 full-time and 95,374 part-time jobs in 1997 (ICA, 2005).

However, as of the ICA's survey report in 2005, cooperatives, like other enterprises have seen their operations significantly affected by external challenges in the political and economic environment. Despite these, the cooperative movement is promising to a growing potential for cooperative development, and for cooperative renewal, in light of the limitations of the free market in regard to social responsibility and equity, the advantages of decentralization of power, the importance of stakeholder and community involvement in economic and social life, and the growing role of the civil society (ICA, 2005).

### **2.3.3 Empirical Studies Conducted in Ethiopia**

Co-operatives are providing the mechanism to organize and mobilize people for self-help action in providing the services required by farmer members and rural community: farm input supply and output marketing in the agricultural sector. Researchers and practitioners have attempted to conduct studies on cooperative movement of Ethiopia. Some of the empirical studies conducted in the country are summarized in the following:

#### **2.3.3.1 Study on Scope of Services**

As self-administered rural institutions, cooperatives have the capacity to reflect, and to respond to the needs of their members; and, at the same time, to help fostering attitudes of self-reliance and self-confidence within a framework of mutual aspirations and mutual action.

Fassil (1990) in his study showed that in spite of the several tasks bestowed upon peasant service cooperatives, they were mainly engaged in the supply of consumer goods to members followed by grain purchase and selling activities. Even in the activities they engaged, they have lower share compared to those of state and other bodies. The problems of the cooperatives were manifested in the sphere of marketing and management, which includes the problems in the supply of both consumer goods and agricultural inputs, participation in purchase and sale of products especially grain, shortage of skilled manpower and financial management. Farmers' demand to use cooperative as marketing agent for farm produces and input basically dependent on the ability of cooperatives to provide diversified services such as grain mill service, tractors service etc. and other benefits. Hence, provision of different services and benefits is an indispensable means in increasing the participation of the farmers in marketing their farm produces through the cooperatives (Fassil, 1990).

Dessaiegn (1994) revealed that Cooperative auditors from MoA investigated more than 24 million Birr were misappropriated by the management committee and employees of MPCs. That was almost certainly just the tip of the iceberg, given that audits were carried out on fewer than 25 per cent of cooperatives. The members lacked tangible benefits and there was no role to play for members hence sense of ownership gradually degraded (Dessaiegn, 1994).

### **2.3.3.2 Study on Performance of Cooperatives**

Daniel (2006) also used ratios analysis to evaluate performances of cooperatives taking the two years financial data (2001/2 and 2002/3) in the study districts. The liquidity analysis showed that the cooperatives under investigation were below the satisfactory rate (a current ratio of less than 2.00) for two consecutive years. All of the cooperatives under investigation in the two districts use financial leverage (financed more of their total asset with creditors fund i.e. on average 89.35 per cent of the assets of the cooperatives was financed with creditors fund in the two years). The profitability ratio of the cooperatives under investigation in the two districts showed that the profitability of the cooperatives was weak. All the cooperatives earn return on their asset below the interest rate the financial institution extend credit. The debt ratio shows the financial risk i.e. as debt becomes an increasing percentage of the cooperatives' financing source, the cooperatives face inability to meet debt obligations (Dessaiegn, 2006).

### **2.3.3.3 Study on Membership and Members' Participation**

Tesfaye (1995) revealed that producers' cooperatives failed in the past not because of failure inherent in the collective management but because of forced membership with out the interest of the farmers and formation of the cooperatives in hurry without any sufficient preparation and feasibility study. The problem of intervention of the Derg regime in the affairs of cooperatives

i.e. using them for its political ends and the largeness and complexity of the organizations for the managerial capacity of the farmers were also a reason for the failures of the cooperatives (Tesfaye, 1995).

Haileselasie (2003), in his study about cooperatives in Saesi-Tsaeda-Imba, investigated that 78.7 percent of the members became member in cooperatives through mobilization and persuasion by the civil societies such as Farmers, Youth and Women's Associations. As a result, the members' were not aware of the duties and rights they have in the cooperative societies. According to Haileselasie's finding, for example, out of the total respondents members' participation in the annual meeting was 12.2 per cent and 68.8 per cent of the total respondents had bought only one share. The result of the study revealed that the overall participation of members in the study area was weak (Haileselasie, 2003).

Gebru (2006) found out in his study that the participation of women accounts 20-25 per cent in various cooperative types in Tigray region. And he concluded that though women are under represented in membership and leadership, the condition is improving from year to year in the region. Gebru (2006), in his conclusion stated that cooperatives are assisting farmers in far and remote areas of the region to distribute agricultural input and credit. He also concluded that despite international price increases over time for the agricultural input particularly fertilizer, cooperatives are distributing at faire and reasonable price (Gebru, 2006).

### **2.3.3.4 Empirical Studies on Econometric Models/Tobit Model**

Several researchers attempted to apply the Tobit econometric model to study participation of local people in various development activities including cooperatives, and adoption of new and/or improved technologies. Getahun (2004) used Tobit model in assessing factors affecting adoption



of wheat technology. His analysis showed that fertilizer use, income and credit influenced the probability of adoption and intensity of improved wheat varieties.

Klein et al. (1997) used Tobit model to analyze the amount business conducted with different type of cooperatives. The research result revealed that relatively larger sized farms did a great proportion of grain marketing and chemical purchases through the cooperatives and bought more of their fuel from the cooperatives. Older farmers patronized all types of cooperatives more than younger farmers except for farm chemical. At the highest level of off-farm income, grain farmers used the cooperative more intensively. The perception of competitive price led to a higher rate of patronage.

Tefera (2004) also used Tobit model in identifying the determinants of smallholder farmers' demand for non-formal credit. The result showed that gender of the household head, number of children below fourteen years of age, fertilizer use and interest rate on the credit were found to determine the demands for non-formal credit.

Gizachew (2005) in his study recognized that Market participation and sales volume decisions are found to be important elements in the study of dairy marketing patterns. He used Participation in dairy sale as dichotomous dependent variable and examined using the Maximum Likelihood Estimation procedure of logit model. As a result, Participation decision of the smallholder was affected by education of household head, experience in dairy production, and return time from the district capital and financial income from different sources. The sales volume decision of dairy was analyzed using Tobit model. Education of the household head, extension visit, and return time from the district capital, financial income from different sources, credit, grain production and crossbred dairy cows were important determinants affecting volume of dairy sales.

Daniel (2006) used Tobit regression model to identify the factors influencing farmers' marketing of teff through the cooperatives in his study districts. The model result revealed that among 17

explanatory variables included in Tobit model, 10 were found to be significant at less than 10 per cent probability level: family size, cooperative price for teff, position in the cooperative, farm size, yield of teff, patronage refund, fertilizer credit, distance of the cooperative from the farmer's house and distance of the district (main) market from the farmer's house were found to be significantly related to the farmers' marketing of teff through the cooperatives. And among these significant variables district, Cooperative price for teff, position in the cooperative, farm size, yield of teff, patronage refund and distance of the district market from the farmer's house were found to be significantly and positively related to the farmers' marketing of teff through the cooperatives.

It could be inferred from the above studies that the potential of co-operation is immense to Ethiopian condition and appear well suited to the economic, social and institutional needs of development in the rural Ethiopian economy.

# **CHAPTER III**

## **MATERIALS AND METHODS**

### **3.1 Site Selections and Description of the Study Area**

#### **3.1.1 Location and Physical Features of the Study Area**

The Tigray National Regional State is situated between 12<sup>o</sup> 15' and 14<sup>o</sup> 57' N latitude and 36<sup>o</sup> 27' and 39<sup>o</sup> 59' E longitude. It is bordered to the North by Eritrea; to the West by the Sudan, to the South by Amhara and to the East by Afar Regional States. It covers a total of 53,638 square km surface area. It belongs to the African dry lands, which are often called as the Sudano-Sahelian Region (BoFED, 1998). The study area, Eastern Tigray Zone, is located in the northern most part of Tigray region. It is bordered with Afar in the East, Southern East Tigray in the south, Central Tigray in the west and Eritrea in the north. Eastern zone has six districts and 94 tabias (Peasant Associations). Total area of the Zone is 4717.5 km<sup>2</sup> (CSA, 2006).

The two districts of the study area, Saesi-Tsaeda-Imba and Atsiby Womberta, are found in Eastern Tigray Zone. Saesie-Tsaeda-Imba district is located in the eastern zone of Tigray region on which the capital Firewoyni is located 60 km far from Mekelle, on the way from Mekelle to Adigrat. It has a total area of about 933.12 km<sup>2</sup>. It is divided into 24 administrative PAs of which 22 are rural and two Kebeles are town administration. Atsiby Womberta is located about 65 km north east of the Tigray Regional State capital of Mekelle. About half of the distance from Mekelle to the capital of the district, Endasselassie, is off the main road to the east branching at

the town of Agula'e. Total area of the district is 885.3 km<sup>2</sup> (CSA, 2006). It is divided into 16 administrative 'tabias' (PAs) and two towns administrative.

Moreover, the survey conducted by UNDP, 1998 for socio-economic study for the land use indicated that in the total area of Eastern zone 437,118.2 hectares, 58.04 per cent is cultivated, 9.36 per cent for grazing land, 17.66 per cent for forest and bush land, and the rest 14.96 per cent is classified as miscellaneous land (BoFED, 1998).

The mean annual temperature ranges from 15 to 19<sup>o</sup>c. The climate of the zone is classified into three agro-climatologic resources: High land representing 73.4 per cent, Midland 12.6 per cent and lowland 14 per cent. The altitude of the area ranges from 1500m-3200m.a.s.l. (BoARD, 2004). The average annual rainfall of eastern zone ranges from 400-800mm (BoARD, 2004). The major soil types in the area include black clay loam 'Walka' (20.3 percent), red clay loam 'Baekel' (36.8 per cent), sandy soil 'Hutsa' (31.8 per cent), red sandy loam 'Mekhah' (6.3 per cent) and mixture of black and red clay loam (4.8 per cent) (BoARD, 2004).

### **3.1.2 Demographic Features of the Study Area**

According to July 2006 estimates of CSA, the region has a total population of 4,334,996 of which 2,136,000 were male and 2,198,996 were female. The female population was slightly more than the male population, that is, 50.7 per cent. The rural population of the region has been 3,518,996 representing 81.2 per cent of the total (CSA, 2006). The region has a total of 750,160 households out of which over 83 per cent, that is, 597,872 were rural households. Total population of the zone as of July 2006 is 686,564. The female population accounts for about 52.1 per cent and remaining 47.9 per cent are male. The urban population of the Zone is estimated to be 18.4 per cent (CSA, 2006).

According to the CSA estimation as of July 2006, the total population was estimated to be 113,966 and 138,291 for Atsiby Womberta and Saesie-Tsaeda-Imba district respectively. The female proportion is estimated to be 52.7 per cent and 53.6 per cent for both Saesie-Tsaeda-Imba and Atsiby Womberta districts respectively. The districts have a population density of about 128.7 persons per km<sup>2</sup> for Saesie-Tsaeda-Imba and 148.2 persons per Km<sup>2</sup> for Atsiby Womberta.

### **3.1.3 Economic Activities of the Study Areas**

Crop production in the region as well as in the study area is cereal dominated. Cereals account for 84 per cent of the cultivated land, while oil crops and pulses constitute 9 and 7 per cent, respectively (BoARD, 2000). A review of the area under different crops for the past five to six years shows that sorghum, barely and teff are the three most import cereal crops in the region, in terms of area coverage. It has also been estimated that there is 300,000 ha of potential irrigable land in the Region (BoARD, 2004).

Like in other parts of the country, the farming techniques used by most farmers in the study areas are traditional and the dominant farming system is crop-livestock mixed farming. Livestock also constitute an important part of the rural economy of the region, the zone as well as the districts of the study area. Eastern Tigray Zone is believed to account for about 14 per cent of the region's livestock population. Livestock are kept partly as capital, which can be turned into cash when required (Table 2).

Similar to other parts of Ethiopian highland, the districts enjoy subtropical climate, which allows the cultivation of a wide range of crops. Crop production in both Saesi-Tsaeda-Imba and Atsiby is almost entirely dependent on rainfall. The main crops grown in the districts include teff, maize, wheat, barely, sorghum, millet, chick peas and beans. However, most parts of the study area suffer from unreliable erratic pattern of precipitation, which often results in crop failure. Crop

and livestock yields are very low. The main production and productivity constraints are land degradation which resulted in poor soil fertility. Increasing population pressure of both human and livestock exacerbated the degradation process.

**Table 2 The livestock population in the study area**

S. No	Type of Livestock	Eastern Tigray*	Tigray*
1	Cattle	291405	2622166
2	Sheep	338565	789064
3	Goat	169232	2399807
4	Equine	70681	393594
5	Camel	Data Not Available	30905
6	Poultry	420529	3131239
7	Beehives	39576	182341

Sources: \* CSA Sample Survey Estimation (2006)

### **3.1.4 Agricultural extension and Infrastructure of the Study Area**

The existing agricultural extension services, though it is inadequate to support a major expansion in farm production, have brought remarkable changes in terms of area coverage and service provision, over the last decade. The total numbers of extension centers have reached 36 in 2006 in both districts Atsiby and Saesi-Tsaeda-Imba. The number of extension agents increased to 108 over the same period. Currently three extension workers/DAs are placed at each Peasant Associations to provide technical assistance in crop, livestock production and Natural Resource Management. Most of the DAs have diplomas and/or certificates i.e they are graduates from recently established agricultural colleges.

The existing road network is inadequate and poor. The asphalt road connects the district capital, Firewoyni town with Mekelle, Wukiro, Idagahamus, Adigrate and other small villages located on the main road. The same condition is witnessed in Atsiby Womberta in road networks. The all weather road branched from Agula'e Town to the east crossing Haik Mesahil, Endasselassie and Dessia Towns. The other all weather road stretches from Wukiro to Endasselassie. Small villages along side the roads are benefited from the transportation services. Otherwise, the remaining rural

roads in the two districts are dry whether roads which are rough, unfit for transportation of agricultural products for they lack regular maintenance. Donkeys and human portage are commonly used to transport produce to the local markets and to take supplies from such points to the farm.

### **3.1.5 Marketing and credit services of the Study Area**

Markets in Tigray, as is in other parts of the country, serve as media for rural commodity and manufactured product exchange. Despite the economic role, local markets also have social and political role to enhance the exchange of information and views among the local people. Most frequently, the farmers in the study area used to sell their produce directly to consumers in the near by local markets. Sorghum, oilseeds, teff, wheat, barley, gum and incense, livestock and livestock products such as cattle, goat and sheep, honey and hide and skin are the most important outputs produced in abundance. Inadequate standardization and grading methods, traditional units of measurement characterize the marketing system in the study area across the open-air markets and poor transport and communication facilities. The major primary markets in the districts' towns are Idaga Hamus, Frewoyini, Endasilassie, Desse'a and Haik-Mesahil town markets. Cooperatives' role with regard to output marketing in the study area is limited in purchasing food grains from the surplus producing areas in the harvest period /inside and outside the region/ to distribute during dry period (TCPO, 2004). This is so because the area is known as drought prone, the farmland holding is small and fragmented and as a result, productivity is very poor.

With regard to input marketing, AISE and Guna Trading House were the major suppliers for more than 10 years. Currently, however, Inderta Cooperatives Union came to involve in fertilizer import and distribution in the Region. Inderta Cooperatives Union is the sole supplier of fertilizer in collaboration with other primary level cooperatives through out the region for the last two

cropping seasons. Seed and chemicals (pesticide, fungicide, etc...) supply is so far done by the BoARD while cooperatives and district input experts are involved in distributing to farmers.

As far as the provision of institutional farm credit is concerned, most farmers have an access to Dedebit Rural Credit Services (DECSI), Rural Saving and Credit Cooperative (RuSACCOs) and the Multi-Purpose Service Cooperatives. However, since 2000, the role of cooperatives in credit provision is increasing from year to year. Sources of loan for cooperatives are Commercial Bank of Ethiopia (CBE) through regional government budget collateral and European Union (EU) and World Bank through the Regional Food Security Coordination Office. The CBE's loan is working in almost 32 districts of the region both short term and medium term loan; while the EU/World Bank loan is disbursed in 25 districts in the form of medium term loan.

All possible sources of loans through cooperatives are working in the study area. Easy access and timely availability, simple and low costly, and proximity are the main reasons supposed to determine farmers' to shift their demand for loan via cooperatives. Following the initiative of VOCA/Ethiopia to launch the promotion of rural micro finance cooperatives in 2001 and later on, in 2003 by RUFIP, RuSACCOs also are becoming important sources of loan to their members (TCPO, 2005).

### **3.1.6 Cooperatives Sector in the Study Areas**

According to the 2005's Tigray Cooperatives Promotion Office (TCPO) report, the total number of primary cooperative societies at regional level is 1309, of which 582 primary cooperative societies are Multi-Purpose Cooperative Societies having total number of membership of about 338,242 members (93.79 per cent of the total members of different kinds of cooperative societies). Of which 555 MPCs are registered at the regional and district level promotional

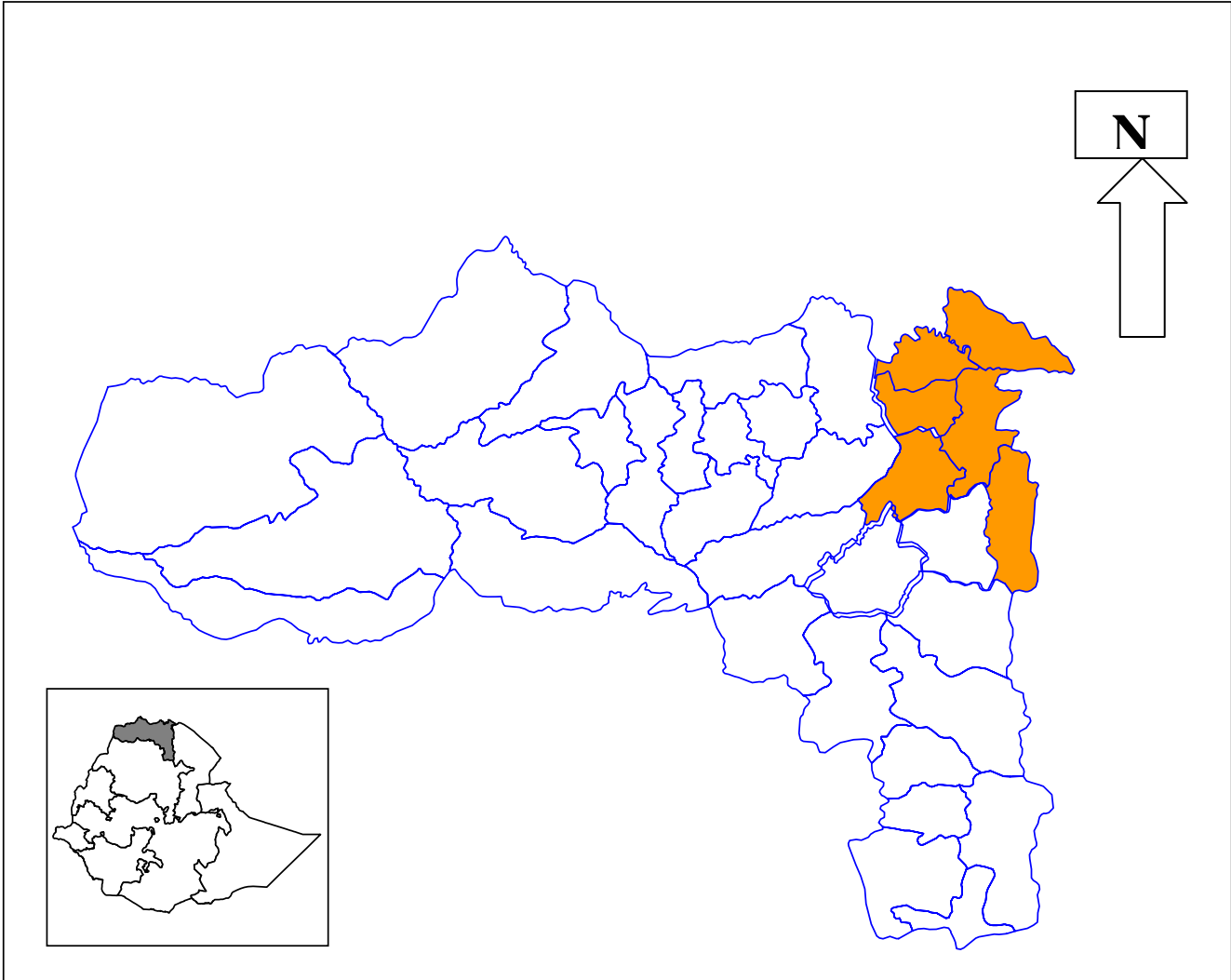


offices (TCPO, 2005). From the above data, it is possible to say that the agricultural multipurpose cooperatives have wider base in area coverage and membership.

Currently, there are 12 Multi-Purposes, 11 Water Users Associations (WUAs), two handicrafts and 6 Rural Saving and Credit Cooperatives (RuSACCOs) in Saesi-Tsaeda-Imba and 16 Multi-Purposes, 6 WUAs, 5 RuSACCOs and two dairy cooperatives in Atsiby Womberta (DCPD, 2007). The total number of members of MPCSSs increased from 13618 in 2003 to 14832 in 2007 in A/Womberta while in Saesi-Tsaeda-Imba it increased from 11003 to 17560 members of same years (DCPD, 2007). In the year 2007 the proportion of female to total membership constitutes about 43.4 and 34.8 per cent for Atsiby Womberta and Saesi-Tsaeda-Imba respectively. According to Audit report of each district the total capital of MPCSSs (2003) registered was 973, 846.91 birr and 157, 967.46 birr for Saesi-Tsaeda-Imba and Atsiby Womberta respectively. The capital of same MPCSSs increased in the year 2007 to 2,401,907.09 and 322,354.19 birr for Saesi-Tsaeda-Imba and Atsiby Womberta respectively (Appendix VIII).

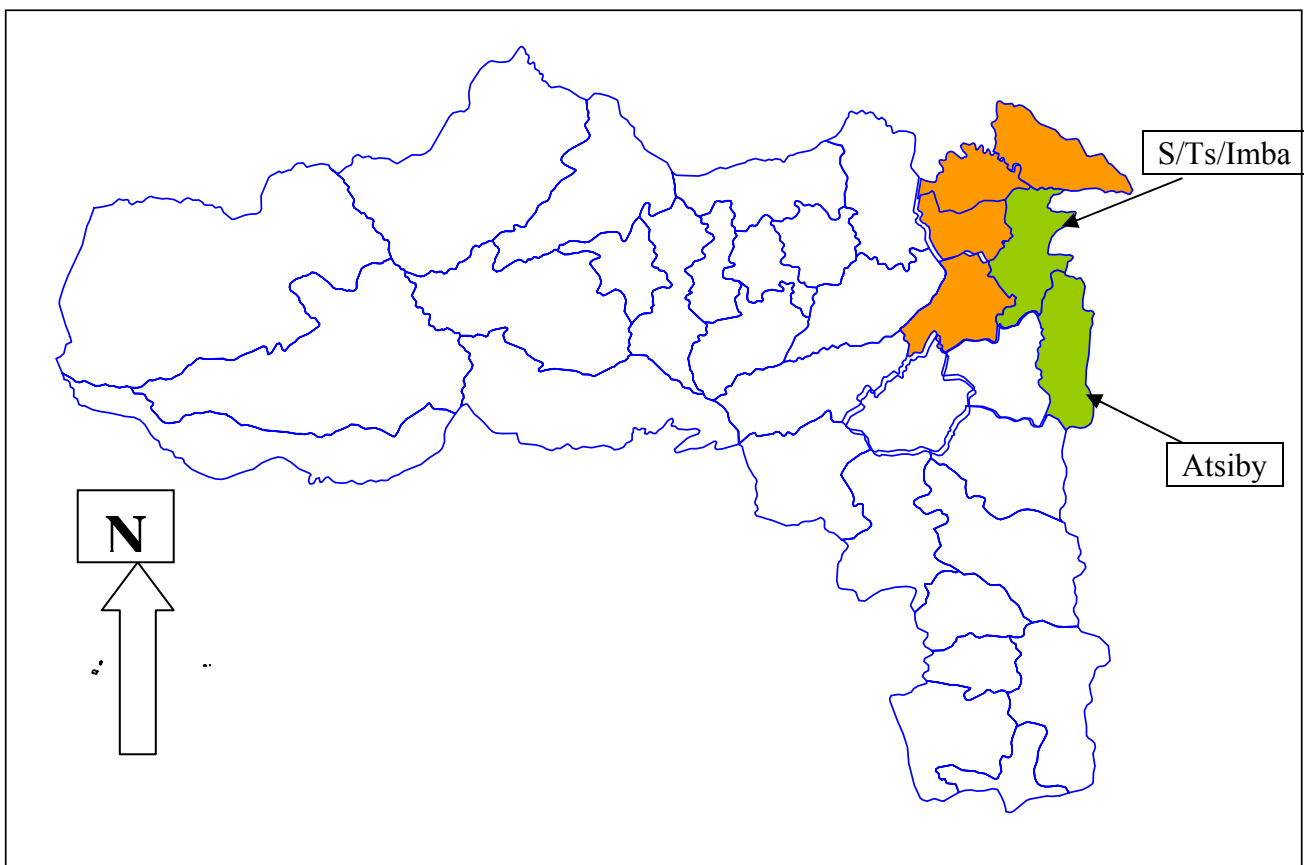
The government of the region is providing promotional and regulatory services to the cooperatives at regional and district level. Particularly, the district level promotional department is responsible to organize the people on voluntarily basis, register and provide technical assistance and keep the momentum of cooperatives development in their course of service provision to the members. To do so the promotional department is organized at district level into the organization and promotion team, marketing and credit team and auditing and registrar team. Each team is consisted of three experts. Besides, one team leader for each team and one department head are appointed to coordinate the overall effort of the department (DCPD, 2007).

**Fig. 1 Map of Eastern Tigray Zone, Tigray Regional National State, Ethiopia**



Source: UNDP Documentation (1998)

**Fig 2 Map of Atsiby Womberta and S/Ts/Imba**



Source: UNDP Documentation (1998)

### 3.2 Sampling Methods

The ultimate objective of sampling is to select a set of elements from a population. Random sampling enhances the likelihood of accomplishing this objective and also allows for the objective assessment of the reliability of the sample. Eastern Tigray Zone comprises of seven districts and 94 Kebeles having a total number of 117,000 households (CSA, 2004). The zone is classified into two big agro climatic zones: High land and Mid Land/Low land. Accordingly, two districts were selected randomly, one from the highland and one from the lowland/midland in order to have proportional representation to the agro-climatological condition of the zone. Thus Saesi-Tsaida-Imba and Atsiby-Womberta districts were selected for the study. There are 16 MPCSSs in Atsiby-Womberta and 12 MPCSSs in Saesi-Tsaeda-Imba districts. Hence four MPCSSs from Atsiby-Womberta and three MPCSSs from Saesi-Tsaeda-Imba were selected randomly for the research (Table 3).

The probability proportionate technique to determine the sample size was followed. Hence the total numbers of the member respondents selected are 162 from all the seven MPCSSs. The proportion of sample size from the total number of members of the sample MPCSSs is 1.556 per cent. The sample size is sufficient to collect adequate primary data from the study areas. The sample size for the study is determined in the following way:

$$\text{Maximum Margin of Error (5\%)} = Z \sqrt{(P/1-P)/n} \quad (1)$$

$$5\% e = 1.96 \times \sqrt{0.12(0.88)/n}$$

$$5\% e = 1.96 \times \sqrt{0.1056/\sqrt{n}}$$

$$5\% = 0.636/\sqrt{n}$$

$$n = 161.8 \sim 162s$$

Where, n = minimum sample size

P% = the proportion belongs to the target population

Z = the value of the level of corresponding to the level of confidence required

e = the margin of error required (95%).

The target population in the two districts is 12 per cent of the total number of members in the zone, level of confidence 95 per cent, which corresponds to Z score of 1.96. Hence, the sample size was fixed as 162 members, which is enough to meet the minimum requirement for the sampling.

**Table 3. Randomly Selected MPCSSs, total membership and sample sizes.**

S. No	Woreda/MPCSs Name	Membership in Number			Sample Size (1.556%)
		Male	Female	Total	
1	Atsiby Womberta	<b>2122</b>	<b>1764</b>	<b>3886</b>	<b>61</b>
1.1	Mahibere bokur	707	516	1223	19
1.2	Bahelo Adi-shum akeb	513	362	875	14
1.3	Haile Manjus	498	531	1029	16
1.4	Sur-Anbesa	404	355	759	12
2	Saesi-Tsada-Imba	<b>4313</b>	<b>2208</b>	<b>6521</b>	<b>101</b>
2.1	Mahibere-Genet	922	522	1444	22
2.2	Ibyet Behibret	1676	767	2443	38
2.3	Fire-Hiwot	1715	919	2634	41
	<b>Total</b>	<b>6435</b>	<b>3972</b>	<b>10407</b>	<b>162</b>

Source: TCPO 2005

### **3.3 Data Collection Procedures and Sources**

It is obviously known that data are of two broad types with regard to sources: primary and secondary. Both secondary and primary data on a wide variety of variables were required to meet the objectives of the study. Based on the literature reviewed and observations made in the area, it is envisioned that huge database is required. A combination of qualitative and quantitative approaches was employed to collect data. The information required, with regard to secondary data, include: both financial and physical quantity of purchased and sold of agricultural input/output, recording of activities, data related to production, purchases, sales, members, assets, credits disbursed and collected, employees, profits/losses.

Most of the data related to the performance of the cooperatives were collected for about five years from each of the seven primary Multi-Purpose Cooperative Societies. Secondary data were obtained from various sources such as reports of MoARD, Bureau of Finance Economic Development, cooperatives, etc at different levels. Maps, information from NGOs operating in the area and other published and unpublished materials, which were found to be relevant for the study, were utilized.

Primary data were collected from sample respondents through using a structured interview schedule, which was designed to generate data on some social, institutional and economic variables that are supposed to be important for the study. Important data collected from the primary sources include, farmers access to input and credit, annual income and expenditure, members duration in cooperatives, access to market, perception on input and output prices, loan available, access to extension facility, farm size, livestock holding, other socio-economic characteristics, like on and off-farm income, age of household heads, gender, family size,

educational level, participation in cooperatives, perception, etc. The primary sources of data were sample farmers.

The data were collected in between August-November 2007. Twelve Tenth-grade completed who speak the local language were recruited from the study area and acquainted with the questions, trained on methods of data collection and interviewing techniques. Interview schedule was developed in English and later translated into local language, Tigrigna. Besides, field trips were made before the actual survey to observe the overall features of the selected cooperatives and to pre-test the interview schedule. For pre-testing purpose, 12 farm households outside the sample farmers were interviewed, at the rate of one farmer by each enumerator. After pre-testing, a second meeting was held with the enumerators to discuss on their field experiences, clarity of questions, language, unexpected responses and additional response options for the questions. After incorporating corrections, the final version of the interview schedule was prepared (Appendix VII). Continuous supervision was made by the principal researcher to correct possible errors on the spot.

### **3.4 Method of Data Analysis**

Farmer members' participation behavior, especially in low income countries, is influenced by a complex set of socio-economic, demographic, technical and institutional factors. Modeling farmers' response to cooperatives' intervention in agricultural input/output marketing has, therefore, become important both theoretically and empirically. Several models are available to analyze factors affecting members' participation in cooperative affairs. The choice of a member to participate or not may depend upon several factors. Some of these alternative models are briefly discussed below.

### **3.4.1 Functional and Organizational Performances**

To meet the first objective of the study, to evaluate Performance of Cooperatives, an attempt was made to describe the functions and organizational status of MPCSSs. Cooperatives' Function and Performance refers to the ability of cooperatives in accomplishing their planned activities within specified time and required budget allocated. Based on the data available at the district promotional offices and cooperatives, it was attempted to evaluate the function and performance of cooperatives in input output marketing, credit service provision, capital accumulation, membership number, profit and loss using simple percentage analysis. But simple percentage analysis was not adequate to evaluate cooperatives performance.

### **3.4.2 Financial Performance/Ratio analysis**

The researcher used different financial ratio analysis. Financial ratios can be designed to evaluate cooperative's performance. Ratios can be used as one tool in identifying areas of strengths or weakness in cooperatives. Financial ratios enable to make comparison of cooperative's financial conditions over time or in relation to other cooperatives. Ratios standardize various elements of financial data for differences in the size of a series of financial data when making comparisons over time or among cooperatives.

#### **3.4.1.1 Liquidity ratio**

A cooperative, which intends to remain viable business entity, must have enough cash on hand to pay its debts as they come due. In other words, the cooperatives must remain liquid. One way to determine the case is to examine the relationship between a cooperative's current assets and current liabilities. Liquidity ratio also is quick measure and means to ensure whether the cooperative is capable to provide sufficient cash to conduct business over the next few months.



According to Birmingham and Houston (1998) pointed out that one of the most commonly used liquidity ratio is the current ratio that is computed by dividing current asset by current liabilities.

$$\text{Current ratio} = \frac{\text{Current asset}}{\text{Current liability}} \quad (2)$$

#### **3.4.1.2 Financial leverage management ratio**

Whenever a cooperative finance a portion of asset is related with any type of financing such as debts, the cooperative is said to be using financial leverage. According Birmingham and Houston (1998) financial leverage management ratio measures the degree to which a firm is employing financial leverage. According to these authors, of the several types of financial leverage ratios, debt ratio is commonly used. It measures the portion of a firm's total asset that is financed with creditors' fund. It is computed by dividing total debt by total asset.

$$\text{Debt ratio} = \frac{\text{Total debt}}{\text{Total asset}} \quad (3)$$

#### **3.4.1.3 Profitability ratio**

Profitability is the net effect of a number of policies and decisions. Profitability ratios measure how effectively a firm's management was generating profits on sales, total assets, most importantly stockholders' investment (Birmingham and Houston, 1998). These authors also suggested that the most commonly used profitability ratio refers to the return on total asset, which is computed by dividing net income by total asset.

$$\text{Return on total asset} = \frac{\text{Net income}}{\text{Total asset}}$$

(4)

### 3.4.3 Descriptive Analysis and Econometrics Model

The study of analysis role of cooperatives in input/output marketing is based up on dichotomous regression models. As a result it needs to explain the probability of participation on cooperative affairs to use as marketing means or channel including the extent and intensity of participation index. Knowledge that a member farmer is participating in cooperatives business may not provide much information about his extent of participation in the cooperative. A strictly dichotomous variable often is not sufficient for examining the intensity of members' participation in cooperatives.

Discrete regression models are models in which the dependent variable assumes discrete values. The simplest of these models is that in, which the dependent variable Y is binary (it can assume only two values denoted by 0 and 1) (Amemiya, 1985; Gujarati, 1988 and Maddala, 1997). According to Amemiya (1985); Gujarati (1988) and Maddala (1997), the three most commonly used approaches to estimating such models are the Linear Probability Model (LPM), the Logit model and the probit model. The Linear Probability Model is the model, which expresses the dichotomous dependent variable (Y) as a linear function of the explanatory variable (X). Because of its computational simplicity, LPM has been used in econometric applications especially during and before the 1960s.

However, as indicated by Maddala (1997), Amemiya (1985) and Gujarati (1988) the linear probability model has an obvious defect in that the estimated probability values can lie outside

the normal 0-1 ranges. The fundamental problem with the LPM is that it is not logically a very attractive model because it assumes that the marginal or incremental effects of explanatory variables remain constant, that is  $P_i = E(y=1/X)$  increases linearly with X (Maddala, 1997 and Gujarati, 1988).

The limitation of the linear probability model suggests that there is a need to have an appropriate model in which the relationship between the probability that an event will occur and the explanatory variables is non-linear (Gujarati, 1988; Maddala, 1997). The authors suggested that the sigmoid or S-shaped curve, which very much resembles the Cumulative Distribution Function (CDF) of random variable, is used to model regressions where the response variable is dichotomous, taking 0-1 values. The Cumulative Distributions Functions (CDFs), which are commonly chosen to represent the 0-1 response models, are the Logit (logistic CDF) model and the Probit (normal CDF) Model.

Logit and Probit models are the convenient functional forms for models with binary endogenous variables (Johnston and Dinardo, 1997). These two models are commonly used in studies involving qualitative choices. To explain the behavior of dichotomous dependent variable we have to use a suitably chosen Cumulative Distribution Function (CDF). The Logit model uses the cumulative logistic function. But this is not the only CDF that one can use. In some applications the normal CDF has been found useful. The estimating model that emerges from normal CDF is popularly known as the probit model (Gujarati, 1995). The logistic and probit formulations are quite comparable, the chief difference being that the logistic has slightly flatter tails, which is the normal curve approaches the axes more quickly than the logistic curve. Therefore, the choice between the two is one of mathematical convenience and ready availability of computer programs (Gujarati, 1988).

### **3.4.3.1 The Tobit Model**

Members' Participation studies based upon dichotomous regression models may attempt to explain only the probability of active participants versus passive-participants rather than the extent and intensity of members' participation. Knowledge that a member is actively participating may not provide much information about members' behavior because he/she may be using 1 percent or 100 percent of his/her level or intensity of participation in the cooperatives' affairs. Similarly, with respect to involving in exercising their right in decision, purchasing of input or selling their output to the cooperatives and so on, a member may be involving in lower level or at large intensity. A strictly dichotomous variable often is not sufficient for examining the intensity of participation.

There is also a broad class of models that have both discrete and continuous parts. One important model in this category is the Tobit. Tobit is an extension of the Probit model and it is really one approach to dealing with the problem of censored data (Johnston and Dinardo, 1997). Some authors call such models limited dependent variable models, because of the restriction put on the values taken by the regressand (Gujarati, 1995).

Examining the empirical studies in the literature, many researchers have employed the Tobit model to identify factors influencing the participation of members in cooperatives as well as other aspects of development efforts. For example, Daniel (2006) and Gizachew (2005), used the Tobit model to estimate the probability and the intensity of farmers market participation in agricultural produces.

### 3.4.3.2 Specification of the Tobit Model

The econometric model applied for analyzing factors influencing participation and intensity of members' participation in cooperatives is the Tobit model shown in equation (5). This model is chosen because, it has an advantage over other models (LPM, Logistic, and Probit) in that, and it reveals both the probability of participation of members and intensity of their participation.

Following Maddala (1992), Amemiya (1985) and Johnston and Dinardo (1997), the Tobit model can be defined as:

$$Y_i^* = \beta X_i + u_i \quad i = 1, 2 \dots n$$
$$Y_i = Y_i^* \text{ if } Y_i^* > 0 \quad (5)$$
$$= 0 \text{ if } Y_i^* \leq 0$$

Where,

$Y_i$  = the observed dependent variable, in our case the index of intensity of participation.

$Y_i^*$  = the latent variable which is not observable.

$X_i$  = vector of factors affecting members' participation and index of participation

$\beta$  = vector of unknown parameters

$u_i$  = residuals that are independently and normally distributed with mean zero and a common variance  $\sigma^2$ .

Note that the threshold value in the above model is zero. This is not a very restrictive assumption, because the threshold value can be set to zero or assumed to be any known or unknown value (Amemiya, 1985). The Tobit model shown above is also called a censored regression model because it is possible to view the problem as one where observations of  $Y^*$  at or below zero are censored (Johnston and Dinardo, 1997).

The model parameters are estimated by maximizing the Tobit likelihood function of the following form (Maddala, 1997 and Amemiya, 1985).

$$L = \prod_{Y_i^* > 0} \frac{1}{\sigma} f\left(\frac{Y_i - \beta_i X_i}{\sigma}\right) \prod_{Y_i^* \leq 0} F\left(\frac{-\beta_i X_i}{\sigma}\right) \quad (6)$$

Where  $f$  and  $F$  are respectively, the density function and cumulative distribution function of

$Y_i^*$ .  $\prod_{Y_i^* \leq 0}$  means the product over those  $i$  for which  $Y_i^* \leq 0$ , and  $\prod_{Y_i^* > 0}$  means the product over

those  $i$  for which  $Y_i^* > 0$ .

An econometric software known as “Limdep” was employed to run the Tobit model. It may not be sensible to interpret the coefficients of a Tobit in the same way as one interprets coefficients in an uncensored linear model (Johnston and Dinardo, 1997). Hence, one has to compute the derivatives of the estimated Tobit model to predict the effects of changes in the exogenous variables.

As cited in Maddala (1997), Johnston and Dinardo (1997), McDonald and Moffit proposed the following techniques to decompose the effects of explanatory variables into participation and intensity effects. Thus, a change in  $X_i$  (explanatory variables) has two effects. It affects the conditional mean of  $Y_i$  in the positive part of the distribution, and it affects the probability that the observation will fall in that part of the distribution. Similar approach is used in this study.

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

$$\frac{\partial E(Y_i)}{\partial X_i} = F(z) \beta_i \quad (7)$$

Where,  $\frac{\beta_i X_i}{\sigma}$  is denoted by z, following Maddala, (1997)

2. The Change in the probability of participating in cooperatives as independent variable  $X_i$  changes is:

$$\frac{\partial F(Z)}{\partial X_i} = f(z) \frac{\beta_i}{\sigma} \quad (8)$$

3. The change in intensity of participation with respect to a change in an explanatory variable among active participants is:

$$\frac{\partial E(Y_i / Y_i^* > 0)}{\partial X_i} = \beta_i \left[ 1 - Z \frac{f(z)}{F(z)} - \left( \frac{f(z)}{F(z)} \right)^2 \right] \quad (9)$$

Where,  $F(z)$  is the cumulative normal distribution of  $Z$ ,  $f(z)$  is the value of the derivative of the normal curve at a given point (i.e., unit normal density),  $Z$  is the z-score for the area under normal curve,  $\beta$  is a vector of Tobit maximum likelihood estimates and  $s$  is the standard error of the error term.

Using descriptive statistics it is also possible to compare and contrast different characteristics of the sample member households along with the econometric model. Hence, descriptive statistics such as mean, percentage and standard deviation are computed to analyze the collected data.

With regard to fourth objective, percentage analysis was employed to study and interpret the problems of societies, which determine the performance of the cooperatives. Finally, the researcher summarized the members' suggestions based on the result of the analysis and discussions.

## 3.5 Definition of Variables

In this particular study the main socio economic and demographic variable hypothesized to differentiate between active participants and non-participants of members' on agricultural input/output marketing of Cooperatives include the following:

### 3.5.1 The dependent variable ( $Y_i$ )

#### **Members' Participation and intensity of participation in cooperatives**

**Members' Participation:** refers to the tendency of the members to actively associate in planning, executing and monitoring and evaluation of activities related to cooperatives. The dependent variable for analysis is dichotomous nature representing the observed status of members' participation in cooperatives affairs including in agricultural input/output marketing. Depending on the index result of each respondent, the respondents were categorized into two groups: passive and active members. The respondents who scored 0.5 and above values were grouped as actively participating members (APM), while the others who scored below 0.5 value was grouped as passive participant members (PPM).

**Participation Index (PI):** is the yardstick or standard to measure the level of the participation of members in various activities related to cooperatives. Moreover, index of participation of members in cooperatives was also a complementary dependent variable, which is useful to identify determining factors that affect the intensity of members' participation. In order to measure level of participation in cooperative undertaking, the researcher has identified the most important indicators of participation. Accordingly, the researcher selected the following indicators: Attending annual meeting, approving the by-law/amendment, annual plan and budget, audit report, determining share values, sharing responsibilities, evaluating and approving executed activities report to measure members' involvement members' willingness to exercise



their democratic rights; and buying and selling (Input/Output), using available loan using the services rendered, and buying additional share capital to measure members' economic participation. This information was collected from the sample households through interviewing method. The qualitative nature of the indicators measured by scoring was organized to develop participation index, by simply adding the scorings and divided to the total possible maximum score in order to identify whether member was participating actively or not.

Therefore, the dependent variable of the Tobit model has continuous value. As observed in different empirical studies the dependent variable can be expressed in terms of ratio, actual figure and log form depending on the purpose of the study. As a result, in analyzing the role of cooperatives in input/output marketing the factors that influenced members' to decide participate in cooperatives was substantiated as index of intensity of members' participation as the dependent variable of the Tobit model.

### **3.5.2 The independent variables**

Members' decision to participate in cooperatives' affairs and the intensity of their participation in a given period of time is hypothesized to be influenced by a combined effect of various factors such as household characteristics, socio-economic and physical environments in which the members are operating. Based on the brief literature review in this study a total of 25 variables are hypothesized to explain the dependent variable of the study.

**Age of the member (MEMAGE):** is defined, as number of completed years of the respondent or member. It is continuous variable. The assumption in the study is that as age progress farmers acquire experience and knowledge in participating and the intensity of members' participation in the cooperatives. In this regard, this variable is hypothesized to positively influence members' participation and members' intensity of participation.

**Sex of the members (MEMSEX):** represents to the characteristics of the members in terms of masculine and feminine. It is dummy variable. Hence male members score 1 and otherwise zero. It is expected that male-headed households have more experience and access in participating in the cooperatives.

**Family size of members (MEMFASI):** - Family size is number of persons in the family. It is a continuous variable. The larger the family members, the more the labour force available for production purpose, the less the probability to be weak in participating in input/output marketing of the society. On the contrary to this fact large family size may imply self-insufficiency because large households consume more than do the small households. Therefore, the coefficient of this variable may show negative or positive sign.

**Education level of the members (MEDUST):** - This represents the level of formal schooling completed by the members. It is a discrete variable where "0" represents illiterates, "1" represent read and write "2" represents 1-8<sup>th</sup> grade, "3" represent 8-12<sup>th</sup> grade and "4" represent above 12<sup>th</sup> grade. Educated members are expected to have more exposure to the external environment and accumulated knowledge through learning. Moreover, educated members are familiar with their duties and rights they have in cooperatives and keep in touch to take right decision. Therefore, educated members would be expected to have active participation experience.

**Farming experience (MEFAREX):** - This represents the total number of years that the member has spent in cultivating his/ her own farming. It is a continuous variable. It is believed that experience teaches and trains members with respect to farming operations. Hence, more experienced members are more likely to be patronizing than the less experienced one.

**Off farm income of members in Birr (OFINCEM):** - refers to the income obtained from different activities apart from agriculture. It is a continuous variable. Since members have

inadequate on-farm income they often look for other sources of income. So this income has a great support for farming population to fulfill their obligation. Moreover, the income raised from such activities help the members not to sale their crops immediately after harvest at cheap price. Rather the trend of their involvement in buying agricultural inputs increases on the contrary.

**On-farm income of members in Birr (ONINCEM):** -. This refers to the total amount of cash that specific member raised from on-farm activities on cash. It is a continuous variable and this income is the immediate source of capital for smallholder farmers to finance their day-to-day activities. Therefore, the higher the cash income the members have, the more they will involve in marketing activities of cooperatives.

**Total annual income in birr (TAINCEM):** refers to the total earnings of all the members of the family of the respondent for one year. This can be obtained by adding the income earned by the family members and income from on-farm and off-farm for one year.

**Members' farm holding size in hectare (FRLHEM):** - refers the total farm size possessed by the member. It is continuous variable. Since it represents ownership of important farm asset, it is expected that it enhance the capacity of the members to involve in every aspect of marketing activities of cooperatives.

**Members' number of livestock in TLU (LSTKEM):** - Livestock are the farmers' important sources of income, means of transportation, and food and draught power for crop cultivation in the study area. Total livestock of the members is measured in Tropical Livestock Unit (TLU). It is therefore, logical to expect that a higher value of livestock unit increase the probability of being active participant.

**Soil fertility status of members' holding (SOFERTS):** - refers to the soil fertility status of sample farmers' cropland as perceived by the respondents. It is to be measured based on: "0" if

the soil is poor, "1" if the soil is fair and "2" if the soil is fertile. If the soil is fertile the product raised from the land is sufficient enough, *ceteris paribus*. So fertile the soil is, the higher will be the farmer to have marketable surplus.

**Total consumption expenditure of the member in Birr (TEXPEM):** - The amount of total expenditure on consumption of goods and services determines the availability of liquid asset for fulfilling members' obligation, i.e. to make right decision to participate or not. If the members' expenditure is high, the possibility of using improved agricultural input is low.

**Proximity to Village Market in Km (PROXIMA):** refers to the distance from house of members to the village market place. The distance to the village market place directly determines the member farmers' decision whether to participate or not in cooperatives. It is measured in terms of Kilo meter (km).

**Distance from the extension Service (DISEXTN):** refers to the distance between the extension office and members' house located. It is measured in terms of kilo meter. The distance to the extension workers' center has a direct impact on the member farmers' decision whether to participate or not in cooperatives through the purchase of input and improves their productivity in order to have marketable surplus.

**Perceived Cooperatives' role Performance by members (PECORPM):** is the perception of members to the ability of cooperatives in accomplishing their planned activities to achieve their commitment to the members within specified time and required budget allocated. Besides, the role performance of cooperatives also is independent variable, which is measured by the degree of members' perception on: Role of cooperatives in price stabilizing, Market information dissemination, solving market problems, providing demand oriented services and Provided Credit Services. This information was collected from the sample member households through

interviewing method. The qualitative nature of the indicators was measured by scoring to quantify the members' perception in role performance of cooperatives. Finally, the scoring was summed up and divided to the total in order to develop index to know the degree of members' perception on role performances of cooperatives.

**Access to credit (ACTCINP):** This is a dummy variable, which is expressed in terms of member's accessibility to production credit to purchase available input through cooperatives. Several studies have shown that access to credit plays a significant role in enhancing the use of agricultural input. In the present study, it is hypothesized that access to input credit would have positive influence on members' participation intensity.

**Access to agricultural input (INPUTPUR):** refers to members' ability and willingness to purchase certain volume of agricultural input for the 2006 cropping season on loan or cash on hand basis. The explanatory variable is continuous. Access to agricultural input is expected to enhance members' participation in cooperatives affairs.

**Access of alternative marketing service providers (ACALTMAR):** refers to the availability and accessibility of alternative marketing service providers in their locality. This is a dummy variable, which takes a value 0 if the member household has access to alternative marketing service provider and 1 use cooperatives as service providers.

**Duration of Membership (MEMDURA):** refers to the duration of time in which members began to fulfill their obligation and become eligible for participating and patronizing in the cooperatives. Duration of membership is measured in number of years the member stayed in the cooperatives. It is hypothesized that membership duration has a positive effect to participate in cooperatives affairs.

**Perceived agricultural input/output prices (PERAIOPR):** It is a dummy variable and if the perceived price of agricultural output condition is poor "0" and if fair "1". Some of the products are naturally harvested within particular time and may be perishable and have to be disposed immediately after harvest. Moreover, commitments such as loan, land use and income taxes are mostly settled after harvest.

**Number of paid up Share capital of the members (MESHCA):** refers to the number of paid up share capital owned by the members. It is a continuous variable. The more the number of paid up capital members have the more role they have in participating in cooperatives affairs.

**Membership Status (MEMSTA):** refers to the condition how the members join to the cooperatives. It is dummy variable which is measured in terms of those who become members through means of self initiatives or clear understanding of the objectives are given "1" and otherwise, "0".

**Perception of Members' on Transparency and Accountability (TRACCT):** refers to the relationship between the general assembly, BoDs and employees in planning, executing and evaluating the cooperatives undertakings. Important points to indicate the existence of transparency and accountability in side the cooperatives are: willingness and ability of the board to conduct annual general meeting, report to general meeting, passing decisions based on the by-law, members' willingness to be exercise their duties and rights, and steps used to distribute dividend. The variable is continuous variable measured by developing index based on the scorings of the indicators.

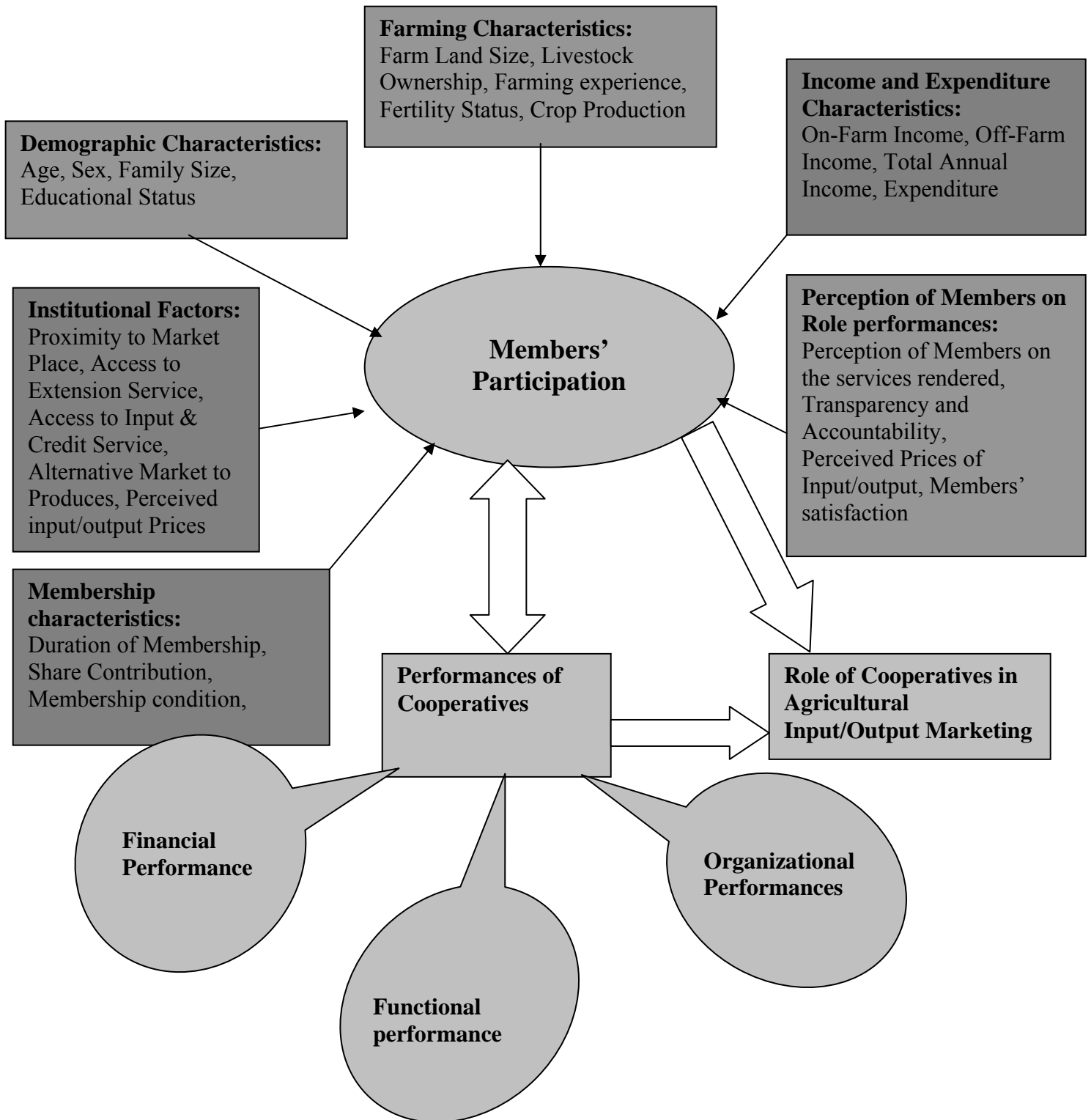
**Perception of Members Satisfaction (SATIFEM):** refers to the degree of members' satisfaction in the available services through cooperatives. It is continuous variable. It is measured directly by summing up the scorings in each satisfaction indicators. Indicators used to measure satisfaction

of members on the service rendered through cooperatives included: Price differences, Demand orientation, Proximity, Timing, quality and costs of service provisions. Each indicator is measured using Lager's scale.

**Crop Production (MECROPR):** refers to the member farmers' quantity of crops produced in kg in the 2006-cropping season. It is continuous variable. The more farmers are able to produce from the cultivated land, the more they will be willing to use improved agricultural input and loan providing through cooperatives.

Therefore, based on the reviews of the previous research findings and the researcher's understanding on the context of the topic the following explanatory variables were selected and used to analyze the role of cooperatives in agricultural input and output marketing. The conceptual frame work of the dependent and explanatory variables is presented on figure 3.

**Fig. 3 Conceptual Frame work and relationship of the dependent and Independent Variables**





## CHAPTER IV

### RESULTS AND DISCUSSION

This chapter presents the findings from simple percentage, ratio analysis, descriptive and econometric analysis. Simple analysis was used to describe the functional and organizational performances of cooperatives in various activities in the study area. The financial ratio analysis made use of three ratios i.e. current, debt and return on total asset to examine the performance of the cooperatives found in Atsiby Womberta and Saesi-Tsaida-Imba districts. The descriptive analysis made use of tools such as mean and frequency. T-test and  $\chi^2$ - test were also employed to test the significant level of the explanatory variables. Econometric analysis was employed to identify the most important factors that influence the participation of members in the cooperatives.

#### **4.1 Performances of MPCs**

The first objective of the study was addressed by using different performance measures. Measurement of performance involves knowing how far actual performance is consistent with planned performance or with standards already established. Some simple figurative expression and ratio analysis were employed to assess the change in some economic variables such as the trend of business transaction in terms of volume or value and in the financial condition of cooperatives.

##### **4.1.1 Functional Performances of Cooperatives in the Study Area**

The study area is known as food insecure area in the region. A few years ago, droughts have been occurring almost at interval of every two-three years. Hence it is usual phenomena to see people

in the rural parts of the study area who almost entirely depend on food aid. According to FAO report in 2005, even in a good harvest period, the production is not adequate for the household consumption. For instance, according to the report, the balance of total food production to meet demand was 145,077 Metric tons in deficit. Samson (2002) also revealed that 80 per cent of the households in the study area received food aid in the year 2000/ 2001. Therefore, as the study area is a food deficit, co-operatives have little role in assembling farmers' produces. The co-operatives were engaged more in procuring food grain for members' consumption, fertilizer and seed distribution and short and medium-term credit provision for fertilizer and the household packages. Due to high competition from the local traders, cooperatives' involvement in consumer goods purchase is decreasing from year to year.

#### **4.1.1.1 Food Grain Procurement and Distribution**

The farmers in the study area used to demand food grain for consumption starting from May. Cooperatives have indispensable role in filling the gap. This is so because the rugged nature landscape of the study area coupled with its steep valleys and high upland areas makes the transport of bulky commodities both difficult and expensive at individual farmers' level. Consequently, cooperatives were actively involving in procuring food grains like *teff*, maize and wheat from surplus producing areas, in and/or outside the region, to distribute among the members in the rain season. The volume procured is increasing over time in Saesi-Tsaeda-Imba and decreasing in Atsiby Womberta (Table 4). Total volume of food grain procured in the year 2002 was 235 qts while the volume increased to 3567 quintals (qts) in the year 2006. Despite the inconsistency in procuring food grains due to financial constraint, they were attempting to satisfy their members demand. The financial statement of some cooperatives revealed that food grain business is not as profitable as credit services. Lack of transparency and accountability in the

procuring process can be pointed out as main factor attributing for less profitability. The board and the management have neither controlling mechanism to persuade purchasers nor they involve in the purchase to ensure transparency in the process. As it was indicated in the financial statement of audit report, procurement of consumer goods and food grain have been always the sources of disagreement and conflict between members and the board (Audit report, 2002-2006).

In all the case, MPCs in the study area involvement to purchase or collect members' produces was very poor. Low potential in agricultural production and productivities, farmers' lack of orientation to market their produce through cooperatives and generally lack of awareness to produce for marketing purpose were among the most essential constraints, which had substantial contribution for the poor role of cooperatives in assembling agricultural produces.

#### **4.1.1.2 Fertilizer and Seed Distribution**

Fertilizer distribution has become the most important business activity for almost all MPCs in the study area since 1999. Distribution of fertilizer through cooperatives is carried out starting from May to end of July. Cooperatives used to distribute fertilizer for both members and non-member farmers. The only difference is that members are eligible to purchase fertilizer on credit basis. The role of cooperatives in fertilizer distribution is growing in Saesi-Tsada-Imba while the distribution in Atsiby Womberta through cooperatives was declining for the last five years (Table 4). Fertilizer distributed through cooperatives in the year 2002 was 855 qts and 415.875 qts in Saesi-Tsada-Imba and Atsiby Womberta respectively. The volume distributed through MPCs in Saesi-Tsada-Imba increased to 1246 qts in 2006. The district cooperatives promotion department (DCPD) report indicated that, as of 2006, cooperatives were a source of fertilizer for 87 per cent in Saesi-Tsada-Imba and zero in Atsiby Womberta. Most often, the average volume of DAP and Urea taken from the cooperatives were 37.5 and 25 kg respectively. The average

quantity consumed by the farmers is too little as compared to other farmers in the country. Moreover, there is no private wholesaler or retailer dealing in fertilizer distribution in the study area.

Cooperative involvement in seed distribution is poor. Usually the input department in the district office of agricultural and rural development (DOARD) is responsible for the distribution. In Saesi-Tsada-Imba, in the year 2002-2006 total volume of seed distributed were 362.10 qts. The volume distributed included only the quantity distributed through sample MPCSSs. Besides, out of the total volume of seed distributed for the five consecutive years 125 qts were improved seed (wheat) and 60.5 kg was Vegetable seed (Table 4). Barley, wheat and chickpeas were the most important type of seeds distributed. The District Cooperatives Promotion Department (DCDP) report shows that cooperatives ceased to involve in seed distribution in Atsiby Womberta. In the year 2002, 16.375 qt was distributed through cooperatives. However, cooperatives had no role in the year 2005 and 2006 (Table 4).

The MPCSSs in Saesi-Tsada-Imba were advancing towards provision of pesticides to the members starting from 2003 (Table 4). There were steady increases in the supply of pesticides through cooperatives (27 kg to 65 kg). The input department in DOARD and MPCSSs has close relationship in Saesi-Tsada-Imba as compared to Atsiby Womberta. The concerted effort of input department and cooperatives promotion team in the district is creating encouraging environment to cooperatives. Therefore, cooperatives' role in input distribution is improving from year to year in Saesi-Tsada-Imba.

**Table 4 Total Volume of Food Grain, Fertilizer, Seed and Pesticide Distributed through cooperatives in Quintal**

District	Activities	2002	2003	2004	2005	2006
Atsiby Womberta	Food Grain	277	737	885	NA	NA
	Fertilizer	415.88	335	155	NA	NA
	Seed	16.38	66.75	27.5	NA	NA
	Pesticide	NA	NA	NA	NA	NA
Saesi-Tsada-Imba	Food Grain	571	845	1479	1509	1661
	Fertilizer	855	914	982	1032	1246
	Seed	11.50	25	128	30.27	167.35
	Pesticide	-	0.27	0.27	0.60	0.65

Sources: Districts' Cooperatives Promotion Department (2007)

#### **4.1.1.3 Credit Provision**

There were two Credit sources for cooperatives: CBE through the regional government budget guarantee for fertilizer purchase and revolving credit fund from donor organizations for the household package purposes. Documents show that in the study area larger proportion of fertilizer sales to farmers was on credit basis. The credit sales are either channeled through cooperatives or agricultural offices. Although the share from the total credit extended to farmers is declining, there is also one regional based micro-finance institution that is dealing with input credit: Dedebit Credit and Saving Institution (DECSI).

Prior to the year 2000, Dedebit Credit and Saving Institution had a lion share in the credit market of the region particularly in relation to chemical fertilizer marketing. According to district level promoters' opinion, cooperatives began to receive consistent and effective technical and administrative support after the establishment of independent cooperatives' promotional office at the regional, zonal and district level. The support from the government enables cooperatives to have vital role in input distribution, which had significant impact on the growth of cooperatives'

credit market share in the region as well as in the study area. Accordingly, the magnitude of credit disbursed in 2002 was 840,000 birr while the amount increased in 2006, to 4,070,800 birr. The loan was disbursed for both fertilizer and seed purchase and household package program in the study districts. The data collected from the study districts cooperatives' promotion department revealed that there was a substantial increment of loan disbursed to the beneficiaries (Table 5).

According to the by-law of cooperatives, regardless of its source, members must be the only users of available loan. However, considering challenges of farmers to credit access, cooperatives took the responsibility of disbursing loan for the household package to include non-members of their vicinity. Cooperatives work in collaboration with district level agricultural and rural development office and local administration to propose and approve loan beneficiaries for the household packages. This is so because the source of fund for the household package was donors (EU and World Bank). The responsibility of managing the community based fund based on the agreed procedure fallen on the shoulder of cooperatives. The manual or procedure was prepared with full consultation of donors, cooperatives, promoters and other stakeholders including BoARD in the year 2002. With regard to repayment performances, the audit report of cooperatives shows that on average the annual repayment was 97 per cent for the fertilizer and seed loan, and 69 per cent for household packages in the two districts.

## **4.1.2 Organizational Performances**

### **4.1.2.1. Capital and Membership in Cooperatives**

In Eastern Tigray, the beginning of cooperatives movement can be traced back to the mid 1960s. Besides, the documents in BoARD revealed that there were strong movements in the beginning of 1980s. Due to prolonged war and political instability, the cooperatives momentum in the study

area was impaired for more than 10 years. The year 1998 was a new chapter for cooperatives movement in the country. Following the Federal Government enacted proclamation No 147/1998, the reorganizing efforts based on the new proclamation began which had persuasive effect to regain their momentum. The government created Conducive environment by permitting cooperatives involve in input distribution and credit provision. The regional government favoured cooperatives to have access for credit from Commercial Bank of Ethiopia through regional budget collateral or guarantee arrangement. As a result, their role of involvement in input credit marketing increased, which in turn had significant impact on increasing the number of members and total amount of capital in birr (Table 5).

Consequently, the data gathered from the financial statement of cooperatives show that the total amount of capital in the year 2002 was 602,646.57 birr while the amount increased to 1,270,895.38 birr in 2006 (Table 5). The capital increase was almost above 100 per cent in five years time. Membership increase in number, additional share contribution, cooperatives successful engagement in loan provision and input marketing had significant contribution according to the financial statement of each sample MPCs in the study areas. According to audit reports, the members' share contribution is also proportional to that of collectively owned capital by making profits.

However, improper practices of handling documents, recordings and accounts due to poor management were creating difficulties to the district level auditors in differentiating reserve, social fund with cooperatives' profit as well as in distributing the patronage dividends. The pursuit of capital from profit is important and desirable practice, so long as the element of members' share capital to the total capital structure is so proportional. The argument is that it

fosters member control in making policy decisions and avoids abandon the fundamental values of the co-operative movement (Crawford, 1997).

**Table 5 Statistics of Cooperatives in the study Districts in Eastern Zone of Tigray**

<b>Description</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>
Loan disbursed	840,000	960,900	1,265,650	2,522,450	4,170,000
Capital	602,646.57	734,751.88	895,114.05	1,114,713.42	1,270,895.38
Profit	88,816.93	16,6615.29	61,919.09	115,995.40	125,151.90
Members in No	9014	9108	9231	9399	10889

Sources: Reports of District Cooperative Promotion Office in Atsiby and Saesi-Tsaeda-Imba 2007

#### **4.1.2.2 General Meetings, BoDs and Employees**

The control structure of co-operatives is made up of three tiers: the general assembly, BoDs and employees. Each structure has clearly demarked duties and responsibilities stated in the By-Law. The General Meeting of Members makes policy through the annual meeting of members. In the annual meetings the members exercise control over the cooperatives. According to the by-law of MPCSS' members, at least, were expected to involve in one annual meeting per annum. However, cooperatives were usually unable to run the meetings accordingly due to limited willingness of members and lack of boards to notify the annual meeting ahead of time. After several calls only 75 and 83 per cent of the annual meetings were conducted in the sample MPCSSs in both Atsiby and Saesi-Tsaeda-Imba districts.

The BoDs are the delegates of the GA, which controls the works of the co-operative on behalf of members. The boards of directors are consisted of Management Committee and Control Committee. Both are accountable to the general assembly. According to the By-Law, the boards' term is three years after election with the possibility of extending one additional term. However, only two cooperative societies in Saesi-Tsaeda-Imba were managed to change boards for the past



ten years. The remaining six sample cooperatives had limitations to be abided by their by-law. Except the minor replacement elections to fill the number of missed board members, no changes were made as per the terms stated in the by-law. Besides, the control committee had failed to take the responsibility of controlling the property of cooperatives on behalf of members.

In most case the MPCs have employees who are responsible to carry out activities such as book keepings, store and shop keeping, and sometimes managers. The employees are accountable to the board. There were six bookkeepers, five shop/store keepers, seven purchasers, 11 guards, one accountant and one manager in the seven sample MPCs. The employees' terms of agreement are based on the labour law of the country. The level of education of the employees was at most secondary school. Maximum monthly salary paid to the manager of one cooperative society in Saesi-Tsaeda-Imba, 500 birr/month, while the remaining employees' salary ranges between 90-320 birr/month. In all sample MPCs, working procedures, by-laws, financial documents were introduced though they are not utilizing the documents properly due to lack of skills and technical supervisions from district and regional level promoters. Almost all MPCs of the study area had their own office and working area though the offices had lack some essential working furniture and equipments (Appendix IX).

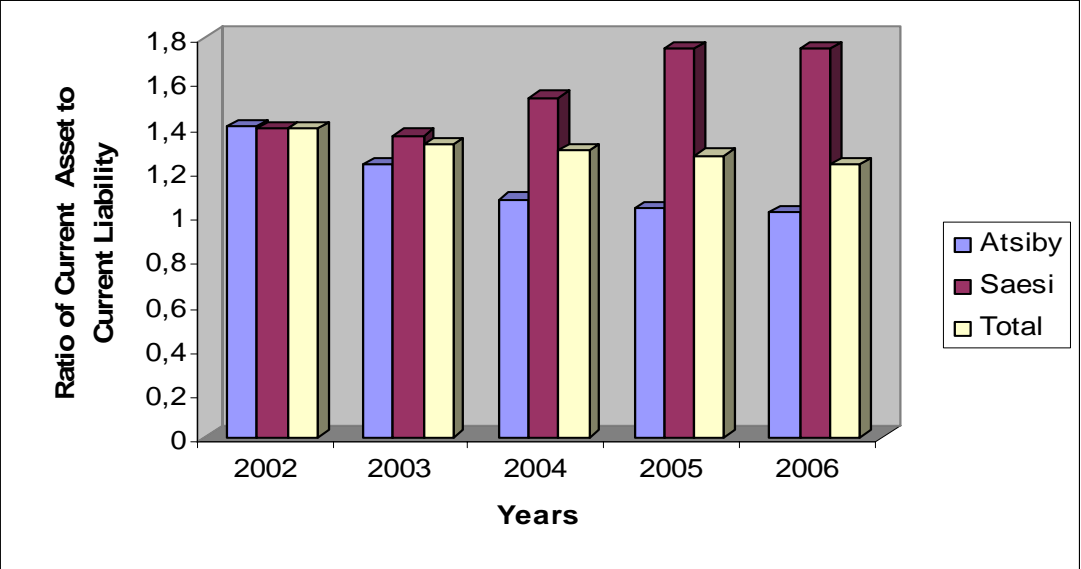
### **4.1.3 Financial Performances (Ratio Analysis)**

#### **4.1.3.1 Liquidity analysis**

The satisfactory rate of current ratio that is accepted by most financial institutions as condition for granting or continuing commercial loan is 2.00. With this benchmark when the reference years (2002 - 2006) are observed, all the sample cooperatives in the two districts performed below the desirable standard. In 2002 the average current ratio for the selected cooperatives for

this purpose in the two districts was 1.389 (Table 6 and Fig. 2). The highest ratio was 2.29, which was scored by Haile Manjus in Atsiby and the lowest was 1.03, which was scored by Mahibere Genet in Saesi-Taseda-Imba, (Appendix II). In 2003 the average current ratio was 1.316 (Table 6). The average current ratio for the year 2004 became 1.295. In the year 2005, the average current ratios were 1.75 and 1.01 for both Saesi-Tsaeda-Imba and Atsiby districts respectively. In the year 2006 there was one cooperative in Atsiby district, which in general scored below 1.00. The trend of liquidity ratio was increasing in Saesi-Tsaeda-Imba and decreasing in Atsiby Womberta.

**Fig. 4 Liquidity Ratio Analysis**



When one observes the performance of the cooperatives, there was slight decrease in the liquidity ratio in the year 2003 as compared to the 2002. This implies that their current liabilities were rising slightly than their current assets. In most cases, the cooperatives have credit access both from financial institutions via the regional government collateral arrangement and from NGOs in the form of revolving credit fund. However, the ability to get credit by their own to meet their short-term demand for money (to purchase farmers’ output or input) is endangered. Lenders may

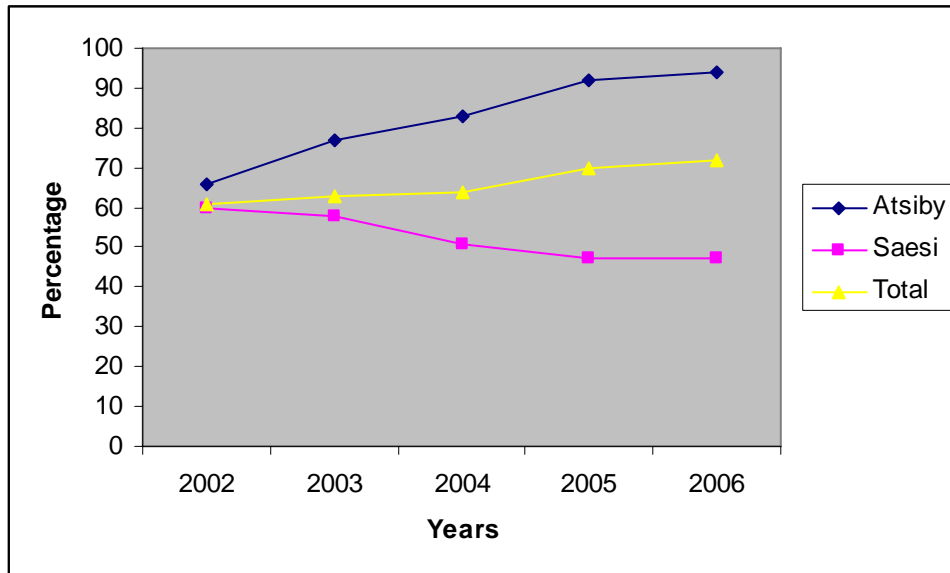
not be willing to extend short-term loan to the cooperatives, as the financial institutions require current ratio to remain at or above 2.00 as a condition for granting loan.

#### **4.1.3.2 Financial leverage management analysis**

The financial leverage of the sample cooperatives in the two districts was computed employing the debt to total asset ratio (finances a portion of assets with debts). The cooperatives under investigation in the two districts financed more of their total asset with creditors' fund. In 2002 the average debt-asset ratio was 61 per cent (Fig, 5). This indicates that 61 per cent of the total asset of the cooperatives was financed with creditors' fund. In the year 2003 the average debt-asset ratio increased to 63.05 per cent. However, two MPCs from Saesi-Tsaeda-Imba district and none from Atsiby district cooperatives have shown slight decrease in debt-asset ratio in 2006 as compared to the previous years. The trend of the financial leverage was increasing in Atsiby Womberta while it was decreasing in Saesi-Tsaeda-Imba for the past five years (Figure 5).

Observing the five years data of how the cooperatives were financed, external financial sources have supplied at least 61 per cent of the cooperatives finance in Atsiby Womberta and 47 per cent in Saesi-Tsaeda-Imba (Appendix III). The smaller the proportion (in most cases <50 percent) of the total asset financed by the financing institutions, the smaller the risk that the firm is unable to pay its debt (Brigham, et al., 1998). Having higher proportion of asset financed by the external sources (creditors) fund may lead cooperatives to the risk of bankruptcy if the management seeks to increase the debt further by borrowing additional funds.

**Fig 5 Debt to total Asset ratio analysis in the study area**



#### **4.1.3.3 Profitability Ratio**

The profitability ratios demonstrate how well the firm is making investment and financing decisions. According to William et al. (2003) firms need to earn return on their asset that enables them to pay the interest of the money they borrowed i.e. they need to have return on their asset, which is equal or better than the interest rate of the money they borrowed.

One can observe from Table 6, the profitability ratios of the cooperatives under investigation were fluctuating in the past five years. The earning of cooperatives under investigation in 2002, the highest was 530 per cent in Atsiby, which was scored by Mahibere Bokuru and the lowest, was 0 per cent, which was scored by three cooperatives in Atsiby and one in Saesi-Tsada-Imba (Appendix III). In 2003 the highest ratio was 891 per cent, which was scored by Mahibere Bokiru and the lowest was 0 per cent, which was scored by Haile Manjus Cooperative Society in Atsiby. In 2002 the average profitability of the cooperatives under investigation was 34 per cent though four out of the selected cooperatives were not profitable. In 2003 the average ratio increased to 35 per cent and only one cooperative was not profitable. The average profitability ratio for 2004

declined to 12 per cent and cooperatives, which were not profitable, became two in number (Appendix III).

**Table 6 Ratio of Liquidity, Debt to Total Asset and Return on Total Assets in the study area**

Year	Liquidity Ratio			Debt to TA Ratio			Profitability Ratio		
	S/Ts/ Imba	Atsiby	Total	S/Ts/ Imba	Atsiby	Total	S/Ts/ Imba	Atsiby	Total
2002	1.39	1.37	1.389	60%	66%	61%	21%	178%	34%
2003	1.36	1.23	1.316	58%	77%	63%	23%	154%	35%
2004	1.53	1.10	1.295	51%	83%	64%	13%	9%	12%
2005	1.75	1.01	1.271	47%	92%	70%	20%	20%	20%
2006	1.75	1.01	1.233	47%	94%	72%	13%	36%	19%

Sources: Annual Audit Report of the two Districts' Cooperatives Promotion Department

Even though there was improvement in profitability ratio in 2002-2006, the most important sources of profit for almost all profit making cooperatives was loan interest collected from the Members and non-members borrowed the fund. As the major source of the loan fund was the donors revolving credit fund through bilateral agreement for food security purposes, its cost of fund was very much low. As a result, their profitability in 2002 and 2003 was higher than the year 2004-2006. Later on, when cooperatives began to borrow money from the financial institutions for fertilizer distribution purpose, which had relatively high cost of loan interest (7 per cent), cooperatives' profitability ratio started to fluctuate and is affecting their liquidity, asset management and financial management. Even some of the cooperatives were not in a position to achieve the profitability ratio which is equal or better than the interest rate (7 per cent) with which they borrowed money from the financial institutions. The possible reasons for the difference in profitability among the cooperative lies on how effectively the cooperative management is generating profit on sales, total assets, money they borrowed, repayment performances and most importantly members' investment (share capital).

## **4.2 Members' Participation**

### **4.2.1 Descriptive Analysis**

This section discusses the nature of the socio-economic and demographic characteristics of the member households that affect their participation in the affairs of cooperatives. As discussed earlier in the methodology part, the study was based on cross sectional data obtained from 162 member households. The discussions in this section mainly compare the two household groups: Passive and Active participants in the cooperatives affairs.

#### **4.2.1.1 Participation in Cooperatives Affairs**

The study examines the participation of all the respondents in cooperatives: in decision making, exercising their democratic rights and economic participation. Components of participation were identified and selected for the study purpose based on literature review. The researcher used 12 participation indicators and measured members' degree of participation accordingly (Appendix X). Simple participation index was developed to easily group the respondents into APM and PPM. The participation index was worked out by adding the individual respondent scorings of all the indicators and dividing to the possible maximum total scoring that one respondent had to score. The result of the study shows that 45.7 per cent of the total sample respondent (74 respondents) found to have relatively high level of participation/APMs while 54.3 per cent of the respondents were PPMs (88 respondents) (Table 7); i.e the participation index for 74 respondents was 0.5 and above, and vice versa.

The study result shows the maximum and minimum participation index scored from the sample respondents was 0.925 and 0.1 respectively for APM while the PPMs score were 0.48 and 0. The participation index of the sample respondents indicates 54.3 per cent of the total respondents

were passive in their participation while 45.7 per cent of the total respondents involving actively in achieving the objectives of collective efforts. Most members were actively involved in using available loan and buying agricultural input particularly fertilizer. Sample respondents' participation in selling agricultural output to cooperatives was very poor. Moreover, the tendency of the index of respondents in decision or exercising the democratic rights was higher for the actively participating respondents than PPMs (Table 7).

To be more specific, based on co-operative's principle, it is members who have the democratic rights to involve in decision making with out any kind of discrimination. On this regard, the study result of members' participation index shows that members' involvement to elect boards and involve the general meeting scored 0.4753 and 0.4629 respectively. On the contrary, members were very much reluctant to share responsibility to have a leading role in cooperatives (Appendix X). The respondents participated in approving the by-law, annual budget and activity plan, and other undertakings, which require decision in the general assembly. In general, the study found out that 77.2 per cent of the total respondents could not involve in exercising their democratic right nor had participation in decision (Table 7). This implies that the member-co-operative relations were low.

**Table 7 Distribution of Members' Participation in Cooperatives Affairs**

Variables	Category	PPMs (N=88)		APMs (N=74)	
		Count	Percent	Count	Percent
Participation in DM	Otherwise	86	97.7	39	52.7
	Strongly participate	2	2.3	35	47.3
Economic Participation	Otherwise	79	89.8	9	12.2
	Strongly participate	9	10.2	65	87.8
Participation Index					
PPM	0-0.49	88			
APM	0.5-1.0			74	

Source: Primary Data (October, 2007)

Predominantly the establishment of cooperatives at the grass root level is to obtain economic and social benefits to the members. To achieve the objectives of cooperatives, members must involve in financing, using available services, marketing outputs and purchasing inputs. Active involvement of members has an indispensable effect in the overall results of cooperatives. That is why the researcher attempted to assess as to what level members are participating in the activities of cooperatives: Using available loan, buying and selling, using available services and financing. Maximum level of members' participation was seen in using available loan as per the participation index scoring, that is 0.5925. Apart from the index, the findings of the research revealed that 45.7 per cent of the total respondents replied that they were strongly participating while 54.3 per cent of the total respondents had weak participation in playing their role to achieve the overall objectives (Table 7). The finding coincides with Haileselesie's, 2003, result of participation of members in cooperatives in Saesi-Tsaeda-Imba district.

#### **4.2.1.2 Demographic Characteristics**

##### **4.2.1.2.1 Family Size**

Total number of family members of the sample households was about 978, out of which 49.7 per cent were male and 50.3 per cent were female. This figure was approximately consistent with secondary data obtained from each district BoFED, which indicated that male constitute about 49.2 per cent of the total population of the district. Maximum and minimum number of family members of the respondents is 10 and 1 respectively for PPMs and 11 and 2 for active participant members. Average family size for the active participants is 6.22 and for passive participants 5.89 in number (Appendix XI). This average is exceeding the national average which implies that the



study area is relatively densely populated. The percentage difference between the two sample groups is insignificant (Table 8).

#### **4.2.1.2.2 Sex**

The proportion of female passive participant households is about 61.4 per cent while the actively participating female headed household is 30.6 per cent of the total sample female members. On the contrary, passive and actively participating male led households accounted for 47.8 and 52.2 per cent of the male respondents respectively. And when we compare the number of male headed households with the total, the share was only 69.8 per cent while the remaining 30.2 per cent belongs to the FHH (Table 8). The percentage difference in between the two groups in the Chi-square test shows sex was statistically significant variable (Chi-Square=6.427, p=0.011). This implies that male-headed households were participating actively more than female headed households. The study result is consistent with the study result of Gebru, 2006, that female representation in cooperatives is lower though the trend is promising.

#### **4.2.1.2.3 Age**

The age structure of sample households shows that the average age of passive participants was 49.7 years compared to 45.77 years for active participant members with the minimum and the maximum age of 22 and 67 years respectively (Appendix XI). The mean difference between the two age group respondents was statistically significant ( $t=2.731$ ,  $p=0.007$ ) at 1 per cent probability level. The age is expected to be a great source of experience in every day-to-day activity of human beings. So the elder households are expected to have more experience in the Agricultural Input utilization and marketing output through cooperatives.

**Table 8 Family Size, sex and age of the Members**

Family Size	PPM	Percent	APM	Percent	Total	Percent
Below 3	27	61.4	17	38.6	44	27.2
3-5 Family Members	49	52.1	45	47.9	94	58.0
6-8 Family Members	12	50.0	12	50.0	24	14.8
N	88		74		162	
T-value	-0.913					
P-value	0.363					
Sex of the Respondents						
Female	34	69.4	15	30.6	49	30.2
Male	54	47.8	59	52.2	113	69.8
N	88		74		162	
Chi-Square	6.427			P-Value	0.011	
Age Category						
15-25	1	1.1	1	1.4	2	1.2
26-50	45	51.1	48	64.9	93	57.4
Above 50	42	47.7	25	33.8	67	41.4
N	88		74		162	
T-value	2.73					
P-Value	0.007					

Source: Primary data (2007)

#### 4.2.1.2.4 Level of Education

Most researchers agree on role of education to motivate and let members participate on cooperatives' affairs actively. This is so because members who are literate have an opportunity to be acquainted with the rights and obligations they have in the cooperatives. For instance it can help members to understand their right easily to be a member, use available services like agricultural input, loan and also meet their obligation such as contributing share capital. The educational status in the study area indicates that about 48.8 per cent of the total respondents were illiterate; about 33.3 per cent attended literacy classes while around 14.82 and 3.05 per cent had primary and secondary level education respectively. Moreover, about 45.5 per cent of passive and 52.7 per cent of active participant members were illiterate, 44.3 per cent passive and 20.3 active participants were able to read and write while 10.2 and 20.3 per cent had primary

education for both passive and actively participating members respectively. The percentage difference for both PPM and APM shows that there is a significant difference at 1 per cent significant level ( $t= 29.62$ ,  $p=0.00$ ). In terms of access to formal education (Table 9), the result indicates that passive participant members had less access to education as compared to that of members participating actively.

**Table 9 Literacy Status of Household Head**

Educational Status	PPM (N=88)		APM (N=74)		All cases (N=162)	
Illiterate	40	45.5	39	52.7	79	48.8 %
Read and write	39	44.3	15	20.3	54	33.3 %
Grade 1-8	9	10.2	15	20.3	24	14.82%
Grade 9-12			5	6.8	5	3.05%
		$\chi^2=29.62$	$p=0.00$			

Source: Primary data (2007)

### 4.2.1.3 Farming Characteristics

#### 4.2.1.3.1 Farm land size

Obviously, land in rural areas is a very important means of production. It plays a central role in producing crops and rearing livestock. Moreover, access to land offers a privilege to get access to agricultural extension services and new agricultural technologies.

Land is the primary resource (input) in the production process. The average total farm size was 0.56 ha for active participants and 0.6 ha for non-participants (Appendix XI). There are no following practices for both active and passive participant members for the farmers have shortage of land in the study area. The maximum farmland holding is 2.12 ha and 2.81 ha for the actively participating and passive members respectively. Landless farmers are 9 from the passive members and 4 from actively participating members. According to information obtained from administration council of the district, since 1975 land distribution had been taken place for

several times in the districts. Hence, the mean comparison of two groups in terms of mean farm land size revealed that there is no significant difference between the two sample groups, which 0.6 ha is for passive members and 0.56 ha for active members (T-Test= 0.558) (Table 10).

Among the sample groups reported that they used their own and rented in land for the main cropping season, *Meher*, were 46.1 and 53.9 per cent passive and APMs respectively. This implies that actively participating members seek for additional lands, other than owned land, through some possible arrangements (Table 10).

**Table 10 Distribution of Land use system of sample respondents**

Categories	PPM	Percent	APM	Percent	Total	Percent
0.1-1.0 ha	81	54.7	67	45.3	148	91.4
1.1-2.0 ha	3	33.3	6	66.7	9	5.5
Above 2.0 ha	1	20.0	4	80.0	5	3.1
N	88		74		162	
Own land and rent in	59	46.1	69	53.9	128	79.0
Otherwise	29	65.9	15	34.1	44	21.0
T-value					-0.586	
P-Value					0.558	

Source: Primary data (2007)

#### **4.2.1.3.2 Crop production**

Farmers' objectives in crop production are mainly for dietary and cash income. The major crops grown in the study area are barley, wheat, teff, faba bean, field peas and lentils. The amount of crop produced in kilogram and their descriptive statistics are presented in table 11. The annual total crop production of sample households was 72505.0 kg from 93.5 ha of cultivated land in the

2006 cropping season. Even if the overall average crop production was 444.6 kg, it ranges from a minimum of 100 kg to a maximum of 2162 kg. The proportion of cereal and pulse producing farmer members were 68.4 and 32.6 per cent from PPMs and APMs respectively. Though the number of farmers seems low, 58.1 per cent of the APMs were involving in vegetable and fruit production (Table 11). The mean difference between the two sample group statistically significant at 10 per cent probability level.

**Table 11 Types of Crops and production in Kg in the year 2006**

Types of Crops	PPMs	Percent	APMs	Percent	Total	Per cent	T-Value	P-Value
Cereals and Pulses	64	68.4	31	32.6	95	58.6	1.802	0.073
Vegetables and Fruits	6	25.0	18	75.0	24	14.8		
Cereals & Pulses & Vegetables	18	41.9	25	58.1	43	26.6		
N	88		74		162			
Maximum	1130		2162		2162			
Minimum	100		100		100			
Average	353.7		526.5		444.6			
Std Dev	217.2		444.6		368.5			

Source: Primary data (Oct. 2007)

#### **4.2.1.3.3 Soil fertility**

This variable tries to investigate soil fertility problems of farmers due to erosion and depletion of the cultivated land. It was hypothesized that households who have soil fertility problem are less likely to participate in the cooperatives including purchasing agricultural input and use of available loan. The distribution of sample households by soil fertility problem is presented Table 12. The study result shows that 55.0 per cent of the PPMs and 45 per cent of the APMs have farmland with poor soil fertility status. Of the sample farmers that have farmland with good soil fertility status were 61.4 per cent from PPMs and 38.6 from APMs. The percentage differences between the two sample groups are insignificant.

#### 4.2.1.3.4 Livestock holding

Livestock provide milk, meat, traction power, income and transport. Moreover, farmers send livestock to market as one of coping mechanisms during food shortage. Livestock owned by the sample households include cattle, sheep and goat, equine and poultry. The total livestock population owned by the sample respondents was 322.6 TLU but 48.7 per cent of the respondents were without livestock. The minimum and maximum number of TLU was 0 and 15.2 for actively participating members, and 0 and 4.3 TLU for the passive members (Appendix XI). The average holding was 0.53 and 2.174 TLU for both active and passive members respectively. So the survey result demonstrated that the mean difference between two sample household groups regarding livestock holding is significant at less than 1 per cent probability level (Table 12).

**Table 12 Fertility Status of Members' Farm Land and Livestock ownership status of respondents**

Soil Fertility	PPM: N=88	Per cent	APM: N=74	Per cent
Poor	22	55.0	18	45.0
Medium	42	50.0	42	50.0
Good	24	61.4	14	38.6
Chi-Square Value		1.835		
P-Value		0.399		
Livestock Ownership status of members				
Nil	66	83.5	13	16.5
1-5 TLU	21	34.4	40	65.6
Above 5 TLU	1	4.5	21	95.5
T	-4.958			
P	.000			

Source: Primary data (Oct. 2007)

#### 4.2.1.3.5 Farming experience

The respondents' average experience in farming was 30.27 years with standard deviation of 13.66. Furthermore, the average farming experience of PPM was 28.1 years with standard deviation of 9.08, while for the APM it was 25.88 with standard deviation of 8.1. The mean

difference in farming experience was statistically tested and there was no significant difference between the two sample groups (Table 13).

**Table 13 Distribution of sample Members' Farm Experiences**

Farm Experience	PPM	APM	Total
Minimum	10	5	5
Maximum	50	41	43
Average	28.1	25.88	30.27
Std. Dev	9.08	8.1	10.30
T	1.631	P=0.105	

Source: Primary data (Oct. 2007)

#### **4.2.1.4 Income and Expenditure Characteristics**

Often agricultural households' income is determined by household's production activities and changes in factors influencing production activities. The household cash income was estimated based on the sales of crops, livestock and their products and off-farm income that the farmer or any of the household members earned in the year. However, farmers are reluctant to reliably estimate their income.

##### **4.2.1.4.1 On-Farm Income**

The total on-farm income of sample respondents was 475,263 birr. The average on farm income of actively participating members is 3813.8 birr/year and exceeds the average on-farm income of the passive members by 51.3 per cent (2193.6 birr/year). The major sources of cash income were from the sale of wheat, barley, pulses and vegetables. Besides, both livestock, cereals, pulses and vegetables on average contribute 82 per cent of the total annual income per household of the sampled farmers. In agreement with the stated hypothesis in this study, there was significant difference in the mean annual income from on-farm activity between two sample groups at 1 per cent probability level. Sales of crops and livestock are the major cash income sources for the

households in the study area. About 56.2 per cent of the total sample respondents earned cash income from sales of cereals and pulses whereas about 40.7 per cent of the sample respondents earned cash income from sales of cereals, pulses, vegetable and livestock and /or livestock by-products (Table 14).

**Table 14 Sources of on-farm income of sample respondents**

<b>Sources</b>	<b>PPM</b>	<b>%</b>	<b>APM</b>	<b>%</b>	<b>Total</b>	<b>%</b>
Cereals and Pulses	69	75.8	22	24.2	91	56.2
Vegetables and Fruits	1	50.0	1	50.0	2	1.2
All (Including Livestock)	15	22.7	51	77.3	66	40.7
None	3	100			3	1.9
N	88		74		162	

Source: Primary data (Oct. 2007)

#### **4.2.1.4.2 Off- Farm Income**

Eighteen percent of the total income earned is from non-farm income. The average off-farm income is 446.97 birr/year for passive and 874.5 birr for actively participating members. The income earned from off-farm is from labor employment, handcrafts, and home made alcohol and other informal businesses. Table 15 shows the distribution of households by off-farm/non-farm income. The survey result showed that 71 percent of the sample households earned less than Br. 1000. Among the actively participating member households 41.9 percent of them earned above 1000 birr per year. The farmers used to generate income during holidays, market days as well as during social gatherings at the farmers' field and residences. The income generated from off-farm/non-farm activity ranges from no income to a maximum of Birr 4000 per household within the study year (Table 15). It is usual in the study area that farmers used to engage in various income generating activities. This is so because the farm produce is inadequate to fulfill their demand for consumption expenditure as well as purchase of livestock. In agreement with the



stated hypothesis in this study, there was significant difference in the mean annual income from off-farm/non-farm activity between two sample groups at less than 5 percent probability level.

#### 4.2.1.4.3 Annual income

The total annual income of the households in study area is a function of crop, livestock, horticultural productions and employment on off-farm/non-farm activities. The distribution of households' total annual income in relation to participation in cooperatives is explained in Table 15. The average household income of the sample respondents was found to be Br. 3,563.57. The mean difference between two groups was Birr 856.27 which is highly substantial. The group statistics showed that there is significant difference in total annual income of household between members who are participating and passive in participation in the cooperatives affairs at less than 1 per cent probability level.

**Table 15 Distribution of On-Farm Income and sources of the on-farm income**

In Come Type	Passive				Active				P	T=
	Min	Max	Mean	St. dev	Min	Max	Mean	St. dev		
<b>On-Farm</b>	0	7500	2193.6	1249.64	910.0	12090	3813.8	2344.7	000	-5.606
<b>Off-Farm</b>	0	3240	446.97	707.18	0	4000	874.5	977.14	0.002	-3.222
<b>Total Income</b>	1090	8870	2640.45	1368.60	1000	15000	3563	2089.84	000	-6.98
<b>Expenditure</b>	1000	8700	2537.07	1186.00	1090	8870	3496.7	1368.6	000	-4.781

#### 4.2.1.4.4 Members' Expenditure

Table 15 shows distribution of sample households by total annual expenditure per household. Sampled farmers on average spent Br. 2975.20 per household (HH) with standard deviation of 1356.2. The survey result also showed that the average expenditure for actively participating member households was 3496.7 Birr per HH as compared to Birr 2537.07 Birr per HH for passive participant members. The statistical analysis revealed that the mean difference between

two groups in relation to expenditure per HH was significant at less than 1 percent probability level (Table 15).

#### **4.2.1.5 Farmers' Institutional Environment**

##### **4.2.1.5.1 Access to Credit and Input Services**

Rural credit activities are vital in improving productive resources through purchase of agricultural inputs, filling the consumption gap when it occurs, availing resources for meeting social obligations, etc. The major formal credit providing institutions are DECSI and Cooperatives, which provides both Long-term and short-term loans. Frequently, farmers in the area depend on credit to purchase farm inputs. The report from BoARD revealed both the number of borrower farmers and the amount of loans provided are increasing every year. Farmers' major sources of fertilizer credit in Eastern Tigray Zone are Dedebit Credit and Saving Institutions and cooperatives. In the cropping season of the 2006, for instance, out of the total respondents not used credit the result shows, 75.4 per cent and 24.6 per cent were PPM and APM respectively. For various reasons, they were not willing to receive credit from agricultural offices or cooperatives. The corresponding percentages who received loan for same season were 41.6 per cent and 58.4 per cent of PPM and APM respectively (Table 16). The research result shows 62.3 per cent of the total sample respondent had access for credit and input through cooperatives. In addition, the percentage difference of the two sample respondents was significant at 1 per cent probability level (Chi-Square = 42.178, P=0.008).

Population pressure accelerated continuous cultivation of farmland and this exacerbated soil nutrient depletion, declines in organic matter content and finally brought reduced crop

productivity (FAO, 2004). To increase production and yield farmers need to use of artificial fertilizers UREA and DAP as per the recommendation for macro nutrients (N and P).

**Table 16 Distribution of respondents to Access of input and loan, input purchased**

Description	PPM N=88	Percent	APM N=74	Percent	Total	Percent
No	46	75.4	15	24.6	61	37.7
Yes	42	41.6	59	58.4	101	62.3
Chi-Sq.			42.178			
P			0.008			
<b>Input Purchased in Birr</b>						
None Users	84	96.5	3	3.5	87	53.7
0-100 Birr	2	15.4	11	84.6	13	8.0
100-200 Birr	1	2.8	36	87.2	37	22.8
Above 200 Birr	1	4.2	24	95.8	25	15.5
T-Value			-14.957			
P-Value			0.000			

Source: Primary data (Oct. 2007)

Artificial/inorganic fertilizers are often used in all parts of the study area. Out of the surveyed member farmers, 46.3 per cent were reported in using artificial fertilizers DAP and/or UREA for cereals such as wheat and teff (Table 16). Documents from BoARD elucidated factors attributed to low consumption are, among others, poor perception on the use and application of artificial fertilizer, drought, low price for grain, which does not cover the cost of agricultural input and risk aversion associated with crop failure.

#### **4.2.1.5.2 Distance from Extension Services and Market Places**

The use of agricultural input and credit is often influenced by the farmer's access to extension services, since extension agents provide improved inputs and technical advice. In the study area, in each PA there are supposed to be available at least three extension agents supervising to all farming community to provide technical assistance on improved agricultural practices, livestock

production and natural resources management. The extension agents are expected to facilitate fertilizer credit distribution and collecting repayments in addition to the technical support. In the study area, the distance between farmers' farm and extension on average, for PPM is 3.17 km and APM 3.03 km. On the other hand, about 57.1 per cent and 42.9 per cent of the sample respondents travel less than 2.5 km to the extension center both PPM and APM respectively (Table 17). The range of distance from the extension center to the farm land is 1-8 km for PPM while it is 0.05-8 km for APM (Appendix XI). The mean difference between the two sample groups was insignificant.

**Table 17 Members' Location from Local Market and extension services**

Distance from extension	PPMM		APM		Distance from Market Place			
	Percent		Percent		PPM	Percent	APM	Percent
Above 5 Km	4	66.7	2	33.3	12	60.0	8	40.0
2.5-5.0 Km	48	51.6	45	48.4	37	56.1	29	43.9
Below 2.5 Km	36	57.1	27	42.9	39	51.3	37	48.7
N	88		74		88		74	
T-Value=0.436					T=0.168			
P=0.663					P=0.867			

Source: Primary data (Oct. 2007)

Respondents in the study area reported that they sold some of their agricultural products right after harvest to cover costs of farm inputs, social obligation and urgent family expenses by taking to the immediate near by local market. The survey result indicated that the average distance of respondents' home from the nearest market place was 2.89 km (Appendix XI). On average APM was located about 2.87 km distance whereas PPM was about 2.91 km far away from the nearest market. From among the total respondents, 12.4 per cent lived at a distance above 5 km, 46.9 per cent of the respondent lived at a distance of 2.5 km or below away from the local market and from among them 40.7 percent of the respondent located in a distance between 2.5-5 km (Table 17). The longer distance implies that people less often go to market and more time was required to get to market.

### 4.2.1.5.3 Marketing Alternatives

Out of the total respondent households, 78.4 per cent use other alternatives market opportunities to sell their produce (Table 18). The alternatives for farmers were selling their produce directly to consumers, retailers and whole sellers in the local market. From the sample households who have access to market alternatives through cooperatives are 48.6 and 51.4 per cent for the PPM and APM respectively. Chi-square test run showed that the percentage difference between the two-sample groups was statistically significant at 5 per cent probability level ( $\chi^2=3.999$  and  $P=0.046$ ).

**Table 18 Distribution of respondents in accessing Alternative Marketing Opportunities**

	PPM	%	APM	%	Total	%
Alternative Market						
Otherwise	71	55.9	56	44.1	127	78.4
Cooperative	17	48.6	18	51.4	35	21.6
N	88		74		162	
Chi-Sq	3.999		P=0.046			

Source: Primary data (Oct. 2007)

### 4.2.1.6 Membership Characters

#### 4.2.1.6.1 Share Contribution of the Members

The result in Table 19 revealed that 60.5 per cent of the total respondents have only one paid up share capital while 32.1 per cent of the respondents purchase one additional share in the cooperatives. The study also reveals that members who have more than three shares are 7.4 per cent (Table 19). Additional number of paid up share capital is essential to build up the sense of ownership among members of cooperatives. The study result shows that 78.5 and 21.5 per cent of the PPMs and APMs have only the voting share in cooperatives while 15.9 and 84.1 per cent of PPMs and APMs respectively have secured additional paid up share capital in the previous years. The study result indicates that actively participating members (APM) have much better sense of

ownership and willingness to purchase additional share to finance cooperatives. The mean difference between sample groups is significant at 1 percent probability level (Table 19).

#### 4.2.1.6.2 Membership Duration and Status

Difficulties are encountered when the principle of the “voluntary and open membership”, is violated. Co-operative principles require that membership should not be assumed to imply either political commitment or obligation. Co-operatives organized and tightly controlled by government, as instruments of state economic policy are rarely conducive to the development of democratically controlled, member-owned co-operatives (Coward, 2004). Because they are created to serve the objectives of politicians and planners; on which their objective may or may not coincide with members who have little effective control of the cooperatives.

**Table 19 Distribution of Duration of Membership, Share Contribution and Membership Status**

	PPM	%	APM	Percent	Total	Percent
1-5 years	19	61.3	12	38.7	31	19.1
6-10 Years	25	62.5	15	37.5	40	24.7
Above 10	44	48.4	47	51.6	91	56.2
T				-1.363		
P				0.175		
Share Contribution of Members						
0-1 Share	77	78.5	21	21.5	T-Value	P-Value
Additional Share	10	15.9	53	84.1	-7.671	.000
Membership Status						
Otherwise	75	72.8	28	27.2	38.792	.000
Convinced and Self initiated	13	22.0	46	78.0		

Source: Primary Data (Oct. 2007)

Although there was a kind of persuading the farmers to be members of cooperatives in late 1990s and early 2000s, the existing members had become members in different periods. The study result shows that 56.2 per cent of the total respondents became members for more than 10 years while 24.7 per cent of the respondents became members in between 6-10 years before (Table 19).

The study result also shows that there is no significant difference in between the two sample respondent groups in their mean difference.

It is unusual for farmers in the study areas to become a member in cooperatives through self-initiatives or convinced with the objectives and benefits. Table 19 shows that 72.8 per cent of the PPMs and 27.2 APMs had become members through mobilization or persuasion. 63.5 per cent of the total sample respondents joined into cooperatives not because they were clear on the merits they can secure being a member but to secure food aid or involve in food for work programs.

#### **4.2.1.7 Perception of Members**

##### **4.2.1.7.1 Perception on the Role Performances of Cooperatives**

With regard to members' perceived role of cooperatives upon achieving their goal, the respondents were asked certain questions to identify their reaction. The indicators used to measure members' perception on the role of cooperatives included: price stabilization, information dissemination, solving marketing problems and rendering demand oriented service. Accordingly, the research result reveals that, 39.5, 56.2, 53.7 and 62.4 per cent of the total respondents disagreed that cooperatives were playing important role in achieving the price stabilization, market information dissemination, solving marketing problems of the members and rendering demand oriented services objectives respectively. Therefore, the study result indicates that members' perception were negative on cooperatives towards achieving their objectives. The percentage difference between the two respondent groups for price stabilization, market information dissemination and solving marketing problems is significant at one percent level of probability (Table 20).

**Table 20 Distribution of Members Perception on the role performance of cooperatives**

Variables	Category	PPMs (N=88)		APMs (N=74)		X <sup>2</sup>	P-Value
		Count	Per cent	Count	Per cent		
Pricing stabilization	Disagree	58	65.9	6	8.1	80.95	.000
	Not Sure	25	28.4	17	23.0		
	Agree	5	5.7	51	68.9		
Information Dissemination	Disagree	69	78.4	22	29.7	42.62	.000
	Not Sure	18	20.5	36	48.6		
	Agree	1	1.1	16	21.6		
Solving Marketing Problems	Disagree	65	73.9	22	29.7	77.62	.000
	Not Sure	22	25.0	35	47.3		
	Agree	1	1.1	17	23.0		
Demand Oriented Services	Disagree	56	63.6	45	60.8	0.34	0.235
	Not Sure	23	26.1	21	28.4		
	Agree	9	20.3	8	20.8		

Source: Primary data (Oct. 2007)

#### 4.2.1.7.2 Members' Perception on Transparency and Accountability

The control structure of co-operatives is made up of three tiers: the general assembly, BoDs and employees. Each structure has clearly demarked duties and responsibilities. The General Meeting of Members makes policy and through the annual meeting members exercises control. The BoDs are the delegates of the GA, which controls the works of the co-operative on behalf of members. In most case the MPCs have employees who are responsible to carry out activities such as book keeping, store keeping, shop keeping and sometimes managing. The employees are accountable to the board, and the board in turn to the GA.

Important points used to indicate the existence of transparency and accountability inside the cooperatives: willingness and ability of the board to conduct Annual General Meeting, report to General Meeting, passing decisions based on the by-law, members' willingness to exercise their duties and rights and steps used to distribute dividend were among some.



Cooperatives need to disclose their members a specific time/date in a year to hold an Annual General Meeting. The annual general meeting is mandated to hear and approve the audit report, decide how any surplus shall be used and distributed, electing Board, approving the annual plan and budget etc. An attempt was made to recognize whether the cooperatives had a regular annual general meeting or not in the study areas. The study result shows that 26.1 per cent of PPM and 41.9 per cent of APMs were aware of the existence of regular annual meeting and were capable to attend (Table 21). The remaining members 69.1 per cent of the total respondents from both PPM and APM were not well informed to attend the annual general meeting. In most MPCs the general meeting is used to be carried on after several calls.

Consequently, 30.9 per cent of the total respondents were aware about the reports discussed in the GM while 69.1 per cent of the respondents were not clear about the report or not involved in the meeting to be informed about the achievements (Table 21). On the other hand, 32.1 per cent of the total respondents also responded that the board and management were used to pass decisions based on the mandate given to them in the by-law, while 67.9 per cent said they have no ideas on what base the board and management used to pass decisions.

In addition, the study result shows that 30.2 per cent of the total respondent said they were aware to their duties and rights while 69.8 per cent were not. This means majority of the members were not aware on what they must do in order to be able exercise their rights. Patronage Dividend is the distinguishing feature of cooperatives from other form of business organizations. Members are expected to be informed on when and how dividend is distributed to members. However, the study reveals that only 32.1 per cent of the total sample respondents had clear understanding on

the dividend distributing procedures and methods while the remaining 68.9 per cent lack the understanding.

**Table 21 Perception of members on Transparency and Accountability of coops**

Description	PPM= 88				APM=74			
	Yes	No	Yes	No	Yes	No	Yes	No
Conducting Annual Meeting Timely	23	26.1	65	73.9	31	41.9	43	58.1
Reporting to The General Meeting	19	21.6	69	78.4	31	41.9	43	58.1
Deciding Based on the By-Law	16	18.2	72	81.8	26	34.1	48	64.9
Awareness on Duties and Rights	25	28.4	63	71.6	24	32.4	50	67.6
Distributing Dividend	22	25.00	66	75.0	30	40.5	44	59.5
N	16	18.2	72	81.8	30	40.5	44	59.5
X <sup>2</sup>	9.885							
T	0.002							

Source: Primary Data (Oct. 2007)

In general, the study result indicates that 28.4 per cent of the total respondent agreed with the existence of transparency and accountability in the cooperatives, while 71.6 per cent of the respondent disagreed with this idea. The chi-square test also indicates that there is significance difference between the groups at 1 per cent level of significance (Table 21).

#### **4.2.1.7.3 Perceived Agricultural input/output Prices of Cooperatives**

It is obviously known that the willingness of farmers to purchase agricultural input is influenced by the expected agricultural products price. That is, if members observe and perceive that the pricing policy is unfair, they refrain to use improved agricultural inputs based on recommended rate and selling their produce to the cooperatives. This will have its own negative consequence in letting them involving in the affairs of cooperatives. So members are very much price sensitive and enthusiastic to have great concern upon agricultural output/input prices. The concern emanates from the very nature of cooperatives that they are established to stabilize market prices

to producers by increasing members' bargaining power. With regard to the respondents' perception on agricultural output and input prices, 31.5 per cent of the total respondents have good perception and 68.5 per cent of the respondent perceived poorly (Table, 22). There is no percentage difference between the two sample groups.

**Table 22 Distribution of perceived prices of agricultural input/output**

Description	PPM	Per cent	APM	Per cent	Total	Per cent
Poor Perception	62	55.9	49	44.1	111	68.5
Good Perception	26	51.0	25	49.0	51	31.5
N	88		74		162	
Chi-Sq				0.335		
P				0.563		

Sources: Primary Data (Oct 2007)

#### **4.2.1.7.4 Members' Satisfaction**

Most co-operatives, in the study area in particular, operate in a commercial circumstances which any form of business enterprise would find difficult. Like their farmer-members, the co-operatives have to operate in very marginal conditions. Their members are usually poor, often subsistence, and farmers.

Hence members' may expect price differences, demand-oriented service provision, proximity to the village, appropriate timing, less cost and high quality of services. However, mostly, it could be beyond their capacities to meet all the criteria. An attempt was made to measure members' satisfaction using the above stated indicators.

Accordingly, the study result reveals that members' perception on price differences on the services rendered by cooperatives as comparing to other service providers were that out of the total respondents 54.3 per cent of the total respondent were not happy on this regard. Overall, 29.4 and 60.6 per cent of PPM and APM respectively were satisfied by the service providing

through cooperatives while 70.6 and 39.4 of PPM and APM were dissatisfied by the pricing, costs, timing and quality of services cooperatives rendering.

**Table 23 Distribution of Perception of Members' Satisfaction on the services rendered through cooperatives**

Indicators	PPM (N=88)				APM			
	Yes	%	No	%	Yes	%	No	%
Price Differences	19	20.2	69	79.8	55	67.8	19	32.2
Demand oriented	24	27.3	64	72.7	45	60.8	29	39.2
Proximity	23	26.1	65	73.9	43	58.2	31	41.8
Timing of supply	34	38.6	54	61.4	38	51.3	36	48.7
Costs of services	37	42.1	51	57.9	47	63.5	27	36.5
Quality of services	18	20.1	70	79.9	41	55.4	33	45.6
Total	155	29.4	373	70.6	269	60.6	175	39.4
Chi-Square					97.579			
P-Value					0.000			

Sources: Primary Data (Oct 2007)

Depending on the number of total responses, the major problems perceived by members as a major problem to affect satisfaction in the study areas were reported to be lack of price differences, demand oriented services, proximity or location, late supply of input, high cost and poor quality of services (Table 23). The percentage differences between the two sample groups are significant at 1 per cent probability level.

#### **4.2.2 Econometrics Model Analysis /Tobit**

Prior to running the Tobit model, the hypothesized explanatory variables were checked for the existence of multi-Collinearity and heteroscedasticity. Very often data we use in regression analysis cannot give decisive answers to the questions we pose. This is because the standard errors are very high or the t-ratios are very low. This sort of situation occurs when the independent variables display little variation and/or high intercorrelations. The situation where the independent variables are highly intercorrelated is referred to as multi-collinearity (Maddala, 1992). Before running the model all the hypothesized explanatory variables were checked for the

existence of multi-Collinearity problem. There are two measures that are often suggested to test the existence of multi-collinearity. These are: Variance Inflation Factor (VIF) for association among the continuous independent variables and contingency coefficients for dummy explanatory variables.

The technique of variance inflation factor (VIF) was employed to detect the problem of multicollinearity among the continuous variables. According to Maddala (1992), VIF can be

$$\text{defined as: } VIF(x_i) = \frac{1}{1 - R_i^2}$$

Where,  $R_i^2$  is the square of multiple correlation coefficients that results when one explanatory variable ( $X_i$ ) is regressed against all other explanatory variables. The larger the value of VIF ( $X_i$ ) the more “troublesome” or collinear the variable  $X_i$  is. As a rule of thumb, if the VIF of a variable exceeds 10, there is a multicollinearity problem. Nine explanatory variables were tested for VIF. The VIF values displayed below have shown that five continuous explanatory variables have no serious multicollinearity problem (Table 24).

**Table 24 Variance Inflation Factor for Continuous explanatory Variables**

S. No	Variables	R <sup>2</sup>	VIF
1	MEMSHCA	0.405*	1.628
2	LSTKEM	0.402*	1.193
3	TEXPEM	0.993	154.045
4	TAINCEM	0.994	166.067
5	OFINCEM	0.439**	1.239
6	ONINCEM	0.997	168.032
7	MECROPR	0.968	30.845
8	MEMAGE	0.311**	1.107
9	INPUTPUR	0.712*	2.029

Sources: Computed primary data

\*Significant at 1% level

\*\*Significant at 5% level

Similarly, contingency coefficients were computed to check the existence of multicollinearity problem among the discrete explanatory variables. The contingency coefficient is computed as:

$$C = \sqrt{\frac{\chi^2}{N + \chi^2}}$$

Where, C= Coefficient of contingency

$\chi^2$  = Chi-square random variable and

N = total sample size.

The decision rule for contingency coefficients is that when its value approaches 1, there is a problem of association between the discrete variables. The result in Appendix XII indicates that eight discrete explanatory variables had no the problem of multicollinearity.

One of the assumptions in regression analysis is that the errors  $u_i$  have a common variance  $\sigma^2$ . If the errors do not have a constant variance we say they are heteroscedastic (Maddala, 1992). In the general linear model, OLS estimates are consistent but not efficient when the disturbances are heteroscedastic. In the case of the limited dependent variable models (such as Tobit), the estimate of the corresponding regression coefficient is upward biased in the presence of heteroscedasticity. But nothing can be said about the other coefficients and the direction of the bias. It is more practicable to make some reasonable assumptions about the nature of heteroscedasticity and estimate the model than just to say that Maximum Likelihood estimates are inconsistent if heteroscedasticity is ignored (Maddala, 1997).

In this study heteroscedasticity was tested for some suspected variables by running heteroscedasticity Tobit model using econometric software (LIMDEP). Green (2000) has indicated that if hetroscedasticity is present in Tobit model, it could take the following form:

$$\sigma_i^2 = \sigma^2 e^{\alpha'}$$

Where,  $\sigma_i^2$  represent the heteroscedastic explanatory variable. A test for heteroscedasticity thus involves the hypothesis that  $\alpha = 0$ . Therefore, in this study a heteroscedasticity corrected Tobit model was used in the regression of the dependent variable on the explanatory variables'.

Total amount of input purchased in birr and livestock ownership in TLU were assumed as the possible sources of heteroscedasticity. We found that total amount of input purchased was statistically significant for heteroscedasticity, while livestock ownership was not significant. For the convenience of computing the marginal effects and change of probability in members' participation for the study, the Tobit model was estimated by simply excluding one variable, which was found to be significant for heteroscedasticity (i.e. Input Purchased).

#### **4.2.2.1 Determinants of Probability of Participation and Index of Participation**

Estimates of the parameters of the variables expected to determine the probability of participation and level of participation are displayed on the Table below. A total of 12 explanatory variables were considered in the econometric model out of which 10 variables were found to significantly influence the participation probability and index of participation intensity. Of the total 10 explanatory variables six discrete and four continuous explanatory variables were found to be significant to determine the probability of participation and index of participation intensity.

As expected, Age (AGEMEM) was negatively influencing the change of probability of members' decision to participate in cooperatives affairs (significant at 10 per cent level). The direction of the coefficient of this variable showed a negative relation with members' participation and is significant at 10 per cent probability level. This means that an increase in the age of household head decreases the likelihood for the household to participate on the affairs of cooperatives by

0.15 per cent. This is possible because as farmers get more and more experience in their farming operation, climatic knowledge of their area, accumulate wealth and use better planning than the younger ones, the behavior farmers averting risk increases with increasing in age and experiences of the household head. Hence, they may prefer to refrain from actively participating in the affairs of cooperatives. On the other hand, perhaps, the inverse relationship of age with participation in cooperatives happened due to the fact that the younger farm households cannot get enough land to support their livelihood compared to the older farm households. Therefore the younger households have to rely more on non-farm employment than the older ones to support their livelihood. Usually farmers with small land holding or devoid of farm land depend on non-farm activities, which don't require active participation in cooperatives. However, the result proves the hypothesis that members' age has significant contribution to the change in the probability of members' participation.

The econometric model result revealed that gender differentials among the member farm households (MEMSEX) were positively influencing the decision to participate and intensity participation (significant at 10 per cent level). The positive sign indicates that male-headed households were more likely to participate in cooperatives: input purchasing, using loan services, and other affairs of cooperatives which involve decision. Being a male-headed household increases the probability of participation by 7.45 per cent. This result is in conformity with the priori hypothesis.

As expected, level of education (MEDUST) was positively influencing the probability of participation and intensity of participation (significant at 5 per cent level). Education (the change in status of household head from illiterate to literate) increases the probability of participation by 8.55 per cent. This suggests that members' with better intellectual capital have the ability to improve their



access to seek information so that they can easily understand the benefit of collective efforts, their duties and responsibilities, and the principles and values of cooperation. The more members have ability to read and write the more they can have access to share others' experiences of cooperation and as a result, improves the probability of their participation.

Share contribution of members (MEMSHCA) was also positively related with participation and intensity of participation (significant at less than 10 per cent level). Each additional unit of members' financial contribution increases the probability of participation by 1.92 per cent. This suggests that participation is more likely enthusiastic to households with large number of share capital.

Access to Credit and Input (ACCINP) is another important factor which was positively related to the dependent variable (significant at 5 per cent level). Access to credit and input increases the probability of participation by 24.67 per cent. The result coincides with the fact that credit is essential to farmers to purchase fertilizer, seed, farm implements and pesticide and maintain close relationship between members and cooperatives. Basically, cooperatives are established to address issues related to input and credit provision.

Of interesting is the finding that the off-farm income of members (OFINCEM) have inverse relationship with probability of participation (significant at 5 per cent level). Perhaps, involvement in various activities increases the ability of members to generate additional income through diversification of non-farm activities, which can have impact in changing the probability of members' participation by 0.04 per cent. This result also confirms with the hypothesis that off-farm income has significant impact on participation of members' in cooperatives affairs. The more farmers used to earn off-farm income the more they decide to relay on non-farm activities

for their livelihood, which doesn't request necessarily to involve in input/output marketing, purchasing share capital as well as other undertakings of cooperatives.

Perceived satisfaction of members (MESATIF) also has positive relationship to the probability of members' participation (significant at 10 per cent level). The perception of members' satisfaction on services delivered by cooperatives increases the probability of participation by 9.25 per cent. Pricing policy, demand oriented service provision, timely, less costly and high quality of services are the most important indicators used to measure members' satisfaction. Hence the result of the study shows as a unit increase of members' satisfaction the likelihood to change the probability of participation also increases at 9.25 per cent. The result is inconformity with the hypothesis that members' participation is determined by the satisfaction on the services rendered through cooperatives.

Total livestock owned (TLU) is another factor, which was positively related to the dependent variable (significant at 10 per cent level). Each additional unit of Livestock increases the change of probability of participation by 1.26 per cent. The implication is that livestock are important sources of cash income in rural area, which can be used for purchasing of input, use available loan services, feel confident participate in cooperatives activities which may involve decision and exercising their duties and responsibilities including buying additional share capital. In addition, farmers who owned a large number of livestock have the capacity to buy share capital, bear risks of using agricultural input and available loan services. Therefore, the result coincides with the hypothesis that livestock ownership is significant factor to determine members' participation.

It is also apparent from the results that the participation of members is influenced by the condition which allows them to become members (Significant at 5 per cent). Sample respondents who became member through self initiation and convinced by the promotional works were

participating actively better than the other groups. Being a member through self-initiation and convincing manners (that is through the efforts of awareness raising activities) more likely encourage them decide participate in various activities of cooperatives actively and increases the change of probability of their participation by 9.15 per cent. The implication is that, convinced members are keen to be aware of what is going on in the cooperatives and encouraged to have active role in patronizing the business. On the contrary, persuaded members were passive to involve in the affairs of cooperatives.

The priori expectation was the existence of alternative marketing opportunities may not affect members' participation in cooperatives. However, the expectation may be reversed when there are alternative market outlets available in their locality. The availability of alternative market opportunity, therefore, has negatively influenced members' participation in cooperatives (at 1 per cent significant level). Though the nature of farming practice in the study area doesn't allow the farmers to have the experiences of producing for marketing purpose they used to sell part of their produces to consumers directly, or to retailers and wholesalers on the nearby local markets. Most frequently, they also used to buy basic necessities from the private dealers for consumption. This is so because from the very nature of consumer behavior, members may not be ready to compromise on their own comparative advantages to share risks with cooperatives assuming future benefits. Perhaps, lack of price differences, supply of goods and services based on members' demand, high cost and poor quality services might attribute to members' interest in looking for alternative market opportunities. Therefore, access to alternative marketing opportunity decreases the probability of members' participation in cooperatives affairs by 16.22 per cent. The result implies that cooperatives lack a system that makes them competent in providing services to attract members' comprehensive participation in all activities (Table 24).

The fact is that members' commitment to use cooperatives as marketing outlet or agent depends only as long as they are capable to offer attractive prices or quality services.

**Table 25: Maximum Likelihood Estimates of Tobit Model**

Explanatory Variables	Estimated Coefficient	Standard Error	T-Ratio	Change in probability
				$\frac{\partial f(z)}{\partial x_i} = f(z) \frac{\beta_i}{\sigma}$
Constant	0.109959	0.0876701	1.25424	0.1629
MEMAGE	-0.00097959	0.00155535	-0.629821***	-0.00145
MEMSEX	0.0502671	0.0301517	1.66714***	0.0745
MEDUST	0.0576828	0.0284818	2.02525**	0.0855
LSTKEM	0.00850377	0.00630097	1.3496***	0.0126
MESHCA	0.0129954	0.0156566	0.830031***	0.0192
PERCORPM	0.0679764	0.0370421	1.83511	0.4733
TRACCT	0.214548	0.044392	4.83303	0.3180
MESTA	0.0617288	0.0305601	2.01991**	0.0915
MESATIF	0.0623782	0.0296878	2.10114**	0.0925
ALTMAR	-0.109397	0.0311118	-3.51626*	-0.1622
ACCINP	0.166482	0.0318713	5.22357**	0.2467
OFINCEM	-0.000243	0.000161	-1.50958**	-0.0004

Source: Computed result of primary data

\*\*\*, \*\*, \* Represents level of significance at 10% 5% and 1 % respectively

#### **4.2.2.2 Effects of Changes of the Significant Explanatory Variables on the Index of Participation Intensity**

The results of the Tobit model were also used to identify the effects of marginal changes of the explanatory variables on the level of participation (participation index) of members in cooperatives. Table 25, presents the effect of marginal changes (derivatives) of explanatory variables on the intensity of participation (participation index) among actively participating members (APMs) as well as the entire sample households.

Members' age, off-farm income and access to alternative marketing opportunities were the only significant explanatory variables which had inverse relationship with index of members' participation intensity while the marginal effect of other significant explanatory variables had positive relations. Members' age was one of the explanatory variables, which had inverse relations with the intensity of participation. The increase in one year in age reduces the index of participation by 0.0008 for APMs and by 0.0007 for the whole sample respondents. As the age of farmers increases their decision on resource allocation including time depends on the tangible and expected outputs which they thought it can bring for them. This is so because age taught them to thoroughly see the risks and benefits associated with participating in cooperatives.

Variables representing the demographic characteristics: educational status and sex of respondents had found positively determining the members' index of participation. Sex status of the household head (being a male) increases the intensity of members' participation by 0.0409 among APMs, and by 0.0376 among the entire sample. This implies that male headed households have better understanding on the benefits of cooperation than female headed household members.

Similarly, the marginal effect result reveals that the change in the education status of the member HH (from illiterate to literate) increases participation index by 0.0469 among APMs, and by 0.0433 among the whole sample respondents.

The farming characteristic variable used in the analysis, i.e., number of total livestock (TLU) owned has a positive effect. A unit increase in the number of livestock owned (TLU) increases index of participation about 0.0102 among APMs and by 0.0064 among the entire sample. Farmers who have larger number of livestock have sufficient number of oxen to plough their field timely and as a result obtain high yield and income to demand services from cooperatives.

Off-farm income of members was the only significant explanatory variable representing income and expenditure characteristics used for the analysis. The study result shows that the amount of off-farm income earned is negatively related to the level of members' participation (index). An increase in the off-farm income of the members by 1 birr decreases the index of participation 0.0002 for APMs and by 0.000018 for the entire sample respondents.

Variable representing institutional service, Access to input credit, have positively influenced members' intensity of participation in cooperatives. Access to input credit increases members' participation intensity by 0.1354 among APM and by 0.1248 among the entire sample. The study result revealed that members were easily accessible to the loan and input services of cooperatives. The more cooperatives involve in input supply and credit service provision, they can secure the more effective participation of members.

Access to alternative marketing opportunities (ALTMAR) was also significant explanatory variable, which represents institutional characters. The study reveals that as farmer members have accesses to more alternatives marketing opportunities for their output and basic needs the probability of using cooperatives as marketing outlets or agents decreases. An increase in the

number of the alternative marketing opportunities decreases level of participation by 0.0889 for APMS by 0.0820 for the whole sample respondents.

The explanatory variables representing membership characteristics: members' share capital contribution and the condition members joined to cooperatives had positively influenced on the intensity of members' participation. A decision of members to buy a unit of additional shares in the cooperatives let increases the index of participation by 0.0106 among APMs and by 0.0097 among the entire sample. This directly implies, as members have more number of share capital (paid up) in the cooperatives the more likely they could have enthusiastic to be involved in the affairs of cooperatives.

As expected, condition of membership to be member in cooperatives was influenced positively level of participation. The marginal effect result shows that being a member through self initiation and convincing mechanisms (promotional efforts) increases the index of participation by 0.0502 for the actively participating members and by 0.0463 for the whole sample respondents. Promotional efforts were so essential to enhance self-initiated membership so that members' level of participation in cooperatives can be improved.

The explanatory variable members satisfaction upon the services delivered through cooperatives has positive sign and the marginal effect of change determines the level of participation of members by 0.0507 for APMs and 0.0468 for the whole sample respondents. The marginal effect of the result implies that as the level of members' satisfaction increases the members' commitment to participate in cooperatives also improves.

**Table 26: The Effects of Change in the Significant Explanatory Variables on Intensity of Participation**

Explanatory Variables	Estimated Coefficient	Change among APM $\frac{\partial E(Y_i / Y_i^* > 0)}{\partial X_i}$	Marginal Effect Among the Whole $\frac{\partial E(Y_i)}{\partial x_i}$
MEMAGE	-0.00097959	0.0008	0.0007
MEMSEX	0.0502671	0.0409	0.0376
MEDUST	0.0576828	0.0469	0.0433
LSTKEM	0.00850377	0.0102	0.0064
MESHCA	0.0129954	0.0106	0.0097
MEMSTAT	0.0617288	0.0502	0.0463
MESATIF	0.0623782	0.0507	0.0468
ALTMAR	-0.109397	-0.0889	-0.0820
ACCINP	0.166482	0.1354	0.1248
OFINCEM	-0.000243	-0.0002	-0.00018

Sources: Computed result of Primary data

Log Likelihood Function= 109.132

F(z)= 0.7498

f(z)=0.2128

Z=1.15



## **4.3 Problems of Cooperatives**

Low standards of performance, bad management, financial failure, corruption and misuse of funds, use of co-operatives for political ends, have been common features of co-operative enterprise in several areas. As a consequence, a great deal of understandable crisis has been witnessed in the co-operatives, and many, including some members, have become doubtful as to its ability to play an effective role in the development process. There are a number of problems, which inhibit co-operative development and adversely affect performance. For simplicity of analysis, problems, the most important of which are discussed below classifying into three groups. Out of the total respondent households, 16.1 per cent (26 in No) participated in leadership of cooperatives as BoDs. From the sample households who have participated in leaderships, 67 and 33 per cent were APMs and PPMs, respectively.

### **4.3.1 Organizational/ Internal Problems**

As far as internal condition of cooperatives is concerned, it is consisted of management committee, general assembly and cooperatives' employees. Moreover, physical and financial properties, the systems and procedures also constitute the internal or organizational part of cooperatives.

Therefore, limitations in the capacity of MC or BoDs, initial capital, members' participation in DM, transparency and accountability of the board and management, awareness on duties and responsibilities, failure of members to involve in general meeting were used as indicators to measure the internal or organizational problems of cooperatives. Accordingly, the study result reveals as indicated in Table 26, the sample respondents agreed that failure of members to

involve in general meeting, poor participation in decision-making and limitation in exercising their democratic right were the most important problems to determine the performances of MPCs. The index result in table 27 indicates that the highest scoring was failure of members to attend the annual general meeting. Members can only have the opportunities to elect boards, approve annual budget and activities, and evaluate the audit as well as activities report in the annual meeting. If they failed to attend the meeting, they might not have a power to make decisions and opportunities to exercise their democratic right.

Lack of equal opportunities to enjoy benefits as well as make decisions, limited capacity of boards and employees and lack of awareness on their duties and responsibilities are important problems to impede cooperatives performance. The problems are highly interrelated problems. Besides, lack of equal opportunities to all members is the effect of limited capacities of the board and management including their limitation in transparency and accountability on the steps used to pass decisions. Had it been involved in all aspects of DM, members might have effective patrons in collective marketing. There has been a tendency to argue that a major cause of co-operative failure is the constraint imposed on the lack of management skills and clearly demarked members' authority to exercise their democratic right. Moreover, the standard of management within co-operatives is often inherently poor. As has already been stated, co-operatives often work in markets and geographical areas considered as marginal in terms of profit potential by most other forms of commercial business enterprise. This being the case, the salaries, working conditions and work location that they are able to offer fail to attract top quality managers. Therefore, the internal problem or organizational constraint is the most important problem that requires due attention to improve the performances of cooperatives.

**Table 27, Organizational/Internal problems of cooperative**

S. No	Organizational/ Internal Problems	Important		Less Important		Not Important		Index
		Cnt	%	Cnt	%	Cnt	%	
1	Limited Capacity of BoDs & Management	102	63.0	28	17.3	32	19.7	0.694
2	Inadequate initial capital	81	50	40	24.7	41	25.3	0.623
3	Poor participation in DM	109	67.2	21	13	32	19.8	0.738
4	Lack of transparency and accountability	88	54.3	22	13.6	52	32.1	0.611
5	Failure to involve in annual meetings	108	66.7	26	16	28	17.3	0.747
6	Awareness of duties & responsibilities	87	53.7	43	26.5	32	19.8	0.670
7	Equal opportunity in passing decision	100	61.7	26	16.1	36	22.2	0.698
8	Limitation to exercise their right	101	62.3	24	14.8	37	19.6	0.703
		776	59.9	230	17.7	290	22.4	0.688

Source: Primary data (Oct. 2007)

Moreover, the result also indicates that lack of adequate initial capital is important problem to retard the performance of cooperatives. The creation of collectively owned capital by either reinvestment of profits (surplus) or buying additional shares is a highly important and desirable practice, though most of members failed to contribute more than one paid up share capital. Overall, more than fifty percent of the sample respondents agree that the indicators for the organizational or internal problems are real bottlenecks to impede the performance of cooperatives in input out put marketing.

### 4.3.2 External Problems

MPCSs are working on area where most profit oriented private and public enterprises refused to work with. The situation of members and the place where they are located have vital role in either impairing their movement or enhancing their performances. The external environment is beyond

the control of cooperative members as well as boards. The constraints listed on table 27 are assumed to represent external problems. The problem index of the survey result reveals that the major problem that affects participation of members and performance of cooperatives most significantly was the interference from other group who have vested interest on the expenses of cooperatives. Usually, the interference was seen from local and district administrators, promoters and other individuals. Regardless to the reasons to interfere on cooperatives affairs, its contribution in degrading members' sense of ownership upon cooperatives is very much.

On the other hand, unfair prices offered to agricultural produces, existence of unfair competition, small and fragmented land holding, increase of agricultural input price over time, and high cost of production were the most important problems affecting cooperatives performance. The unfair price offered to agricultural produces as a result of unfair competition was limiting cooperatives' scope of services. Consequently, cooperatives were unable to involve in marketing agricultural produces. Farmland is an important input for farming operation. The size of farmland is also essential factor of production and productivity. Farmer members demand for agricultural input depends on the size and fertility status of the land. The study result revealed that sample respondents also agreed that small and fragmented land holding, price increase for agricultural input over time, unfair competition and high cost of production were the most important problems that are affecting members' participation to improve performance of cooperatives.

Land is an essential input for proper utilization of agricultural inputs. Small size of farm land coupled with fragmented nature of the occupations are affecting highly the demand for improved agricultural input particularly fertilizer. Besides, high cost of production due to steady increase of fertilizer and labour costs and unfair competition from the private sector also has considerable impact to discourage members' patron in cooperatives. Similarly, factors, which determine

members' patron in other study areas such as unfair prices, offered to the produces of members and interference of other groups upon cooperatives had also high impact on the participation of members and performance of cooperatives in the study area.

**Table 28 External Problems affecting members' Participation**

S. No	External Problems	Important		Less Important		Not Important		Index
		Cnt	%	Cnt	%	Cnt	%	
1	Small and fragmented farm holdings	86	53.1	34	21	42	25.9	0.636
2	High- influence of vested interest	118	72.8	22	13.6	22	13.6	0.799
3	Price increase for agricultural inputs	89	54.9	24	14.8	49	30.3	0.623
4	Existence of other competitors	93	57.4	25	15.4	44	27.2	0.651
5	Low price of produces	102	62.9	31	19.1	29	18.0	0.725
6	High cost of production	86	53.1	32	19.8	44	27.1	0.629
		574	59.1	168	17.3	230	23.6	0.677

Sources: Primary data (Oct. 2007)

#### **4.4.3 Infrastructural Development Problems**

Increase in the agricultural production, should be achieved through the use of improved technologies. At the same time farmers should have access to market for their produces. The bulky and perishable nature of agricultural input and output requires massive transportation facilities, road networks, adequate warehouses, packaging materials, proper way of post harvest handling and other infrastructural facilities. Most frequently, due to remoteness and marginalization of the rural areas, market infrastructure tends to be deficient. There is lack of appropriate roads, communication means, and transportation. There is also lack of appropriate storage, irrigation facilities. This resulted into significant increase of cost of transactions. High transaction costs coupled with seasonal nature of demand and supply for agricultural input and output respectively, it is usually evident that price increases during peak demand period to input

and decreases in supply peak period for the produces. Consequently, cooperatives fail to compete and give adequate services to members due to inefficient management capacity.

The study result in the table 28 reveals that the 57.8 per cent of the total respondent perceived the cooperatives performance is highly affected due to infrastructural development problems while 21.4 per cent refused to accept. Besides, the respondents agreed on the shortage of trained man power, lack of information on market oriented production, communication facilities, marketing infrastructure, storage and transportation facilities, access to irrigation facilities, linkage with financial institutions, and electrification are affecting the performance of cooperatives and members participation as well (Table 28).

**Table 29 Infrastructure Development Problems**

S. No	Infrastructural Problems	Important		Less Important		Not Important		Index
		Cnt	%	Cnt	%	Cnt	%	
1	Trained man power	99	61.1	31	19.1	32	19.8	0.707
2	Information on market oriented production	105	64.8	31	19.1	26	16.1	0.744
3	Communication Facilities	98	60.5	34	21	30	18.5	0.709
4	Marketing Infrastructure	102	63.0	30	18.5	30	18.5	0.722
5	Storage and transportation facility	99	61.1	25	15.4	38	23.5	0.688
6	Access to Irrigation facilities	81	50	36	24.7	45	25.3	0.611
7	Linkage with Financial institution	81	50	42	25.9	39	24.1	0.629
8	Electrification	85	52.5	40	24.7	37	22.8	0.648
	Total	750	57.8	269	20.8	277	21.4	0.682

Source: Primary data (Oct. 2007)

Based on the index result, the most important problem of infrastructure according to the sample respondents' view was lack of sufficient information on market oriented production. The extension service providing to the farmers focuses on increasing production and productivities. Extension workers trained on agronomy, livestock production and natural resource management

have limited skill and experience to let the producers plan by answering what, how, when, where and why they need to produce.

On the other hand, the sample respondents also view shortage of trained man power and marketing infrastructure as important problem to determine cooperatives performance in input/output marketing. The day to day activities of cooperatives are managed by the employees whose academic background didn't exceed the secondary school. Mostly, the in-service training programs providing to up grade the employees skill were not based on the needs or gaps. As a result, the employees are not as such well oriented to assist the board or directors in passing decisions or formulating policies. Hence cooperatives are poor in their performances.

Equally, communication facilities were also important infrastructural problem by retarding the flow of information. Information is crucial for agricultural producers. Cooperatives and member farmers may require information for planning, implementing farm production and marketing. The existing communication facilities are not adequate to enhance the concerted efforts of cooperatives and member farmers.

On the top of this, lack of storage and transport facilities (including road), electricity and irrigation facility were among the important problems of infrastructure to affect performances of cooperatives. The storages or warehouses owned by cooperatives are below the required standard. Inadequate size or capacity, unevenly leveled floor, holes on the walls, floor and roof were the most important problems of the stores. Lack of electricity on the rural area is an obstacle to cooperatives plans little bit-advanced activities: agro-processing. Overall infrastructure is key area where members were clearly understood its level of effect up on their own individual as well as collective efforts.

## 4.4 Summary of Members' Suggestions

At the end of interviews sample respondents were requested to offer their suggestion. However, due to redundancy and similarities the researcher preferred to summarize into six categories. Moreover, all the sample member respondents didn't be able to provide suggestions clearly. The suggestions include:

**Demand Oriented Service Provision:** 45.1 per cent of the sample respondents' suggested that cooperatives business must be demand oriented. This view is from the very point that the service rendered through cooperatives is not planned based on members' demand. As it was discussed in the problem, little effort is done usually to consult members on planning, executing and evaluating activities. Lack of skill and experience to incorporate members view in the plan, negligence, and vested interest of certain group could be the cause for the problem. Members should have opportunities to express their needs. Services providing through cooperatives have to be based on members demand. Otherwise, the effort of cooperatives may fail to attain the objectives for shortage of fulfilling members' demand. Therefore, a concerted effort of the board, employees and promoters is required to take initiative in arranging opportunities to identify members' desires or ideas.

**Elect capable and dependable Management Committees:** According to the sample respondents' suggestion, 55.0 per cent of the sample respondents suggested that cooperatives management committees need to be capable, respected and dependable in order to carry out their mandate in effective and efficient way. The general assembly is supreme power of cooperatives. Election of MC is executed during annual meetings of the members. Members should involve in electing MCs. However, GA has supreme power, MCs are also mandated to pass decisions and give directions to the management or employees. Concern is required to elect capable, highly



respected and dependable board so that they can play a pivotal role in achieving the objectives. This is so because members have poor concern and involvement in electing MCs. The suggestion is from the very fact that members usually neither are willing to share responsibility nor have concern to elect dependable board members.

**Education and Training to members, MCs and employees:** Providing education and training on regular basis is one of the principles of cooperatives. The principle of education is fundamental in the co-operatives operation. It is an important principle, especially for cooperatives in the study area where the majority of their members are illiterate. Effective change of co-operatives can only be realized if the members are actively participating in their co-operative affairs. The members are owners, users of the services available and liable to control the over all activities. The efforts of promotional works have an advantage to bring about attitudinal change and inculcate sense of ownership among members. Therefore, organizations involving in promotional works must be well organized to train members in the advantages, duties and rights, principles and values of cooperatives. Management committees are the responsible bodies to lead the overall activities. They hire and fire employees, monitor the day to day activities, approve transactions and evaluate performances of employees. Unless they are well equipped with the principles, values, duties and responsibilities, it is too difficult to them to have meaningful role in managing activities and giving the right directions. Therefore, capacitating boards and employees have an indispensable result in achieving the objectives.

**Diversify Cooperatives Business/ Agricultural implements, inputs, collecting outputs etc:** The study result indicates that 42.0 per cent of the total sample respondents suggested that proper assessment of demand and potentials of the study areas is required in order to diversify cooperatives business and services. Cooperatives and/or other stakeholders should assess the

situation properly in order to diversify the business and meet members' demand. Diversification enables them to reduce risks and increase their profit and scope of service provision. Members' suggestion on this regard is correct. Regular assessment of the condition helps identify problems and suggest solutions. Assessment is also important for planning, monitoring and evaluations. Particularly cooperatives' involvement in collecting members' produce in the study area was almost poor. Though the area is known as major food deficit because of the frequently occurring draught and marginalized farm lands, farmers used to send part of their produce to the local market. If cooperatives are capable and competent to capture members market by offering fair prices, the access of alternative market opportunities would never be so crucial issue to cooperatives.

**Problem Oriented Support from NGOs and Cooperatives:** The study result shows 35.1 per cent of the sample respondents suggested that Governmental and NGOs support is crucial for cooperatives development. The support should focus on tangible and selected issues which have paramount importance to improve role of cooperatives in meeting their objectives. But the interventions need to have limited scope to avoid any kind of interference in their internal affairs. For instance, cooperatives operate in a very marginalized and remote areas where for most private enterprises would be difficult. Infrastructures such as road, store, electricity, communication facilities and other services are not developed well. As a result, the transaction and other related costs are very high. In most cases high transaction expenses are the main causes for cooperatives to be poor competent in the market. The government and NGOs can help cooperatives by expanding and improving infrastructure, providing soft and long term loan and developing systems and procedures, and providing trainings to the MCs and employees.

**Improve credit uses and loan repayment performances:** in this regard, the study result reveals 56.2 per cent of the sample respondents suggested the importance of dependable sources of loan and systems developed to manage loan available. Reliable source of fund for operation and investment is badly required by the cooperatives and members as well. Members' ability and willingness to finance cooperatives is limited for various reasons. The wider range of cooperatives' roles can only be attained if cooperatives have access to reliable and dependable sources of loan. Improving the cooperatives financial management is essential to secure credit and give confident to the creditors. Cooperatives are responsible to provide loan to the members for investment as well as agricultural operation such as input purchase, weeding, cultivating, threshing etc. Therefore, there need to be additional and specific types of feasible business projects where members can involve largely in generating additional income for their livelihood. Loan disbursed need to be collected properly so that cooperatives can cover their fund as well as operational costs in disbursing and collecting loans to and from cooperatives.

**Table 30 Summary of Suggestion of sample respondents**

S.No	Suggestions	No of Respondents	Percent
1	Demand Oriented Service Provision	73	45.1
2	Elect capable and dependable Management Committees	89	55.0
3	Education and Training to members, MCs and employees	26	16.1
4	Diversify Cooperatives Business	68	42.0
5	Problem oriented support from NGOs and government	57	35.1
6	Improve credit uses and loan repayment performances	91	56.2

Sources: Primary Data (October 2007)

# CHAPTER V

## CONCLUSION AND RECOMMENDATION

### 5.1 Conclusions

Ethiopia is among the poorest countries in the world where agriculture is almost the major source of living for more than 83 per cent of its people. Besides, even though the sector is the dominant sector in the national economy, its performance has been poor and failed to bring sustainable changes in the living standards of the rural community. The sector is failing from meeting the most basic and important function of the provision of food to a rapidly expanding population. Among others, underdeveloped agricultural marketing system is a major factor responsible for the poor performance of the sector.

Because of the inherent characteristics of cooperatives, it is true that different social, cultural, economical and political scenarios determine for their movement to be successful or full of failure. The nature of cooperatives as social organization/Association/ and economic organizations/business enterprises/ give them an opportunity to have dual objectives. Economic success is basic to the achievement of co-operative purpose for, in the long run, unprofitable enterprises cannot be sustained. On the other hand, they have social obligation to pursue for the successful achievement to the very concepts of equity and fair dealing.

Mostly the potential of co-operatives, and the extent of their development, has, in many cases, fallen for short of expectations. Low standards of performance, bad management, financial failure, corruption and misuse of funds, use of co-operatives for political ends, have been common features of co-operative enterprise in several areas. As a consequence, a great deal of

understandable crisis has been witnessed in co-operatives, and many, including some members, have become skeptical as to its ability to play an effective role in the development process.

The overall objective of the study is to analyze role of MPCs in agricultural input/output marketing in the study area. In order to see the role of cooperatives, it was preferred to give emphasis on evaluating their overall performances and members' participation as well as perceived problems in using the available services. Simple percentage analysis, ratio analysis, descriptive and econometrics model were employed to identify determining factors of the role of cooperatives in performing their activities as well as participation of the members.

Therefore, two districts and seven MPCs were selected at random from Eastern Tigray Zone for the study. A total of 162 member households of cooperatives were considered for this study of which 162 cases were included in the econometric model. In addition, secondary data obtained from relevant institutions were used.

Multi-purpose cooperatives operating in the agricultural sector of the national economy are supposed to increase efficiency of the marketing system and promote agricultural development in the rural area. The purpose of cooperatives is to coordinate individual efforts through improving bargaining power, creating economies of scales for members' produces and input, and sharing risks among the members. In order to see how MPCs are performing in the study area, an attempt was made to collect the available data in food grain distribution, input and credit provision, capital accumulation and profit making (2002-2006) from the district offices. The result was discussed organizing in three categories such as functional, organizational and financial performances.

The result shows that MPCs in Saesi-Tsaeda-Imba are functioning better in food grain distribution, input supply and credit provision than MPCs in Atsiby Womberta. The trend in the

function of MPCs in the activities stated earlier is increasing from year to year in S/Ts/Imba while it is fluctuating in Atsiby. MPCs in the two districts used to both medium term and short term loans from CBE for fertilizer and seed, and EU and World Bank for household package programs. Credit is the most important profit making business for the MPCs and beneficiaries. According to audit report of the study area, there was also healthy loan repayment performance. Consequently, a steady growth was witnessed in capital accumulation for the last five years. However, the service rendered by MPCs had neither consistency nor based on members' demand except input and credit services. Little effort had been made with regard to promotional support from the two district promotional departments to overcome the problem they have in procurement. In general, their contribution to market members' produce was very poor. Therefore, a concerted effort is required to improve their role in input/output marketing among the MPCs, governmental organizations, NGOs and the community.

With regard organizational performances, the cooperatives have their own working procedures and systems, by-laws, employees and boards, and working areas. Due to lack of comprehensive understanding on the by-law, working procedures and systems, they are not performing well though MPCs in Saesi-Tsaeda-Imba are performing with slightly better than Atsiby Womberta District. Similar results were found on the studies done by Gebru (2006) and Haileselasie (2003). Limitation of cooperatives to use qualified manpower, the management capacity of the cooperatives' board of directors and other employed workers were the most important obstacles identified as a finding. Accordingly, they suggested education and trainings, improving their financial capacity through encouraging members' financial contribution and enhancing participation of the farmers to patronize are among the possible solutions to improve their weak performances.

On the other hand, to evaluate the performance of cooperatives, ratios were analyzed taking the five years financial data (2002 and 2006). The liquidity analysis showed that the cooperatives under investigation were below the satisfactory rate (a current ratio of less than 2.00) for the last five years. All of the cooperatives under investigation in the two districts use financial leverage (financed more of their total asset with creditors fund i.e. on average 60.1 per cent of the assets of the cooperatives was financed with creditors fund for the last five years). The profitability ratio of the cooperatives under investigation in the two districts showed that their profitability was weak. For instance, the difference between return on asset (ROA) compared to the interest rate of financial institution was very low. Therefore, over all performance of cooperatives in the study area was weak or below the desirable level. Daniel (2006) analyzed cooperatives financial ratio to evaluate their financial performance in Ada'a Liben and Lume districts of Oromia regional state. The same problem was seen in the financial performances of cooperatives.

The descriptive statistics and econometric model were also used for analyzing the data in addition to the ratio analysis. T-test was used to compare the mean values of the continuous explanatory variables and examine the existence of statistically significant differences between APMs and PPMs in cooperatives affairs. The T-test showed significant difference in the age of the farmers, Livestock ownership, total annual income including on-farm and off-farm, expenditure, input purchased by the members, and share capital contribution between the two groups at less than 10 per cent probability level. Discrete variables were also compared using Chi-square test to see if there is statistically significant difference between the two groups. The Chi-square test also revealed that the discrete variables: sex, access to input and credit, membership status, educational status, members' satisfaction, perception on role performance of cooperatives, access

to alternative marketing opportunities and transparency and accountability showed significant differences between the two sample groups at less than 10 per cent probability level.

Econometric software called "Limdep" was employed to estimate the Tobit model to identify factors influencing the participation and index of members' participation (intensity of participation). The Tobit model was chosen since it has advantage over other models in revealing both the probability of participation and the intensity of participation (Participation Index).

Probability of participation and intensity of participation appear to be significantly and positively influenced by education status, sex, age, number of paid up share capital, off-income, total livestock owned, access to input credit, membership status, access to alternative marketing opportunities and members' satisfaction; while the influence of members' age, off-farm income and access to alternative market had inverse relationship and significant to determine participation. Perceived role performance, perception of members' on transparency and accountability, expenditure, on-farm income, total annual income, input purchased, perception on input/output prices, fertility status and farm size of the farm household, membership duration and family size were not significantly related to the dependent variable.

Moreover, perceived problems and members' suggestions were also identified sufficiently to analyze role of cooperatives. Accordingly, the most important problems that impede cooperatives performances are classified in to three categories. Internal/organizational problem which includes: limitation of management committee, employees, poor participation of members, lack of transparency and accountability etc ...; external problems: fragmented landholding, interference, agricultural input price increase, low agricultural produces price; and infrastructure related problems: lack of irrigation facilities, lack of trained man power, poor linkage with reliable financial institution, marketing infrastructure, communication facilities, storage and



transportation facilities and road. Based on the problems identified, the sample respondents offered suggestions to overcome the problems.

Performance of cooperatives and members' participation were used as key factors to analyze cooperatives role in agricultural input/output marketing in the study area. This is so because without active participation of members' it is difficult to think MPCs can perform well. That means if members' participation is weak cooperatives may fail to be on the right position to have a vital role on agricultural input output marketing. On the other hand poor performance of cooperatives prohibits members' active participations. Therefore, evaluation of performances of MPCs, members' participation in MPCs and identification of problems that affect cooperatives performance were adequate to analyze the role of cooperatives in agricultural input output marketing in the study area.

## **5.2 Recommendations**

On the basis of the results of this study, the following policy implications are suggested so as to be considered in the future intervention strategies which are aimed at the promotion of cooperatives at local (PAs), district, zonal, regional and federal level. These may be broadly viewed as strengthening institutional set up of cooperative sector in promoting from the grass root to the federal level as well through horizontal and vertical integration.

### **1. Human Resource Development**

The study result shows that education, age and sex of the household head, members' satisfaction and membership status are among the significant variables affecting the probability of participation and intensity of participation. To tackle the problem the intervention strategies focus should include development of awareness by giving due attention on educating members.

Members are owners, users and responsible to control cooperatives. Efforts have to be done to raise awareness of members on the principles, values including their duties and responsibilities. Besides, Board is expected to run the activities of cooperatives. A performance of cooperatives depends on the strength of Board in formulating appropriate policy to the management or employees. The promotional departments at district or regional level should assess the situation to design training programs to improve the capacity of the Board and employees. Raising awareness of members, up grading the capacity of Boards and employees are the most important efforts to improve the performance of MPCs. Well functioning and performing cooperatives can secure their members' active participation to achieve their objectives.

## **2. Strengthening organizational and Institutional Capacity of MPCs**

The poor functional, organizational and financial performances; poor participation of sample respondents in various activities of cooperatives; the significant explanatory variables of the econometric model result; the internal, external and infrastructural problems that affect performance of MPCs and members' suggestion are not only indicators limitations on organizational and institutional capacity of the MPCs of the study area. But also it implies for the need of effective intervention measures to improve the situation. Therefore, to overcome the problems of MPCs sustainably, the Government, NGOs and cooperatives should focus on the following points:

The MPCs are poor in their organizational performance as it was discussed in the internal and external problems, which are affecting the organizational and institutional capacities. Therefore, this requires proper design to adopt of area and activity specific office management system or procedure and operational manual and needs to be introduced into MPCs. Organizations actively involving in promoting cooperatives must be able to provide outreach services or on spot

trainings to the Board as well as employees. In addition, the promotional offices need to give due attention to introduce research based comprehensive technical and legal support. Involvement of the community in designing, developing and demonstrating the appropriate cooperatives' policy, regulations/procedures and approach enhances proper identification of social, cultural, political and economic constraints. Well designed and developed approach is essential to promote vertical and horizontal integration among cooperatives, cost effective resource utilization and bring about efficiency in their performances.

Apart from members' suggestion, the functional performance of MPCs result indicates that the scope of service rendered through cooperatives is limited to fertilizer distribution and credit provision. Therefore, the concerted effort of Government and NGOs is required to capacitate MPCs' management so as to assess the opportunities and potentials of their locality in preparing cooperatives' business plan. Need assessment is also important to identify members' need for certain services. Involvement of members in planning, implementing and evaluating is critical to improve cooperatives' performances. Due attention to the development of business development service appropriate for MPCs fosters the role of cooperatives in agricultural input output marketing through improving their management.

The availability of alternative market opportunity, access to input and credit and members' satisfaction on the services have significant contribution on members' participation in cooperatives. Though the nature of farming practice in the study area doesn't permit farmers to have the experiences of producing for marketing purpose, they used to sell part of their produces to consumers directly, or to retailers and wholesalers on the nearby local markets. Unless the extension services develop mechanism to provide strong support on market oriented agricultural production, members' demand for input credit service through cooperatives may not sustain long.

Therefore, the extension service needs to give special emphasis to change in the mind set of farmers to produce for market and assist cooperatives to involve in collecting the produces.

Moreover, the problem analysis revealed that the availability of infrastructure was an important determinant factor in promoting cooperatives' performance. Lack of marketing infrastructure, communication facilities and trained man power has been cited as major factors that determine cooperatives' performances in the study area. Therefore, the federal as well as the regional Governments should invest on infrastructure such as marketing infrastructure, introducing appropriate communication technologies, roads, power supply, water supply etc. Particularly, the role of cooperatives in promoting quality and standardization is vital and it is useful to the farmers to have access to high value market. Thus familiarization of cooperatives with the technology useful for quality and standardization improvement and maintenance including their application is important to improve members' participation as well as cooperatives performance.

### **3. Improve Cooperatives' Access to Financial Capital**

The sources of financial capital in rural areas are livestock, cash crop, and credit and off-arm income. The analysis of determinants of participation and intensity of participation revealed that almost significant number of the farm households depend on cooperatives for the purchase of input and loan. The access to input credit has significant positive effects. However, the MPCSS' financial performance result indicates that their financial performance is poor since the major source of fund, for operation is from external sources. Efforts aimed at promoting productivity through the use of improved inputs such as fertilizers should also take into account for the existence of reliable financial sources. The government and NGOs should involve in designing a mechanism to promote members' saving and additional share contribution so that MPCSS can provide both long term and short term credit to resource poor farmers in sustainable manner.

This is so because promoting new members, issuing additional shares and encouraging the existing members to purchase additional share capital, and mobilizing saving from members are the most important means to improve the financial strength of cooperatives from internal sources. Despite the efforts done to secure fund from lenders and donors, strengthening the internal financial sources should get prior attention so that cooperatives can have sound and healthy financial status. Sound and healthy financial leverage is the basic requirement/prerequisite to establish direct relationship between cooperatives and most financial institutions.

### **5.3 Implication for future research**

The role of cooperatives in agricultural input output marketing was studied only on Eastern zone of Tigray region. The other regions may have different situations. So, it is worth to study the role of cooperatives in agricultural input output marketing of other regions of Ethiopia.

## REFERENCES

- Alemayehu Lirensu. (1993). Grain Marketing Reform in Ethiopia: A Study of the Impact of Deregulation on the Structure and Performance of Grain Markets. Unpublished Ph. D. Dissertation, University of East Anglia, Norwich.
- Amemiya, T.,(1981). Qualitative response models: A survey. *Journal of Economic Literature*.
- Asfaw Negassa (2003). The Effects of marketing policy changes on spatial Grain market Efficiency: Extension to the parity Bounds Model and an application to Ethiopia. A paper presented at the Harnessing markets for Agricultural Growth in Ethiopia.
- Asmare Hagos, (1989). The impact of farm size on efficiency of the farmers producers' cooperatives: the case of Harrer-Zuria awraja. M.Sc. Thesis, Agricultural Economics, Alemaya University of Agriculture, Alemaya, Ethiopia.
- Barrett, C.B., J.T. Li, and D. Bailey. (2000). Factor and Product Market Tradability and Equilibrium in Pacific Rim Pork Industries. *Journal of Agricultural Resource Economics*.
- Bekele Hundie, (2001). Factors influencing input loan repayment performance of smallholders in Ethiopia: the case of Oromia and Amhara national states: M.Sc Thesis, Alemaya University of Agriculture, Ethiopia.
- Bereket Kebede, T.S. Jayne, and Mekonen Tadesse. (1996). Urban Grain Consumption Patterns in Ethiopia: Implications for Food Pricing Policy and Food Aid Programs. Summary of Preliminary Findings Urban Household Survey, Draft, Ministry of Economic Development and Cooperation, Department of Agricultural Economics Michigan State University, Department of Economics Addis Ababa University, Addis Ababa.

- Bringham, E.F. and J.F. Houston, (1998). Ratio Analysis. In: Dryden Press (ed.), Fundamentals of Financial Management. The Dryden press, Orlando, Florida, U.S.A.
- BoARD Tigray Region. (2003), Regional Strategic Plan (2003-5). Mekelle, Tigray.
- BoARD Tigray Region. (2004), Regional Annual Report. Mekelle, Tigray.
- BoFED Tigray Region. (1998). Socioeconomic Survey on Livelihood of Rural People in Eastern Tigray, Mekelle, Tigray.
- Center for Cooperatives, 2004. Working together for stronger cooperatives. University of Wisconsin, Madison, U.S.A. www. Wis. Edu/uwcc. Accessed In October 2005.
- Central Statistical Authority. (1997/98-2001-02). External merchandize Trade Statistical Bulletins. Addis Ababa, Ethiopia.
- Central Statistics Authority. (2006). Population Annual Estimation Report. Addis Ababa, Ethiopia.
- Central Statistical Authority. (2003). Household Crop production Survey Report. Addis Ababa, Ethiopia.
- Chukwu, S.K., 1990. Economics of the Cooperative Business Enterprise. Marburg, Germany.
- Crawford I.M.. (1997). Marketing and Agribusiness Management. The publication issued by the FAO Regional Office for Africa.
- Dadi, Legesse, A. Negassa, and S. Franzel. (1992). Marketing Maize and Teff in Western Ethiopia: Implications for Policy Following Market Liberalization. *Food Policy* 17.
- Daneil Belay, 2006. Performance Of Primary Agricultural Cooperatives And Determnants Of Members' Decision To Use As Marketing Agent In Adaa Liben And Lume Districts, MSc Paper, Alemaya University, Ethiopia

- David J.Luck, Ronald S. Rubin. (2005). Marketing Research, Seventh Edition. Prentice-Hall of India. New Delhi.
- Dawit Alemu. (2004). The status and challenges of agricultural marketing in Ethiopia, , Melkassa Agricultural Research Center, EARO
- Debrah S.H. and Brehanu Anteneh. (1991). Dairy Marketing in Ethiopia. Market of first Sale and Producers' Marketing Patterns. ILCA Research Report 1991 Addis Ababa, Ethiopia.
- Demelash Seifu. (2004). Sesame Marketing System. Amhara National Regional State Agricultural Commodity Marketing System Study, BahirDar, Ethiopia.
- Dessalegn, G., Jayne T.S., and Shaffer J.D. (1998). Market Structure, Conduct, and Performance: Constraints of performance of Ethiopian Grain Markets. Working Paper 9, Grain Market Research Project, Ministry of Economic Development and Cooperation,.
- Dessalegn Rahmeto, (1994). After Mengistu, a Mammoth Task. Ceres No 147. 1994.
- Eleni Gabre-Madhin, Bongor, and Suresh Babu. (2002). Ethiopian Development Research Institute and International Food Policy Research Institute Washington.
- Fassil Teffera, 1990. The Development of peasant service cooperatives in post revolutionary Ethiopia (1974-1987). Institute of Ethiopian Studies. Addis Ababa University, Ethiopia.
- FCC/A (Federal Cooperative Commission/Agency), 2005. Cooperative Annual magazine. Addis Ababa, Ethiopia.
- FCC/A (Federal Cooperative Commission/Agency), 2005. Annual report for the year 2004/2005. Unpublished document, Addis Ababa, Ethiopia.



- Gebbru, D. G. (2006). The Benefits of Co-Operative Membership: A Comparative Study in Ofla and Kafita Humera District, Tigray Region, Ethiopia, A Thesis in University College Cork, National University of Ireland, Cork.
- Getahun Degu (2004) Assessment of factors affecting adoption of wheat technology and its impact: the case of Hulu woreda, Ethiopia, M.Sc. Thesis, Agricultural Economics, Alemaya University, Ethiopia.
- Gizachew Geteneh, (2005). Dairy Marketing Patterns And Efficiency: A Case Study Of Ada'a Liben District Of Oromia Region, MSc Paper, Alemaya University, Ethiopia
- Green, W.H., (2000). Econometric Analysis. Prentice Hall International, Inc, New York University, New York, U.S.A.
- Gujarati, D.N., 1988. Basic Econometrics, M.C. Graw Printing Press, U.S.A.
- Gujarati, D.N., 1995. Basic Econometrics. Third edition. United States of Military Academy, West Point.
- Haileselasie G. N. (2003). The Benefits of Co-Operative Membership: A Comparative Study in Saesie Tsaeda Emba District, Tigray Region, Ethiopia, A Thesis in University College Cork, National University of Ireland, Cork.
- Johnston, J. and Dinardo, J. (1997). Econometrics Methods. Fourth Edition, The McGraw-Hill Companies, Inc, New York, U.S.A.
- Kebebew Daka, (1978). Cooperative movement in Ethiopia. M.Sc. Thesis, Addis Ababa University.
- Kimberiy A. Zeuli and Robert Cooper. (1980). Cooperatives: Principles and Practices in the 21<sup>st</sup>

- Century, Madison Publication, USA.
- Kotler. P. (2003). Marketing Management. Prince Hall, Delhi-India.
- Krishaswami O.R and V. Kulandaiswamy. (1992). Theory of Cooperation: An In depth Analysis. Coimbatore: Shanma Publications.
- Maddalla, G.S., (1992). Introduction to Econometrics: 2<sup>nd</sup> ed. Business Economics: University of Florida and Ohio state University, Mac Milan publishing Company, New York.
- Maddala, G.S., (1997). Limited Dependent and Quantitative Variables in Econometrics. Cambridge University Press.
- MoARD. (2005). Annual Summary of annual Report Cereals Production and Grain Marketing, Addis Ababa, Ethiopia.
- Negarit Gazet 288/2002. (2002). National Agricultural Input Authority Proclamation: Proclamation number 288/2002. Addis Ababa, Ethiopia.
- Sammuel G/selassie. (2006). Intensification of Smallholder Agriculture in Ethiopia: Options and Scenarios. A Paper prepared for the Future Agricultures Consortium Meeting at the Institute of Development Studies Addis Ababa, Ethiopia.
- Sukhpal Sing. (2002). Rural Marketing. Focus on Agricultural Input. Institute of Rural Management, Anand, Gujarat.
- Tefera Derbew (2004). Determinants of smallholder farmers' demand for non-formal credit: the case of Farta woreda, M.Sc. Thesis, Agricultural Economics, Alemaya University, Ethiopia.
- Tigray Cooperative Promotion Office (TCPO). (2005). Annual Report submitted to Federal Cooperative Agency, Mekelle, Tigray, Ethiopia.

Tretcher, D.D., (1999). Impact of diversification on agricultural cooperative in Wisconsin.

Agribusiness. USA

T.S. Jayne, J. Govereh, M. Wanzala, M. Demeke. (2002). Fertilizer market development: a comparative analysis of Ethiopia, Kenya, and Zambia Department of Agricultural Economics, Michigan State University, Agriculture Hall 1485 Sylvan Glen, East Lansing, MI 48824 1039,USA.

Wegenie Yirko, (1989). The development of agricultural producers' cooperatives in Ethiopia: cases from Arsi region. M.Sc. Thesis, Addis Ababa University, Ethiopia.

William, J.R, S.F. Haka, M.S. Bettner and R.F. Meigs, (2003). Financial statement analysis. In: McGraw-Hill (ed.), Financial Accounting. McGraw-Hill Companies, Inc, New York, U.S.A.

Zerihun Alemayehu. (1998). Cooperatives Movement in Ethiopia, Unpublished paper presented in the National Workshop in Addis Ababa, Ethiopia.

<http://www.fao.org/docrep/X5661E/x5661e09.htm> Annual crop Assessment Report. (2005).

<http://www.ica.org> Annual Journal of Cooperatives

<http://www.ilo.org> Cooperatives and Employment Opportunity. Unpublished Paper.

[http:// www.usda.org/acdi/voca](http://www.usda.org/acdi/voca). Cooperatives Development Project Review Report, 2005

## APPENDICES

### Appendix I Conversion factors used to estimate tropical livestock unit (TLU)

Livestock Type	TLU (Tropical Livestock Unit)
Calf	0.20
Weaned Calf	0.34
Heifer	0.75
Cows/Oxen	1.0
Horse/Mule	1.10
Donkey	0.70
Donkey (Young)	0.35
Sheep/Goat	0.13
Sheep/Goat (Young)	0.06
Camel	1.25
Chicken	0.013

Source: Storck et al., (1991)

### Appendix II Liquidity Ratio of MPCSSs in the study Area

MPCSSs	2002	2003	2004	2005	2006
<b>Tsaesi Tsaeda Imba</b>	CA/CL	CA/CL	CA/CL	CA/CL	CA/CL
Ibyet Bhbret	1.85	1.63	1.59	1.49	1.57
M/genet	1.03	1.25	1.38	1.51	1.38
Fre Hiwot	1.28	1.17	1.26	1.64	1.85
S/Total	1.39	1.36	1.53	1.75	1.75
Atsiby Womberta					
Haile Manjus	2.29	2.29	2.29	1.03	1.03
B/A/Akob	3.34	3.48	1.13	1.13	1.05
Sur Anbessa	1.33	1.01	1.01	1.00	1.00
Mahbere Bokiru	1.59	3.07	1.04	1.04	0.88
S/Total	1.40	1.23	1.07	1.03	1.01
G/Total	1.39	1.32	1.29	1.27	1.23

Sources: Financial Report of MPCSSs

### Appendix III Summary of MPCSSs' Ratio Analysis

Woreda/Coop's Name	2002		2003		2004		2005		2006	
	Dt/TA	ROTA	Dt/TA	ROTA	Dt/TA	ROTA	Dt/TA	ROTA	Dt/TA	ROTA
<b>Tsaesi Tsaeda Imba</b>										
Ibyet Bhbret	50%	0%	58%	114%	55%	30%	60%	72%	57%	32%
M/genet	68%	31%	50%	23%	48%	17%	45%	17%	48%	7%
Fre Hiwot	73%	8%	73%	16%	68%	9%	55%	11%	50%	19%
S/Total	60%	21%	58%	23%	51%	13%	47%	20%	47%	13%
<b>Atsiby Womberta</b>										
Haile Manjus	36%	0%	36%	0%	36%	0%	95%	144%	95%	144%
B/A/Akob	25%	0%	24%	7%	53%	3%	53%	3%	82%	5%
Sur Anbessa	72%	0%	89%	4%	89%	4%	97%	0%	97%	64%
Mahbere Bokiru	55%	530%	31%	891%	79%	0%	79%	0%	91%	21%
S/Total	66%	178%	77%	154%	83%	9%	92%	20%	94%	36%
G/Total	61%	34%	63%	35%	64%	12%	70%	20%	72%	19%

Sources: Financial Report of MPCSSs

#### Appendix IV Trends of Membership in the Study Area

Name of the Cooperatives	Membership Trends in the cooperatives														
	2002			2003			2004			2005			2006		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
M/Bokiru	699	524	1223	708	526	1234	710	526	1236	720	540	1260	831	622	1453
Sur anbessa	480	388	868	480	388	868	487	392	879	511	446	957	511	446	957
B/A/Shum Akob	624	304	928	624	304	928	624	306	930	625	306	931	625	306	931
Haile Manjus	458	426	884	458	426	884	462	427	889	478	476	954	496	531	1027
Khokeb Tsibah	554	434	988	554	434	988	554	438	992	554	438	992	554	438	992
S/Total	2815	2076	4891	2824	2078	4902	2837	2089	4926	2888	2206	5094	3017	2343	5360
Mahbere Genet	750	415	1165	782	428	1210	804	443	1247	814	438	1252	814	438	1252
Ibyet Behbret	1225	619	1844	1230	619	1849	1248	619	1867	1334	623	1957	1334	623	1957
Fre-Hiwot	1304	757	2061	1304	757	2061	1318	762	2080	1326	762	2088	1326	762	2088
S/Total	3279	1791	5070	3316	1804	5120	3370	1824	5194	3474	1823	5297	3474	1823	5297
G/Total	6094	3867	9961	6140	3882	10022	6207	3913	10120	6362	4029	10391	6491	4166	10657

Sources: District Cooperatives Promotional Department

**Appendix V Total Volume of Food Grains Marketed by MPCs  
in Quintal**

Name of Cooperative	2002	2003	2004	2005	2006
Mahiberegenet	494	352	858	656	828
Frehiwot	49	0	99	426	151
Ibyet Behibret	28	493	522	427	682
S/total	571	845	1479	1509	1661
Haile Manjus	157	125	0		
B/A/Akob	0	308	130	NA	NA
Mahiber Bokur	120	170	145	NA	NA
Sur Anbessa	0	134	610	NA	NA
S/Total	277	737	885	NA	NA
Total	848	1582	2364	1509	1661

Sources: DCPD 2007

**Appendix VI Total Volume of input distributed through  
cooperatives in Quintal**

Description	2002	2003	2004	2005	2006
S/Ts/Imba					
Fertilizer	855	914	982	1032	1246
Seed	11.50	25	128	30.27	167.33
Pesticide	0	0.27	0.27	0.05	0.65
Atsiby Womberta					
Fertilizer	415.88	335	155		
Seed	16.375	66.75	27.50		
Pesticide					

Sources: DCPD 2007

**Appendix VII The types and number of cooperative societies in Ethiopia (2005)**

S. No	Types of Cooperatives	No. of Cooperatives	Number of Members			Capital in Mil. Birr
			Male	Female	T/Members	
1	Multipurpose	5104	3285990	401747	3687797	347.36
2	Dairy	112	3048	1087	4135	3.3
3	Incense	14	1257	202	1459	0.129
4	Fishery	36	2267	134	2401	3.42
5	Irrigation	1442	26280	4217	30497	11.86
6	Apiary	40	2478	44	2522	0.442
7	Seed Production	17	1751	182	1933	2.37
8	Fruit and Vegetable	60	-	-	1740	0.719
9	Livestock Production and Vet. Service	149	3180	383	3563	3.13
10	Slaughtering House	8	239	7	246	0.82
11	Coffee Pulpery	1	16	4	20	0.35
12	Tree Growers	12	1430	295	1736	0.203
13	Sugar Cane Producers	9	1311	453	1764	1.94
14	SACCOs	4178	69072	33589	102661	1037.62
15	Housing	5869	-	-	424731	18.37
16	Rural Electrification	12	2963	774	3737	0.47
17	Handcrafts	1514	-	-	31408	121.8
18	Mining	355	25335	1044	26379	5.85
19	Consumers	81	-	-	6459	3.07
20	Construction	204	-	-	19431	10.304
21	Others	930	3018	128	3146	1.744
	<b>Total</b>	<b>19147</b>	<b>3430435</b>	<b>444354</b>	<b>4076323</b>	<b>1475.253</b>

Source: Federal Cooperatives Agency, 2005



## Appendix VIII Basic Data of the study districts

Description	Unit	Tigray	Eastern Tigray	Atsiby	S/Ts/Imba	Source
Total Area	Km <sup>2</sup>	53,638	4717.5	885.3	933.12	CSA
No of Peasant Associations /Tabias/	No	620	94	16	24	BOFED
<b>LAND USE</b>						
- Cultivated Land	Ha	NA	253,703	NA	NA	BOFED AND BOARD
- Forest	Ha		77195.1			
- Grazing	Ha		41963.3			
- Misellenous	Ha		65392.9			
- Total Area	Ha		437118.2			
<b>Climate</b>						
- Range of Tem	°C	NA	15-29°C	12-19°C	NA	BOARD * IPMS-Atsiby Project
- Range of Rain faul	Mm	400-1200	300-800	700-800	300-800	
- Range of Altitude	M	NA	900-3200	918-3069*	1500-2500	
Total population	No	4334996	686564	113966	138291	CSA, July 2006
Male	No	2136000	328864	52880	65412	
Female	No	2198996	357700	61086	72879	
Rural population	No	3518996	560237	105725	119995	
Urban population	No	816000	126327	8241	18296	
Population Density	No/km <sup>2</sup>	86.6	141.6	148.2	128.7	
<b>Rural Based Cooperatives</b>						Regional and District Coops Promotion Offices, 2005 and 2007
MPCSs	No	582	NA	16	12	
WUA	No	131	NA	6	11	
RuSACCO	No	211	NA	5	6	
Dairy	No	12	NA	2	2	
Handcrafts	No	21	NA	0	2	
Total No of Members	No	338242	NA	14832	11003	
Capital	Birr		NA	322354	2401907	

**Appendix IX Organizational Statistic of Sample Cooperatives in the Study Area (1998-2007)**

S. No	Description	Unit	Atsiby Womberta		Saesi-Tsaeda-Imba		Remarks
			Plan	Actual	Plan	Actual	
1	General Meetings Conducted Within 1998-2007	No	40	30	30	25	1 GA/year/Cooperative
2	Election of Board of Directors (1998-2007)	No	3	1	3	2	Three Election Periods within 10 years
2.1	Management Committee /MC/	No	20	16	16	16	5 MC/cooperative
2.2	Control Committee	No	12	12	9	9	3 CC/Cooperative
2.3	Procurement Officers	No	4	4	3	3	1 Procurement Officer/Coop
3	Employees and Staff						
3.1	Manager	No	4	0	3	1	1 manager/coop
3.2	Accountant	No	4	0	3	1	1 accountant/coop
3.3	Book Recorder/Keeper	No	4	3	3	2	1 Book keeper/coop
3.4	Shop Keeper	No	4	3	3	3	1 Shop Keeper/coop
3.5	Store Keeper	No	4	0	3	0	Optional
3.6	Guards	No	4	5	3	6	
4	Office and Store	Set	4	4	3	3	
5	Office Furniture and Equipment	Set	4	4	3	3	
6	Working Procedures and Documents						
6.1	By-Law	No	4	4	3	3	1 By-Law/coop
6.2	Internal-By-Law	No	4	4	3	3	1 Internal By-Law/coop
6.3	Human Resource Policy	No	4	0	3	0	1 Document/Coop
6.4	Membership Book	No	4	4	3	3	1 Membership Book/coop
6.5	Participation Recording Book	No	4	2	3	3	1 Membership Book/coop
6.6	Stamp	Set	4	4	3	3	1 Set/Coop
6.7	Journals and Ledgers	Set	12	12	9	9	3 set/coop
6.8	Vouchers	Set	12	12	9	9	3 set/coop
6.9	Members ID	No	4	1	3	1	

Source: MPCs Quarter and Annual Report (1998-2007)

## Appendix X Summary of Members Participation Index

Indicators of Participation	MO (2)	Rarely (1)	Not at All (0)	Index of Participation
• Attending Annual Meeting	52	46	64	0.4629
• Approving the by-law/Amendment	57	40	65	0.4753
• Electing board of directors	55	43	64	0.4722
• Approving annual plan and budget	50	47	65	0.4537
• Approving Audit Report	47	47	68	0.4319
• Determining Share Values	34	34	94	0.3148
• Sharing responsibilities	7	19	136	0.1018
• Evaluating & Approving Executed Activities Report	43	32	87	0.3642
• Buying and Selling (Input/Output)	46	38	78	0.4012
• Using Available Loan	81	30	51	0.5925
• Using the Services Rendered	60	36	66	0.4815
• Buying Additional Share Capital	12	52	98	0.2346
Total*	544	464	936	
	1088	464	0	0.3992

\*Maximum Possible Scoring:  $162 * 12 * 2 = 3,888$   
 Sources: Primary data Computed (2007-2008)

### Appendix XI Summary of Continuous Variables Result

Explanatory Variable	Passive				Active				P	T
	Min	Max	Mean	St. dev	Min	Max	Mean	St. dev		
Age in years	67	22	49.7	9.62	59	22	46.2	8.7	2.732	0.007
Family Size in No	10	1	5.89	2.24	11	2	6.22	2.34	-0.913	0.367
On-Farm in birr	0	7500	2193.6	1249.64	910.0	12090	3813.8	2344.7	-5.606	000
Off-Farm in birr	0	3240	446.97	707.18	0	4000	874.5	977.14	-3.222	0.002
Total Income in birr	1090	8870	2640.4	1368.60	1000	15000	3563	2089.84	-6.98	000
Expenditure in birr	1000	8700	2537.1	1186.00	1090	8870	3496.7	1368.6	-4.781	000
Farm Land Size in Ha	2.81	0.00	0.6	0.49	2.12	0.00	0.58	0.44	-0.586	0.558
Farming Experience in years	50	10	28.10	9.08	41	5	25.88	8.10	1.631	0.105
Livestock Ownership in TLU	4.3	0	0.53	1.07	15.2	0	2.17	2.88	4.958	000
Input Purchased in birr	354	00	7.55	41.97	365	00	178.50	97.00	-14.957	000
Crop Production in kg	1130	100	353.7	217.2	2162	100	526.5	444.6		
Distance From Market km	8	0.4	2.91	1.45	6	0.33	2.87	1.32	0.168	0.867
Distance from Extension km	8	1	3.2	1.87	8	0.05	3.03	2.91	0.436	0.663
No of Shares in No										
Membership Duration In Years	26	3	9.2	4.14	25	3	9.99	4.24	-1.363	1.175

Sources: Primary data Computed (2007-2008)

**Appendix XII Result of Contingency Co-efficient**

	PATINEX	MEMSEX	MEDUST	PECORPM	MESATIF	MEMSTA	TRACC	ALTMAR	ACCINP
PATINEX	1.00	0.195	0.199	0.471	0.413	0.440	0.407	0.240	0.485
MEMSEX		1.00	0.120	0.133	0.145	0.107	0.127	0.032	0.190
MEDUST			1.00	0.245	0.151	0.202	0.164	0.058	0.050
PECORP				1.00	0.451	0.382	0.284	0.049	0.326
MESATIF					1.00	0.422	0.365	0.162	0.203
MEMSTA						1.00	0.252	0.120	0.291
ALTMAR							1.00	0.015	0.276
TRACCT								1.00	0.276
ACCINP									1.00

Sources: Computed result of Primary data

**Appendix XIII**

**Mekelle University**

**SCHOOL OF GRADUATE STUDIES**

**Interview Schedule developed for the study of Analysis of the Role of Multi-Purpose Cooperatives in Agricultural Input/Output marketing, Eastern Tigray Zone.**

Date \_\_\_\_\_

Code No \_\_\_\_\_

Name of Respondent \_\_\_\_\_ Woreda \_\_\_\_\_

Kebele \_\_\_\_\_ Village \_\_\_\_\_ MPCS \_\_\_\_\_

Interviewer name \_\_\_\_\_

**I Household Characteristics**

1. Age of the member \_\_\_\_\_ years
2. Sex of the member F (0) M (1)
3. Family size of the member in Number \_\_\_\_\_
4. Level of education
  1. Illiterate (0)
  2. Read and write (1)
  3. Grade 1-8 (2)
  4. Grade 8-12 (3)

**II. Income and Expenditure of Members**

5 Income source from on-farm activities in birr \_\_\_\_\_

5.1 Sources on-farm income

Cereals and Pulses (0)
Livestock (1)
Vegetables and Fruits (2)
All (3)

6. Cash income from off-farm work \_\_\_\_\_

6.1 Sources

Daily laborer (0)
Trading (1)
Handicraft (2)
Firewood selling (3)
Home made drinks (4)

7. Total Annual Income \_\_\_\_\_

8. Indicate the amount of money spent of your family for the year 2006.

Total Annual Expenditures \_\_\_\_\_

### III. Farming Characteristics

9. Farming experience in full years (head of household's) \_\_\_\_\_ years.

10. Do you own land? Yes (1) No (0)

10.1 If your answer is yes, size and use of land holding in 2006 crop year is:

- Total cultivated land in 2006 crop year \_\_\_\_\_ Timid/Hectares
- Own land \_\_\_\_\_ Timid
- Rent In \_\_\_\_\_ Timid
- Rent Out \_\_\_\_\_ Timid

10.2 No of plot of land \_\_\_\_\_

10.3 Type of crops cultivated during 2006 cropping season

- Cereals
- Pulses
- Vegetables and fruits

11. Do you own Livestock? Yes (1) No (0)

11.1 How many livestock do you have?

- Cattle \_\_\_\_\_
- Goat and Sheep \_\_\_\_\_
- Others \_\_\_\_\_

12 Fertility status and soil character of the plots as perceived by the member farmer.

a) Good (2) b) Medium (1) c) Poor (0)

### IV. Institutional Characteristics

13. The distance from extension agent (km)

14. Proximity to Village/Town market (Km)

15. Access to input and credit

15.1 Did you involve in purchasing agricultural input from the Cooperative? Yes/No

15.2 Total Amount of input purchased from the cooperative \_\_\_\_\_ in birr

15.3 Did you borrow money for agricultural input from the cooperative? Yes/No

15.4 Why do you prefer to borrow and purchase loan and input respectively from the Cooperatives?

- Less security is required (0)
- Easier to get loan (1)
- Get terms to suit the situation (2)
- Cheapest source of credit that could be found (3)
- Possibility of getting on time (4)
- All (5)
- No other alternatives (6)
- None (7)

16. Did you produce for a market in a particular cropping season? Yes No

17. Access to Marketing alternatives

	Type of purchaser	Yes (1)	No (0)
1/	To consumers in the local market		
2/	To the retail traders		
3/	To whole sellers		
4/	To the cooperative		
5/	To the gov't		
6/	To NGO		
7/	Others, specify__		

18. How do you see the pricing strategy of the cooperatives in input/output marketing?

- a) Poor b) No Difference c) Reasonable d) Attractive/Very Good



**V. Member's Perception on the role cooperatives.**

19. How do you evaluate on the performance role of cooperatives?

Sr. No	Decision views	Strongly Agree (2)	Not Sure (1)	Disagree (0)
1	Price Stabilization			
2	Disseminating market information			
3	Credit Provision			
4	Solving members' marketing problems			
5	Demand Oriented Service Provision			
6	Achieving Objectives			

20. Perception of members on cooperatives' board and management Transparency and Accountability

Description	Yes (1)	No (0)
Conducting Annual Meeting Timely		
Reporting to The General Meeting		
Deciding Based on the By-Law		
Awareness on Duties and Rights		
Dividend distribution Procedure		

a) Total Score 2.5 Above 2.5 (1)    b) Total Score below 2.5 (0)

21 Perception of Members' Satisfaction on the services rendered through cooperatives

S. No	Indicators	Yes (1)	No (0)
1	Price Differences		
2	Demand oriented		
3	Proximity to the village		
4	Timing of input supply		
5	Costs to use the services		
6	Quality of services		

## VI. Membership

22. How did you become a member in the cooperative?

• Own interest and free choice (4)
• Awareness by promoters (3)
• Looking for service rendered by the cooperatives (2)
• Influenced by neighbors (1)
• Forced by the administration: Food for Work and/or Food Aid (0)

23. Membership Duration in Number of Years \_\_\_\_\_

24. Share Contribution in Number \_\_\_\_\_

## Part VII Members Participation in Cooperatives' Affairs

### I. Participation in exercising democratic rights and decisions

Description	MO (2)	Rarely (1)	Not at All (0)
• Attending Annual Meeting			
• Approving the by-law/Amendment			
• Electing board of directors			
• Approving annual plan and budget			
• Approving and Approving Audit Report			
• Determining Share Values			
• Sharing responsibilities			
• Evaluating & Approving Executed Activities Report			
• Others if (Specify)			

### 2. Member's Economic Participation

Description	MO (2)	Rarely (1)	Never (0)
• Buying and Selling (Input/Output)			
• Using Available Loan			
• Using the Services Rendered			
• Buying Additional Share Capital			
• Other (specify)			

### Part VIII Perceived Constraints of cooperative in input/output marketing

S. No	Constraints	Important(2)	Not Sure (1)	Less Important (0)
I	<b>Organizational/ Internal Problems</b>			(0)
1.1	Limited Capacity of BoDs & Management			
1.2	Inadequate initial capital			
1.3	Poor participation of members in DM			
1.4	Lack of transparency and accountability			
1.5	Failure to notify annual meetings			
1.6	Knowledge about duties & responsibilities			
1.7	Equal opportunity in passing decision			
1.8	Limitation to exercise their right			
II	<b>External Problems</b>			
2.1	Small and fragmented farm holdings			
2.2	High- influence of vested interest			
2.3	Price increase for agricultural inputs			
2.4	Existence of other competitors			
2.5	Low price of produces			
2.6	High cost of production			
III	<b>Infrastructural Problems</b>			
3.1	Availability of trained man power			
3.2	Information on market oriented production			
3.3	Communication Technology			
3.4	Marketing Infrastructure			
3.5	Storage and transportation facility			
3.6	Access to Irrigation facilities			
3.7	Linkage with Financial institution			
3.8	Electrification			

### **Part IX Specific Suggestions**

Please indicate your specific suggestions to improve the participation of members and performance of cooperatives in agricultural input/output marketing.

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_