

Action For Development

Report on Baseline Survey of Nyangatom Woreda in South Omo Zone, SNNPRS

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Acronyms

AE	Adult Equivalent
AEAs	Agricultural Extension Agents
AFD	Action For Development
BoFED	Bureau of Finance and Economic Development (of SNNPRS)
CBO	Community-based organization
CFW	Cash-for-Work
CSA	Central Statistical Agency
CSO	Civil society organization
EC	Ethiopian Calendar
EEA	Ethiopian Economics Association
FAO	Food and Agriculture Organization
FFW	Food-for-Work
FGD	Focus Group Discussion
FGT	Foster, Greer and Thorbecke (refers to the poverty measure jointly developed by these three authors)
FHHHs	Female-headed households
GOs	Government Organizations/Offices
Ha or ha	Hectare
HEWs	Health Extension Workers
HH	Household
IFAD	International Fund for Agricultural Development
IGA	Income Generation Activity
KA	Kebele Administration
kcal	Kilo Calorie
km	Kilo meter
MEDaC	Ministry of Economic Development and Cooperation
MHHHs	Male-headed households
mm	Millimeter
MoFED	Ministry of Finance and Economic Development
NGO	Non-government Organization
PASDEP	Plan for Accelerated and Sustained Development to End Poverty
PG	Poverty gap
PGI	Poverty gap index
PRA	Participatory Research and Action (a.k.a. Participatory Rural Appraisal)
SD	Standard Deviation
SNNPRS	Southern Nations, Nationalities and Peoples Regional State
SRS	Simple Random Sampling
STD	Sexually Transmitted Disease
TLU	Tropical Livestock Unit
WOAPD	Woreda Office of Agriculture and Pastoral Development
WOE	Woreda Office of Education
WOFED	Woreda Office of Finance and Economic Development
WHO	Woreda Office of Health
WOWD	Woreda Office of Water Development

Table of Content

<i>Acknowledgements</i>	<i>i</i>
<i>Acronyms</i>	<i>ii</i>
<i>Table of Content</i>	<i>iii</i>
<i>List of Tables</i>	<i>v</i>
<i>List of Figures</i>	<i>vi</i>
EXECUTIVE SUMMARY	1
PART I: BACKGROUND	6
1 Action For Development (AFD), An Overview	6
2 Introduction	7
2.1 Rationales of the Study	8
2.1.1 Statement of the Problem	8
2.1.2 Objectives of the Study	9
2.1.3 Significance of the Study	9
2.2 Scope and Limitation of the Study	10
2.3 Methodology	10
2.3.1 Sources and Method of Data Collection	10
2.3.2 Measurement and Indicators of Poverty.....	12
2.3.3 Data Analysis	14
2.4 Organization of the Report	19
3 Description of the Study Area	20
3.1 Location and Ecology	20
3.2 Population	20
3.3 Livestock Production	21
3.4 Rangeland and Pasture Conditions	21
PART II: RESULTS AND DISCUSSION	23
4 Community Wealth Categorization	23
5 Household Characteristics	24
5.1 Family Size and Age of Sample Household Heads	24
5.2 Demographic Characteristics of Sample Households	25
6 Livelihood and Poverty Situation in the Study Area	27
6.1 Livelihood Strategies of Sample Households	27
6.2 Activity Portfolio	28
6.2.1 Livestock Production	28
6.2.2 Access to and Utilization of Modern Agricultural Inputs	29
6.2.3 Production Constraints as Perceived by Sample Respondents	29
6.2.4 Crises management by Sample HHs during Drought and Food Shortage.....	30

6.2.5	Off-farm Employment and Returns.....	31
6.3	Income Portfolio	31
6.3.1	Type and Composition of Main Income Sources.....	31
6.3.2	Livelihood fragmentation and income diversity	35
6.4	Dimensions of Poverty.....	36
6.4.1	Poverty Line and Indices.....	36
6.4.2	Consumption Expenditure of Sample Households.....	37
6.4.3	Access to Basic Social and Economic Services	38
7	Access to Basic Social and Economic Services.....	39
7.1	Access to Health Services.....	39
7.2	Access to Education Services.....	41
7.3	Access to Water Supply Facilities	43
7.4	Access to Veterinary Services.....	44
7.5	Road Facilities and Communication.....	46
7.6	Market Places	47
7.7	Land Ownership and Land Use Right.....	48
7.8	Livestock Ownership.....	49
8	Other Issues of Poverty	51
8.1	Gender	51
8.1.1	The Gender Division of Labor and Productive Roles	51
8.1.2	Livestock Endowment and Gender Roles	52
8.1.3	Access to Information, Credit, Input and Agricultural Extension	54
8.2	Conflict	55
9	Vulnerability to Drought in the Study Area.....	57
9.1	Level of Vulnerability to Food insecurity.....	57
9.2	Households' Food Market Dependency	59
9.3	Households' Annual Earned Income	60
9.4	Liquid Asset Stock of the Households	60
9.5	Income Diversification of the Households.....	61
9.6	Loss of Livestock due to Drought	61
9.7	Loss of Livestock due to Flood Hazard	62
9.8	Loss of Livestock due to Conflict	62
PART III: CONCLUSIONS & RECOMMENDATIONS.....		67
10	Conclusion.....	67
11	Recommendations	68
ANNEX.....		72
A.	References.....	72

List of Tables

Table 1: Livestock Population of Nyangatom woreda	21
Table 2: Quantitative measure (average holding) used for ranking wealth categories	23
Table 3: Distribution of sample HHs by sample KAs and wealth category	24
Table 4: Distribution of Family Size among the wealth categories.....	24
Table 5: Sample Households by age categories.....	26
Table 6: Distribution of Sample HHs by Age Group	27
Table 7: Major livelihood activities of sample households by wealth category	28
Table 8: Activity portfolio of sample households.....	28
Table 9: Mean income share per AE by wealth categories.....	32
Table 10: Sample HHs' annual income per AE from sale of livestock	34
Table 11: Annual income of sample HHs per AE from other sources than livestock	34
Table 12: Diversity of income sources in HH portfolio	36
Table 13: Food Consumption of the Lowest Income Quartile and Value of Food Poverty Line	36
Table 14: Absolute Poverty Indices of Sample Households.....	36
Table 15: Distribution of sample HHs Consumption Expenditure and the Poverty Index.....	37
Table 16: Mean per-capita consumption expenditure among the poor and non-poor sample HHs..	38
Table 17: Sample HHs' access to basic social and economic services (distance in km).....	39
Table 18: Number of family members sick in sample HHs during the last one year	40
Table 19: Type of measures taken for treatment of sick persons in sample HHs	41
Table 20: Educational level of sample household heads by wealth categories	42
Table 21: Education Status of Household Heads of the Sample Population	43
Table 22: Source of Drinking Water during the Dry Season by Group.....	43
Table 23: Responses of sample HHs about type of veterinary services they get.....	45
Table 24: Time since sample HHs got livestock vaccination service.....	45
Table 25: Period in which sample households sale their livestock.....	50
Table 26: Sample households' reason to sale livestock.....	50
Table 27: Distribution of livestock holding by sample households (TLU/AE).....	51
Table 28: Purpose of livestock ownership by sex of sample HH heads	52
Table 29: Livestock types owned by male-headed and female-headed sample HHs	53
Table 30: Response on credit, extension and input supply by sex of sample HH heads	55
Table 31: Response of sample HHs on areas with which they face inter-clan conflict.....	56
Table 32: Responses of sample households on major causes of the conflict.....	57
Table 33: Percent distribution of sample households by food purchase/exchange.....	60
Table 34: Percent distribution of sample households by annual earned income per AE.....	60
Table 35: Proportion of sample households who lost livestock due to drought	62
Table 36: Proportion of sample households who lost livestock due to flood	62
Table 37: Proportion of sample households who lost livestock due to conflict	63
Table 38: Percent distribution of sample households by level of vulnerability	64
Table 39: Understanding of drought by sample households.....	64

List of Figures

Figure 1: Percentage distribution of sample households by sex of HH heads	26
Figure 2: Trend of school dropout rate by sex	42

EXECUTIVE SUMMARY

Action For Development (AFD) is an indigenous NGO that implements a program of integrated dry lands development in various parts of Ethiopia. AFD evolved from the FAO-operated freedom From Hunger Campaign, which had been implementing various rehabilitation and development programs in selected drought-prone areas in the Southern part of Ethiopia.

AFD implements its development programs, among other places, in South Omo zone of the Southern Nations, Nationalities and Peoples' Region (SNNPR). The South Omo zone is located in the south-western corner of the region, and the country as well. Jinka town, the zonal capital, is located 5°-48° North and 3°-33° East, about 750 km south-west of Addis Ababa and 525 km from Hawassa, the regional capital. The total area of the zonal administration is 22,360 square kilometer, which constitutes about 18.95% area size of the region. The zone has mainly an arid climate with modest and erratic pattern of rainfall. Recurrence of intermittent drought and flood disrupts social life and livelihoods, often decimating the productive resources of the people and accentuating their vulnerability. The inhabitants of the zone are predominantly ethnic minorities whose livelihood is based mainly on pastoralism, subsistence farming, shifting cultivation, fishing along the Omo River and the like. The people subsist in conditions of deprivation and vulnerability, perpetuated by a wide range of natural and man-made causes such as environmental calamities (like flood and drought), conflict, marginalization, a narrow livelihood base, lack of basic social and economic services, feeble capabilities, human and animal disease, harmful traditional practices (HTPs), skewed gender relations, etc.

In response to the disaster caused by the flood, AFD was implementing various emergency and rehabilitation interventions in Nyangatom and Dasenech woredas over the last two years, side by side with its regular development activities in Maale woreda of the zone. By way of consolidating its earlier emergency interventions whereby building grassroots disaster risk reduction capacities in these woredas, AFD is currently implementing a year-long project with the support of its funding partner, Christian Aid.

AFD commissioned this study with an intention of building a profile of the existing situation and livelihood context in Nyangatom woreda, and based on the survey findings to design a three to five years development project that will help reduce vulnerability of the people and contribute to the realization of their right to development.

Overview of Nyangatom Woreda

Location, distance, boundary and ecology: Nyangatom is one of the eight woredas in South Omo zone of SNNPR. Nyangatom, together with Dasenech woreda, was part of Kuraz woreda until it was legally recognized as an independent woreda since July 8, 2006 (Hamle 1, 1998EC). The woreda is divided into 20 Kebele Administrations (KAs). Kangateen, the woreda capital, is found at a distance of 915 km south-west of Addis Ababa, about 690 km from Hawassa, the regional capital and 165 km west of Jinka, the zonal capital. Nyangatom is bordered by Maji zone and Selamago woreda in the north, Dasenech woreda in the south, Hamer woreda in the east and the Sudan and Kenya in the west. The woreda has arid climate, with an altitude of 300 meter above sea level at Kangateen. (Woreda Strategic Plan, 2008)

Population: As per the Summary and Statistical Report of the 2007 Population and Housing Census Results, the woreda population was 17,632 (49.6% female). The projection using the regional average annual growth rate of 2.9% makes the woreda population about 18,143 in

2008. However, the Woreda Administration report indicated that the population was estimated to be 35,251 in 2008, which is nearly double the projection based on the official census.

Language and religion: The people in Nyangatom woreda predominantly belong to the *Nyangatom* ethnic group, and *Nyangatomigna* (one of the Omo-Nylotic family) is the major vernacular language in the woreda, while Amharic is used as a written language. Traditional belief is followed by significant majority of the population.

Climate: The woreda has one agro-ecological zone: dry lowland 'Kolla' to 'Bereha'. There are two rainy seasons i.e. 'Belg', the short rainy season that mostly occurs from mid February to May, and 'Meher', the main rainy season from September to mid October. The period from June to August, which in many other highland places in the country is known to receive high rainfall for agriculture, is mostly a dry season in Nyangatom.

Infrastructure and Basic Services: Until very recent, Nyangatom was part of the previous Kuraz woreda and it has been newly established as an independent woreda since 2006. The woreda is severely underdeveloped due to lack of basic social and commercial services such as road and transport, education and health services, water supply and sanitation. It also did not have telephone until it got one just in January 2009. Unlike other neighboring woredas, Nyangatom has no all-weather road that links it with Jinka, and it seems that a new road being constructed in the near future is also unlikely. This is because the woreda is on the other side of the Omo River, and building an all-weather road requires huge investment to construct bridge, which perhaps can make such a project unfeasible due to the large investment being already made on Dry Port in nearby Dasenech woreda. Besides, there are no access roads that connect the KAs in Nyangatom to the woreda center, Kangateen.

Survey Methodology

Both primary and secondary sources were used to collate data. Questionnaire surveys were applied as primary source of data. Key informants, particularly local government offices, traditional associations, and above all, sample households were used as primary sources both for qualitative and quantitative data. On top of questionnaire surveys, various participatory methods such as focus group discussions (FGDs), key informant interviews (KII) as well as Participatory Vulnerability Assessment (PVA) and PRA tools were applied. Moreover, an intensive review of documents was done as secondary source. The documents reviewed include various relevant policies, researches, statistical data and the like.

Regarding the household survey, the results obtained from the explanatory survey that was made prior to the formal survey indicated that the study would require a two-stage stratified random sampling technique. First, all 20 KAs in Nyangatom were identified using composite index adapted from a working document of Chronic Vulnerability Index (CVI) for Ethiopia prepared by a core group of CVI Early Warning Working Group (EWWG)/Disaster Prevention and Preparedness Commission (DPPC) conducted in 2004. In stratifying the KAs, the indicators used to establish a composite index were livestock holding (KAs with relatively huge livestock), access to drinking water (number of water points available in the area), access to market (walking time in minutes), and malaria risk (based on historical trend). Accordingly, four sample KAs (Ayepa, Lopokor, Lorenkachaw and Nyaragoy) were selected from 20 KAs in the woreda.

Following this, households in the four sample KAs were stratified by wealth categories using participatory wealth ranking undertaken with key informants. After deciding the total number of households to be included in the sample survey, probability proportional to size was employed

to select 90 sample household heads. Then, the 90 sample households were interviewed by using semi-structured survey questionnaire. The survey (including the household survey, key informant interviews and focus group discussions) lasted from November to December, 2008.

Summary of Major Findings

Livelihood and Vulnerability Situation

Pastoralism with opportunistic movement is the primary livelihood base for almost all population in the woreda. Based on the survey result, it can be said that the majority of people in the woreda are vulnerable to structural food insecurity as 94.4% of the sample population fall in vulnerable group. Lack of access to basic social and commercial services, other risk factors like drought, flood and conflict are among the major contributing factors. Hence, vulnerability to food insecurity has been a constant reality for many poor people in the woreda.

As the household survey result computed using the poverty measure ($P\alpha$) developed by Foster, Greer and Thorbecke (1983) shows that the proportion of poor people measured in absolute head count index¹ ($\alpha = 0$) is 0.733. This means, about 73.3% of the sample households in the study area live below the absolute poverty line as they could not get the minimum income of Birr 705, adjusted for the requirement of non-food items expenditure, per adult equivalent (AE)² per year needed to afford the minimum calorie required (2200 kcal per day per adult). When compared with the national target set in the PASDEP to reduce population below the poverty line to 31% in 2008/09, the proportion in the study area of 73.3% is much higher indicating the severity of the poverty problem in the woreda.

The poverty gap index³ ($\alpha=1$), a measure that captures the mean aggregate consumption shortfall relative to the poverty line across the whole population in the woreda is found to be 0.212. This shows that the total consumption needed to bring the entire population to the poverty line is 21.2%. Similarly, the Foster, Greer and Thorbecke (FGT) severity index⁴ (the squared poverty gap, ($\alpha=2$) in consumption expenditure) shows that 11.1% of the sample households fall below the threshold line implying severe inequality, which suggests that there is a high degree of inequality among the lowest quartile population.

Community Access to Basic Social Services

Due to the marginalization of the area by the past successive regimes, lack of access to all basic services in general and a service delivery system that fits the life style of pastoralists in particular remained a major factor that has greatly impeded social transformation in Nyangatom.

Education: As shown in Table 20 below, over 94% of the survey participant household heads are non-literate. According to the Woreda Office of Education (WOE), there were 17 Alternative Basic Education (ABE) centers all of which have been constructed and run by NGOs and six full-cycle (1-8) primary schools in the woreda in 2008/09 academic year. The number of students was 1,890 (41.7% girls) in ABE and 955 (32% girls) in formal primary grade 1-8. The

¹ Head count index is defined as the proportion of the population whose measured standard of living is less than the poverty line, which is Birr 705.

² The World Health Organization (1985) adult equivalent scale has been used to determine adult equivalent size.

³ Poverty gap index measures the distance to the poverty line for the average poor person.

⁴ Squared poverty gap index, indicates the depth of poverty, which is the difference between the poverty line and the mean income of the poor expressed as a percentage of the poverty line.

Gross Enrolment Rate in the same academic year was 55% for boys and 47% for girls, which is significantly lower than the national target for 2008/09 as per the PASDEP of 105.7% and 105.2%, respectively. The student-teacher and student-classroom ratio in Nyangatom was 29 and 37 respectively while the PASDEP target ratio is 54 for both, indicating high wastage of resources in the study woreda, which may be ascribed to the very low enrolment rate. The household survey result shows that the average distance to primary school is 17.3 km, which is too far by the national standard and implies accessibility problem of the existing schools. This, in turn, may be taken as one of the causes for lower enrolment in Nyangatom.

Health: The Woreda Office of Health (WOH) record shows that there were six health institutions (one health center and five health posts) in 2008. This means, three-fourth KAs in the woreda have no health post, and thus people in these KAs lack access to basic health care services. Accordingly, the household survey also shows that accessibility is a serious issue as the mean distance to the existing health facilities is found to be nearly 35 km. Besides, even the existing facilities are facing extreme shortage of health professionals, drugs and equipment that are essential to deliver the required services. For instance, there was no doctor, but only eight nurses and eleven health extension workers in the woreda, compared to at least two doctors and 11 nurses needed to meet the PASDEP target ratio of one doctor to 18,000 and one nurse to 3,100 people, and 40 HEWs required to meet the minimum standard of two per KA.

Water: As shown in the Woreda Office of Water Development (WOWD) records, there were 55 hand-dug wells (HDWs) in 2008, but 23 of which (42%) were not functioning. The proportion of people who had access to protected water, including the non-operating HDWs, was estimated to be 28.4% (WOWD), which is low when compared with the national target in the PASDEP of 76.8% for 2008/09, and it would be even worse if the non-functional HDWs are excluded. Scarcity of potential water in general, and lack of access to protected sources in particular is the major problem in Nyangatom. Most of the people use unsafe water from aquifers in the river bed sands and ponds for drinking, which is the main cause of communicable health problems.

Community Access to Commercial Services

According to the survey findings, access to and utilization of basic commercial services like market, road transport, communication facilities, agricultural extension and veterinary health facility in the woreda is very little if not naught. In most cases, people either lack access or travel long distances to available facilities to get almost any type of commercial service, impacting negatively on the lives of the population.

Despite the obvious fact that access to animal health services is crucial for the pastoralist community who depend mainly on livestock for their living, the focus group discussions revealed that the veterinary facilities available to the pastoralist communities in Nyangatom woreda are inadequate and even the existing ones are not functioning at the expected level due to lack of skilled human resource, essential drugs and equipment.

Similarly, the survey result shows that 25.5% of the sample households (mainly the poor and very poor groups) do not know even the kind of vet services available in the woreda as indicated in Table 20 below.

Opportunities and Potentials

The societal systems and norms such as taking care of and efficient utilization of communal resources, effective local mechanisms of managing conflicts and indigenous knowledge of

animal husbandry are great social capitals that provide very good foundation to build on and bring about transformation in Nyangatom woreda.

Regarding resources, the woreda has huge potential for livestock development, vast irrigable land along the Omo River basin and the river itself which represents enormous opportunities for irrigation, fishing and marine transport that has not yet been exploited effectively and efficiently. Nyangatom also has other natural resources like gum trees.

Key Recommendations

a) Food security

- Since recurrent drought is becoming a more frequent phenomenon in the study woreda, community-based early warning system should be initiated to mitigate its effect.
- To tap a great potential for livestock development in the study woreda, establishing community-based animal health service delivery system need to be given emphasis.
- To narrow the food gap by creating alternative employment opportunities, improving access to financial credit is found indispensable. Restocking, establishing food grain bank, and other employment opportunities like beekeeping and gum-arabica (incense) collection are the areas to focus on for pastoral drop outs.

b) Basic social services

Poor access to basic social services is a serious problem that has greatly impeded the capability of the people for achieving development. Therefore, the following are recommended:

- **Health:** Improving malaria prevention and control activities through community based sanitation activities,
- **Education:** Providing the existing education facilities, especially primary schools with essential teaching/learning materials like desks, blackboards and reference books,
-

c) Building the capacity of service providers and users

- Serious capacity gap was observed on the part of the public service provider sector offices in the woreda. Hence, it is necessary to undertake various capacity building programs such as trainings, provision of materials and the like for local community and government. In addition, initiating dialogue forums for the community in which local socio-economic or other problems including HTPs are discussed and debated and joint actions are agreed should be initiated if social transformation is to be achieved by the people themselves.
- Lack of access to information that the pastoral and agro-pastoral communities in Nyangatom woreda are facing due to geographical isolation and remoteness of the area is one of the major problems affecting livelihood. Hence, strengthen the existing information centers and networking with other initiatives is important to reduce vulnerability.
- Strengthen a peace project initiative started with German-based international NGO called “ded”. The peace process should take place all year round and care has to be taken in selecting influential leaders and opinion leaders and the employment of traditional conflict resolution mechanisms.

PART I: BACKGROUND

1 Action For Development (AFD), An Overview

Action For Development (AFD) is an indigenous NGO that implements a program of integrated dry-lands development in various parts of Ethiopia. AFD evolved from the FAO-operated “Freedom from Hunger Campaign/Action for Development (FFHC/AD)”, which had been implementing various rehabilitation and development programs in selected drought-prone areas in the Southern part of Ethiopia for over a decade. It was constituted as an indigenous NGO in 1997 in consideration of the need to build upon the achievements of FFHC/AD and enhancing its impact, while promoting opportunities for the improvement of grassroots livelihoods.

The AFD program is generally aimed at the attainment of food security and sustainable livelihoods at the grassroots level. To enhance the attainment of its organizational objectives, AFD implements multi-sectoral activities in the areas of livelihood diversification, enhancement of access to social and economic services, disaster risk reduction, empowerment of the marginalized, gender justice, HIV/AIDS, etc.

Among other places, AFD implements its development program in the South Omo zone of the Southern Nations, Nationalities, and Peoples’ Region (SNNPR). The South Omo zone is located in the south-western corner of the region, and the country as well. The zone has an arid climate with modest and erratic pattern of rainfall. Recurrence of intermittent drought and flood disrupts social life and livelihoods, often decimating the productive resources of the people and accentuating their vulnerability. The inhabitants of the zone are predominantly ethnic minorities whose livelihood is based on pastoralism, farming, shifting cultivation, fish farming, etc. The people subsist in conditions of deprivation and vulnerability, perpetuated by a wide range of natural and man-made causes such as natural calamities, conflict, marginalization, a narrow livelihood base, denial of the right to basic social and economic services, feeble capabilities, human and animal disease, HTPs, skewed gender relations, etc.

The supreme governing body of AFD is its General Assembly, while strategic guidance is provided by a Board of Directors. Day-to-day activities are carried out by the secretariat that is led by the Executive Director who is supported by the management team at the headquarters in Addis Ababa, and five field offices in Borena and South Omo zones of the Oromia and SNNP regions respectively.

Over the last several years, AFD have been building its competence in dry lands development by undertaking various participatory pastoral development interventions that have contributed to the enhancement of productivity, the securing of livelihoods, the enhancement of access to social services, the empowerment of the marginalized, etc. Such a good track record has given the organization the required impetus and rational to continue to be engaged with development interventions in the marginalized pastoral and non-pastoral dry land areas of the country with a view to the attainment of food security and sustainable livelihoods at the grassroots level.

In consideration of the need for the consolidation and continuity of the ongoing interventions, and the need for addressing the underlying causes of the vulnerability of the communities in

the three woredas, AFD commissioned the baseline survey. The purpose of the survey is to build a profile of the existing situation and context, and based on the survey findings, to design a three to five years development project that will help reduce the vulnerability of the people and contribute to the realization of their right to development.

2 Introduction

In the face of agriculture's contribution to the national economy, production and productivity is very low, it is subsistence oriented, there is high variability in production, and it is also largely affected by recurrent drought. As a result, the proportion of people below poverty line in the country was estimated to be 38.7% (39.3% rural and 35.1% urban) in 2004/05 (MoFED, 2006). One of the reasons for low production and productivity in agriculture is lack of assets that is very important for the livelihood base of the poor rural households.

Everywhere in Ethiopia achieving food security is undoubtedly related mainly with reducing poverty. The fact in Nyangatom woreda is not different from the overall country situation in improving food security and reducing poverty. Improving the service delivery system and the institutional set up together with improving the delivery of financial services helps to improve the livelihood base and livelihood strategies of the poor by increasing asset ownership, and buffer the shocks facing the poor people during food deficit periods locally known as hungry seasons in most rural setting.

The very production mode of pastoralism, which employs mobility as a key strategy for raising livestock, reflects that pastoral areas are prone to periodic and unexpected climatic shocks, perhaps more than other livelihood systems. This insight the livestock population in pastoral areas is subject to sudden and considerable variation, depending on the intensity and duration of droughts, diseases outbreak, floods, and conflict.

Addressing the multi-faceting poverty in Ethiopia particularly in the marginal dry land areas requires broader and coordinated interventions that call upon the concerted effort of all relevant actors, including the government, NGOs, other civil societies and donors. Different authors indicated that the major factors that affect the pace and direction of socio-economic development of a given country and/or locality are resource endowments, availability of appropriate technology and cultural legacies and the presence of vibrant and pro-poor institutions.

Among other shortfalls, access to financial services is extremely low in Nyangatom and this has made poor people unable to build and change the mix of livelihood assets at their disposal. It is evident that the poor people are very vulnerable and sometimes they move from one crisis to another in a vicious circle. Access to various endowments could enable them to manage risk better and take advantage of opportunities to be exploited. Reducing vulnerability and risk cannot be achieved without having the necessary resources including financial assets. Rural financial service can be taken as a possible pathway that contributes to the reduction of rural households' vulnerability to food insecurity. This is because it includes stimulating income source diversification, high value commodity production and technology adoption; and improving levels of income and ability to accumulate crucial livelihood assets.

Available evidences show that many people in the woreda are suffering from poverty and lack of basic social services. Particularly malaria and unavailability of potable water are

critical problems widely known for the past many years. Most people in the woreda are vulnerable to structural food insecurity as the mean food gap period is usually more than 6 months.

While the government and a few NGOs, including AFD, have been undertaking various development programs in the woreda, much more is still required to address the problems because the challenges are overwhelming. Now, AFD commissioned this study intending to gain better understanding of the critical issues in the area as a basis to formulate a more comprehensive development program that can enable the agency to effectively contribute its share to fighting against poverty and achieving food security and sustainable livelihood in the woreda.

2.1 Rationales of the Study

2.1.1 Statement of the Problem

The situation of poverty in Ethiopia for the last nearly four decades, more specifically of its chronic food shortage has made the country to depend on external food assistance. Buchanan, *et al.* (1995) indicated that since the mid 1980s, Ethiopia has become one of the largest recipients of food aid in the world, over 80% of it carrying the emergency label. Yet, the country has continued to suffer from recurrent episodes of acute food insecurity, even famine. It is estimated that more than half of the population is food insecure and the proportion is growing as poverty intensifies. Ministry of Finance (MOF, 2006) has indicated that during 2002/03–2005/06 Ethiopian economy had grown by about 11% on the average; but many claims that these aggregate measures of economic growth trends provide only the crudest indicators of welfare and do not portray the poverty trends. It is also argued by many that economic growth does not necessarily mean poverty reduction as far as there is unequal distribution of resources, unbalanced growth in the public and private sectors' resources do not reach the poor, etc.

Generally, the determining factors of poverty and vulnerabilities are varied and complex and need close analysis at the grass roots, i.e. at the level of the poor themselves. If the poor and their problems are to be identified more clearly, then they must be asked what they think and given the opportunity to express their priority needs as they see it from their perspective. However, it is not always possible to cover all these dimensions to understand poverty at any level, as the study of poverty is a continuous process, and need to be supplemented by various qualitative and quantitative measures. Therefore, a central issue in studies relating to poverty and vulnerability is the analysis of integrative and disintegrative forces at macro as well as meso and micro levels.

The study area, namely Nyangatom administrative woreda of South Omo zone in Southern People Nation Nationalities Regional State, is not different from other similar parts of the country with respect to the poverty and vulnerability situations. The woreda is represented by pastoralism mode of life that involves mobility and taking advantage of opportunities provided by nature, with coping strategies to deal with its caprices as pastoralist do elsewhere in Ethiopia. Precarious food shortage, rangeland degradation, very limited or inexistence of infrastructures and social services, marginalization, climate based problems like, flood, recurrent drought and its related negative outcomes are the main features of the area.

Despite many faced livelihood problems in the area, limited attempt has been made to study the issues related to poverty and vulnerability to food insecurity. Moreover, contextual factors that are believed to explain the dimensions as well as magnitudes of poverty and vulnerability in Nyangatom woreda have not been evaluated using better empirical methods of measurement available, and consequently the problems pertaining to local situation could not be addressed yet.

It is obvious that any strategy or plan that attempts to reduce or alleviate poverty requires in depth, area-focused studies that considers all poverty dimensions. Therefore, even if this study is not expected to alleviate the existing poverty situation all together, which is not a simple task, it can serve as a good starting point. A better understanding of the current livelihood situations with regard to constraints and opportunities will pave the way for strategically addressing the prevailing poverty in the study area. Accordingly, this study has been conducted with the main aims of measuring food or income poverty in pastoralist community and examining the relationship between poverty and different socio-economic characteristics in Nyangatom woreda including situations determining vulnerabilities to food insecurity, and to develop a project document based on the findings.

2.1.2 Objectives of the Study

As stated in the Terms of Reference, the key objectives of this study are:

- To assess vulnerabilities, capacities and opportunities, to design a long-term development project that can contribute to the strengthening of capacity for disaster risk reduction and the attainment of food security and sustainable livelihoods.
- To establish baseline information against which to measure changes resulting from future project interventions

2.1.3 Significance of the Study

Many authors in the area have indicated that the dimensions and causes of rural poverty and vulnerability are complex and vary from context to context. Poverty affects people of different characteristics in different ways; because they play different roles as they have different needs and face different constraints and opportunities. It is most likely that communities or households in extreme poverty differ from the average and non-poor communities/households in several distinct ways such as accessibility of social services, demographic characteristics, and other socio-economic conditions. Proper understanding of these characteristics and conditions constitutes an essential starting point and is key to the formulation of policies, designing appropriate strategies and practical steps that the government and non-state actors can take in order to reduce poverty and promote sustainable development at micro, meso and macro levels.

Hence, a better understanding of the patterns of poverty and the relationship between poverty and socio-economic factors can provide bases necessary to formulate appropriate measures and plausible intervention strategies. So, the outcome of this study is expected to contribute towards improving knowledge of the nature and magnitude of poverty in the society, its distribution and connection with the vulnerability situations so as to help combating poverty in the study area as well as other areas with similar characteristics.

Therefore, local and international organizations might benefit from the results of the study to direct their efforts to the fight against poverty and vulnerability in the area.

2.2 Scope and Limitation of the Study

The study has been conducted to assess the dimensions and the determinants of poverty the pastoralist communities of Nagangatom woreda are living in and to analyze the extent to which the determining factors contribute to the probability of being poor or not poor at micro level in the woreda. The study focused on pastoralists residing in homogenous dry land agro-ecology. It was undertaken by concentrating on a limited number of pastoral households emphasizing exploration of the different aspects as well as the determining factors of wealth status at community and household level, to identify the poverty situation, together with the vulnerability dimensions of food insecurity.

Inter-temporal variation in livelihood as a result of seasonal variability is not covered in this study, as it needs time series study and data. Moreover, since the study was limited to the specific nature and socio-economic set up of the pastoralists in Nyangatom woreda, the results and findings are the reflections of livelihood in the study areas which cannot be replicated directly to other locations. Critical data shortfall and its variation in content caused limitation to substantiate the findings of primary data obtained from the sample household survey.

The scope of this study was limited too by time and budget constraints. However, even if the study was restricted in terms of coverage, the findings and results can be used as entry point to initiate development interventions in the study area.

2.3 Methodology

This section of the report attempts to provide brief description of the sources and methods of data collection as well as the analytical methods employed and procedures followed during the analysis of the primary data.

2.3.1 Sources and Method of Data Collection

2.3.1.1 Sampling method

The study design followed a two stage stratified random sampling using vulnerability indicators. The criteria for selecting sample KAs were identified using composite index adapted from a working document of Chronic Vulnerability Index (CVI) for Ethiopia prepared by a core group of CVI Early Warning Working Group (EWWG)/Disaster Prevention and Preparedness Commission (DPPC) in 2004. In stratifying the KAs, the indicators used to establish a composite index were livestock holding (KAs known for their livestock abundance), access to drinking water (number of water points available in the area), access to market (walking time in minutes), and malaria risk (based on historical trend). Then, four KAs, namely Ayepa, Lopokor, Lorenkachaw and Nyaragoy, were stratified as more vulnerable ones from 20 KAs in the woreda.

Following the identification of sample KAs, informal survey was conducted in the selected areas. This has enabled collection of wide range of preliminary information through

observation by visiting the areas, and discussions with key informants, focus groups and community members. Based on the information obtained from the informal survey, questionnaire that was used later for the formal household survey was drafted and structured. Next, the survey questionnaire was pre-tested at field to check its relevance and appropriateness before it was actually applied to collate data from sample informants.

Then, households were stratified based on wealth categories using participatory wealth ranking undertaken with key informants. After deciding the total number of households in each of the four sample KAs, probability proportional to size was employed to select 90 sample household heads. This sample size was assumed to be fairly enough to gather adequate data on demography, socio-economic behaviors, livelihood styles, environmental factors, traditional institutional setup, and the like. Primary data was collected from the 90 sample households using the semi-structured survey questionnaire.

2.3.1.2 Data and Data Source

Various primary and secondary data were gathered from different relevant sources and reviewed for analysis. Key informants, particularly local government offices, traditional associations, and above all, sample households were used as primary sources both for qualitative and quantitative data. Primary data was gathered through questionnaire surveys and appropriate participatory methods such as focus group discussions (FGDs), key informant interviews (KII) as well as Participatory Vulnerability Assessment (PVA) and PRA tools. Different published and unpublished documents (e.g. policies, strategies, plans, reports, statistical abstracts) were reviewed to collate pertinent secondary information.

The qualitative data collected for the purpose of this study include vulnerability issues, shocks and trends focusing mainly on drought and flood frequency, impact on human and livestock, length of hungry period, major health shocks, conflicts, information on population trend, and production patterns of livestock. Moreover, issues such as availability of credit services, infrastructure and social services, as well as communal natural resources like forest and pasture, and water were investigated to collate qualitative data.

2.3.1.3 Methods and Instruments of Data Collection

The primary data were collected using qualitative and survey methods. A range of participatory methods including PRA exercises such as wealth ranking and preference ranking, as well as key informant interviews, focus group discussions and field observations were conducted. Besides, descriptive statistics and FGT poverty measure were used to analyze quantitative data.

Survey method was used to collect quantitative data. A structured interview schedule set and used to collect relevant data needed to undertake the quantitative study. This was made within 15 consecutive dates of November - December 2008. Before the actual data collection, however, several preparatory activities were conducted. Questionnaires were pre-tested prior to the survey that presumably built confidences of the enumerators in one side and used as yardstick to gauge farmers understanding on the other.

Twelve enumerators who know the study area and the local culture and speak the native language were recruited for conducting the field survey. Before deploying for field work, the

enumerators were trained on the methods of data collection and contents of the interview schedule to enable them to successfully accomplish the tasks.

2.3.2 Measurement and Indicators of Poverty

2.3.2.1 Poverty Measurement Procedures

Literatures indicate that three ingredients are required in computing a poverty measure. First, one has to choose the relevant dimension and indicator of well-being. Second, one has to select a poverty line, that is, a threshold below which a given household or individual will be classified as poor. Finally, one has to select a poverty measure to be used for reporting for the population as a whole or for a population subgroup only.

When estimating poverty using monetary measures, one may have a choice between using income or consumption expenditure as the indicator of well-being. Most analysts argue that, provided the information on consumption obtained from a household survey is detailed enough, consumption will be a better indicator of poverty measurement than income for the following reasons (FSS, 2002; Sowa, *et al.* 2002):

First, consumption is a better outcome indicator than income. Actual consumption is more closely related to a person's well-being in the sense defined above, that is, of having enough to meet current basic needs. On the other hand, income is only one of the elements that will allow consumption of goods; others include questions of access and availability. Secondly, consumption may be better measured than income. In poor agrarian economies, incomes for rural households may fluctuate during the year, according to the harvest cycle. In urban economies with large informal sectors, income flows also may be erratic. This implies a potential difficulty for households in correctly recalling their income, in which case the information on income derived from the survey may be of low quality. In estimating agrarian income, an additional difficulty in estimating income consists of excluding the inputs purchased for agricultural production from the farmer's revenues. Finally, large shares of income are not monetized if households consume their own production or exchange it for other goods, and it might be difficult to price these. Estimating consumption has its own difficulties, but it may be more reliable if the consumption module in the household survey is well designed.

Thirdly, consumption may better reflect a household's actual standard of living and ability to meet basic needs. Consumption expenditures reflect not only the goods and services that a household can afford with its current income, but also whether or not that household can access credit markets or household savings at times when current income is low or even negative, perhaps because of seasonal variation, harvest failure, or other circumstances that cause income to fluctuate widely. One should not be dogmatic, however, about using consumption data for measuring poverty. The use of income as a poverty measurement may have its own advantages. For instance, measuring poverty by income allows for a distinction to be made between sources of income. When such distinctions can be made, income may be more easily compared with data from other sources, such as wages, thereby providing a check on the quality of data in the household survey. Generally, because of the aforementioned reasons and reliability of the available information, consumption expenditure is basically used as an important poverty measures indicator.

2.3.2.2 Determination of a Poverty Line

The non-welfaristic approach often used for drawing a poverty line is based on the basic needs or minimum caloric requirement: direct calorie intake, food energy intake, and cost of basic need methods. In the case of direct calorie intake method, a poverty line is defined as the minimum calorie requirement for survival. Individuals who consume below a predetermined minimum level of calorie intake are deemed to be under poverty. Hence, this method equates poverty with malnutrition. The drawback of this method is that it does not take into account the cost of getting the basic calorie requirement. It totally overlooks the non-food requirement. If poverty has to be measured by a lack of command on basic goods and services, measuring poverty by calorie intake only is unlikely to reveal the extent of impoverishment of a given society.

The second non-welfaristic method of setting a poverty line is the food energy intake method. The basic idea in this method is to find the per capita consumption at which a household is expected to fulfill its calorie requirement. In this case, the poverty line is then defined as the level of per capita consumption at which people are expected to meet their predetermined minimum calorie requirement. It is normally determined by regressing the per capita consumption expenditure on calorie intake. Then the predicted value of the per capita consumption expenditure at the predetermined calorie intake level is taken as the poverty line. This method is an improvement over the direct calorie intake in terms of representativeness of the poverty line as it now provides the monetary value rather than purely nutritional concept of poverty. However, if this method is applied to different regions and periods within the same country, the underlying consumption pattern of the population group just consuming the necessary nutrient amount will vary. Hence, this method yields differentials in the poverty line in excess of the cost of living facing the poor. In other words this method does not yield a consistent threshold (poverty line) across groups, regions and periods.

The third method of setting a poverty line is the cost of a basic need method. First, the food poverty line is defined by selecting a 'basket' of food items typically consumed by the poor. The quantity of the basket is determined in such a way that the given bundle meets the predetermined level of minimum caloric requirement. This 'basket' is valued at local prices or at national prices if the objective is to arrive at a consistent poverty line across regions and groups. To account for the non-food expenditure, the poverty line is divided by the food share of the two poorest quartiles or quintiles as the case may be. This method yields a representative poverty line in the sense that it provides a monetary value of a poverty line that accounts for food and non-food components. Unlike the food energy intake method, the latter provides consistent poverty lines across regions and groups. Adjustments for spatial and inter-temporal variations could be made to set a poverty line that is consistent across regions, groups and periods. Then a specific allowance for the non-food component consistent with the spending patterns of the poor is added to the food poverty line (Fields, 1993; Glewwe & van der Gaag, 1990).

Each of these approaches has had its disciples and critics, and a great deal of research has been carried out. Work in the societal, quantitative and socio-economic fields has given rise to international standards, such as the poverty thresholds and lines used by the World Bank, and the human development indices developed by the UNDP. These standards provide a basis for comparing the poverty levels of different developing countries and poverty profiles for identifying the main components. A wider range of instruments will be needed to

supplement these quantitative approaches with the qualitative ones and bridge the gap between poverty analyses.

In general, measuring poverty has proved crucial for antipoverty policy. But it has required research that goes beyond incidence—beyond counting the poor. It is necessary also to assess the intensity and distribution of poverty. At a global level, such assessments show where the problem is greatest, where and when it is increasing or decreasing, and perhaps what its correlates are (Datt and Ravallion, 1992). At national and regional levels, according to these sources, show that attributing poverty (as between incidence, intensity, and intra poor distribution) tells a lot about appropriate steps towards curing it. Lack of such measurement in much of Africa until recently (van der Gaag and Glewwe 1988; Glewwe and Twum-Baah 1991; and Glewwe 1990 cited in Datt and Ravallion, 1993) clearly explain the weakness of antipoverty policy, to which Ethiopia is not uniquely escaped.

2.3.3 Data Analysis

2.3.3.1 Data Analysis Method

The analysis of qualitative data was made both during and after data collection. Data were coded, filtered and subjected to analysis using descriptive statistics, such as ANOVA (analysis of variance), cross tabulation, independent sample T-test, frequencies, and percentage, mean and standard deviations. In addition, income portfolio analysis, and diversity indices were used to arrive at a conclusion with regard to activity and income portfolio of the sample informants at household level.

2.3.3.2 Analytical Model

Poverty analysis was generally carried out on the basis of income as the household level indicator of well-being. This is in contrast with conventional practice, where consumption expenditures are commonly taken as the well-fare indicator. The principal reason for choosing consumption is well stated above.

To attain the issue with the dimension of poverty, hence, the FGT poverty measure that was introduced by Foster, Greer and Thorbecke (1984) was used. The first step was distinguishing the poor and non-poor. In order to classify into two groups, demarcation point or line is required to be drawn to have single measuring yardstick in poverty analysis. Poverty line, which is obtained by quantifying the various indicators of well being was used as the yardstick starting point for poverty analysis in assessing well-being and determining who is poor and who is not. People are counted as poor when their measured standard of living (generally in either income or consumption) is below poverty line, otherwise non-poor (Rath, 1996). Based on this, three poverty measures that are identified by Foster *et al.*, (1984) are employed. These include headcount index; the poverty gap index; and severity index or Foster-Greer-Thorbecke (FGT) index of poverty (MEDaC, 1999; FAO, 2001).

The headcount index, the poverty gap (PG) and the squared poverty gap index (PGI) all belong to the FGT class of measures. The mathematical expression of the model is as follows:

$$P_{\alpha} = \frac{1}{N} \sum_{i=1}^q \left(\frac{z - y_i}{z} \right)^{\alpha}$$

Where: P_{α} = poverty measure
 Z = Poverty line
 Y_i = income level
 N = population number
 q = is the number of poor
 α = is the weight attached to the severity of the poor

The measures are defined for $\alpha \geq 0$, where α is a measure of the sensitivity of the index to poverty. The parameter α determines the weight given to the severity of the poverty. For $\alpha = 0$, $P_0 = F(z)$, the cumulative income distribution at the poverty line z . In other words, for $\alpha = 0$, all poor are given equal weight and P_0 equals the head count ratio. For $\alpha = 1$, each poor person is weighted by the distance s/he is to the poverty line, $(z - y_i)$ relative to z . Thus, P_1 measures the distance to the poverty line for the average poor person, this reveals the poverty gap. For $\alpha = 2$, the weight given to each of the poor is more than proportional to the shortfall from the poverty line. It is the squared poverty gap index. Head count index is defined as the proportion of the population whose measured standard of living is less than the poverty line. However, this index doesn't capture differences among the poor. The poverty gap index squared indicates the depth of poverty, which is the difference between the poverty line and the mean income of the poor expressed as a percentage of the poverty line. This as well, has a drawback being insensitive to the distribution of income among the poor. In addition to the above measures, the widely used measure of the severity of poverty is the FGT index. This measures the mean of the individual poverty gaps raised to a power reflecting society's valuation of different degrees of poverty.

2.3.3.3 Estimation Procedure

Following the completion of data collection, the responses were coded, filtered and entered into SPSS version 13.0 software program for statistical analysis. In the first hand, among the available approaches that were used in assessing well-being and measuring poverty money-metric welfare indicator is selected and consumption/expenditure based measure approach is pursued.

The method used for setting the absolute poverty line is the cost-of-basic-needs method because of the advantages it has over the other alternative ways. This method is based on the estimated cost of the bundle of goods adequate to ensure that basic needs are met. Accordingly, establishing a line starts with defining and selecting a 'basket' of food items typically consumed by the poor. The quantity of the basket is determined in such a way that the given bundle meets the predetermined level of minimum energy intake (2200 kcal). According to various literatures, (e.g. MOFED, 2002; FSS, 2002) the food poverty line used in Ethiopia is based on a basket providing 2200 kcal per adult equivalent per day.

Therefore, based on the food consumption behavior and expenditure pattern of the community in the study area, a basket of food items typically consumed by the poor is

identified. Likewise, in this study 2200 kcal per adult equivalent per day has been used as the minimum calorie requirement per person per day and this basket is valued using local market prices in order to reflect the actual food poverty line in the locality. Putting differently, the actual expenditure/per adult/annum is calculated by summing up all the expenditure components and dividing by total adult equivalent (AE) of the household. A standard food bundle was defined based on the actual consumption pattern of households consuming less than 2200 kcal/day and the value of minimum amount of cereals, meat, milk, salt and etc., at an average price of the indicated food items in the local markets plus the sum of estimated minimum amount of money needed to cover the above mentioned expenses per AE per annum were used as a threshold beyond which the household is said to be poor or non-poor in the study area.

In a nutshell, the absolute poverty line is defined on the basis of the cost of obtaining the minimum calorie requirement for subsistence, which is 2200 kcal per adult per day (Ravallian, 1994), taking the diet of the lowest income quartile households. The calorie share of the diets to the minimum calorie required for subsistence is calculated to arrive at the level of calorie and quantities of food group items that gives the 2200 kcal.

Once we have identified the poor and non-poor groups of households, the next step is to pinpoint characteristics that are correlated with poverty and that can be used for targeting interventions.

2.3.3.4 Definition of Variables and Working Hypotheses

The dichotomous dependent variable is regressed on a series of socioeconomic, biophysical and communities' characteristics that are identified and included as explanatory variables. The dependent variable in this case is a dummy variable, which takes a value of one or zero groups depending on whether or not a household is poor. This means when the dependent variable regressed over the independent variables, it takes the value of 1 for the poor groups and 0 for non-poor groups.

Once the analytical procedure and its requirements are known, it is necessary to identify the potential explanatory variables that work for all sample households living in the woreda. Different variables are expected to affect wealth/poverty status in the study area. The major variables that are expected to have influence on the household to be poor or not poor are presented and explained below. Efforts were made to incorporate demographic, biophysical and socioeconomic factors, which are expected to be relevant in the pastoralist livelihood systems of Nyangatom woreda.

Accordingly, the associated hypotheses of the study built with respect to each one of the regressor and relevant data are collected on the following variables that are matching, and work for the sample populations in the woreda.

- (i) **Family Size:** this is the total number of adult equivalent to represent a total family size that live together under the same household adjusted to adult equivalent (AE). The expectation is that as the family size increases the probability of the household to have disguised unemployment and dependency ratio would increase which in turn would affect the well being of the household. Therefore, it is hypothesized that family size is expected to have positive association with poverty and negatively affect the household well being.

- (ii) **Dependency Ratio:** this is the ratio of children under age 15 and old age of above 64 to total family (total dependency ratio) expressed in terms of AE. The existence of large number of children under age of 15 and old age of 65 and above in the family could affect the poverty status of the household. This is due to the fact that the working age population (active labor force i.e., 15-64 years) supports not only themselves, but also additional dependent persons in the family. Thus, it is hypothesized that the family with relatively large number of dependent family members (high dependency ratio) has a direct relation with household poverty status. A household with large economically non-active family members tend to be poorer than those households with small family size, because of high dependency burden.
- (iii) **Age of Household Head:** this is a continuous explanatory variable designating age of the household head. The likelihood of being immersed into poverty is inversely related to age. As the age of the household head increases, the person is expected to acquire more experience and endowed with more assets. However, there also be an argument that as the age of the household heads increases there is a probability of having large number of children which contribute to large family size. In addition, as the age gets older the ability and strength of the person gets weaker and this would result in low income generating capacities. Moreover, in pastoralist system that requires frequent mobility old aged group are expected to be affected by poverty. Hence, households with older household heads are expected to be poor as compared to the households headed by the younger ones. Thus, it is hypothesized that older age of the household head is positively associated to the household poverty.
- (iv) **Livestock Ownership:** is the total number of livestock holding of the pastoral per adult equivalent measured in Tropical Livestock Units (TLU). Livestock are the source of livelihood of pastoralist community in the lowlands of Ethiopia. Possession of livestock is expected to have a positive impact on households' poverty situation. Since households with more number of livestock obtain more milk, milk products, blood and meat for direct consumption, large size livestock owners are expected to be non-poor. Besides, a household with large livestock holding can obtain more cash income from the sale of live animals. Therefore, it is expected that a higher number of TLU will increase the probability of the household to be non-poor. That is, as TLU increases poverty of the household reduces.
- (v) **Non-farm income per adult equivalent per annum:** This represents the amount of various income sources received (in cash or in kind) by the sample households or any of the household members in the year other than the sale of livestock and livestock products. Hence, it is expected that the unavailability of off-farm and/or non-farm income is negatively associated with household poverty.
- (vi) **Total Annual Income per adult equivalent from livestock sources:** is an important variable explaining the characteristics of poor and non-poor households, in that those who have earned relatively larger income per AE could be non-poor. Larger income per AE has positive impact on the probability of being non-poor or negative impact on poverty. This is anticipated because, in the study area, the main source of income for both kinds of sample households is obtained from sale of livestock and livestock products.

- (vii) **Distance from Market center:** proximity to market centers creates access to additional income by providing opportunities of selling livestock and livestock products as well as getting opportunities of engaging in employment and easy access to inputs and transportation. It is, therefore, expected that households nearer to market center have better chance to reduce household poverty than who do not have a proximity to market centers. Proximity to market centers is hypothesized to affect poverty negatively.
- (viii) **Herd diversification:** change in herd composition or herd diversification is one important risk minimizing strategy that have been adopted by pastoral community in order to develop resilience after sustaining the calamities of the recurrent drought. Therefore, it is hypothesized that herd diversification is expected to have positive contribution in improving the wellbeing of the pastoralist community or negatively affect poverty.
- (ix) **Animal Disease Incidence:** This variable is continuous and represents the total number of livestock died (TLU) per adult equivalent per year as a consequence of disease occurrences. Almost in all areas of the woreda inhabited localities it is thought that there is high prevalence of animal diseases. Veterinary services and facilities are very limited. As a result, it is expected that existence of animal disease incidences will deteriorate the livelihood of the pastoralists and it will have positive impact in aggravating poverty.
- (x) **Education level of Household head:** this is a variable that stands for educational level of the pastoral household head. Household heads in Nyangatom like any place in the country is highly influential in decision making process. S/He is the leader of the family for any sort of business activities that generates income. Hence, her/his education level has a positive contribution to the welfare of the family so that it is expected to have a negative correlation with poverty.
- (xi) **Pasture Management Practice:** this is a dummy variable for pastoralists experience/ tradition of rangeland or pasture utilization for grazing, having a value of 1 if the pastoralist is using shifting from one pasture land to another pasture land following dry and wet season grazing area; 0 otherwise. Assuming other things being normal, availability of pasture is limiting factor for existence of livestock which are the basis for the pastoralist livelihood. Obviously, pastoralists have traditional knowledge and mechanism for managing rangeland resources by moving their animals between dry and wet seasons. The traditional shifting practices followed by pastoral household have an influence on over utilization of rangeland or availability of pasture for livestock which in turn affects the livelihood of the pastoralist. Therefore, it is hypothesized that the pastoralist who will move his/her livestock using the organized traditional opportunistic movement is expected to have better wellbeing and non-poor.
- (xii) **Tribal Conflict:** this is a discrete variable whether or not the pastoralist has involvement in tribal conflicts. Pastoralists in the area are mostly known for their involvement in conflict for the reason of having control over range land resources, either pasture or watering point. Engaging into conflict has its own merits and demerits. Some argue that it has an advantage because a pastoralist may raid livestock and increase wealth while the other say there will always be a loss in wealth as a result of losing animals, household assets and even family member's death might occur which negatively threat the household life. But in most cases due to

restriction of movements and inability to use the available pasture and water points there will be loss of livestock because of feed and water shortages. Hence, it is expected that existence of conflict in the area aggravates the household poverty through livestock lost. Accordingly, it is hypothesized that involvement in the conflict has positive association with the household/ individual poverty.

2.4 Organization of the Report

The main body of this report is organized into three major parts.

- Part I provides background information which includes an overview of AFD (Section 1), an introduction of the survey rationales and methodology employed in data collection and analysis (Section 2), as well as a brief description of the study area (Section 3).
- Part II deals with the results and discussion of the study outcomes in six main sub-parts. Wealth categorization of the sample households by the community is presented in Section 4. The characteristics of the sample households such as demography are given in Section 5. Vulnerability and poverty issues in the study area are covered in Section 6. Section 7 contains the findings on access to basic social and commercial services like education, health, water, veterinary and extension services as well as infrastructures road, communication and market, Section 8 contains other poverty issues like gender and conflict, while Section 9 deals with vulnerability to drought and food insecurity.
- Part III presents summary of concluding remarks and recommendations (Section 10 and 11).

Additional relevant information (i.e. references, household survey questionnaire, FGD guides, KII guides and checklist for validation workshop) are annexed at the end of the report.

3 Description of the Study Area

3.1 Location and Ecology

Nyangatom woreda is located in South Omo zone of SNNPR, comprising of 20 Kebele Administrations (KAs). Kangateen, the woreda capital, is found at a distance of 915 km south-west of Addis Ababa, about 690 km from Hawassa, the regional capital and 165 km west of Jinka, the zonal capital. Nyangatom is bordered by Maji zone and Selamago woreda in the north, Dasenech woreda in the south, Hamer woreda in the east and the Sudan and Kenya in the west.

Nyangatom and Dasenech were part of the previous Kuraz woreda, until it is separated and legally established as an independent woreda on July 8, 2006 (Hamle 1, 1998EC). The woreda has mainly arid climate with altitude of Kangateen is about 300m.a.s.l. (Woreda Strategic Plan, 2008)

A low-lying flat dry land area of the woreda is characterized by loose and fragile soils and dominated by bushy and woody covers which accounts for about 2% of total area coverage, as per the report from woreda Rural Development and Pastoral Development. The vast flat areas provide grazing areas for cattle and small ruminants. Omo is the only River bordering the woreda through out its courses.

There are two rainy seasons in the woreda called *Belg* and *Meher*. The small rainy season (*Belg*) normally lasts from late March and late May while the main rainy season (*Meher*) is usually from late September to mid November. Rainfall has similar pattern throughout the woreda both in terms of amount and distribution.

3.2 Population

As per the recent Summary and Statistical Report of the 2007 Population and Housing Census Results, the woreda population was 17,632 (of which 8,747 or 49.6% female). The projection using the regional average annual growth rate of 2.9% and based on the official census report makes the woreda population about 18,143 in 2008, albeit the Woreda Administration indicated the population size in 2008 to be 35,251 which exceeds the size in the official census report by 94.1%. The inhabitants of Nyangatom woreda belong mainly to the *Nyangatom* ethnic group.

Pastoralists predominantly inhabit the woreda and opportunistic farming has also been noted to some degrees along the Omo river basin by some individuals. There are important factors that have shaped patterns of settlement in the woreda, which include flows of migration due to conflicts because of resource constraints (mainly water and pasture), pastoralism, and recurrent food insecurity.

Because of remoteness and exclusion by previous successive governments, the woreda is highly underdeveloped and facing severe lack of social services such as education, health, water and sanitation and other important infrastructure like roads and communication facilities that are essential to support the livelihood base of the people in the area.

3.3 Livestock Production

Pastoralists of Nyangatom woreda rear four major livestock types differently from the livestock types found in the Horn of Africa – goats, cattle, sheep, and camels. In place of camels, donkeys are widely known in Nyangatom. However, finger counted pastorals introduced camels in the near past, and the value of camels is not yet well recognized by the society at large. According to Nyangatom woreda Rural and Pastoral Development Office, the total livestock population of the woreda in the year 2007 is estimated to be 870,750 of animals (Table 1). Cattle and goat are the most dominant species since the area is mostly flat and has a long dry season that covers from October to February and usually has little shower supporting the browse and grazing balance. Sheep is also reared widely but not as much as goat. Donkeys are very common throughout the woreda and kept as pack animal.

Table 1: Livestock Population of Nyangatom woreda

Livestock types	YEAR		
	2005	2006	2007
Oxen	85,000	88,009	93,650
Cows	165,000	170,000	190,029
Steers	43,000	45,000	51,010
Heifers	98,000	97,000	107,501
Calves	89,000	90,000	100,050
Donkeys	60,439	61,439	63,430
Sheep	98,820	101,710	120,430
Goat	129,128	129,005	140,090
Hens	3,080	4,001	4,560
Total	771,467	786,164	870,750

Source: Nyangatom woreda Rural and Pastoral Development Office, 2008

3.4 Rangeland and Pasture Conditions

Rangelands in Nyangatom woreda experience low rainfall with long spell of dry season and frequently recurring drought. The influence of drought on the quantity and quality of forage production has highly affected livelihood of the pastoralists. Productivity of the rangelands is determined mostly by variation in the rainfall patterns. But, the distribution and intensity of the rainfall is erratic and irregular. According to the baseline survey result, the existing rangelands are mainly woodlands with grass found in pocket areas that causes the pastoralist to move to a place which they usually refer to as '*No One's Land*' around Kibish KA. Additionally, rangelands are also subject to the problem of soil compaction. Several factors cause degradation of rangelands though its impacts vary across time and space. In the study woreda, the main reasons for rangeland degradation are erratic rainfall pattern, overgrazing (high livestock population and low mobility), soil erosion and deforestation. The frequent drought that the woreda has experienced for the past many years has reduced the quality of grass and tree composition and coverage of rangelands. Overgrazing, especially in the grazing areas, has reduced the rangelands species' composition and sometimes made them sandy. The recently spreading noxious weed called '*Prosopis Juliflora*' in Kibish area is becoming an alarming threat for the majority of pastoralists in the woreda because of two reasons: Kibish is the area where the majority of pastorals move to in search of grazing land; and, the fast multiplication rate of the weed by suppressing the endogenous plant species. Although soil erosion is not considered a major factor, it is found to be causing the formation

of gullies that dissect rangelands and is making the range lands inaccessible in the near future. On the other hand, pastoralists in Nyangatom commonly manage rangelands and there is no clan difference over rangelands control. However, the tribal conflicts with almost all the surrounding ethnic groups over resource seem to have exerting pressure on the available rangeland within their own boundary.

The ownership of grazing land is mainly communal and they are using the available grazing and pasture lands for large number of animals, and all the livestock graze in the same place. Livestock productivity is mainly affected by availability of feed. But availability of feed for different species of livestock varies across seasons. In dry season, feed is available more for small ruminants and is scarce for cattle. The basic grazing management practices of the pastoralists in Nyangatom are moving animals each season and moving to '*No One's Land*' when the situation turns against them. They also move animals in dry season though it is preferred to keep them around the settlement areas in wet season. In some situations herds are divided into moving and village groups. Burning grazing land is practiced in order to initiate fresh grass growth and avoid incidences of some parasitic weeds and insects.

PART II: RESULTS AND DISCUSSION

The results and discussions in this section deal with findings focusing mainly on poverty status (food/income poverty), based on wealth categories, livelihood strategies, activity and income portfolio, resource endowment at household, and vulnerability to food insecurity.

4 Community Wealth Categorization

Proper analysis of rural livelihood, particularly its diversity and complexity, calls for the need to categorize wealth groups in terms of community-based, socially disaggregated views. Wealth categorization is important because it helps outsiders to identify who is poor and who is not. Different wealth categories face different constraints and livelihood options, and hence make dissimilar choices, in pursuing livelihood strategies. The procedures employed to establish wealth categories of households in the study area and the result there from are summarized below. Household-level data was disaggregated accordingly for further analysis in subsequent sections.

Wealth categorization is undertaken based on community-defined criteria. This is because determinants of wealth and stratification of wealth groups vary from one locality to another. Various studies identified land, oxen and other livestock, as well as labor as important economic resources; and variability in access to these resources is therefore considered as explanation to differences in rural societies (Chapman and Hailekiros 1999 and Yared 1999). However, different societies assign different weight to these factors in terms of defining economic and social positions of the households.

In this study, participatory wealth ranking exercises were carried out by different groups representing the broad sections of the community. These include men-only groups, women-only groups, youth groups and mixed groups of the local community in the sample KAs. The exercise was begun with identification of wealth strata. When categorizing the wealth groups, community representatives in some of the sample KAs agreed that households in their area are categorized into four different wealth groups' i.e. rich, medium, poor, and very poor. However, after lengthy discussion and deliberations in the current herd size and the living standard across all wealth categories in the woreda, they reached consensus that the rich are too few in number and they cannot represent a population group in the area. It was finally agreed that medium, poor and very poor categories are the main wealth groups which can reasonably represent the whole woreda population.

The key indicators used for the above wealth categorization is indicated in Table 2 below.

Table 2: Quantitative measure (average holding) used for ranking wealth categories

Criteria	Wealth categories		
	Medium	Poor	Very Poor
Ox	50	10	1
Cow	20	5	1
Goat	80	30	5
Donkey	7	4	1

Source: own survey, 2008

Number of daughters and wives were also mentioned as criteria for wealth categorization, in that daughters can increase the number of cattle in the form of dowry during marriage and wives can give frequent birth increasing the likelihood of getting more baby daughters. However, for this particular study the result indicated in Table 2 was accepted by the key informants. According to the above criteria set by key informants and using participatory wealth ranking method, the 90 sample households were categorized as 'medium', 'poor' and, 'very poor' accounting for 21.1%, 35.6%, and 43.3%, respectively (Table 3).

Table 3: Distribution of sample HHs by sample KAs and wealth category

Name of sample KAs	Total No. of HHs per KA	Total sample HHs		Sample size by wealth category					
				Medium		Poor		Very poor	
		No.	Percent	No.	Percent	No.	Percent	No.	Percent
Ayepa	284	20	22.3	5	5.6	10	11.1	5	5.6
Lopokor	569	40	44.4	5	5.5	10	11.1	25	27.8
Lorenkachaw	142	10	11.1	3	3.3	3	3.3	4	4.4
Nyaragoy	285	20	22.2	6	6.7	9	10.0	5	5.5
Total	1,280	90	100.0	19	21.1	32	35.6	39	43.3

Source: Own survey, 2008

5 Household Characteristics

5.1 Family Size and Age of Sample Household Heads

The survey results reveal that the mean family size for the study area is 9.9 persons per household, which is more than twice the national average of 4.9. As depicted in Table 4, the medium wealth groups have family size ranging from a minimum of 6 to a maximum of 15 persons, whereas the poor have family size from 4 to 19 and the very poor have 6 to 13 persons per household. These figures reflect the community in the area is pursuing extended family system like the case in most highland areas in the country. Large family size is considered an asset in the rural setting as most activities demand active labor force without which households would more likely be poor as they are unable to attain household objective with less labor. This seems the reason why the mean family size of sample households in all wealth categories is similarly very high.

Table 4: Distribution of Family Size among the wealth categories

Variables	Wealth category			
	Total sample	Medium	Poor	Very poor
Family size per HH				
Mean	9.9	9.9	9.8	9.9
SD	2.18	2.3	2.6	1.8
Minimum	4	6	4	6
Maximum	19	15	19	13
Age of HH Heads				
Mean	37.1	37.7	37.9	36.3
SD	10.9	10.3	11.4	11.2
Minimum	17	19	23	17
Maximum	63	56	63	58

Source: own survey, 2008

One remarkable finding of this survey concerns the age of household heads and its relationship with wealth status. The mean age of the household heads for the whole sample is 37.1 years, and the mean age for the medium, poor and very poor wealth categories is 37.7, 37.9, and 36.3 years, respectively. The minimum age is 17 years, the maximum is 63 years and the standard deviation is 10.9 years for the whole sample (Table 4). From this result one can observe that age seems to have no relationship with the wealth categories in the area, as the mean age of sample households across all wealth categories fall within the same range. The other possible reason as to why age does not show association with wealth categories might be the narrow livelihood base available for all age groups.

5.2 Demographic Characteristics of Sample Households

Evaluating the size and age structure of rural households can give crucial information for livelihood analysis since they are directly related to endowment of labor force, consumption and fertility behavior.

The demographic, social and economic situations of a society are strongly influenced by its age and sex composition. The prospect of the future population growth, among other things, is determined by its age and sex composition. In most developing countries, high proportion of children and young population is an indication of potentially high fertility demographic characteristic. A population with higher young age group has large number of future potential parents and hence rapid population growth (CSA, 2005). Demands on social services such as health and education are related to age and sex composition of a population.

Table 5 below gives the proportion of people under each age category in the sample HHs. Regarding the age structure of family members, survey result indicated that the mean number of children below 14 for the whole sample is 4.2 per household, with mean number of children in medium, poor and very poor HHs being 4.2, 4.0 and 4.3, respectively.

The mean number of family members whose age is between 14-64 is 3.0 for the whole sample as well as for each wealth category. The mean number of family members aged greater than 64 is 0.8 for the whole sample with mean number distribution of 0.7, 0.8, and 0.8 for medium, poor and very poor wealth groups. However, the mean number of man-equivalent family members is 3.0 (including 2.9, 3.0, and 3.0 for medium, poor, and very poor wealth groups, respectively). The proportion of consumer and working members of the family or mean dependency ration is found to be 1.9 with the mean distribution of 1.7, 1.8, and 2.0 for medium, poor and very poor wealth groups, respectively (Table 5).

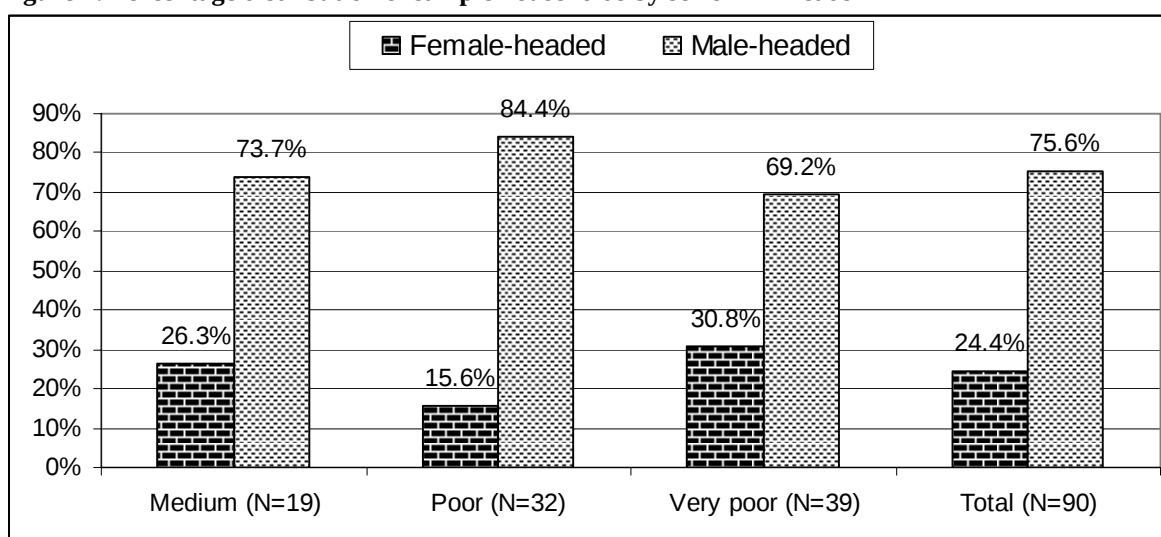
In the sample KAs, the number of people in dependent age group is greater than the number of people in independent age group. From these results one can arrive at a conclusion that this high dependency ratio could be taken as a contributing factor for the poverty situation in the area. Looking at the age dependency ratio in the area, the ratio of the very poor is estimated to be 2.0. This means that for each 100 person in the working age group of the very poor, there are about 200 young and old dependents to be supported. The 1.8 and 1.7 consumer-worker ratio for the poor and medium wealth groups indicates the presence of about 180 and 170 dependents for 100 economically active people in these wealth groups. This implies that there is a heavy burden on the economically active population in the study area to feed and provide other basic needs for children and old people across all wealth categories.

Table 5: Sample Households by age categories

Age category	Total sample	Wealth category		
		Medium	Poor	Very poor
Age<14				
Mean	4.2	4.2	4.0	4.3
SD	1.2	1.1	1.4	1.1
Age 14 -64				
Mean	3.0	3.0	3.0	3.0
SD	0.9	0.9	0.9	0.9
Age >64				
Mean	0.8	0.7	0.8	0.8
SD	0.9	0.9	1.1	0.8
Consumption unit				
Mean	5.0	3.1	3.1	2.8
SD	1.6	1.0	1.1	0.8
Man equivalent				
Mean	3.0	2.9	3.0	3.0
SD	0.9	0.8	1.0	0.9
Dependency ratio				
Mean	1.9	1.7	1.8	2.0
SD	0.8	0.7	1.0	0.7

Source: own survey result, 2008

Figure 1 reveals that the proportion of male-headed and female-headed households for the whole sample is 75.6% and 24.4%. However, the analysis within the same wealth group indicates that majority of the female-headed sample households are found in the very poor group as the proportion in this group is 30.8%, but 26.3% for medium and 15.6% for poor.

Figure 1: Percentage distribution of sample households by sex of HH heads

Source: own survey, 2008

In terms of age structure, 54.5% and 1.65% of sample household members were found to constitute children less than 14 years and elders above age 64, respectively. Hence, the working-age population (i.e., 14-64 years) accounts for only 44% of the population in the sample HHs, signifying a higher reproductive potential that seems to be above the normal age structure of the country. In general, the proportion by age structure shows a declining trend as one ascends to next higher age group. One possible reason might be the high birth rate in the area as observed from the high proportion of children aged 0-13 (Table 6).

Table 6: Distribution of Sample HHs by Age Group

Age Group	% of Poor (N=66)	% of Non-poor (N=24)	% of Total (N=90)
0 – 13	30.6	23.9	54.5
14 – 29	13.5	12.9	26.4
30 – 49	8.4	4.3	12.7
50 – 64	3.3	1.65	4.95
> 64	0.87	0.78	1.65

Source: own survey, 2008

With regard to the sex structure, the overall sex ratio that is the population of total males to total females in the sample population is xxx which might indicates a higher proportion of male population in the study area.

6 Livelihood and Poverty Situation in the Study Area

6.1 Livelihood Strategies of Sample Households

Livelihood strategies can be taken as the different types of livelihood activities a household pursues using the asset at their disposal. Livelihood strategies are dynamic. They are changing from time to time according to the level of asset endowment at community or household level. It can, therefore, be concluded that livelihood strategies and asset endowment are interrelated, and that they determine a household's wealth status and the level of vulnerability to food insecurity.

In this study, households in the study area are found to pursue different livelihood strategies in their day-to-day struggle to earn their living and fulfill their aspirations for better life. The different types of activities they are pursuing are both within the agricultural and non-agricultural sectors. The activities in non-agricultural sectors could further take two forms as off-farm employment opportunity, and non-farm income generating activities. The following section discusses the existing livelihood strategies of sample households together with wealth categories and livelihood resources identified in the area.

According to the study result, all the 90 sample respondents (100%) were found to pursue agriculture (livestock production) while 48.8% were engaged in livestock and off-farm (Table 7). The focus group discussion revealed that the non-farm activities are not known in the community because of the nature of livelihood system they are pursuing, as well as lack of opportunities and the marginal location of the area that deprived them of the possibility to engage in other income diversification activities.

Table 7: Major livelihood activities of sample households by wealth category

Activities	Total sample (%)	Wealth category (%)		
		Medium	Poor	Very poor
Livestock production	100.0	21.1	35.6	43.3
Livestock production plus Off-farm	48.8	7.8	18.8	22.2

Source: own survey, 2008

According to the above result, all wealth groups participate in off-farm activities with the percentage distribution of 22.2%, 18.8% and 7.8% for the very poor, poor and medium wealth groups, respectively. The probable reason all wealth groups participating in off-farm activities could be to ensure their household food security, because of the narrow income diversification opportunities in the area, even though the percentage distribution of medium wealth category is nearly one-third of the very poor wealth groups.

6.2 Activity Portfolio

This section deals with the participation level of sample households in different livelihood activities that are identified in sample KAs. Different and diverse livelihood activities are known to exist in the study area, but participation in some of them is determined by the kind of asset ownership and endowment at household level. Dealing with the household activity portfolio definitely insight the level of sample households participation in different kinds of livelihood activities. Activity portfolio also informs what really allows households to or constrains them from participating in different kinds of livelihood activities that is known to have high return, remunerative, and sustainable one to escape from the prevailing poverty and improve the livelihood options at household level. Accordingly, the study result indicates that sample households are found to engage in different livelihood activities to improve their livelihood options. The livelihood activities in the study area are generally within agricultural activities. As it was explained by key informant groups, some of the activities are done on a permanent basis, while some are done temporarily in a provisional way to overcome the cash and food deficit gap at household level across different wealth categories. The following discussion is based on the results in Table 8 below.

Table 8: Activity portfolio of sample households

Kind of activities	Total sample (%)	Wealth category (%)		
		Medium	Poor	Very poor
<u>Farm activities</u>				
Livestock rearing	100.0	21.1	35.6	43.3
<u>Off-Farm activities</u>				
Livestock rearing plus cattle herding wage	10.0	0.0	2.2	7.8
Livestock rearing plus Safety Net Wage	24.4	7.8	4.4	12.2
Livestock rearing plus wildlife hunting	14.4	0.0	12.2	2.2

Source: own survey, 2008

6.2.1 Livestock Production

Like many other dry land areas in Ethiopia, pastoralism is the key agricultural production system in the study area. Livestock is the major source of food (milk, blood and meat) and income, as well as a source of employment in Nyangatom, although crop production is practiced in a smaller quantity around the Omo river banks. It was observed during field visit

that communities along the banks of the river practice flood recession farming system with major focus of sorghum and maize crops, followed by chick pea and haricot bean. The crop stand and the biomass observed could tip off that alluvial soils accumulated along the riverbanks are with better organic matter which is favorable for the proper growth and maturation of crop. The harvest obtained from such a farming practice on a given plot of land can be used to conduct field research to compare the output obtained from irrigation activities conducted with the application of inorganic fertilizers, like DAP and UREA.

Basically, the survey result depicts that all sample households in the study area depend on livestock production. However, the fact that the statistics show all sample households engaged in livestock rearing does not guarantee that all wealth groups follow the same pathways and earn similar benefits from this sector. The difference observed among household ownership and access to different types and herd structures implies variation in livelihood activities and capacities in mitigating risks.

6.2.2 Access to and Utilization of Modern Agricultural Inputs

Modern inputs such as artificial insemination (AI), improved breeds and veterinary services are considered to have a significant importance in improving livestock production and productivity in Nyangatom like in other similar places in Ethiopia. The Ministry of Agriculture has encouraged farmers/pastorals to utilize these modern inputs mainly through existing agricultural extension packages and /or programs.

Despite the objective set by the Ministry of Agriculture, the above mentioned agricultural inputs are barely available in the study woreda perhaps because of its remote geographical placement, extremely low level of agricultural extension service and poor infrastructures for creating access to and utilizations of these inputs. Moreover, the price of these inputs is escalating, which could limit subsistence farmers including the sample households who may not afford even if the inputs were available. Besides, though the households in the study area have the financial capacity to buy, they may not be interested in using the inputs because of their low awareness of the importance. Unavailability of the modern inputs in the area seems to have been determined by these factors.

6.2.3 Production Constraints as Perceived by Sample Respondents

In all rural setting the livelihood activities are divided mainly into two: permanent and temporary activities. The permanent livelihood activities are those on which a communities' livelihood is predominantly based on, while the temporary activities are those which are undertaken to top up any shortage that is not fulfilled by permanent livelihood activities. In the study area, too, results of the household survey and group discussions revealed that livestock production is the permanent livelihood activity in which all sample households across all wealth categories are participating.

Respondents were asked to rank the most important production-related constraint in the woreda limiting the involvement of males and females in productive, reproductive as well as community roles. The result shows that drought is the most important production constraint for both male and female respondents, followed by feed shortage (90%) and lack of drinking water (65%) as perceived by men and lack of drinking water (96%) and lack of financial capital (85%) comes next in women's priority order.

Unavailability and/or drying-off of grazing land was considered seriously by men (100%) than women (90%), probably because of their major responsibility for ensuring grazing of livestock. When feed shortage occurs, men are supposed to walk long distance for searching pasture. Men were also worried about the animal diseases (85%), conflicts over resources like pasture and water and territory (72%), and lack of water (80%). On women's side, lack of food shortage (72%) and lack of credit services (53%) were the other main constraints in their ranking order. This implies that how the concerns of women and men within the same context can vary depending on their respective livelihood roles. Generally, in the traditional livestock husbandry system in Nyangatom, constraints like shortage of water and animal feed, veterinary services and credit facilities were found to be key factors that limit livelihood improvement. Moreover, weakness of the link between traditional weather forecasting methods and the early warning system of the government and NGOs appears to have hampered the pastoral system in getting better information and using it properly. It was observed that the existing early warning system was being used mainly for emergency response purpose, but not as a means of providing early warning, as its name suggests, for prior preparedness and risk management. Poor communication facilities and infrastructure were also mentioned as bottlenecks during focus group discussions that have constrained the pastoralist livelihood system and well-being in the woreda.

On top of the above stated problems, drought is the most important limiting factor and a covariant risk variable that is found to be the major production constraint hindering the improvement of the major livelihood activity (livestock production). The women group however, strongly raised shortage drinking water; in fact, it is can also be associated with drought. The water sources are found in distant valleys and women had to travel long distances daily to fetch water. Unavailability of water in most of the area was found to be the critical issue that causes health problems to women and children. As understood from the focus group discussion, men rarely support women in fetching water (even when women are pregnant, sick or give birth) as this is considered women's particular duty in the division of labor. In addition, women group indicated that unavailability of water increases the domestic chores and limit them to focus just on household routine than other more important factors that can help improve livelihood.

6.2.4 Crises management by Sample HHs during Drought and Food Shortage

It has been mentioned that pastoralism, with extensive, mobile grazing of livestock on communal rangelands is the key production system in Nyangatom woreda. The area is found in extreme south west characterized by soils with low organic matter and low nutrient content experienced with a year to year variability in rainfall which regularly takes the form of drought. Drought is familiar risk factor and recurrent in the study area. Unfavorable situations caused by natural, social and other factors hinder the HHs involvement of productive and reproductive as well as community roles. The period a household can cover consumption by purchasing food is found to be 5.8 months on average for the whole sample, the average period by wealth category being 8.3, 5.6 and 4.7 months for medium, poor and very poor. During the period from 1985EC to 2000EC, drought had occurred ten times in Nyangatom, and all of them were known to be serious drought years in the area.

In most cases, when HHs faces food deficit; they opt to decide to maintain their life through adopting other means to avert the situations. Households do have experience in using different strategies to cope up with stress situations and adopt various crises management

strategies. The traditional crises management strategies like livestock accumulation, regular and opportunistic herd movements depending on the rainfall pattern, livestock breed and species diversification, and herd dispersion between community members are well known in Nyangatom woreda. The strategies facilitated their access to and command over food including some other important consumption item in order to better lead their live and livelihood. Besides, borrowing cash, move to other areas, wage labor, selling animals are found to be as crises management strategies when the situation get worst with a proportion of 11% and 4%, 25% and 8%; 18% and 1.1%, 65% and 50% respectively to MHHs and FHHs.

When serious drought occurs in the area and food shortage faces within the HH; men and women HHs do have their own ways to escape from the incidences in most awful situations. Different survival measures were usually adopted by HHs in order to cope with the problems. In this particular reference, the survey result indicates that FHHs and very poor men depends more on safety net daily wage (if they get employment opportunity), and selling of their few small ruminants to buffer the worst hardships and shocks they are facing with. The situation indicates how people in Nyangatom woreda managing crises that affecting their access to the productive and reproductive resources using the scarce resources at hand without any external support. Irrespective of the crises type, one can realize how the poor and the very poor herders end up with an unviable herd size than the medium herders, even if the later groups loose the same relative amount of livestock at any time in the year.

6.2.5 Off-farm Employment and Returns

Off-farm employment opportunities in the study area mainly refer to agricultural wage labor like cattle herding, daily wage on safety net program, and hunting of wild life. The assessment indicated that 48.8% of sample populations are engaged in various off-farm activities with a proportion of 7.8%, 18.8% and 22.2% for the medium, poor and very poor wealth categories (Table 5). The focus group discussion revealed that, the trend in participating of various off-farm activities is generally increasing due to the declining of income from livestock resources which is largely associated with the reduction of herd size caused by drought, conflict and livestock diseases.

6.3 Income Portfolio

6.3.1 Type and Composition of Main Income Sources

This section deals with the income dimensions of livelihood activities by sample households in the study area that obtained through livelihood diversifications. Accordingly, the average estimated total mean annual income of households in the study area as a whole is Birr 784.84 per adult equivalent (Table 9). When annual income of households is decomposed by source from highest to lowest, livestock sale income ranks first (61.7%), income from safety-net (16%), remittance (12.5%), sale of milk and milk products (5.96%) and wage from cattle herding (4.2%). From the result one can see the limited income sources in the study area. The result also indicates that livestock is the only reliable asset for pastoralists in Nyangatom serving as major income source to ensure household food security.

Table 9: Mean income share per AE by wealth categories

HH income share by components	Wealth categories			Total Mean Income	T-Value
	Medium	Poor	Very poor		
Livestock sale					
Mean	957.89	438.28	291.15	484.22	8.490*
SD	507.20	163.49	83.22	(61.7)	
Cattle herding					
Mean	0.00	8.21	9.69	33.00	0.931
SD	0.00	52.67	55.87	(4.2)	
Remittance					
Mean	0.00	189.38	64.62	95.33	6.779*
SD	0.00	251.51	173.02	(12.15)	
Safety-Net Wage					
Mean	218.63	16.41	169.74	125.54	3.498**
SD	290.75	64.64	278.25	(16.00)	
Sales of milk and milk products					
Mean	22.63	56.41	50.56	46.74	1.067
SD	62.52	113.31	95.93	(5.96)	
Total HH mean annual income					
Mean	1,199.16	710.16	644.28	784.84	4.189***
SD	595.66	357.59	361.69	(100.00)	

Source: own survey, 2008

*, **, *** significant at 1%, 5%, and 10% probability level

Focus group discussions indicated that sample households in the medium wealth categories are in a relatively better position in terms of getting the benefits from engagement in agricultural livelihood activities. Table 9 above shows that the medium wealth group earns a mean income 3.3 times greater than the very poor and 2.2 times greater than the poor wealth groups. The fact that the medium wealth group is relatively better endowed with livestock resources than the other two wealth groups is the plausible explanation for the medium to enjoy relatively higher income and serve different purposes from livestock sale. From the figure one can easily understand the income variation between the different wealth groups and the medium wealth categories benefited more from livestock sale than the very poor and poor wealth groups. It has been understood that the majority of sample households depend almost entirely on their livestock to earn their livelihoods as most of sample households' annual income is basically derived from sales of livestock. Sheep and goats are the most frequently sold for cash or exchanged for food items as deemed necessary. Most of the sheep and goats are usually sold in the dry season while the rest are sold during the wet seasons. Cattle are usually sold during the dry seasons if the households do not have sheep and goats to dispose and/or if the market price of sheep and goats is not attractive. This is because in the dry season there would be more purchase of cereals as milk gets reduced sharply in response to feed shortage and unavailability of water.

Further data investigation for the reason why all wealth groups sales their livestock indicates that it is to shuttle household food requirement with percentage distribution of 14.4%, 24.4%, and 40% for the medium, poor and very poor wealth groups, respectively. This result hinted that the medium wealth groups are in better position to maintain their livestock than the poor and very poor wealth groups.

As indicated in the same above Table 9, safety-net wage labor is identified as the second higher income source in the area. This heavy reliance on the safety net program discloses the low level of income diversification sources in the area and the likelihood of greater herd size shrinkage because of less income diversification opportunities in the area.

The safety-net program is the only available government intervention in supporting the pastoral community and enabling them to relatively improvise opportunity in fulfilling household food requirement which could have been impossible otherwise without selling their livestock resources. The result showed that out of total sample households 24.4% of sample populations are found to be benefited from this intervention with a proportion of 7.8%, 4.4%, and 12.2% for the medium, poor and very poor wealth groups (Table 8). The figure indicates that the medium wealth categories are relatively benefiting from the program than the poor wealth group, in contradiction with the very purpose of the program expected to give priority for the resource poor pastorals who are supposed to have narrow livelihood base than those who relatively better endowed with livelihood resources. The inclusion of medium wealth groups in slightly greater number than the poor wealth groups could probably insight the targeting problem in selecting safety-net beneficiaries.

From focus group discussion with community members, it was learnt that some people in their area are receiving remittance (income drawn as non-farm) from relatives in Kenya and the Sudan. Key informants revealed that the ethnic group in the study area, in general, has a clear tribal relation with the group of people living in the above mentioned countries. In agreement with this statement, remittance stood 3rd major income source in Nagngatoom. As indicated in Table 6, 12.2% of the total means income is obtained from remittance. The amount received by the poor is about 3 times greater than the amount received by the very poor wealth groups; followed by sale of milk and milk by-products and cattle herding, with a percentage distribution of 5.6% and 4.2%, respectively. The statistical analysis run based on the above finding indicates that all income sources became significant with different percentage probability with the exception of cattle herding and selling of milk and milk-by products. The significant result mean that all income streams might have significant contribution in changing the prevailing income poverty situation with the exception of the income drawn from cattle herding and selling of milk and milk by-products which probably might not stave to change the pastoral income status in reducing the income poverty situation they are living in. In conclusion, while all sample households try to diversify their income in supporting their livelihood, the relatively higher income strata (in this case the medium wealth group) seem in a better position to obtain better livelihood.

In relation with the income from livestock sale, Table 10 depicts that more than 60% of the poor households earn less than Birr 601 per annum per adult equivalent. It is only 20% of the non-poor groups that has earned less than the indicated amount of income. The minimum and maximum annual income from livestock sales is Birr 100 and 1,300 per AE for the poor households, respectively where as it is Birr 125 and 2,200 per AE for the non-poor ones. The mean income from the sales of live animals shows that there were significant differences between poor and non-poor household at less than 1% level of probability. This result exactly identical with the finding indicated in income portfolio and as hypothesized; where livestock and the income derived from the sale of this sector could probably determine the poverty status in the area.

Table 10: Sample HHs' annual income per AE from sale of livestock

Birr/AE	Poor (N=66)		Non-poor (N=24)		Total (N=90)	
	No.	Percent	No.	Percent	No.	Percent
<200	6	6.6	2	2.2	8	8.8
200 – 600	54	60.0	13	14.5	67	74.5
601 – 1000	5	5.6	1	1.1	6	6.7
1001 – 1500	1	1.1	7	7.8	8	8.9
>2001	0	0	1	1.1	1	1.1
Mean	412.54		651.48		484.22	
SD	231.84		522.38		359.56	
T – value					9.02*	

* Significant at 1% probability level

Source: own survey, 2008

Further analysis of data on income sources indicates that 54.4% of the total sample households obtained between Birr 0 and 200 (the distribution by wealth category being 40% and 14.4% for the poor and non-poor), and 45.5% obtained between Birr 200 and 800 (33.4% and 9.9% for the poor and non-poor) (Table 11). It is only 2.2% of the non-poor group who obtained Birr greater than 801 from this sector. While both wealth groups participate in different off-farm activities, analysis of the sample household data shows that on average the poor households earned Birr 259.52 per AE per year from off-farm income sources to top up their main income while the non-poor earned Birr 240.70. Close observation on the narrow gap in the mean amount obtained from off-farm sources seems to have contributed to the relatively high amount of income received from safety-net and remittance which have significant contribution for differing in poverty status as explained above in Table 9.

Table 11: Annual income of sample HHs per AE from other sources than livestock

Birr/AE	Poor (N=66)		Non-poor (N=24)		Total (N=90)	
	No.	Percent	No.	Percent	No.	Percent
0 – 200	36	40.0	13	14.4	49	54.4
201 – 400	8	8.9	3	3.3	11	12.2
401 – 600	15	16.7	4	4.4	19	21.1
601 – 800	7	7.8	2	2.2	9	10.0
>801	0	0.0	2	2.2	2	2.2
Mean	259.52		240.70		253.88	
SD	284.93		320.24		294.26	
t – value					- 0.696*	

* Significant at 5% probability level.

Source: Own Survey Result, 2008

As indicated on Table 9 above, there is statistically significant difference (at less than 5% probability level) between the mean non-farm income (i.e. remittance) obtained by the poor and non-poor groups. This result might mean that the average amount of income received by both groups has contribution in stratifying the people into poor and non-poor groups besides supporting to fulfill families' household requirement, if selected off-farm activities are properly initiated and well directed to the needy beneficiaries.

6.3.2 Livelihood fragmentation and income diversity

The diversity index is a measure of how fragmented a household's income portfolio is. This assesses how many different pieces the total income is broken into, and therefore how many different diverse sources a livelihood depends up on (Start *et al.*, 2005).

The diversity index that is proposed by Chang (1997) and used by Ellis (2001) describes best in terms of both the number of activities and the distribution of total income between the different wealth groups. In this study, a diversification index was used to calculate diversity index for each household and the statistics is summarized by household type, using the mean and the standard deviation. The statistical mathematical specification for the market concentration index is expressed as follows:

$$IMCI = \frac{1}{\sum_{i=1}^n X_i^2}$$

Where, IMCI is the inverse of Herfindal-Hirschman index, and X_i^2 is the square of proportional to total income of each activity.

The logic is the maximum index value possible is equal to the number of income sources, and this would be attained if total income is equally distributed between each income sources; otherwise it falls away rapidly if any one income source begins to take more than equal proportion of income.

In Sub Saharan Africa reliance on agriculture tends to diminish continuously as income level rises, i.e., the more diverse the income portfolio the better-off the rural household category is. Elsewhere, a common pattern is for the very poor and the comparatively well off to have the most diverse livelihoods, while the middle ranges of income display less diversity (Ellis, 1998). In the present study, the index for the medium, poor, and very poor 6.7, 4.5, and 3.0, respectively, however, shows how all wealth groups exposed to more or less equally available off-farm activities in the area in addition to the income from livestock sale.

Looking at Table 9 above, of the three off-farm activities available, 77.7% income is drawn from two major income sources (livestock sale and safety-net), for medium wealth category favoring the highest index this group than the other two wealth groups. In similar vein, livestock sale, remittance, and safety-net income sources are the 3 major income sources for the poor and very poor wealth groups. Even though diversity indices are calculated from all available income sources, the amount of mean income obtained from each category contribute for the variation in diversity indices. Putting differently, safety-net is the second largest for the medium and very poor wealth groups, and remittance is the second largest income streams available to poor and third largest income streams for the very poor wealth groups that result the indices fitting the order of the present wealth categories. Looking at the amount of mean income of the latter groups, the poor is found in a better position than the very poor wealth groups. The finding could probably substantiate how the very poor wealth group has little access to different income sources that have significant contribution in staving household income requirement than the poor and the medium wealth groups. The cash received from the given income sources is also very little when compared with the other two groups. As indicated in Table 12 the indices are against the result stated by (Ellis, 1998) and neither fit with the result in the Sub Saharan Africa nor belonged to the category of elsewhere in Africa. This is because the area is exceptionally marginal without other

livelihood options other than stated above in drawing relatively lucrative income than the existing ones. In a conclusion, the case in Nyangatom and the resultant indices might signify how all wealth groups are struggling to avert or spread risk than accumulating wealth like other pastoralists elsewhere in Ethiopia. However, this implies the need for further more detailed study that consider a time series data.

Table 12: Diversity of income sources in HH portfolio

Wealth category	Diversity index
Medium	6.7
Poor	4.5
Very poor	3.0

Source: own survey, 2008

6.4 Dimensions of Poverty

6.4.1 Poverty Line and Indices

The food poverty line which is calculated from the data available is found to be Birr 564.07 (Table 13). The non-food expenditure component is also calculated using the average food share of the lowest income quartile households. The food share of the lowest income quartile is found to be 66.05%. This figure is used to estimate an allowance of non food expenditure and found to be Birr 141.02 and, therefore, gives a total poverty line of Birr 705.09 which is approximately Birr 705.

Table 13: Food Consumption of the Lowest Income Quartile and Value of Food Poverty Line

Food item	Mean kcal per kg/Lt	Gram consumed per adult per day	Kcal per day per adult	Kcal share (%)	Mean price per Kg/Lt (Birr)	Value of poverty line per year (Birr)	Expenditure share (%)
Cereal	3.47	487.53	1257.40	57.2	2.00	355.90	63.1
Milk	0.85	284.84	734.64	33.4	1.50	155.95	27.6
Meat	1.97	32.88	84.80	3.9	2.50	30.00	5.3
Butter	8.12	5.48	14.13	0.6	5.00	10.00	1.8
Borde	3.66	34.08	87.89	4.0	0.50	6.22	1.1
Coffee pulp	1.19	3.29	8.48	0.4	1.25	1.50	0.3
Salt	1.78	4.93	12.71	0.6	2.50	4.50	0.8
Total			2200			564.07	100.0

Source: Own computation, 2008

Note: The mean kcal per kg/Lt is extracted from poverty profile of Ethiopia, a report for Welfare Monitoring Unit of MOFED 1999/2000. The rest figures are the outcome of own computation.

This poverty line is used to estimate the poverty indices in the study area. Accordingly, the poverty indices were calculated using the FGT measures and found out to be 0.733, 0.212 and 0.111 for head count, poverty gap and poverty severity, respectively (Table 14).

Table 14: Absolute Poverty Indices of Sample Households

Poverty indices	Index values
Head count index ($\alpha=0$)	0.733
Poverty gap ($\alpha=1$)	0.212
Squared poverty gap ($\alpha=2$)	0.111

Source: own computation, 2008

The poverty measure (P_{α}) developed by Foster, Greer and Thorbecke (1983) are used to explain the extent of poverty in the study area. The resulting poverty estimates for the study area (Table 10) shows that the percentage of poor people measured in absolute head count index ($\alpha = 0$) is about 73.3%. This figure indicates that this proportion of sample households in Nyangatom woreda live below absolute poverty line. This implies that 73.3% of the population are unable to get the minimum calorie required (2200 kcal per day per adult) adjusted for the requirement of non food items expenditure. Putting differently, this proportion of pastoralists are unable to fulfill the minimum amount of income i.e., Birr 705 per adult equivalent per year and live under absolute poverty. The poverty gap index ($\alpha=1$), a measure that captures the mean aggregate consumption shortfall relative to the poverty line across the whole population is found to be 0.212 which means that the percentage of total consumption needed to bring the entire population to the poverty line is 21.2%. Similarly, the FGT severity index (the squared poverty gap, $\alpha=2$) in consumption expenditure shows that 11.1% fall below the threshold line implying severe inequality. In other words, it means that there is a high degree of inequality among the lowest quartile population. Looking at these figures, one can realize how they are different from that of the national indices that are indicated in the 1999/2000 poverty profile for Ethiopia at Birr 1057 where the real per capita consumption expenditure for the rural and urban people was Birr 995 and 1453, respectively (MoFED, 2002).

6.4.2 Consumption Expenditure of Sample Households

The result of the survey shows that the overall mean consumption expenditure for the sample households is Birr 690.41 per AE. The minimum and maximum consumption expenditure per AE for the year 2007/08 production year was Birr 89.03 and 4,411.43, and the mean consumption expenditure for the poor and non-poor groups is Birr 357.55 and 1,605.79, respectively. The statistical analysis shows that there is a significant difference between the two means at a less than 1% probability level (Table 15) in terms of distribution of consumption expenditure.

Table 15: Distribution of sample HHs Consumption Expenditure and the Poverty Index

Birr/AE	Poverty status					
	Poor (=66)		Non-poor (=24)		T - value	Total
	No.	Percent	No.	Percent		No. Percent
Less 705	66	73.3				66 73.3
706 -1410	2	2.2	12	13.3		14 15.5
1411 - 2115	0	0	6	6.7		6 6.7
2116 - 2881	0	0	1	1.1		1 1.1
>2881	0	0	3	3.3		3 3.3
Min (Birr/AE)		89.03		236.33		89.03
Max (Birr/AE)		1,210.30		4,411.43		4,411.43
Mean		357.55		1,605.79		690.41
S.D					59.831*	820.59
HC		72.2				
PG		21.2				
FGT		11.1				

*Significant at 1% probability level

Source: own survey, 2008

The mean per-capita consumption expenditure of the sample households in 2007/08 production year is estimated to be Birr 831.42. The study result indicated that the mean per capita consumption of non-poor households is Birr 1,746.8 and that of the poor households is Birr 498.55. While the minimum and maximum consumption expenditure for poor households is Birr 230.08 and 839.09 per capita, while it is Birr 858.35 and 4,552.44 per capita, respectively for non-poor group. The mean difference between annual consumption expenditures of the two groups is significantly different at 1% probability level (Table 16). This result mean the per capita consumption expenditure among sample households could probably contribute for the creation of poor and non-poor groups in the study area.

Table 16: Mean per-capita consumption expenditure among the poor and non-poor sample HHs

Birr/AE	Poverty status					
	Poor (=66)		Non-poor (=24)		T – value	Total
	No.	Percent	No.	Percent		No. Percent
Less 824	64	71.1				64 71.1
825 – 1649	2	2.2	17	18.8		19 21.1
1650 - 2474			3	3.3		3 3.3
Greater 3300			4	4.4		4 4.4
Min (Birr/AE)		230.08		858.35		230.08
Max (Birr/AE)		839.09		4,552.44		4,552.44
Mean		498.55		1,746.80		831.42
S.D		179.49		1,149.91		820.59
T – value					8.16*	

*Significant at 1% probability level

Source: own survey, 2008

Generally it is known that food-insecure people are those whose food intake is below the minimum calorie (energy) requirements, as well as those who exhibit physical symptoms caused by energy and nutrient deficiencies resulting from an inadequate or unbalanced diet or from the body's inability to use food effectively because of infection or disease. This particular study did not attempt, however, to collect anthropometric data to assess the physical symptoms of sample households to measure the adequacy or balance of diet. However, those individuals who are unable to meet their minimum calorie requirement, based on available data on consumption expenditure, were taken as food insecure people and categorized as poor and non-poor.

6.4.3 Access to Basic Social and Economic Services

Scrutiny of data regarding access to public services showed that a mean distance to the nearest health facility is 34.98 km and proximity to the nearest school is found on average at a distance of 17.26 km. As it can be seen from Table 17, a mean distance to access grain mill, telephone, and postal services is 31.91, 35.58 and 35.58 km, respectively. When compared to the national average, the result shows all necessary facilities like the above one are found in a very far distances. The attempt undertaken for the numerical analysis shows there are no statistically significant differences between the poor and non-poor households at less than 5% probability level with respect to mean value of proximity to all services. These results mean that all the services are available to all sample households are found to be in

relatively equal distances and have nothing to contribute for the poverty status. This means other factor remain constant, distances to accessing these services may not favour neither the poor nor the non-poor groups.

Table 17: Sample HHs' access to basic social and economic services (distance in km)

Basic Services	Non-poor		Poor		Total	
	Mean	SD	Mean	SD	Mean	SD
School	20.71	15.85	19.00	12.66	17.26	13.65
Grain mill	28.83	9.64	33.03	28.83	31.91	25.19
Veterinary	24.29	8.68	29.09	11.59	27.81	11.05
Health services	35.92	13.05	34.64	13.19	34.98	13.09
Water	6.95	3.52	6.63	3.40	6.87	3.41
Telephone services	28.92	13.41	38.00	13.68	35.58	14.12
Postal services	28.92	13.41	38.00	13.68	35.58	14.12

Source: Own computational result, 2008

Similarly, access to veterinary services and drinking water points are not found to differ statistically across the two groups in terms of the physical distances. People in Nyangatom, travels an average of 27.81 km to get veterinary services and about 16.87 km to fetch drinking water during dry seasons. During wet season, surface water collected from run offs into traditional ponds and aquifers in the sands of the river basins are used. Generally, the community in the study area are poorly accessed to services when compared to the national data in almost every aspect of service availability. For instance, the mean distance to the nearest school, health institutions and drinking water points during dry seasons is 17.26, 34.98 and 36.87 km in Nyangatom woreda whereas the national mean distances to these services for rural Ethiopia are 3.38, 7.98 and 0.41 km respectively. Still worse, in some extreme remote KAs of the low land areas some pastoralists do not have the slightest clue as to how to utilize and access the existence of such services in the woreda, mostly situated in Kangateen, the woreda capital.

7 Access to Basic Social and Economic Services

7.1 Access to Health Services

According to the Woreda Office of Health (WOH, 2008), Nagangtom had one health center, and five health posts that provide services to pastoral community in the whole woreda. All of them are providing static health services. These health institutions are constructed by the government and NGOs with the aim of reaching the entire community of the area under discussion. With regard to skilled personnel, there were only eight nurses and 11 health extension agents (HEAs) in the woreda. The required health personnel, equipment and drugs as well as facilities that make these health institutions functional by the standard of the country were not in place. There was no doctor though at least two are required as per the PASDEP target of one doctor to 18,000 people. The nurses and HEWs to population ration in Nyangatom was 1:4,406 and 1:3,205 respectively while the national target as per the PASDEP is 1:3,100 for both. Lack of safe and adequate water supply, shortage of health professionals, medical supplies and equipment and other facilities are the major constraints

limiting service provision in the study area. As a result, people are forced to travel very long distances (on average up to 35 km) on foot and/or pack animals to get health services.

An important aspect of human capital is the health status of individuals in the society as it has repercussions on their potential of productivity besides having a direct impact on welfare of individuals. During the survey, information was collected from each household about the health status of each member in the year prior to the interview period. Table 18, indicates number of family members sick in the sample households during 2007/8.

Table 18: Number of family members sick in sample HHs during the last one year

No. of sick Persons/HH	Poor (n = 66)		Non-poor (n=24)		Overall (n=90)	
	No.	Percent	No.	Percent	No.	Percent
1 – 2	22	24.4	8	8.8	30	33.3
3 – 4	18	20	8	8.8	26	28.8
5 – 6	4	4.4	2	2.2	6	6.7
> 6	5	5.6	0	0	5	5.6
No sick person	17	18.9	6	6.7	23	25.6
Mean	2.25		2.33		2.27	
SD	0.96		1.05		0.98	
T - value = .089*						

* Significant at 1% probability level

Source: Own Survey Result, 2008

Data analysis on the response about the health status of sample households across the study area shows that 33.3% households have 1 to 2 family members who were sick with the percentage distribution of 24.4% and 8.8% for poor and non-poor groups. Further processing of data shows 28.8%, 6.7% and 5.6% respondents indicated that they have had sick family members ranging from 3 to 4, 5 to 6, and greater than 6 family members, respectively during the same period. Twenty three (25.6%) sample households reported that they did not have sick family member. Statistically significant difference is found between the poor and non-poor households (Table 18) in terms of the average number of sick persons. The possible reason might be that both groups have relative differences in their livelihood resources under which they make their livelihoods.

Analysis concerning the kinds of assistance given to sick persons across the woreda indicates that 13.3% of the respondents reported that they did nothing even if they are sick, while 27.8% indicated that they used to visit traditional healers to get support from. Similarly, 22.2% had known to visit the available health facilities in order to get treatment, 23.3% said that they purchased medicines from shops and 13.3% used the combinations of traditional healer as well as purchase of drugs from shops. Table 19 shows that while majority of the poor (36.7%) are taking care of sick persons by taking the sick persons to traditional healers and buying drugs from any shops; the majority of non-poor sample households (15.7%) are used the combination of traditional healers and taking the sick persons to the existing health facilities. According to the above result, one can realize how the different wealth categories managing sickness in their respective households based on their living status.

Table 19: Type of measures taken for treatment of sick persons in sample HHs

Measures taken	Poor		Non-poor		Total	
	No.	Percent	No.	Percent	No.	Percent
Did nothing	8	8.9	4	4.4	12	13.3
Visited traditional healer	17	18.9	8	8.9	25	27.8
Visited formal health facility	15	16.7	6	6.7	21	23.4
Bought drugs from shop	16	17.8	4	4.4	20	22.2
Visited traditional healer and bought drugs from shops	10	11.1	2	2.2	12	13.3

Source: own survey, 2008

Further processing of data reveals that malaria, diarrhea, and both malaria and diarrhea were found to be the major of sickness in the study woreda with a percentage distribution of 40%, 21.4%, and 38.6%, respectively. In reality these diseases are known to be controlled through preventive measures without requiring huge financial investment. In SSA malaria is considered as one of the major killer diseases, where the Ethiopian government ratifies the agreement to combat malaria and HIV/AIDS in the Millennium Development Goals until 2010 among the 189 state nations.

In relation with health issues, focus group discussion reveals that indigenous health care mechanisms including herbalists, bone-setters; spiritual healers are the available community health institutions which are respected and reputed by the majority of people in Nyangatom.

7.2 Access to Education Services

The pastoral communities of Nyangatom woreda are characterized by below average school attendance and achievement. The delivery of educational services to these people is carried out using conventional methods and little attempt is made to adapt curricula to the pastoralist environment and livelihood system. According to the WOE, there were 17 Alternative Basic Education (ABE) centers which have been constructed and run by NGOs and six full-cycle (1-8) in the woreda in 2008/09 academic year.

However, all key indicators show that the education service in Nyangatom is very poor. For instance, the Gross Enrolment Rate was 55% for male and 47% for female compared to 105.7% and 105.2% of the national target as per the PASDEP. Besides, girls' participation is very low, especially at formal primary school where girls constitute only 32% of the students.

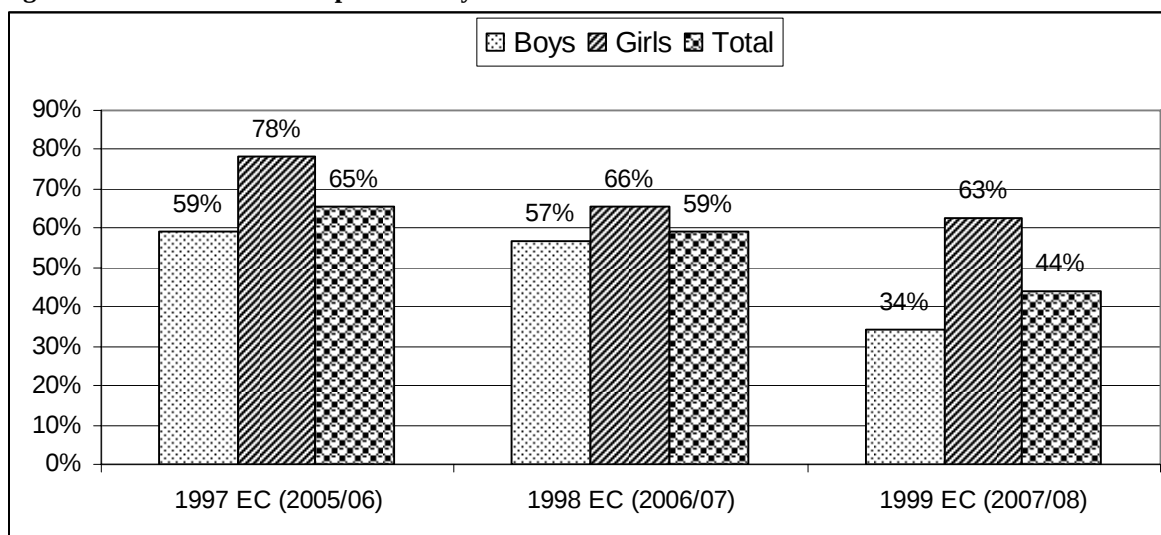
	No. of students enrolled			Girls' participation	Gender disparity
	Boys	Girls	Total		
Formal primary (1-8)	649	306	955	32.0%	52.9%
ABE Centers	1,102	788	1,890	41.7%	28.5%
Total	1,751	1,094	2,845	38.5%	37.5%
GER in Nyangatom	65.7	34	48.4		
PASDEP target	105.7	105.2	105.5	49%-50%	4%-0%

Comparison of other key indicators as shown below also reveals that the education sector's performance in the study woreda is very weak. For example, student-teacher ratio and student-section ratio were 32 and 40 compared with the policy target of 53 and 54, which indicates wastage of resources in the study wereda. The ratio of girls to boys in Nyangatom

was 0.62, while the target in the PASDEP is 0.96 for primary grade 1-4 and 1.00 for primary grade 5-8.

Nevertheless, the school enrolment rates shown above tell only half of the story. Usually enrolment rates are calculated at the beginning of the academic year, and do not show the completion rate. As can be seen in Figure 2, significant majority of the enrolled students actually dropout of school. The dropout rate was 65% for 1997EC (59% boys and 78% girls), 59% for 1998EC (57% boys and 66% girls), and 44% for 1999EC (34% boys and 63% girls). While these figures show that the overall dropout rate in Nyangatom is extremely high, but girls had suffered the most.

Figure 2: Trend of school dropout rate by sex



Source: Woreda Office of Education and own computation, 2008

Besides, the household survey result revealed that the mean distance to primary school was 17.3km.

The population in the study area is largely illiterate. Hence, they do not possess the skills needed to improve their livelihood through diversifying their activity and/or income portfolio for employment outside the pastoral areas.

Table 20: Educational level of sample household heads by wealth categories

Education level	Total sample (%)	Wealth Category (%)		
		Medium	Poor	Very poor
Non-literate	94.40	20.00	34.44	40.00
Read and write	3.30	0.00	0.00	3.33
Grade 1-4	2.20	1.11	1.11	0.00

Source: own survey, 2008

As indicted in Table 20 above, 94.4% of the total sample households from all wealth categories were found to be non-literate. Of the total 5.5% literate sample households, 1.1%, 1.1%, and 3.3% belong to the medium, poor, and very poor wealth categories, respectively. But there was no household head from the very poor wealth group who attended grade 1-4 schooling. From the above findings, it can be seen that the majority of sample respondents

from all wealth groups were non-literate, and there is no visible difference in the education status of the various wealth groups. This result suggests that, contrary to the hypothesis, education in Nyangatom is negatively related with wealth status, even though it is supported by many researches and empirically verified that the living condition of literate rural people is mostly better than that of the illiterates. To verify the above result, further analyses were undertaken through a dichotomous dependent variable known as “poor” and “non-poor”.

Table 21: Education Status of Household Heads of the Sample Population

Education level	Non-poor (%)	Poor (%)	Total (%)
Non-literate	24.44	70.00	94.44
Read and write	2.22	1.11	3.33
Grade 1-4	0.00	2.22	2.22
Mean	1.08	1.08	1.08
SD	0.36	0.28	0.34
T-value	0.927		

Source: Own Survey Result, 2008

As indicated in Table 21, it was found that 3.3% of the sample HH heads were able to read and write (informal education including religious teaching) while 2.2% have attended primary education (grade 1-4), but 94.4% of the respondents cannot read and write. Also, the analysis shows that there is no statistically significant (up to 10% significance level) difference between poor and non-poor in terms of the education level of household heads. The mean schooling of both the poor and non-poor sample households was found to be identical and it is 1.08. The very low level of education for the so called ‘literate’ household heads and very low number of people who can just read and write may explain why education did not bring a statically differing result on the poverty status. Therefore, it may be concluded that education was not a major factor determining wealth status of sample households in the study woreda.

7.3 Access to Water Supply Facilities

Low and erratic rainfall is a fact of life in Nyangatom woreda. Pastoral production systems have always relied upon surface water and groundwater sources. Access to water during the dry season in turn determines access to and control over grazing areas. According to the data obtained from the WOWD, there were 55 HDWs (shallow wells) in 2008, of which 23 were not functional. These water supply schemes were believed to benefit about 10,000 people (i.e. 28.4% of the woreda population).

The survey result however indicated that during the long dry seasons about 52.2% of the respondents fetch water from rivers whereas 13.3% of the respondents use aquifers in the river bed sands and 34.4% use ponds (Table 24).

Table 22: Source of Drinking Water during the Dry Season by Group

Source of water	Total sample (%)	Wealth Category (%)		
		Medium	Poor	Very poor
Aquifers in sand of riverbeds	13.3	2.2	6.7	4.4
Ponds	34.4	5.6	12.2	16.7
River	52.2	13.3	16.7	22.2

Source: Own Survey Result, 2008

The study clearly depicted that there is acute drinking water problem for the pastoralists, and drinking water has been identified as a top agenda and priority in the woreda, particularly for women survey participants.

7.4 Access to Veterinary Services

Despite the importance of livestock to the larger sector of the population and the economy of the region, the sub-sector has remained untapped and productivities are extremely low. Prevalence of livestock diseases and shortage of feed and their interaction constitute important constraints to livestock production of the region. The main livestock diseases prevalent in the woreda are Foot and Mouth Disease (FMD), Contagious Bovine Pleuropneumonia (CBPP), Contagious Caprine Pleuropneumonia (CCPP), Trypanosomiasis, Anthrax, Black leg, Pasteurellosis, TBD (Babesiosis, Anaplasmosis) and internal and external parasites.

Livestock disease is a major constraint to livestock production and a cause of food insecurity for pastoral communities in Nyangatom woreda. The key informant interviews revealed that wide prevalence of diseases such as Contagious Bovine Pleuropneumonia (CBPP), and Contagious Caprine Pleuropneumonia (CCPP), results in high rates of morbidity and mortality. Livestock diseases coupled with nutritional stress account for calf mortality even in average rainfall years. Teat damage caused by tick bites has an important effect on milk production as the information obtained from focus group discussion.

An elderly key informant reveals that there are four categories of animal ills. First, diseases that cause sudden death are explained in terms of destiny and they are seen as being of a supernatural will. Man can do very little to prevent such occurrences. The following are among the most important in this category: render pest, foot and mouth disease, anthrax, and birth deformities (a sign of bad omen to come as they believe in).

Second, diseases and parasites perceived as communicable from herd to herd. These include render pest, coughs, ticks, and mites. Cross-infection is believed to occur when certain species of stock mix with certain wild animals, e.g. cattle mixing with kudus or gazelles, or when flocks belonging to different owners are grouped together; infected donkeys and goats are mixed; housing conditions are poor; grazing is restricted and/or when the environment is clayish and wet.

Third, identified as chronic diseases which are believed to remain inside the animal and weaken it. Pneumonia, emaciation, and mastitis fall into this category. Fourth, the remaining many diseases are believed to be curable and preventable by good husbandry. These include, to name but a few, abortion, water-borne diseases, and bone fractures. Several diseases are linked to malnutrition, to long distance travel as well as to wet or dry seasons.

Among the various curative practices used by the Nyangatom, firing and branding are favorite treatments (though traditional creating wastage of skin unwanted for market), especially for swellings, fractures, bruises, lameness, and bites from wild animals. There are also multi-purpose household cures, which are very widely used by pastoralists, on their own initiative and at their own discretion. The curing mechanisms are used for a wide range of ailments, from bloat through retained placenta to insect bites, these include: feeding salt or salty water, milk, sorghum soap, coffee pulp, malted grain or tobacco drinks; applying ointments of salt and oil; dousing animals with cold water; smearing swellings with hot dung and soil. Kerosene, salt or barks of selected tree are used as dressings. When more complex

treatments are needed, these are prepared and administered by traditional veterinarians who are respected by the society. These individuals are older people, always male and in most cases are themselves animal herders. They are mostly illiterate and live among the community in the rural setting.

During drought, certain diseases become critical in cattle. Interesting information obtained during focus group discussion revealed that shortage of pasture is forcing grazers such as cattle and donkeys to graze close to the ground, which may affect the mouth, teeth, and throat; and this may further allow the passage of some diseases to the digestive system causing irritation and sickness.

While existence of the animal health services are crucial for the pastoralist community, who depend significantly on livestock for their living, institutional veterinary centers that provide services to the animals of these pastoralist communities are not well established and functional. According to the report from the focus group discussion, even though there are about one veterinary clinic and five health posts, the majority of pastoralists are not able to utilize the services because of cash constraints.

Table 23: Responses of sample HHs about type of veterinary services they get

Vet Services	Total sample (%)	Wealth Category (%)		
		Medium	Poor	Very poor
Vaccination	11.1	2.2	1.1	7.8
Treatment	2.2	1.1	1.1	0.0
Vaccination plus treatment	61.1	17.8	20.0	23.3
I don't know about service	25.5	0.0	13.3	12.2

Sources: own survey, 2008

In consistent with the focus group discussion, out of total sample households 25.5% of sample households do not know the kind of services available in the woreda, with a percentage distribution of 0.0%, 13.3%, and 12.2 for the medium, poor and very poor wealth groups, respectively. As indicated in Table 23, the majority of sample respondents knew about the veterinary services given in the area, irrespective of service utilizations.

According to the WORPD, there were only two Animal Health Technicians, but no veterinarian assigned to this particular woreda where pastoralism is the major livelihood base. These two animal health technicians have been assigned to provide veterinary service like vaccination and clinical animal health care for the whole woreda, but without any facilities such as equipment and medicines. Looking at the status of the existing facilities, one might arrive at conclusions that pastoralists in Nyangatom woreda could not get even minimum animal health care. Moreover, the household survey results indicate the public veterinary service facility had been very poor both in terms of coverage and quantity/quality.

Table 24: Time since sample HHs got livestock vaccination service

Time since vaccination	Total sample (%)	Wealth Category (%)		
		Medium	Poor	Very poor
One year	48.9	10.0	21.1	17.8
Two years	30.0	5.6	6.7	17.8
Three years	4.4	1.1	1.1	2.2
Above three years	5.5	4.4	0.0	1.1
Never been vaccinated	11.1	0.0	6.7	4.4

Source: own survey, 2008

In addition to the above major diseases, the focus group discussion indicated that the risk of epidemic diseases potentially threatens all pastoralists. However, poor pastoralists are more vulnerable to this risk, as they are more marginalized they often lack access to veterinary services and do not have the means to purchase drugs for disease prevention and treatment.

The survey result shows that 51% of the total respondents' livestock did not receive annual vaccinations over the last one year. The rest 48.9% have reportedly received livestock vaccination service as an integral part of various emergency operations carried out in the woreda in response to drought effect and its mitigation starting from year 2000. Had it not been for the emergency situation, the livestock in the area would have not been received a vaccination service as understood from the discussion from key informants group. This view is unanimously confirmed by the communities and it can be stated that these communities are denied veterinary services and facilities they deserve. The statistical result (Table 20) also shows that there is no statistically significant difference between the poor and non-poor pastoralists in terms of getting annual vaccination for their livestock.

To bridge the gap, NGOs operating in the woreda urged to engage in promotion of community based animal health service delivery systems mainly through Community Animal Health Workers (CAHWs). The introduction of community-based animal health workers (CBAHW) should be considered as a powerful measure not only to increase the coverage of preventive animal health services in sparsely populated areas, but also to provide curative services and preventive measures for non-epidemic diseases on a cost recovery basis. Additionally CBAHWs can be engaged by the public sector for disease surveillance and prevention campaigns against transboundary animal diseases as Nagnagatom woreda is bordering with Kenya and the Sudan. These are meant to involve in training and emergency veterinary interventions in order to increase the service coverage in order to reach the remotest pastoral areas.

7.5 Road Facilities and Communication

Absence of such Road infrastructure had tremendously affected the woreda in terms of communication and market accessibility, and hence, many people of the woreda seems cut off from the regional as well as national economic activities. Internal feeder road is still an issue for the whole woreda and hence there is big impediment in advancing the development processes in the woreda. As substantiated by key informants, there was a big hurdle to construct service facilities as well as to conduct the food aid program when drought and flood affected people in the woreda.

Nagnagatom woreda do not have a well developed rural infrastructure that links and connects different parts of the Woredas or that creates communication access to the neighboring woredas and Jinka, the zonal capital. This means transport is inaccessible particularly to most of the pastoral communities for the reason that pastoralists are residing at the remote areas far from towns where there is grazing land and water for their animals. There are no all weather roads that link the woreda to the main Jinka-Addis Ababa road. As a result, despite the existence of donkeys in most of the occasions that serves as the prominent means of transport in the area, people and animal trek long distances to reach social service centers and markets.

Until recently, the woreda center had no telephone services. But since January 2009, a public telecommunication center is established in Kangatten. This being the case, the sample household survey respondents indicated that they have to still travel up to 35.58 km on average to get this service. Besides, postal service is not much known in the community owing to an absence of the service.

In relation to infrastructures, rural roads and telecommunication in general have paramount importance to the integration of the remote areas where many of the poor pastoralists live. Not only are people able to move between rural and urban areas more easily if the transport infrastructure is good, but they are also more likely to be better informed about their livelihood opportunities at their disposal. It is well understood that a well informed community might be able to diversify livelihood strategies by acquiring improved livelihood options so that they may start stepping up the ladder to a better wealth group.

7.6 Market Places

Road access is very important factor for rural development and poverty reduction, especially in relation to access to market for agricultural products. The main markets for the pastoral community in woreda are found in Kangateen, the capital of Nyangatom. This market place is traditional in nature and are characterised by inadequate marketing facilities and services while it is the major market place for selling livestock and other farm products. Most pastoralists transport their agricultural produce to this market place by donkeys and/or on their shoulders.

Discussion with community representatives revealed that market places found in Kenya and the Sudan are the other preferred areas visited by Nyangatom people. As indicated in Table 17, the mean distances to market place for the people in the study area was found to be 33.3 km within the boundary of the woreda; whereas the average distances for market places found outside the country is estimated to be 65km. Because of the conflict situation community members in Nyangatom are not able to freely move to other big market places to benefit from their livestock sale. Market places in pastoral areas like Nyangatom are the places where pastorals openly communicate vital information that furnish them bargaining power in selling their agricultural produces. The restriction of movements in different and yet important market places will hamper the pastoral livelihood and put their life and creative mind in bleak. Given the predominant livestock resource in pastoral communities, one can argue how pastorals in Nyangatom are excluded from entering in competitive National markets let alone penetrating export markets.

Exclusion of pastorals from livestock markets due to insufficient health standards and / or due to conflicts can be taken as market risk where outsiders particularly policy makers should be concerned about. The reduction of this risk needs attention not only because of the negative impact it has on the national economy but also because if local livestock keepers were able to participate in satisfying the demand for livestock products, they would increase their monetary income and thereby their capacity to handle other risks.

Transport constitutes a major cost factor in livestock trading: livestock are trekked or trucked to markets, with trekking being the predominant mode of transportation in most pastoral areas including Nyangatom. However, trekking has high indirect costs due to animal mortality, weight loss, trekker time as a result of stock routes and watering points being mostly in bad conditions, and carries the risks of raids or conflict along marketing routes. The public sector should facilitate to reduce the transport costs imposed on pastoralists, e.g. by

investing in transport infrastructure (roads, trekking routes and water points) based on the principle to levy user fees and taxes on livestock producers and traders for visible and tangible services and for maintenances and upgrading of market facilities.

7.7 Land Ownership and Land Use Right

Literatures indicate that through out the history of modern Ethiopia pastoral land has always been under direct control of state. Ayalew Gerbre (2001) in his book 'Pastoralism under pressure' and World Bank (2001) in its paper 'Pastoral area development in Ethiopia' have indicated that since the early 1900s, Ethiopia's grazing lands have been regarded as property of the State. This was formalized in Proclamation No. 70 of 1944, in the 1955 Revised Constitution of Ethiopia and in the 1960 Ethiopian Civil Code. In 1942, a poll tax law transferred pastoralist obligations for taxation payments from the traditional chiefs to the State. As Ethiopian land tenure systems are strictly related to tax-based state revenue, a special taxation law was proclaimed in 1950 for the '*zellan*' land (no man's lands) and stated that tax assessment was based on the type and number of animals owned or possessed by pastoralist households. The 1975 land reform proclamation reaffirmed State ownership of pastoral land and established Peasants Associations (KAs) in pastoral areas with clear pastoralist sedenterization objectives. The new 1994 Constitution, however, provides for pastoralists a guarantee "not to be displaced without their wish". It does not, however, provide the by-laws for the protection of the rangeland or provide for compensation for alienated land and remains underpinned by a strong State sentiment for pastoralist settlement.

During a survey sample households were asked about the land ownership they are living on and to whom they believe land belongs to. According to the response obtained, 72.5% of the respondents believe that the land belongs to the community and open to all; while 13.3% perceived that land is the property of government. The remaining 14.2% of the respondents do not know to whom the pasture and grazing lands belongs to. Grazing resources are communally administered by elders and clan leaders who formulate rules about resource use, administer enforcement, and ensure that sanctions and penalties are implemented. Land tenure rules dictating access and control over resources do not vary in Nyangatom woreda, as the people belonged to the same ethnic group, as clan structures do not dominating resource management. One of the major problems regarding land tenure is that, in common with small farmers in the highlands, pastoral communities have no formal rights to land. In pastoral areas, the demarcation of user rights is clearly more difficult than in areas of settled agriculture and their fluidity is part of a process of strategic forage and water utilization supported by traditional rules and the principle of reciprocity.

In reality, pastorals access to traditionally used grazing areas has decreased over time. This has been accelerated by changes in land-use policies at the national level which have impacted the pastoralists. Before 1974, pastoral land ownership and administration largely rested in the hands of the local traditional leaders and the community. After 1974, although the elders continue to play a significant role, they became accountable to the central administration through the chairman of the local KAs, whose responsibilities sometimes conflict with those of the elders. These KAs purportedly favour the sedentarization of pastoralists. As states have attempted to impose institutions developed for a sedentary population on nomadic populations, pastoral institutions have come under strain and pastoralists/state relations seems conflictive. The critical questions about pastoral governance concern the relationship between the formal institutions of the state and the

informal and partly traditional rules and social structures of the pastoralists. It is therefore, in Nyangatom customary authorities and traditional rules still dominates large areas of decision making, especially about natural resource management and economic life. Effective pastoral governance needs to be however, a mix, varying with local circumstances, of informal and formal institutions and rules. The role of formal government should be to provide a framework within which customary local institutions and rules regulate everyday economic and political affairs if we are serious about inclusive development in pastoral communities.

These being the case, the majority of herders in Nyangatom fall in the “tragedy of the commons” as explained by (Hardin 1968:1244). *Lukale* and *Kibish* are common grazing places for the pastoralists in Nyangatom. Each herdsman is trying to keep as many cattle as possible on the commons. As a rational being, each herdsman seeks to maximize his gain. The rational herdsman concludes that the only sensible course to pursue is to add another animal, and another; and another. This is the conclusion reached by each and every rational herdsman sharing a commons. Therein is the tragedy. Each man is locked into a system which compels him to increase his herd without limit—in a resource that is limited. Ruin is the destination towards which all men rush, each pursuing his own interest in a society that believes in the freedom of the commons. Freedom in a commons brings ruin to all. This is exactly what is happening in Nyangatom. To cite example of the situation, encroachment of unwanted plant species has been considered a menace to the deterioration and decline of the pastoral rangeland. In *Kibish* for instance the introduction and rapid expansion of *Prosopis juliflora*, which was introduced as a drought livestock supplement feed and for soil conservation, in Kenya, is aggressively claiming prime wet lands and water points in the land of commons. Despite a fear developed by Nyangatoms’ their enemies harbouring this place, they are not taking measure to control its spread at its early stage as the weed threat for pasture lands they are using in common.

7.8 Livestock Ownership

Livestock production is the major source of livelihoods for people in Nyangatom. The main types of animals reared by the people include cattle, goat, sheep, and donkey. Livestock production is constrained by such problems as animal diseases, shortage of feed and water, low productivity of local breeds, inadequate extension coverage, and marketing problem.

Key informants from the elderly groups strikingly revealed venerable information that every Nyangatom herder seeks three basic characteristics in his cattle. First, milk ability: the animal should be a high milk yielder. Second, walking ability: the ability to walk long distances over varied temperature; and the third character is cattle must be loyal to their owners and hostile to outsiders particularly when they are looted during raids.

The same informant group discloses the processes of selection among the newly born herds. Bull selection is a crucial part of good management among the Nyangatom pastoralists. Bull selection is seen as a continuous process that involves strong skills, and critical observation on the bull’s growth, from birth to maturity, and the merits of its offspring. Herders with ample indigenous knowledge notice the calf’s character, live weight gain, health and other characteristics from the date of birth until the first year of the calve This same examination continues up to 2nd and 3rd years, the time when important decision is made either to keep or eliminate (by sale or slaughter) of the less potentially productive males. The prospective bull is identified at this time and the herders already start to talk about it as “the bull”.

Livestock management is traditional, and the main products are milk, butter, egg, meat, hides and skin. It has been learnt from the focus group discussion that about two-third of the milk is marketed in the form of butter, while live animals are sold to bridge food deficit. The price of animals and animal products is not that lucrative due to lack of potential markets and access due to conflict. However, there seems a potential for securing, diversifying and enhancing the livelihoods of the people by improving productivity and creating market linkages.

The focus group discussion further reveals problems associated with the price variation in livestock sale over the years. The major reasons for price variations are found to be the availability of more animals to the existing market by all pastoralists due to the exposure to drought risk. Sample HHs in all wealth categories sale livestock throughout the year (Table 25), regardless of the market price variation. This was substantiated in that out of total respondents 82% sample households replied that they got less money than their expectation against the 8% who reported to obtain reasonable price from their livestock sale. Lack of access to potential markets and insufficient demand for buying livestock were found to be the potential reasons for receiving poor livestock price with the proportion of 35.5% and 46.5%, respectively. Based on the findings from the sample households, one might arrive at a conclusion that majority of pastoralist in Nyangatom sale their livestock at lower prices than their cattle deserve in order to bridge food shortage due to various push factors.

Table 25: Period in which sample households sale their livestock

Months for livestock sale	Total Sample (%)	Wealth Category (%)		
		Medium	Poor	Very poor
Sep - Nov	21.1	7.8	3.3	10.0
Dec - Feb	18.9	3.3	12.2	3.3
Mar - Apr	33.3	6.7	12.2	14.4
Jun - Aug	26.7	3.3	7.8	15.6
Total	100.0	21.1	35.6	43.3

Source: own survey, 2008

As indicated in Table 26, community members in Nyangatom sale their livestock in different periods as they differ in facing household problems. The major reason for sale of livestock is to fulfill their household food requirement, as 78.9% of sample households sale their livestock in meeting their household food requirement (Table 26). The very poor wealth groups are the most exposed in selling their few livestock resources than the two wealth groups in fulfilling their household food requirement.

Table 26: Sample households' reason to sale livestock

Reason for livestock sale	Total Sample (%)	Wealth Category (%)		
		Medium	Poor	Very poor
To settle debts	11.1	4.4	5.6	1.1
To pay land tax	3.3	1.1	2.2	0.0
Social obligations (wedding, funeral, etc.)	3.3	0.0	1.1	2.2
To meet family food requirements	78.9	14.4	24.4	40.0
To meet family requirements other than food	3.3	1.1	2.2	0.0

Source: own survey, 2008

Pastoralists who produce milk, meat or blood for their own consumption with the aim to be self supporting, need adequate numbers of animals for sustained provision of food. According to the survey result, pastoralist households own 3.81 TLU/AE (Tropical Livestock

Unit per Adult Equivalent) on average. The livestock ownership ranges from a minimum of 0.04 to a maximum of 43.18 TLU/AE. The mean number of livestock owned by the poor households is found to be 2.45 TLU/AE whereas for the non-poor group the mean ownership in TLU was found to be 6.25 per adult equivalent (Table 27). The mean difference in TLU/AE between the poor and non-poor groups is found to be statistically significant at 1% probability level. This means the amount of TLU/AE might determine the wealth status of sample households to be poor and non-poor as stated in the hypothesis.

Table 27: Distribution of livestock holding by sample households (TLU/AE)

TLU/AE	Poor (n = 66)		Non-poor (n=24)		Overall (n=90)	
	No.	Percent	No.	Percent	No.	Percent
< 1	4	4.4	0	0.0	4	4.4
1.00 - 2.49	32	35.6	10	11.1	42	45.6
2.50 - 3.99	12	13.3	12	13.3	24	26.6
4.0 - 7.00	3	3.3	6	6.6	9	10.4
> 7.00	3	3.3	9	10	12	13
Mean (No.)	2.45		6.25		4.22	
SD (No.)	1.85		5.12		4.75	
T – value = - 4.415*						

* Significant at 1% probability level.

Source: own survey, 2008

Information gathered at the community level confirmed that among the pastoral communities wealth is measured by the number of sheep and goats, cattle and pack animals as indicated in Table 3. Cattle are considered as the most important sources of livelihood by almost all people because they can produce milk and butter, which can be sold in exchange for maize, sorghum and other important item to be used for household consumption. Sheep and goats are important next to cattle since they are considered as 'liquid assets' to be drawn first in buffering shocks and protecting large ruminants from being sold.

8 Other Issues of Poverty

8.1 Gender

8.1.1 The Gender Division of Labor and Productive Roles

The study examines what women and men in the target population do and why, and thus enabling to differentiate men's and women's responsibilities in performing tasks related to productive, reproductive and community roles. The division of labor between men and women depends on the socio-economic, cultural and institutional factors. Activity profile analysis focuses on identifying the role division to perform activities related to livestock and off-farm activities as productive roles in the pastoral community reveals the difference in roles and responsibilities related to reproductive and community roles.

Like the majority of nomadic society elsewhere in Ethiopia, Nyangatom society is also rooted in patriarchy, which is the basis of family; clan and tribal organizational structures. The institution of patriarchy is further reinforced by the traditional interpretation of the teachings of the clan structure and the culture of the ethnic group. It has been noted that in the study

area, there are major differences in the working roles of men and women. As a rule, tasks performed by men are controlled by men, and those performed by women are controlled by women. Men control grazing and watering of animals, wage earning and livestock marketing. Women control baby animals when the majority of herds are in the residence areas, poultry, milk and milk products, water and fuel for domestic use, as well as grain grinding, meal preparation, house cleaning and clothes washing. This intensive female labor is neither recognized nor valued by the community as women are not allowed to attend ceremonies, meetings and public decision making that affect their live and livelihood. Differently to other places, women in this area are free to go to market even though they are designated in most cases for purchasing purposes than selling household resources.

The production system, of study area, generally is known as pastoralism. The study mainly focuses on pastoral in which livestock rearing and herding are the two major components of the farming system. Like other parts of the country, women play important roles directly or indirectly both in livestock production activities at household level.

8.1.2 Livestock Endowment and Gender Roles

As indicated above in this document, livestock rearing and pastoralism are indispensable occupation in Nagnagatom woreda. Livestock production includes both large animals such as cattle, donkey and small ruminants like sheep, and goat. In Nyangatom livestock are the bases of the economy that provide food, cash and transportation at the time of their movement. Particularly small ruminants (sheep and goat) are reared and sold by households to squelch the immediate household needs. It is also true that by-products (milk and butter) from livestock have important economic role for pastorals by which the HHs use to buy daily consumable items like coffee pulp, kerosene, and others. These are mostly located in household premises and managed by women and young girls. Normally, HHs stock large animals for different purposes. Table 28 contains the detailed information as to why HHs in Nyangatom is keeping livestock.

Table 28: Purpose of livestock ownership by sex of sample HH heads

Purpose	Male-headed HHs % (N= 66)			Female-headed HHs % (N=24)		
	Cattle	Small ruminants	Donkeys	Cattle	Small ruminants	Donkeys
Milk production	90	4		94	15	
Meat production	35	58	3.3	32	6	1.1
Blood production	6			2.2		
Source of cash	88	72		76	77	
Asset	95	63	46	92	90	12
Transportation			44			94

Source: own survey, 2008

As illustrated in Table 28, both male headed and female headed households keeping cattle because they are crucial HH assets. The second principal motive for keeping cattle is milk production. Milk is a regular part of meal in the woreda. As indicated in the above table, both MHHs and FHHs consider both cattle and small ruminants as a source of cash. Meat obtained from all listed animals including 'donkey' with percentage distribution of 35%, 58%, and 3.3% and 32%, 6%, and 1.1% for cattle, small ruminants and donkeys, respectively. Key informants revealed that meat from donkeys rarely used only when respected guests like brother or sister in law of the couple arrived in the household and in order to show how close

they are and respected their guest in the eyes of the family. Blood production is also known to be used as meal next to milk when cattle gains body weight during wet seasons.

More than 70% of women and men indicated that small animals can be easily sold and generate money to respond to the immediate family needs. Especially women attracted to rear small animals than large animals. Donkeys are used to transport things and chattels in as pack animals in the pastoral system. Consumption patterns and preference of animal products per gender also depend on the male's and female's access to it. It has been learnt that women enjoy unreserved milk ownership when cattle are not away from the residential places and when they are fully responsible to feed all family members. In case when animals away from the living place in search of grazing land, family members responsible in herding the cattle enjoy together with the newly born calve.

Goat milk is highly appreciated by livestock owners and it is mainly fed to children and considered as a substitute for breast feed. Meat production is the other important reason for keeping these small ruminants. The following table shows livestock types and the structures owned by HHs.

Table 29: Livestock types owned by male-headed and female-headed sample HHs

Type and number of livestock		Total sample	Sex of household head	
			Male	Female
Cattle				
	Mean	72.5	76.4	60.6
	SD	156.8	174.2	84.9
	Minimum	1.0	2.0	1.0
	Maximum	350.0	350.0	70.0
Goat				
	Mean	89.3	91.0	65.8
	SD	132.1	153.8	120.8
	Minimum	2.0	2.0	2.0
	Maximum	400.0	400.0	112.0
Sheep				
	Mean	55.3	60.2	24.6
	SD	71.3	74.4	45.8
	Minimum	1.0	1.0	1.0
	Maximum	80.0	80.0	22.0
Camel				
	Mean	0.2	0.2	0.0
	SD	1.1	1.0	0.0
	Minimum	0.0	0.0	0.0
	Maximum	8.0	8.0	0.0
Donkey				
	Mean	3.4	3.6	2.7
	SD	5.8	6.5	3.0
	Minimum	0.0	0.0	0.0
	Maximum	50.0	50.0	6.0

Source: own survey, 2008

The result displayed in Table 29 indicates that the total mean number of cattle in the area is 72.5, with mean distribution of 76.4 and 60.6 for male and female HHs, respectively. The minimum and maximum number of cattle is also found to be 1 and 650, with distribution of 2 and 1; and 350 and 70, respectively for male and female groups in the given order. The numbers of cattle owned by female headed households are 5 times less than that of owned by male headed households. Similarly, the mean numbers of goats are found to be 91.0 and 65.8, for male and female groups, respectively. The minimum numbers of goats are found to be 2 for both sexes and the maximum of 400 and 112, for male and female groups, respectively. The mean numbers of sheep for male and female households are found to be 60.2 and 24.6, with the minimum of 1 for both groups and maximum of 80 and 22 for male and female groups. Close examination of the above result hinted maleness and femaleness might contribute in determining the herd size and structures in Nyangatom woreda. In all cases males are favored in having large herd size from all livestock types than females. Female headed families seems more gravitated to rear small animals in greater number than large ruminants. The problem with female headed families in keeping cattle is strongly related with the household labor force. In case if she do not have young son she might inclined to adjust her herd structure to small ruminants. The information from key informants revealed that the herd size of female headed households is subjected for rapid shrinkage unless she decides to form new marriage after losing her husbands.

8.1.3 Access to Information, Credit, Input and Agricultural Extension

Availability of credit, input, and information services are fundamental for achieving a society that works towards social and economic transformation. Female-headed HHs were deprived of critical information that can help improve livelihood. In addition, women have limited access to credit service, extension and agricultural input supplies. The finding in Table 30 shows the unavailability of formal credit sources in the area. Sample households in the study area, hence had not obtained other alternatives with the exception of informal credit sources such as neighbors and relatives. As indicated in the same table only three of the 22 female-headed HHs had access to credit from informal sources. The rest 12 female-headed HH did not get any credit from the same source. The figure shows how difficult to Female-headed HHs to access credit from the available sources. The reasons might seem first they lack the confidence to request for credit, and secondly with the understanding of their income streams no one opts to lend them for credit.

It is clear that formal and informal credit services have an important role to play in both rural and urban areas' development. While undertaking this study, no formal organizations have been observed rendering credit services in the study area. This being the case, 91.2% male sample HH heads had got credit from informal sources such as relatives, neighbors, and friends. In general, 55.7% male and 8.8% female sample households received credit in the form of cash (Table 30).

Regarding the provision of extension services, it is only 15% male-headed HHs who reported its availability, against 85% male-headed and all 100% female-headed replied that it was unavailable. This is despite the fact that information is considered a crucial resource to motivate the poor and marginalized segments of the society to take part in the development processes.

Table 30: Response on credit, extension and input supply by sex of sample HH heads

Items	Male-headed HHs % (N=68)	Female-headed HHs % (N=22)
Credit service		
Formal sources	0	0
Informal sources	91.2	27
Cash	55.7	8.8
Kind	64.4	0
Extension service		
Not available	75	100
Available	15	0
Information and agricultural technology		
Not available	100	100
Available	0	0

Source: Survey results, 2008

Appropriate agricultural inputs such as local breeds with improved milk performance, in the case of Nyangatom, are considered to have a significant importance in improving agricultural production and productivity. Ministry of Agriculture has encouraged rural people to utilize improved inputs mainly through the existing agricultural extension packages and /or programs.

However, availability of agricultural information, inputs, and technologies in the study area is found in the extremely poor situation and hence both MHHs and FHHs, chosen as sample respondents, are facing repeated problems related to livestock and as well as other institutional facilities. Poor coverage in the woreda might seem because of the new establishment of the woreda and its underdeveloped structural set up. The situation hence forced people to pursue the traditional way of livestock production within the radius of the tragedy of the commons.

A characteristic of rural livelihoods living in agricultural activities is that many of the survival opportunities open to poor households, exhibit a high correlation between risks attached to alternative income streams. This is to mean if there is climate change causing drought, for instance, in a particular locality, all income streams are adversely affected simultaneously. As poverty increases and intensifies destitution, the agricultural wage labor work and other remunerative activities are reduced from time to time and the majority of sample households from all wealth categories participate in any kind of available activities. Such situation could probably weaken their potential ability to creatively involve in livelihood activities and erode the self confidence either to specialize and/or diversify ruminative activities that improve their livelihood base. This view captures the line of thinking that involves: 'those who are poor and hungry will become dependent society to outsiders loosing all their social capitals important to cope with changing environments.

8.2 Conflict

Questions of ethnic affiliation and identity, the exclusion of minorities, the demarcation of borders, as well as the competition for scarce resources, harmful traditional practices and a socially determined culture of violence are among the sources of conflict in the South Omo

zone. Weak regional governmental structures and inadequate governance too are further marked as significant elements for the conflict through out zonal administration.

In the pastoralist areas in the South of SNNPR and Oromia “ethnic” conflicts most commonly appear due to lack of resources. This is aggravated by traditional cultural practices like cattle raiding and the killing ethos of ethnic groups on both sides involving concepts of heroism and manhood - and the increased use of small arms. The consequence of this constantly worsening situation is that the ethnic groups are in competition for grazing land and water sources. This leads to groups leaving their lands, particularly in the dry season, and migrating to territories of other ethnic groups. Violent clashes occur more frequently and result in the loss of lives. The use of small arms has given this a dimension which is far beyond the traditionally practiced violent clashes.

Inter-clan and intra-clan conflict causes loss of human life, loss of livestock, destruction of property, and further decline in rangeland resources. Intra-clan conflict usually lasts for a short period of time and is often solved through traditional social organisations. This usually happens within the big clans in the different pastoral Regions. Conflicts of this type are not known in Nyangatom, though it happens in different major clans of South Omo. On the contrary, inter-clan conflict between two major pastoral clans has far greater consequences on property, lives, and resources. For example, Dasenech and Nyangatom are identified as historical enemies, as Dasenech are considering Nyangatom supported by Turkana and Toposa clans, from Kenya and the Sudan, respectively. Nyangatom are the people who are rooted with the clans from the aforementioned border countries, as claimed by surrounding ethnic groups; albeit Nyangatom mark Turkana as their enemies like the other ethnic groups bordering their woreda.

Table 31: Response of sample HHs on areas with which they face inter-clan conflict

Areas	Total sample (%)	Wealth Category (%)		
		Medium	Poor	Very poor
Turkana and Dasenech	62.2	8.9	21.1	32.2
Karo	37.8	12.2	14.4	11.1
Total	100.0	21.1	35.6	43.3

Source: own survey, 2008

Result in Table 31: summarize responses from sample households in that they have a serious conflict with Turkana and Dasenech, and Karo ethnic group. Conflict with Turkana and Dasenech constitutes about 60% and conflict with Karo constitutes about 37%. As understood from the focus group discussion, the years 1979, 1985, 1987, 1988, 1989, were known a conflict period remembered in the area during Derg regime; and the years 1997, 1998, 1999, 2000, and 2001 are the conflict periods with the advent of EPRDF. When further investigation made to know the most serious conflict in the area, the years 1985, 1996, 1997, 1998, 1999, and the year 2000 were a serious conflict time that create damage and deepen the poverty situation in the area. Close examination of the conflict periods, out of 10 total conflict years in the area, the five serious conflict periods are known during EPRDF. Key informants strongly argue that the existing ethnic based governance system give way to shape and transform the former resource based conflict to ethnic based conflict. This suggestion may closely correlate and highlight how a socio-cultural or ethnic definition of pastoralism is sensitive to ignite conflict among pastoralists.

Table 32: Responses of sample households on major causes of the conflict

causes of conflicts	Total Sample (%)	Wealth Category (%)		
		Medium	Poor	Very poor
For control over water points	15.6	6.7	7.8	1.1
For control over pasture lands	45.6	6.7	15.6	23.3
For safeguarding clan territory	10.0	2.2	6.7	1.1
For expanding the territory	10.0	4.4	3.3	2.2
Looting to accumulate wealth	18.9	1.1	2.2	15.6
Total	100.0	21.1	35.6	43.3

Sources: own survey, 2008

The finding in Table 32 indicates that 61.2% of the conflicts are known to be resource based conflicts automated through looking for water and pasture lands. The rest of conflicts are instigated due to the ambition emanated to accumulate wealth, to safe guard clan territory, and expanding clan territory with the percentage distribution of 18.9%, 10%, and 10%, respectively. As indicated in the above table out of 18.9% of sample populations, 15.6% are the very poor group who are involved to accumulate wealth as they are resource poor farmers. The effect of all the above conflicts were end up through loss of livestock, loss of households assets, and increase in number of livestock with the percentage distribution of 66%, 15%, and 9%, respectively. When these results disaggregated in wealth categories, 36.7%, 18.9%, and 17.8% of sample households from the very poor, poor and medium wealth groups, respectively were due to conflicts erupted for various reasons. Out of the total 9% of sample households who increased their herd size, the very poor and poor wealth groups constitutes 2% and 7%, respectively. The resultant effect of conflict hinted 64% the very poor wealth category lost their livestock than other wealth groups when compared with their original plan in terms of getting increased number of livestock.

Further data investigation in relation with conflict, food shortage / starvation, migration and death family members were found to be the common effect of conflict during each conflict period as reported by the respondents group with the percentage distribution of 34%, 53% and 13%, respectively. Looking all the negative effects of conflict of any type, it can be understood, without further statistical analysis how the risk of violent conflict can expand and grow into civil strife and war if the issue left to the people who are far beyond their capacity and severely hit in a series of conflict. With no doubt, it negatively affects pastoralist livelihoods per se but also it deters pastorals from investing the meager resources they have in the management of other risk like drought risks, for instance. Conflict management encompasses both conflict prevention and conflict resolution to mitigate the effects of conflict. Traditionally, the response to conflict was fixed on resolution. However, there must be a paradigm shift that conflict prevention strategies are probably more effective than resolution oriented strategies.

9 Vulnerability to Drought in the Study Area

9.1 Level of Vulnerability to Food insecurity

Vulnerability is the susceptibility of individuals or households to specific risk events; where risk refers to the likelihood of shocks and stress that can be either external (weather-based

events, market crises, *etc.*) or internal (marriage expenses, sickness and death) to the household.

There is mutually reinforcing relationship between vulnerability and food insecurity (Ayalneh, 2002). Although current knowledge in vulnerability science is insufficient or inadequate (EPFAFS, 2007), it is important to recognize that vulnerability or livelihood insecurity is a constant reality for many poor people, and that insecurity is a core dimension of most poverty. Vulnerability is fundamentally about risk, uncertainty and lack of security (DFID, 1999). Risks can affect pastoralists at two levels: First, some of the assets *per se* subject to risks. For instance a drought or an epidemic may significantly reduce herd size; conflicts particularly ethnic conflict erodes social capitals available within the community. Second, the transformation of asset into income benefits subject to risks; for example, encroachment of land by settlers, for instance, deprive pastoralists to access water points; declining terms of trade for livestock might put them to receive fewer prices from livestock sale.

While undertaking base line survey for planning long term intervention, assessing household vulnerability is indispensable in terms not only of immediate access, but also of the stability and sustainability of those channels through which the household mediates its food access. According to Scaramozzino, (2006) the main advantages of the vulnerability approach are twofold: First, the approach is explicitly dynamic and forward-looking, in the sense that it is not simply concerned with current outcomes but looks at their future incidence. Second, can fully consider the uncertainties associated with future food insecurity, such as the role of external shocks and the strategies that households, communities or public institutions can adopt in order to reduce the likelihood of negative outcomes.

In fact, many aspects of vulnerability and its reduction are still not fully understood and seems requiring applied research. In order to undertake reducing measures, important distinction should be made between idiosyncratic risks which affect single households (example the death of breadwinner at household) and covariant risks which affect larger population (drought and health epidemic, for instance).

Strategies designed to reduce idiosyncratic risks should be embedded in the standard poverty reduction program like schooling, public health programs and introduction of micro-finance institutions, in order to enhance peoples' capacity to cope with individual or household risks largely irrespective of their initial livestock assets. On the other hand specific strategies are required to reduce the vulnerability of pastoral people to covariant risks which impact on pastoralists as a group. According to the risks they attempt to address, the strategies should combine strategies for risk reduction, mitigation and coping. The most desirable outcome would be to reduce the probability of risk occurrences at zero level. If this is unachievable due to various reasons, it is necessary to equally develop the strategies that reduce the impact of shocks on the livelihoods of pastoral people, as well as strategies for their rehabilitation and /or diversification after the shocks has occurred.

In measuring households' vulnerability to food insecurity different authors stated that still there is no agreement on how it should be measured. However, there are a number of attempts made to measure households' vulnerability to food insecurity. The attempts made were with their limitations and are followed by critics on the methodologies used. However, in this study, by taking the necessary precautions the method used by IFAD (2007) is adapted to measure households' vulnerability to food insecurity.

According to IFAD (2007), in order to construct the indicators to identify households that are vulnerable to food insecurity, the household must be characterized based on the following features: food production or food market dependency, income, asset ownership, income diversification, and crop diversification. The proxies used for each of these components are, respectively, the household's own food production, total household earned income, liquid asset stocks, the number of income sources, and number of crop diversified. The area under investigation is the area where habitants pursue pastoral livelihood system with little crop production capacity. Hence, crop diversification as proxy indicator is not taken for this particular study as it does not signify the issue of vulnerability to food insecurity. Instead other risk factors that could probably change to hazard conditions are included as proxy indicators to measure vulnerability. Accordingly, the number of lost animals due to conflict, drought, and flood are taken as the fourth, fifth, and sixth proxy indicators for the three risk variables.

Considering the above proxy indicators, any attempt that tries to uncover the issue of vulnerability to food insecurity, should consider the concepts of food access, availability, and utilization. In order to consider the three aspects of food security and/or insecurity, there is no other option than involving the above indicators in order to correlate the issues of vulnerability to food insecurity with the concept of access and availability. It is the access and availability of food potentially signifies the food security and /or insecurity issues at household, community or country level. The first variable is included in the indicator, hence, to reflect the source of household food supply. The second indicates the household's ability to access food through earned revenues. The third reflects the household's ability to cope with short-term food shortages, while the fourth, fifth, and sixth variables are indicative of the household's strategy in reducing the risk of entitlement failure.

Accordingly, by grouping the data obtained from respondents for each of the above variables in to quintiles or five scales (very low to high) the variables were examined to identify households' level of vulnerability to food insecurity.

9.2 Households' Food Market Dependency

Households' food market dependency was estimated on the basis of the length of period the purchased or exchanged food item able to cover sample households' food requirement. Using this indicator sample households were asked to tell for how many months the amount of food purchased or exchanged through livestock is able to cover household consumption.

After getting the amount of food obtained from market, the total amount of food purchased or exchanged was compared to the annual food requirement of each household based on the family size that the household has. Each family member was considered to require 2.36 quintals/AE of grain per year to fulfill the energy level required to obtain 2200kcl.

According to Mulat (1999), the 2200 calories per person per day level set by the Ethiopian government was used as a minimum required for an active and healthy life. This level of calorie intake was calculated to require about 2.36 qt of grain (cereals or pulses) per person per year. As a result, the percentage of sample households' obtaining food through purchasing or exchanging from market ranging from very low to very high account for 10%, 17.8%, 56.7%, 1.1% and 14.4%, respectively (Table 31).

Table 33: Percent distribution of sample households by food purchase/exchange

Purchased food items	Total sample (%)	Wealth Category (%)		
		Medium	Poor	Very poor
Very low (0 - 20%)	10	0	4.4	5.6
Low (21- 40%)	17.8	1.1	4.5	12.2
Medium (41- 60%)	56.7	10	23.4	23.3
High (61 - 80%)	1.1	1.1	0	0
Very high ($\geq 81\%$)	14.4	8.9	3.3	2.2
Total	100.0	21.1	35.6	43.3

Source: own survey, 2008

9.3 Households' Annual Earned Income

Households' annual earned income was calculated from agriculture, and off-farm income sources obtained by sample households. The earned income was put under the range of five categories from very low to very high income level. The result shows that the percentage of sample households with earned income from very low to very high account for 73.3%, 15.6%, 6.7%, 1.1%, and 3.3%, respectively (Table 32).

Table 34: Percent distribution of sample households by annual earned income per AE

Annual earned income	Total sample %	Wealth Category (%)		
		Medium	Poor	Very poor
Very low (<705 Birr/AE)	73.3	12.2	28.9	32.2
Low ($\geq 705 - 1410$ Birr/AE)	15.6	7.8	3.3	4.4
Medium ($>1411 - 2115$ Birr/AE)	6.7	1.1	1.1	4.4
High ($\geq 2116 - 2881$ Birr/AE)	1.1	0.0	0.0	1.1
Very high (>2881 Birr/AE)	3.3	0.0	2.2	1.1

Source: own survey, 2008

9.4 Liquid Asset Stock of the Households

In this study, among the various available household asset stocks recorded, assets which are considered as liquids assets is taken on the basis of information obtained directly from respondents, group discussion, key informants, and review of literature. As a result, sheep and goats were identified as liquid livestock assets and are in the first draw down list to buffer shocks.

Therefore, selected livestock type (sheep and goats), owned by sample households were taken for comparison by putting the sum of the estimated values of these liquid asset stocks in to five categories ranging from very low to very high.

The result shows that the percentage of sample households with total estimated value of liquid asset stock in tropical livestock unit (TLU) very low to very high account for 4.4%, 54.1%, 24.2%, 8.2%, and 8.9%, respectively (Table 33).

Table 33: Percent distribution of sample HHs liquid asset ownership in TLU

Category	Total sample %	Wealth Category (%)		
		Medium	Poor	Very poor
Very low (<1)	4.4	0.0	0.0	4.4
Low ($\geq 1 - 3.99$)	54.1	3.3	16.3	34.5
Medium ($\geq 4 - 5.49$)	24.2	4.4	15.4	4.4
High ($\geq 5.5 - 7.0$)	8.2	4.4	3.8	0.0
Very high (> 7.0)	8.9	8.9	0.0	0.0
Total	100	21.0	35.5	43.3

Source: own survey, 2008

9.5 Income Diversification of the Households

According to IFAD (2007), the proxy indicator for income diversification is the number of income sources. As discussed in the previous section, in this study, income sources are broadly categorized into two: agriculture and off-farm. Then, the proportion of sample HHs by number of these income source categories was taken into consideration. The number of income source categories from one to five was similarly rated from very low to very high.

The result indicates that the percentage of sample households with number of income sources from very low to very high account for 40%, 36.7%, 17.8%, 5.6%, and 0.0%, respectively (Table 34).

Table 34: Percent distribution of sample HHs by number of income sources

Income diversification	Total sample %	Wealth Category (%)		
		Medium	Poor	Very poor
Very low (= 1)	40.0	10.0	13.3	16.7
Low (=2)	36.7	8.9	13.3	14.4
Medium (=3)	17.8	2.2	7.8	7.8
High (=4)	5.6	0.0	1.1	4.4
Very high ((>4)	0.0	0.0	0.0	0.0
Total	100.0	21.1	35.6	43.3

Source: own survey, 2008

9.6 Loss of Livestock due to Drought

The key informant interview revealed that drought has become a normal phenomenon in Nyangatom for the past many years. The frequency and intensity of drought is increasing and led many pastoralists to starvation and transform to destitution. The severity of drought is not only due to the reduced amount of rain received each year but also due to increased fragility of the environment and decreased coping capacity of the community.

Crops are produced in little quantity following the River basin of Omo. For this reason instead of crop diversification it could be possible to calculate the different types of livestock owned by pastoralists. However, the survey data indicated the only animal differing among pastoralists is camel the quantity of which could not differ among households at any parameter. Hence, number of livestock lost due to drought is taken as proxy indicator based

on the possibility to adapt IFAD work in estimating vulnerability according to the local context. In Nyangatom livestock are the livelihood bases for all community members.

Accordingly, the result indicates that the percentage of sample households who lost their livestock due to drought hazard are found from very low to very high account for 40%, 36.7%, 17.8%, 5.6%, and 0%, respectively.

Table 35: Proportion of sample households who lost livestock due to drought

Livestock category (No.)	Total sample %	Wealth Category (%)		
		Medium	Poor	Very poor
Very low (=0)	40.0	10.0	13.3	16.7
Low (1 - 10)	36.7	8.9	13.3	14.4
Medium (11 - 15)	17.8	2.2	7.8	7.8
High (16 - 20)	5.6	0	1.1	4.4
Very high (>21)	0	0	0	0
Total	100.0	21.1	35.6	43.3

Source: own survey, 2008

9.7 Loss of Livestock due to Flood Hazard

Flood is one of the risk factor in most pastoral livelihood, including Nyangatom. The strength and length of occurrence of the flood varies depending on the intensity and duration of the rain in the highlands that are known as Omo River tributary. Therefore, if the rainfall in the high lands is heavy and if it occurs for a prolonged period of time, the flood hazard will transform to disaster in areas like Nyangatom. Accordingly, this variable is taken as proxy indicator following the same principle shown above, to estimate vulnerability to food insecurity situation in the pastoral livelihood.

Table 36: Proportion of sample households who lost livestock due to flood

Livestock category (No.)	Total sample %	Wealth Category (%)		
		Medium	Poor	Very poor
Very low (=0)	80.1	11.1	29.0	40.0
Low (1 - 10)	4.4	1.1	1.1	2.2
Medium (11 - 15)	10	6.7	2.2	1.1
High (16 - 20)	1.1	1.1	0	0
Very high (>21)	4.4	1.1	3.3	0
Total	100	21.1	35.6	43.3

Source: own survey, 2008

Following the calculation of livestock number lost during the last flood hazard, from each sample household, the result indicates that the percentage of sample households who lost their livestock due to flood hazard are found from very low to very high account for 80.1%, 4.4%, 10%, 1.1%, and 4.4%, respectively.

9.8 Loss of Livestock due to Conflict

The major causes of conflict as explained in section 3.5, competition over scarce natural resource, tradition of cattle rustling and mistrust between the ethnic groups in the surrounding Pastoral kebeles.

Number of livestock lost during consecutive conflict over the past five years, from each sample household, found from very low to very high account for 12.2%, 74.5%, 8.8%, 0.0%, and 4.4%, respectively.

Table 37: Proportion of sample households who lost livestock due to conflict

Livestock category (No.)	Total sample %	Wealth Category (%)		
		Medium	Poor	Very poor
Very low (=0)	12.2	6.7	4.4	1.1
Low (1 - 10)	74.5	11.1	27.8	35.6
Medium (11 - 15)	8.8	1.1	1.1	6.6
High (16 - 20)	0.0	0.0	0.0	0.0
Very high (>21)	4.4	2.2	2.2	0.0
Total	100.0	21.1	35.6	43.3

Source: own survey, 2008

In the second step the rating made on households own food production, earned income, liquid assets stock, number of income sources and number of livestock lost due to drought, flood and conflict was reduced from quintiles to terciles. After establishing a tercile, similar to the method used by IFAD (2007), it was assumed that belonging to the low tercile contributes nothing to the households' food security measure and takes a value of zero; the medium tercile, 1 point; and the high tercile, 2 points. The partial scores were added for each individual household. Total scores of up to 3 points were presumed to reflect extreme vulnerability, while 4 to 7 indicate moderately vulnerability and from 8 to 12, less vulnerability.

As a result, out of the total sample population, 72.2% fall into the category of extreme vulnerability, 22.2% were moderately/less vulnerable, and the remaining 5.6% were less vulnerable to food insecurity (Table 36). Analysis of what constitutes these vulnerability groups by wealth status shows that the 72.2% extremely vulnerable includes all but 2.2% less to that of the very poor and 5.6% of the medium; and 25.6% of the poor groups. The 22.2% moderately vulnerable group consists of 10% of the medium, 10% of the poor, and 2.2% of the very poor; and the less-vulnerable comprises only 5.6% of medium wealth categories.

In general, the result indicates that sample households that are associated with relatively low income, low staple food purchasing ability, low number of income source, and high number of livestock loss due to various risk factors make them more vulnerable than other sample groups who have relatively better income sources, have more food deficit gap at household level, relatively better number of income sources, and less number of livestock loss due to risk factors. Close examination of this result showed that eventhough the head count poverty line showed that 73.3% sample households are living under the poverty line; the 94.4% vulnerability to food insecurity disclose how worst the forthcoming situation unless collaborative measure is taken to reduce the figure indicating extreme vulnerability. Out of the total sample population it is only 5.6% who are not found in vulnerable situation provided that all other risk factors remain constant. The slight increments in any one of the risk factors could potentially change the statistics from the 5.6% and might more people would be drawn to extreme vulnerability.

Table 38: Percent distribution of sample households by level of vulnerability

Level of vulnerability	Total sample (%)	Wealth Category (%)		
		Medium	Poor	Very poor
Extremely vulnerable	72.2	5.6	25.6	41.1
Less vulnerable	22.2	10.0	10.0	2.2
Not vulnerable	5.6	5.6	0.0	0.0

Source: own survey, 2008

In relation with the issue of vulnerability and to better understand the characteristics of potential risk factors like drought, flood, and conflict, trends and shocks in the study area were conducted with key informant groups. Many and varied sources of shocks have been experienced in the sample KAs over many years, and the current level of vulnerabilities is somehow deeper than it was. The group discussion result revealed that, the livestock sector which is the major livelihood base hit frequently due to drought. Children and elderly people were highly affected due to the disastrous situation of drought and the associated health problem mainly in the years 1985, 1986, 1987, 1993, 1995, 1996, 1998, 1999 and 2000 EC. .

Looking at the above drought periods, one could easily understand how the study woreda was seriously hit by drought, in various years, since 1985. Unlike the previously recorded drought, however, large number of livestock deaths occurred, in 1986 and 1993 which was aggravated by the widespread effect of livestock diseases.

Within the literature differentiation is frequently made between metrological drought (involving a reduction in rainfall), hydrological drought (involving a reduction in water resources whether from rivers, groundwater or underground aquifers), agricultural drought (involving moisture availability falling below the optimum amount required by a crop during its growth cycle resulting in impaired growth and reduced yields), and socio-economic drought relating the supply and demand of some economic goods or services to the occurrences of the above drought types. Such definitional differences reflect the different disciplinary perspectives on drought and the numerous and complex ways in which human activity is related to water and moisture availability. Because of these complexities, variations in perspective, and the fact that drought are temporary phenomenon's occurring within climate and whether systems, which themselves are constantly changing, droughts are particularly difficult to define in a way that government and donor organizations would find operationally useful. Despite drought has definitional problems, pastoralists in Nyangatom however, gave their own meaning as they perceive drought from their own perspective. Accordingly, shortage of pasture and water, lack of rainfall, death of animals, lack of food and starvation, and animal and human diseases are found to be as operational definitions given by sample households with percentage distribution of 36.7%, 12.2%, 2.2%, 42.4%, and 5.6%, respectively (Table 37).

Table 39: Understanding of drought by sample households

Drought meaning	Total sample (%)	Wealth Category		
		Medium	Poor	Very poor
Shortage of pasture and water	42.4	13.3	12.2	16.8
Lack of rainfall	12.2	0.0	3.3	8.9
Death of animals	2.2	0.0	0.0	2.2
Lack of food and starvation	36.7	4.4	17.8	21.1
Animal and human disease outbreak	5.6	3.3	2.2	0.0
Total	100.0	21.1	35.6	43.3

Source: own survey, 2008

Looking at the above result the percentage share for shortage of pasture and water and lack of food and starvation may hint that the way pastoralists perceiving risk in terms of its potential effect to their livestock than their own security even at the time of drought.

Despite the frequent drought occurrence for longer time, there was no adequate and sustainable attempt made by development agencies including government authorities. Nevertheless, woreda administrations had not failed to recognize and give the necessary attention to the problem caused by drought, significant and sustainable action was not taken by various agencies operating in the area that are said to work for the development of the community.

Drought mitigation intervention in the form of food aid was launched in the area after years of people's suffering through government safety net program, although the program is not free of targeting problem as claimed by majority sample respondents.

Flood, which is another risk factor, occurs annually following the main rainy seasons in the high lands. The period of the big rains in the highlands stretches from June to August. Basically this period is a dry season period for Nyangatom Woredas. As mentioned earlier in this document, if the rainfall in the high lands is heavy and if it occurs continuously for longer period, the flood hazard changed to disasters in Dasenech. According to the community, severe flooding occurred in 1937, 1972, 1973, 1986, and 1998 EC in the study area.

Attention was drawn to the devastation caused by the flood; extensive emergency operations were undertaken by the government, NGOs, and UN agencies as explained by key informants. The efforts of these organizations have gone a long way in saving lives and providing relief to the affected population and their livestock resources. Among the emergency and rehabilitation interventions undertaken following the flood, AFD has been playing a leading role for ensuring sustainable measures through the support of donor agencies.

Conflict is also another hurdle and serious of all that put life in severe and worst situation. The people in Nyangatom considering themselves as if they are embedded by enemies and develop suspicion of harsh measure to be taken against their ethnic group and are therefore took conflict as part of their life. As explained by key informants, it is unavoidable unless serious measure is taken by government to create harmony with all the surrounding ethnic groups. When all risk factors coming at once or one after the other in the area, important traditional measures that are rooted for generation will face to slip out and individual coping mechanism will take place by rousing out the venerable social capitals that favor communal efforts towards group benefits.

In the former time communities used their past experiences and indigenous knowledge to cope and manage all the risk factors without waiting for the outside support. As the frequency and intensity of all risk factors increasing, without changing the response behavior of the duty bearer, communities are forced to give up their traditional and yet communal coping behavior.

Natural factors like absence or shortage of rainfall, absence of clean and protected potable water, lack of adequate administrative linkage between community and administrative structure (at all levels), lack of adequate road and transportation facility, might be taken as

the major factors contributing for the vulnerability of people to food insecurity in the study area.

However, vulnerability to food insecurity is not only caused by drought, flood, and conflicts'; negligence and lack of in-depth analysis to the problems, the processes and structures that unable to give swift delivery system, inadequate and irresponsible response behaviors seems the silent and salient dimensions to be addressed in order to protect the livelihood base of the pastoral communities. Structural dimensions like political and ideological domination, misuse and resource abuse, and poor partnerships among institutions and development actors are the other dimensions worsening the situation more than ever before. When all the above problems taking their own from and strategy in a more illusive and painstaking way, communities strength and self reliance mechanism will be eroded that help them to cope and withstand various risks and which in the aftermath collapse communities' creative power.

PART III: CONCLUSIONS & RECOMMENDATIONS

10 Conclusion

Agriculture particularly livestock production is the primary livelihood base for all sample respondents and the community in Nyangatom, and the trend analysis shows these resources had been decreasing constantly during the past 10 years. In fact, some of the households are participating in relatively remunerative off-farm activities like a government supported safety-net program. This program is the only and relatively better off-farm activities open up employment opportunities to all people in the woreda. This implies that people in the study area serious constraints to diversify their income sources to lead a better and improved livelihood.

For a number of reasons traditional risk management strategies seems to become increasingly ineffective and poverty levels among Nyangatom people have risen. Dependency and looking for food handouts seems in putting at danger their pastoral life. It is why recommended to invest on pastorals development for good economic reasons. Pastorals are best, if not the only, means to make productive and sustainable use of natural resources in arid and semi arid areas that would otherwise remain unexploited.

At the same time, however, increasing human and livestock in the dry land areas like Ngagnagtom needs to be addressed by strategies that support the adoption of alternative income generation activities. As the study indicates increased human populations with the unwise use of resources decreases the relative abundance of natural resources that give way to shape and exacerbate the problems. In a nut shell, the vulnerability situation in Ngagnagtom seems far beyond the direct control of individuals, households and communities unless comprehensive measure is taken sooner than later.

Regarding changes in living condition, a large proportion of sample households replied that their overall living standard has declined over the past fifteen years. This finding was checked with the result of the participatory wealth ranking made for the sample households and in the validation workshops to verify consistency. As indicated in Table 3 above, the relatively better-off wealth category now termed as 'medium' one was known as 'rich' wealth groups. Accordingly, the perception that the living condition of majority of the people in the study area has declined was consistently reflected by all other sources of information.

In respect to occurrence of food shortage over the past 12 months, most sample households indicated that they have experienced food shortage and that all capable wealth groups were forced to draw small ruminants to market; and for the very poor and poor wealth groups were subjected to reduce the amount and frequency of their daily meals.

In general, the survey results suggest that the main causes for people's vulnerability to food insecurity in the woreda are depleted natural resource and the conflict over resources, the frequent shortfall of rain and its impact over livestock resources and low level of capital formation, weak local institutions, and poor access to essential services that can help the community expand their livelihood options.

It was observed that community access to basic social services like education, health and potable water as well as to essential commercial services such as road, market, credit,

agricultural extension, veterinary health, information and communication is far below the requirement in the area. On top of these, the pastoral people are not using the existing facilities effectively mainly due to lack of awareness and accessibility problems of the services. This does not mean however, the overwhelming poverty has nothing to do in utilizing the existing facilities.

The focus group discussion revealed that the non-responsiveness and poor accountability of government body and particularly their reluctance is reflected in lack of hearing public opinions while making important decision making. The community discussion further disclosed the governance is oriented more towards political commitment, suppressing the respected social capitals, than making effort towards the pressing need of communities to bring about social and economic transformation of the population in the area.

11 Recommendations

It has been observed that the dimensions and causes of livelihood insecurity are vast and complex. People who are constrained by lack of better livelihood options are affected in different ways. This study has revealed the likelihood that the situation of community groups being different despite they are living in a similar vulnerability context is high due to their access to resources and endowments like livestock ownership, social services, demographic characteristics, and other socio-economic conditions. Proper understanding of these characteristics and conditions, particularly identifying who is poor and where they live, who does what are essential starting points for formulating policies, designing appropriate strategies and interventions. These could dictate GOs and NGOs development direction and sharpen their focuses in order to reduce the vulnerability and food insecurity or poverty in general to achieve sustainable development.

In case of uncertainty, diversification of income sources is an important part of a household's strategy to reduce the risk of entitlement failures. At low levels of income and high levels of vulnerability and food insecurity, diversity of income composition may be even more important than the actual income level to ensure the survival of vulnerable households in the event of food security failure. The present study clearly point out how the community are leading the mired living condition due to the very limited options to diversify their income sources. As the problems intensified in each different year, community members opt to sell their meager livestock resource that result the herd size shrinking.

Some of the interventions recommended below have to be dealt with extreme care as they can lead to disrupting the normal way of life and lead to increased dependency and even conflict if left unchecked in the long run. Keeping these in mind, the following are recommended:

a) Food security

Recurrent drought is a common phenomenon in Nagnagtom. The saving of livelihood needs to be recognized as being the most important as saving human lives in emergencies. Normally, livestock production in pastoral areas follows a 'boom and bust' cycle, where livestock multiply in good years and perish during drought. However, the increasing recurrence of droughts has resulted in extending the 'bust cycle incurring net losses of livestock to pastoral households. The few early warning systems that collect information in pastoral areas by the government is designed to equate the scale of crises into tons of relief

food requirement rather than linking the information to initiating the livelihood saving measures. Therefore:

- ***The existing community-based early warning system (CBEWS) should be strengthened until the system is instituted and community able to shoulder responsibility by their own;*** where the main task of the system is reviewing the analysis of conventional EW information system, incorporating traditional EW indicators and developing and applying pre-planned response modalities to save livelihoods than focusing to look for food handouts. In most pastoral areas including Nyangatom, the existing EW systems seems operating in the absence of pre-planned responses for pastoralists that are linked to varying nature of crises (alert, alarm , and emergency stages) in drought cycle management and that focus on pastoral livelihoods. For example the system does not indicate at what stage of the crises appropriate measures such should begin. Moreover, CBEWS should strive to include the rigorous data collection system that has proved to be effective in signaling the onset of food insecurity, develop systematic reporting structure that work up and down (from grass root up to zonal DPPC, and vice versa).
- ***Establishing community based food grain bank (CBFGBs);*** with the aim of supporting pastorals to protect them from entitlement failure during drought period (normally known as hungry period) to create access and availability of food. This will be done during normal time when the livestock productivity is at 'boom' stage and when volunteer pastorals commit to allocate livestock matching with family food requirement and as collateral in order to obtain food grain with relatively reasonable price during drought time. The implementation of this activity will require initial investments which should be injected after lengthy deliberations with community leaders and traditional rulers. Among various dialogue forums to be undertaken prior to embark all recommended interventions, the three widely known steps like consultations, presence and influence, should be given emphasis for pastoral engagement and genuine participation on the issues that affect their life and livelihoods. It has to be clear that consultation to involve in opening arenas for dialogue and information sharing; presence to involve institutionalizing regular access for certain groups in decision making; and influence to bring communities engagement to the point where groups can translate access and presence into a tangible effect decision making on implementation and program sustainability.

Livestock resource development is an important area of intervention that has great potential in the study woreda despite limited rainfall and severe livestock disease. In order to address this problem the following is recommended:

- ***Establishing community-based animal health service delivery system through community based animal health workers (CBAHWs) and by involving government agencies working in this sector.*** The continuity of such intervention as veterinary service providers in their communities depends largely on making an income from sale of drugs and charging for the services. AFD should be aware the disruption of such system if communities are provided free drugs and employ animal health workers particularly during emergency intervention. These make it difficult for CBAHs to resume their normal services once communities used to free drugs. Past hand on experiences showed that different agencies operating in the same affected area may apply different subsidy rates, confusing the CBAHs and the community. A uniform modus operandi should be developed in case different agencies operating in and around the area. As the selection of CBAHWs are carried out by pastoral groups, the training to be given for CBAHWs should also focus on selected livestock diseases for clinical and vaccination services that

are also selected by community. The fundamental tenets of recommending the customary-based animal health delivery services are: the system recognizes pastoralists' voices and work with them; it recognizes also that veterinary para-professionals have a role in veterinary service provision that is under used but practical than the formal veterinary institutions.

To narrow the existing food gap in one hand and to cater comprehensive and appropriate food security packages in another, the followings are found imperative:

- **Conducting restocking project;** the rationale for implementing restocking project is mainly to hasten pastoralists' return to self-sufficiency. The project will prevent pastoralists from failing out the production system and becoming destitute. The key is to encourage community implemented restocking projects, (example those targeting to restock 40 – 50 families at a time), with viable units of livestock mix to address family needs. Care must be taken in that restocking should supplement traditional systems on a matching basis but should not replace them. As restocking schemes are usually small, given the needs of any drought affected area, the selection process should also be given emphasis. Ideally, restocking should be encouraged only if there are no possibilities for other forms of livelihoods apart from pastoralism in the area.
- **Creating other employment opportunities through creating access to financial credit;** Access to financial services enables poor people to build and change their mix of livelihood assets at hand. Poor people are very vulnerable and some times they move from one crisis to another in a vicious circle. Access to microfinance institutions enables them to manage risk better and take advantage of opportunities. Reducing vulnerability and risk is an important impact of financial assets. Possible pathways through which rural financial service contributes to the reduction of rural households' vulnerability to food insecurity include: stimulating income source diversification, high value commodity production and technology adoption; and improving levels of income and ability to accumulate crucial livelihood assets. This means rural credit will expand the opportunity of off-farm and non-farm activities that generate employment and increase options for the resource poor pastoralists to diversify their income streams, and thereby reduce their vulnerability to food insecurity. Accordingly, the following are suggested the implementation of which however, required serious attention and considerable grace period for its maturity and gauging communities commitment. This will be implemented in areas where there are possibilities to switch on to other livelihood activities, potential restockees should be encouraged to exit the system and earn other form of livelihoods to complement the household income for which some initial support, in fact, should be provided. Potential livelihood activities identified for the would-be pastoral drop-outs include honey production, gum-arabica (incense) collection and petty trading on specific and selected commodities.
- **Conducting adoption trails for staple food crops through the riverian agriculture that include field days organization to demonstrate the results from adoption trails;** Keeping other factors constant, the result from successive field trial may undoubtedly help agricultural researchers and pastoral community elsewhere in Ethiopia who resides along the river banks if this particular activity receives necessary attention and proper process documentation. Result dissemination will be part of the activity to popularize both the system and organizational commitments that strive do discourage the blanket extension recommendation of improved input utilization. This will be done through well organized workshop arrangement.

b) Basic social services

Improving access to basic social services such as education, health and potable water is important to enhance the capability of human capital which is vital for inducing positive change in the lives of the poor. Therefore, the following are recommended:

- ***Improving malaria prevention and control activities, including establishing and equipping health posts in malaria infested areas through establishing community based sanitation system;*** the importance of establishing community based sanitation system is to reduce the prevalence of malaria in the area where its effect is serious. Malaria infestation can be easily controlled if community members are properly organized to prevent its spread at its breeding site and with minimum cost than requiring for cure.

c) Building the capacity of service providers and users

Serious capacity gap was observed on the part of the public service provider of government offices in the woreda. Community members have complained that they are not responsive to community needs. Hence, it is necessary to undertake:

- ***Various capacity building program for community and government***

Improving rural households' access to market is crucial. This includes not only building and maintaining physical infrastructures like roads, but also establishing information centre that can provide efficient and reliable market information and improving communication facilities in the community managed disaster management and early warning system. These are expected to enable rural households to increase income and manage risks to improve their future livelihood and reduce vulnerability in general. Hence,

- ***Strengthen the existing information centers and networking with other similar initiatives conducted by other NGOs***

Keeping other risk factors constant, conflict is a serious threat in disrupting the smooth livelihood system in a place like Nyangatom. Without securing peace it is impossible to accede in other important interventions like mentioned above. For this reason,

- ***Strengthen a peace project initiative started with German based INGO called "ded".*** The peace process should take place all year round and care has to be taken in selecting influential leaders and opinion leaders and the employment of traditional conflict resolution mechanisms. It should be noted that this process expensive, as it takes so many meetings before a peace deal struck.

ANNEX

A. References

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