Chapter - One

INTRODUCTION

1.1 Background and the Importance of Goats

Goat *(Capra hircus)* is one of the key components of the livestock farming system. It was undoubtedly the first ruminant domesticated by man and that it has been associated with man for up to 10,000 years and also said that it was domesticated besides sheep and dogs. The majority of rural people in developing countries depend on goats for cash, meat, manure, milk and its fiber. Goats are primarily reared for meat and manure and regarded as the second important animal species for generating cash income of the farmers (Gaten et al. 1990).

In Nepal goats are the most demanded common livestock species because of their wide acceptance as a source of animal protein for all religious and ethnic groups. In general all caste and ethnic groups of Nepal accept goat meat. Marginal landless and small farmers are involved in goat enterprise for sustainable income and gainful employment. Livestock and vegetable farming sector is the backbone of rural economy in terms of labour utilization, employment and income generation. Also, goat rearing contributes substantial by improvement in the nutritional status of the people. Based on ecological zones and genotypic characteristics, goat breeds in Nepal include Chyangra, Sinhal, hill goat also known as Khari and Terai goat.

Goats are energetic, inquisitive and versatile in the art of food gathering. They have a greater tendency, than cattle and sheep to change their diet with changing season. Goats spend over half of their total grazing time eating leaves and shoots of trees and bushes and also have

special preference for inflorescences of grasses. Most important, the goat appears to have a superior adoption to tropics because of its ability to conserve water, travel well, and graze selectively and to take willingly a wide variety of vegetation. Semi-arid areas with sparse vegetation, bushes and shrubs cannot support cattle and shit to browsing taste of goats even more than sheep. Mountain areas with steep slopes (above 30^{o} and higher than 2,000 masl cannot be used safely by cattle, but may be used big goats. Special feeding habits are exhibited by goats, this is made possible by their mobile upper lips and very prehensile tongues, goats are able to graze on very short grass and to browse on foliage which is not the common feed of other livestock. Goats can be profitably utilized to browse plants into milk and meat unlike other ruminants goats have higher crude fibred digestibility and also can adjusted to scarcity fodder conditions.

Importance of Goats in Nepal

Nepal is predominantly an agricultural country. The proportion of population engaged in agriculture is 65.6 percent (Agriculture survey, 2001). Agriculture sector (including livestock, forestry and fishery) is the major contributor to Gross Domestic Product. Out of the total AGDP, the contribution of livestock sector is 31.5 percent. The total livestock population of country is 17,902,361. Among the domesticated animals cattle occupies 32 percent. Goat contributed about 19.45 percent to the national livestock gross domestic product (CBS, 2001).After buffalo; goat is second biggest source of meat in Nepal. The Agriculture Perspective Plan (1995) has estimated the contribution of livestock GDP to increase from 31 percent before APP level to 45 percent in the last period. In 1990/91, the population of goat was 5,366,946 till 2003/04the number of goat has increased to 6,979,875 (MoAC). Data shows that in 1981 to

1999 the number of per household goat was decreased by 4.6 to 3.99. Seventy two percent of goats are located in hill and mountain regions. About 51 percent goats in the hills of Nepal are mostly the poor farmers who hold about 0.1 to 1 hectare of land. Landless farmers have marginal number of goats i.e. 0.46 percent of the total goat population (CBS, 2001). Every year Nepal imports 300-500thousand goats annually either from India or Tibet to fulfill the demand of goat meat (anonymous,1995) . Total amount of Nepalese currency that goes India from Nepal appears to 50 crores each year (Kharel, 2000).

Mahatma Gandhi said that goats are a 'poor man's cow' because it gives meat, manure, milk as well as cash income to poor people. Goat is a means of transport in the Trans Himalayan region. It is also the source of hides that turns into water bags and the source of hair and fleece in making Fere and pashmina (woolen shawl). The importance of goat in the rural economy is evidenced by its unparalleled economic traits, ability to get acclimatized under diversified agro climatic condition, unfastidious type in choosing of available forage; high fertility and short generation interval; practically no religious restrictions for goat and its products; economically goat is ideally suited for poorer rural folk especially for marginal, landless labourers by its low cost maintenance short-term return or capital with low risk capital investment, no investment of extraneous labor, as such, the entire rural household members especially women folk and children are brought into the gamut of activities.

Goats are one of the most important livestock commodities in Nepalese farming system. In Nepal, goats are used as pack animals (Karnali Trock), as source of income generation, as source of raw materials of cottage industry, as maintains soil fertility, as employment generation, as mutton production and supply of animal protein, as potential cash

insurance for farmers in case of emergency. In this context, the most challenging issue in rural livelihood depends on sustainable goat production, which contributes to poverty reduction in rural areas.

1.2 Statement of the Problem

Increasing poverty is a burning issue of Nepal. Poverty exists everywhere but it is crucial and debilitating in developing countries, where more than one person in five subsists on less than US$ 1 per day (WDR, 2000). In Nepal, 85.8 percent people are living in vast rural areas and facing deadly problem of poverty. Developed countries are catching more and more opportunities but in countries like ours we are trapped in the deepened ring of poverty. Our physical and social infrastructures are destroyed day by day and the gap between the haves and haves not is also widened. This has led to the frustration of the poor people. They are isolated from society by so called elites. The ability of rural people is so limited that they are not able to meet their hand to mouth requirement. Lack of basic health opportunities fail to give education to their children and the maternal health is also in frustrating condition.

Nepal is predominated by vast rural areas. Only 14.2 percent of the people are living in urban areas. So the magnitude of poverty is much wide spread in rural areas. However the recent government date indicates that poverty incidence in the country declined from 42 percent 1995-96 to 31 percent (CBS, 2003-04). The incidence of poverty in Nepal declined by about 11 percent over the time of eight years, a decline of 3.7 percent per year. The incidence of poverty in urban areas has more than halved (it declined from 22 to 10 percent), but the incidence of poverty remained higher in rural areas. Mainly facing the arm conflict, more than thousand were killed and also thousands are displaced. Rural infrastructure and

government services are limited in remote areas. Over 95 percent of the poor people are still living in rural areas and remaining 5 percent live in urban areas. According to government data, the gap between the haves and have not is widened. As a result of unequal growth in per capita consumption across different income groups and geographic regions, inequality increased substantially. The poverty rate remain and much higher in rural areas.

In this context, goat keeping is the effective fighting equipment for mitigating of rural poverty. Goats are the cow of rural poor. That means goats are called living bank of rural poor. A goat eats little and occupies small area. We can change the face of rural poor only by economic upliftment, i.e. income generation. Goat keeping is that kind of sector which can easily started by limited resources by using limited resource, we can improve economic condition and that leads the overall improvement on their daily livelihood. So that goat keeping is the only one essential alternative sector for rural poverty alleviation.

1.3 Significance of the Study

Goat farming is a well-known phenomenon among rural people. Goats are the source of meat, milk, money and manure. It is the source of insurance for rural poor. It is a known fact that a large fraction of rural population is living under poverty line, i.e. extreme poverty. This study intends to measure the current status of goat rearing in the study area. It will also attempt to explore the relation between poverty and goat rearing. Income-generation is the most essential factor for alleviating rural poverty. Therefore this study will try to give the potential path for rural poverty alleviation.

This study has great importance at national and local levels. At the national level, it will be very helpful to make plan and policies for poverty alleviation. This study will also indicates some way to the future researchers and also offer information to the people interested in goat rearing.

1.4 Objectives of the Study

The general objective of the study is to examine and analyze the role of goat rearing in alleviating rural poverty. It has the following specific objectives:

1. To identify the current status of goat rearing in the study area
2. To explore the contribution of goat rearing in income generation.
3. To analyze the level of income of people before and after improving goat management.
4. To propose the appropriate model of goat rearing for rural poor.

1.5 Limitation of the Study

Each and every research work has its own limitation likewise, this study is also not an exception, the study is being undertaken under time and resource constraints. The study carried out in Kalanti Bhumidanda village development committee of Kavrepalanchok district. The other limitations of the study are as follows:

a. There are many dimension of poverty but this study focus to assess the poverty related to income generation.

b. This study intends to focus on goat rearing, so it covers those household who have more than 5 goats.
c. The possible outcome may or may not be generalized in the case of goat rearing in other areas of Nepal, due to the differences in topography, available resources and knowledge of the farmers.
d. This study mainly is based on primary data.

1.6 Organization of the Study

This study is divided into five chapters. The first chapter is introductory which includes background of the study, statement of the problem, objectives, significant limitation and organization of the study.

The second chapter deals with literature review in which theoretical literature and empirical literature are described. Mainly, theoretical review covered books information and empirical review covered reports, documents, magazine about goat rearing.

Third chapter is concerned with methodology of the study, which included the research design selection of the study area, nature and sources of data, universe and sample, data collection techniques tools and methods of data analysis and interpretation procedure.

Chapter four mainly concerned with finding and discussion which includes existing production system, goat herd composition, reproductive parameter related to goat economy, goat breeds, preference for domestic animals, goats contribution in income generation, level of income of people before and after improvement in goat management, and finally projection of appropriate model of goat rearing for rural poor.

In the last chapter summary, conclusions and Recommendations are included.

Chapter - Two

LITERATURE REVIEW

Literature review is the fundamental part of any research studies. It show how the topic under study related to the previous studies. It gains background information of the problem under investigation. Mainly, literature review acquire past knowledge linking with present studies. The objectives of reviewing the literature are being clarity and focus to one's research problem, improve ones methodology and broaden one's knowledge base in one's research areas. In this chapter attempt has been made to review the past and current literature related to goat rearing to make linkage for rural poverty alleviation.

There is a little information related to goat rearing. In the context of Nepal goat rearing is in a traditional management system that has not been commercialization. Goat husbandry in Nepal is mainly related to subsistence agriculture. In this work literature review is divided in two parts as follows.

2.1 Theoretical Review

This review gives the clear information about theoretical knowledge about goat and its rearing technique. Mainly it gives the background information about goats.

2.1.1 Common Breeds of Goats in Nepal

Mainly, there are three types of goats found in Nepal.

2.1.1.1. Indigenous Breeds of Goat

Indigenous breeds of goat contribute in rural economy of Nepal. Four common goat breeds have been recognized as indigenous goats. They are

Chyangra, Sinhal, Khari (hill goats) and Terai goat, which are distributed on different Eco-zones of the country.

a. Chyangra:

Chyangra goats are raised in trans- Himalayan region of Nepal above 2400 masl. They are managed under migratory system along with Bhyanglung sheep .The Chyangra population has been estimated to be about 6 percent of the total goat population in the country (Joshi and Shrestha, 2002). They are easily recognized by their spirally coiled horn scimitar type heteronymous as well as homonymous twisted horns (17-28cm). Pashmina or cashmere is found beneath the coarse but Silky longer hair. The average adult body weight is 35.0-40.0 kg and 27.0-30.0 kg for male and female respectively.

b. Sinhal:

Sinhal is mountain breed of goat mostly found on the southern flank of the high mountain region from 1500 to 3000 masl. They are generally kept with Baruwal sheep as a mixed flock. Sinhal breed comprises of about 35 percent of the total goat population in the country. This breed is heaviest among the native goat breeds of Nepal. The average adult body weight of male and female goats is 42.0 kg and 35.0 kg respectively with average wither height 67 cm.

c. Khari/Aule:

Khari goat is most commonly raised breed in mid hills compared to other indigenous breeds (Kharel, et al. 1998). These goats have relatively small body size with body weight ranging between 20.0-40.0 kg. The average wither height is 53-63 cm. They are more prolific among the four indigenous breeds and have a wide adaptation in different agro climatic

zones. They generally produce first kid by the age of 16 months with the kidding interval of 9 months. From the different location of Nepal (east to west), seven color variants were identified with dominance of black followed by brown (Kharel, *et al*, 1998).

d. Terai Goats:

Terai goats are mostly found in southern plains (Terai) of Nepal, this breeds constitute about 9 percent of the total goat population. This breed said to be developed from the population originating from the Jamunapari and native breeds. A wise range of variation is found within this breed. Goat colours vary from black, white, brown, brown mixed with red, black with white marking, ash colour to black and white on ear. The range of adult body weight of male 30.0-32.0 kg and that of female is 18.0-32.0 kg. Terai and hill goats are also similar in terms of prolificacy.

2.1.1.2 Exotic Goat Breeds Introduced in Nepal

Many exotic breeds of goat were introduced in Nepal during the late 1950s; the main aim was to develop half breed goat to improve in meat production. Following exotic breeds were introduced in Nepal.

Table 2.1: Exotic Goat Breeds Introduced in Nepal

Breed	Origin	Adult Body Weight (kg)	Wither height (cm)	Suitable rearing region
Jamunapari	Madhya Pradesh, India	65-75	70-110	Terai & Hill region
Barbari	Barbara of Somali, Africa	35.8 male 22.6 female	70.7 male 56.2 female	Arid & Semi arid region
Beetal	Punjab and Hariyana	59 male 35 female	91 male 77 female	Terai
Saanen	Switzerland	75 male 65 female	Average 75-90 cm	Terai & hill region
Damascus	Syria, Lebanon and Cyprus	60 male 55 female	Average 58-65 cm	Terai & hill region

Source: Upreti, 2000

2.1.1.3 Crossbred Goats in Nepal

Research and development agencies of Nepal are involved in improving the productivity of indigenous goats by cross breeding mostly with Indian goat breeds by using exotic bucks in local does. Government form/research stations are aimed produce purebred or cross bread males for distribution to the farmers to upgrade their animals. However, it has been realized though lately that indigenous goats under the prevailing environment and production system are productive and economic compared to the exotic breeds due to their high prolificacy and disease resistance ability.

a. Jamunapari × Khari:

The average adult body weight of crossbred (50% Jamunapari × 50% khari) male goat was 52 kg, and the adult female was 34 kg. The crossbred included both first filial (F_1) generation and crossbred from intermating of first cross. The yearling weight was 15.6 and 14.5 kg for male and female respectively. (Oli, 1988 Kunwar, 2001) have reported slightly higher yearling weights of crossbred goats between 17.7 to 22.0 kg. The average body length, wither height and chest girth of the crossbred goats were larger than those of Khari and were similar to those of Jamunapari goats. The crossbred are found in Terai and low hills of Nepal.

b. Barbari × Khari:

The adult body weight of the first cross between Barbari (male) and Khari (female) is slightly bigger than those of both pure bred parents . However, yearling, weight of crossbred is similar to that of Khari goats. The age at first kidding (564 days) and kidding interval (286 days) are

comparable to those of Khari. Multiple births rate in crossbred goat are high (58.33%). The crossbred are found in Terai and mid hill of Nepal.

c. Saanen ×Khari:

The adult body size of the crossbred between (Saanen male × Khari female) is about 48 kg, with average age at first kidding of 423 days and kidding interval of 257 days. The average lactation yield is about 148 liter in a lactation period of 134 days. Multiple birth rate in also very high (91%). However, cross breeding with Saanen is not very common in Nepal. (Upreti, 2001)

d. Kiko × Khari:

The kiko crossbred goat was first produced in Nepal with importation of frozen semen of kiko goats from New Zealand. The adult body size and yearling weight both male and female crossbred is found to be higher than the khari goats. Multiple births are moderate (33%). The average age at the first kidding and kidding intervals are 576 days and 496 days respectively.

2.1.2 Population and Distribution of Goats in Nepal

In Nepal, the total goat population is estimated to be about 6.97 million head during 2004, (CBS, 2004). The average annual increment of the goat population in the country was 3.05 percent during the last decade (1991-2004) and is presented in table 2.2.

Table 2.2: Population and Distribution of Goats

Year	Numbers	Annual Increase (%)	Meat (Metric tons)
1991	5366946	-	29372
1992	5405793	0.72	29844
1993	5451710	0.85	30377
1994	5524657	1.34	30702
1995	5649056	2.25	30908
1996	5783140	2.37	32040
1997	5921956	2.4	34550
1998	6080060	2.67	35640
1999	6204616	2.05	36235
2000	6325144	1.94	36930
2001	6478380	2.42	37769
2002	6606858	1.98	38584
2003	6791861	2.80	39664
2004	6979875	2.77	40540

Source: MoAC, 2005

Table 2.3: Goat Population of Five Regions in Different Years

Regions	1981/82 CBS	1986/87 MoAC	1991/92 CBS	1996/97 MoAC	1998/99 MoAC	2002/003 MoAC
Eastern	292158	1406333	1383334	1487837	292158	1759728
Central	1237607	1548390	1712089	1794300	17966555	1764302
Western	544174	1044620	1087127	1129900	544174	1290816
Mid-Western	473395	774362	899574	1048049	1176691	1198687
Far-western	272894	316228	430416	461870	500334	593325
Total	2820228	5089933	5512540	5921956	6204616	6606858

Source: MoAC and CBS, 2004

2.1.3 Importance of Goat

Attempts to increase research and development effort on goats will need to cognisance of the pattern of ownership of goats in developing countries. Such effort must be addressed mainly to the smallholders or peasant farmers and landless agricultural laborers, who represent most of the world's poor. Goats are often reared together by small farmers, which has definite advantages, perhaps the most important one of which is effective utilization of the feed resources. Goats are values primarily for

the production of meat, milk, skins and fibre (Nair, Mohair and Pashmina). The magnitude of this contribution by goats is not known, but it is likely to be very much more significant than in generally recognized.

2.1.3.1 Meat Production

The preference for goat meat is probably related to certain special features (including its distinctive flavors) which make it quite different from mutton. Whereas, in sheep, the fat is distributed all over the body, visceral fat deposition is characteristic of goats (Villegas et al. 1938). This, in turn, affects the succulence and tenderness of meat. Weight for weight, goat meat has a higher lean content than mutton. Owen *et al.* (1977) for example, showed that, at all ages indigenous male and female goats had a significantly higher percentage of muscle and bone and a lower fat percentage. In most of Asian and African countries, goat meat is most preferred. In Nepal, goats are used as holly animal and sacrifices to the gods in the festival. Goat meat is accepted by almost all ethnic groups and is one of the most expensive meats. It share about 20 percent of the total meat production in the country equivalent to 40.5 thousands metric tons of meat, which, at the current price value is worth to 130 million US$ per annum (MoAC, 2004).

2.1.3.2 Milk Production

Almost a third of the world's goat population is found in Southeast Asia, where goats are of great importance as a source of milk and milk product (as well as meat) for the subsistence farmers, most of who exist in extreme poverty. In temperate countries, where goats are used primary or exclusively for milk production, claims have been made that goat milk has important advantages over cow milk for human nutrition. Jenness (1980) in his recent review on the composition of goat milk, he

concentrates on a comparison of goat milk, with human milk and also cow milk. The protein content of goat milk is much higher than that of human milk in relation to total calories. The total energy supplied by goat milk is derived 50 percent from fat and 25 percent each from lactose and protein where as the proportion for human milk are 55 percent from fat, 38 percent from lactose, and only 7 percent from protein. Jenness considers that the higher proportion of smaller fat globules in goat milk as compared to cow milk is unlikely to affect digestibility; he considers that the higher proportion of short-and-medium-chain fatty acids may be of greater significance for ease of digestion. In regard to minerals, go at milk is an excellent source of calcium and phosphorus, which are present in excess of the infant requirement. Excess of potassium and chloride, however, was blamed for the severe acidosis which developed in an infant fed on undiluted raw goat milk (Harrison et al. 1979). Goat milk contains an adequacy or excess of vitamins except C and D., pyridoxine and folic acid. Cow milk is adequate in all except vitamins C and D. Folic acid deficiency is the main cause of the anemia suffered by infants fed solely on goat milk. The milk production of goat has played an important role in the developed country. A goat can be called miniature cow which produces good milk it need not nutritive fodders as a cow and sheep needs. Goat milk has been used for production of soft cheese in recent years in some parts of Nepal that indicates the wider scope of goat milk. Goat cheese is an important product in many European countries as well as in the Middle East. Syria and Libya produce 50 percent of the world goat cheese. Goat milk also used in cosmetic industry and as medicine in eye sore caused by toxic effect of tallow tree and in skin wounds in rural area.

Table 2.4: Comparative Average Composition of Milks

Item	Goat	Cow	Human
Fat %	3.80	3.60	4.00
Solid not fat%	8.90	9.00	8.90
Lactose %	4.10	4.70	6.90
Nitrogen × 6.38%	3.40	3.20	1.20
Protein %	3.00	3.00	1.30
Casein , %	2.40	2.60	0.40
Albumin, Globulin, %	0.60	0.60	0.70
Non-Prot. Nitr × 6.38%	0.40	0.20	0.10
Calcium, (CaO) %	0.19	0.18	0.04
Phosphorus, (P_2, O_5) %	0.27	0.23	0.06
Chloride, %	0.15	0.10	0.06
Calories/100 ml	70.00	69.00	68.00

Source: Extension of Goat Handbook, 1995

2.1.3.3 Skin and Fiber Production

The skins and fiber of goat have a number of commercial and economic values. It will promote the foreign trade and can earn foreign currencies. Goat skin is highly valued in European market. In Nepal, the annual collection and processing of the goat skin is about 1.6 million units. In our context, we consumed meat without separate its skin. Mainly in Muslim community they prefer meat without skin. These skins are used largely in the manufacture shoe and lather factory. In addition to the skins, goat hair is a valuable commodity. Common goat hair is a cheap fiber, but mohair and cashmere are specialist fibers of high price per unit weight. Common goat hair is used mainly for the manufacture of cheap felts and carpets for the automobile industry. The fiber-producing goat yields about 200-300 gm of lone coarse hairs (generally shared in spring), which is used for making ropes, sacks and coarse blankets.

The mountain goat produce the inner fine wool that is called Pashmina or cash mere found under neat the long hair covering the body. China, Mongolia, Afghanistan, Russia, and India are the major Pashmina

producing countries of the world. Pakistan is the biggest single exporter of goat skin and hair. It's annual production is about 3500 metric tons of goat fiber of which 80 percent is clipped, and 20 percent is from skins. The annual production of Pashmina is estimated to be about 40 mt. in Nepal. In the hilly region of Nepal, where people poor and can not buy woolen clothes, they use the hair of goats to weave clothes. People in Jumla and Humla use the goat wool for making a variety clothes. (Mainly Ferre)

2.1.3.4 Manure and Haulage

Goat is important source of manure for the agricultural field. It is estimated that a single adult goat gives 700 gm fresh manure per day. A goat is likely to produce 1-2 percent of its weight as dry mater (DM) of manure per day. Urine is particularly rich in Nitrogen and Potassium (Joshi et al, 1990). The goat faecal contain 40-60 percent moisture, 1-3 percent nitrogen, 0.2-0.8 percent phosphorus, 0.4-0.8 percent of potassium and other elements. The goat manure is superior containing 0.83 percent Nitrogen on a fresh weight basis compared to 0.25 percent and 0.33 percent in the faecal of cattle and Buffalo (Oli, 1988). The system of in situ field manure still exists in hills of Nepal and other countries is which, the flock owners get rewards in kind or cash for the manure field. The annual production of goat manure is estimated at 11 million tons in Nepal. And other side goats are used for carrying load (household consumables) in western mountains region of Nepal. The income from load carrying is of much importance to the farmers of this region.

2.1.4 Goat Rearing Compared to other Bovine Livestock

Goat keeping is the backbone of poor countries. There is more economic potential and prospects of goat rearing, in mainly, the question how they may best be utilized to the advantage of mankind. The most important benefits of goat keeping compare to other Bovine on as following:

1. Small size is significant from a number of aspects:

a. *Economic:* Low individual values mean a small initial investment and correspondingly small risk of loss by individual death. This has contributed to the neglect of the goat by many government authorities, but makes it an attractive proposition for household use and subsistence farming, especially for poor families.

b. *Managerial:* Goats can easily be cared for by women and children, occupy little housing space, and supply both meat and milk in adequate quantities suitable for immediate family consumption, which is important in view of the difficulties of storage in the tropics.

c. *Biological:* one or two goat can be kept when nutrition is not adequately for even one cow.

2. Typical feeding habits and preference for browse are behavioural traits which distinguish goats sharply from cattle (Rose innes and mabey, 1964).

3. Their high digestive efficiently for cellulose (Crude fibre) is one of the most significant characteristics of the species, and is probably the foundation of their ability to survive in nutritional environments which would not support cattle. Goats are also efficient producers of milk, and can complete in this respect with

cows, particularly in adverse tropical environments. In some circumstances, goat provides significant amounts of milk where cows can not exist, e.g. Black Bangal goats in the Sinai desert (Devendra, 1981).

4. Their high fertility and short generation interval favour early economic viability of new goat farming projects. Milk production begins the months after the initial mating of a foundation herd, and the first carcass may be on sale in less than years. In contrast, milk production in a herd of cows can not begin for least nine months and under tropical conditions cattle are not usually ready for slaughter until at least three years of age.

   In regard to unimproved indigenous goats in developing countries, these are commonly described as "Unproductive" and "non-descript", both terms being apparently used in a derogatory sense.

2.2 Empirical Review

This review mainly focus on empirical study about goats.

Empirical study on related to the multiple aspect of goat rearing was conducted be different researchers. Empirical review mainly the based on different reports, articles, thesis and other previous research. Goat rearing is proved day by day as 'poor mans cow' in subsistence farming to change rural livelihood conditions. Mainly, in this section some empirical study about goat rearing will be review in following paragraphs.

Devendra (1981 and 1982) has recently reviewed the available publications on the economic of goat enterprise in various tropical and subtropical countries. Several studies considered the economic situation where only goats were reared, for example in Trindad, Venezuela, India

and Peru. Others, however, have considered the relative economic value of rearing goats versus cattle. He reported that under migratory and stationary conditions, the income earned from goats were higher than from cattle. In Cyprus, the net returns from goats were found to be higher than those from sheep for average production units. More recently he reported that the net profits from rearing 30 meat goats, in comparison with malpura sheep in Rajasthan, India, gave a profit of Rs. 823.5 per year for goats and a loss of Rs. 134.0 for sheep. The higher profits for goats were attributed to higher prolificacy and lower mortality (Devendra, 1982).

Ecker, (1978) conducted an empirical study in Punjab with the aim of the question whether the income situation of the rural sub-stratum can be improved by expanding or introducing sheep and goat keeping. In his empirical study "socio-economics of sheep and goat production in Pakistan's Punjab (1978) explained that the goat and sheep play a significant role to raise the income level of agricultural marginal farmers and landless agricultural laboures developed with a few years. According the landless and marginal farmers, buffalo and cow keeping allows a significantly better fodder utilization, it need big investment and the risk is too high in other side goat herd will be rise in low investment, less labour input, less amount of fodder utilization and the lesser risk of capital (Ecker ferdinand, 1978)

Shrestha, (1978) pointed out that being a heterogeneous geographic condition the possibility of goat keeping in Nepal is very widely. Being an agricultural country goat plays significant role. He explained that the goat husbandry is more beneficial then other farming in the hilly and dried region where qualitative feeding are not available because the goat need not need huge qualitative feeding. Mainly in hilly and high hilly

region where cultivation is not applicable and difficult to keep cattle and buffalo but it is suitable for goat husbandry. He concluded that every year Nepal imports a mass number sheep and goat from the neighbours countries (India and China). This import lead the flight of capital, so to check this capital we have to give primary importance for goat husbandry in Nepal (Shrestha, 1978).

More recently Shrestha, et al. (2006) conducted a study. This study focus that goat marketing has not been well managed due to various marketing and infrastructure constraints. The current market price of goat meat has increased by four fold as compared to last fifteen years. They pointed that there is a good possibilities of goat production due to low cost of production and high market demand. Management of goat market in Nepal is poor as compared to other food grain and vegetable market. They cited that infrastructure for goat market has not been developed so, farmer are compelled to sell his product in low price. Mainly they stressed on the ineffective price fixing policy (Shrestha, et al. 2006).

NARC, Out Reach Research division has conducted a case study on Socio-economic study on goat farming in Bandipur. The case study summaries the outcomes that the farmer still have hesitation to adopt the improved goat breeds because of high incidence of disease. Unavailability of quality fodder, forage and breeding buck and poor management farmers have put a great effort to enhance their living condition but they are confronted with limited resources such as pasture land fodder, forage, Socio-economic and technical constraints. They conclude that commercialization of improved goat rearing generates farm income and increase employment opportunities in the area closed to the Prithvihigh way. Mainly, the study suggested to develop appropriate goat research strategy, give intensive training on control of livestock disease

and off -season vegetable cultivation, breed should be selected on disease resistance basis with local management and farmers should be encourage to stall feeding (NARC, 2003).

Shrestha, (1979) explained the possibility of goats raw hides and skins export from Nepal. To promote the economy of the country, for capture a large share in the international market and to provide employment opportunities, the goat skins helps for the diversification of export trade of Nepal. He pointed that due to an agricultural country. Goat rearing is the must vital economy force. A good number of goats can be find in Nepal, so through the exports of goat skins Nepal not only saves and earns more foreign exchange, but also broaden our production pattern, creates more employment, acquires new skills, utilize wasteful resource and also captures international market (Shrestha, 1979).

Joshi, (2004) pointed out that small ruminants are an important source of cash generation and livelihood for resource poor farming communities (Including women and marginal farmers) who are unable to invest in large ruminants. These animals are an important source of liquid assets for poor farm families and women during the time of famine, illness and emergencies. His study pointed that wool and hairs of the animals are used for making rugs and Bakhu locally in the villages, thus providing self employment and cash generating opportunity to the village women. He added that small ruminant production is important for the sustenance of the overall farming systems (Joshi, 2004).

Shrestha and Joshi (1999) presented that migratory management of small ruminants is an important traditional means of livelihood in the high hills and mountains of Nepal. Sheep and goats under this system are reared for

multiple function meat, wool; manure and transportation are the important contribution made by these migratory small ruminants besides these animals being handy source of cash in the time of need to quench household requirements (Shrestha and Joshi, 1999).

Kantipur daily presented an example of goat rearing in Kabhrepalanchowk district. News reported that mainly deprived women change their overall status. In a NGOs help to form women's group and distribute some goat to group women. They rears goat and after birth, they have to give the kids to next group, this leads expand on goat in villages. Kantipur noted that they get profit by selling of milk and meat. Before staring to goat rearing, they were deprived and feel hesitation to face public and were not able to fulfill of basic needs suffered extreme poverty. But now their status and confident was drastically changed. One women of the group said that Initially we thought we could not get more income by goat rearing and we are not believe in it, but when our groups gone to field trips our attitude was dramatically changed. Now these women are educating their children in boarding school (Kantipur, 2062).

Kantipur has further explained that the people of Chitwan-2, Takatara, Makwanpur district started to keep the goats for milk purpose. According to the local farmer, Ram Hari Bindari, funded by French Government he build cheese production centre and formed 'Chandragiri cheese production group'. Now cheese centre is daily collects 15-20 liters goat milk and produce daily 3-5 kg cheese. Farmer get 35-40 rupees for a liter of goat milk. Mainly, now a large number of people are encouraged to goat rearing for change their economic status and support their livelihood condition (Kantipur, 2062).

Kantipur presented another example of goat rearing. Nimal chandra Lamsal, 35, is rearing goats in large number. He earned 3 lakhs annually in his village he was in South Korea, working 16 hours daily. He was not benefited and return back to start the goat rearing business from two years. He started goat rearing from 40 goats and till now more than 400 goats are in his herds. He expressed that improve goat gives 2 to more then 6 kids on a birth. He has 6 modern herds and worked 6 helpers. District office awarded him as the "Model farmer of the district" this year. Now he has 8 hec. areas of improved grass field. Impressed from his performance other people of the villages have started to goat rearing (Kantipur, 2062).

Shrestha, (1994) conducted a study, economic returns from goat work done at eastern and western hill of Nepal. His study concluded the annual economic returns by sold a male goat for one parity as presented on below table:

Table 2.5: Economic Returns from Different Breeds

Breed	Economic Returns (Rs)					
	Meat	Manure	Urine	Hide	Skin	Total
Khari	3325	222	65	20	105	3737
Shinhal	3125	222	65	20	105	3537
Khari ×Jamunapari	3375	222	65	20	105	3749
Khari × Barbari	3299	222	65	20	105	3711
Khari × Kiko	3115	222	65	20	105	3527
Jamunapari	2510	222	65	20	105	2962
Barbari	2932	222	65	20	105	3344

This table has compared the economic returns among 7 different breeds of goat. Mainly, Khari × Jamunapari give highest returns but it takes long time for first kidding (Shrestha, 1994).

Shrestha, (1994) conducted another study Goat Production System in Ghansekuwa, Tanahu. In this study he examined the existence production

system of goat. Mainly, he included economic parameter like body weight, monthly average body weight, kidding interval, litter size, twinning ability, kids\mortality etc. on goat selling per household is Rs. 2901.80. Goats used for home consumption valued equivalent to Rs. 1159.20 per household (Shrestha, 1994).

Normally, the returns from the goat are highly depended on the some economic parameter of goats. Economic parameter included kidding percent, twinning percent, kids mortality kidding interval, body weight etc.

NARC, (2001/2002) reported the result of a health research conducted in Palpa District. The result clearly expressed the economic status of before the program implementation and after program implementation. It can be clearly seen from the following table.

Table 2.6: Indicators of Improvement

Indicators of improvement	Program implementation	
	Before	After
Kidding percent	73.00	100.00
Twinning percent	8.00	16.00
Kid mortality due to disease	28.00	2.50
Body weight of yearling male kids (kg)	11.50	19.00
Total flock strength of goat in the village	193.00	305.00
Total income from goat raising (18 household) (Rs.)	14570.00	70845.00

In another case of parasite control and feed supplementation with locally available feed and mineral the improvement in overall productivity in goat population was highly encouraging significant improvement were recorded in kid survival, kidding and twinning percent and yearling body weight of male kids (NARC, 2001/2002).

Shrestha, (1998) conducted a study on intervention to increase productivity of hills goats. The experiment take 56 does and 4 bucks of

the hill goat breed from the near by village. Lateron, 15 does and 1 buck were placed in each of the following three treatments.

Treatment A: Control grazing 6-8 hours per day and supplemented with native fodder grass 1.5 kg per animal during the night time.

Treatment B: Treatment A + supplemented with improved fodder grasses. Maize + Cowpea + Stylo + Desmodium in summer.

After 15 month experiment treatment A give 15 no of kidding, B give 19 no. of kidding and C give 19 no. of kidding. The number of kidding is higher in treatment B and C and also treatment A gave 1 twins, B gave 4 twins and C gave 5 twins. The experiment concluded that by adding feed supplement we getting the higher productivity from goat (Shrestha, 1998).

Upreti presented a report on reproductive performance of 7 breed of goats. The result showed that Khari was superior in all reproductive trait such as age at first kidding, kidding interval, kidding rate and kid wean per doe. It has indicated the need of promotion of khari goat farming in the hills of Nepal. Similar type of observation has been made in eastern hills. Neuopane (2000) reported lower weaning litter size. (1.39) number with higher kidding interval in western hills indicating the possibility of 3 kidding in 2 years. These important reproductive traits could be the beauty of Khari breed to get high economic rate of return (Upreti et al. 1996).

Chapter - Three

RESEARCH METHODOLOGY

3.1 Introduction

Research methodology refers to various sequential steps adopted by a researcher in studying a problem with certain object in view. This chapter presents the methods used to collect the qualitative data needed for the research. This section has discussed about research design, rational of the selection of the study site, nature and source of data collection, sampling procedure, data collection instruments, modes of data analysis and interpretation.

3.2 Research Design

Research design refers to the arrangement of condition and analysis of data in a manner that aims to be combined relevance information to the research purpose. This research study mainly refers to the status of goat rearing and its involvement in income generation of Kalati Bhumindanda VDC of Kavrepalanchok District. This study mainly based on descriptive data presentation. The opinions, behaviors experience, and characteristics of respondents have studied in detail in order to describe the events occurring at present whereas explanatory research design has applied to know in depth study of the respondents. This study has analyzed the level of income of people before and after improving in goat management by using analytical research design.

3.3 Selection of the Study Area

Kavrepalanchok District is one of the mid-hills district of Nepal in Bagmati zone. This district covers 1396 sq.km. and the elevation range

between 318 masl to 3018 masl. According to Census 2001, the population of this District is 385,218 and it has 87 VDC, 3 election constituencies, 15 Ilakas and 3 municipalities. In terms of natural ressource availability, this District ranks 3rd among 75 district of the country. The total number of households in 70,509 with the average household size of 5.47. In this District, 64 percent of the people (aged above 6 years) are literate and 64.45 percent of the people are directly engaged in agriculture. There is an area of 37, 404 hectares of arable land and potato is the main cash crops of the district. The number of domestic animals is also higher than other districts. There are 176140 buffalos and 2, 25,331 goat. The border of this VDC is connected with Lalitpur District. This VDC is surrounded by Dhungkharka, Chalal Ganesthan and Kushadevi VDC and also Panauti Municipality. This VDC cover an area of 27.28 sq.km and the population is 3801, (Males 1803 and female 1998). The total number of households is 763 and the average household size is 4.98 in number.

The research site was selected due to eagerness and keen interest of researcher to get knowledge and information about goat rearing. Among the other VDCs, the researcher selected this VDC because the proportion of goat rearing is larger than other VDCs, and also for the past few years, this VDC is being developed with the concept of goat rearing for rural poverty alleviation.

3.4 Nature and Source of Data

The source of data was primary and secondary. The primary source of data intended to get from structure questionnaire that was prepared to generate the realistic and accurate data from household survey. The respondents were interviewed to collect the required data. Secondary data

has been collected from published and unpublished documents, journals, bulletins, experts and related organizations involved in goat rearing and rural poverty.

3.5 Universe and Sample

Those household who have more then 5 goats and lived on Kalanti Bhumidanda VDC were the universe of the study. Mainly out of total 763 households 6 percent goat keeping farmer household were selected for this study. To specify the study out of nine wards, two wards (wards 3 and 9) were selected as cluster sampling methods. By using the purposive sampling method 24 households of ward 3 and 23 household of ward 9 were enumerated in this study.

3.6 Data Collection Techniques

3.6.1 Household Survey

Structure questionnaire have prepared to explore the accurate and realistic data from the different goat owner farmers of the household survey to the study area. The respondents were asked to fill up the questionnaire and those respondents who are not able to fill the questionnaire were filled by the researcher.

3.6.2 Observation

Observation is a key method of data collection for this study. The researcher has observed physical and management condition of goat rearing. Mainly goat herds and their farm was direct observing by the researcher.

3.6.3 Interview

Informant interview and interview of the targeted people is another important method that the researcher followed. Researcher prepared interview format with a set of questionnaire both structured and unstructured and used to collect the information. Altogether 47 household member were selected to the information. With the help of the interview, researcher collected both qualitative as well as quantitative data essential to support the research program.

3.6.4 Focused Group Discussion

Focused group discussion represents point of view and capabilities or knowledge. The focused group discussions were conducted in gathering of the member numbering 6-10 with proper checklist on the basis of the objective. The researcher conducted focused group discussion between local goat rearing groups. Two groups were selected in this discussion.

3.7 Data Collection Tools

3.7.1 Structured Questionnaire

The household interview questionnaire is a vital for data collection in any social researcher as it is reliable and has more validity. Researcher used this tool in collecting data related to the quantitative information. The questionnaire was also used to accumulate the qualitative information.

3.7.2 Key Informant Interview

The key informant interview checklist is another important tool to collect quantitative data. Researcher used the checklist to collect the information from the professional and the officials related to the study.

3.8 Data Analysis and Interpretation

The data collected from various sources and techniques mentioned above were analyzed descriptively. The Tables, Charts, Bar- diagram and Cross tabulation were used in the interpretation of the primary data. Some basic statistical tools like, average, percentage and distribution were used in the study.

Chapter-Four

FINDINGS AND DISCUSSION

4.1 Existing Goat Production System

4.1.1 General Management

Goats are rarely used to graze in community pasture land and jungle. Small numbers of farmer used to maintain their goat at community and near by forest the goats are maintained under the stall feeding practice. They are not allowed to graze during the day on natural pasture, forest, fallow land. Some farmer doe with small kids are kept tethered just beside the house.

4.1.2 Breeding Management

There is no systematic breeding management adopted so far for the goats. In project area most of the cases, availability of fully matured breeding buck in the flock is rare. So, breeding practice depends on the availability of the buck in their own or neighbours houses. But the breeding bucks at neighbours shed are not the selected one. In practice, farmer selects the good and vigorous buck for castration to get more meat which results the negative selection of breeding buck. From the present study it has been observed that the similar situation was noticed in project area at Kabhre. Several workers reported this situation in different agro-ecological zone of the country. The existing breeding management system practiced at project site suggested that there is a big room to improve in breeding management which ultimately improves in meat and milk production. Therefore, it is most important to control inbreeding in goat herd to improve in reproductive efficiency to get maximum economic return.

4.1.3 Housing Management

Goat was kept with other animal in the shed and feeds were offered in the ground. Farmers do not have separate house or shed for the goats. Some farmers kept their goats attached to their house. All types of goats irrespective of age and sex were kept in the same room. Shed were unhyginically and uncomfortably. Farmers reported that cattle and buffalo frequently attacked the goats that caused abortion. Few farmers built the improved shed for the goats. Shed were made with locally available material i.e. wood, bamboo, stone.

4.1.4 Feeding Management

Almost farmers fed their goat on stall-feed. Among the grazing farmer, high proportions of children were involved in goat rearing. They fed their goats with ground forage and twigs of fodder trees. Some farmer managed their goat with kids in tethering. Only for small animal, twigs are provided during the night. Rice bran, Maize flour with kitchen waste was also fed. They used to provide by-products of cereal and concentrate with some common salt. During the dry season in the month of Magh to Jestha maximum tree fodder are supplied to goats.

4.1.5 Health Care

There was hardly any kind of veterinary services available in the study area. If the goats are sick or wounded, farmers report to the veterinary clinic and get medicine. They had no knowledge about drenching and deeping. When adult castrated goat get sick they prefer to slaughter rather go for treatment. Effect of parasite, both internal and external, was the main problem of goats followed by pneumonia and poisoning.

4.1.6 Production and Market

Main products of goats were meat and manure. Livestock market is available not nearby from the village. Castrated, intact buck and other goats were collected by the middle man in cheaper price. Middle men were benefited than the goat producer. The gap between the price of live meat and slaughter meat is high difference it leads more benefit to middle man. It was found that middle men gave Rs.130 live meat per kg and the slaughter meat price per kg was found Rs 190 in villages.

4.2 Goat Herd Composition

In national level the average goat herd size is 3.9 (CBS, 2001). It means a family has about 4 goats. The present study recorded total 307 goats and the existing average herd size in study area is calculated to be 6.53 numbers. The number of goats per family at study site was almost double compared to the national average (3.9vs.6.53). The herd composition is related to their economic status. Existing goat herd population in study site is shown in Table 4.1.

Table: 4.1 Existing Goat Herd Composition in Study Area

Goat	Sex	Number	Avg. herd size	Percentage
Adult	Male	19	0.41	6.19
	Female	121	2.57	39.42
Hogget	Male	31	0.66	10.09
	Female	18	0.39	5.88
Kids	Male	59	1.25	19.21
	Female	59	1.25	19.21
	Total	307	6.53	100.00

Source: Field Survey, 2006

The table 4.1 presents the existing herd composition of goat at study site. The goats which age of more than 9 months are considered as adult. Similarly the ages of 6-9 months are hogget and less than 6 months are

kids. There were about 3 mother goats in per household. The average number of adult male goat (castrated or buck) was small in number compared to females. In every herd adult female occupied about 40 percent. It showed that the production of kids is significantly increasing. The data showed that the numbers of hogget female are small in number compared to male hogget. This situation could be existed as farmer used to sell the female hogget as breeding stock compared to the male hogget. The average number of male and female kids are equal, as shown on table 4.1 but when they become hogget farmer gave preference to sold female kids as breeding stock and male kept for fattening for meat purpose.

Among the different age group of goat, adult female dominated in herd composition (39.42 percent) followed by the kids. Only 6.19 percent adult male were recorded in farmer flocks. Only about 6 percent female hogget were maintained by the farmer. The causerie number could be due to the higher off take rate, i.e., sold at this stage as breeding stock. Comparatively higher numbers of female were maintain that indicated the awareness of goat keeper in keeping female for production purpose.

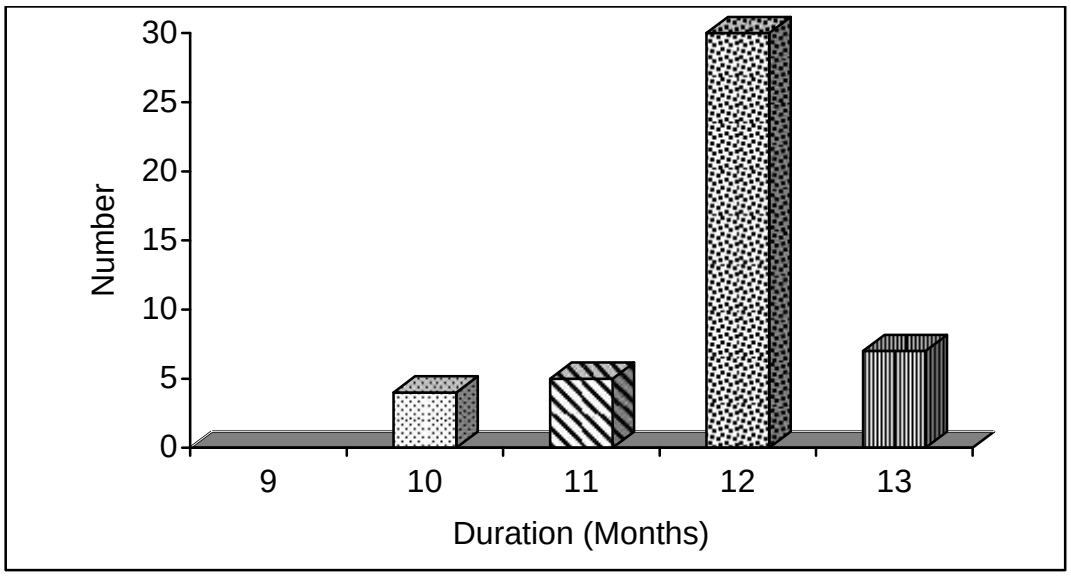
4.3 Reproductive Parameter Related to Goat Economy

Reproductive parameter to contribute on economy includes: the age of first kidding, kidding interval, twinning ability, ability to wean more kids per kidding. If improved technology is used to improve on reproductive and productive performance more economic return can be generated over the existing breeding, feeding and management practices. Some possible parameters are presented as follows.

4.3.1 Age of First Kidding

It is important reproductive parameter that directly related to goat economy. In Nepalese condition, the first age of kidding of goats is about 7-9 months (Upreti, 2001). Physiologically it is not advisable to breed goat at less than 8 month of age. If goats are breed at less than 8 month, the kid's mortality is high and ever goes up to 20 percent due to the low in birth weight and not adequate milk to reared twin kids (Upreti, 2001). The existing kidding pattern, age of first kidding is shown in figure 4.1.

Figure 4.1: Age of First Kidding



Source: Field Survey, 2006

The national average age of first mating is 9 month. Generally, after 150 days of mating, the hogget give kids. The age of first kidding in study area was 12 month. Mainly 63.83 percent of the respondents estimated it to be 12 month. Accordingly, 8.51 percent farmer gives their view on 9 month. Generally respondents are nearly about 11, 12 and 13 month. It reveals that they are very near to their opinion. Respondents said that the time of 1st kidding is depended on goat breeds. Normally, in Khari goats the 1st kidding is of 12 months. They explained that 1st kidding related to

environment factor such as temperature or time availability of buck in goat herds and the nutrition.

4.3.2 Kidding Interval

Kidding interval is the gap between two kidding. Generally, after kidding of two month a goat is ready for mating and then the gap between two kidding interval is 7 month. The present study revealed that about 42.55 percent goats in the farmers house recorded kidding interval of 8-9 months and 21.27 recorded high duration, followed by 14.89 percent very long period. Several studies have shown that 8 month kidding interval is suitable if improved technology is applied on goat rearing. Upreti, 2001 recommended an eight month kidding interval to get 3 crops (kids) in 24 month.

Table 4.2: Kidding Interval of Goats

Duration (month)	Number	Percentage
6	6	12.78
7	4	8.51
8	20	42.55
9	10	21.27
10	7	14.89
Total	47	100.00

Source: Field survey, 2006

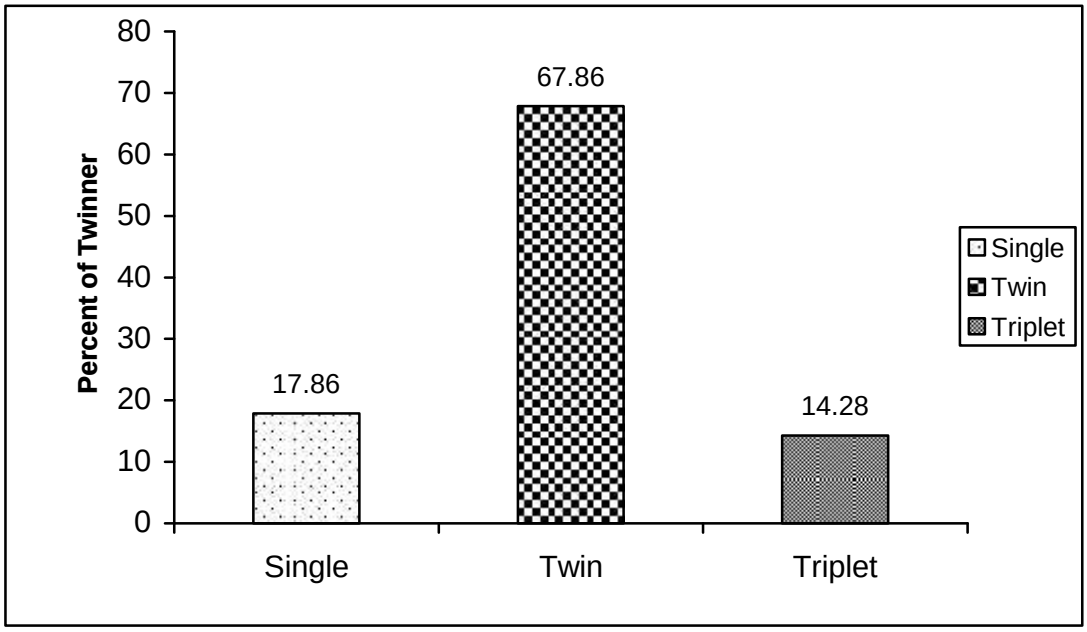
The study has indicated that there is room to improve in kidding interval which ultimately helps to improve in kid survival. By adjusting the lower kidding interval, at least 21.29 percent breeding doe would have appropriate kidding interval of 8 months which would improve kid survival. Total 36.16 percent had longer kidding interval just under utilized their reproductive efficiency. This longer interval could be reduced improve on kidding interval. Because of the different environment condition the new breed of goat is not always very suitable

for same place. In this reason the kidding interval is frequently increased. The respondent explained that the influencing factor of kidding interval is environment and breeding. They focus that khari goat give three birth in every two year in better management but Sinhal and Jamunapari goats give a birth duration of 13 and 12 months interval, respectively. Therefore, Khari would be the suitable breed to get profit from the goat farming in this region.

4.3.3 Kidding Efficiency

Twinning ability of goats is desirable characteristic among the reproductive traits of goat. Mainly for economic purpose twinning is necessary. Farmers always select those goats which produces twins or triplet. On the duration of this study the farmers were willing for triplet and some are only said twins. First of all, look a glance about the twinning ability of respondent goats below on following bar-diagram.

Figure 4.2: Kidding Efficiency of Goat



Source: Field Survey, 2006

The above figure describes that about to 68 percent of the goats produced twins followed by 14.28, 17.85 percent triplet and single. The production of triplet kids is not preferred as it increases the Kids mortality. Present study recorded that 17.86 percent doe are producing single kids which can still be reduced to 10 percent. A flock can be a profitable if 90 percent breeding doe can wean twin kids and it is possible to meet target, kids mortality can be reduced if triplet produce doe 14.28 percent in this study are culled and replace with twinner.

Some respondents were willing for triplet. According to Upreti, 2001, doe producing triplets are not suitable for breeding. The main reason for this – is among the triplets, the last birth is always lower in weight and weak. As the goat is having only two teats first and second born used the teat and the last one is not having excess on milk. This problem causes enhance of death of triplet which reduce in kid survival. In the present study, the kidding percentage was 1.53 which is almost similar to national average for Khari breed.

4.3.4 Productive Age of Goats

All goats have certain high productive age. In this study period, the goat has high kidding percentage, high twining ability, high care of kids and low mortality of kids. To get more benefits, we have to change our mother goat after certain time interval, the study shown the following opinion for selling age of their breeding doe.

Table 4.3: Productive Age of Goats

Duration of Sales	Age (yrs)	Number	Percentage
After 5-10 th kidding	4-7	7	14.89
After 10-15 th kidding	7-10	2	4.25
After 15-20 th kidding	10-13	6	12.79
After 20-25 th kidding	13-17	2	4.25
After Old	17^{+}	28	59.57
Not Sale	-	2	4.25
Total		47	100.00

Source: Field Survey, 2006

The above Table reflects that 59.57 of the respondent had their opinion to keep mother in the old age. It means they sold or changed their mother when it was old. Several workers have reported said that to get better benefit, it is important to remove breeding doe after 7 years of old. This is suitable productive age of goat. In this particular age, it is practically possible to improve on the productive and reproductive performance. Once the breeding doe are older than this, following inefficiency appears and goat rising is not economical.

- High kids mortality due to low milk production and low rearing ability.
- Lower in average birth weight less than 1.5 kg.,that ultimately reduce kid's survivability.

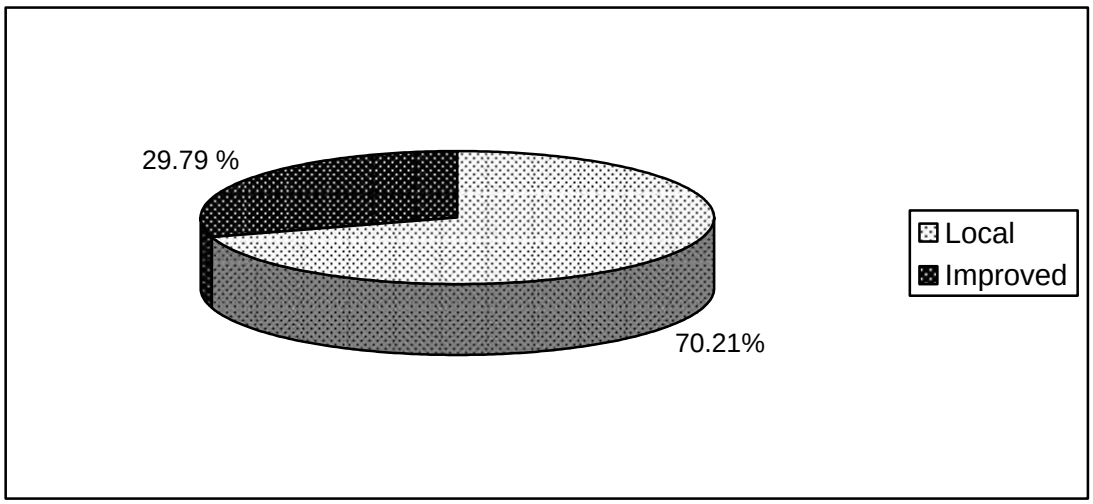
Generally, 8-10 kidding interval is the optimum duration of reproduction. In this stage kidding and twins rate is high and adult and kid mortality is low.

4.4 Goat Breeds

Improve breeds generate more income compare to the indigenous goat. Improved goats are (a) native goats, of heavy selection and (b) Crossbreed of exotic and native goats. Local goats are well adopted in

local environment but are poor in income generation if they are not improved. Chyangra, Sinhal, Khari and Terai are main native breeds and Jamunapari, Barabari and Sannen are the exotic breed. Among these breed Khari as a native and half breed (Khari × Jamunapari) were mainly available in study site. Khari, although not improved, was pre dominant breed in study site.

Figure 4.3: Goat Breeds Available at Study Site



Source: Field Survey, 2006

Fig. 4.3 showed that unimproved local goats were dominating (70.21 %) in number compared to the improved (29.79 %). Here the improved mean both the crossbreed and selected local goats. Khari were smaller (25 kg) in body weight compared to the improved (35 kg). Data indicated that there is great opportunity to improve the local breed which ultimately could improve in reproductive parameters to increase in meat and milk production. Half-breed (Khari×Barbari and Khari ×Jamunapari) at study site were preferred by the farmers. Therefore, it is important to improve Khari goats to get more profit from goats farming in the rural area particularly in mid-hills.

4.5 Feeding Pattern of Goats

The information from the respondents revealed that the patterns of feeding among 47 respondents were varied. The feeding also dependent on their economic condition. Most of the respondent preferences, grazing management system but grazing land was not adequately available. The feeding pattern adopted by the goat keeper in study site is shown in table 4.4.

Table 4.4: Feeding Pattern for Goats

Feeding pattern	Number	Percent
Stall fed	26	55.31
Tethering	3	6.38
Grazing	5	10.63
Stall-feed and grazing	13	27.68
Total	47	100.00

Source: Field Survey, 2006

More than 55 percent farmers adopted stall fed management system followed by stall fed cum grazing (27.68 %). Grazing goat on community land was adopted by only about 11 percent. The lower percent of grazing management was due to lack of grazing land and shepherds. Very few adopted tethering system of management. The existing situation prevailed that stall fed management system is suitable due to the shortage of grazing land and shepherd. The main benefit of stall-feed is best utilization of feed resources. Conserving environment, accumulation of manure and save the time for other household work. The study showed that those farmers who had more Pakho and forest they preferred for grazing. Study showed that 76.20 percent goat raiser were children and 14.28 percent women were involved for grazing goats. Women were involved highly for collection of forage, agricultural crop-residue, and tree foliage for stall feeding.

4.6 Preference for Domestic Animals

The study was aimed to find out the preference of farmer, as per their economic status on livestock keeping. The preference to keep animals is shown in table 4.5.

Table 4.5: Preference between domestic animals

Animals	Number	Percent
Buffalo	10	21.27
Cow	-	-
Goats	37	78.73
Total	47	100.00

Source: Field Survey, 2006

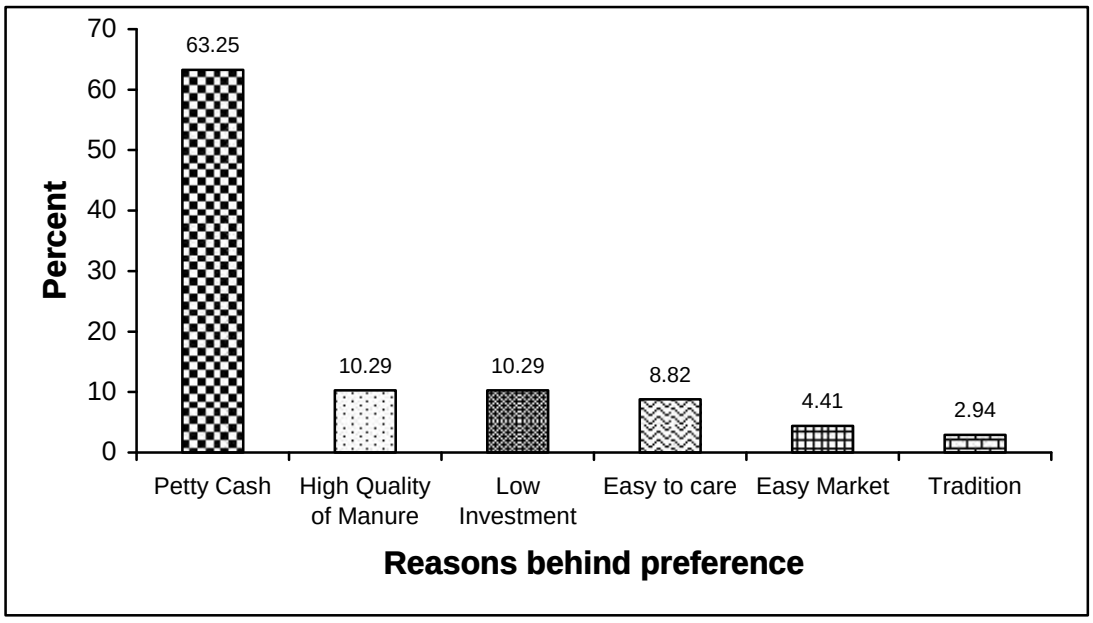
This study prevailed that about 79 percent farmer preferred to keep goats followed by the buffalo, no body were interested to keep cattle. Farmer preferred buffalo than cow, as buffalo is double purpose species, which could be used for both meat and milk. Even poor farmer preferred buffalo. They further said that the investment is high in buffalo but the returns would be fast and higher then goats. They said that by selling milk they could fulfill their daily needs. The interesting point is that the poor farmer were interested to keep buffalo, they wanted to get rid of poverty in short period. But the middle level farmers are highly interested for keeping goats. The farmers in the project area are not interested to keep cows.

4.6.1 Reason behind Preference Goats

It can be seen from table 4.5 that more farmers are giving high preference (78.73 %) for goat rearing. Majority of goat keeper (63.25 %) reported that the goats were reared for petty cash. Farmer explained that goat is also known as "Living Bank" that means the animal could be sold any time to get cash. It is so handy and easy to sold on the spot. They told that if they have goats they could easily solve their urgent problem. They used the immediate cash: for school fee, to treat the sick, to purchase the

inputs such as fertilizer, pesticides, crop seeds etc. Second largest group reported that the goat is preferred because the investment to run the enterprise is very low (10.29 % of respondents) and goats are the sources of high quality manure (10.29 % of respondents). Small number of farmer (8.82 %) said that they would prefer goat farming because it was easy to care. Very small number of farmer adopted goat farming due to the traditional farming i.e. as it was adopted by their fore father.

Figure 4.4: Causes Behind Preference for Goats



Source: Field Survey, 2006

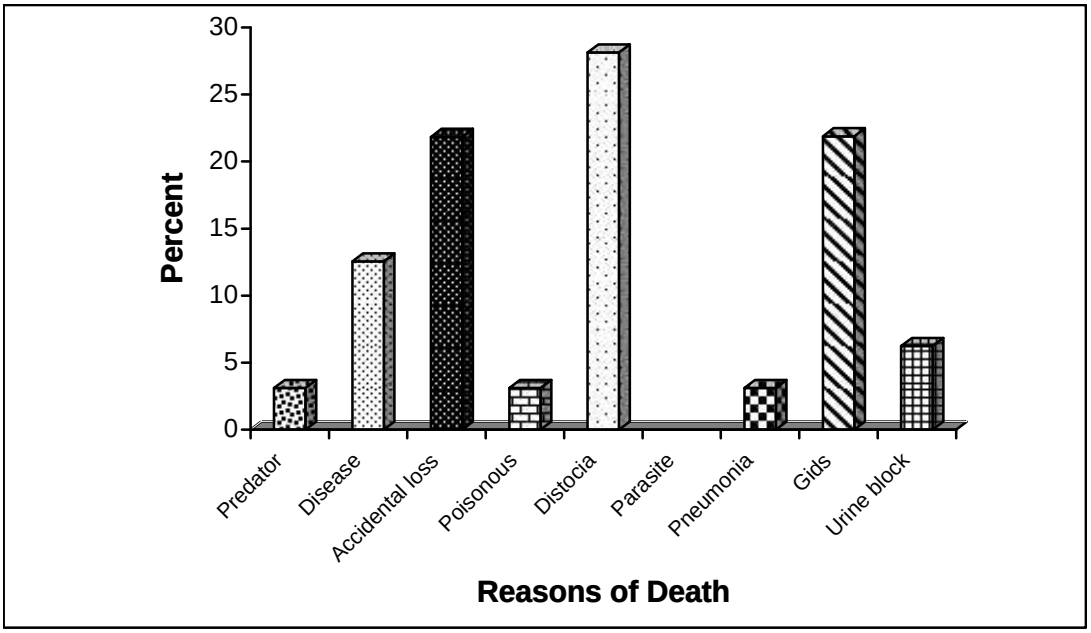
This study indicated that the intervention of new technology on goat rearing could help to generates income which ultimately helps to solve the immediate problem faced by the farmer.

4.7 Goats Mortality

The information from the respondents revealed that the mortality of the goats were frequently high than the national average. The study found 10.23 and 2.6 percent adult and kids mortality in the study area. Mortality was the main negative factor for sustainable goat raising. The current

goats mortality in the study area was presented on the following bar-diagram.

Figure 4.5: Reason of Goats Mortality



Source: Field Survey, 2006

The above figure presents that high proportion of goats were killed by distocia. It was covered 28.13 percent of total mortality. Generally Gids was the second killer of goats. The study was not found any cases of mortality due to the parasite but it was found two cases of mortality by urine block. Little cases were found by predator, pneumonia and poisoning.

4.8 Goats Contribution in Income Generation

Goat plays a significant contribution in income generation. The main purpose of keeping goats is for income generation, so the goat contributes to the people unless it gives little or more amount. This study finds the significant contribution of goats in household income. We analyzed this topic with following two sub-topics:

4.8.1 Goats Sales (Over 3 year period)

Three year information was collected on the goat keeping that covered 2060-2062.The goat selling status is shown in table 4.6.

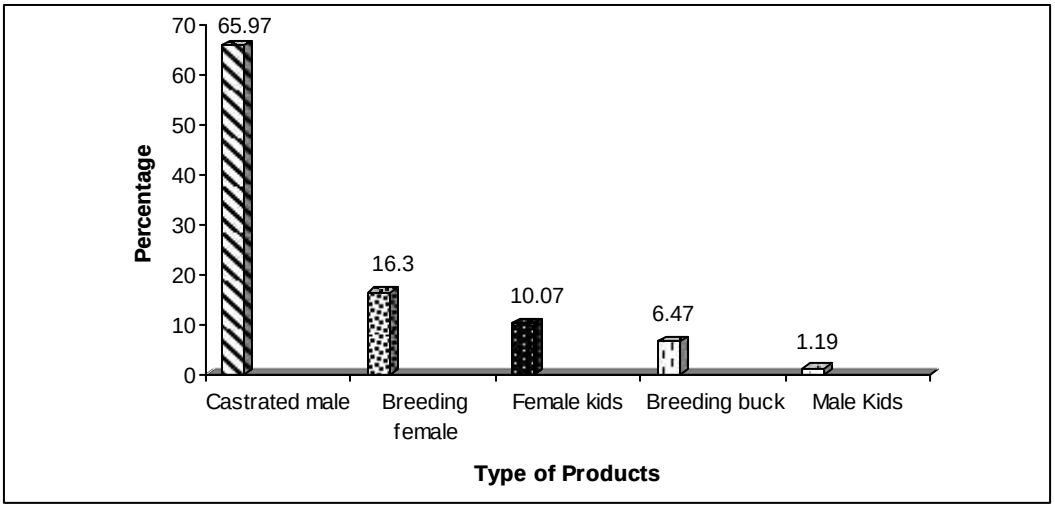
Table 4.6: Goat Sales (Over a 3 year Period, 2060-62 B.S)

Items	Number	Avg. number	Percent
Castrated male	275	5.85	65.97
Breeding Buck	27	0.57	6.47
Breeding female	68	1.44	16.30
Male kids	5	0.10	1.19
Female kids	42	0.89	10.07
Total	417	-	100.00

Source: Field Survey, 2006

In the Three years between 47 households had sold 417 goats. As shown in the above table 275 castrated males were sold, which is 65.97 percent of the total sale. It shows that the large number of goat were sold as castrated male and that also indicated the castrated male were the main source of income. During the three years the average sale of castrated males per 5.85 that means about 6 castrated male goats were sold during 3 year. In this way two castrated goats per farmer were sold each year. Only small numbers of breeding buck were sold (6.47 %). The second largest selling of goat was breeding female (16.30 %). Breeding bucks were sold in small number (6.47 %) which could be increase if goats are managed in scientific way. The data indicates that male kids were rarely sold. During the three years period 47 households just sold 5 male kids each but the sale percent of female kids was slightly high.

Figure 4.6: Selling of Goats (Over the three year period)



Source: Field Survey, 2006

4.8.2 Income Expenditure Analysis

It is important to calculate income and expenditure to find out the economic return from goat farming. The cost included that expenditure which is given for goat rearing. Normally the cost included feeding and veterinary expenditure. In the study area, the average goat herd size is 6.53. As the herd size is small, additional fodder and forage production is not needed and also no need of additional labour for rearing. Farmer family could maintain the goats. The number of goat that could be sold is shown in table 4.6. For calculating the cost and benefit it important to convert those data into monetary form to get it understands.

Table 4.7: General Norms for Calculating Cost and Benefit

Parameter	Number
Marketable age of C.M (month)	15
Marketable age of B.B. (Month)	12
Marketable weight of B.B. and C.M. (Kg)	25
Marketable price of C.M. (kg. /Rs.)	160
Fresh manure price (kg. /Rs.)	2
Marketable price of B.F. (per/Rs.)	1500
Male and female kids Avg.Wgt. (Kg.)	12
Male and female kids average age (Month)	5
Average amount of fresh manure for C.M., B.F. B.B. (day/gm)	700
Average amount of fresh manure male and female kids (day/gm)	500

Note: C.M. =Castrated male, B.F. = Breeding female, B.B. = Breeding Buck, Avg = Average, Wgt. = Weight.

The expenditure and income in the three year period was calculated as follows:

4.8.2.1 Expenditure Analysis

In existing traditional goat management system, flock management cost is very low of about Rs. 50 per goat annually (Upreti, 2001). Goat is managed in limited input. Some cost is involved on veterinary drug, mainly for drenching and periodical treatment. The total expenditure was calculated in Table 4.8.

Table 4.8: Analysis of Expenditure on Goats (During Three years)

Description	Number	Time (Month)	Expenditure Rs./goat	Total (Rs. '000)
Castrated male	275	15	62.56	17.204
Breeding buck	27	12	50.04	1.351
Breeding female	68	8	33.36	2.263
Male Kids	5	5	20.85	0.104
Female kids	42	5	20.85	0.875
Total	417	45	-	21.803

Source: Field Survey, 2006

Over three years period, total expenditure was of Rs. 21803.5 for their 417 goats as shown in Table 4.8.

4.8.2.2 Income Analysis

The main economic sources are meat and manure in the mid-hills of Nepal. Milk is another possible source of income but so far, drinking milk was not adopted by the farmer. But if genetically improved goats are reared with improved technology, the production can be double which ultimately help to generate higher economic return. Income analysis is presented in Table 4.9 and 4.10.

A. Meat production

Table 4.9: Analysis of Income from Meat

Description	Total number	Average weight (kg)	Price per kg	Total earning (Rs. '000)
Castrated male	275	25	130	893.75
Breeding buck	27	25	160	108.00
Breeding female	68	-	1500/goat	102.00
Male kids	5	12	120	7.20
Female kids	42	12	100	50.40
Total	417			1161.35

Source: Field Survey, 2006

The above Table show that the highest income was got from castrated male .Breeding buck was the second largest source of income. The earning from Male kids was comparatively small than Female kids.

B. Manure

Table 4.10: Income from Manure

Description	Total number	Average manure production gm/ day	Total manure per day (kg)	Duration (months)	Total Manure (kg)	Total earning (Rs. '000)
Castrated male	275	700	192.5	15	87587.5	175.17
Breeding Buck	27	700	18.9	12	6898.5	13.79
Breeding female	68	700	47.6	8	11424.0	22.84
Male kids	5	300	1.5	5	225.0	0.45
Female kids	42	300	1.5	5	1890.0	3.78
Total	417	-	272.6	45	108025.0	216.03

Source: Field Survey, 2006

The data of Table 4.10 show the income from manure over 3 year. During this period they had sold 417 goats. Total 417 goats daily provided 272.6 kg manure. It means over 3 year period the goat produced 108025 kg fresh manure. Normally the market price of goats manure is Rs. 2 per kg. It shows that the earning from manure selling was Rs. 216050. Average per household income was of Rs. 4596 in 3 year duration. It means annual income per household was Rs. 1532. Farmer did not sold manure directly because they have limited number of goats, so they used manure

to increase agricultural production. The contents of Nitrogen and phosphorous is high in goats manure. The main benefit for goat keeper is that they get more amounts of Nitrogen and Phosphorous from their fresh manure. It could directly reduce the expenditure on chemical fertilizers.

During the 3 years period income expenditure analysis, the net profit got by farmers is presented on following table:

Table 4.11: Net income from Goats (3 years)

(Amount in Rs. '000)

Product	Expenditure	Income		Total	Net Income	Contributions
		Meat	Manure			
Castrated male	17.204	893.750	175.174	1068.924	1051.720	I
Breeding buck	1.351	108.000	13.797	121.797	120.448	II
Breeding Female	2.268	102.000	22.848	124.848	122.580	II
Male kids	0.104	7.200	0.450	7.650	7.546	V
Female kids	0.875	50.400	3.780	54.180	53.305	IV
	21.802	1161.350	216.049	1377.399	1355.597	-

Source: Field Survey, 2006

Looking at the net income, castrated male were the main source of income followed by breeding male, breeding buck, female kids and male kids. Study has indicated that castrated male and breeding female were major source of income, kids has small contribution on the net income. Using information as presented in Table 4.9 and 4.10, it can be seen that during the 3 years the net income was found Rs 28843. They have got Rs 9615 annually. In conclusion, it can be easily predicted that the amount of net profit per household plays a significant role in income generation.

4.9 Level of Income of People before and after Improvement in Goat Management

Level of income before improving means the existence situation of current goat management system. The study was able to explore the

current level of income from goat rearing in the study area. In existing goat rearing system, annual per house hold income Rs. 9,615. The main concerning issue is that the current management system adopted by the farmer is not very good in the study area. The result has indicated that there is a room for improving management system, technically to increase level of farmer income from goat farming. Improving means not only change good breeds but also improve in management practices. There is no doubt that if the farmer could change their existence management pattern, their level of income would be increased. Level of income is related on some common important technical parameters which are as follow:

4.9.1 Age of First Mating

The study finds that the average age of first mating of goats is nine months. The main point is that the goat keepers had not given more attention to their hogget to make early breeding. Delay age of first mating resulting lower economic return.

If they improve the breeds and their nutrition the current age of first mating would reduced to 8 months. Early mating means early kidding also. This early age of first mating gives income to the farmer faster than the existing nine months of age of first mating.

4.9. 2 Mating Percentage

The national average of mating percentage is 90 percent but the respondents said that their female frequently re-interested for mating. Normally in this management system the mating was estimated below 90 percent.

The high mating percentage is depended on the breeds of goat and their environmental condition. It means if we have a breeding buck in each goat flock there is high chance for a successful mating. If the farmer adopts this concept, we can increase the mating percentage of 95 percent (Table 4.12). This can directly influence increase in the level of income.

4.9. 3 Kidding Percentage

The average kidding percentage of goats was 1.53 kids per birth. It means generally all mother goats didn't give twinning birth. Work reported by ARS Bandipur (1999/2000) has shown that the kidding percent is 175. Mainly in study area goat breeds are dominated by Khari goats. Recent research concluded that the twining percent is high in Khari goats (Shrestha, 2002). Among the experiment between different breeds Khari gave 59.8 percent twinner, followed by 37.4 and 2.8 single and triplet respectively (ARS, Bandipur 1999).

Mainly to get more benefit normally twinning mother is necessary. Triplet kids are not preferred as it increases the kids mortality. It is important to select improve breeds of goats that has twinning ability. In this study the 17.85 percent mother goat give only single birth. The single ton is not economy for farmer. After improving in goat management the kidding percent would reach up to 1.80 per birth. It leads farmers economy.

4.9. 4 Mortality Rate

Distocia, accidental loss and Gids disease were the main caused of death. The average rate of mortality was high in study area. Among the death 30 percent kids died due to distocia, 23.53 percent were died due to accident. Mainly hogget were died by the disease called Gids. It is said that

kids mortality was 8.0 percent and adult mortality was 2 percent in Khari goats. Mainly in kids mortality, weaning rate is highly considered. If the kids are used to wean at 120 day, the kid survival rate can be improved (Upreti, 2001).

For improving goat rearing managed some technical aspects. Mainly almost farmer had mixed farm. It means they had buffalo, cow, bullock etc. Mortality of kids was higher because of accidental case. Lack of drenching and deeping also responsible to high mortality. If they adopt drenching and deeping that could reduced kids mortality by improving milk yield. It reduced kids mortality up to 15 percent (ARC, Banditipur, 2000) After managed the farm carefully the rate of mortality of kids and adult would be decreased at up to 8 and 2 percent respectively.

4.9.5 Marketable Weight

The result indicated that the average marketable weight of castrated male was 25 kg. Mainly farmer sold their goat as castrated. The number of improve breed was very low. It was explained that local goats were easily adoptable in certain conditions but they could not gave higher weight. Generally in study area the farmer started to sale their castrated male when they obtained 15 kg weight.

The study showed that the average selling weight of castrated male was just 25 kg. It was lower then national average as 30 kg. It was found that farmers used to sale goat still it's growing in higher rate. If they adopted drenching and deeping twice a year, it could increased the goats weight at 20 percent (upreti, 2001). To get higher weight they need to give more attention for the feeding of goats. The another important point for increase marketable weight is good weaning time if they weans their kids at 120 days, this leads the better growth performance of kids (Khanal *et*

al, 2000). Mainly they need to give high attention for goats improved feeding. If they considered this issues the average weight of castrated male would increased up to 35 kg. It opens the door of high income. The possible improving common important technical parameter is shown on this table with before and after improvement.

Table 4.12: Reproductive Traits and Perform of Goat in Study Area

Parameter	Status	
	Existing (Before)	Improved (After)
Age of first mating (Month)	9.00	8.00
Mating percentage	90.00	95.00
Kidding percentage	1.53	1.75
Mortality of Kids(percent)	10.50	10.00
Mortality of adult(percent)	2.60	2.00
Marketable weight (kg)	25.00	30.00

Source: Field Survey, 2006

4.10 Projection of Appropriate Model of Goat Rearing for Rural Poor

Poverty is widespread in rural areas and their livelihood is highly depends on subsistence agriculture. We have to uplift those poor people by encouraging in income generation. Goat rearing is our traditional phenomenons where households had some number of goats. Due to lack of appropriate landholding size, they are not able to rear goats in large number. For alleviation of rural poverty it has recommend 5 goats model for rural poor people. This model would be appropriate to their manpower, land holding size, easily care in small sheds and not need of additional supplementation.

Table: 4. 13 Initial Cost for this Model

Description	Cost (Rs'000)
Five Breeding female (per goat 2000)	10.0
Land (own)	-
Shed (no separate shed needed, managed in combined in with other livestock, but to systematize bamboo and some other materials are needed).	1.0
Equipment (miscellaneous)	0.5
Total Fixed Capital	11.5

Table 4.13 presents the initial cost required for starting 5 goats model. It needs 11500 for buying goat, shed management and other miscellaneous needs.

Table: 4.14: Expenditure for Five Goats Model (for 5 year)

(Amount in Rs. '000)

Description	Year				
	1	2	3	4	5
Depreciation of goat cost as 25 percent	-	2.50	2.50	2.50	2.50
Depreciation of shed cost as 25 percent	-	0.25	0.25	0.25	0.25
Miscellaneous (depreciation of equipment cost as 25%)	-	0.12	0.12	0.12	0.12
Feeding cost	-	0.50	0.80	1.10	1.40
Capital interest (18 % as related to agriculture loan)	-	2.30	2.30	2.30	2.30
Total expenditure	-	5.67	5.97	6.27	6.57

* Often the veterinary cost will be covered from the manure income.

The Table 4.14 explains the total expenditure during 5 years period. It separates the depreciation of loan and other materials. The interest on loans from bank is also presented. Generally, feeding cost is little at the initial stage and after increasing the number of goats it also increases. The

goats mainly depend on forage, tree twigs and other fodder grass. It has already been discussed about goats manure. A goat can produce 0.7 kg of fresh manure per day, fetches a price of 1 Rupee. Veterinary cost for goat is maintained by its manure. In this projection veterinary cost will be covered by goats manure. During the 5 year period the expenditure will reached only Rs. 24500.

Table 4.15: Number of Goats for Sale

(Amount in Rs. '000)

Product	Year					
	1	2	3	4	5	Total
Castrated male	-	8	11	15	35	59
Breeding female	3	4	7	16	27	57
Breeding buck	-	-	2	2	3	7
Total	3	12	20	33	65	123

This Table showed that in the 5 years, 59 castrated male, 57 breeding female and 7 breeding buck will be sold. The sale of goat product will be highly increased in the period. After the fourth year the number of C.M. will be doubled each year and ranges of breeding female are same to castrated male.

Table 4.16: Income from Five Goat Model (5 yrs)

(Amount in Rs. '000)

Product	Year					
	1	2	3	4	5	Total
Castrated male	-	31.20	42.90	58.50	136.50	269.10
Breeding female	6.00	8.00	14.00	32.00	114.00	174.00
Breeding buck	-	-	10.00	10.00	70.00	90.00
Total	6.00	39.20	66.90	100.50	320.50	533.10

Table 4.17: Total Income Expenditure Analysis (5yrs)

(Amount in Rs. '000)

Product	Year					
	1	2	3	4	5	Total
Total income	6.00	39.29	66.90	100.50	320.50	533.10
Total expenditure	-	5.67	5.97	6.27	6.57	24.50
Net profit	6.00	33.53	60.93	94.23	313.93	508.60

The Table 4.16 and 4.17 mainly presented the income from C.M. in monetary term. It can be estimated the increasing level by observed the initial income of Rs. 6000 to the final earning of Rs.320500. During the years the income increase not double and triplet range but increased in more times.

Table 4.18: General Norms for Calculating Economic Parameter of Goats

Parameter	Number
Age of first mating (Month)	8
Mating percentage	95
Age of first kidding (Month)	14
Sex ratio	1:1
Rest period	2
Kidding percentage	1.75
Adult mortality (percent)	2
Kids mortality (Percent)	8
Marketable age of C.M. (Month)	15
Marketable age of B.B. (Month)	12
Marketable age of B.F. (Month)	8
Marketable weight of C.M. (kg)	30
Marketable price of C.M. live (Rs/kg)	130
Marketable price of B.B. (Rs/buck)	5000
Marketable price of B.F. (Rs./Female)	2000
Off take rate of B.F. (Percent)	50
Selection of B. B. (Percent)	10

The above description proved that goat rearing is an effective weapon for alleviating rural poverty. If the poor people of rural areas adopt this

model they could leave their poverty far from them within 5 years. This appears to be a reality and the farmers would get more than Rs. 1 lakh annually. Those have opportunity for hand to mouth, are absolutely benefited in the few years. They can get loan from bank at 18 percent interest and returned it in the second year. They started their farm by Rs. 11500 and get Rs. 508600 net profit in five years. In five years the depreciation will end and Rs. 5175 will appear as additional profit. The expenditure also increase day by day but the profit leads it more then 20 times. During the later period the need of labour is also increased. Farmer needs to send their children in school on day and use this labour force in morning and evening for the required additional labour. This saves the out labour cost. The off take rate of breeding female is high (50 percent) because the poor people have limited land so this leads easily manage of flock.

In nutshell, in our context the climatic condition of our country is good for different breeds of goats and available different nutrition fodders are also easily available in our country. Therefore, if we give this message to our rural people, it plays a great role in alleviating rural poverty.

Chapter - Five

Summary, Conclusion and Recommendations

5.1 Summary

- Most of the goat keepers maintained goats under stall feeding practice. Goats are rarely used to graze in community pasture land and jungle.

- There was no systematic breeding management adopted so far the goats on study area. In most of the cases, availability of fully matured breeding buck in the flock was rared.

- Goats were kept with other animal in the shed and feeds were offered on the ground. Shed were managed unhygenically and uncomfortably.

- There were hardly any kinds of veterinary services available in the study area. They had no knowledge about drenching and deeping practices.

- Castrated, Intact buck and other goats were collected by the middle man in cheaper price and the gap between the price of live meat and sacrificing meat is high difference .Middle man were more benefited than the real producer.

- The existing goat herd size in the study area was found 6.53 per household. This was almost double compared to the national average(3.9 per household).Among the different age group of goat, adult female dominated in herd composition (39.42 %) followed by the kids.

- Mainly distocia was the main death caused of adult doe. It covers nearly 30 percent of adult doe death. 22 percent of death was related to accident. Due to keep in attached shed the case of abortion was found high. Mainly few numbers of goats were killed by predator.

- Age of first kidding in study area was found 12 month. Mainly 63.83 percent of the respondents were estimated it to be 12 months.

- The study recorded that nearly 43 percent goats in the farmers herd recorded kidding interval of 8-9 months. At least 22 percent breeding doe would have appropriated kidding interval of 8 month. Nearly 37 percent had longer kidding interval just underutilized there reproductive efficiency.

- About 68 percent of the goats produced twins. It was recorded that 18 percent doe gave single kids. The average kidding percentage was recorded 1.53 per birth.

- Around 60 percent of the respondent had their opinion to keep mother in the old age and about 15 percent were directly opposed of selling mother doe.

- Khari, although not improved, was predominant breed on study area. It was covered 70.21 percent of the total breed; just 29.79 percent goats were found improved.

- Due to the lack of grazing land and shepherd more than 55 percent farmers adopted stall-fed management system. About 28 percent farmers adopted stall fed cum grazing and very few (6.38 %) adopted tethering system of management.

- Study showed that 76.20 percent goat rearer were children. Women were involved mainly for collection of forage, agricultural crop residue and tree foliage for stall feeding

- The study prevailed that about 79 percent farmers preferred to keep goat followed by the buffalo. Nobody was interested for keeping cattle.

- Majority of goat keepers (63.25 %) reported that the goats were reared for petty cash. They listed the reason behind preference of goat are like as petty cash, high quality of manure, low investment, easy to care, easy market and tradition.

- In the three years between 47 household had sold 417 goats. 65.97 percent of the total selling was castrated male. Between three years, the average sale of castrated male per household was nearly six. It was indicated that annually they had sold 2 castrated male. Breeding female were the second largest selling (16.30 %).

- Over 3 years period, total expenditure for 417 goats were Rs. 21803.5 and total income of 47 household was Rs.1377400. It presented that 47 household earned 28843 net profit during 3 year period. Annually per household earned Rs. 9615 from goat selling.

- Five goat model projections estimated that during the 5 years the total income from goat selling would be Rs.533100 and total expenditure only reach Rs.24500 .It indicated that they will earn Rs.508600 net profit during the 5 years period. It showed that farmers got more than 1 lakh annually.

5.2 Conclusion

Poverty is the main crucial issue of underdeveloped country. We have to increase in our income level for get rid of poverty. An income generation activities lead the reduction of poverty. Goat rearing is the tools of income generation. This is a effective weapons for combating our rural poverty. We will start these enterprises with low investment, little feeding and putting low risk. This study analyzed that all the respondents get annually Rs.9615 by their traditional flock rearing. It indicated that monthly they got 801.2 rupees. We can easily change this traditional flock rearing system into modern flock by small improvement in breeding, feeding and its management. Five goat model projections analyzed that during the five years period, farmers were able to get Rs.508600 net profit. It indicated that they earned monthly Rs. 8476 net profit. The application of improved goat rearing technology on the existing one can improved of goat products (i.e. meat and milk) which provides higher economic return that alleviate the deep-rooted rural poverty among goat keepers.

5.3 Recommendations

This study was conducted to find the 'Role of Goat Rearing for Rural Poverty Alleviation'. Based on the findings and conclusion some recommendation are put forth for the improving of goat rearing as the weapon of rural poverty alleviation on following two parts.

5.3.1 Recommendation for Planning and Management

Based on the conclusion drawn from the analysis of the field survey data and observation, the following planning recommendations are made.

1. To get high economic return from the goat rearing in rural areas. It can be recommended to apply new rearing technology particular on breeding, feeding, management and health care.
    - In the study area the dominated breeds were local Khari local but not improved. They have no knowledge about selection. To get high economic return cross breeds goat (Barbari × Khari and Jamunapari × Khari) will be extended.
    - It is necessary to give intensive training on breeding shed management and goat diseases. Attention should be given for decreasing kids and adults mortality.
    - Provide seasonal drenching and deeping services against the internal parasites and other disease in flock. At least two times a year (Ashwin and Baisakha).
    - Veterinary services should be extended.
    - Farmers have to give knowledge about productive age of goats.
    - It is necessary to discourage open grazing and encourage stall feeding practice.

2. The existing government input delivery system that includes the veterinary care, loan and market facilities is not sufficient to the rural poor. It has been recommended that government should make a special goat development program to use the available resources to make goat enterprise economical.

3. Encourage to develop a goat keeping farmers co-operative for facilitating the goat development activities. Through co-operative they can be able to develop the market channel to sell their animals rather than sending to the market through middle man.

4. Adult and kids mortality was found higher than national average (national average adult 2% and kids 10%). Due to the higher mortality farmer were compelled to loss their goats. The study recommend to the government for providing goat insurance to get relief by the accidental losses.

5. Promote the production of high yielding and nutritious grasses and fodder that are suitable for the local climatic condition.

6. Children are highly involved in Goat rising, it is recommended that the right of education will be secured.

7. Programme for milking Goats needs to be launched.

8. For the raising of Goat economy, micro-credit programmed should be started on lower interest rate.

5.3.2 Recommendation for Further Research

The area bears greater potential for the conduct of development-oriented research, as only a very few studies, have been done on it so far. The possible areas of research are listed here under categorically.

1 Gender studies on goat rearing
2 Marketing channel of goats enterprise.
3 Child labour on goat rearing.
4 Milking goats and rural economy.
5 Evaluate the existing government program, policies and its implementation related to goat rearing.

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Annex- iv

Table 1: Land distribution among farmers (in Ropani)

Land types	Total	Average
Khet	89	1.89
Bari	408	8.68
Pakho	257	5.46
Forest	44	0.93
Total	798	

Table 2: Domestic animals of farmer shed

Animals	Total	Percent
Cattle	68	10.78
Buffalo	58	9.22
Goat	307	48.73
Sheep	-	-
Swine	10	1.59
Poultry	187	29.68
Total	630	100

Table 3: Interest for goat rearing

Interest	Total	Percent
Yes	45	95.74
No	2	4.26
Total	47	100

* Respondents highly interested for goat rearing

Table 4: Encouragement for rearing goats

Encourage by	No. of respondent	Percent
NGOs	-	-
Tradition	23	48.93
Government	-	-
Impression	4	8.52
Self	20	42.55
Total	47	100.00

* Encouragement for rearing goats were tradition

Table 5: Rearing of goat

Rearer	No. of respondent	Percent
Children	16	76.20
Women	3	14.28
Man	1	4.76
Leisure person	1	4.76
Total	21	100.00

* Children are highly involved in goat rearing

Table 6: Feeding of goats

Feeder	No. of respondent	Percent
Children	2	4.25
Women	30	63.82
Man	4	8.51
Leisure person	11	23.42
Total	47	100.00

* Women's are highly involved in feeding.

Table 8: Marketing channel for selling goats.

Marketing channel	No. of respondent	Percent
Local market	6	12.76
Middleman	38	80.85
Butchers	3	6.39
Total	47	100.00

* Middleman's were the main channel for goat sales.

Table 9: Use of income from goat sales

Distribution of income	No. of respondents	Percent
Household Problem	19	40.42
Education	3	6.38
Basic need	21	44.68
Gold	2	4.28
Agricultural inputs	1	2.12
Saving in the Bank	1	2.12
Total	47	100.00

* Use of income for basic need was comparably high.

Table 10: Education of children

Distribution	No. of Respondent	Percent
Government School	9	19.14
Boarding school	28	59.58
Both	10	21.28
Total	47	100.00

* High proportion of children study in boarding school

Table 11: Knowledge about milking goats

Response	No. of respondent	Percent
Yes	18	38.29
No	29	67.71
Total	47	100.00

* High percent of respondent were unknown about milking goats.

Table 12: Satisfaction from goat rearing

Range of satisfaction	No. of respondent	Percent
Very satisfied	38	80.85
Moderate	9	19.15
Not satisfied	47	100.00
Total	47	

* Respondents are highly satisfied by goat rearing.