

## Impact of Goat Development Project on Livelihood Assets: the case of Northern Red Sea Region in Eritrea

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Specialization in Rural Development and Food Security

By

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## **Dedication**

I lovingly dedicate this to my parents who supported me in each step of the way.

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## **Abbreviations**

CERF	Central Emergency Response Fund
CIA	Central Intelligence Agency
FAO	Food and Agriculture Organization
GSE	Government of the State of Eritrea
IFAD	International Fund for Agricultural Development
IGAD	Inter-Governmental Authority on Development
MDGs	Millennium Development Goals
MOA	Ministry of Agriculture
MLWE	Ministry of Land Water and Environment
NGOs	Non-Governmental Organizations
OXFAM	Oxford Committee for Famine Relief
UNDP	United Nation Development Program
WB	World Bank
WCF	Water Charitable Foundation
WHO	World Health Organization
Zoba	Region

## **Abstract**

This research was carried out in the Northern Red Sea Region in Eritrea. It was aimed to examine the impact of the goat development project which was introduced in the region in 2007. This study presents the impact of the project in livelihood asset of the male and female headed households. The data for this study was collected in July-2012 through pre structured questionnaire which involved direct interview of thirty household heads (fifteen male and fifteen female headed households), purposively sampled from the total of 2000 beneficiaries of the project. Moreover the manager of the project in the Ministry of Agriculture in Northern Red Sea region was also interviewed.

Sustainable livelihood framework was adopted to demonstrate the impact of the development project in the livelihood assets of the selected households. Microsoft excels was used as a tool for analysis. Dependency on a single source of income, lack of access to productive assets, shortage of labour and drought were the main sources of vulnerability in the study area. Cultivation of crops was the main source of living of the household heads, casual labours and livestock rearing were also used. Households use different coping strategies in times of food shortage such as dependency on neighbours/relatives, selling of livestock, selling farm implements and planting seeds. Female headed households use more destructive strategies as compared to male headed households, which make them more vulnerable to food shortage and poverty.

Results from this study indicated that the project had positive and negative impact on the livelihood assets of the household heads. Improvements in milk consumption, efficient utilization of unpaid family labour, better asset ownership, additional cash income and better social status are some of the positive impacts that the project induces on the livelihood assets of the household heads. On the other hand deterioration of pasture land due to overgrazing and unwise management of manure of goats were some of the negative impacts which were identified in this study. With proper management of goats, goat development project can contribute substantially in improving food security and reduction poverty of poor households.

From the outcomes of the research, it was concluded that goat development project has a positive influence in the majority of the livelihood assets of the selected household heads and further promotion of this kind of project was recommended.



# **Chapter 1 Introduction**

## **1.1 Back Ground Information**

Eritrea is one of the under developed countries located in the north east of Africa with a total area of 124,432 km<sup>2</sup> and total population of 5.6 million. The country is a land of varied topography, climate and rainfall. Climate varies according to different topographical regions, with average temperature range of 20°C in highlands to 35°C in lowlands and average rainfall of 1000 mm to 300 mm (Rena, 2005).

Food security is embedded in the government's strategies for poverty reduction and national development. In terms of the current national policy of the country food security refers to the existence of the capacity and ability to make readily accessible to all Eritreans food sufficient in quantity and acceptable quality at an affordable price at any time and place within the country (Rena, 2005).

Agriculture is the backbone of the country. Eighty percent of the population earn their living from farming. However the country has so far not managed to raise crop production to a level that can support the entire population and is forced to cover nearly 50% of its cereal requirement through imports. Considering the role of the agricultural sector in the livelihood of the rural population, the government is giving a higher priority to raise the agricultural productivity. Goat development project is among many of development interventions in the agricultural sector.

Goat rearing is an integral part of the livestock sub sector. It has been playing a significant role to improve food and nutritional security, poverty alleviation in arid and semi-arid areas. In such areas, goats are being raised by peasants because of their low initial investment, low input requirement, higher prolific, early sexual maturity, and ease in marketing (Kumar et al 2010).

There is a marked trend towards keeping more small ruminants as a proportion of livestock holdings than large ruminants. There are many reasons for this. According to Peacock (2005), they are relatively cheap to acquire and reproduce quickly, enabling pastoralists to use them as a means to acquire cattle or camels. Moreover, with more regular droughts pastoral families are in a constant state of recovery from the last drought and seldom get a chance to re-establish the previous status quo based on larger stock.

Taking the advantages of goats into account, the Ministry of Agriculture in collaboration with OXFAM and FAO, introduced a goat development project in the Northern Red Sea Zone to improve the livelihood of the poor households. The development project was aimed at making a contribution to the reconstruction and rehabilitation of the livelihood of poor households. In this regard, the project trays to improve the livelihood of the beneficiaries by providing inputs via goats and through training to upgrade the skills and experience in goat management.

With all the benefits of goats, the relevant questions arose about the impact of the development project on the livelihood of the beneficiaries. How far has the project enabled the beneficiaries to improve their livelihood assets, accumulate physical assets, and gain social benefits. This study aims to find answers for the questions about the impact of goat development project on the livelihood assets of the beneficiary households.

## **1.2 Problem Statement**

Over years poverty and food insecurity have been serious problems among rural resource-poor in the Northern Red Sea Region. Considering effects of poverty, the Ministry of Agriculture recognizes the importance of eliminating hunger and ensuring sustainable food security within the region as a necessary first step to poverty eradication.

In collaboration with OXFAM and FAO, the Ministry of Agriculture takes the initiative to help the poor farmers in Northern Red Rea Region to tackle the problem of poverty. The project was introduced in 2007 and was designed to provide five small ruminants to poor households who typically lack collateral, steady employment and a verifiable credit history.

Reviews of livestock interventions show that livestock plays an important role in human nutrition, health and poverty reduction in developing countries. Often it is claimed that the potential of small ruminants to reduce poverty is enormous. If the poor can acquire animals, their livestock can help them along a pathway out of poverty.

However, the Ministry of Agriculture has a low insight in the outcomes of the goat development project and want to find out if the development project has actually helped the poor. This research was done in order to assess the extent in which the project has assisted poor households to improve their livelihood assets.

### **1.3 Research Objective**

The objective of this research is to examine the impact of the goat development project on the livelihood assets and draw recommendations that could help the Ministry of Agriculture and beneficiaries of the project, for effective implementation and full exploitation of the benefits of the goat project.

### **1.4 Research Question**

1. What is the impact of the goat development project in livelihood assets of households?

1.1 What are the positive and negative impacts of the goat development project in the livelihood assets?

1.2 What were the main constraints perceived by male and female headed households in management of goats?

1.3 Who was involved in the project?

1.4 What are the suitable criteria's used to assess livelihood assets?

### **1.5 Justification of the Study**

Experts believe that small ruminants as a tool for poverty alleviation has the highest efficiency and sustainability for reducing poverty and hunger in poor countries. Eritrea as one of the poorest countries has recently welcomed several NGO-based institutions with the aim to improve the agricultural sector. The goat development project is among many interventions in the agricultural sector.

The project was aimed to assist the rural poor to develop their means of income while increasing food security. In any development project, the success of a project is based on the planned activities which had to be carried out using a defined budget, human resources and other inputs. In addition, a project progress has to be progressively measured through defined project indicators. However this has not been done for the goat development project in the past 5 years. Therefore it is important to carry out research in order to demonstrate to donors the impact of the development projects they help finance. Moreover knowing development results implies a number of changes in the way interventions are designed, implemented, monitored, and managed. In line with that one impact of the development can help to focus the support for programs on the basis of evidence of the benefits. This research will focus on

assessing the impact of the development project on the livelihood assets, because assets are the bases for increasing productivity and reducing vulnerability of poor people's livelihood.

## Chapter 2: Literature Review

### 2.1 Livestock Production and its Challenges in Eritrea

In Eritrea, livestock are regarded as one of the most important assets for developing its economy. Livestock are critical to the subsistence and wellbeing of most Eritreans. Land use categories indicate that livestock-related activities make use of 56% of the 12,200,000 hectares available in Eritrea (FAO, 2000). Many Eritreans depend on livestock for draft power, food, income, fertilizer, fuel, transportation, asset accumulation and investments in traditional social insurance systems. Furthermore, in drought prone Eritrea livestock offer the most common coping mechanism for staving off disaster (Leonard, 2008).

The livestock sector in the country is populated mainly by small scale producers. Most livestock owners are poor, although individuals who are extremely poor often do not own livestock. Indigenous small ruminants are the most numerous types of livestock, camels, cattle, and poultry are also prevalent in the country. Natural pasture is the main source of nutrition for livestock, supplemented by crop residues, industrial by products and commercial feeds. The quantity and quality of forage is often limited due to recurrent drought, overgrazing, and an acute shortage of grazing land (GSE, 2006). Most of the livestock production is in the arid and semi-arid lowland areas of the country. Goats are kept more in most parts of Eritrea, and goat production is dominant in Barka, Denkal, Semhar, Senhit, Gash Setit and eastern Akele Guzai. According to the report from World Health Organization, 2007, in Northern red sea region there were 1, 456, 929 sheep and goats.

Based on a participatory policy making process, the Ministry of Agriculture (MoA) identified a list of main constraints in the livestock sector. The main constraints identified were summarized by Moehler, (2007). The main constraints identified were:

***Absence or inadequate provision of credit services:*** Livestock owners have difficulty obtaining credit to begin or expand production, purchase inputs, increase stock, etc. The credit supply system is not in existence in most parts of the rural areas. Small scale business support institutions, which were providing support for the small scale producers also closed down due to the problems with funding. Though credit and savings are important elements in supporting rural development there is no assured source of this service to the rural producers.

***Scarcity of feed:*** Feed and water shortages are the most common and challenging constraints for most livestock owners, especially for the poor. The feed resource base for sheep and goat

production in Eritrea is natural grazing and crop residues. The quality and supply of these resources is seasonally variable. Grazing resources in the highlands are diminishing due to increases in cropping land. Bush encroachment and overgrazing have reduced grazing resources in the pastoral areas (Towelde and Tesfai, 2006).

***Lack of infrastructure:*** Infrastructure necessary to transport livestock or livestock products from remote rural communities, where production is concentrated, to urban markets is lacking. Goats are generally trekked long distances for marketing, often without adequate water and feed. There are no market centres and stock routes with the necessary facilities such as feeding and watering points (Moehler, 2007).

***Inadequate veterinary coverage:*** The high incidence of livestock diseases pose a major challenge in the profitable rearing of livestock and the productivity of the livestock. Although most of the diseases are management diseases which can be easily prevented through the control of ticks and worms, most of the rural farmers have no access to the necessary drugs for their prevention. This results in a loss of livestock numbers due to high mortality and morbidity (Towelde and Tesfai, 2006).

***Long marketing channels and lack of market information:*** Producers do not have access to market information. The system lacks market orientation, which would have been an important driving force for increased production.

***Anaemic government services and regulatory framework:*** The Ministry of Agriculture have a limited amount of budget from the government; hence they are not able to provide the required services to remote areas (Moehler, 2007). Small scale resource poor livestock keepers usually cannot get access to government services for health care and breed improvement, and this limits their ability to improve the productivity of their animals.

Nevertheless the livestock production has a great potential to contribute to the improvement of household food security and reduction of poverty in Eritrea. Taking these constraints into consideration, the Ministry of Agriculture gave training to the farmers/ producers. This was hoped to contribute to the better management of the goats and hence improve their productivity. Moreover there is an attempt to establish market places in some areas which enable the farmers to share market information.

## **2.2 Special Features of Goats**

Goats have played a number of multiple roles in the support of man's livelihood for many years all over the world. While goats were originally domesticated in southwest Asia they quickly moved into Africa and now can be found in every environment on the continent (Devries, 2008). Goats have many special features that make them more attractive to rural poor farmers; some of their features are summarized as follows:

### ***Adaptability***

Because of their flexibility, goats have adapted to virtually every climate on the planet, overall they appear to withstand drought better than other livestock's and have higher survival rates under drought condition (Lebbie, 2003).

### ***Feeding behaviour***

Goats are browsers; they have high digestive efficiency for coarse roughages. Goats are highly selective feeders- a strategy that enables them to thrive and produce even when feed resources, except bushes and shrubs, appear to be non-existent (Devendra, 2004). With regard to water requirements, water economy is also an important biological feature.

### ***Reproduction cycles***

Goats have short reproductive cycles, and reproduce quickly. Age at sexual maturity in does is 7 to 8 months and 12 months for bucks, twinning is nearly 50%, whereas abortion occurs in about 1 to 10% of does (Tibbo, 2000). This allows farmers/ producer quick interval of selling part of their flock and generating cash income.

Goats are an ideal species for poverty reduction and economic development for the poor in developing countries. These special characteristics are the major reasons which make goats attractive for poverty reduction and improvement of family food security and livelihood of the poor in developing countries. This characteristic is especially desirable in fragile environments of Eritrea.

Indeed these special features appear to be one of the factors that make goats more attractive in ensuring food security and reduction of poverty in Eritrea as compared to other livestock. With more recurrent droughts in Eritrea, goats with the above mentioned special features are important to rural poor farmers to recover from drought.

## **2.3 Goats in Poverty Reduction**

Livestock contribution in tackling poverty and maintaining sustainable livelihoods is high. They can make a contribution to better livelihoods of the rural poor in developing countries, which include Sub Sahara Africa, Latin America and Asia.

The role of goats in poverty alleviation and their contribution to sustainable livelihoods especially in rural areas have been demonstrated by several Research and Development (R&D) programmes in many countries. The studies reviewed concluded that the development programs of goats can significantly contribute to reducing of poverty and improving the livelihoods of poor households.

A synthesis report (Tadele, 2007) provided an integrated summary and analysis of the findings from three impact studies of goat development project on the livelihood of poor women who are the beneficiaries of the goat project, conducted in eastern Ethiopia in 2006. The research found out that 88% of the beneficiaries who sold goats earned high mean annual cash income. As a result, they acquired assets and diversified their livelihoods. The women farmers became more economically empowered, which enable them to gain greater control over their resources, which in turn increased their capacity to participate in social activities and household decision making.

Peacock (2005) provided a summary of the findings of goat development project in potential for goats to reduce poverty in Africa. The goat development projects for these studies were selected from different countries in Africa (Ethiopia, Kenya, Zambia and South Africa). This study found out that studies carried out in different African countries demonstrated that goat development projects had positive impacts on the livelihood of households. The beneficiaries were able to accumulate productive assets, invest more in developing their valuable livestock assets, send their children to school, pay hospital fees and survive during drought periods.

An article written by Devries (2008), also described Heifer Internationals experience promoting goats for the poor. The report is written from recent case studies conducted in China, Peru, Romania and Tanzania. The experience shows that goats can be very beneficial to the poor. They are much more, providing not only food and income, but also security as a living bank. They also help make the total farming system more productive by converting roughage and by products into food, fibre and manure.



In summary, all the above mentioned studies evidenced that, the goat development project plays an important role in improving livelihood of households, particularly those which are living in poverty.

## **2.4 Goats Contribution to Livelihood Assets**

### **2.4.1 Goats as a Financial Capital**

The economic contribution of small ruminants to poor farm households and livelihood systems is high. Goats are among the major economically important livestock in the world. They play an important role in the livelihood of resource poor farmers. They provide their owners with a vast range of products and services such as meat, milk, skin, hair, horns, bones, manure and urine for cash.

Goats are reported to be more economical than cattle and sheep under natural grazing browsing (Sharma and Jindal, 2008). They require much lower investments and facilities in terms of housing, feed, labour and health care. The basic principles of economics in goat farming are based on smaller size, costs less than cattle, require less feeds, present fewer risks, and have quick return (there is quick pay of dues because of fast multiplication and early maturity). Peacock (2005), also states that goats have a high economic importance and can play a vital role in ensuring the security of family members. In time of trouble, such as crop failure or family illness, goats can be sold and food or medicine purchased.

Goats are often regarded as, income generators and reservoirs of wealth (Coppock et al, 2006). In some cultural settings, women are often not entitled to own land since agriculture (crop production) provides only seasonal employment; rearing goats would provide employment and incomes as a subsidiary occupation. In summary from these literatures the economic importance of goats can be understood.

### **2.4.2 Goats in Social Status of Households**

Livestock in general and especially sheep and goats play an important role in the social status in many countries. Goats provide more than meat, milk and profit at the household level in rural communities. They play a role in maintaining social relations and are regularly slaughtered at religious and other ceremonies. According to Peacock (2005), goats provide their owners with a broad range of products and socio- economic services and have played an important role in the social life of many African people, being used as gifts, dowry, in religious rituals and heritage.

The social benefits of goats is also stated by Lebbie, (2004), in some cultures through the use of goats for bride price payments, important ritual rites and as sacrificial lambs for important visitors, goats provide a means of fortifying socio-cultural linkages among the living and between the living and the dead. In Swaziland goats skins are used as traditional mats and clothing (sidziya) for ladies. The latter is worn during cultural ceremonies such as customary marriage (Kuteka and Umtsimba), lussango reed dance and many others (Saico and Abul, 2007).

Goat production in Eritrea is not market oriented, but rather is used within the framework of the subsistence farming system as producers of meat, milk, hides, etc. In rural areas, farmers generally rarely slaughter their animals; they consider it to be unaffordable. Goats are used by all religions and most of the cultures for special occasions, like honouring special guests and religious ceremonies (Alkali, 2007). From these literatures the importance of goats in social status of various religions and cultures around the world can be understood.

#### **2.4.3 Goats contribution to Human Capital**

The main human capital value that goats provide is nutrition. The nutritional value of animal products to overcome mal nutrition has thoroughly been studied. Health and nutrition are important elements in the development process. Adequate nutrition enhances physical health, thereby improves labour productivity. Good nutrition is also associated with learning ability; hence good nutrition leads to higher human capital accumulation.

According to Peacock (2001), development and improvement of goat productivity offer the most significant and direct positive impact for improved family protein and energy intake. Goats are an excellent source of meat, the protein is higher than most other meats, and the fat content is lower than beef or pork. On a worldwide basis, goat meat is considered as an important source, with high consumption rates for many cultures. Many persons, who for religious or other reasons restrain from consuming other meats, depend heavily on goat meat.

Devendra (2004), made a generalization about nutritional contribution of goats by stating that goat milk is valuable for children, the malnourished, pregnant mothers and the elderly in areas where cow or buffalo milk is not available, mainly due to sales to urban areas. Secondly, there are no religious taboos against goat meat, milk and their products.

These considerations together underline the fact that goats currently make a most important contribution in nutrition and food security to rural communities not only in those countries

where there are sizeable small ruminant populations, such as India, Pakistan and China, but also elsewhere, such as Indonesia and the Philippines (Devendra, 2004).

#### **2.4.4 Goat's and the Natural Capital**

Goats have a wide range of interactions with and can have both adverse and beneficial consequences on natural resources. The livestock influence the atmosphere and climate, the land degradation, the water resources and the biodiversity.

According to Libbie (2003), the manure and urine from goats is an invaluable source of organic fertilizer for maintaining or improving agricultural production. It is important where most rural goat keepers cannot afford the expensive inorganic fertilizers for use in their traditional low-input crops and horticultural production systems.

However if goats are not well managed they could compact and disrupt soils structure and increase runoff and erosion. Among ruminants, the degradation from goat overgrazing is the most severe because of the species ability to graze on residual biomass and ligneous species that are left as vegetative cover by other species.

### **2.5 The Livelihood in the Northern Red Sea Region**

In Eritrea, agriculture engages 80 % of the population and is the main stay of the economy. It mainly consists of subsistence rainfed crop production, irrigation and pastoralism. 12 % of the total land area of the country (around 1.5 million ha) is arable. Nevertheless, about 50 % of this receives an average annual rainfall below 200 mm, which makes crop production rain fed agriculture impossible. Even in the areas with an annual rainfall of 400 mm and above, crop yield is adversely affected by among others, erratic nature of the rain (CIA, 2011).

Poverty and food insecurity are widespread and still on the increase, though the greatest number of poor live in the densely populated highlands, poverty is most severe in the arid lowlands areas of the Zoba Northern Red Sea (ZNRS). The poor have been disproportionately affected by the war and drought and many are struggling to re-establish their livelihoods having lost assets such as boats and livestock (IFAD, 2010).

The Northern Red Sea Zone of Eritrea is the region likely to be affected by the consequences of drought and this has resulted in special interventions, supported by CERF, OXFAM and other NGOs targeted at this area. The rapid assessment carried out in 2006 showed that the main source of livelihood in the region was Government food support due to persistent

rainfall shortage, with major occupations being subsistence rainfed farming, pastoralism, fisheries and mining. Some employment also exists in Massawa in the meat processing, cement, salt and fishing industries (WCF, 2007).

Most of the residents of Northern Red Sea region lead their lives through farming and livestock rearing. The strategy of increased productivity as a means to end hunger and malnutrition has been used for many years in this region. Pear millet, sorghum, sesame, beans and maize are some of the crops that are grown in Northern red sea region. However the region has not been spared from the effects of climate change which in some years have resulted in shortage of rainfall seasons and drought. Small scale rural farmers who produce over 80 % of their cereals are very vulnerable to the effects of climate change, because their production is based on rainfed type of cultivation and entire usage of natural resources. Any shift in the rainfall pattern therefore affects them negatively in terms of their cereal productivity.

## **2.6 Poverty and Food Insecurity in Eritrea**

The situation of food insecurity in sub-Saharan Africa in general and in the greater horn of Africa in particular is worse than in any other region in the world. Eritrea, being part of this region, is suffering from the problem of food insecurity. The majority of the people in Eritrea who face the threat of food insecurity are the poor who live and earn their livelihood in the rural areas.

The magnitude of poverty and food insecurity in the country is widening from time to time. According to Government of state of Eritrea in 2004, 66% of Eritreans were unable to obtain sufficient food (in terms of calories) and other essential goods and services to lead a healthy life. Among these, approximately 37% live under extreme poverty, i.e. below the food poverty line.

The overall development strategy of the country focuses on increase of agricultural production, enhance beneficiary participation and empowerment to manage infrastructures, create employment opportunities and enhance rural incomes which would be achieved through improvement of existing irrigation schemes, domestic water supply, and livestock production (RDP, 2011).

However the country has failed in achieving self-reliance in food security. Recurrent drought and almost complete absence of rain has threatened the lives of over 1.4 million Eritreans by

seriously undermining agricultural and livestock production. Although the causes of food insecurity and poverty are intricate some of the recent events affecting it are low agricultural productivity, due to short, erratic and irregular rain periods, recurrent drought, improper traditional farming system, low soil fertility, rapid population growth, the wide spread of HIV/AIDS, and war (GSE, 2004).

## **2.7 Women in Food Production in Rural Areas**

Agriculture is the most important sector of the economy of rural poor. The sector is hampered by antiquated methods, dependency on irregular rainfall and shortage of male labour. Many female headed households are constrained in their food production because of the shortage of male labour. While land laws do not discriminate against women, there are disadvantages due to lack of exposure to extension services, training and credit.

The roles of women among the different ethnic groups are defined by tradition or religious justifications. Their role is strictly confined to household chores and minor activities outside the homestead. Women are subjected to such tradition and beliefs that do not recognize their basic rights to participate in all the economic spheres of their communities. As a result major decisions are made by the male; even in female headed households' relatives and extended families make decision for them. Women do not have equal opportunities for employments as cultural requirements limit their activities to within the home and village. They possess fewer assets, have lower literacy/ numeracy rate and are burdened by domestic cores including fetching water and collecting fire wood (IFAD, 2010). As a result they are constrained from education and exposure to new technologies that could help them to improve their productivity in insuring food security of their households.

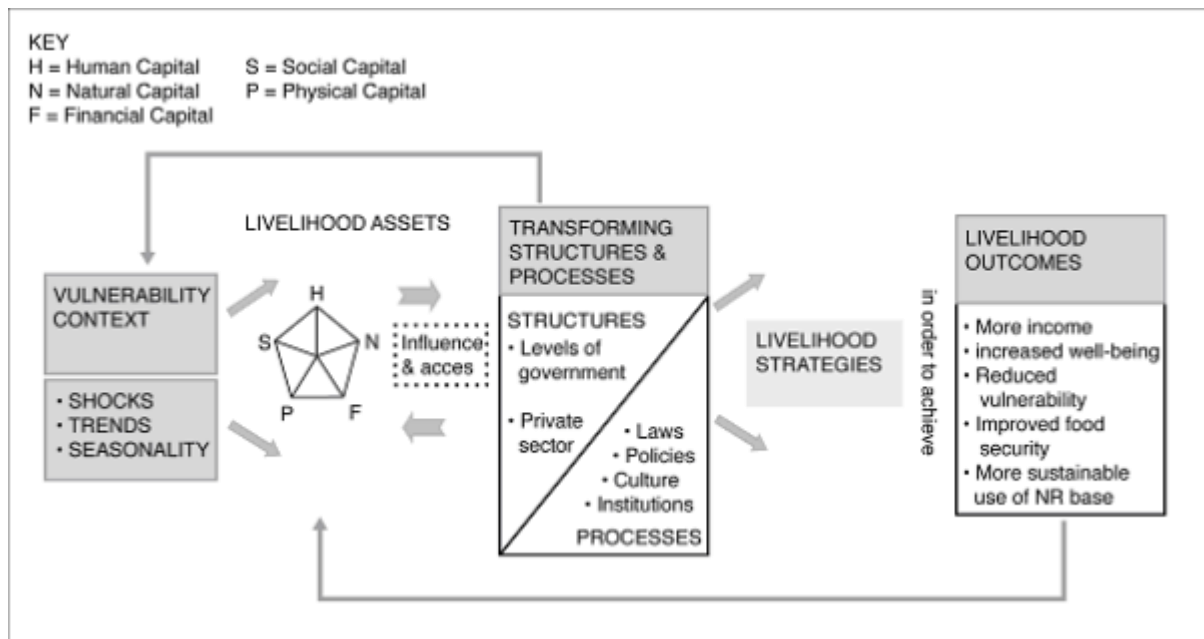
Women are generally the most disadvantaged, the most vulnerable and victims of extreme poverty. Rearing small ruminants, such as goats are therefore considered to be the potential options for the female headed households to earn their livelihood on a sustainable basis. Small ruminants are specifically beneficial to the rural women as they provide food and additional income to the household. The income from the ruminants could be used to cover the costs of health, education, travel, food and other emergency needs. Goats are among the most important ruminants to women, as they require low inputs and low labour requirement and have the capacity to utilize low quality feeds. Therefor goats with low inputs could help women to escape out of poverty.

## 2.8 Conceptual Framework

### 2.8.1 Sustainable livelihood Framework

Sustainable livelihood framework is adopted as a conceptual frame work to discuss the impact of the goat development project on the livelihood assets of the beneficiary household heads. This section therefore elaborates the definition of the key concepts of the livelihood assets which was used in the research.

Figure 1 Livelihood frame work adopted from poverty-wellbeing.net



### 2.8.2 Operational Definition of Concepts of Livelihood Assets

#### *Livelihood*

Livelihoods are defined as the capabilities, assets (including materials and social resources) and activities required for a means of living. Livelihood is considered to be sustainable when it can cope with and recover from stress and shocks and maintain or enhance its capabilities and assets both now and in the future, while not undermining the natural resource base (Lasse, 2001). The study focus was on the impact of the goat development project on livelihood assets.

### *i. Livelihood Assets*

The livelihood assets available to the household represent the basic platform upon which the household draw assets, or capitals to make a living. Kollmair (2002), defined livelihood assets as follows:

**Human Capital:** "Human capital represents the skills, knowledge, nutrition, ability to labour and good health that together enable people to pursue different livelihood strategies and achieve their livelihood objectives" Kollmair (2002). For the purpose of this research, effects of goat development project on human capital, skills and knowledge acquired during trainings given by the project, household labour management in tending of goats, and nutritional benefits from meat and milk of goats were considered.

**Social Capital:** social resources upon which people draw in seeking for their livelihood outcomes, such as networks and connectedness, that increase people's trust and ability to cooperate or membership in more formalised groups and their systems of rules, norms and sanctions Kollmair (2002). The amount of social capital is determined through birth, age, gender, tribe, religion, marriage, wealth and number of children. In this paper the effect of goat development project in the social life of the beneficiaries, through use of goats in, marriage (dowry), gift, religion, funeral, and birth of a child, support to strengthen their social relation and connectedness were considered.

**Natural Capital:** Natural capital is the term used for the natural resource stocks from which resource flows and services (such as land, water, forests, air quality, erosion protection, biodiversity degree and rate of change, etc.) useful for livelihoods are derived (Ellis, 2000). Livestock rearing in the region is highly dependent on the natural pastures, therefore in the context of this research the effect of goat development project in natural capital, use of manure as a fertilizer to improve soil fertility and access to grazing pasture land were taken into consideration.

**Physical Capital:** Physical capital comprises the basic infrastructure and producer goods needed to support livelihoods, such as affordable transport, secure shelter and buildings, adequate water supply and sanitation, affordable energy and access to information (Ellis, 2000). This study was focused on the effect of goat development project on improvement and changes in housing, land, farm implements, livestock, other new assets acquired as a result of the having the goats were considered.

***Financial Assets:*** Financial capital denotes the financial resources that people use to achieve their livelihood objectives and it comprises the important availability of cash or equivalent, which enables people to adopt different livelihood strategies. Two main sources of financial capital can be identified, available stocks (cash, bank deposits or liquid assets such as livestock) and regular inflows of money (labour income, pensions, or other transfers from the state, and remittances) Kollmair (2002). Goats are liquid assets that can be easily converted in to cash. In the context of this research the effects of goat development project in improving availability of cash income from the sales goat's meat, milk and manure to meet their cash requirements were considered.

#### ***ii. Livelihood Outcomes***

Livelihood outcomes are the achievements of livelihood strategies, such as more income (e.g. cash or savings in bank), increased well-being (e.g. non material goods, like self-esteem, health status, access to services, sense of inclusion), reduced vulnerability (e.g. better resilience through increase in asset status), improved food security (e.g. increase in financial capital in order to buy food) and a more sustainable use of natural resources e.g. appropriate property rights (Ellis, 2000). In this paper the livelihood outcomes such as improved in nutrition, increase in cash income, improve knowledge on management of goats, improved asset ownership, and improved social status were considered.

#### ***iii. Household***

Household refers to a person or group of persons living together in the same house or compound, sharing the same house keeping arrangements and being catered for as one unit. In this study household refer to the proposed occupant of the single-family residence.

#### ***iv. Beneficiaries***

In the broadest sense is a natural person or other legal entity who receives money or other benefits from a benefactor. Here beneficiaries are those who receive goats from the development project.

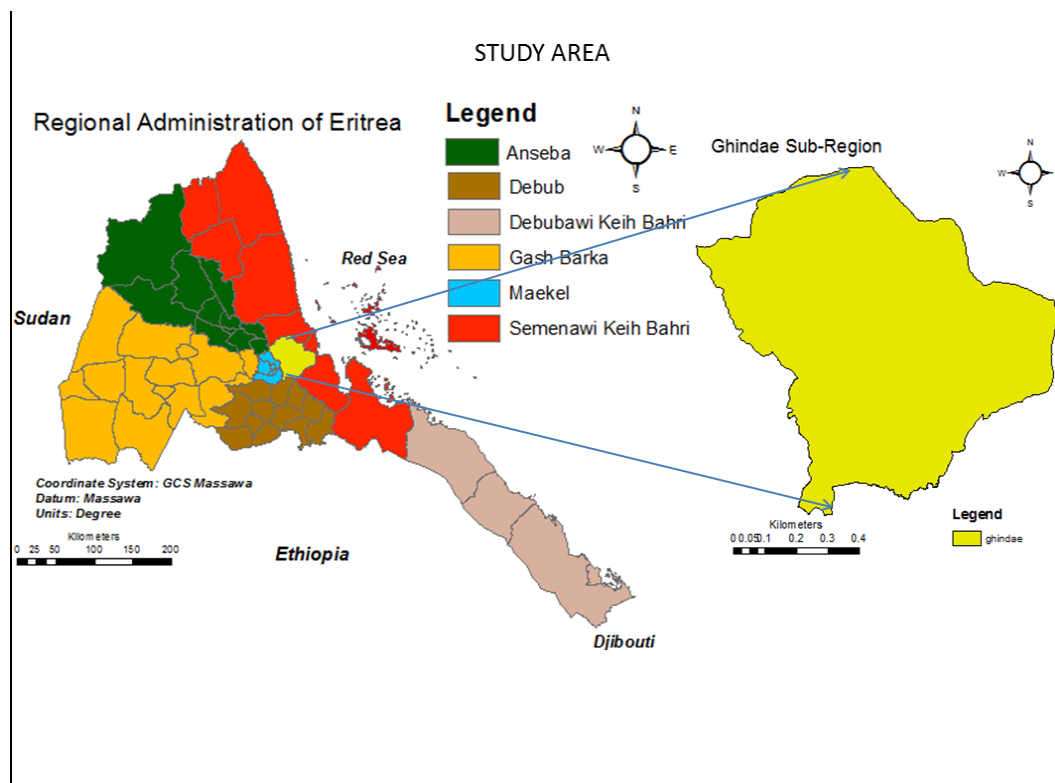


## Chapter 3: Research Design and Methodology

### 3.1 Study Area

The study was conducted in Northern Red Sea region. The region has a total surface area of around 27,800 km<sup>2</sup> and total population of 897, 454 (Wikipedia, 2010). There are six ethnic groups in the region Afar, Saho, Tigre, Rashaida, Tigrigna and Nara. The average annual rainfall ranges from 380 mm in the arid areas to 1000 mm in the eastern escarpments and annual temperature varying between 28-38 °C. The altitude ranges from 900m above sea level to 1800 m below sea level. There are nine sub regions in the region namely Ghindae, Foro, Shieb, Karura, Nakfa, Gelalo, Dahlak, Afabet and Massawa. Ghindae was chosen for study. The main criteria used for selection of the sub region were: there must male and female headed beneficiaries of the goat development in 2007, ease of access that is, there should be transport facility to reach the region.

Figure 2 Map of Ghindae



### **3.2 Research Strategy**

The research was carried out in two phases: the first phase focused on literature study, aimed at collecting theories on the available literatures for better understanding of the concepts of goats, livelihood assets, livelihood outcomes and impact studies of goats in livelihood assets, food security and poverty situation in Eritrea. The references were also used as sources for defining, conceptualizing and operationalizing of the key concepts. In the second phase the study used survey as an approach to collect data.

Respondents were purposively sampled. Fifteen male headed and fifteen female headed households were selected from 2000 beneficiaries. The list of beneficiaries was obtained from the Ministry of Agriculture head office in the Northern Red Sea region. The second step was random selection of 15 male headed and 15 female headed beneficiaries who are the residents of Ghindae sub region and was done by the data collector. The final step was to identify the exact address of the selected households in Ghindae sub region; this was done by the data collector in collaboration with the Ministry of Agriculture branch office and the Regional Administration of Ghindae sub region.

### **3.3 Method of Data Collection**

Pre-structured questionnaire was used to interview the respondents and an interview was also done with the manager of the project. The questionnaires were filled through face to face interview. This is selected to collect quantitative and qualitative data required for the research.

Respondents were interviewed on their current livelihood situation compared to their livelihood situation before receiving the goats. In the questionnaire five livelihood assets were considered.

### **3.4 Data Analysis**

The data collected was qualitative and quantitative. The data from questionnaire interviews were coded and entered in Microsoft excel for analysis, Microsoft excel was used as a tool for calculating the percentages and drawing graphs. Descriptive analysis was used to analyse the impact of the goat development project in the livelihood assets.

The data was clustered according to male and female headed households for comparison. Sustainable livelihood framework was adapted for data analysis. Goat development project was assessed against the influence it had on five livelihood assets. In vulnerability context

drought, short and erratic rain and war were considered as they affect the livelihood assets and livelihood strategies. In the livelihood strategies the different strategies used by male and female headed households to make their living were described. The livelihood outcomes in the conceptual framework were improved nutrition, food availability, better asset ownership, increase cash income from sale of goats and goat products.

Table 1 Adopted sustainable livelihood framework

<b>Component</b>	<b>Characteristics used in analysis</b>
Vulnerability Context	Drought, short and erratic rain, war, shortage of labour
Livelihood assets	Physical: farm implements, housing, livestock Human: nutrition, labour, knowledge (trainings) Financial: cash income from goat Social: use of goats in social life (religious and cultural festivals, wedding, funeral) Natural: Access to natural pasture and use of manure as fertilizer
Transforming structures and process	Ministry of Agriculture, OXFAM, NGO, Ministry of tourism, Ministry of Environment
Livelihood strategies	Crop cultivation, Livestock rearing, off-farm activities
Livelihood outcomes	better nutrition, additional income, better asset ownership,

### 3.5 Study Limitations

Poor internet connection and electricity in the country delayed the questionnaire to reach to the data collector. It was difficult for respondents to give estimation of the percentage of cash income spent on food stuffs.

## Chapter 4 Results and Discussion

### 4.1 Demographic Characteristics of the Respondents

The Table 2 below provides the overview of the composition of respondents who benefited from the goat development project.

Table 2 Demographic characteristics of the respondents

Characteristics	Category	Female headed (N=15)		Male headed (N=15)	
		Number	Percentage (%)	Number	Percentage (%)
Age	20-35	3	20	2	13
	36-51	9	60	10	67
	62-67	2	13	2	13
	68-80	1	7	1	7
Marital status	Single	-	-	-	-
	Married	-	-	15	100
	Divorced	6	40	-	-
	Widow	9	60	-	-
<b>Total</b>		<b>15</b>	<b>100%</b>	<b>15</b>	<b>100%</b>
Average family size		4.6		5.3	

As it is indicated in the Table 2, the age of 67% of male headed and 60% of female headed household respondents laid in the range 36-59, which is the productive age. The average age of female headed respondents was 45 and male headed households 50.

The average family size of female headed household was 4.6 and that of male headed households was 5.3. This is close to average national family size 5.1 (GSE, 2004). Generally male headed households had a larger family size as compared to female headed households. All male headed household respondents were married. Forty percent of the female headed household respondents were divorced and sixty percent were widow.

Table 3 Main means of living of the respondents

Means of living	Female headed (N=15)		Male headed ( N=15)	
	Number	Percentage	Number	Percentage
Cultivation of crops	10	67	8	53
Livestock rearing	-	-	2	13
Cultivation of crops and livestock rearing	-	-	1	7
Non-farm activity	5	33	4	27
<b>Total</b>	<b>15</b>	<b>100 %</b>	<b>15</b>	<b>100 %</b>

The study revealed that 67% female headed households and 53% male headed households depended on cultivation of crops as a main means of living to lead their life. One of the interviewed male headed household respondents used both cultivation of crops and livestock rearing as a means of living.

As it is indicated in the Table 3 the majority of the interviewed male and female headed households had only one main source of living. Agriculture was the main source of living, though there were some casual labours.

The literature reviewed (Hussein and Nelson, 2004), provided a summary of the findings diversification of means of living in rural areas in four countries (Ethiopia, Mali, Bangladesh and Tanzania). The research done in four countries concluded that, although diversification of means of living was an important strategy by which rural people may work to achieve sustainable livelihoods, it was one that generally operates in conjunction with other strategies which also contribute to the formation of sustainable livelihoods. This is in line with the above finding. It is important to highlight that the means of living identified in the Table 3 were the main sources of living.

The main crops which were grown by female headed households were sorghum, maize, pepper and tomato, on average size of ¼ hectares of land. Male headed households grew

crops such as sorghum, maize, pepper, vegetables, fruits such as orange and coffee. Male headed households own an average of ½ hectares of agricultural land. Farming was done in traditional way using oxen; this required man power to cultivate. This study demonstrated that female headed households own smaller land compared to male headed households. The main reason for this is, for a woman who is divorced or widowed half of their land is returned back to the community and is given to new applicants.

The majority (73%) of the interviewed female headed households, who owned agricultural land, rent or sold their land because of lack of man labour. According to the Eritrean land proclamation number 58/1994 land is not allowed for selling. Land belongs to the Government whereby any Eritrean above 18 years old has the right to use land for agriculture. Agricultural land is administered by the community/ communal land (GSE, 2006). However in this study, female headed households indicated that they sell their land because of lack of labour. Usually selling or renting of land was done illegally.

The result of this study demonstrated that the potential of cultivating out of season vegetables, fruits and cash generating products like coffee was considerably higher in male headed households as compared to female headed households. The main non-farm activity for female headed households was cleaning activities and farm activities. For male headed household non-farm activities was construction, farm work and selling of firewood/charcoal.

## **4.2 Vulnerability Context**

Crop production is an extremely important sector which accounts about 80 % in the livelihood of the people in the country. Various reasons could be given as to why agricultural production was low and failed to meet even the minimum annual food requirements at household level in the area. Among many of the others were recurrent drought, erratic and short rain periods, and shortage of labour were the main factors that hindered self-sufficiency in food production (CIA, 2011).

Recurrent drought and almost complete absence of rain reduce the crop and livestock production sharply. Based on the survey findings it was identified that shortage of rainfall significantly undermines the crop production, and escalated the crop price to the extent where the poor cannot afford it. As a result many arable lands were left fallow during cropping periods. Drought also was reported to have caused reduction in the availability of pasture and drinking water for livestock. Goats were introduced as an opportunity for livelihood

diversification; however drought and lack of veterinary services limited the full exploitation of the contribution of livestock.

The crises have been aggravated by the continued war and mobilization of large number of labour to armed forces leading to a reduction in the range of household earning opportunities and limiting the income of many households. This is demonstrated in this study; it was found out that 20 % of the male headed household respondents were displaced refuge from their home due to war and live in the study area as a refugee. Consequently they become dependent on the aid from the government and relatives/neighbours. In Eritrea lack of labour result in massive destruction of economic, social infrastructure and led to a marked decline in the living conditions of the rural households (GSE, 2004). This literature is consistent with the findings of the study, from the total interviewed household heads 40% female headed households and 20% of male headed households' respondent, indicated that lack of labour was the major constraint for food production in their household.

In order to compare the vulnerability to food insecurity between male and female headed households, the respondents were asked to indicate if they had any problems of food shortage in the past 2 years. Food shortage was seen in large number in female headed household respondents as compared to male headed household. From the total interviewed respondents 73% female headed and 53% male headed respondents indicated that they face food shortage in their household. The survey finding is in line with the literatures written on the general food security issues in the country. The literature concluded that women comprise about 30% of the labour force, this group is however poorer on average than male headed households, because the majority of the poor women in the rural areas are engaged in low paying manual labour in agriculture. Female headed households have fewer household assets including livestock than male headed households, which makes them more susceptible to food insecurity and poverty (GSE, 2004).

Generally the lack of assets, household dependency on a single source of income, shortage of labour, and harsh environmental conditions makes households more vulnerable to food insecurity and poverty.

### 4.3 Constraints in Management of Goats

Goats were introduced to poor households to provide them with another source of food and income. However there were many constraints that hindered the full exploitation of the contribution of goats in their livelihoods. The main constraints perceived by the household heads in goat production were summarized in the Table 4.

Table 4 Constraints in management of goats

Constraint	Female headed (N=15)		Male headed (N=15)	
	Number	Percentage (%)	Number	Percentage (%)
Predator	6	40	1	7
Disease	5	33	6	40
Drought	5	33	6	40
Labour shortage	5	33	3	20
In accessibility to pasture land	2	13	4	27

As it is indicated in the Table 4 the main constraint perceived by the majority of respondents in managing of goats was disease, labour shortage, drought and predator. Based on the respective names and symptoms estimated by the respondents, the type of the disease was identified by consulting the Veterinary office in Ghindae sub region. According to Veterinary expert from the Ministry of Agriculture the type of disease identified were CCPP (Contagious Caprine Pleuro Pneumonia) and FMD (Foot and Mouth Disease). According to the report of OIE Scientific and Technical Department, 2009 Contagious Caprine Pleuro Pneumonia (CCPP) is a highly contagious infectious disease of goats caused by the *Mycoplasma Mycoides Capri* and *Mycoplasma F38* bacteria. CCPP damage the lung tissue, which interferes with effective respiration and causes the goat to die from lack of oxygen. Mortality rate can reach 100%. Foot and Mouth Disease of goats is also an infectious and sometimes fatal viral disease. The virus causes a high fever followed by blisters inside mouth and on the feet that may rupture and cause lameness.

Veterinary expert from the Ministry of Agriculture in Ghindae sub region indicated that, veterinary services were given for free in the area but farmers hardly use the opportunity provided by the Ministry. The main reason given by one of the interviewed male and female headed households on why they do not use the veterinary services in the area was that, the veterinary office is far from their village and is not easily accessible. If the goats are sick, farmers either slaughter or sell them.



Drought was also mentioned as a main constraint by both male and female headed households. The Northern Red Sea Region is characterized as an arid area, with recurrent drought. According to the report of the Ministry of Land Water and Environment, 2007, the occurrences of seasonal droughts in the country are more frequent than in the past. Drought reduces the availability of feed and water; as a result the full utilization of the benefits provided by the livestock sector is limited.

The main predators which were mentioned by the interviewed respondents were Fox, Hyena, and Monkey. One of the interviewed female headed household who lost her goats indicate that, group of monkey attacked the goats and she lost her goats six months after she receive from the project. The problems of predator are more mentioned by female headed households as compared to male headed this could be related to the shortage of labour in herding of goats. Labour shortage was reported more in female headed households as compared to male headed. In the majority of the female headed households herding was done by children. However in male headed households men were also involved in herding. One of the interviewed female headed respondent indicated that her children do not like herding, and go to play leaving the goats in the field. As a result the goats were attacked by a group of monkeys.

Generally disease, predators, drought, shortage of labour and lack of feed were the main constraints perceived by male and female headed households in rearing of goats. From thirty sampled household heads three of them lost their goats and no information on the impact of the project in their livelihood asset was obtained.

## **4.4 Impact on Livelihood Assets**

### **4.4.1 Physical Capital**

Physical capital comprises productive (farm implements, livestock's etc.) and non-productive (building, household furniture etc.) assets. In rural areas generally female headed households have very limited access to or ownership of physical capital. This situation is partly an outcome of socio-cultural discrimination against women, lack of education and employment opportunities (UNDP, 2011). In order to determine the impact of the goat development project in the physical asset, the respondents were asked to indicate if they spent any of the cash income generated from goats in any of the physical assets.

Table 5 Households who used cash income generated from goats on physical assets

Type of physical asset	Female Headed (N=13)		Male Headed (N=14)	
	Number	percentage	Number	Percentage
Farm implements	3	23	13	93
Livestock (chicken)	2	15	3	21
Grass thatched to Iron sheet	1	8	3	21
New tent +wire for fence	-	-	1	7
House hold items (Detergents, water container, stool)	6	46	10	71
Livestock shade	1	8	1	7

Physical assets play a major role not only in economic production, but also in providing security against difficult times. Even though the percentage of cash income spent on the physical assets was not identified during the survey, the respondents indicated that they used the cash income generated from the sale of goats in accumulation of physical asset.

The majority of the female headed households indicated that they used cash income to buy household items while male headed households used to buy the productive assets (farm implements). As it is indicated in the Table 5, 46% female headed households used cash income generated from goats in purchasing of household implements such as water containers, fire wood stove and stool. The majority of male headed households (93%) indicated that they used the cash income in repairing and buying of farm implements and planting seeds. The finding of the survey is in line with the literatures on the impact studies of goats in the physical assets by (Tadele, 2007); the report concluded that the cash income generated from goats was important in acquiring assets and diversifying livelihoods.

One of the interviewed female headed and three male headed household respondent indicated that they used the cash income generated from goats in improving their house (changed the roof from grass thatched to iron sheet). Male headed household respondents, who were displaced from their village due to war, also indicated that they used the cash income to buy

new tents (for housing), iron wire for fence and the new shades for the livestock. Both households used cash income generated from goats to diversify their livelihood.

This study also demonstrated that male and female headed households vary in their livestock ownership.

Table 6 Livestock ownership

Type of livestock	Category	Female headed (N=15)			Male headed (N=15)		
		Number	Percentage	No/HH	Number	Percentage	No/HH
Goats	none	2	13		1	7	
	1-5	3	20		2	13	
	6-10	6	40	7.4	4	27	7.8
	11-15	4	27		8	53	
Chickens	none	8	53	8	13	87	7
	1-10	5	33		1	7	
	11-20	2	13		1	7	
Donkey	None	13	87		14	93	
	1	2	13		1	7	
<b>Total</b>		<b>15</b>	<b>100%</b>		<b>15</b>	<b>100%</b>	

Three of the interviewed female headed and four male headed households indicated that they had goats before they receive from the project. The decline in the number of goats owned could result from a combination of factors. According to (Moehler, 2007), the main constraints identified in the livestock production in Eritrea were lack of feed and disease. This is also confirmed during the survey undertaken in the study area. Two of the interviewed female headed and one male headed household indicated that they had lost their goats because of lack of feed, ate poisonous grass and disease. The respondents who lost their goats because of disease claimed that, the veterinary services are far from their village. As a result they could not get an easy access to health services.

Even though there was a shortage of food and lack of easy access to veterinary services, the majority of the household heads were able to maintain and increase the number of goats. This

finding is also further strengthened by literature (Lebbie, 2003); on goats' sheer ability to thrive in harsh environments.

In addition as it is shown in the Table 6 the household heads also own livestock such as chicken and donkey. The number of female headed households who owned chicken was higher than male headed households. This is because female headed household have lower employment opportunities as compared to male headed household, as a result rearing of poultry was considered as a potential option to earn their livelihood on sustainable base. Donkey was owned by both male and female headed households as a means of transport. Even though this study cannot exactly determined the extent in which goats assist the households to improve their asset ownership, it was confirmed that cash income generated from sale of goats had a contribution in improving households physical asset ownership.

#### **4.4.2 Financial Capital**

From the interviews conducted most of the households surveyed relied on the sale of crops as the main source of financial capital, and in some households casual labours such as cleaning activities, sale of firewood and construction activities were the main source of income in their households.

Goats create employment opportunities to households. The role of goats in the household income was straight forward the result of this study demonstrated that 87% female headed households who sold goats gain average cash income of 2816 NAKFA/year from sale of two goats (average price of adult goat was 1408 <sup>1</sup>NAKFA). However 87% male headed household respondent who sold goats indicated that they gain average cash income of 3336 NAKFA/ year from the sale of two goats (The average selling price of adult goat was 1658 NAKFA). The difference in selling price between male and female headed households could be related to shortage of access to market information and bargaining power. As it is indicated in Figure 4, many female headed households depended on their close relatives and neighbours to sell their goats. This could limit their access to the market information and the benefits from sale of goats.

Both male and female headed households indicated that sales of goat was usually done once or twice a year during Eid and Easter ceremonies, when there is a high demand and good price of goats. In both households milk from goats was not meant for sale. Instead it was used for household consumption to feed the children and lactating women, and sometimes it was

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<sup>1</sup> 50 Nakfa was equivalent to 1 Euro during study period

given as a gift to sick and pregnant women in the neighbourhood. One of the interviewed male headed households indicated that they let goat kids to suck the milk. In one of the interviewed female headed household, the sale of milk was seen as a taboo.

In this study it was demonstrated that goat rearing has provided an opportunity for covering important financial demands such as paying school fees, medical expenses, food expenses, clothing and transportation expenses.

Table 7 Ways by which cash income from sale of goats was used in meeting household obligations

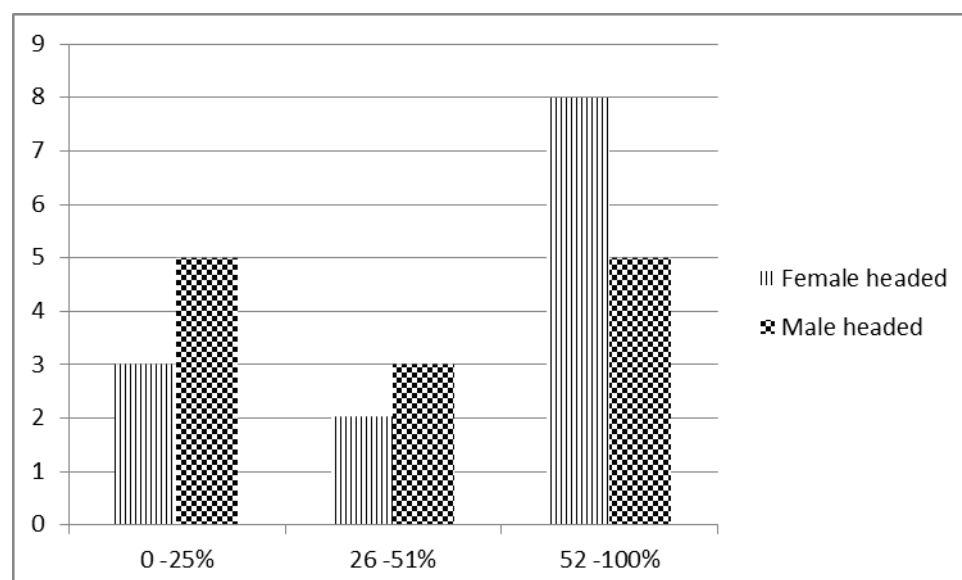
<b>Variables</b>	<b>Female Headed (N=13)</b>		<b>Male Headed(N=14)</b>	
	<b>Number</b>	<b>percentage</b>	<b>Number</b>	<b>Percentage</b>
Paying school fees	10	77	12	86
Paying medical expenses	7	54	11	79
Paying for food stuffs	13	100	14	93
Paying for clothing	11	85	12	86
Paying transportation	1	8	3	21

From the Table 7, it can be concluded that the majority of the respondents (100%) of female headed households and (93%) of the male headed households used the cash income generated from goats to cover food expenses. This finding is also strengthened by the literatures, Peacock, 2005, states that goats have high economic importance and can play a vital role in ensuring the security of family members. In time of trouble, such as crop failure or family illness, goats can be sold and food or medicine is purchased.

In order to determine the role of the generated cash income in improving food availability in the household, the respondents were asked to estimate the percentage of generated cash income they spent on food stuff in their household. Percentage estimation was done with the help of data collector. Estimation of percentages was confusing, difficult and had poor reliability. Even though the percentages given were estimations they could give a general picture of the cash income spent on food stuffs in male and female headed households. Figure

3 indicates the estimated percentage of cash income generated from the sale of goats spent on food stuff.

Figure 3 Estimated percentage of generated income spent on food stuff



Most of the respondents expressed the income generated from their involvement in rearing of goats helped them to provide food to their families. Figure 3 indicated that female headed household respondents spent largest portion of the generated cash income (average 55%) in food stuffs as compared to male headed households (average 39%). The main food stuffs that were bought from the cash generated from sale of goats include coffee, sugar, salt, cooking oil, pea flour (shiro), vegetables, sorghum and maize.

Generally introduction of goats provide both household heads with additional income and the cash generated from goats helped more to the interviewed female headed household to cover food expenses as compared to male headed households.

#### 4.4.3 Social Capital

The importance of goats is far beyond the nutritional and financial benefits. Goats bring their owners a set of social benefits. A household head that is able to provide care for his family will have dignity and pride and will be in better place and respected in their community. Especially for women headed household, to be able to move from a dependent to a provider was a pleasure and blessing (Peacock, 2005). This literature is in line with the research finding. One of the interviewed female headed household respondents said that: having goats, bring her a relief from the stress of hard life and feel happy hearing the voice of goats. Both male and female headed households indicated that they used goats in their social life. The

Table 8 shows various social activities in which goats were used in male and female headed households.

Table 8 Social activities in which goats were used

Social activity	Female head (N=13)		Male head (N=14)	
	Number	Percentage	Number	percentage
Wedding	1	8	4	29
Dowry	1	8	4	29
Funeral	12	92	10	71
Religious ceremonies	12	92	13	93
Honouring a guest	4	31	2	14
Supporting disabled	-	-	1	7

This study indicated that 93% of the interviewed male and 92% female headed household respondents used goats in religious ceremonies such as Easter, Eid and during baptism. Moreover as it is indicated in the Table 8, goats were also used in wedding, as dowry, funeral and honouring a guest. One of the interviewed male headed respondents confirmed that they used goat as a gift to support disabled ones. Goat milk was also used to visit sick and pregnant women in neighbours/relatives, to strengthen relations and maintain contacts with their close families and neighbours. This finding was further strengthened by other studies which were done in African countries, According to literature of (Peacock, 2005), goats provide their owners with a broad range of products and socio- economic services, and have played an important role in the social life of many African people, being used as gifts, dowry, in religious rituals and heritage.

Livestock holding represent wealth in rural areas. One of the interviewed male headed respondents designates that: *increasing the number of my goats makes me feel wealthy and financially secure*. Moreover one of the interviewed female headed household respondents indicated that, having the goats in their lives brings them love, happiness and great pleasure in their family.

This study demonstrated that goats had a contribution in the social life of the interviewed male and female headed households.

#### **4.4.4 Human Capital**

##### ***Nutrition***

The majority of the interviewed male and female headed household respondents indicated that goats provided them with milk and meat. They were able to acquire 1.5- 2 liters of milk/day and consume an average 1 liter/ per day. All the respondents mentioned that availability of milk and meat in the households did increase as compared to the situation before they receive the goats from the project. The result of the survey is consistent with literature of (Peacock, 2005), which state that the most important human capital that goats provide to their owners is nutrition; they contribute most significant and direct positive impact for improved family protein and energy intake.

All the interviewed household heads acknowledged that milk consumption is increased in their household, they do not sell the milk from the goats instead they opt to use it for household consumption. One of the male headed household respondents indicated that they do not use milk from goats instead they let the goat kids suck the milk.

Goats also provided their owners with high protein content of meat. The majority of the respondents indicated that they consume meat from their goats once or twice a year. Farmers rarely slaughter goats usually during religious holydays (Easter and Eid) and when the goats are seriously sick and have no hope to recover, because it was expensive to eat goat meat. In addition one of the female headed respondents indicated that they slaughter goat if any one of the family members is seriously sick, in order to help him/ her to recover. This finding is further strengthened by literature (Devendra, 2004) provided a summary of the nutritional benefit of goats by stating that goat provide owners with high valued of protein (milk and meat). Goat milk is valuable for children, malnourished and elders.

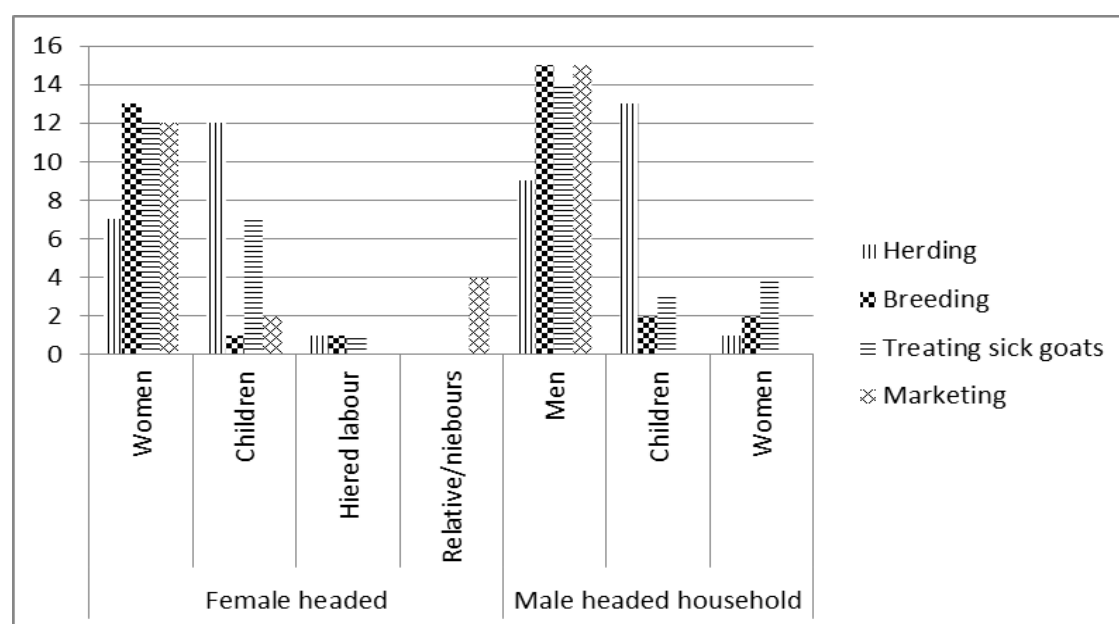
Generally the study indicated that, improvement in the nutrition and food security of households was achieved directly from increased consumption of milk and sometimes meat, and indirectly through additional cash availability to acquire other food stuffs.



### *Labour division in management of goats*

Family labour was the main source of livestock farm labour in the region. The result of this survey indicated that all the family members including men, and close relatives were involved in management of goats. Labour division in managing of goats varies in male and female headed household. Figure 4 shows an important set of differences in activities of goat management associated with the two household heads.

Figure 4 Labour division in management of goats



Lack of labour was one of the main constraints in goat rearing. In this essence children were a vital source of labour for herding. In both male and female headed households herding was done by children, though both men and women also helped.

The majority of the respondents complained about poor access to natural pastures, consequently demand of children labour in herding of goats increased. Children were required to travel 5-7 km in a search of feed and water especially during dry seasons. Considering the competition of labour with other enterprises, ten (67%) of the interviewed female headed and six (40%) male headed household respondent indicated that they had problems of labour shortage in herding of goats. As a coping strategy neighbours/related families combine herds and in some cases the children were forced to be absent from school. One of the interviewed male headed household and two female head household respondent indicated that, they do not let their children to go to school at the times when labour is highly needed.

As it is indicated in the Figure 4 thirteen women in female headed households and fifteen men in male headed household were involved in breeding activity. In both household heads children also helped in breeding activities. In male headed households marketing was done by men and in the majority of female headed household it was done by women, except in two households in which elder son helps. Moreover four female headed households depended on neighbours/relatives in marketing. Hired labour was only practiced in one of the female headed household, the respondents said that;

*I am old and do not have any one to help me, as a result management of the goats is done by hired labour and marketing is done by close relatives/ neighbours.*

Even though children also helped in treatment of goats, twelve women in female headed and, fourteen men in male headed respondents, were involved in treatment of sick goats. Generally in the majority of the interviewed household heads there was an efficient utilization of unpaid family labour in managing of goats.

### ***Training***

Education is an important ingredient in production activities. Both male and female household heads were able to attend the training on management of goats given by the Ministry of Agriculture (Department of Animal Production and Veterinary Services). The training was given in two phases, in the first phase the extension workers were given training of trainers by OXFAM and in the second phase the extension workers gave trainings to the beneficiaries of the project.

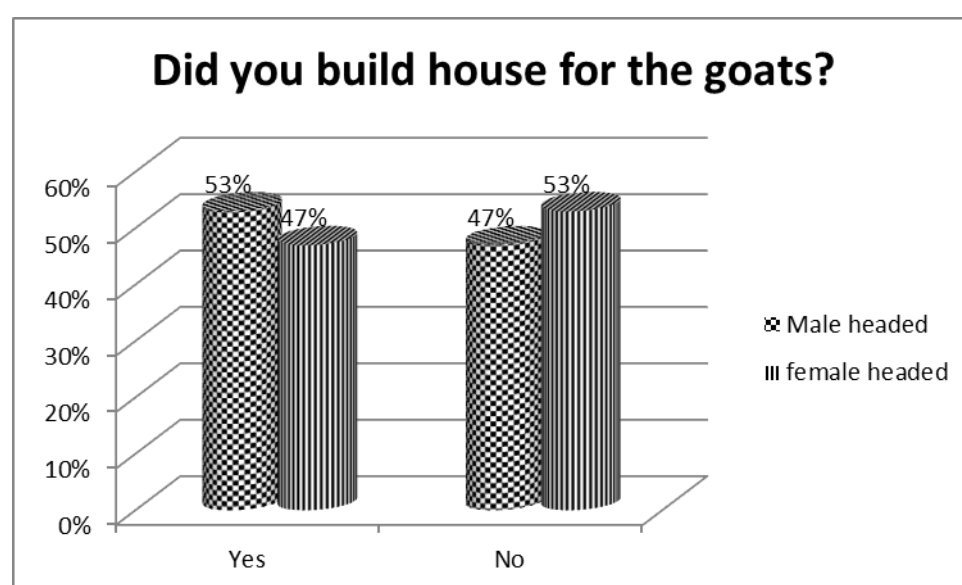
Farmer training is an important tool widely utilized by development programs in developing countries. Trainings are an avenue for development workers to pass on new information and to correct misconceptions concerning animal management, as well as reassure the development workers that the animals will receive adequate care (Vandenberg and Jiggins, 2007). Many rural households have some experience of rearing goats, in this study for example from the total interviewed household heads three (20%) female headed and four (27%) male headed households were rearing goats before they receive from the project. Still training in goat management is desirable to farmers as they are often eager to improve their knowledge and experience.

Training given includes on housing, feeding (forage such as elephant grass and leaf of sweet potato were introduced), and health care. The training manual which was used for training of

the household heads was prepared by FAO in the local language (Tigrigna). All the respondents indicated that they were obliged to attend the training; otherwise he/ she will be cancelled from the project.

The outcomes on the adoption of the training to the household heads were important in determining the usefulness of the training. In order to determine the rate of adoption, the beneficiary household heads were asked if they build the recommended house to the goats. The figure 5 below shows the percentage of household heads who build the recommended house.

Figure 5 Housing for goats



Although all the respondents were aware of the need of good housing for goats only half of them were able to build the recommended house during training. In this study 53% of the interviewed male household heads and 47% female head households indicated that, they build the recommended house. The remaining household heads did not build houses for the goats. The main reason given by the respondents who did not build house was that, the building materials were expensive, which is beyond their capacity and most of them prefer to keep in the shades of their house. Moreover the number of goats could also be used to determine the rate of adoption of the trainings given on management of goats. As it is indicated in the Table 6, the majority of the interviewed household heads were able to increase or maintain the number of goats this could be related to the result of good management. In general this study indicated that the farmers were exposed to new forage

production and management of goats that could help them to improve their knowledge and experience in management of goats.

#### **4.4.5 Natural Capital**

##### ***Natural pasture:***

Both male and female headed households indicated that there was shortage of feed due to recurrent drought, low rainfall and overgrazing. This has been aggravated by reserving of a large portion of the grazing land as a National Park. All the respondents confirmed that, they used to have access to natural pasture; they were paying 20 NAKFA as a tax in a year to get access to the pasture land. However later on according to the rule from the government, the areas they used to graze become reserved as a National Park and become inaccessible for grazing or browsing. The respondents designated that if their goats were found in the reserved National Park they need to pay a penalty 500 NAKFA per a goat or sometimes if they do not have the money they were forced to give up their goats.

Generally, it has been observed that grazing has a negative impact on the ecological stability of the grazing area, although at varying levels. This impact results primarily from two sources- browsing of the ground flora and erosion as a result of hove marks (MLEW, 2007).

In order to determine the causes of feed shortage, respondents were asked to indicate the main causes of feed shortage. Establishment of national park was mentioned by the majority of the household heads. Establishment of National Park highly reduces the grazing land, and forces the livestock owners to travel a long distance in a search of feed. One of the interviewed female headed household respondents indicated that they have to travel 5-7 km in a search of water and feed, which gives them an extra burden in managing of goats. Moreover over grazing was mentioned by 40% female headed households and 20% male headed households as main cause of feed shortage.

The respondents were also asked what they feed the goats after the establishment of the National Park and in times of feed shortage. The interviewed respondents indicated that they used different coping strategies to feed their goats to thrive during harsh conditions. Male and female headed households used the same strategies to provide feed to goats during drought periods. The main coping strategies include: collecting of dried food stuff (left overs), buying poor quality cereal crops, collecting of cactus peels, collecting leaves from a tree Neem (*Azadiracta indica*), and buying concentrates.

The data obtained from the respondents indicated that farmers predominantly supplemented low quality feed to their goats, and still goats give them good quality of meat and milk. The literature also validates this data, Devendra, 2004, states that goats are browsers; they have high digestive efficiency for coarse roughages. Goats are highly selective feeders- a strategy that enables them to thrive and produce even when feed resources, except bushes and shrubs, appear to be non- existent.

Moreover four female headed and two male headed household respondents indicated that during drought periods or dry seasons, they send their goats to highlands to their close relatives until the dry period ends. Northern Red Sea region is characterized by extreme climatic variability, especially with respect to rainfall. This variability may be seasonal as in annual alternation between wet and dry season or unpredictable and erratic as in a multi- year droughts. Livestock mobility is one of the most effective techniques, the livestock owners have developed for both exploiting and coping with both regular seasonal variability and droughts in these semi-arid and arid areas (MLWE, 2007). This literature is in line with the research finding. The majority of the interviewed respondents indicated that, during the hottest periods of the year (Jun, July and August) they move their livestock to the coolest areas of the region and to highlands.

All the interviewed respondents indicated that they have problems of water shortage; they have to travel a long distance to get access to water sources, or they have to wait for water delivery track. The water delivery track comes every 3 days to provide water to the villagers, for 15 gallons they pay 5 NAKFA and share the water with their livestock's. The respondents indicated that goats were watered every 2 or 3 days depending on the availability of water. Generally it was indicated that more money and labour was required to get access to natural pasture and water resources.

#### ***Manure from goats:***

The most important contribution of goats in the natural capital was the provision of manure. All of the interviewed respondents who were engaged in cultivation activities indicated that they use manure of goats as a fertilizer in their agricultural fields; this has a positive impact in improving soil fertility and increasing crop productivity. This finding is further strengthened by the literature on the importance of goat manure in improving soil fertility. According to Libbie, 2003, the manure and urine from goats is an invaluable source of organic fertilizer for maintaining or improving agricultural production. However the households who do not own

agricultural land throw away the manure from goat in water canals to be taken by rain. This could induce a negative impact as the manure carried by runoffs can contaminate the surface water which is used by humans and animals. One of the interviewed male headed respondents indicated that they dry the manure and used it as a fuel.

## 4.5 Institutions in the Region

Goat development project is part of the food security and poverty alleviation programs of the Ministry of Agriculture. There are many institutions in the region which work in collaboration with the Ministry of Agriculture in improving food security and poverty reduction. The main institutions which are active in the region and their responsibilities are described in the Table 9.

Table 9 Institutions and their responsibilities

<b>Institutions</b>	<b>Responsibilities</b>
Ministry of Agriculture (Department of Veterinary Office and Animal Production, Crop Production unit)	<ul style="list-style-type: none"> <li>- Follow up on the health condition of livestock's</li> <li>- Provide health services to beneficiaries when needed</li> <li>- Give training on health care</li> <li>- Research on improved seeds</li> <li>- Extension services in crop production</li> </ul>
Village Administration	<ul style="list-style-type: none"> <li>- Village administration</li> <li>- Was active in selection of beneficiaries during implementation of goat development project</li> <li>- Was involved in supervision of the process of purchasing the goats and was acting as a bridge between the beneficiaries and the institution</li> <li>- Organize community based soil and water conservation practices</li> <li>- Land allocation</li> </ul>
OXFAM international	- Funding of development projects,

	<ul style="list-style-type: none"> <li>- Was active in purchasing, supervision of goats (in goat development project)</li> <li>- Give training of trainers (in the Ministry of Agriculture)</li> </ul>
FAO	<ul style="list-style-type: none"> <li>- Funding of development projects</li> <li>- Give training of trainers on soil, water and biodiversity conservation, livestock management and crop production</li> </ul>
Ministry of Land Water and Environment	<ul style="list-style-type: none"> <li>- Coordinate environmental Actions</li> <li>- Give awareness raising on environmental conservation practices</li> </ul>

As it is indicated in the Table 9 the Ministry of Agriculture (Veterinary and Animal Breeding office), village administration, the selected beneficiary household heads, FAO and OXFAM were participated in the goat development project. The project was aimed to improve the wellbeing of the poorest households in the region. The main beneficiaries of the project were the disabled, widowed, elders and other poor people who were recommended by the village administration.

According to the manager of the goat development project, goats were chosen for intervention mainly for three reasons; first the community have a long tradition of rearing goats, second goats in the region utilize low quality of feed and give good milk and meat in return and thirdly the topography of the region is dominated by mountains and goats can thrive well compared to other livestock's.

#### **4.6 Coping Strategies in Times of Food Shortage**

Crop cultivation was the main source of food and income of the majority of the interviewed household heads. Different studies present a variety of coping strategies that household are likely to adopt when faced with food shortages. Knowing coping strategies employed by households is important to understand how coping strategies applied by the households, increase vulnerability or mitigate the effects of food shortage. The study also explored the ways in which the households response to crises of food shortage.

Households actively try to protect their livelihoods, adopting several actions and mechanisms when faced with shocks and stress that affect their livelihood. These behavioural responses

are termed as coping strategies and encompass a wide range of economic, social, political and behavioural responses to declining food security or perceived threats to food security (Young et al, 2001). Table 10 below shows the main coping strategies that were adopted by male and female headed households in times of food shortage.

Table 10 Households coping strategy

<b>Coping strategy</b>	<b>Female headed households (N=15)</b>		<b>Male headed households (N=15)</b>	
	<b>Number</b>	<b>Percentage (%)</b>	<b>Number</b>	<b>Percentage (%)</b>
Borrow money from relatives/neighbours	1	7	2	13
Consuming planting seeds	3	20	1	7
Selling farm implements	1	7	-	-
Depend on relatives/ neighbours for food	8	53	5	33
Food aid	-	-	3	20
Selling of livestock	3	20	2	13
Casual labour (in garden+ cleaning activities)	3	20	2	13

The main coping strategies which were adopted by the interviewed male and female headed households during periods of crop failure or shortage of food were depending on relatives or neighbours, food aid and work in casual labour (in farms and cleaning activities). This study demonstrated that female headed households used erosive coping strategies such as consume planting seeds, selling/renting of cultivable land and farm implements as compared to male headed households. Consequently this makes them more vulnerable to food insecurity and poverty. Agricultural land is under the government, and is under communal administration, selling/ renting of land is done illegally by making internal agreements (between seller and buyer).



Eritrean communities have developed indigenous social welfare system and ecological coping mechanisms that protect the poor from hunger, starvation, even under most difficult circumstances (GSE, 2004). This is also confirmed in this study, from total interviewed households 53% of the female headed and 33% of the male headed respondents indicate that they depend on their relatives/neighbours in times of food shortage.

Selling of livestock was also one of the strategies adopted by male and female headed households. The interviewed respondents indicated that goats and chicken were the livestock's which were sold during times of food shortage. The literatures also validate this data. Peacock, 2005 stated that goats have a high economic importance and can play a vital role in ensuring the security of family members. In times of trouble, such as crop failure or family illness, goats can be sold and food or medicine is purchased.

## **4.7 Livelihood Outcomes**

### ***Better nutrition and food availability***

Goats provide their owners with milk and meat. The majority of the interviewed household heads consumed milk and meat from the goats. Even though meat consumption was considered expensive by the households, they slaughter goats rarely during religious ceremonies. Increased availability of milk entails a better household nutrition. Generally improvements in the nutrition and food security of households were achieved directly from increased consumption of milk and sometimes meat, and indirectly through additional cash availability to acquire other food stuffs.

### ***Additional cash income***

Goat enterprise provides additional cash income to the households. This is evidenced during this study in which female headed households were able to get cash income of an average of 2816 NAKFA/ year and male headed households an average 3316 NAKFA/year from sale of goats.

### ***Better social status***

Goats also had contribution in the social status of the households. They were used in religious and cultural ceremonies. Moreover goats had a role in improving the social status of the households. Especially for female headed households which have a limited access to

productive resources and employment opportunities, goats provide them with employment and additional income. Therefore to be able to provide the family needs, place them in a better position in society. Livestock are considered as a wealth in rural areas, having goats brings the household heads prestige in the society.

### ***Better asset ownership***

Goats indirectly contributed to improvement of asset ownership of the interviewed households. Households used cash income generated from the sale of goats in purchasing assets. This is evidenced, by households who spent cash income generated from sale of goats on in improving their asset ownership.

### ***Sustainable use of natural resource***

Households used manure from goats in their agricultural fields as a fertilizer. This has two main advantages. First for households who cannot afford to purchase fertilizers and second it improves the soil fertility by providing valuable nutrients and ensure sustainable production of food.

## **Chapter 5 Conclusion and Recommendation**

### **5.1 Conclusions**

The research was designed to examine the impact of goat development project in the livelihood assets. Thirty households were interviewed. The average age of female headed respondent was 40 and that of male headed respondent was 45.

1. Both male and female headed households used cultivation of crops as the main source of living. Most livestock producers in the region were subsistence farmers. The benefits of goats to both household heads were direct and more permanent. These include better nutrition, additional cash income, better asset ownership, and increased self-reliance.
2. The main factors of the study were related to the impact of goat development project in asset ownership, nutrition, financial, social status, labour management in rearing of goats, knowledge in management of goats, and access to natural resources. The main sources of vulnerability for the people were external and internal shocks that include drought, war, and shortage of labour. Female headed households were more vulnerable to food shortage as compared to male headed households.
3. Goat development project had a positive influence in human capital of both male and female headed household by increasing the availability of milk, meat and additional cash income to buy food stuffs. In nutritional sense, goats provide them with a regular supply of high value protein to the families, especially children, who raise them.
4. Labour shortage was seen more in female headed households as compared to male headed households. There was more effective utilization of unpaid family labour, with some exceptions where dependence on relatives/neighbours and the absence of children from school was seen in some households. Both male and female headed households were trained on management of goats and were exposed to new forage production to feed their goats, which have a positive influence in improving their knowledge and experience in management of goats.
5. Goat enterprise was positively associated with social capital of the households. Goats were used in social life of both male and female headed households. The majority of male and female headed households used goats in religious ceremonies, baptism, marriage (dowry), and honouring a guest. Households share milk and also labour in herding of goats this has a positive influence in strengthening their relation and

maintaining contacts with each other. Moreover household heads used cash income generated from sale of goats to provide household obligations. This has a contribution to increase self-reliance especially for female headed households who have limited employment opportunities and access to productive assets; goats provide them with an employment.

6. In both male and female headed household respondents physical capital is positively influenced by the project. Household heads used cash income generated from sale of goats in improving their physical asset ownership. This is evidenced by the households who spent cash income generated from sale of goats in productive assets (such as farm implements and livestock), and non-productive assets (such as tents and household items).
7. Largest portion of the natural pasture in the region was inaccessible; it was conserved as a National Park. Livestock were forced to graze in a small area which could lead to declining of vegetation cover due to overgrazing. Use of manure of goats as fertilizer has a positive impact on the natural capital by improving the soil fertility. Generally natural capital is positively influenced by use of manure as a fertilizer to improve soil fertility and negatively influenced by over grazing. Dumping of manure in water canals also has a negative impact on surface water resources.
8. Goat enterprise had helped households to diversify their livelihood. Financially, the project had a positive influence on the financial capital of the household heads by providing additional cash income from sale of goats. Milk from goats was used only for household consumption. Cash income from sales of goats was mainly directed to household necessities such as sugar, coffee, salt, oil, sorghum, maize, pea, vegetables, clothing, school fees, transportation and medicines, farm implements and household items. In the region, goats distributed to households provide more security and more importantly additional income from sale of live goats. On average male headed households gain a higher cash income (2816 NAKFA/ year) from sale of goats as compared to female headed households which gain an average(1658 NAKFA/year).

An overall conclusion, the result of the survey attests the positive influence of the goat development project in the livelihoods of both male and female headed households. Significant increased productivity from goats can be achieved with better management of goats and better availability of veterinary services. Introduction of goat development project in the region was feasible. Although, there were some obstacles that hinder the productivity

of goats in the region, such kind of project still has the potential of improving food security and reduction of poverty. As a result further promotion of such kind of project is recommended.

## **5.2 Recommendation**

For the goat development project to be more effective the following general recommendations were presented with the aim at improving the performance of goat production.

1. Sustainable goat production can be achieved with the availability of health care services. In order for livestock owners to benefit from health care services, the Ministry of Agriculture need to reconsider the farmers from the village that could give service to livestock owners. Proper health care service and continues follow up to the producers could be done only if veterinary office are as close as possible and easily accessible by livestock owners.
2. During the study it was realized that only half of the trained household heads adopt what they have learnt during trainings. In order to ensure the full adaptation of the trainings, the Ministry of Agriculture and OXFAM should have to take in to consideration of giving subsidise for the inputs.
3. The trainings given included feeding, housing and health care. However in the study it was indicated that many female headed households depended on their close relatives or neighbours for marketing of their goats. This limits their access to market information and benefits from sale of goats. Therefore it is important to incorporate marketing in the training programs to improve their knowledge in marketing.
4. Livestock owners need to form their own organization or groups to solve the problems in management of goats. Organizations/groups can serve a variety of purposes including mutual support, encouragement, and access to concentrates and market information.
5. Livestock owners used natural pasture to feed their goats; however availability of natural pasture is becoming limited due to recurrent drought and overgrazing. As a result natural pastures might not be an option in the near future. There for in order to solve the feed problem goat owners should start to cultivate the forage which was introduced to them during training.

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## Annexes

### Annex 1 Questionnaire

#### Introduction

Hello, my name is..... I'm conducting a research on the effects of goat development project in Northern Red sea region. I assure you that any information given to me is meant only for educational purpose and it is anonymous and confidential. Therefore, you are free to respond these questions honestly. In addition, feel free to ask if you have any doubt. I would appreciate your participation in answering the questions in advance. Thank you for your cooperation.

#### I. Demographic characteristics

1. Serial number of the household head\_\_\_\_\_
2. Sex of the household head Male\_\_\_\_\_ Female\_\_\_\_\_
3. Family size \_\_\_\_\_
4. Age of household head. < 35\_\_\_\_ 36-59\_\_\_\_ 60-69\_\_\_\_ >70\_\_\_\_
5. Marital status: single \_\_\_\_\_ Married \_\_\_\_\_ Widow \_\_\_\_\_ Divorced \_\_\_\_\_
6. What is the source of livelihood of the household? Crop cultivation\_\_\_\_ Livestock rearing\_\_\_\_ non-farm\_\_\_\_\_
7. If cultivation, what are the main type of crops you grow? \_\_\_\_\_
8. What is the size of your farm land in hectares? \_\_\_\_\_

#### II. Physical Asset

9. How many goats do you have now? Old male\_\_\_\_\_ old female\_\_\_\_\_ mature male\_\_\_\_\_ mature female\_\_\_\_\_ young male\_\_\_\_\_ young female \_\_\_\_\_
10. Did you receive goats from the goat project in 2007? Yes\_\_\_\_ No\_\_\_\_\_
11. If yes, how many goats did you receive from the project? Old male\_\_\_\_\_ Old female\_\_\_\_\_ mature male\_\_\_\_\_ mature female\_\_\_\_\_ young male\_\_\_\_\_ young female\_\_\_\_\_
12. How many goats do you own before you receive from the project? Male\_\_\_\_ Female\_\_\_\_
13. Do you have other livestock? Yes\_\_\_\_\_ No\_\_\_\_\_
14. If yes, how many of these types of livestock do you have?

Oxen\_\_\_\_ Donkey\_\_\_\_ Sheep\_\_\_\_ chicken \_\_\_\_\_ Other (Specify) \_\_\_\_\_

15. Which type and number of this livestock do you own from sale of goats?

Oxen\_\_\_\_ Donkey\_\_\_\_ Sheep\_\_\_\_ chicken \_\_\_\_\_ Other (Specify) \_\_\_\_\_

16. What are the most important properties that you able to own from sales of goats?

Farm implements \_\_\_\_\_ House \_\_ household items \_\_\_\_\_ Other \_\_\_\_\_  
specify \_\_\_\_\_

### **III. Human asset**

17. Did you get training on management of goats? Yes \_\_\_\_\_ No \_\_\_\_\_

18. If yes, who gave you the training? \_\_\_\_\_

19. What was the training about?

Housing \_\_\_\_\_ Feeding \_\_\_\_\_ Health care \_\_\_\_\_ marketing \_\_\_\_\_ other \_\_\_\_\_

20. Who attend the training?

21. Did you build house to goats according to trainings given? Yes \_\_\_\_\_ No \_\_\_\_\_

22. If no why? \_\_\_\_\_

23. Who is responsible for breeding of the goats?

Men\_\_\_\_ Women\_\_\_\_ Children \_\_\_\_\_ Hired labour \_\_\_\_\_

24. Who is responsible for herding of the goats?

Men\_\_\_\_ Women\_\_\_\_ Children \_\_\_\_\_ Hired labour \_\_\_\_\_

25. Who is responsible for taking care of the sick goats?

Men\_\_\_\_ Women\_\_\_\_ Children \_\_\_\_\_ Hired labour \_\_\_\_\_

26. Do you have any problems of labour shortage in herding of the goats? yes\_\_ no\_\_

27. If yes, what do you do to solve the problem? \_\_\_\_\_

28. What is your main constraint in rearing of the goats?

Drought \_\_\_\_\_ disease \_\_\_\_\_ Predator \_\_\_\_\_ other \_\_\_\_\_

### **Nutrition**

29. Do you consume milk from the goats? Yes\_\_\_\_ No\_\_\_\_

30. If yes, how many litters of milk do you consume in a day? morning\_\_\_\_ afternoon\_\_\_\_

31. How often do you eat meat from these goats? \_\_\_\_\_
32. In what occasions do you slaughter goats? \_\_\_\_\_
33. Is there any change in the consumption of meat and milk because of the goats you receive? Yes\_\_\_\_\_ No\_\_\_\_\_
34. If yes, what kind of change? \_\_\_\_\_
35. Did you face any shortage of food in household before you receive the goats?  
Yes\_\_\_ No\_\_\_\_\_
36. If yes, what was the main Cause of food shortage? \_\_\_\_\_
37. What was the impact on your food consumption? Skip meals \_\_ reduction ration size \_\_\_\_\_ depend on relatives \_\_\_\_\_ other \_\_\_\_\_
38. What did your household do to overcome this difficult situation?  
Food aid\_\_ Sell farm implements\_\_ Sell livestock\_\_\_\_\_ Sell planting seeds\_\_\_\_\_ other\_\_\_\_\_
39. What are the three main food stuffs that you can buy from the sales of goats, that you didn't able to afford before receiving goats?  
\_\_\_\_\_

#### **IV. Financial Asset**

40. How many goats do you sell per season? minimum\_\_\_\_\_ maximum\_\_\_\_\_
41. What is the average selling price of a goat per season? minimum\_\_\_\_\_ maximum\_\_\_\_\_
42. How many litters of milk do you get per a day in a season? minimum\_\_\_\_\_ maximum\_\_\_\_\_
43. How many lactation days does the goat have in a season? \_\_\_\_\_
44. How many litters of milk do you sell in a day per season? \_\_\_\_\_
45. What is the average selling price of milk? \_\_\_\_\_
46. Do the goats adequately support your family needs in income? Yes\_\_\_ No\_\_\_
47. If yes, what are your three most important needs that the goats could help you to meet?  
School fee \_\_ medical expenses \_\_ food stuff \_\_ Clothing\_\_ Other\_\_\_  
Specify\_\_\_\_\_
48. What percentage of the generated income is spent on food stuff? \_\_\_\_\_

49. What benefits do you get from manure of goats?

Sale\_\_\_\_\_ fertilizer \_\_\_\_\_ Fuel \_\_\_\_\_

50. If for sale, on average how much do you get from sale of manure per year? \_\_\_\_\_

## **V. Social Asset**

51. Do goats have value in your social life?

Yes\_\_\_\_\_ No\_\_\_\_\_

52. If yes, which aspect of your social life do you use goats?

As a gifts\_\_ dowry\_\_ Religious rituals\_\_ Birth of a child\_\_ Funeral\_\_ Honouring a  
gest\_\_ support\_\_\_\_\_ Other\_\_\_\_\_

53. What other social benefits could you get from the goats? \_\_\_\_\_

54. Do you involve in support practices in management of goats? Yes\_\_ No\_\_\_\_\_

55. If yes, what are the support practices in management of goats?

Labour in herding \_\_\_\_ breeding \_\_\_\_\_ treating sick goat \_\_\_\_\_ others\_\_\_\_\_

## **VI. Natural asset**

56. Did you have access to natural pasture? Yes\_\_\_\_\_ No\_\_\_\_\_

57. If yes, how far away is the pasture? Near\_\_\_\_\_ Far\_\_\_\_\_ very far\_\_\_\_\_

58. Do goats have equal access with other livestock to pasture? Yes\_\_\_\_\_ No\_\_\_\_\_

59. Do you think there is enough pasture for the goats? Yes\_\_\_\_\_ No\_\_\_\_\_

60. If no, why? \_\_\_\_\_

61. Do you think the goats have enough water to drink? Yes\_\_\_\_\_ no\_\_\_\_\_

62. If no, what is the reason? \_\_\_\_\_

63. How frequent do you water the goats? \_\_\_\_\_

64. What do you do to overcome the problems of feed and water shortage?

## **VII. Selection procedure**

65. Who selected you to benefit from the project? \_\_\_\_\_

66. How were you selected for the project?

67. What information was provided about the project after the selection?

68. What else did you get from the project apart from goats? \_\_\_\_\_

## **Annex 2 Questionnaire for the Project Manager**

1. Why goats are chosen for intervention?
2. Who are the beneficiaries of the project?
3. Who was responsible for selecting the beneficiaries?
4. Who was responsible for training of the beneficiaries?
5. What was the effect of the training?
6. Who was responsible for selecting and purchasing of the goats?
7. Who else was involved in the project? What was their responsibility?
8. Do you give follow up or support services for the beneficiary households?
9. What are the problems faced by the beneficiaries?
10. How can you determine the output or the result of the project?