Economic Impact of Goat Rearing on Livelihood of Goat Farmers in Nabrangpur District of Odisha

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DEPARTMENT OF VETERINARY AND ANIMAL HUSBANDRY EXTENSION
COLLEGE OF VETERINARY SCIENCE AND ANIMAL HUSBANDRY
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IN

VETERINARY AND ANIMAL HUSBANDRY EXTENSION

By

Dr. Monalisa Mohanty

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CERTIFICATE-I

This is to certify that the thesis entitled **"Economic Impact of Goat Rearing on Livelihood of Goat Farmers in Nabrangpur District of Odisa"** submitted in partial fulfilment of the requirements for the award of the degree of **Master of Veterinary Science (Veterinary and Animal Husbandry Extension)** to the Orissa University of Agriculture and Technology is faithful record of bonafide and original research work carried out by **Dr. Monalisa Mohanty** under my guidance and supervision. No part of the thesis has been submitted for any other degree or diploma.

It is further certified that the assistance and help received by her from various sources during the course of investigation has been duly acknowledged.

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This is to certify that the thesis entitled **"Economic Impact of Goat Rearing on Livelihood of Goat Farmers in Nabrangpur District of Odisha"** submitted by **Dr. Monalisa Mohanty** to the Orissa University of Agriculture and Technology, Bhubaneswar in partial fulfillment of the requirements for the degree of **Master of Veterinary Science (Veterinary and Animal Husbandry Extension)** has been approved/disapproved by the students' advisory committee and the external examiner.

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Place: Bhubaneswar

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LIST OF ABBREVIATIONS

AC	:	Acre
ARD	:	Animal Resources Development
AVAS	:	Additional Veterinary Assistant Surgeon
BDO	:	Block Development Officer
BPL	:	Below Poverty Line
CDVO	:	Chief District Veterinary Officer
CVSc & AH	:	College of Veterinary Science and Animal Husbandry
DAH&VS	:	Directorate of Animal Husbandry and Veterinary Services
DTC	:	District Training Coordinator
D	:	Disagree
F	:	Frequency
F & ARD	:	Fishery and Animal Resource Development
GEN	:	General
GDP	:	Gross Domestic Product
GP	:	Grampanchayat
GoO	:	Government of Odisha
ICDS	:	Intrgrated Child Development Services
ICMR	:	Indian Caouncil of Medical Research
KM	:	Kilometer
LAC	:	Livestock Aid Centre
LI	:	Livestock Inspector
NSDP	:	Net State Domestic Product
OBC	:	Other Backward Caste
PRI	:	Panchayat Raj Institution
SA	:	Strongly Agree

SD	:	Standard Deviation
SC	:	Schedule Caste
ST	:	Schedule Tribe
TV	:	Television
US	:	United States
UD	:	Undecided
VAS	:	Veterinary Assistant Surgeon
VD	:	Veterinary Dispensary
%	:	Percentage

ABSTRACT

The research study on “Economic Impact of Goat rearing on livelihood of the goat farmers in Nabarangpur district of Odisha” was carried out in two blocks of Nabrangpur district of Odisha. 120 respondents were selected randomly with having minimum 10 numbers of goats with 5 years of experience in goat rearing. The major findings of the study are that the goats are reared mostly by middle aged group of people, most of the respondents are of ST category and having semipucca houses in the study area. The average number of goats reared by the farmers is 21 to 30 numbers with 5 to 10 years of experience. The annual income of 85% respondents was between 50,000 to 1 lakh. The correlation analysis of socio-economic profile of respondents revealed that age is negatively and significantly co-related with education of the beneficiaries. However, the education is positively and significantly co-related with occupation and no of goats owned of the farmers. Family size was found negatively co-related with education and occupation of the goat farmers. Whereas, occupation of the goat farmers was found positively and significantly co-related with number of goats owned and annual income of the farmers. Annual income of the farmers was positively and significantly correlated with the possession of goats by the farmers. Most of the respondents reported that they are having kids of birth weight between 1 to 2 kg and most of the respondents reported that they sell their goats at 10 to 15 kg body weight at 1 to 1.5 years of age. 48.33% respondent reported that their kid mortality was 10 to 15% and 58.33% of respondent reported that their adult mortality was 20-30%. Psychological impact has highest score followed by economic impact, social impact, impact on communication and extension behavior. The correlation analysis revealed that there is no significant correlation between most of the social variables and impact on beneficiaries. Only occupation was found having positive and significant relationship with the psychological impact on beneficiary. Extension support constraint was ranked first by the respondents followed by financial constraint, operational constraints and marketing constraints. So, Government should take steps to popularize goat rearing in mass media, regular training, exposure visits to nearby successful farms and provide necessary financial support to the farmers.

CHAPTER-I

INTRODUCTION

Agriculture is the backbone of the country. More than 70 percent of the population earn their living from farming. However, the country has so far not managed to raise crop productivity to a level that can provide economic benefit to the farming community. Considering the role of the agricultural allied sector in the livelihood of the rural population, the government is giving a higher priority to raise the agricultural and livestock productivity.

One of the important components of agriculture, livestock sector not only provides essential proteins and nutritious human diet through milk, eggs, meat etc., but also plays an important role in utilization of non-edible agricultural by-products and employment generation. India is endowed with the largest livestock population in the world. It accounts for 299.9 million bovine population as 19th livestock census 2012. There are about 65.06 million sheep and135.17 million goats in the country. The population of livestock is still increasing rapidly in India.

There is a marked trend towards keeping more small ruminants as a proportion of livestock holdings than large ruminants. There are many reasons for this. According to Peacock (2005), they are relatively cheap to acquire and reproduce quickly, enabling poor farmers to use them as a means to acquire large animals. Moreover, with more natural disasters and uncertainty with agriculture production, they provide regular financial support for sustenance. Animal Husbandry along with agriculture, continue to be an integral part of human life since the process of civilization started. These activities have contributed not only to the food basket and draught animal power but also by maintaining ecological balance. It has been playing a prominent socio-economic role in India. It plays a significant role in generating gainful employment in the rural sector, particularly among the landless, small and marginal farmers and women.

The small ruminant like goats were among the first farm animals to be domesticated. As indicated by the archeological evidence, they have been associated

with man in a symbiotic relationship for up to 10,000 years. Goats disseminated all over the world because their great adaptability to varying environmental conditions and the different nutritional regimes under which they were evolved and subsequently maintained. They proved useful to man throughout the ages due to their productivity, small size and non-competiveness with him for food (Aziz, 2010). Goats contribution to society is correctly placed and recognized in sustainable livelihood and food security of resource poor people. Goats from centuries have been an integral component of farming systems and most preferred species of small, marginal farmers and land less community due to lower initial investment, lesser risk, early return, high prolificacy, wide adaptability in various agro-climatic regions. Round the year demand of goat products in market and their acceptability across religions also make it one of the preferred livestock species. Goats make important contribution to the stability of smallholder farming system needs. Due to these characteristics goat numbers in the world during period 2000-2013 were increased by 33.8%. The largest number is observed in Asia, followed by Africa representing about 59.7 and 35 per cent respectively, summing up to 94.7 percent of world total goat population. The largest number of goats in the world is in China, followed by India, Pakistan and Bangladesh and these four countries keep 45 percent of total world goats (FAOSTAT, 2013).

India is endowed with 22 descript breeds of goats although a large number of goats (75%) are non-descript due to indiscriminate breeding, inter-mixing and inadequate breed specific improvement programmes (Singh *et. al.*, 2008). Dairy goat is considered the cow of the poor. The goat eats little, occupies a small area and produces enough milk for the average unitary family, whereas maintaining a cow at home cannot be afforded by the homeowner, hence, the growing popularity of goat as the poor person's cow. World goat milk production was increased by 39.2% during the period 2000-2012 (FAOSTAT 2013). The developing countries produce approximately 83 per cent of the total amount. The largest amount of goat milk is produced in India (4 million metric tons) followed by Bangladesh and Sudan. However, marketing of goat milk and its products is still in its infancy. So far, there have been no marketing efforts attempted on a broad scale. As reported by Dubeuf and Boyazoglu (2009) and Luo (2009), less than 5 per cent of the total milk produced by goats is marketed. Goat meat is widely consumed in the developing countries.

According to FAOSTAT (2013),In world level of goat milk production during the period 2000-2012 was increased by 41.66%. Asia has the larger contribution in the total meat production (70.7%). Goat meat represents only 2 percent of this total meat produces in the same year in the world. The developing countries produced approximately 97 per cent of this amount. The top ten countries producing goat meat are all from Asia and Africa. China leads the table followed by India in goat meat production. Small ruminants contribute about 10 per cent to the total value of livestock sector, which is around Rs 24,000 million annually. The small ruminants contribute 15 to 27 per cent of family income of smallholders and provide gainful employment of 180 to330 man-days per annum depending on the size of the flock. It has also been shown that irrespective of flock size, women and children contribute to labor force to the extent of about 90 per cent. Goat keepers across the state are either landless or small holder, illiterate, economically poor and socially backward (schedule tribes, schedule caste) and they keep goats in poor management conditions with sub optimal production. Landholdings in general have negative association with goat keeping and further reducing due to gradual shrinking of grazing land. Large flocks of goats are found either in rain fed area of Rajasthan, Gujarat, Andhra or Trans Himalayan zone where abundant waste land is available for grazing. Most of the goats are reared in our country on extensive feeding system with inadequate and improper housing. There is a need to motivate goat keepers with strategic supplementary feeding, and integrate goat rearing with cropping system to raise their productivity level. Several studies in India and abroad revealed that return per rupee of investment was higher from goats than buffaloes. The goat production systems are highly diversified in different parts of country depending upon agro-ecological conditions and cropping system.

Goat development in Odisha

The livestock production system has been an integral part of the rural livelihood system contributing significantly for poverty reduction in the state. In the last two to three decades, it has been observed that the contribution of agriculture sector to Gross Domestic Product (GDP) has been in declining trend whereas the contribution from livestock sector has been increasing. In 2014-15 the contribution of Agriculture and allied sectors to Net State Domestic Product (NSDP) at current prices

is 53,995 crores which is 20.75 % of NSDP and per capital income from these sectors in 2014-2015 is Rs. 59,229/-. The contribution of Animal Husbandry sector to the Agriculture and allied sector is about 25 %.Goat rearing is an integral part of the livestock sub sector. It has been playing a significant role to improve food and nutritional security, poverty alleviation. Goats are being raised by many farmers because of their low initial investment, low input requirement, higher prolific, early sexual maturity, and ease in marketing (Kumar, *et al.*, 2010). According to livestock census 2012 the goat population of India was 13.51 crores (2^{nd} in world) which is a 3.82% decrease over the 2007 census. Odisha was having 6.5 million goats according to 2012 census which was a decrease of 8.6% as compared to 2007 census. Goats have played a number of multiple roles in the support of man's livelihood for many years all over the world. While goats were originally domesticated in southwest Asia they quickly moved into Africa and now can be found in every environment on the continent (Devries, 2008). Goats have many special features that make them more attractive to rural poor farmers. Because of their flexibility, goats have adapted to virtually every climate on the planet, overall they appear to withstand drought better than other livestock's and have higher survival rates under drought condition. Goats are browsers; they have high digestive efficiency for coarse roughages. Goats are highly selective feeders- a strategy that enables them to thrive and produce even when feed resources, except bushes and shrubs, appear to be non-existent (Devendra,2010).Goats have short reproductive cycles, and reproduce quickly. Age at sexual maturity in does is 7 to 8 months and 12 months for bucks, twinning is nearly 50%, whereas abortion occurs in about 1 to 10% of does. This allows farmers/ producer quick interval of selling part of their flock and generating cash income. Goats are an ideal species for poverty reduction and economic development for the poor in developing countries. These special characteristics are the major reasons which make goats attractive for poverty reduction and improvement of family food security and livelihood of the poor in developing countries. The role of goats in poverty alleviation and their contribution to sustainable livelihoods especially in rural areas have been demonstrated by several Research and Development (R&D) programmes in many countries. The studies reviewed concluded that the development programs of goats can significantly contribute to reducing of poverty and improving the livelihoods of poor households.

Peacock (2005) provided a summary of findings of goat development project in potential for goats to reduce poverty in Africa. This study found that goat development projects had positive impacts on the livelihood of households. The beneficiaries were able to accumulate productive assets, send their children to school, pay hospital fees and survive during drought periods.

Goats contribution to livelihood assets

The economic contribution of small ruminants to poor farm households and livelihood systems is high. Goats are among the major economically important livestock in the world. They play an important role in the livelihood of resource poor farmers. They provide their owners with a vast range of products and services such as meat, milk, skin, hair, horns, bones, manure and urine for cash. Goats are reported to be more economical than cattle and sheep under natural grazing, browsing. They require much lower investments and facilities in terms of housing, feed, labour and health care. The basic principles of economics in goat farming are based on smaller size, costs less than cattle, require less feeds, present fewer risks, and have quick return (there is quick pay of dues because of fast multiplication and early maturity). Peacock (2005), also states that goats have a high economic importance and can play a vital role in ensuring the security of family members. In time of trouble, such as crop failure or family illness, goats can be sold and food or medicine purchased. Livestock in general and especially sheep and goats play an important role in the social status in many countries. Goats provide more than meat, milk and profit at the household level in rural communities. They play a role in maintaining social relations and are regularly slaughtered at religious and other ceremonies. According to Peacock (2005), goats provide their owners with a broad range of products and socio-economic services and have played an important role in the social life of many African people, being used as gifts, dowry, in religious rituals and heritage. The social benefit of goats is also stated by Lebbie (2004), in some cultures through the use of goats for bride price payments, important ritual rites and as sacrificial lambs for important visitors, goats provide a means of fortifying socio-cultural linkages among the living and between the living and the dead. In Swaziland, goat's skins are used as traditional mats and clothing for ladies. Farmers generally rarely slaughter their animals; they consider it to be unaffordable. Goats are used by all religions and most

of the cultures for special occasions, like honouring special guests and religious ceremonies. From these literatures, the importance of goats in social status of various religions and cultures around the world can be understood. The main human capital value that goats provide is nutrition. The nutritional value of animal products to overcome malnutrition has thoroughly been studied. Health and nutrition are important elements in the development process. Adequate nutrition enhances physical health, thereby improves labour productivity. Good nutrition is also associated with learning ability; hence good nutrition leads to higher human capital accumulation. According to Peacock (2005), development and improvement of goat productivity offer the most significant and direct positive impact for improved family protein and energy intake. Goats are an excellent source of meat, the protein is higher than most other meats, and the fat content is lower than beef or pork. On a worldwide basis, goat meat is considered as an important source, with high consumption rates for many cultures. Many persons, who for religious or other reasons restrain from consuming other meats, depend heavily on goat meat. Devendra (2010), made a generalization about nutritional contribution of goats by stating that goat milk is valuable for children, the malnourished, pregnant mothers and the elderly in areas where cow or buffalo milk is not available, mainly due to sales to urban areas. Secondly, there are no religious taboos against goat meat, milk and their products. These considerations together underline the fact that goats currently make a most important contribution in nutrition and food security to rural communities not only in those countries where there are sizeable small ruminant populations, such as India, Pakistan and China, but also elsewhere, such as Indonesia and the Philippines.

According to Libbie (2004) The manure and urine from goats is an invaluable source of organic fertilizer for maintaining or improving agricultural production. It is important where most rural goat keepers cannot afford the expensive inorganic fertilizers for use in their traditional low-input crops and horticultural production systems.

Table 1.1.Position of state in India in goat population (19th livestock census)

Rank	State	Number in thousand
1	Rajasthan	21666
2	Uttar Pradesh	15586
3	Bihar	12154
4	West Bengal	11506
5	Andhra Pradesh	9071
10	Odisha	6513

Source:19th Livestock Census, Department of Animal Husbandry, Dairying and Fisheries, Ministry of Agriculture & Farmers Welfare , Govt. of India

Table 1.2.Density of Small Ruminants in Odisha

Districts	2003	2007	2012
Odisha	48	57	52
Jagatsinghpur	102	120	178
Jajpur	108	113	67
Baleswar	90	95	101
Cuttack	91	101	75
Mayurbanjh	81	100	137
Nabarangpur	29	29	28

Source :Dairying in Odisha, A statistical profile, NDDB, 2016

Table 3. District Wise Goat Population in Odisha (2007 and 2012 census)

District	Goat Population	
	2017 census	**2012 census**
Anugul	270591	207271
Bolangir	299710	256173
Balasore	346844	382007
Baragarh	149798	162631
Bhadrak	201333	144109
Boudha	108537	101660
Cuttack	281300	216816
Deogarh	132816	133991
Denkhanal	186634	161919
Gajapati	134822	109369
Ganjam	238755	227049
Jagatsinghpur	171438	115301
Jajpur	257687	181488
Jharsuguda	67238	66805
Kalahandi	241502	216924
Kandhamal	201013	247960
Kendrapara	140749	100486
Keonjhar	438948	544658
Khurda	100322	73967
Koraput	180164	158812
Malkangiri	885971	138247
Mayurbanjh	885602	1132412
Nuapada	84552	61184
Nawarangpur	72762	91777
Nayagarh	126251	77631
Puri	132717	132413
Rayagada	151939	168612
Sambalpur	189017	242489
Sonepur	93403	95340
Sundergarh	354623	563586
State	7127038	6513087

Source: 18th and 19th Livestock Census, Department of Animal Husbandry, Dairying and Fisheries, Ministry of Agriculture &Farmers Welfare, Govt. of India

1.3. Significance of the Problem

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

Goat farming constitutes the means of livelihood of over 25 per cent of Odisha's rural population. Goats are reared predominantly by the landless and marginal farmers and to a lesser extent by the small farmers too (together some 80 per cent), as a means of livelihood. Odisha is also famous for the native germplasm like Ganjam, Black Bengal, Raighar, Badavihana. These breeds are unique in nature and adapt to the local situation very well.

This research is necessitated by number of reasons. One of the reasons is the increased assumption that under livestock sector cattle cannot be replaced by small ruminants where they are endangered by diseases and this resulted in reduced cash inflows among rural dwellers. Goats do exhibit high productivity potential which if well promoted can easily help to improve the rural economy within a short time. Therefore, there is need to encourage the small farmers to rear goats.

The knowledge of the economic system in which goats interact with other farm enterprises may not be known to shape the future of the enterprise combinations. Besides the following question may be answered by this research; to what extend do the smallholder livelihoods depend on goat production to improve their standard of living?

After investigations, the results of this research will be useful to many stakeholders both within the district and outside the district. The research findings and recommendation may also be of great use to non-governmental organizations which are involved in helping or funding a number of communities involved in goat production.

It will also be useful to the Government when considering the services and projects which it should undertake to improve the livelihood of the communities in

the district in relation to goat production. With this in mind, the relevance and seriousness of the problem can not be overemphasized in that it affect a wide range of stakeholders and solutions to the problem will help to improve the standard of living among the rural dwellers. Research is done to know what are the constraints faced by farmers during goat rearing like financial, operational, extension related and marketing constraints, so that different government and non government institution can give emphasis on these problems and initiate to give necessary help to needy farmers. Nabarangpur district is having sizable number of goats population in the state, and most of the tribal families are dependent on goat farming for their livelihood . So, an attempt is made to understand the impact of goat farming on livelihood of goat farmers and what are the constraints faced by those farmers in the district. For this an empirical study entitled as **"Economic Impact of Goat Rearing on Livelihood of Goat Farmers in Nabarangpur District of Odisha"** focusing on the following objective.

1.4. Objectives of the Study

1. To study the socio economic profile of goat farmers.
2. To analyze production and productivity of goats.
3. To analyze the impact of goat farming on livelihood of respondents.
4. To find out constraints faced by goat farmers.

1.5. Scope of the Study

1. The study is expected to generate a database about socio economic profile of goat farmers in the study area.
2. The study helps to analyze the change in economic status, communication and extension behavior and change in psychological status of farmers after goat farming.
3. The study is expected to find out the financial, operational, extension support, socio cultural and marketing constraints faced by goat farmers during goat rearing.
4. The information on socio economic profile, impact on livelihood, production characteristics of goats, constraints faced by farmers during goat farming would be useful to scientists, personnel of department of Animal husbandry, agricultural scientists of universities and extension workers of the Department

of Extension, Krishi Vigyan Kendras and various animal husbandry development agencies of government of India and Non-Government Organisations to look after to this, and plan and replan some goat development schemes and training programmes to enable sustained growth and development of goat industry and development of impact on livelihood of goat farmers.

1.6. Limitations of the Study

Every study is subjected to certain limitations and constraints. This study suffers from usual limitation of time, money and other resources, associated with social research.

As like any other study it is not possible to study all the variables. The findings of the study were based on the verbally expressed opinions and ability of the goat farmers to recall and their honesty in providing required information for study. Since it is not physically possible for an individual researcher to extend his study to a larger area, the study was confined to only Nabarangpur district. Hence, the findings emanating from the study may be applicable to this area or other areas marked by identical conditions.

1.7. Organization of Thesis

This dissertation has been presented in five distinct chapters. **Chapter I** provides background information of the study, statement of the problem, objectives of the investigation along with its scope and limitation. **Chapter II** seeks to provide an insight into related studies carried out by different researchers in the past. **Chapter III** deals with description of the locale of the study and profile of study area sampling design, operational of different variables and their measurement, techniques of data collection and statistical analysis. **Chapter IV** describes the 'results of the study'. **Chapter V** describes the "discussion"part of the study. **Chapter VI** summarizes the main findings of this study and conclusions emerging there from and follows the 'future scope of research'. Bibliography and appendices have been given at the end of the thesis.

CHAPTER-II

REVIEW OF LITERATURE

A comprehensive review is an integral part of any research study. It is also necessary in developing the conceptual framework and selection of appropriate design for the study. By undertaking a literature review we will able to critically summarizes the current knowledge in the area under investigation, identifying any strengths and weaknesses in previous work, so helping us to identify them in our research and thus eliminate the potential weaknesses, whilst bringing to the fore the potential strengths. Moreover, it helps a great deal to elucidate the problem of study, formulate objectives and decide upon the methodology and exemplifying the inference of the study. The relevant literature reviewed for the present study has been discussed in this chapter under the following subheads.

2.1. Socio economic profile of goat farmers

2.2. Production and productivity traits of goats

2.3. Impact on livelihood of beneficiaries due to goat farming

2.4. Constraints faced by goat farmers

2.1. Socio economic profile of Goat farmers

Socio economic status is an economic and social status of an individual's or family's economic and social position in relation to others, based on income, education, and occupation. Socio economic status gives researcher a reference to look into the complete picture of the research. Various studies are reviewed to understand the profile of goat farmers and their social economic status relevant for the present study.

Sarangi and Swain (2017) in his study on “Impact assessment of National Mission For Protein Suppliment (NMPS) for Goat Development Programme in Coastal District of Odisha observed that age and family type are moderately

correlated; annual income and goats owned are highly correlated. Socio-economic condition of beneficiary group is better than non beneficiaries group.

Panda and Das (2017) in his study on "A Comprehensive study on Goat Finance in Mayurbanjh District of Odisha" revealed that the socio economic variables like education, family size and income of the respondents are significantly correlated with the financial knowledge level of goat farmers. Age, education, and income are positively correlated with knowledge on health care and general management and marketing with PSB beneficiaries. Whereas, the variables like income is negatively correlated with knowledge on health care and general management among MFI beneficiaries. Family size and education variable were found significantly correlated with knowledge on health care and general management and marketing.

Dhara *et al*. (2016) in their study on "Socioeconomic Status of the Goat Farmers in Nadia District of West Bengal" concluded that women (62.75%) were mostly engaged in goat rearing. The majority of the goat owners were within the age group of 30- 45 and they were mostly marginal farmers (64.71%). Most of the goat owners received training on animal husbandry. The caste, family size or farmers education had little impact on income generation but training on animal husbandry helped them to earn more. Thus, the socio- economic status of the goat farmers mostly women can be uplifted through training particularly on goat husbandry. The improvement of Black Bengal goat in the farmers' house towards economic goat rearing and knowledge of scientific breeding practice has a potential for improving the livelihood of the poor farmers.

Nipane *et al*. (2016) in their study on "Socio-economic status of goat keepers in Bhandara district of Maharastra" found that majority (96.86%) of the respondents had male headed ownership, more than 85 per cent in above 30 years of age category, primary school (34%) and high school (22.28%) educated. Most of the respondents (56%) found in the higher category of annual income i.e. Rs. 10000 and above following agriculture + goat farming (34%) and labour + goat farming (33.71%) as their main occupation. More than 90 per cent respondents not participated in any social institution were landless (43.14%) and marginal farmers (39.71%). However, more than half (51.71%) per cent of the respondents had only goats in their livestock holding. The socio-economic factors viz. sex, age, education, annual income,

occupation, social participation, land holding and livestock holding were positively and significantly associated with goat farming.

Yusoff (2016) in their study on "Socio-economic factors in relation to small ruminant farming potential in Malaysia: ranchers' perspective" concluded that highest number of respondents was involved between the ages of 40 to 50 years (23.5%), 92.8% were male and 7.2 % female. The married (86.7%) respondents and holding two family members were dominated in this industry. The majority of the ranchers were educated with less than five years of experience (36%), while a few (1.2 %) were illiterate in this farming. However, a significant (67.7%) of the respondents were keeping this industry as a part time job. Mostly land size of farms was less than 5 acres and dominated by owners' farms (75.6%).

Sabapara (2016) in his study on "Socio-Economic Profile of Goat Rearers and Marketing Practices of Goats in Southern Gujarat, India" revealed that majority of the goat rearers belong to middle age group (31-45 years). Majority of the respondents belonged to the Scheduled Tribe community followed by Other Back Ward Caste community and majority of the respondents were illiterate and had a medium family size of 4 to 6 members. Majority of the respondents were landless and agricultural labourers and had goat rearing as their subsidiary occupation as a source of income. Majority of the goat rearers had an annual income less than Rs. 25,000/-. The annual income of the respondents was mainly from their main occupation and sale of goats. Most of the goat rearers sold their goats at their village round the year on the basis of physical appearance to the middle man at 7-12 months of age of kids.

Ahmad & Fayaz (2015) in their study on "An economic analysis of goat rearing in Kohistan district, Khyber Pakhtunkhwa" revealed that the average per flock per annum cost incurred for large flock size was Rs. 603883.16 and for small size was Rs. 664920.69. Resultantly, annual net return was estimated Rs. 78477.13 for small group and Rs. 277440.0 for large group. The NPV was observed to be positive (considering interest rate of 14.5 percent as per ZTBL charges for livestock enterprises) for both large and small flock size as Rs.165704.83 and Rs. 34990.09, respectively. B/C-ratio was found greater than one (1.29 in case of small and 1.45 in case of large groups). Finally, the IRR value 29.65 % in case of small group and 46 %

in case of large group was greater than the required rate of return which supports the financial viability of the enterprise.

Byaruhanga *et al.* (2015) in their study on "Socio-economic Aspects of Goat Production in a Rural Agro-pastoral System of Uganda" revealed that Majority (87%) of de fecto household heads were male. About 41.2% of the farmers were aged ≥51 years. The average number of goats per household was 9.2. Most farmers (63.2%) owned ≤5 acres of land. Indigenous goats were mainly acquired by buying (85%) while exotic goats and their crosses were acquired from government programs (34%). Goats have a number of roles, though mainly kept as a source of cash income (98.2%), followed by socio-cultural values (69.3%). The biggest problem in marketing of goats was high taxation. Majority of goat owners were men (84.86%) but a few cases (average 15.14%) of women that owned goats independently were also reported.

Sone *et al.* (2015) in their study found that average age of household heads of goat rearers was 43.5 years and majority of respondents across all the clusters belonged to general category followed by Scheduled Caste (SC) category.

Rawat *et al.* (2015) in their study on "Socio-Economic Analysis of Goat Rearing Farmers in Mahoba District of Bundelkhand" found that 45 per cent of respondents had average family size of 3 to5 persons, 35 per cent respondents had average family size of 1 to 3 persons and 20 per cent had family size of 5 to 10 persons. 33 per cent and 24 per cent respectively had intermediate and high school level of education. 8 per cent respondents were illiterate. Agriculture was the main occupation and so as the source of income too. Thus, for most of the respondents Goat rearing is only taken as a secondary or side occupation for generating additional income for the family. The most important income sources of the respondents included agriculture 52%, Goat keeping 25%, business 14% and salary 9%. The respondents indicated that 52% and 25% of the income from agriculture and Goat keeping was mainly used for purchasing food items, and covering education and health expenses.

Yogi *et al.* (2014) in their study on "Constraint Analysis of Goat Rearing Households in Rajasthan" concluded that family members performed different operations in goat rearing. The overall average family size for all goat rearing households was 8 members and ranged from 6.24 members to 11.97 members. The economic and social progress of the households depends upon the size of the operational land holdings. Overall average size of the operational land holdings of the goat rearing households was 1.80 hectares, varying from 1.16 hectare in medium flock size category to 2.08 hectares in small flock size category. It was also observed that the deviating ratio of the other backward caste households across the flock size categories could have affected the distribution of size of land holding. Category-wise observation further revealed that goat rearing was followed as the main occupation by nearly half of the total small category households, 100% by medium and large flock size category households. From amongst small flock size category households, the rest adopted the agriculture and other agricultural related occupations for their livelihood. The results showed that in the absence of alternate livelihood options in the study area, large and medium flock owners adopted goat rearing as the main occupation. About 10% of small category households adopted agriculture as the main occupation as they had larger operational land holdings.

Adams and Yankyera (2014) in their study on "Socioeconomic Characteristics of Subsistent Small Ruminant Farmers in Three Regions of Northern Ghana" had a conclusion that Majority of respondents were males (71.5%), household-heads (65.9%), married (73.5%), Muslims (62.1%) and uneducated (63.9%). Access to extension (29.8%) and credit (14.9%) services was low. Farmers‟ average age (47.29 years) and sheep holdings (12.14 acres) were similar across the regions, and purpose of rearing small ruminants differ significantly. Adult children and female spouses contribute meaningfully to small ruminant management practices. Thus, socio-economic and farm characteristics offer significant input in designing effective livestock programs.

Singh *et al.* (2013) observed in a study carried out in two districts Hamirpur and Mahoba in Bundelkhand and region of Uttar Pradesh that majority of goat keepers belonged to the backward social community (54%), followed by Scheduled Caste (37%) and general category (9%).

Rai *et al*. (2013) in their study on "Livelihood security through improved goat rearing practices under field conditions" observed that majority of goat keepers (90%) belonged to socioeconomically backward communities. The literacy rate was very low in adopted villages. Goat keeping was a secondary occupation for them contributing about 16% of annual income. Goats were mainly looked after by the women and children of the families.

Manzi *et al.* (2013) in their study on "Socio-economic assessment of indigenous goat production system in rural areas of Bugesera District in Rwanda" found that 71% of goat owners were found to be women. Women are more likely to own small ruminants probably because of their determination to increase their economic autonomy and their bargaining power within the household. Thus owning small ruminants contributes to their empowerment. Most of the land used for goat farming was individually owned (87.6%), having been either traditionally inherited or purchased. Fifty four percent (54%) of the farmers reported to be getting information about breeding, feeding, production, marketing and any other techniques from local radios. Others reported that they get information from local authorities (sector veterinarians) and neighbours while some revealed to look for any information anywhere (use skills acquired traditionally). Ninety five percent (95%) of the farmers reported to have not received any training and only 3.3% attended any such training.

Mohan and Singh (2012) in their study on "Socio-economic aspects of goat farmers in semi arid region of Uttar Pradesh" concluded that majority of goat owners belonged to landless and marginal farmer's category. About 60% of the farmers" annual income ranged from 10,000 to 30,000. Study also revealed that 60% of goat farmers rear indigenous breeds of goats.

Raghavan and Raja (2012) in their study "Analysis on the Socio Economic Status of the Goat Farmers of Malabar Region of Kerala" revealed that majority are marginal farmers with a land holding of less than 50 cents. Nearly 92% of the heads of the families were educated and 15% of them had high school level education and above. Majority of the farmers (55.73%) had a tiled house with concrete flooring. Females are mainly engaged in goat rearing. Majority of the farmers (66%) listen to the radio/television programmes and equal number of them access to training classes and almost all of them are interested to learn more if classes are arranged.

Zaibet *et al.* (2012) in their study on "Social changes, economic performance and development: the case of goat production in Oman" revealed that more than 60% of the farmers are holding flock sizes of less than 40 head while 20% have a flock size of more than 60 head. These classes seem to be in accordance with the size of farm holdings and more particularly the size of the household, i.e. family labor (with correlation coefficients of 0.6 and 0.75, respectively). These preliminary observations describe animal rearing systems in this community. Although grazing is the basis for feeding animals, fodder, and other farm products remain essential in maintaining these relatively large flock sizes. Family labor, on the other hand, represents the essence of animal husbandry in the community and largely determines the size of the flock. The amount of income of non-farm origin is significantly higher than income generated from animals. This phenomenon is exacerbated by severe climatic conditions that have led to the decline of rural income. Major sources of non-farm income are government pensions or salaries and remittance income received from household members working in the capital area. In addition to providing high proportion of household food and income, animals in traditional production systems serve social and cultural functions prestige) explaining the large flock size within limited production resources.

Kumar *et al.* (2012) in their study on "Socio- economic profile of goat farmers in Uttar Pradesh" revealed that majority of the respondents belonged to middle age group (66.2%), illiterate (44.6%) with medium level of experience in goat farming (68.8%) and medium family education status (73.7%). Education level of goat farmers was significantly associated with land holding category of goat farmers, whereas no association was observed with age and experience of the respondents. Majority of the respondents belonged to joint family (52.9%) and Hindu religion (93.3%) followed by other backward class (48.7%). Family type, caste and family education status were significantly associated with landholding categories of goat farmers. Agriculture and animal husbandry were the primary occupations of the respondents and majority of them had smaller flock size. The contribution of goats to household income was higher in landless goat owners as compared to the other categories. Thus, goats can be used as tool for alleviating poverty and source of livelihood in rural areas.

Rathore and Nikam (2011) reported in a study that out of 120 respondents 56 per cent were middle aged, 65 per cent live in a joint families, 53.33 per cent being illiterates, 33.33 per cent were marginal farmers with 525 per cent having agriculture as major occupation.

Sathyanarayan *et al.* (2010), in their study on "Socioeconomic Status of Livestock farmers of Narasapura Village - A Benchmark Analysis" reported that majority of the farmers had low to medium profile. More than half (63.08%) of the livestock farmers lived in nuclear type family followed by joint family (36.92%). Majority of the farmers are the members of the cooperative societies followed by self help groups. It was found that majority (96.92%) of the respondents belonged to low family income and an equal percentage of respondents belonged to medium (1.54%) and high (1.54%) family income categories. Majority (92.30%) of the respondents were holding small acres of rain fed land followed by medium (6.17%) and large (1.53%). Hundred percentage of the respondents owned poultry followed by goat (33.84%). Since least investment is required to maintain poultry and goats, it could be the possible reason for possessing poultry and goats by majority of the farmers.

Sahlu and Goetsch (2005) studied that goats or for that matter livestock, are not the most important factor in agriculture in developed countries, rather, people are. But, most people in poor countries are farmers and pastoralists whose livelihood and sometimes survival do depend on their stock. Loss of livestock in developed countries typically represents only an economic hardship, whereas it can potentially be a life-threatening event in poor countries. Goats have a unique place in developing countries compared with cattle because of a role in gender equality. Goats are managed and owned by the female of the household with the help of her children, giving her the right to make decisions with regards to food security and providing a source of income she manages. There is a need to assess the role of goats in shaping societies, not only from a socio-economic view, but also relative to cultural and social perspectives.

Misra *et al*. (2000) observed that the small ruminants contribute 15 to 27% of family income to the small holders and provide gainful employment of 180 to 330 man-days per annum depending on the size of the flock.

2.2. Production and productivity traits of goats

Sarangi and Swain (2017) in his study on "Impact Assessment Of National Mission for Protein Suppliment (NMPS) for Goat Development Programme in Coastal District of Odisha" observed that productive and reproductive traits of goats reared under NMPS are better than the goat reared under non-NMPS.

Rai *et al*. (2013) in their study on "Livelihood Security through Improved Goat Rearing Practices under Field Conditions" revealed that low productivity of goats was mainly attributed to inadequate feeding, health measures and breeding practices.

Manzi *et al.* (2013) in their study on "Socio-economic assessment of indigenous goat production system in rural areas of Bugesera District in Rwanda" revealed that very few farmers (4%) in the study area kept records out of which only 2% of the farmers responded to be keeping breeding records on kidding date, date of service after kidding, and number of kids born. Records and record keeping is one of the most critical areas in improved goat productivity as evaluation is based on performance records. Without record keeping, one cannot monitor events in the flock related to the reproductive parameters.

Rajput and Tripathi (2009) in their study on "Perception of Stakeholders about Incidence of Diseases among Small Ruminants" revealed that pica, pneumonia and pox were the most prevalent diseases which are mainly responsible for decrease productivity while contagious ecthyma and enterotoxaemia were comparatively least prevalent diseases.

Sahlu and Goetsch (2005) in their study on "A foresight on goat research" revealed that one of the foremost areas is the refining of nutritional requirements and nutrient utilization, inclusive of components such as impacts of grazing conditions and prior nutritional plane. Likewise, study of means to prevent unacceptable levels of internal parasitism as well as effects of infestation on nutrient needs is called for. Moreover, changes such as increasing concerns for animal welfare, land deterioration, and food safety will impact the direction of goat research programs in the foreseeable future. Feedstuffs represent the major cost of production of livestock, including goats. Thus, nutrition and feeding practices are of great importance, and more research is

needed to develop and evaluate feeding programs that enhance level, efficiency, and (or) profitability of production of goat meat, milk, and fibre. Feeding and nutrition have obvious influences on maintenance, reproduction, and tissue and fibre growth of goats. As has occurred with other livestock species, improvements in levels and efficiencies of production by goats have been achieved through changes in genetics and management practices.

Peacock (2005) in his study on Goats "A pathway out of poverty" revealed that in order to improve production, it is important that goat producers have access to reliable and affordable support services offering them access to knowledge and inputs, including credit and other financial services. Historically, in many developing countries, government extension and veterinary departments have provided services to livestock keepers. These services were frequently subsidized, to some extent, and were often concentrated in the higher potential districts, leaving marginalized livestock keepers, such as pastoralists or the landless, under-served. The public sector reforms of the 1990s have led many of these public services to be cut back and in some cases withdrawn altogether. While the private sector has emerged, in some countries, to fill the gap they typically provide services to wealthier livestock farmers, such as dairy farmers, commercial poultry and pig keepers, leaving the poor even more marginalized from these vital services.

Ahuya *et al.* (2003) reported that intra and inter farmer-group visits and livestock exhibitions and auctions encouraged competitiveness among the various farmer-groups and members within such groups; hence enhancing the uptake and dissemination of the dairy goat technology as illustrated by the realization of high survival rates, high growth rates, and high increases in improved goat population in the project area.

Seleka (2001) in his study on "Determinants of small run supply of small ruminants in Botswana" revealed that overall productivity indicators such as mortality and utilization(home slaughter and sales) rates reveal low level of productivity in the small ruminant industry, particularly in the communal system where livestock graze and breed under uncontrolled environment. High mortality rates are generally caused by prevalence of poor management and inadequate husbandry practices.

2.3. Impact of goat rearing on livelihood of farmers

Sarangi and Swain (2017) in his study on "Impact Assessment of National Mission for Protein Suppliment (NMPS) for Goat Development Programme in Coastal District of Odisha" observed in their study that Impacts like economical, social, communication and psychological impacts are higher on beneficiaries of NMPS than the non-NMPS beneficiaries. The results of this study indicated that there is definitely increase in productive parameter of goats reared under NMPS thereby increasing socio-economic conditions of the beneficiaries thus having a positive impact on livelihood.

Ahmad & Fayaz (2015) in their study on "An economic analysis of goat rearing in Kohistan district, Khyber Pakhtunkhwa" revealed that the goat rearing enterprise in the study area made a significant net contribution to the economic welfare of the sample respondents. The Benefit cost analysis reveals that benefits exceed costs for all values of discount rates taken into account for the sampled enterprise. The values of IRR further indicate the robustness of the results and support the main conclusion. The values of IRR are far greater than prevailing discount rate and signify that the schemes will remain viable at any discount rates below estimated IRR for the enterprise. Therefore, the study suggests that enterprise under consideration is profitable and may be extended to farmer communities experiencing the same climatic and socio-economic conditions and interested farmers should be provided technical and financial assistance in starting the goats rearing enterprise.

Dixit and Singh (2014) in their study on "Economic analysis of goat rearing under field conditions of Bundelkhand region" revealed that goats are reared by more than 75% households as an assured source of income in economic distress and risk aversion situation. The average number of goats per household was 2, 8 and 23 for small medium and large goat farmers, with an overall average of 9.2. It was observed that as land holding size decreased the flock size increased. Overall, land holding size was 1.64 hectare and ranged from 1.23 hectare (large farmer) to 1.96 hectare (small farmer). Similarly, it was found that average flock size increased as the number of family members increased.

Dixit and Mohan (2014) in their study on "Economics of goat production in Mathura district of Uttar Pradesh" revealed that overall cost of rearing per goat was Rs.1228.8 and it decreased with the increase in flock size. It was Rs. 1472.9 for small followed by Rs. 1172.3 for medium and Rs.995.90 for large flocks; however, per goat net returns over variable cost were Rs.1799.1 for small, Rs. 2254.3 for medium and Rs. 2561.5 for large flocks. The overall net annual income per goat was Rs. 2178.00. Goat farming provides financial security to poor households. 90% investment was made on purchase of goats followed by 8% on construction of shed and 2% on equipment like manger, drinking water tank, utensils, ropes etc.

Dubeufa and Sayadib (2014) in their study on "Multi-functionality issues for small ruminants: What changes are needed in territorial public policies and training? Report of two round tables on territorial issues and training for the development of goat farming" revealed that goats play an important role in primary function (contribution of meat of anima origin), secondary productive function (milk and meat processing), tertiary productive function (sale of cheeses, of kids or lambs, of local crafts, and possibly agro-tourism), environmental and esthetic functions.

Tanwar and Chand (2013) in their study on "Economic analysis of goat rearing in field conditions in Rajasthan" revealed that the variable and fixed costs shared 86.27 and 13.73% of gross cost. The labour cost shared 72% of variable cost and interest on investment shared 13% of fixed cost. Gross cost per goat decreased with increase in herd size. Income from sale of kids/adults contributed to 56.01% to returns followed by sale of milk (40.65%) and manure (3.40%). Net income was maximum in large herd size and minimum in small herd size. Income and employment generation also improved with increase in herd size. It was concluded that goat rearing plays a vital role in generating income and employment to farmers in Rajasthan. The overall net return and farm income per family was Rs. 15269/- and Rs. 31403.17 respectively. Net returns, family labour income and farm income increased proportionately with increase in herd size. They also reported that among the goat rearing activities, grazing of goats was the main activity to provide employment.

Manzi *et al.* (2013) in their study on "Socio-economic assessment of indigenous goat production system in rural areas of Bugesera District in Rwanda" revealed that Indigenous goats have important socio-economic roles in the livelihood strategies of the poor farmers, especially those in rural and hard-to-reach areas. Those roles include their use as savings, insurance, security, accumulation and diversification of assets, social and cultural functions. They are also valued for their productive performance, adaptation and disease resistance.

Budisatriaa and Udob (2012) in their study on "Goat-based aid programme in Central Java: An effective intervention for the poor and vulnerable?" revealed that all farmers agreed that the goat-based aid programme was useful and, for the majority, it improved their economic situation. Successful farmers group members had 2.5 times higher value added from goats in the period that the credit was not yet settled and 1.4 times higher value added when the credit was settled than failed farmers group members. The goats based aid programme made a valuable contribution to the livelihoods of the majority of farmers in the disaster attacked area, in terms of economic results and social status. The initial assessment of the beneficiaries by the local government should have considered prior experience with livestock. The goats distributed were thoroughly screened by the donor. Nevertheless, the local government could have increased the commitment of\ the beneficiaries by giving them the opportunity to select the goats themselves, and by sanctioning farmers who failed to repay their goat credit.

Soni *et al.* (2011) in their study on "Socio-economic impact of the improved goat farming practices on tribal" revealed that goat has been a ready cash riding dependence on high cost private credit, increased share of income from goat to family's total income, increase profit/goat/annum, increased awareness about commercial goat farming and its advantages, increased access to goat milk for family consumption and increase in employment generation through goats reported by the 98.38, 96.77, 88.77, 80.64, 72.58 and 100 percent selected respondents goat farmers as socioeconomic indicators respectively. Similarly, bicycle, construction of house, construction of goat shed, television/ radio, scooter/motor cycle, jewellery, children education and mobile phone reported 56.45, 48.38, 80.64, 32.25, 8.06, 27.41 and 25.17 percent selected respondents goat farmers as status of family's assets, respectively.

De Vries (2008) on his study on "Goats for the poor: Some keys to successful promotion of goat production among the poor" revealed that a related best practice‖ used in all cases was to recruit and train community-based volunteers to provide practical on the farm assistance. The front line extension workers who live in the local area and are selected and supported by the community or group are often referred to as Community Animal Health Workers or Promoters. Even in China where the government gives good extension support to goat production, community volunteers provide an ongoing presence and are a key factor in encouraging and teaching the best practices.

Devendra (2007) in his study on "Concluding synthesis and the future for sustainable goat production" revealed that associated with goat production systems, reference is made to several million small farmers and the landless, who because of goat ownership, are able to survive and support their livelihoods and households. The key descriptors concerning these people are deprivation, subsistence, illiteracy, survival and vulnerability, in which there is a continuing poverty–adaptation–fragile lives–little hope–low life expectancy complex.

Peacock (2005) in his study on "Goats-A pathway out of poverty" revealed that goats can play a vital role in ensuring the food security of a household often being the only asset possessed by a poor household. In time of trouble, such as crop failure or family illness, goats can be sold and food or medicine purchased. This is a vital role in ensuring the security of family members. Goats can play a vital role in supporting families through all these situations. Being relatively tolerant to drought goats can survive on woody browse and infrequent watering. Their fast reproduction rate enables their owners to recover quickly, following a drought. Goats, being small, can be carried or moved easily, if a family is forced to flee their home..

Kosgey *et al.* (2004) observed that small ruminants (i.e., sheep and goats), especially indigenous breeds, are widespread and important to the subsistence, economic and social livelihoods of a large human population in developing countries. Unlike commercial farmers, they tend to keep animals for multiple needs, and not only as an economic enterprise, i.e., tangible benefits (i.e., cash income from animal, milk and meat sales and for home consumption, manure, fibre and skins) and

intangible benefits (e.g., savings, an insurance against emergencies, and cultural and ceremonial purposes) are important.

Lebbie (2004) in his study on "Goats under household conditions" revealed that at the rural community level, goats play a significant role in the food chain and overall livelihoods of the poor rural households where they are also largely the property of resource poor women and their children. Goats still remain largely marginalized, even at the household level. In general, goats do not contribute much to direct income earnings in rural households. As tangible financial assets, however, goat product consumption and sales enhance economic stability of households in times of crops failures and currency fluctuations. Goat keeping provides employment for the rural poor women and their children, whose responsibility is to take care of the goats. In addition to providing food and economic stability, goats can transform household and industrial waste, crop-residues and other farm byproducts (including damaged and spoiled grains, vegetables and root crops) into high value commodities. Goats also graze and utilize uncultivated parts of farms, thus transforming wasteland into high value commodities.

Lebbie and Ramsay (1999) in their study on "A perspective on conservation and management of small ruminant genetic resources in the sub-Saharan Africa" revealed that Small ruminant genetic resources (SRGR), including sheep and goats, provide sustenance, cash income, socio-cultural linkages and insurance against risks in fragile and harsh environments, particularly in rural communities.

Teufel *et al.* (1997) in their study on "Contribution of goat husbandry to household income in the Punjab, Pakistan: A Review" revealed that goat husbandry contributes to the income of landless and small-holder households. The economic success of goat husbandry depends on the availability of resources within the household i.e. land, livestock, labour, off-farm income. The average annual profit achieved by the 41 households that had received a goat from the farmers' organisation was Rs 454.62 per goat. Generation of income is by far the most important objective of goat husbandry for the surveyed households, followed by production of animals for ceremonial slaughter. The main characteristics associated with economically successful goat husbandry, i.e., having no or little land and no regular substantial cash

income. These are the households that have to find a new economic base for their livelihood, as their traditional professions are not needed any longer.

2.4. Constraints faced by farmers in goat rearing

Sarangi and Swain (2017) in his study on "Impact Assessment of National Mission for Protein Suppliment (NMPS) for Goat Development Programme in Coastal District of Odisha" observed in their study that financial constraint was ranked first by the respondents followed by operational constraint, as second. The extension support constraint was ranked third and socio-cultural constraint was ranked fourth by the beneficiaries. The marketing constraint faced by the beneficiaries was ranked fifth.

Naidu *et al.* (2016) in their study on "Constraints in goat rearing faced by farmers and perception of veterinarians of Andhra Pradesh" revealed that Lack of supply of superior quality goats on subsidized basis was the major constraint (94%) perceived by the farmers. Lack of encouragement from government for goat rearing (92%), financial assistance from banks or government for purchase of goats (80%), organized market for sale of goats (76%) and shrinkage of grazing area (70) were the other major constraints faced by goat farmers. No special government programme for the development of goat production system (77%), farmers own treatment or approaching quacks for the treatment of sick goats in early stages of diseases (72%), shrinkage of grazing lands (69%), feed and fodder shortage, particularly during summer months (68%) and lack of scientific knowledge about feeding and management of goats to farmers (65%) were the major constraints perceived by the field veterinarians.

Dubeuf *et al*. (2014) in their study on "Scaling up successful practices for pro-poor development projects involving goats: First outputs of a comparative study" found that the weaknesses in implementing successful practices are very small herds size, low educational level, lack of forage, water and fodders, few negotiation capacity, few veterinarian products and services opportunity, lack of clear project objectives, lack of coordination between the community and state levels investment.

Yogi *et al*. (2014) discussed the socio-economic background of goat rearing households and specific findings of constraint analysis to prioritize the problems

faced at household level. Garrett's ranking technique was used to prioritize various constraints. Scarcity of water bodies and inadequacy of basic facilities like marketing, credit and veterinary services for goat keepers were identified as the major constraints. The study revealed that the severity of the non-institutional constraints was more in Rajasthan.

Rai *et al*. (2013) in their study on "Livelihood security through improved goat rearing practices under field conditions" revealed that help of the veterinarians was rarely taken due to high treatment cost. More than 90% goats were sold by goat keepers in their villages to butchers/middlemen. These middlemen moved round the year in the villages and further sold these goats to itinerant traders resulting in less profitable business for goat farmers.

Manzi and Mutabazi (2013) in their study on "Socio-economic assessment of indigenous goat production system in rural areas of Bugesera District in Rwanda" revealed that the main constraints to goat farming are low prices and lack of market for the animals, limited feed resources during drought years and high mortality of the kids and lambs. From the researcher perspective, the main constraints are lack of initiatives by the central and district government to assist the small ruminant farmers in development of small ruminant systems through research, extension and commercialisation. Funding of small ruminant development programs have been minimum resulting in small efforts by the NGOs or from the research institutions.

Budisatria and Udob (2012) in their study on "Goat-based aid programme in Central Java: An effective intervention for the poor and vulnerable?" revealed that the internal factors responsible for failure of the goat development programmes were unpreparedness of the farmers, limited experience in keeping animals, inability to keep relatively large numbers of animals, and that their job did not relate to agricultural activities. External factors were a lack of government support, limited land availability, and poor management of the farmers' group. Non-adapted animals (they were from other areas) and the related factor, high mortality rates, were also mentioned as major factors contributing to failure within the programme.

Ahuya *et al*. (2012) in their study on "Developmental challenges and opportunities in the goat industry: The Kenyan experience" revealed that goat

production in Kenya, like in many other countries are constrained by: (a) management related issues (e.g. inadequate husbandry), (b) inadequate and ready supply of the most appropriate type of breeding stock and how they can be improved, (c) lack or poor supply of inputs, including drugs, feed, water, etc., (d) unavailability of appropriate markets and poor market organization, (e) poor infrastructure and lack of efficient information networks, (f) poor public policy on the environment, especially on the administration of animal health policies and controlling disease, (g) decreasing size of farm-lands to allow for alternative options that can be exploited economically, (h) insecurity and livestock rustling among pastoral communities, (i) Frequent drought and lack of preparedness for such calamities.

De Vries (2008) on his study on "Goats for the poor: Some keys to successful promotion of goat production among the poor" revealed that constraints to livestock raising in particular goats include the lack of good breeding stock, lack of veterinary and extension services, lack of credit and access to markets. Focusing more assistance on women farmers would improve impact on the poor. Value-based holistic community development with self-help groups creates a foundation for increasing farmer incomes by providing a forum for education, mutual support and developing markets. Most common obstacle faced by small scale goat producers is lack of access to good breeding stock. A second major constraint is access to adequate veterinary care and extension services. A third obstacle faced by many goat producers is lack of access to markets for goat products and also for supplies.

Kosgey *et al.* (2006) observed that to tackle the foregoing bottlenecks in goat industry, public and non-public support systems, particularly in terms of farmer education and provision of extension and veterinary services, are fundamental.

Peacock (2005) in his study on "Goats-A pathway out of poverty" revealed that the potential and constraints to pro-poor goat development in Africa are an absence of a poverty-focus and specific targeting of the poor, application of inappropriate technology to inappropriate species (e.g. goats)., absence of service delivery to the poor and the capture of project benefits by the wealthy. The underlying reason identified for these failings are weaknesses in the institutional framework within which livestock interventions operate, such as: the way public sector research and extension organizations are under-funded and function including their lack of

poverty-focus, out-dated and inhibiting national and international legislation (e.g. on issues related to animal health land tenure, etc.), weak private sector development and weak representation of the interests of the poor, etc.

Iniguez (2004) in his study on "Goats in resource-poor systems in the dry environments of West Asia, Central Asia and the Inter-Andean valleys" revealed that access to markets is urgently required to reverse the trend to increasing poverty for farmers of Inter-Andean valleys. If this is possible, production systems will likely tend to intensify. Thus, the search for market opportunities, particularly for products with added value is an important avenue to consider, in addition to the organization of production and marketing to target the production of kids and milk derivatives. For such a strategy an evaluation of conventional and non-conventional feeding resources is needed along with the implementation of adaptive research to improve the feeding system, herd management and animal health. While this is urgently required, research and development often focuses on the introduction of technologies without due consideration to markets, which results in lack of adoption.

Lebbie (2004) in his study on "Goats under household conditions" revealed that the major constraints faced by the goat rearers are poor rural households, poor animal management, inadequate and lack of investment into goat farming and production and unfounded prejudices limit goat development.

Ahuya *et al.* (2003) observed that stronger linkages between researchers, extension agents and farmers that allow problems to be discussed and timely solutions found are needed in order to improve the condition of goat rearers.

Fehr and Boyazoglu (1999) concluded that ecological constraint and social and economic circumstances of the target groups have been insufficiently considered, and too often programmes were planned and implemented without a clear strategy for phasing out or linking with long-term development programmes.

CHAPTER-III

MATERIALS AND METHODS

This chapter deals with the methods and procedures followed during the course of investigation. The method includes selection of problems; selection of samples, research design, tools and techniques for data collection, etc., presented below systematically. An attempt is made to operationalize both the dependent and independent variables used in the research study. Moreover, valid statistical methods are used in the process of analysis of data in the line of objective of the study.

The methodology adopted in the study is presented below under the following sub-heads.

3.1. Selection of problem
3.2. Area of the study
3.3. Research design
3.4. Sampling Procedure
3.5. Tools of the study
3.6. Selection of variable
3.7. Operationalization of independent variables
3.8. Operationalization of dependent variables.
3.9. Constraints faced by goat farmers
3.10. Data processing and analysis using statistical methods

3.1. Selection of Problem

A research problem, in general, refers to some difficulty which a researcher experiences in the context of either a theoretical or practical situation and wants to obtain a solution for the same. While attempting to select a problem for investigation in a research study, it is important to give priority on establishing a clear, realistic, unambiguous objective, delineating the effects of probable factors. However, the conceptualization of research problems will help the researcher to take up the investigation in right direction. Keeping this principle in mind, the present research study is designed to know the impact of goat farming on livelihood of goat farmers.

Goat rearing has been an integral part of the rural livelihood system contributing significantly to hunger and poverty reduction in the state. The goat rearing done in the state is very low intensity economic activity which is mainly focused towards supplementary income. The activity is more of traditional practice of rearing small flocks of goats with the objective of rearing goats to sale at the time of family needs. The feeding system employed by the rearers is almost the same throughout the state and relies on open grazing and without any supplementation of concentrates.

It is presumed that the goat farmers have improved their socio-economic standards through goat rearing. Moreover, it is hypothesized that goat rearing helps in increasing the livelihood of goat farmers. In this context questions are asked, "Does goat rearing helps in improving the socio-economic standard of farmers? Hence to have answers to these propositions, the present research study entitled **"Economic Impact of Goat rearing on Livelihood of Goat Farmers in Nabarangpur District of Odisha"** was selected with much care, and in consultation with the guide and co-guide.

3.2. Area of the Study

The study was undertaken in Nabarangpur district of Odisha state. Odisha lies between the latitudes 17.78^0 N and 22.73^0 N, and between longitudes 81.37^0 E and 87.53^0 E. The state has an area of 155,707 km^2, which is 4.87% of total area of India, and a coastline of 450 km. In the eastern part of the state lies the coastal plain. It extends from the Subarnarekha River in the north to the Rushikulya river in the south. The lake Chilika is part of the coastal plains. The plains are rich in fertile silt deposited by the six major rivers flowing into the Bay of Bengal: Subarnarekha, Budhabalanga, Baitarani, Brahmani, Mahanadi and Rushikulya. Three-quarters of the state is covered in mountain ranges. Deep and broad valleys are found in these ranges which are made by rivers. The valleys have fertile soil and are densely populated. Odisha also has plateaus and rolling uplands, which have lower elevation than the plateaus. The highest point in the state is Deomali at 1672 metres. The state experiences four meteorological seasons: winter (January to February), monsoon season3(March to May), south-west monsoon season (June to September) and northeast monsoon season (October–December). However, locally the year is divided into six traditional seasons (or *rutus*): *Grishma* (summer), *Barsha* (rainy season), *Sharata* (autumn), *Hemanta* (dew), *Shita* (winter) and *Basanta* (spring).

Map 3.1: Map of India showing Odisha state

Map 3.2: Location of Odisha in relation to its boundaries

Table 3.1: Odisha at a glance (Census 2012)

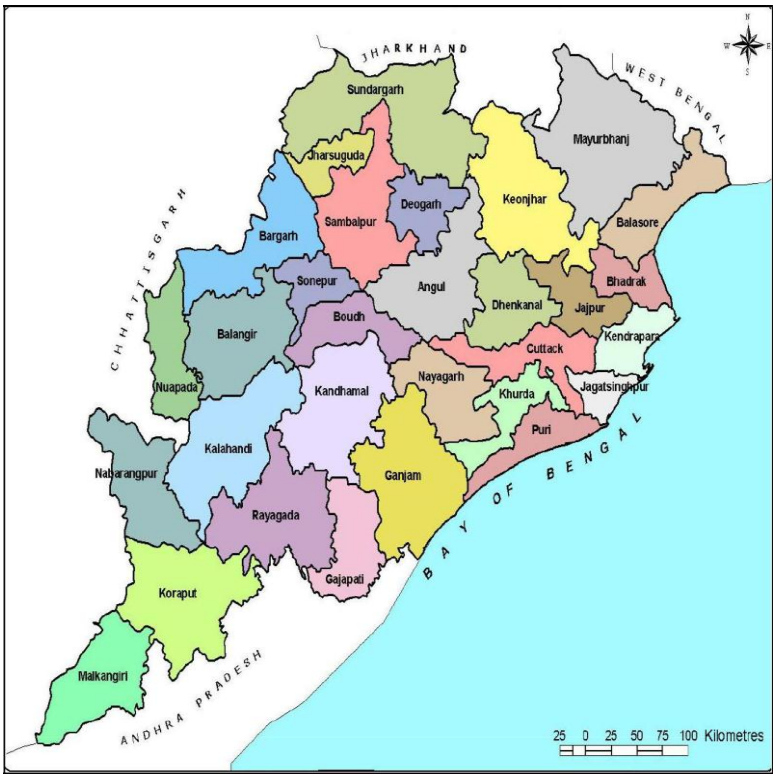
Sl. No.	Particular	Quantity
1	Total area(sq.km)	155707
2	Total population	41974218
	Total male	21212136
	Total female	20762082
3	Decadal growth rate in%	14
4	Density of population per sq km	270
5	Sex ratio(females per 1000males)	979
6	Total urban population	7003656
	Total males	3625933
	Total females	3377723
7	Total rural population	34970562
	Total male	17586203
	Total female	17384359
8	Total literates	26742595
	Total male literates	15089681
	Total female literates	11652914
9	Total scheduled castes population	7188463
	Percentage to total population	17.1
10	Total schedule tribes population	9590756
	Percentage to total population	22.08
11	Number of districts	30
12	Number of sub divisions	58
13	Number of blocks	314
14	Number of grama panchayats	6234
15	Number of villages	51313

Source: Panchayat Raj Department, Odisha.gov.in

Table 3.2: Livestock population of Odisha (2012 census)

Sl. No.	Species	Numbers
1	Cattle (indigenous)	10315499
2	Total cattle	11621272
3	Buffalo	726306
4	Pig	280316
5	Goat	6513087
6	Sheep	1581129
7	Birds in farm	7636249
8	Backyard poultry	12254289
9	Total poultry	19890538

Goat constitutes 78% of the total small animal population in the state which speaks about its popularity over other small animals like sheep and pig. Goat farming constitutes the means of livelihood of over 25 per cent of Odisha's rural population. Goats are reared predominantly by the landless and marginal farmers and to a lesser extent by the small farmers too (together some 80 per cent), as a means of livelihood. Odisha is also famous for the native germplasm like Ganjam, Black Bengal, Raighar and Badavihana. These breeds are unique in nature and adapt to the local situation very well. The traditional goat husbandry system operates with the rearing of indigenous species in small numbers or in small flocks by individual families. The inputs in terms of financial investment for such type of venture are nearly zero and therefore, the productivity is also low in this conventional small holder system. There are also farmers who exclusively rear goats, with a flock size of 10 to 50, who rarely adopt modern practices for better production. Since goat rearing is having tremendous impact on livelihood of poor people, it is essential. For the economic upliftment of farmers and to generate employment, goat farming should be promoted.



Map 3.3: Map of Odisha State showing different districts

3.2.1. Institutional Structure in Odisha for livestock service delivery

Provision of adequate livestock service is a prerequisite for increasing the production potentiality of livestock. Veterinary Dispensary and Livestock Aid Centres (LAC), operated by the Directorate of Animal Husbandry and Veterinary Services (DAH and VS) under the Fisheries and Animal Resource Development Department of the Government of Odisha are the main sources of veterinary services to all categories of livestock owners. The above institutions mostly provide curative health services, vaccination, artificial insemination and limited extension services. By the end of 2016, there were 540 Veterinary Hospitals / Dispensaries, 3040 Livestock Aid Centres in the state to provide veterinary services.

Table 3.3: Veterinary Institutions under the AHVS departments

Sl. No.	Institutions	Numbers
1	VD	540
2	LAC	3040
3	VD+LAC+OTHER CENTRES	2659+3190
4	Clinical Investigation Laboratory,State Veterinary Lab	4
5	Animal Disease Research Institute	1
6	District Diagnostic Laboratory	26
7	Odisha Biological Product Institute	2
8	Department Training Centres	7
9	Livestock Breeding Farms	11
10	Poultry Breeding Farms +Duck Breeding Farms	8+2
11	Fodder Farms	20
12	Goat Breeding Farms	6
13	Sheep Breeding Farms	1

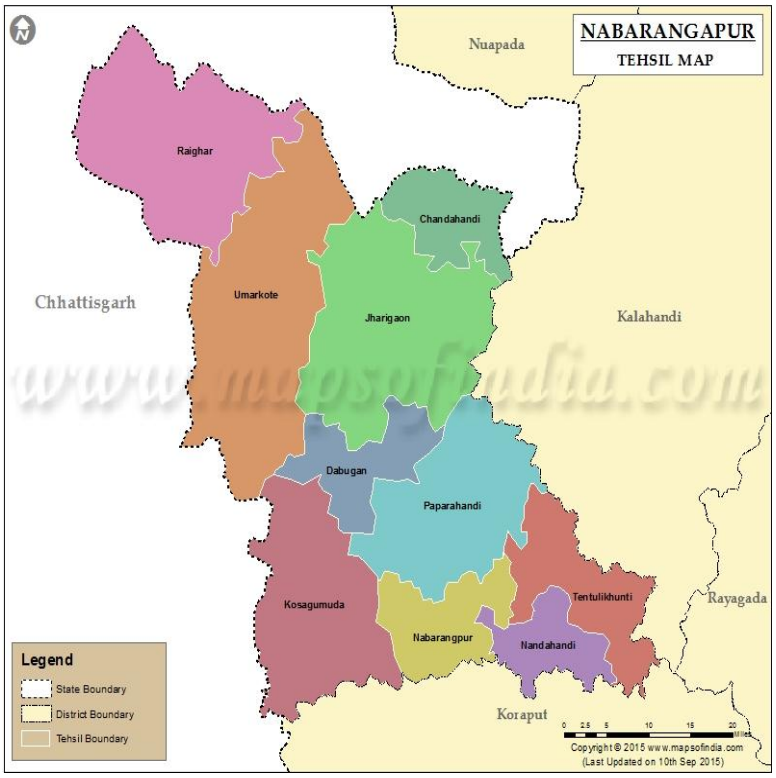
Source- Annual Report -2014-15, F&ARD, GoO

The State has three Clinical Investigation Laboratories, one State Veterinary Laboratory, one Animal Disease Research Institute, one Frozen Semen Bank and two Biological Product Institutes. One Veterinary Officer's Training Institute, three Livestock Inspector Training Centres, one Frozen Semen Artificial Insemination Training Centre, one Animal Disease Research Institute and one Fodder Training Centre are catering to the capacity building needs of the Veterinary Department field staff. On an average, there was one centre per 45 Km^2 catering to some 7,500 animals in the state. The distribution of these centres within the state is highly imbalanced.

3.2.2 Nabarangpur District

It is located 423 km east towards state capital Bhubaneswar. Total population is 1218762.it is the 17^{th} largest district in the state by population. Nabarangpur District, also known as Nabarangapur District and Nawarangpur District, is a district of Odisha, India. The city of Nabarangpur is the district headquarters. Most of its population is tribal, and most of the land is forested. Situated in the southwest corner of Odisha, it borders Koraput District. Nabarangpur district is situated at 19.14’

latitude and 82.32' longitude at an average elevation of 1,876 feet (572 m). The area of the district is 5294.5 km^2. Its boundary stretches in the north to Kalahandi District, west to Jagdalpur District in Chhattisgarh, east to Kalahandi and Rayagada District and south to Koraput District. The river Indravati forms the border between Nabarangpur and Koraput districts. The district capital Nabarangpur is located on the plateau about 2,000 ft (610 m) above sea level



Map 3.4: Map of Nabarangpur district

Table 3.4: Administrative Set up of Nabarangpur District

No of Subdivisions	1
No of Blocks	10
No of Tehsils	4
No of Municipalities	1
No of NACs	1
No of Gramapanchyats	169
No of Villages	876

Table 3.5: Profile of Nabarangpur District

Sl. No.	Facts	Units	Magnitudes
1	Geographical area	SQ.KM.	5924
2	Population	Nos	1025766
3	Female population	Nos	510604
4	Male population	Nos	515162
5	Density of population	Person /sq.km	230
6	Literacy rate	Percentage	33.93
7	Male literacy rate	Percentage	47.04
8	Female literacy rate	Percentage	20.67

Table 3.6: Livestock population of Nabarangpur District (19th census)

Sl. No.	Species	Numbers
1	Cattle (indigenous)	378799
2	Cattle(CB)	13755
3	Total cattle	392554
4	Buffalo	41108
5	Pig	9311
6	Goat	61089
7	Sheep	85873
8	Total poultry	476677

Source : Census 2011

Table 3.7: Animal Husbandry Departmental Institutions in the Nabarangpur

Sl. No.	Name of institutions	Unit
1	Veterinary hospitals	2
2	Veterinary dispensaries	14
3	Livestock Aid Centres	87

(Source : Chief District Veterinary Officer, Nabarangpur)

3.3. Research design

The research design serves as a road map of conducting research. As per Kerlinger (1973) research design is the plan and strategy of investigation conceived so as to obtain answer to the research questions and control variance. In fact, the research

design is the conceptual structure within which research is conducted; it constitutes the blueprint for the collection, measurement and analysis of data. As such the design includes an outline of what the researcher will do up to the final analysis of data. Research design is needed because it facilitates the smooth sailing of the various research operations, thereby making research as efficient as possible yielding maximal information with minimal expenditure of effort, time and money. The research design in this study is considered in the right of ex-post-facto research approach. Ex-post-facto research design is the systematic experimental investigation which is used when the control on the independent variable is negligible. In this study, research design is developed keeping in mind the objectives to be attained, type of techniques and investigation followed and statistical tools applied for analysis.

3.3.1. Plan of work

Considering the limitations of postgraduate research study, attempt was made to plan the research work within the stipulated time, man power and possibility of movements and access to the area of the study. Efforts were made to collect relevant literature related to the present study conducted in the past. In order to gain an in-depth understanding of the subject, attempt was also made to have prior visits to the area under study before formulation of research objectives and development of the schedule. The pilot study was conducted to test the relevance of the schedule pertaining to the research objective and to take steps to rectify the mistake, if any, in the schedule. In the entire plan of work for this study, the experts related to the subject and advisory committee members were regularly contacted and their advice was sought which have been incorporated in the study.

3.4. Sampling procedure

3.4.1. Selection of district

There are 30 revenue districts in Odisha. Out of these, Nabarangpur district was selected purposefully. Nabarangpur district was selected because considerable numbers of goats and goats farmers are present in this district.

3.4.2. Selection of blocks

There are 10 numbers of blocks in the district and out of 10 blocks, two blocks were selected randomly for the study. These two blocks selected were Papdahandi and Raighar block.

Table 3.8: Blocks of Nabrangpur district

Sl. No.	Name of Blocks
1	Nabarangpur
2	Nandahandi
3	Tentulikhunti
4	Papdahandi
5	Kosagumunda
6	Dabugam
7	Umerkote
8	Raighar
9	Jharigam
10	Chandahandi

3.4.3. Selection of Grampanchayat and villages

From each block, 12 GPs were selected randomly and from each GP, one village was selected randomly for the study. The name of the GPs and villages selected from these two blocks of Nabrangpur district are presented in the table 3.9 and 3.10.

Table 3.9: Name of GPs and villages of Papdahandi block

Sl. No.	Name of GP	Name of the Villages	No of Respondents
1	Dangara	Dangara	5
2	Hatibeda	Hatibeda	5
3	Jatabal	Chingudisar	5
4	Kantamal	Botokari	5
5	Maidalpur	Aumli	5
6	Patri	Bheja	5
7	Tumberla	Mahuli	5

8	Dengaguda	Kharki	5
9	Sirsi	Palpur	5
10	Semala	Usigam	5
11	Papdahandi	Dokraguda	5
12	Pandikote	Gumidora	5
Total			**60**

Table 3.10: Name of GPs and Villages of Raighar block

Sl. No.	Name of GP	Name of the Villages	No of Respondents
1	Bobai	Mahulbata	5
2	Debagam	Kurubela	5
3	Ganjapara	Kusumpur	5
4	Hatabarandi	Jhatirpara	5
5	Jodenga	Kukurkuan	5
6	Kaskanga	Sagirpara	5
7	Kaudela	Tarangpur	5
8	Turudhi	Odandi	5
9	Parua	Chatabeda	5
10	Nakitsemeda	Ganranji	5
11	Kurabeda	Kaliapadar	5
12	Kundei	Kanadhi	5
Total			**60**

3.4.4. Selection of respondent

Twelve villages from twelve GPs of Papdahandi block & twelve villages from twelve GPs of Raighar block were selected for the study. Thus, twenty four villages of the district was selected. For each village, a list of the goat farmers was prepared who were having minimum 10 numbers of goats and reared goats for more than 5 years, with the help of local people, LI &VAS. Then, from the list of each village, five goat farmers were selected randomly. Thus, from 24 villages, 120 farmers were selected for the study.

3.5. Tools and techniques used for data collection

For any social research study, the tools used should be reliable enough to maintain the precision of the result. Similarly, the instruments or tools used should

have utmost validity for the purpose for which it is used. In this research, a pre-structured questionnaire was used to interview the respondents for collection of primary data.

3.5.1. Pilot study

Before deciding the study, a preliminary survey was made on different potential topics. Then the primary data was collected on different districts and the status of goat farmers in different districts was reviewed. Then, a field visit was made to a neutral place and different goat farmers were asked regarding the different aspects of goat rearing. After consulting the mentors and experts of the respective field, the final questionnaire was prepared. All this collected information helped the researcher to select and finalise the variables for the development of interview schedule.

3.5.2. Preparation of interview schedule

On the basis of pilot study and discussions with the stakeholders and experts, the statements were framed. In the course of development of interview schedule, many proposed statements are discarded and new statements are added after judging each item with possible linkage as per the objective set forth in the study. Repeated verifications and proper measures were taken to avoid vague and ambiguous responses that may distort the information flow. Close ended questions were put in the schedule to get appropriate response.

3.5.3. Pre-testing of interview schedule

Before final data collection, entire schedule was pretested with 10% non sample neutral respondents for elimination, addition and alteration. Sufficient care was also taken not to include respondents which are going to be selected for the final interview. On the basis of the experience in the pre-testing, appropriate changes were made in the construction of items and their sequences. The schedule was then finalized. The final form of the schedule has been placed in the appendix-1.

3.5.4. Collection of data

Confidence development with the respondents is the pre-requisite in the collection of factual data. The researcher therefore established good rapport with the respondents before interviewing. He convinced the respondent who felt that these answers were important. The statements as specified in the schedule were asked systematically. Sufficient probing and clarification were made to make clear understanding of the respondents about the questions for getting appropriate response. In some occasions, group discussions with the respondents were made afterwards to confirm the responses received individually. Further, the reactions and suggestions of the respondents beyond the study area were also noted and used during interpretation of the data. The data were collected through personal interview method. The information thus collected was tabulated for empirical measurement analysis.

3.6. Selection of variables

As the basic purpose of research is to explore the depth, type and direction of relationship between independent and dependent variables, there is a need to identify the variables as independent and dependent for research to become pragmatic. Then it is essential for the researcher to make these variables operational and measure them with accuracy and precision with a view to analyze the data successfully. 'Making the variables operational' is a process of defining the measurement of a phenomenon that is not directly measurable, though its existence is indicated by other phenomena. It is the process of defining a fuzzy concept so as to make the theoretical concept clearly distinguishable or measurable, and to understand it in terms of empirical observations.

In this research, independent and dependent variables were selected with due care after extensive review of literature, discussion with experts and preliminary study conducted in the area of investigation. They were made operational by arranging them into a pattern and assigning them scores. The scales of measurement used were nominal and ordinal in nature. The interval and ratio scales of measurement were also used for quantitative data.

Table 3.11: List of independent variable

Sl. No.	Name of variable
1	Age
2	Education
3	Caste
4	Martial status
5	Family type
6	Family size
7	Type of house owned
8	Livestock possession
9	No of years in goat farming
10	Type of major assest owned
11	Land holdings
12	Status of agricultural land
13	Occupation
14	Sources of income(in rupees /annum)
15	Birth weight of goats
16	Weight of goats at marketing age
17	Frequency of deworming per year
18	Frequency of vaccination per year
19	Kid mortality
20	Adult mortality

3.7. Operationalization of independent variables and their measurement

3.7.1. Age

Age refers to the chronological age of the respondents rounded off to nearest whole number at the time of investigation. Further, on the basis of age, the respondents were grouped into 3 categories and assigned with scores accordingly. (Trivedi, 1963)

Sl. No.	Variable	Score
1	Young age (upto 35 yrs)	1
2	Middle age (36-50yrs)	2
3	Old age (above 50yrs)	3

3.7.2. Education

Education refers to the literacy and schooling of the respondentsat the time of investigation. No schooling means a respondent who had not gone to school or taken

any lessons informally to be literate. Functionally literate person is one who can just read and write. Primary school comprises classes I to V, middle school VI to VII and high school VIII to X. College education means the person who has completed +2 and above in the college. Further, on the basis of education, the respondents were grouped into 6 categories and assigned with scores accordingly. (Trivedi, 1963)

Sl. No.	Variable	Score
1	Non schooling	1
2	Functionally literate	2
3	Primary school	3
4	Middle school	4
5	High school	5
6	College education	6

3.7.3. Caste

Caste means the caste declared by government of India in its gazette notification. The caste of a respondent was noted down as per his declarations and no proof about this had been sought for. Further, on the basis of their caste, respondents were grouped into 4 categories and assigned with scores accordingly. (Trivedi, 1963).

Sl. No.	Variable	Score
1	SC	1
2	ST	2
3	OBC	3
4	Others	4

3.7.4. Marital status

Marital status refers to information about the respondent's marriage; whether he/she was married or unmarried. Further, on the basis of marital status, the respondents were grouped into 2 categories and assigned with scores accordingly.

Sl. No.	Variable	Score
1	Married	2
2	Unmarried	1

3.7.5 .Family type

Family type refers to the type of family on the basis of place of living and sharing family activities together. When more than one married person with their entire family members share a common kitchen, it's called as a joint family. Otherwise the nomenclature will be nuclear family. Further, on the basis of family type, the respondents were grouped into 2 categories and assigned with scores accordingly. (Trivedi, 1963)

Sl. No.	Variable	Score
1	Nuclear	1
2	Joint	2

3.7.6. Family size

Family size refers to the size of family on the basis of place of sharing a common kitchen. The members with some social relationship, taking their meals from a common kitchen collectively form a family. Further, on the basis of family size (number of family members), the respondents were grouped into 3 categories and assigned with scores accordingly.

Sl. No.	Variable	Score
1	Up to 2 members	1
2	3-5 members	2
3	>5members	3

3.7.7. Type of house owned

Type of house owned denotes the construction make of the house where the respondent lived at the time of collection of data. A house is termed as pucca if it possesses an RCC roof or asbestos roof with well-furnished walls and floor; semi-pucca if it has the floors and walls made up of brick and roof of straw or earthen tiles. A house is termed as kutcha which doesn't conform to the above constructions. Further, on the basis of type of house owned, the respondents were grouped into 3 categories and assigned with scores accordingly.

Sl. No.	Variable	Score
1	Pucca	3
2	Semi pucca	2
3	Kutcha	1

3.7.8. Livestock possession

It has been operationalized in the study about number of animals, ruminants and birds owned by the respondents towards subsidiary income as well as used in farm activities for draught purpose.

Sl. No.	Variable	Score
1	Goats only	2
2	Goats along with other livestock	1

3.7.9. No. of years of goat rearing

It denotes the continuous number of years of goat rearing the farmer has practiced. The respondents were categorized into 3 categories.

Sl. No.	Variable	Score
1	3-5yrs	1
2	5-10yrs	2
3	Above 10 yrs	3

3.7.10. No. of goats owned

On this basis the respondents were categorized into 5 categories. Since the minimum criterion is 10-20 goats for selection, it is categorized as first group.

Sl. No.	Variable	Score
1	10-20	1
2	21-30	2
3	31-40	3
4	41-50	4
5	>50	5

3.7.11. Type of major asset(s) owned

It refers to the asset(s) the respondent possessed at the time of investigation. The data were collected according to the declaration by the respondent.

Sl. No	Variables	Score
1	Bicycle	1
2	Radio	2
3	T.V	3
4	Bike /Scooter	4
5	Bed/Sofa	5
6	Mobile	6

3.7.12. Land holding

This is defined as a piece of land owned or rented. This may indicate the economic status of the farmer.

Sl. No.	Variable	Score
1	<1acre	1
2	1-2acre	2
3	>2acre	3

3.7.13. Status of agricultural land

This involves the type of ownership of the land. The farmer may be a tenant cultivating other's land, an owner cultivating his own land or a combination of both. Further, on the basis of this, the respondents were grouped into 4 categories and assigned with scores accordingly.

Sl. No.	Variable	Score
1	Both own land and tenant	4
2	Own land	3
3	Tenant only	2
4	Landless	1

3.7.14. Occupation

Occupation refers to the person's vocation by which he earns a living. it's his daily dose of work. Primary occupation is the vocation by which he earns majorly. Secondary occupation helps in subsidiary income. In this case an attempt has been made to know whether the goat farming is their primary or secondary income. Accordingly the respondents were categorized into 3 groups**.**

Sl. No.	Variable	Score
1	Goat as primary occupation	2
2	Goats as secondary occupation	1

3.7.15. Annual income

Annual income of the respondents refers to the amount of money he earned per annum from all sources at the time of investigation. The various sources of income include income from agriculture, livestock, wages and from any other sources including service. A special attempt has been made to document annual income from the goat farming. Accordingly, the respondents were categorized into 3 categories.

Sl. No.	Variable	Score
1	Upto 50000	1
2	50000-100000	2
3	Above 1lakh	3

3.7.16. Birth weight

It refers to weight of kid at time of birth. It can give information about health status of new born kid. Accordingly, variables are categorized into 3 types and accordingly score is given.

Sl. No.	Variable	Score
1	<1kg	1
2	1-2kg	2
3	>2kg	3

3.7.17. Weight of goats at marketing age

It refers to the weight of goat which is eligible to be marketed. If it is more than its market value will be more and it helps to increase the income and livelihood of farmers. Accordingly, it is categorized into 3 types variable and accordingly scores are given.

Sl. No.	Variable	Score
1	<10kg	1
2	10-15kg	2
3	>15kg	3

3.7. 18. Frequency of deworming per year

Deworming is a important activity to be implemented in livestocks. Because worms cause severe fatal effect in animals and production and productivity depends highly on deworming which directly influence livelihood of farmers. Accordingly two variables are taken and score are given.

Sl. No.	Variables	Score
1	<3times	1
2	>3times	2

3.7. 19. Frequency of vaccination per year

Vaccination is a very important activities to be done in livestock. It refers to give vaccine to animals against different diseases like PPR, Entertoxemia, goat pox etc so that animals get immunity against that diseases which directly related to livelihood of farmers. Accordingly, two variables are taken and scoring are given.

Sl. No.	Variables	Score
1	<3times	1
2	>3times	2

3.7.20. Kid mortality

It refers to % of kid died per year which has effect on livelihood of farmers. Accordingly, 3 variables are taken and scoring is done.

Sl. No.	Variable	Score
1	<10%	3
2	10-15%	2
3	>15%	1

3.7.21. Adult mortality

It refers to % of adult goats died per year which has adverse effect on livelihood of farmers. Accordingly 3 variables are taken and score is given.

Sl. No.	Variable	Score
1	<30%	3
2	20-30%	2
3	>30%	1

3.8. Operationalisation of dependent variables and their measurement

3.8.1. Impact on Livelihood due to Goat Rearing:

Livelihood impact is a measure of the tangible and intangible effects/influences/consequences of any intervention upon the livelihood inputs. A livelihood comprises the capabilities, assets and activities required for a means of living (Chambers and Conway, 1992). Livelihoods can be defined at different levels (e.g. individual, household, community), with household being the most common (Chambers and Conway, 1992). Livelihood typologies are similarly often defined with household as the classification unit (Yuerlita *et al.,* 2013; Tittonell *et al.,* 2007), but they may also be defined using broader units such as communities or towns (Stimson *et al.,* 2001). Accessing impacts of different developmental interventions is a common practice being followed in various organizations. It helps to ascertain the status of lives and livelihood of targeted people. Livelihood impact can be measured through economic impact, social impact, impact on communication and extension behavior and psychological impact. So, a total of 40 statements were developed for each category (10 each on economic, social, communication and extension behavior and psychological impact) and validated by highly experienced professor cadre experts of different departments of C.V.Sc. & AH and senior officers of F & ARD, govt. of Odisha. A five point Likert type scale with points suitable for corresponding

variable was incorporated in the interview schedule with scores on a continuum with 1(strongly disagree) to 5(strongly agree) for each of the 40 statements. In a Likert scale, the respondent is asked to respond to each of the statements in terms of several degrees, usually five degrees of agreement or disagreement. The responses of the respondents were recorded in a five-point continuum scale and then summated

Sl. No.	Response	Score
1	Strongly agree	5
2	Agree	4
3	Undecided	3
4	Disagree	2
5	Strongly disagree	1

3.8.2. Economic Impact

An economic impact examines the effect of an event or intervention of a programme on the individual economy. In measuring the economic impact on farmers, their increase in personal savings in banks and construction of house are taken into account. Besides this, the household expenditures such as spending on children's education, medical emergencies and loan repayment are also taken into consideration. In addition to these two criteria, the amount of money gained from scientific rearing to invest in further expansion of farm to earn throughout the year is also taken into account.

3.8.3. Social Impact

Social impact is a methodology to review the social effects of development interventions. Social impact understands the effects on people that happen as a result of an action, activity, project, programme or policy. The 'impact' of this action or activity can be positive or negative, and can be intended or unintended, or a combination of all of these. An activity can have immediate and direct impact on certain people, but it can also have a more far reaching effect on people, which are not directly engaging with it. They might not even know they are being affected at all, but the 'impact' of the action might be very significant to them. In measuring the social impact on beneficiaries, their presence or importance in the society is taken into

account. So their identity in society, participation in various social celebration, getting good marriage proposal for their relatives are taken into account. Besides these criteria, their role in mobilizing and guiding the other goat farmers of the village are taken into account. Since they are the beneficiaries of a government scheme, their importance in government offices at village and block level is also taken into account.

3.8.4. Impact on Communication and Extension Behaviour

According to Leagans (1961) communication is a process by which two or more people exchange ideas, facts, feelings or impressions in ways that each gains a common understanding of meaning, intent and usage of the message. Behavioral Communication is defined as a psychological construct which influences individual differences in the expression of feelings, needs and thoughts as a substitute for more direct and open communication. Specifically, it refers to people's tendency to express feelings, needs, and thoughts by means of indirect messages and behavioral impact. Extension behavior is a science which deals with various strategies of change in behavioral patterns of human beings through technological and scientific innovations for the improvement of their standard of living. It is an act of putting across the people, in an understandable manner, new ideas and improved technology of practical utility and to enable them to put them into practice so as to improve their general standard of living. In measuring the impact on communication and extension behavior of beneficiaries, their exposure to mass media and cosmopolitan behavior is taken into account. Besides these, their interaction with government officials, medicine and feed dealers and approach to banks for availing credit are taken into account. Also their ability to bargain with goat meat retailers for better pricing of goat is taken into account.

3.8.5. Psychological Impact

Psychological impact in the context of this research is the change of situation from a state of despair to self confidence in terms of mental health; from a state of inferiority to peer feeling and from panicky to security. Psychological impact was measured here to know the extent of development of the respondents in relation to their vocation and social presence.

3.9. Constraint faced by goat farmers

Goat provides sustenance and supplements the income of farmer's especially landless, marginal and small categories. Goats are generally maintained on grazing or browsing. Goat farming is low cost enterprises mainly because of the unique characteristic of goat like small size, clean habits; thrive on tree leaves, grasses, etc. In recent years, it has been observed that the farmers are rearing the goats on traditional pattern and not adopting the improved goat husbandry practices because of many constraints. Thus they are getting very less prices for their animals and products. Hence, the present study was undertaken with specific objective to study the constraints faced by goat owners in goat rearing. To study the constraints faced by the goat farmers, 5 major constraint categories such as financial constraints, operational constraints, extension support constraints, socio- cultural constraints and marketing constraints are identified by having discussion with F&ARD officials, beneficiaries and experts of Veterinary College. The identified constraints were further validated by extension personnel. The statements related to constraints are randomly arranged in the questionnaire, and the respondents were asked to assign rank in order of most difficult one to least difficult one. The statement which was mentioned as highest constraint by the respondents is given rank 1 and the least is given 5. Similarly under each constraint category, 5 major constraint statements were asked to the beneficiaries to assign rank in order of most difficult one to least difficult one. So in total 25 statements were asked to goat farmers regarding their difficulties in goat rearing. Constraints were ranked on the basis of **Garrett's ranking technique.**

3.10. Data processing and analysis using statistical methods

Statistical measures provide the investigator with an opportunity of expressing the fact in an empirical way. The statistical measures employed in this study for interpretations of data are explained herewith.

1. Frequency
2. Percentage
3. Mean score
4. Rank order
5. Pearson coefficient of correlation
6. Garrett's ranking technique

3.10.1. Percentage

Percentage was used in descriptive analysis for making simple comparisons between two responses for calculating percentage; the frequency of a particular cell was multiplied by 100 and divided by the total number of respondents in the particular category to which the cell belonged.

$$\text{Percentage} = \frac{\text{Number of respondents}}{\text{Total number of respondents}} \times 100$$

3.10.2. Mean score

It is the arithmetic average and the result obtained when the sum of values of the individuals in the data divided by the number of individuals in the data. Mean is the simplest and relatively stable measures of a series and in enabling data to be composed. Mean is better than other averages especially in social and economic studies where direct quantitative measurements are possible.

3.10.3. Rank order

On the basis of the mean score, rank order was made. The item securing highest mean score was given first rank, next highest second rank and so on. It was assigned to items in roman numericals (I, II, III, IV…).

3.10.4. Karl Pearson's correlation coefficient

Karl Pearson's coefficient of correlation on simple correlation is the most widely used method for measuring the degree of relationship between two variables. The coefficient assumes that there is a linear relationship between the two variables which means that one of the variables is independent and other as dependent. It is also known as product moment correlation coefficient and values lies between +1 to -1 indicatively or negatively related. Formula for Karl Pearson's coefficient of correlation is noted below.

$$r = \frac{\sum(XY) - \frac{\sum X \sum Y}{n}}{\sqrt{\left[\sum X^2 - \frac{(\sum X)^2}{n}\right]\left[\sum Y^2 - \frac{(\sum Y)^2}{n}\right]}}$$

Where r = Coefficient of correlation

X= Independent variable

Y= Dependent variable

N= Total number of respondent

3.10.5. Garrett's ranking technique

To find out the most significant constraint which influences the respondent, Garrett's ranking technique was used. As per this method, respondents have been asked to assign the rank for all constraints and the outcome of such ranking has been converted into score value with the help of the following formula:

Percent position = 100 (Rij – 0.5) / Nj

Where, Rij = Rank given for the ith variable by jth respondents

Nj = Number of variable ranked by jth respondents

With the help of Garrett's table, the percent position estimated is converted into scores. Then for each constraint, the scores of each individual are added and then total value of scores and mean values of score is calculated. The factors having highest mean value is considered to be the most important constraint and ranked 1st. the factors having lowest mean value is considered to be the least important constraint and ranked last.

CHAPTER-IV

RESULTS

This chapter deals with the findings of the study, conducted in Nabarangpur district with 120 goat farmers, which is presented systematically in the line of the objectives for the study. Considering the importance of reliability and validity of instrument used, the interview schedule was developed and data were collected from sample respondents by the researcher at the door step of the respondents. The data were then classified, tabulated and analyzed by using suitable analytical tools and techniques as indicated in the preceding chapter dealing with research methodology. The results of the study are presented below under the following sub- heads.

4.1 Socio-economic profile

4.1.1 Socio-economic profile of goat farmers

4.1.2 Correlation study of socio-economic profile of respondents

4.2. Production and productivity of goats

4.2.1 Birth weight of goats

4.2.2 Weight at marketing age of goats

4.2.3 Frequency of deworming per year in goats

4.2.4 Frequency of vaccination per year

4.2.5 Kid mortality in goats

4.2.6 Adult mortality of goats

4.3. Impact on livelihood of goat farmers

4.3.1 Economic impact

4.3.2 Social impact

4.3.3 Impact on communication and extension behavior

4.3.4 Psychological impact

4.3.5 Correlation analysis of socio-economic variables of respondents and impact on respondents

4.4 Constraints faced by farmers

4.4.1 Financial constraints

4.4.2 Operational constraints

4.4.3 Extension support constraints

4.4.4 Socio-cultural constraints

4.5.5 Marketing constraints

4.5.6 Overall constraints

4.1. Socio-economic profile

4.1.1. Socio-economic profile of goat farmers

Socioeconomic status is an economic and social measure of an individual's or family's economic and social position in relation to others, based on income, education and occupation. Under this head, an attempt was made to study the age, education, caste, marital status, family type, family size which correspond to the social profile and economic profile includes type of house owned, livestock possession, no. of years of goat rearing, no. of goats owned, type of major asset owned, landholding, status of land, occupation and annual income. The study was done taking the independent variables in the following sequence

4.1.1.1. Age profile

Attempts have been made to know the profile of goat farmers belonging to different age group. Age is significant in terms of experience, working capacity, maturity of judgment, decision making and power of understanding. Age of the respondents has got direct or indirect bearing on socio-economic condition. Keeping this in view, the age of the respondents was categorized and presented in table and figure below.

Table 4.1. Distribution of respondents as per Age

Sl. No.	Category	Respondents (n=120)	
		Frequency	**%**
1	Young age(upto 35 yrs)	38	31.66
2	Middle age(36-50yrs)	63	52.51
3	Old age(above 50yrs)	19	15.83
	Total	120	100
		Mean=40.8 SD=9.4	

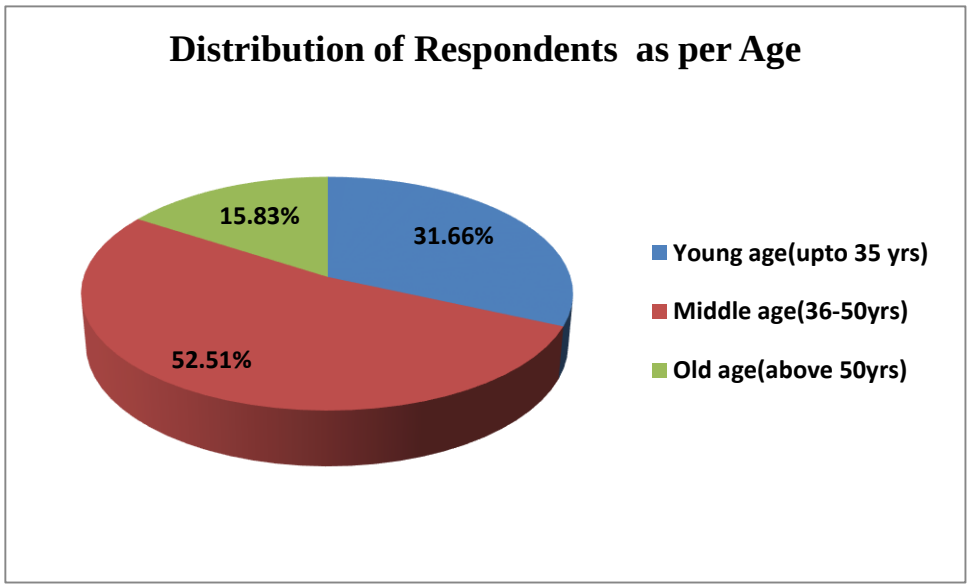


Fig.4.1: Distribution of respondents according to age

The analysis of data presented in the table 4.1 reveals that maximum number (52.51%) of respondent are of middle age group followed by 31.66% and 15.83% of young age and old age group, respectively. The mean age of the respondents was 40.8 years with standard deviation of 9.4 years.

4.1.1.2 Education/ qualification profile

Education is the basis through which an individual becomes empowered and enable him to take the right decision in right prospective. It is the changes in the behavior of an individual acceptable to the society. It enables an individual to be

capable of handling different tasks judiciously. Studies conducted in the past revealed that education is directly related to socio-economic upliftment and development. In order to know the education profile of the respondents, the data were documented and shown in the table below

Table 4.2. Distribution of respondents as per Education

Sl. No.	Category	Respondents (n=120)	
		Frequency	**%**
1	Non schooling	56	46.66
2	Functionally literate	46	38.33
3	Primary school	13	10.83
4	Middle school	0	0
5	High school	4	3.33
6	College education	1	0.83
	Total	**120**	**100**

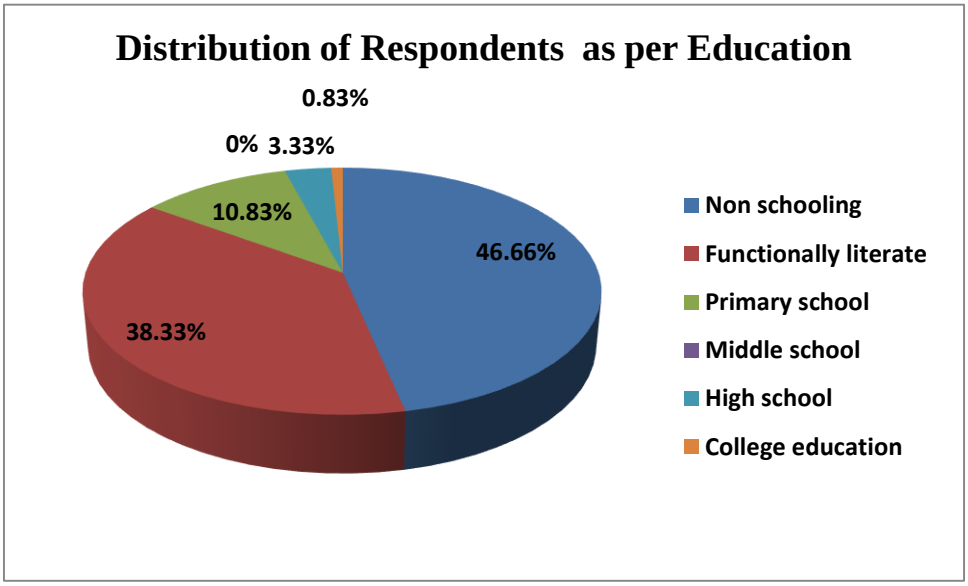


Fig 4.2: Distribution of farmers according to Education

The above table revealed that 46.6% of respondents had non schooling followed by 38.33%, 10.83%, 0%, 3.33% and 0.83% are primary school, middle school, high school and college level of education, respectively.

4.1.1.3 Caste category

Usually goat faming is considered a major livelihood option for the low caste people. Data were collected from the respondents and presented in the table below.

Table 4.3 Distribution of respondents as per Caste

Sl. No.	Category	Respondents (n=120)	
		Frequency	%
1	SC	15	12.5
2	ST	87	72.5
3	OBC	16	13.33
4	General caste	0	0
5	Others	2	1.66
	Total	**120**	**100**

The above table revealed that 72.5% of respondents were of ST caste followed by 12.5%,13.33%,1.66% are of SC,OBC, others category of caste or religion,respectively.

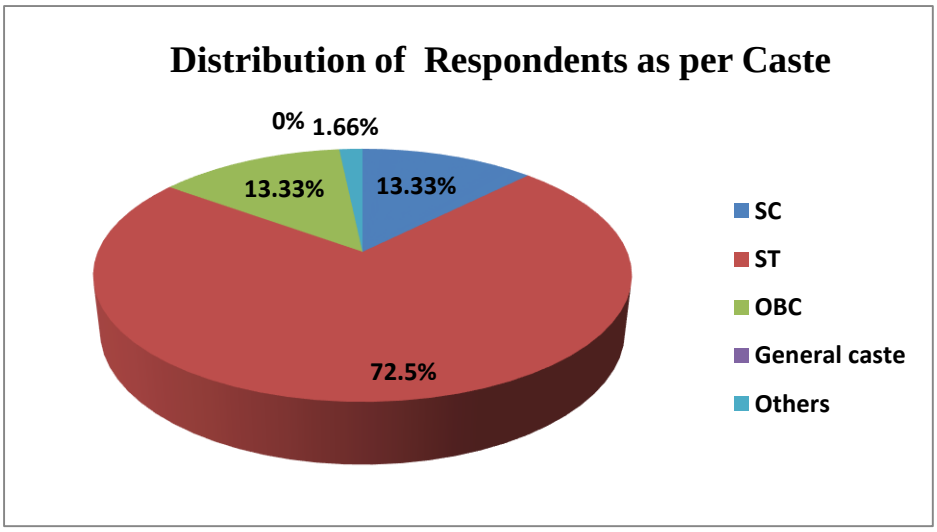


Fig 4.3: Distribution of farmers according to Caste

4.1.1.4 Marital Status

When the person gets married, he has some more responsibility to shoulder. So he tries to increase his income by venturing into new occupation or by more investment in the present occupation. Attempts were made to document the data related to marital status of the respondents as per the following table.

Table 4.4. Distribution of respondents as per Marital Status

Sl No	Category	Respondents (n=120)	
		Frequency	**%**
1	Married	106	88.33
2	Unmarried	14	11.66
	Total	**120**	**100**

The above table revealed that 88.33%of respondents are in married category followed by 11.66% are in unmarried category.

4.1.1.5 Family Type

Family type is also another factor related to goat farming. Attempts were made to analyze the family type according to the following

Table. 4.5.Distribution of respondents as per Family Type

Sl. No.	Category	Respondents (n=120)	
		Frequency	**%**
1	Nuclear	70	58.33
2	Joint	50	41.66
	Total	**120**	**100**

The above table revealed that 58.33% of respondents belongs to nuclear family followed by 41.66% are of joint family.

4.1.1.6 Family Size

Family size also plays an important role in farming. More number of family members make the farming easier but at the same time per capital expenditure increases thus reducing the overall profit. To know the type of family involved in goat farming, it becomes essential to study the family size of the respondents. Data were collected and analysis of data is presented in the given table below this text.

Table .4.6.Distribution of respondents as per Family Size

Sl No	Category	Respondents (n=120)	
		Frequency	%
1	Up to 2 members	0	0
2	3-5 members	30	25
3	>5members	90	75
	Total	**120**	**100**

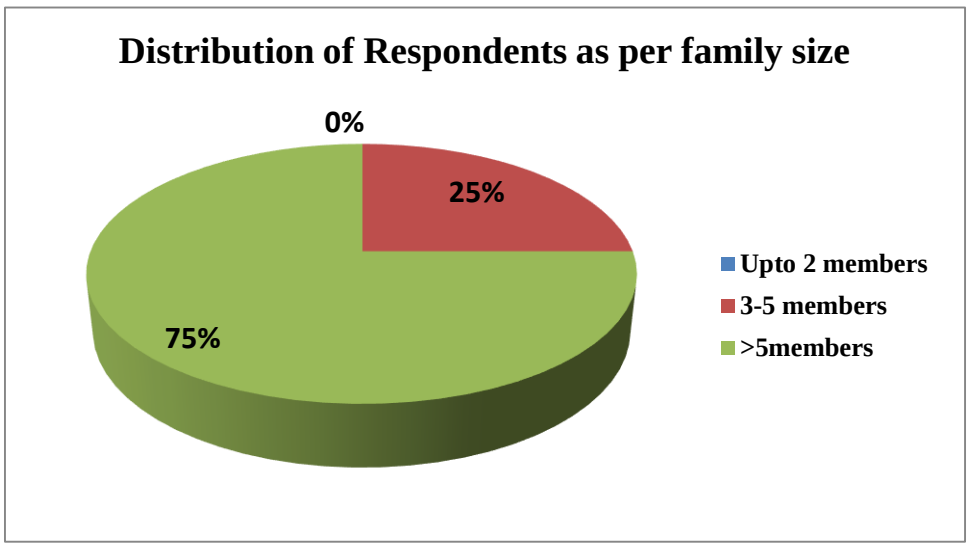


Fig 4.4 Distribution of respondents according to number of family members

Analysis of data presented in table 4.6 reveals that 75% of respondents have family members more than 5 followed by 25% of respondents having family members between 3-5.

4.1.1.7 House Type

Pattern of housing under many situations decide the living standard of people in general and working class people in particular. Those who have good income, have better type of housing than those who have less income. In social study, pattern of housing is one of important determinants; it categorized respondent's hierarchy like social, economic status. It is presumed that the farmers after being associated with goat rearing have good income in order to sustain their economic livelihood. Hence, in this study an attempt was made to know type of housing pattern of farmers have which will reflect light on status of living. The data are collected, analyzed and presented in table.

Table 4.7. Distribution of respondents as per house Type

Sl No	**Category**	**Respondents (n=120)**	
		Frequency	**%**
1	Kutcha	12	10.00
2	Semi Pucca	73	60.83
3	Pucca	35	29.16
	Total	**120**	**100**

The above table revealed that 60.83% of respondents had semi pucca house followed by 29.16% and 10% of pucca house and kutcha house, respectively.

4.1.1.8 Livestock Possession

Livestock possession is considered as an asset by the individual farmers especially goats. Since farming is the age old tradition of most of the farmers, they may possess other livestock like cattle, buffalo, sheep and poultry in addition to the goats. Hence, an attempt is made in this study to know the type of livestock possessed by farmers. The data were collected, analyzed and presented in table below.

Table 4.8. Distribution of respondents as per Livestock Possession

Sl No	Category	Respondents (n=120)	
		Frequency	**%**
1	Goats only	50	41.66
2	Goats with other livestock	70	58.33
	Total	**120**	**100**

The above table reveals that 58.33% of respondents have goats with other livestock and 41.66% respondents have goats only.

4.1.1.9 Number of Goats Owned

Goat as a small animal is a major source of livelihood for the rural poor. The climatic condition of southern Odisha with its vast stretch of forest is conducive for goat rearing and has the ability to provide sustainable livelihood. In conformation with this attempts were made to explore the livelihood status of the respondents as per ownership of goats. Data were collected and exhibited in the table below.

Table 4.9. Distribution of respondents as per number of Goats Owned

Sl No	Category	Respondents (n=120)	
		Frequency	**%**
1	10-20	50	41.66
2	21-30	51	42.5
3	31-40	9	7.5
4	41-50	5	4.16
5	>50	5	4.16
	Total	**120**	**100**

Analysis of data presented in the above table reveals that 42.5% respondents are having goats ranging between 21-30 followed by 41.66%, 7.5%,4.16% and 4.16% respondents are having range between 10-20, 31-40, 41-50 and more than 50 goats, respectively.

4.1.1.10 No. of years of Goat Rearing

Goat farming is an age old practice and is a family farming business. Most of the farmers inherit the goat farming from their parents. So, an attempt has been made to identify the no. of years rearing of goats by farmers. Data were collected and exhibited in the table below.

Table 4.10. Distributionof respondents as per years of Goat Rearing

Sl No	**Category**	**Respondents (n=120)**	
		Frequency	**%**
1	3-5years	32	26.66
2	5-10 years	68	56.66
3	Above 10 years	20	16.66
4	Total	120	100

The above table reveals that 56.66% of respondents are doing goat rearing till 5-10years followed by 26.66% and 16% are doing it for 3-5 years and more than 10years,respectively.

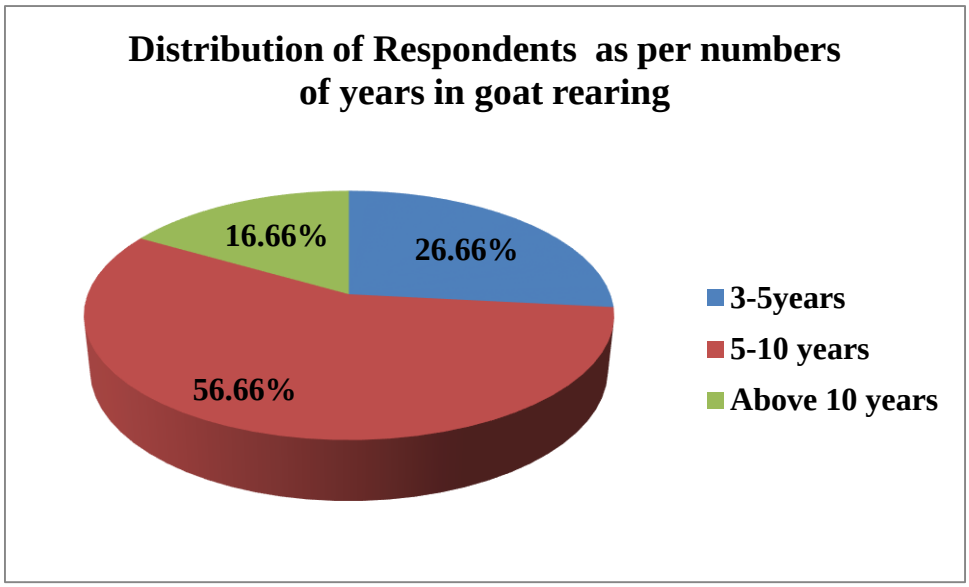


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Fig 4.5. Distribution of respondents according to years of Goat Rearing

4.1.1.11 Land Holding

As all the farmers are farmers by community, tradition and profession, amount of agricultural land possessed by a family speaks about its economic condition. An attempt was made to know the respondents' ownership of agricultural land by collection of relevant data. Data collected during the process were tabulated and presented below.

Table 4.11. Distribution of respondents as per Land Holding

Sl No	Category	Respondents (n=120)	
		Frequency	%
1	Landless	44	36.66
2	<1acre	45	37.5
3	1-2acre	30	25
4	>2acrre	11	9.16
	Total	**120**	**100**

The above table reveals that 37.5% of respondents have less than1 acre land followed by 36.66% are landless followed by 25% have 1-2 acre of land followed by 9.16% have more than 2acre of land.

4.1.1.12 Status of Agricultural Land

The farming status in relation to the ownership or tenancy of agricultural land of the respondents is an indication of their pattern of livelihood. In order to know the agricultural farming status data were collected and presented as the table below.

Table 4.12.Distribution of respondents as per status of Agricultural Land

Sl No	Category	Respondents (n=120)	
		Frequency	%
1	Both own land and tenant	4	3.33
2	Own land	77	64.16
3	Tenant only	1	0.83
4	Landless	38	31.66
	Total	120	100

Analysis of data presented in the above tables reveals that 64.16% respondents are having their own land followed by 31.66%, 3.33% and 0.83% are having no land, both own land and tenant and tenant only, respectively.

4.1.1.13 Occupation

Occupation indicates major source of income of an individual for livelihood. The respondents were engaged in different livelihood activities besides goat rearing. In order to know the occupational category, an attempt was made to document the related data collected from the respondents in the following table.

Table 4.13. Distribution of respondents as per their Occupation

Sl No	Category	Respondents (n=120)	
		Frequency	**%**
1	Goat as primary occupation	63	52.5
2	Goat as secondary occupation	57	47.5
	Total	**120**	**100**

Above table reveals that 52.5% of respondents are having goat as primary occupation followed by 47.5% are having goats as secondary occupation.

4.1.1.14 Annual Income

Annual income is one of the indicators of economic standard of an individual. It's understood that more is the annual income stronger is the economic standard. In order to know the annual income of the respondents, an attempt was made to document the data collected and the data were reflected in the table below.

Table 4.14.Distribution of respondents as per Annual Income

Sl No	Category	Respondents (n=120)	
		Frequency	**%**
1	UptoRs 50000	3	2.5
2	Rs50000-100000	102	85
3	AboveRs 1lakh	15	12.5
	Total	**120**	**100**

Analysis of above table reveals that 85% of respondents are having income between Rs50,000-1,00,000 followed by 12.5% and 2.5% are having income uptoRs50,000 and above Rs1 lakh, respectively.

4.1.2 Correlation study of Socio-economic profile of respondents

Correlation is a term that refers to the strength of a relationship between two variables. A strong, or high, correlation means that two or more variables have a strong relationship with each other while a weak, or low, correlation means that the variables are hardly related. Socioeconomic status (SES) is an economic and social measure of an individual's or family's economic and social position in relation to others, based on income, education, and occupation. So, a correlation analysis of various socio-economic factors gives an indication of positive and negative association between variables. The data of selected socio-economic variables were subjected to zero order correlation.

Table 4.15. Correlation study of Socio-economic Profile of Respondents

	Age	Education	Family size	Occupation	No of goats owned	Annual income
Age	1					
Education	-0.450**	1				
Family size	0.057	-0.080	1			
Occupation	-0.122	0.143*	-0.024	1		
No. of Goats Owned	-0.030	0.243**	0.056	0.503**	1	
Annual income	0.124	0.110	0.057	0.182**	0.289**	1

(*5% level of significance, ** 1% level of significance)

The analysis of above data related to beneficiaries revealed that age is negatively and significantly co-related with education of the beneficiaries. However, the education is positively and significantly co-related with occupation and no of goats owned by the farmers. Family size was found negatively co-related with education and occupation of the goat farmers. Whereas, occupation of the goat farmers was found positively and significantly co-related with no of goat owned and

annual income of the farmers. Annual income of the farmers was positively and significantly correlated with the possession of goats by the farmers.

4.2 Production and Productivity traits of goats

Goat farming plays a major role in the upliftment of rural economy and in gainful employment. But majority of goat farmers rear goats in a traditional, non-scientific manner resulting in decreased growth of the goats. Also health care measures such as deworming and vaccination are not followed regularly which results in high adult and kid mortality. So in this study an attempt has been made to find out production and health care traits of goats. After due consideration, the growth and production traits such as birth weight and weight of goats at marketing age, frequency of deworming per year, frequency of vaccination per year, kid mortality percentage and adult mortality percentage are taken for this research study.

4.2.1 Birth Weight

It refers to weight of kid during birth which is an important factor to know the health status of goat**.**In order to know this, an attempt was made to document the data collected and the data were reflected in the table below.

Table 4.16. Distribution of respondents as birth weight of goats

Sl. No.	**Category**	**Respondents (n=120)**	
		Frequency	**%**
1	<1kg	14	11.66
2	1-2kg	72	60.00
3	>2kg	34	28.33
	Total	**120**	**100**

Analysis of above data reveals that 60% of respondents reported that they are having kids of birth weight ranges between 1-2kg followed by 28.33% and 11.66%respondents are having kids of more than 2 kg birth weight and less than1kg, respectively.

4.2.2. Weight at Marketing Age:

It refers to the age at which goats are ready to sell. In order to know this, an attempt was made to document the data collected and the data were reflected in the table below.

Table 4.17. Distribution of respondents as weight at Marketing Age of Goats

Sl. No.	Category	Respondents (n=120)	
		Frequency	**%**
1	<10kg	12	10
2	10-15kg	78	65
3	>15kg	30	25
	Total	**120**	**100**

From Above table we found that 65% respondents reported that they sell their goats at 10-15 kg body weight whereas 25% and 10% respondents reported that they sell their goats at more than 15kg and less than 10 kg, respectively.

4.2.3. Frequency of Deworming Per Year

Deworming is a very important activity to be done otherwise it has adverse effect on health, productivity and reproductivity of animals which also have an adverse effect on livelihood of farmers.In order to know this, an attempt was made to document the data collected and the data were reflected in the table below.

Table 4.18. Distribution of respondents as frequency of deworming per year

Sl. No.	Category	Respondents (n=120)	
		Frequency	**%**
1	>3times	96	80
2	<3times	24	20
	Total	**120**	**100**

From the above table, we find that 80% respondents reported that they give deworming medicine more than 3times per year whereas 20% respondents are giving less than 3times deworming medicines to their goats per year.

4.2.4.Frequency of Vaccination Per Year

Vaccination means to give vaccine for a particular disease before unset of that disease to develop immunity against that disease. So, it is a very important activity to be done has effect on health, productivity and reproductivity of animals which also have an effect on livelihood of farmers. In order to know this, an attempt was made to document the data collected and the data were reflected in the table below.

Table 4.19. Distribution of respondents as per frequency of vaccination per year

Sl No	Category	Respondents (n=120)	
		Frequency	**%**
1	>3times	98	81.66
2	<3times	22	18.33
	Total	**120**	**100**

Above table reveals that 81.66% of respondent reported that are giving more than 3times vaccination per year whereas 1% of respondents are giving less than 3times vaccination per year.

4.2.5. Kid Mortality

It refers to number of kid died per year which has an effect on income level of farmers. In order to know this, an attempt was made to document the data collected and the data were reflected in the table below**.**

Table 4.20. Distribution of respondents as per Kid Mortality

Sl No	Category	Respondents (n=120)	
		Frequency	**%**
1	<10%	50	41.66
2	10-15%	58	48.33
3	>15%	12	10

From above table we find that 48.33% respondent reported that their kid mortality was 10-15% whereas 41.66% are having their kid mortality of 10-15% and 10% respondents are having their kid mortality of more than15%.

4.2.6 Adult Mortality

It refers to number of adult goat died per year which has an effect on income level of farmers.In order to know this, an attempt was made to document the data collected and the data were reflected in the table below.

Table 4.21. Distribution of respondents as per Adult Mortality

Sl No	Category	Respondents (n=120)	
		Frequency	%
1	<30%	38	31.66
2	20-30%	70	58.33
3	>30%	12	10

Above table reveals that 58.33% of respondent reportedthat their adult mortality was 20-30% whereas 31.66% and 10% are having their kid mortality less than 30% and more than 30 %, respectively.

4.3 Impact on livelihood of farmers due to goat rearing

Goats play an important role in the food and nutritional security. Goat rearing has distinct economic and managerial advantages over other livestock because of its less initial investment, low input requirement, higher prolificacy, early sexual maturity, and ease in marketing. So what are the economic impact, social impact, communication and extension impact and psychological impact due to goat farming on livelihood of farmers were studied by asking some statements to the farmers to know their views.

4.3.1 Economic Impact

The economic impacts that are most frequently measured include increase in income of local farmers enabling them to spend the money for various household

expenditures and save for the future. In this study, 10 statements were developedcarefully which address the various expenditures arising out of increased income of the farmers. These ten questions were asked to 50 beneficiaries and their responses were collected on a five-point scale (5 to 1).

Table 4.22. Response of respondents to the statements on economic impact

Sl No	**Statements**	**Response**					**Mean**
		SA	**A**	**UD**	**DA**	**SD**	
1	Increased in personal savings in bank account	2 1.66	55 45.8	15 12.5	48 40	0 0	3.09
2	Constructed /renovated a pucca /semipucca house on my own land from the profit of goat business	1 0.83	87 72.5	7 5.8	25 20.8	0 0	3.53
3	Able to spend money for my children education	1 0.83	65 54.1	26 21.6	28 23.3	0 0	3.32
4	Able to spend money for emergency medical care of my family members	1 0.83	88 73.3	10 8.33	21 17.5	0 0	3.57
5	My spending on food items has increased than before	1 0.83	95 79.1	15 12.5	19 15.8	0 0	3.9
6	Now I am able to spend more on clothings of my family members	2 1.66	54 45	62 51.6	2 1.6	0 0	3.46
7	Now I am not borrowing money from private money lenders	3 2.5	101 84.1	13 10.8	3 2.5	0 0	3.86
8	My lending money on credit has increased	2 1.66	58 48.3	51 42.5	9 7.5	0 0	3.44
9	Able to invest for purchase of additional goats and inputs for expansion of farms	2 1.66	44 36.6	64 53.3	13 10.8	0 0	3.31
10	My profit from goat rearing has increased	2 1.66	60 50	18 15	40 33.3	0 0	3.2
	Mean score	**34.43**					

(The figures in upper row is frequency and lower is percentage)

Analysis of data relating to economic impact on the farmers revealed that 45.8 percent of the respondent agreed to the statement of increased in personal savings in the bank account due to increased income from goat farming whereas 40 percent of the respondents did not agree to the question. The mean score of this statement was 3.09. When asked about the construction of semi pucca/pucca house on their own land through goat rearing, 72.55% of the respondents agreed while 20.8% disagreed to the statement. The mean score of this statement was3.53. The high mean score for house construction implies that most of the respondents have constructed a semi pucca or pucca house out of the income from goat rearing. When asked about the ability to spend the required amount for children education, 54.1% of the respondents agreed to the statement while 23.3%of the respondents disagreed to the statement, and mean score of this statement was 3.32. Similarly, when asked about ability to spend for emergency medical care of the family members, 73.3% of respondents expressed their ability to bear the expenses and 17.5% expressed their inability and mean score of this statement was 3.57.When asked about spending on food items, 79.1% agreed that their spending on food items has increased whereas 15.5 % disagreed, and the mean score was 3.9. When asked about spending on clothings, 45% agreed that their spending on clothing items has increased due to goat farming. The mean score of the statement was 3.46. When asked about repayment of borrowed money to the private money lenders, 84.1% agreed that they have already repaid the money borrowed from money lenders. The mean score of the statement was 3.86 which was very encouraging. When asked about lending money on credit to others, only 48.3% agreed that they have lent money to others whereas rest did not lent money to others. The mean score was 3.44. When asked about your ability to increase the strength of the farm by purchase of additional goats, 53.3% agreed that they have required ability to add additional goats to their existing farm, and mean score to this statement was 3.31. 50% of goat farmers agreed that their profit has increased due to goat farming whereas 33.3 % farmers did not agree to the statement. The mean score of the statement was 3.2. The overall mean score of economic impact on beneficiaries was 34.43 which is a positive sign for the economic prosperity.

Table 4.23. Distribution of beneficiaries as per Economic Impact

Economic impact				Remarks
Sl.No.	**Impact range**	**Frequency**	**Percent**	
1	High level impact (Mean+1S.D) >38.41	22	18	Maximum score=50 Minimum score=10 Mean=34.43 S.D.=3.98
2	Medium level income (Mean+1S.D)to(Mean-1S.D)	83	69	
3	Low level impact (Mean-1S.D)	15	13	

The distribution of the respondents on the basis of economic impact due to goat rearing is presented in the table 4.23. The table above revealed that 69% of the respondents had medium level of impact due to goat farming followed by 18% and 13% respondents were having high level and low level economic impact, respectively.

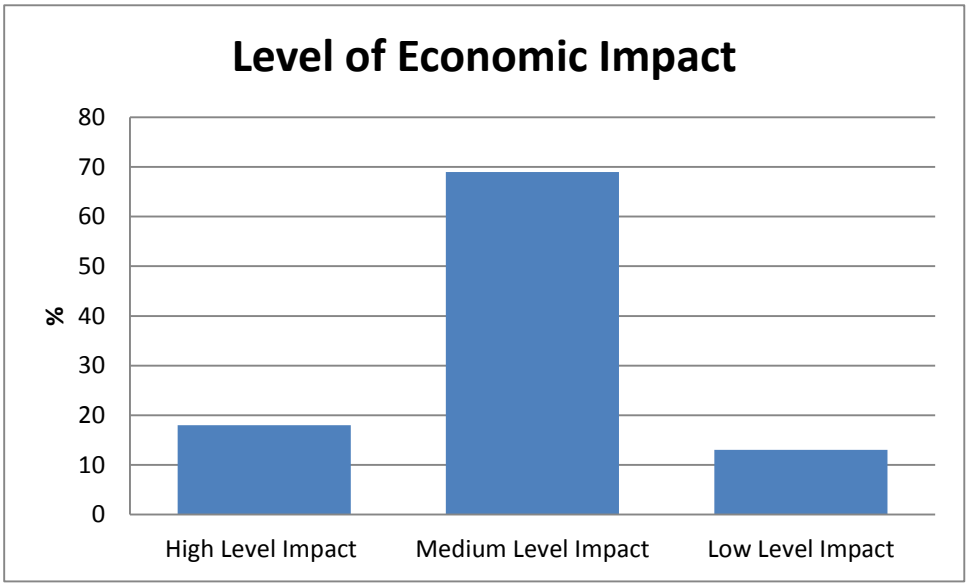


Fig 4.6: Distribution of respondents according to level of Economic Impact

4.3.2 Social Impact

Social impact is a methodology to review the social effects of development interventions. The impact is measured according to the importance, recognition and motivating power of the beneficiary farmer in society. In this study, 10 statements were formulated carefully according to the social acceptance of the goat farmer. These ten questions were asked to 120 beneficiaries and their responses were collected on a five-point scale (5 to 1).

Table 4.24. Social Impact on livelihood of goat farmers

Sl. No.	Statements	Response					Mean score
		SA	A	UD	DA	SD	
1	I am associated with various social organization	0 0	23 19.1	0 0	97 80.3	0 0	2.4
2	I am contacted by the people for various activities in the village	0 0	67 55.8	13 10.8	53 44.2	0 0	3.35
3	I am participating in different celebrations of my village without any inhibition	0 0	107 89.2	2 1.6	13 10.8	0 0	3.75
4	During various social functions I have been contacted for mutton supply with an invitation to attend the function	0 0	105 87.5	2 1.66	13 10.8	0 0	3.76
5	Now I am able to mobilize some of my community members to take up goat rearing as a means of social security	0 0	68 56.6	49 40.8	3 2.5	0 0	3.54
6	Villagers consulting me about goat farming and other social issues	0 0	67 55.8	49 40.8	4 3.3	0 0	3.54
7	Government functionaries at the village and block level are paying attentions towards me	0 0	68 56.6	47 39.2	5 4.2	0 0	3.56
8	I get marriage proposals for me /my family members higher to my level	0 0	29 24.2	15 12.5	76 63.3	0 0	2.60
9	Goat rearing is no more barrier for me in mixing with higher caste people	0 0	107 89.1	0 0	13 10.8	0 0	3.78
10	Villagers take my opinion while deciding on important issues	0 0	108 90	0 0	12 10	0 0	3.8
	Mean score	**34.17**					

(The figures in upper row is frequency and lower is percentage)

Analysis of data relating to social impact on the farmers revealed that 80.3% of the respondentdisagreed to the statement that their association with various social organization has increased whereas only19.1%of the respondents agreed to the statement, and mean score of the statement was 2.4. When asked to them whether they are contacted by the villagers for various activities, 55.8% agreed to the statement while 44.2% disagreed to the statement. The mean score of the statement was 3.35. When asked about your participation in different celebrations of village without any inhibition, 89.2% agreed to the statement whereas 11% disagreed, and mean score is 3.75.Similarly, to a question on whether you supply mutton to the villagers for various social functions, 87.5% of the farmers agreed that they received invitation to the function. Only 10.8% of the farmers disagreed to the statement, and the mean score of the statement was 3.76. 56% of farmers agreed that they could mobilize some of the community members to take up the goat rearing for social security. 55.8 % farmers agreed that the villagers consult them about goat farming and other social issues whereas 40.8% farmers neither agree nor disagree to the statement. The mean score of the statement was 3.54. When the respondents were asked whether they are getting attention of village and block level government functionaries for various programmes, 56.6% agreed to the statement whereas 39.2 % respondents remain undecided. The mean score of the statement was 3.56. To a question, due to goat farming, are you getting marriage proposals for your family from higher level of income family, 63.3% disagree to the statement and only 24.2% agreed to the statement. The mean score of 2.6 was found to be low for the statement. Around 89% of the goat farmers agreed that goat farming is no more a barrier for them to mix with different classes of the people in the society, and the mean score of the statement was 3.78.When a question was asked on whether the villagers take your views on important issues, a majority (90%)of respondents agreed to the statement that the villagers take their opinions while deciding on important issues whereas only 12% did not agree. The mean score of the statement was 3.8. The overall mean score for social impact comes to 34.17.

Table 4.25. Distributionof beneficiaries as per Social Impact

Social impact				**Remarks**
Sl.No	**Impact range**	**Frequency**	**Percent**	
1	High level impact (Mean+1S.D) (>37.005)	13	11	Maximum score=50 Minimum score=10 Mean=34.17 S.D.=2.83
2	Medium level income (Mean+1S.D) to (Mean-1S. D) (37.005-31.344)	90	75	
3	Low level impact (Mean-1S. D) (<31.344)	17	14	

The distribution of the respondents on the basis of social impact due to goat rearing is presented in the table 4.25. The table above revealed that 75% of the respondents had medium level of impact due to goat farming followed by 11% and 14% respondents were having high and low level of social impact, respectively.

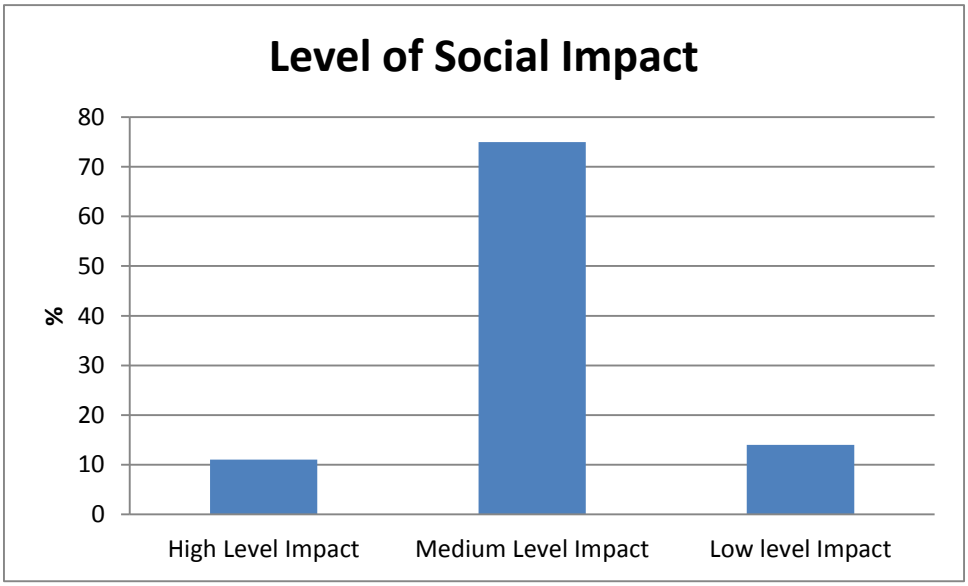


Figure 4.7 Level of Social Impact

4.3.3 Impact on Communication and Extension Behavior

Communication is the mutual interchange of ideas by any effective means. Extension behavior is the ability to communicate improved scientific innovations for improvement of living standard. So in this study, 10 statements were formulated carefully judging the communication ability of the farmers with fellow farmers, feed, medicine and meat retailers as well as banks for approaching credit which will have a direct impact on his livelihood. These ten questions were asked to 120 farmers and their responses were collected on a five-point scale (5 to 1)

Table 4.26. Impact on Communication and Extension Behaviour

Sl. No.	**Statements**	**Response**					**Mean score**
		SA	**A**	**UD**	**DA**	**SD**	
1	My exposure to radio, TV,newspaper,etc has increased	2 1.66	12 10	24 20	82 68.3	0 0	2.45
2	Contact with department officials and PRI personnel is increased	2 1.66	83 69.2	17 14.2	20 16.6	0 0	3.6
3	My visit to town has increased than before	1 0.8	25 20.8	54 45	46 33.3	0 0	2.9
4	Frequency of watching krishi related programmes in TV is increased	1 0.8	14 11.6	38 31.6	67 55.8	0 0	2.57
5	Ability to interact with medicine and feed dealers is developed	1 0.8	68 56.6	23 19.2	28 23.3	0 0	3.35
6	Ability to approach bank and other financial institution for availing credit is developed	1 0.8	62 51.6	13 10.8	44 36.6	0 0	3.15
7	Capability to bargaining with goat meat retailer for better pricing of my goat is developed	1 0.8	80 66.6	5 4.16	34 28.3	0 0	3.4
8	I am able to travel to districts headquarter for attending agricultural exhibitions	1 0.8	76 63.3	17 14.1	26 21.6	0 0	3.43
9	Able to demonstrate and speak better managemental practices of goat farming to villagers	1 0.8	104 86.6	3 2.5	13 10.8	0 0	3.8
10	The skill of interpersonal relationship among the stakeholders has been developed	1 0.8	95 79.2	20 16.6	4 3.3	0 0	3.77
	Mean score	**32.16**					

Analysis of data relating to communication impact on the respondents revealed that 68.33% of the respondents had expressed their disagreement that their exposure to the radio, TV, newspaper, etc., has increased due to goat farming whereas only 10 % agreed to the question. The mean score of the statement was 2.45. To a question, whether their contact with departmental officials and PRI members has increased, 69.2% agreed whereas 16.66% disagreed to the statement, and the mean score of the statement was 3.6.33.3 % farmers undecided to the statement of increased visit to town due to goat farming whereas 20.8 % agreed to the statement and the mean score of the statement was 2.9. When a question was asked that due to goat farming your frequency of viewing krishi related programme has increased, 55.8% disagreed to the statement and only 11.6% respondent agreed to this statement, and mean score of the statement was 2.57. To the question on your ability to interact with medicine and feed dealers, 56.66% agreed to the statement whereas 23.33% disagreed, and 3.35 was the mean score of the statement. 51.66% of the respondents agreed to the statement that their ability to approach to bank and other financial institutions for availing credit has increased whereas 36.66% of the respondents disagreed to the statement, and 3.15 was the mean score of the statement.66.6% of the respondents agreed to the statement that their ability to bargain with goat meat retailer for better pricing has developed whereas 21.6% of the respondents disagreed to the statement, and 3.4 was the mean score of the statement. 63.33%of the beneficiaries expressed their ability to travel to cities for attending agricultural exhibitions where as 21.66% expressed their inability especially to state headquarters having 3.43 mean score of this statement. Majority of farmers (86.6%) agreed that they could demonstrate and speak better management practices of goat farming to villagers, and thee mean score was 3.8 of this statement. Because of all these travelling, trainings, demonstrations and interactions, they are better developed as a communicator and able to maintain good relationship with various stakeholders. 79.2% of the respondents agreed that their skill of interpersonal relationship has developed due to goat farming, however, 3.33% disagreed to the statement, and 3.77 was the mean score of the statement. The overall mean score for impact on communication and extension behavior of beneficiaries was 32.16.

Table4.27. Distribution of beneficiaries as per impact on Communication and Extension Behavior

Impact on Communication and Extension Behavior				
Sl.No	**Impact range**	**Frequency**	**Percent**	**Remarks**
1	High level impact (Mean+1S.D) (>37.24)	4	3	Maximum score=50 Minimum score=10 Mean=32.16 S.D.=5.08
2	Medium level income (Mean+1S.D) to (Mean-1S. D) (37.24-27.08)	84	70	
3	Low level impact (Mean-1S. D) (<27.08)	32	27	

The distribution of the respondents on the basis of communication and extension behavior impact due to goat rearing is presented in the table 4.27. The table above revealed that 70% of the respondents had medium level of communication and extension impact due to goat farming followed by 3% and 27% respondents were having high and low level of communication and extension behavior impact, respectively.

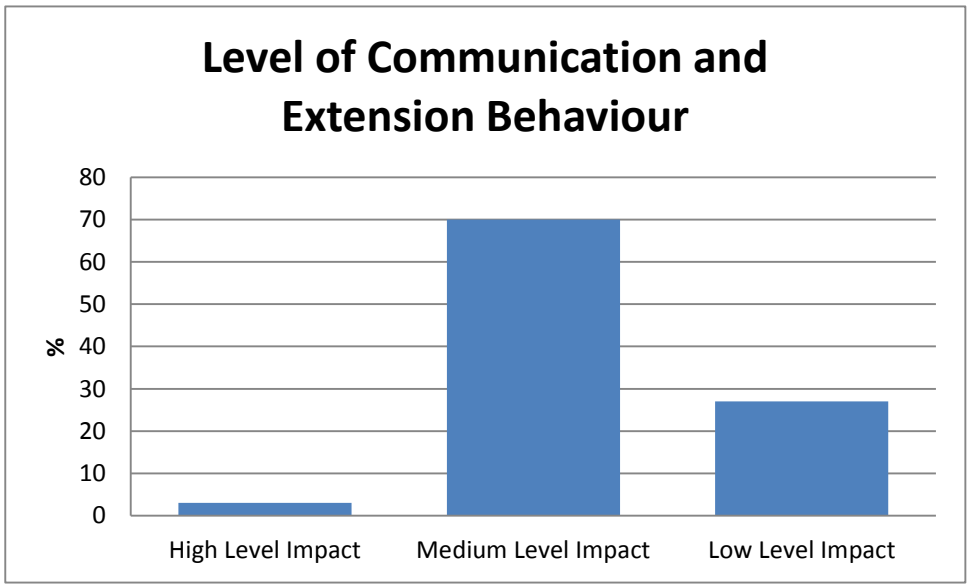


Figure 4.8 Level of Communication and Extension Behaviour Impact

4.3.4 Psychological Impact

Psychological impact in the context of this research is the change of situation from a state of despair to self confidence in terms of mental health; from a state of inferiority to peer feeling and from panicky to security. In this study, 10 statements were formulated carefully which address the various perception and attitude development of respondents. These ten questions were asked to 120 beneficiaries and their responses were collected on a five-point scale (5 to 1).

Table 4.28. Psychological Impact on livelihood of goat farmers

Sl no	Statements	Response					Mean score
		SA	A	UD	DA	SD	
1	I have developed self confidence	3 2.5	65 54.1	32 26.6	20 16.6	0 0	3.42
2	I developed courage to interact freely with economically sound and higher caste people of the village	3 2.5	64 53.3	41 34.1	12 10	0 0	3.4
3	Now I do not have inferior complex	2 1.6	44 36.6	39 32.5	35 29.2	0 0	3.1
4	I feel free to interact with the government officials and other strangers coming to my village	3 2.5	107 89.1	7 5.83	3 2.5	0 0	3.91
5	I feel comfortable in extending advisory services to the goat farmers of my village	2 1.6	81 67.5	25 20.8	12 10	0 0	3.6
6	I developed interest to increase strength of my goat farm	2 1.66	61 50.3	31 25.8	26 21.6	0 0	3.3
7	I developed confidence to take care of family	3 2.5	100 83.3	12 10	2 1.6	0 0	3.79
8	I developed self-image in the society	2 1.66	110 75.8	4 3.3	4 3.3	0 0	3.9
9	I developed the feeling “I can do”	2 1.66	111 91.6	0 0	7 5.8	0 0	3.9
10	I developed the confidence to think on my own for the solution of a problem	2 1.66	115 92.5	0 0	3 2.5	0 0	3.9
	Mean score	**36.22**					

(The figures in upper row is frequency and lower is percentage)

Analysis of data on psychological impact on the farmers revealed that 54.1% agreed that their self-confidence has increased due to goat farming whereas 16.6 % farmers did not agree to the statement, and 3.42 was the mean score of the statement. 53.3% of the respondents agreed to the statement that they have developed courage to interact freely with the better off people of the village whereas only 10 % respondents did not agree to the statement. The mean score of the statement was 3.4. When asked about the inferiority complex with them, 36.66% agreed that they do not have any inferiority complex with them whereas 29.2% disagreed to the statement, and 3.1 was the mean score of the statement.89.1% of respondent expressed their freeness to interact with government officials because of increased exposure and repeated interaction with the outside people. The mean score of the statement was 3.91. Similarly, 67.5% farmers agreed that they are comfortable in extending advisory services to other goat farmers of the area, and 3.6 was the mean score of the statement. 50.3% goat farmers agreed to the statement that they have strong desire to increase the strength of the farm due to high returns, and 3.3 was the mean score of the statement. 83.3% goat farmers agreed to the statement that they have developed confidence to take care of family independently, and 3.79 was the mean score of the statement. 75.83% of the farmers agreed that they developed self-image in the village because of goat farmers whereas only 3.3 % disagreed, and the mean score was 3.9 to this statement.91.66% agreed that they developed a feeling of "I can do" after goatrearing whereas 5.8 % did not agree to the statement. The mean score of the statement was 3.9. Majority (92.5%) of the respondents agreed that they can find out the solution of a problem without outside help whereas only 2.5 % did not agree to the statement, and the mean score of the statement was 3.9. The overall mean score for psychological impact comes to 36.22

Table 4.29. Distribution of beneficiaries as per Psychological impact due to goat farming

Psychological Impact				**Remarks**
Sl .No	**Impact range**	**Frequency**	**Percent**	Maximum score=50 Minimum score=10 Mean=36.22 S.D.=3.23
1	High level impact (Mean+1S.D) (>39.45)	28	23	
2	Medium level income (Mean+1S.D) to (Mean-1S. D) (39.45-32.99)	85	71	
3	Low level impact (Mean-1S. D) (<32.99)	7	6	

The distribution of the respondents on the basis of psychological impact due to goat rearing is presented in the table 4.29. The table above revealed that 71% of the respondents had medium level of psychological impact due to goat farming followed by 23% and 6% respondents were having high and low level psychological impact, respectively.

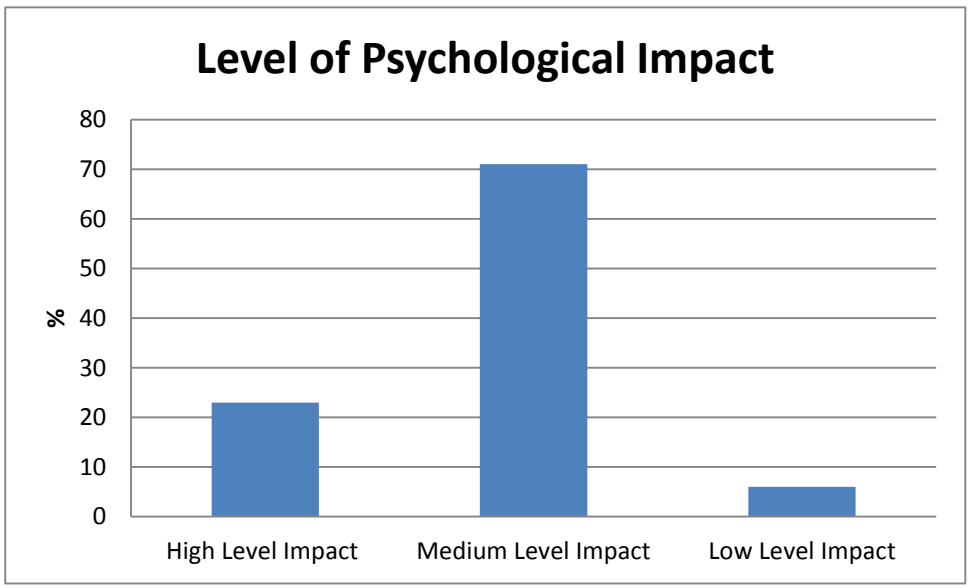


Figure 4.9 level of Psychological impact

4.3.4. Comparison of Levels of Impact on beneficiaries

The various levels of economic, social, communication and psychological impact are compared and presented below in table 4.30 and fig.4.6.

Table 4.30. Distribution of beneficiaries according to level of impact

Types of impact	High level impact (%)	Medium level impact(%)	Low level impact(%)
Economic impact	18	69	13
Social impact	11	75	14
Impact on communication and extension	3	70	27
Psychological impact	23	71	6

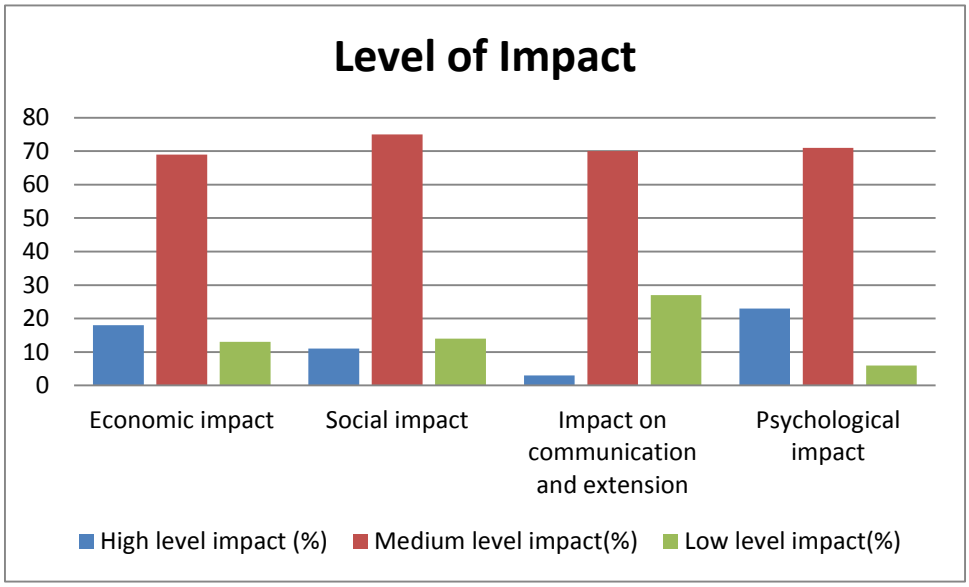


Figure 4.10 Distribution of beneficiaries according to level of impact

4.3.5. Comparison of Means of Impact

The mean scores of various impacts are compared and presented in the table below.

Table 4.31. Mean score of various impact on beneficiaries

Type of impact	**Mean score of impact**
Economic impact	34.43
Social impact	34.17
Impact on communication and extension behavior	32.16
Psychological impact	36.22
Total mean score	**38.24**

Mean scores of various impacts revealed that psychologicalimpact has highest mean score of 36.22 followed by 34.43 for economic impact. Social impact has mean score of 34.17, impact on communication and extension behavior has lowest mean score of 32.16.The overall mean score for impact on beneficiaries is 38.24.

4.3.6 Correlation analysis of selected socio-economic variables of respondents with impacts on respondents.

Correlation analysis of various selected socio-economic variables of respondents with impacts gives an indication of positive and negative association between variables. The data of selected socio-economic variables with various impacts were subjected to zero order Pearson's correlation coefficient and findings are presented in the table 4.32.

Table 4.32: Correlation analysis of selected socio-economic variables of respondents with impacts on respondent

	Age	Education	Occupation	No of goats owned	Annual income	Economic impact	Social impact	Impact on communication and extension behaviour	Psychological impact
Age	1								
Education	-0.458**	1							
Occupation	-0.122	0.143*	1						
No of goats owned	-0.03	0.243**	0.503**	1					
Annual income	0.124	0.11	0.182**	0.289**	1				
Economic impact	0.011	0.008	0.110	0.084	-0.082	1			
Social impact	0.029	0.008	0.007	0.098	0.003	0.128	1		
Impact on communication and extension behavior	0.107	0.012	0.113	-0.004	-0.080	0.313**	0.241**	1	
Psychological impact	0.058	-0.046	0.241**	0.124	0.060	0.327**	0.154*	0.414**	1

(* 5% level of significance, ** 1% level of significance)

The analysis revealed that there is no significant correlation between social variables and impact on beneficiaries. Only occupation was found having positive and significant relationship with the psychological impact on beneficiary. Similar types of findings were reported by Sarangi and Swain (2017) in their study in Odisha. They reported that there is no significant correlation between socio-economic variables like age, education, family type, family size, caste, occupation, types of house, no of goats owned and annual income of the beneficiaries with the economic, social, communication and psychological impact of goat rearing on livelihood of the goat beneficiaries.

4.4. Constraints faced by beneficiaries

The constraints faced by the beneficiary goat farmers are calculated on the basis of Garrett's ranking technique. The beneficiaries were asked about five constraints mainly financial, operational, extension support, social and marketing. Under each category of constraint there are five statements. The respondents were asked to rank these five statements under each category and were also asked to rank the categories of constraints as well. The statement which was mentioned as highest constraint by the respondents is given rank I followed by less and lesser.

4.4.1 Financial Constraints

Table 4.33. Rank of Financial constraints faced by beneficiaries

Sl No	Types of constraints	Mean score	Rank
1	Initial heavy investment for construction of shed and purchase of goats	50	III
2	Insufficient subsidy from government	53.5	II
3	No incentives from government for goat rearing	57	I
4	Unavailability of credit from banks and other financial institutions for supporting the scheme	45	IV
5	My poverty restricts me to participate proactively in the programme	45	V

The analysis presented in the table 4.33 revealed that the statement of no incentives from government for goat rearing secured first rank followed by insufficient subsidy from the Government as second rank. Initial heavy investment for construction of shed and purchase was ranked third and unavailability of credit from banks and other financial institutions for supporting the scheme was ranked fourth by the beneficiaries. My poverty restricts me to participate proactively in the programme ranked fifth.

4.4.2 Operational Constraints

Table 4.34. **Rank of Operational constraints faced by beneficiaries**

Sl No	Types of constraints	Mean score	Rank
1	Difficulty in construction of goat shed	47.75	III
2	Unavailability of kids for starting the farm	50.04	II
3	Unavailability of feed supplements in nearby area	61.87	I
4	Low level of knowledge on goat management	44.33	IV
5	Irregular health advisory services by the department	38.54	V

While analyzing the operational constraints, it was revealed that unavailability of feed supplements in nearby area secured first rank followed by unavailability of kids for starting a farm. Difficulty in construction of goat shed was ranked third and low level of knowledge on goat management was ranked fourth. Irregular health advisory services by the department were ranked fifth.

4.4.3. Extension Support Constraint

Table 4.35. Rank of Extension Support Constraints faced by beneficiaries

Sl No	Types of constraints	Mean score	Rank
1	Lack of training to goat farmers	54.5	II
2	Lack of exposure to successful goat farms	51.62	III
3	Unavailability of extension literature materials on goat farming	45.54	V
4	Lack of idea about benefit of goat farming	55.25	I
5	No regular visit to officials of veterinary department	46.62	IV

The analysis of extension support constraints faced by the beneficiaries presented in the table 4.35 revealed that lack of idea about goat farming secured first rank followed by lack of training to goat farmers, which was ranked second. Lack of exposure to successful goat farms were ranked third and no regular visit of officials of veterinary department was ranked fourth by the respondents. Unavailability of extension literature materials on goat farming ranked fifth.

4.4.4. Socio-Cultural Constraints

Table 4.36. Rank of Socio-Cultural Constraints faced by beneficiaries

Sl no	Types of constraints	Mean score	Rank
1	Goat farming is considered as the occupation of low caste	56.98	I
2	There are certain beliefs that goat keeping in house will restrict the prosperity in the family	48.58	IV
3	Mutton is not preferred by large sections of the people because of health awareness	53.08	II
4	Unavailability of professionals butchers for slaughtering of goats in rural area	51.45	III
5	Non co-operation of neighbours for goat farming	37.5	V

The analysis of socio-cultural constraints faced by the respondents presented in the table 4.36 revealed that goat farming is considered as the occupation of low caste people secured first rank followed by mutton is not preferred by large sections of the people because of health awareness which was ranked second. Unavailability of professionals butchers for slaughtering of goats in rural area was ranked third and there are certain beliefs that goat keeping in house will restrict the prosperity in the family was ranked fourth by the respondents. The noncooperation of neighbours for goat farming ranked fifth.

4.4.5 Marketing Constraint

Table 4.36. Rank of Marketing Constraints faced by beneficiaries

Sl No	Types of constraints	Mean score	Rank
1	Inability to sell the goats at door step	52.91	II
2	High bargaining of goats price by middleman	52.70	III
3	High transportation cost to distant market place	54.83	I
4	Unregulated marketing	47	IV
5	No community managed goat business centre	43.16	V

While analyzing the marketing constraints faced by the beneficiaries presented in the table 4.36, it was revealed that high transportation cost to distant market first rank followed by inability to sell the goats at doorstep was ranked second.High bargaining of goat price by middleman was ranked third and unregulated marketing was ranked fourth by the respondents. No community managed goat business centres was ranked fifth.

Table 4.37. Overall Constraint ranking by respondents

Sl no	Types of constraints	Mean score	Rank
1	Financial constraints	50.60	II
2	Operational constraints	49.51	III
3	Extension support constraint	50.76	I
4	Socio cultural constraints	48.51	V
5	Marketing constraints	50.10	IV

The analysis of overall constraints faced by the beneficiaries presented in the table 4.73 revealed that extension support constraint was ranked first by the respondents followed by financial constraints as rank second. The operational constraint was ranked third and marketing constraint was ranked fourth by the respondents. The socio cultural constraint faced by the respondents was ranked fifth.

CHAPTER-V

DISCUSSION

This chapter deals with the interpretation of the findings of the study, which is presented systematically in the line of the objective. Through this study, an attempt was made to find the effect of some independent variables on the dependable variables which ultimately determines the impact on livelihood of beneficiaries. Further, in this chapter efforts have been made to interpret the probable reasons for the findings of the study. Social factors like age, education, caste, family type, family size etc. were chosen for the purpose of investigation. The results obtained from tabulating the responses of the farmers are discussed herewith under the following sub-heads.

5.1. Socioeconomic profile

5.1.1. Socio-economic profile of goat farmers

5.1.2 Correlation study of socio-economic profile of respondents

5.2. Production and productivity of goats

5.2.1. Birth weight of goats

5.2.2. Weight at marketing age of goats

5.2.3. Frequency of deworming per years in goats

5.2.4. Frequency of vaccination per year

5.2.5. Kid mortality in goats

5.2.6. Adult mortality in goats

5.3. Impact of goat rearing on livelihood of farmers

5.3.1. Economic impact

5.3.2. Social impact

5.3.3. Impact on communication and extension behavior

5.3.4. Psychological impact

5.4.4. Correlation analysis of socio-economic variables of respondents and economic impact on respondents.

5.4. Constraints faced by goat farmer

5.4.1. Financial constraints

5.4.2. Operational constraints

5.4.3. Extension support constraints

5.4.4. Socio-cultural constraints

5.4.5. Marketing constraints

5.4.5. Overall constraints

5.1. Socio-economic profile

5.1.1. Socio-economic profile of goat farmers

5.1.1.1. Age Profile

The results revealed that 52.51% of the farmers belonged to middle age group, i.e. between 36-50 years of age. This reveals that most of the goat rearing activities is done by middle age group person. Out of 120 respondents, only 15.83% of them belong to old age group. Analysis reveal that the old age group persons do not take interest in goat rearing. Similar findings were reported by Ray *et. al*. (2016), Sabapara (2016) and Panda and Das (2017) that majority of the goat owners were within the age group of 30- 45. But Oluka *et al.* (2015) and Sarangi and Swain (2017) reported that 62.5% of the goat farmers had age groups more than equal to 51 years.

5.1.1.2. Education/Qualification

The analysis revealed that 46.66% of respondents had no schooling followed by 38.33% were functionally literate, followed by 10.83% had primary school education, followed by 0% had middle school, followed by 3.33% had high school and followed by 0.83% had college level of education. So, it may be proposed that the level of education of goat farmers is not so high. Since the goat farming is their family business they do not take much interest in studies and leave the school education in between to focus on their family business along with their parent. The low level of education of the goat farmers may also indicate their low social status and decreased profitability because of their inability to read the farm publications like leaflet, folder, etc., for adopting modern rearing practices. Basunathe *et al.* (2016) reported that 34% of the goat farmers had primary school education while 22.8% of the farmers had high school level of education. Singh *et al.* (2012) reported that 44.6% of the goat farmers

are illiterate. Similar types of findings are also reported by Panda and Das (2017) and Sarangi and Swain (2017) in their studies.

5.1.1.3 Caste Category

The analysis of caste category revealed that 72.5% of the total respondents belonged to ST category while 12.5% belonged to schedule caste category. Only 13.33% of the category belonged to OBC category. This corroborates the fact that goat farming is a low caste profession and not generally reared by general caste people. This presence of highest category of ST people proves their affinity towards taking up goat farming without any hesitation. Rai and Singh (2013) also reported that majority of goat keepers (90%) belonged to socioeconomically backward communities. Similar types of findings were reported by Sabapara (2016), Panda and Das (2017) and Sarangi and Swain (2017) in their studies.

5.1.1.4 Marital Status

The analysis of marital status of the respondents revealed that 88.33% of respondents are in married category followed by 11.66% are unmarried category. So, it may be inferred that the farmers who are married are concerned for their livelihood. Yusoff (2016) reported that most of the respondents are married in the farming industry.

5.1.1.5 Family Type

The analysis of data related to family type revealed that in 58.33% of the respondent had nuclear family whereas only 41.66% of the respondents has joint families. Similar findings were reported by Jagadeeswary, *et al.* (2010) in their study in which more than half(63%) of the farmers lived in nuclear type family. But Kumar and Singh, *et al.* (2012) reveals that most of the farmers are of joint family.

5.1.1.6 Family Size

The analysis of family size data revealed that in total 75% of the respondents have family members more than 5.Only 25% have family members between 3 to 5 members. Sabapara (2016), Panda and Das (2017) and Sarangi and Swain (2017) reported in their studies that most of the goat farmers have family size of 4-6 members. Narayan *et al.* (2015) reported that 45 per cent of respondents had average family size of 3 to5 persons, 35 per cent respondents had average family size of 1 to 3

persons and 20 per cent had family size of 5 to 10 persons. Singh *et al.* (2014) reported that the overall average family size for all goat rearing households was 8 members.

5.1.1.7 House Type

Analysis of data related to type of house owned revealed that in total 60.83% of the respondents have semi pucca house. Total 29.16% of the respondents have pucca house. 10% of respondents have kutcha house. It may be inferred from the study that, in goat rearing there is increased level of income so that they can spare the disposable part of their income in construction of semi pucca/ pucca house. Raghavan and Raja (2012) reported that majority of the farmers (55.73%) had a tiled house with concrete flooring. Majority of farmers own semi pucca/ pucca house in our study area. It can also be due to various housing schemes by the central and state government for the rural poor people of the villages in order to convert their kutcha house into pucca house. But after the construction of pucca house, the beneficiaries do not demolish the old kutcha house and they use it for the storage of paddy, wood and in some cases they also use it as a kitchen converting the entire structure into semi pucca pattern.

5.1.1.8 Livestock Possession

Analysis of data related to livestock possession revealed that 58.33% of the total farmers had possession of other livestock along with the goats. Total 41.66% of the respondents had only goats as livestock possession. Similar findings were proposed by Basunathe *et.al*.(2016) who reported that more than half (51.71%) per cent of the respondents had only goats in their livestock holding. Similarly, in another study by Sarangi and Swain (2017) reported that the 46% respondents had only goats as livestock in their houses.

5.1.1.9 Number of goats owned

Analysis of data related to number of goats owned revealed that all 42.5% of respondent are having 21-30 numbers of goats followed by 41.66% are in the range of 10-20 .Oluka *et.al*. (2015) reported that the average number of goats per household was 9.2 (range 3-31). Dharmapala *et al.* (2012) reported that more than 60% of the goat farmers are holding flock sizes of less than 40 head while 20% have a flock size

of more than 50. So, government functionaries must identify them and take necessary steps to educate them about scientific goat rearing.

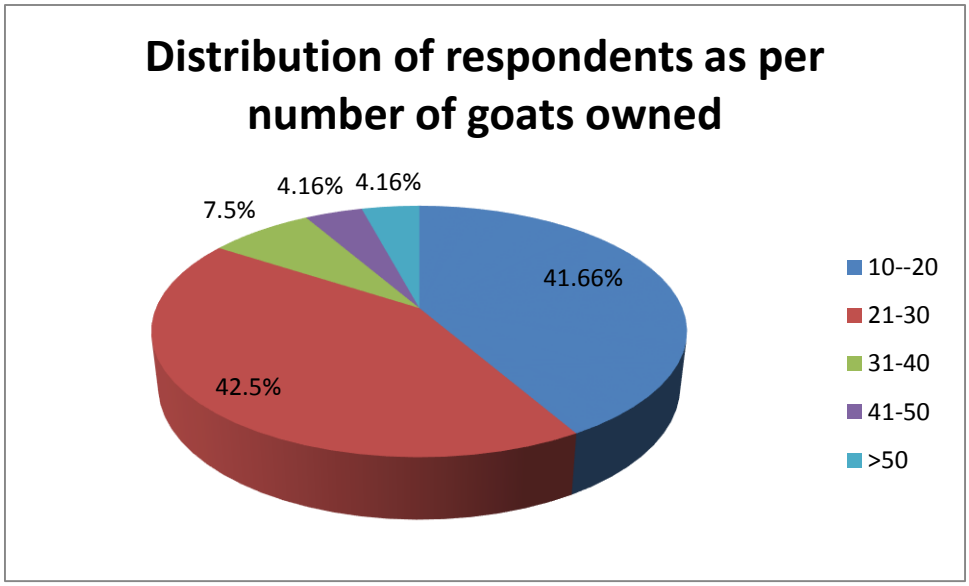


Fig 5.1. Distribution of respondents as per number of goats owned

5.1.10 No. of years of goat rearing

Analysis of data related to years of goat rearing revealed that in total 56.66% of the respondents has experience of 5-10 years of goat rearing. Only 26.66% have 3-5 years of experience of goat rearing. The respondents who are having experience of 3-5 years have ventured into the goat farming by purchasing of goats in the recent past.

5.1.1.11 Land Holding

Analysis of data related to land holding revealed that in total 37.5% of the respondents have land holding of less than 1 acre. 25% of the farmers have land holding between 1 to 2 acres. Only 9.16% of the beneficiaries have more than 2 acres of land holding. So it may be inferred that majority of the farmers have small land holdings. Basunathe *et al.* (2016) reported that 43.14% of the goat farmers were landless and 39.71% of the goat farmers were marginal farmers. Ray *et al.* (2016) reported that goat farmers were mostly marginal farmers. Beneficiaries have more land holding than the non-beneficiaries. But the reason may not be the increased income as the land holdings are inherited properties.

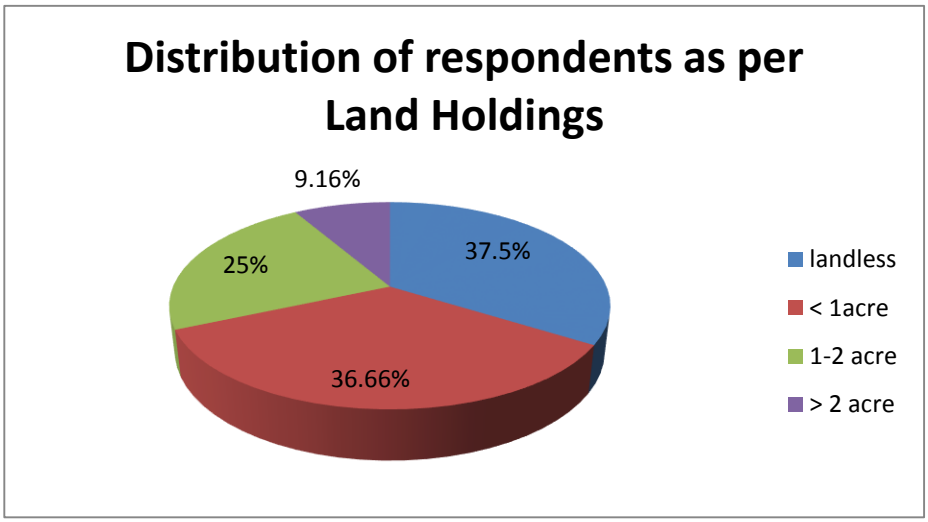


Fig.5.2. Distribution of respondents as per land holding

5.1.1.12 Status of agricultural land

Analysis of data related to status of agricultural land revealed that in total 64.16% of the respond had own land. Only 3.33% of the respondents had both own and tenant land. So, it shows that all the beneficiaries have their own land and do not practice tenancy as they spend most of time in taking care of the large goat flocks. Some of the respondents who have small flock size practice tenancy in addition to their own land in order to add to their income. But Mohan and Singh (2012) reveals that most of the farmers are landless in their study.

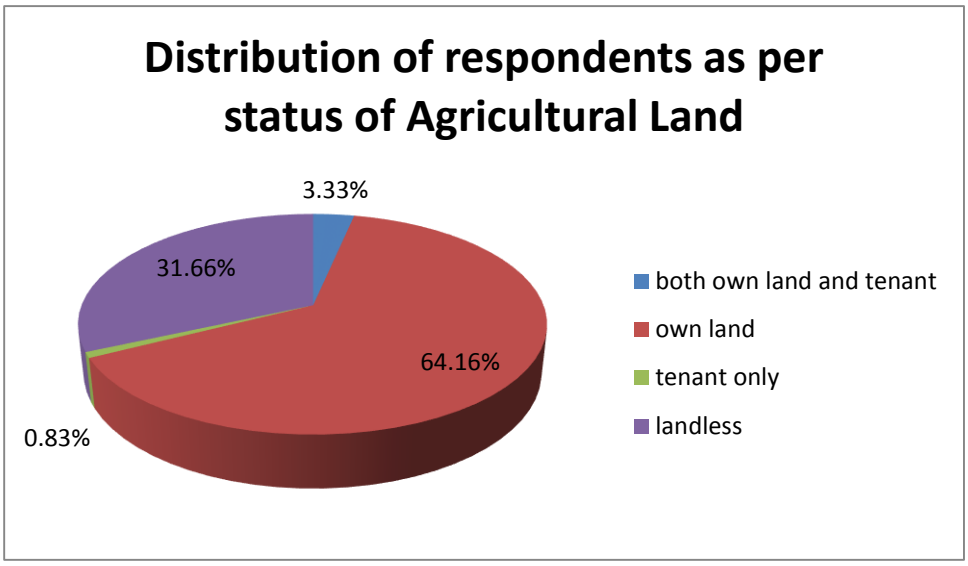


Fig 5.3. Distribution of respondents as per status of agricultural land

5.1.1.13 Occupation

Analysis of data related to occupation revealed that in total 52.5% of the respondents had mentioned goat rearing as their primary occupation.The results indicate that the goat farmers solely depend upon on goat farming as a major source of income for maintaining their livelihood. 47.5% of respondents are having goat as secondary occupation. Because some goat farmers pursue other occupations for maintaining their livelihood and mentioned goat farming as secondary occupation because income from small goat flocks is not enough for sustaining livelihood. When asked about their other occupation, majority of the farmers mentioned daily wage while some of the farmers mentioned livestock as they have other animals and very few mentioned agriculture as their primary occupation. Yusoff *et al.* (2016) reported that 67.7% of the goat farmers were involved in the goat rearing as a part time job. Similarly, Narayan *et al.* (2015) reported that the most important income sources of the respondents included agriculture 52%, Goat keeping 25%, business 14% and salary 9%. The study conducted by Sarangi and Swain (2017) also reported that 52% of the respondents had goat farming as primary occupation.

5.1.1.14 Annual Income

Analysis of data related to annual income revealed that in total 12.5% of the respondents had annual income of above one lakh. 85% of the respondents had annual income of Rs.50, 000- 1, 00,000/. Only 2.5% of the respondents had annual income below 50,000/. So it is quite evident that farmers with large numbers of goats had high income. Jagadeeswary *et. al.* (2010) reported that 96.92% of the goat farmers have low income level, 1.54% has medium level income and 1.54% of the goat farmers have high level of income. Sabapara (2016) reported that majority of the goat rearers had an annual income less than Rs. 25,000. However, the study of Sarangi and Swain(2017) reported that 35% of the respondents had annual income above one lakh.

5.1.2 Correlation study of Socio-economic profile of respondents

The analysis of above data related to beneficiaries revealed that age is negatively and significantly co-related with education of the beneficiaries. However, the education is positively and significantly co-related with occupation and no of goats owned by the farmers. Family size was found negatively co-related with education and occupation of the goat farmers. Whereas, occupation of the goat

farmers was found positively and significantly co-related with no of goat owned and annual income of the farmers. Annual income of the farmers was positively and significantly correlated with the possession of goats by the farmers. Basunathe, *et. al.* (2016) reported that the socio-economic factors like sex, age, education, annual income, occupation, social participation, land holding and livestock holding were positively and significantly associated with goat farming. Singh, *et. al.* (2014) reported that large and medium flock owners adopted goat rearing as the main occupation. About 10% of small category households adopted agriculture as the main occupation as they had larger operational land holdings. Singh, *et al.* (2014) reported that land holding size decreased as the flock size increased. Similarly, it was found that average flock size increased as the number of family members increased. A study conducted by Sarangi and Swain (2017) reported that age and family type are highly correlated; age and occupation are highly correlated. Education is negatively correlated with family type and occupation. They also reported the negative correlation between caste and family size, and annual income is positively and highly correlated with number goats owned.

Fig 5.4. Researcher in interaction with respondents

5.2. Production and Productivity traits of goats

5.2.1. Birth weight of goats

Analysis of data reveals that 60% of the respondents were having kids of 1-2 kg birth weight followed by 28.33% and 11.66 % were having kids of birth weight of more than 2 kg and less than 1 kg, respectively. Birth weight is a production trait depending upon the health status of the does and also on buck. Higher birth weight of kids results in increased adult weight there by increasing the profit for farmers. If the buck is healthy, of superior quality then it is likely to produce healthy kids of high birth weight. Similarly, if the doe is fed properly it is likely to produce healthy kids of high birth weight. Likewise if the goats were dewormed regularly and remain disease free, then they are likely to produce good quality kids. BAIF development research foundation (2015) in their study reported that lack of regular deworming and supplementary feeding resulted in birth of kids of low weight in Odisha and Singh, *et. al.* (2013) reported that low productivity of goats was mainly attributed to inadequate feeding, health measures and breeding practices.

5.2.2 Weight at Marketing Age of goats

Analysis of data reveals that 65% respondents having goats of marketing age 10-15kg and 25% are having more than 15kg.Weight at marketing age is an economic indicator for the farmers. High weight at marketing age results in higher dressing percentage thereby fetching better price for farmers. In the area of the research study, Singh *et al.* (2013) reported that low productivity of goats was mainly attributed to inadequate feeding, health measures and breeding practices. The study of Sarangi and Swain (2017) revealed that the marketing weight of goats in their study areas of Odisha was 12.32 to 16.4 kg.

5.2.3 Frequency of Deworming Per Year in Goats

Analysis of data reveals that 80% of respondent are giving more than 3times deworming medicines followed by 20% respondents are giving less than 3times deworming medicines per year. The goats reared under Indian conditions mainly depend upon grazing in order to fulfil the feed requirements along with supplementation of small amount of concentrates. During grazing animals get infected with worms which arrest their body growth resulting in lower body weight at marketing age with a loss to farmers. Farmers are not aware of the situation as the

goats may not show any symptoms of worm infestation. So it is mandatory to deworm goats 3-4 times a year. Traditional goat farmers also deworm their goats but only once or twice in year when they attend the health camps organized in their village or visit the veterinary dispensary for any other ailments. The officials may themselves deworm the goats or prescribe the farmers for medicine and demonstrate them the process or regular training may be organized for the goat farmers in order to demonstrate the deworming procedure so that the farmers themselves can deworm their goats regularly. Islam,*et. al.* (1991) suggested that provision of adequate feeding and deworming may improve growth performance of goats.

5.2.4 Frequency of Vaccination Per Year

Analysis of data reveals that 81.66% respondents are giving more than 3times vaccination per year. Vaccination protects goats from serious illness and complications of vaccine-preventable diseases such as PPR, Goat Pox, Enterotoxaemia, FMD, etc. In case of Nabarangpur district the vaccines of goats are mostly supplied through government veterinary institutions. The LI/VAS of the area vaccinates the goats mostly through health camp mode. While interviewing the beneficiaries, almost all of them confirmed that their goats are regularly vaccinated against the diseases by the veterinary officials. But all the farmers agreed to vaccinate their goats against PPR which has highest prevalence in the area. Rajput and Tripathi (2009) revealed that Pneumonia and pox were the most prevalent diseases which are mainly responsible for decrease in productivity while contagious ecthyma and enterotoxaemia were comparatively least prevalent diseases**.**

5.2.5 Kid Mortality in goats

The low percentage of mortality of kids of goat farmers indicate better health care measures of kids such as colostrum feeding, deworming, vaccination, high birth weight etc. It may be due to increased interaction between the farmers and veterinary officials who regularly advise the beneficiaries regarding improved health care measures. Analysis of data reveals that 48.33% respondents having their kid mortality in their flock around 10-15% followed by 41.66% were having less than 10%.Seleka (2001) revealed in his study that high mortality rates are generally caused by prevalence of poor management and inadequate husbandry practices. Similar types of findings were reported by Sarangi and Swain (2017) in their study in Odisha.

5.2.6 Adult Mortality in goats

The low percent of adult mortality indicates good managemental practices done by farmers. In the study district, it was found that 58.33% respondents were having 20-30% of adult goat mortality followed by 31.66% respondents were having adult mortality of less than 30% in their flock. Seleka (2001) revealed in his study that high mortality rates are generally caused by prevalence of poor management and inadequate husbandry practices. However, in a study conducted in Ganjam district of Odisha by Sarangi and Swain (2017) reported that adult goat mortality was 4-6 percent.

5.3. Impact on livelihood of beneficiaries due to goat farming

Impact on livelihood is measured in terms of economic impact, social impact, extension and communication impact and psychological impact.

5.3.1 Economic Impact

Analysis of data relating to economic impact on the farmers revealed that 45.8 percent of the respondent agreed to the statement of increased in personal savings in the bank account due to increased income from goat farming whereas 40 percent of the respondents did not agree to the question. The mean score of this statement was 3.09. When asked about the construction of semi pucca/pucca house on their own land through goat rearing, 72.55% of the respondents agreed while 20.8% disagreed to the statement. The mean score of this statement was 3.53. The high mean score for house construction implies that most of the respondents have constructed a semi pucca or pucca house out of the income from goat rearing. When asked about the ability to spend the required amount for children education, 54.1% of the respondents agreed to the statement while 23.3% of the respondents disagreed to the statement, and mean score of this statement was 3.32. Similarly, when asked about ability to spend for emergency medical care of the family members, 73.3% of respondents expressed their ability to bear the expenses and 17.5% expressed their inability and mean score of this statement was 3.57. When asked about spending on food items, 79.1% agreed that their spending on food items has increased whereas 15.5 % disagreed, and the mean score was 3.9. When asked about spending on clothings, 45% agreed that their spending on clothing items has increased due to goat farming. The mean score of the statement was 3.46. When asked about repayment of borrowed money to the private

money lenders, 84.1% agreed that they have already repaid the money borrowed from money lenders. The mean score of the statement was 3.86 which was very encouraging. When asked about lending money on credit to others, only 48.3% agreed that they have lent money to others whereas rest did not lent money to others. The mean score was 3.44. When asked about your ability to increase the strength of the farm by purchase of additional goats, 53.3% agreed that they have required ability to add additional goats to their existing farm, and mean score to this statement was 3.31. 50% of goat farmers agreed that their profit has increased due to goat farming whereas 33.3 % farmers did not agree to the statement. The mean score of the statement was 3. 2. The overall mean score of economic impact on beneficiaries was 34.43 which is a positive sign for the economic prosperity. The analysis of distribution of respondents as per economic impact revealed that there is high level of economic impact on 18% of the beneficiaries while medium level of impact is on 69% of the beneficiaries. So in order to increase the income from goat rearing more scientific methods should be followed. Fayaz, *et. al.* (2015) reported that goat rearing enterprise in the study area made a significant net contribution to the economic welfare of the sample respondents. Chand, *et.al.* (2013) reported that goat rearing plays a vital role in generating income and employment to farmers in Rajasthan. Similarly, Udob, *e.t al.*(2013)revealed that all farmers agreed that the goat-based aid programme was useful and, for the majority, it improved their economic situation. Overall analysis of economic impact revealed that there is definitely increase in the level of income of the goat farmers from goat rearing so that they were able to construct house, save money in the banks, purchase goats for expansion of the farm. But the income level is not so high that all the members are confident enough to bear the educational and medical expenses. Similar types of findings were also reported by Sarangi and Swain (2017) in their study.

Fig 5.5. Goat shed of a goat farmer

5.3.2 Social Impact

Analysis of data relating to social impact on the farmers revealed that 80.3% of the respondent disagreed to the statement that their association with various social organization has increased whereas only 19.1% of the respondents agreed to the statement, and mean score of the statement was 2.4.

It indicates that though the farmers are rearing goats for a long time but they are not able to associate with various social organization due to low income. Goat rearing is a labour intensive farming ranging from taking goats for grazing to feeding and management. So they are apprehensive that joining in social organizations may hamper their business. So either they are undecided or disagreed. It may also highlight that due to their low social status they are not allowed to be associated with various social organizations.

When asked to them whether they are contacted by the villagers for various activities, 55.8% agreed to the statement while 44.2% disagreed to the statement. The mean score of the statement was 3.11.This shows only a handful number of farmers are contacted by village members for welfare activities as it is a community work where participation may be in the form of labour or money.

When asked about your participation in different celebrations of village without any inhibition, 89.2% agreed to the statement whereas 11% disagreed, and mean score is 3.75 which is a good score to this statement. So it shows that goat farmers are always apprehensive about their social position and participate in village functions with much caution.

Similarly, to a question on whether you supply mutton to the villagers for various social functions, 87.5% of the farmers agreed that they received invitation to the function. Only 10.8% of the farmers disagreed to the statement, and the mean score of the statement was 3.76. So it shows that goat farmers are always apprehensive about their social position and participate in village functions with much caution. Goat meat or mutton as popularly called by local people is delicious and relished by all the members of the society. It is considered as precious food item and is cooked in various social functions such as marriage or festive occasions. In order to reduce the cost of expenditure, the organizer always asks the local goat farmer for supply of the superior quality of goat meat at an affordable price. The goat farmers also agree to this proposal as it means a bulk selling at the doorstep. It may be argued that the invitation is not because of higher social status of goat farmers. As the person organizing the function asks for mutton supply, he invites the farmers as a good gesture. Goat farming is the backbone of livelihood of rural people. If reared under good care and management they deliver high profit margins to the farmers. Since farmers are getting good profits from goat rearing. 56% of farmers agreed that they could mobilize some of the community members to take up the goat rearing for social security. 55.8 % farmers agreed that the villagers consult them about goat farming and other social issues whereas 40.8% farmers neither agree nor disagree to the statement. The mean score of the statement was 3.54.

Being selected as a beneficiary under government programme because of some abilities enhances the standard of farmers. When the respondents were asked whether they are getting attention of village and block level government functionaries for various programmes, 56.6% agreed to the statement whereas 39.2 % respondents remain undecided. The mean score of the statement was 3.56.

Majority of the farmers are either undecided or disagreed about getting marriage proposals for their family members from families higher to their level.

63.3% disagree to the statement and only 24.2% agreed to the statement. The mean score of 2.6 was found to be low for the statement. Around 89% of the goat farmers agreed that goat farming is no more a barrier for them to mix with different classes of the people in the society, and the mean score of the statement was 3.78. When a question was asked on whether the villagers take your views on important issues, a majority (90%) of respondents agreed to the statement that the villagers take their opinions while deciding on important issues whereas only 12% did not agree. The mean score of the statement was 3.8. The overall mean score for social impact comes to 34.17.The data related to distribution of respondents as per social impact revealed that there is high level of social impact on 11% of the respondents while medium level of impact is on 75% of the respondents and low level impact is on 14% of the respondents. So in order to increase the social recognition of the goat farmers a lot of effort has to be made. Kosgey (2004) observed that small ruminants not only act as an economic enterprise, the intangible benefits (e.g., savings, an insurance against emergencies, cultural and ceremonial purposes) are also important. Ramsay, *et. al.* (1999) reported that goats provide socio-cultural linkages and insurance against risks in fragile and harsh environments, particularly in rural communities. Similar types of findings were reported by the study conducted by Sarangi and Swain (2017) in the state of Odisha.

Overall analysis of social impact revealed that though the goat farmers are being consulted by various other farmers in the village and recognized by government official, but they are not accepted and recognized socially as a progressive person. So government must take some steps in uniting the villagers to accept goat farming as a business enterprise and start publicizing efforts of progressive farmers in order to make them more acceptable to the society.

5.3.3. Impact on Communication And Extension Behavior

Analysis of data relating to communication impact on the respondents revealed that 68.33% of the respondents had expressed their disagreement that their exposure to the radio, TV, newspaper, etc., has increased due to goat farming whereas only 10 % agreed to the question. The mean score of the statement was 2.45. This data revealed that not more farmers exposed to mass media due to lack of exposure.

The disagreed farmers are of the view that the veterinary officials are in regular contact with them, so there is no need for extra effort. 69.2% of the respondents agreed that their contact with department officials and PRI members has increased a lot whereas 16.66% disagreed to the statement having mean score 3.6 to this statement. The higher contact of the respondents may be due to frequent visit of veterinary officials to their farm to assesses his socio-economic condition and contact local PRI members for recommendations to avail different benefits under government scheme.33.33% farmers disagreed to the statement of increased visit to town and 20.8% agreed to this statement having mean score 2.9. 55.8% disagreed to the statement of watching agriculture related programmes in T.V. and mean score is 2.57 to this statement. It may be because the farmers are not aware of agricultural programmes in television. So, government should popularize these programmes to educate the goat farmers on improved goat rearing practices. To the question on your ability to interact with medicine and feed dealers, 56.66% agreed to the statement whereas 23.33% disagreed, and 3.35 was the mean score of the statement. The increased contact with the medicine and feed dealers may be due to the availability of different advisory services from them. 51.66% agreed and 36.66% disagreed to the statement of approach to bank and other financial institute for availing credit having mean score 3.15 to this statement.

All the farmers are aware of the fact that they are getting lower price than the market because of increased contact with officials, mass media and also because of their frequent travel to cities. So they are in a better position to bargain for better pricing of their goats. So, 66.6% of the respondents in the study district agreed that their ability has increased to bargain with goat meat retailers for better pricing. For various programmes related to goat farming, the beneficiaries were asked to attend different programmes at state and district headquarters. 63.33%of the beneficiaries expressed their ability to travel to cities for attending agricultural exhibitions where as 21.66% expressed their inability especially to state headquarters. But most are of views that they will be attending the programme at district headquarter as it is familiar place to them. So, Veterinary Department may make necessary arrangements to expose these farmers to different goat farming. Most of the farmers (86.6%) agreed to demonstrate and speak better management practices of goat farming to villagers. Because of all these travelling, trainings, demonstrations and interactions, they are

better developed as a communicator, so able to maintain good relationship with various stakeholders. So, 79.2% agreed to the statement, 3.33% disagreed to the statement and 16.66% were undecided about their developed interrelationships. The overall mean score for impact on communication and extension behavior of beneficiaries is 32.16.

The overall analysis of impact on communication and extension behavior of respondents revealed that there is a strong improvement in communication ability of beneficiaries with the department officials, PRI members, feed and medicine dealers and also with goat meat retailers. They also started watching more agriculture related activities in mass media. All these have a direct impact on livelihood as they will be able to save a lot of money by buying from wholesaler shops, bargain for better pricing of goats and also improve the productivity of goats through improved management practices. Overall the beneficiaries are satisfied as they have maintained a perfect interrelationship among the various stakeholders. Communication is both interpersonal and intrapersonal. So the beneficiary has better ability to take correct decisions. Their increased ability to demonstrate to other farmers about improved goat rearing techniques achieves one of the objectives of goat farming to develop the firm as training, demonstration field with an intention for expansion and replication by involving peoples' participation.

The analysis related to distribution of respondents on the basis of level of impact on communication and extension behavior of beneficiaries revealed that there is medium level of impact on 70% of the beneficiaries and low level impact is on 27% of the beneficiaries. So there is significant improvement in the communication abilities of beneficiaries. Similar types of findings were reported by Sarangi and Swain (2017) in their study of goat famers of Ganjam district of Odisha.

5.3.4. Psychological Impact

Analysis of data on psychological impact on the farmers revealed that 54.1% agreed to development of self-confidence, 26.66% were undecided and 16.6% disagreed to the statement. This indicate that these farmers are earning enough from the goat farming due to their increased self-confidence. The farmers who are not earning enough did not show self-confidence. 53.3% of the respondents agreed that they developed courage to interact freely with economically sound and higher caste

people of the village, 34.1% were undecided and 10% disagreed to the statement.This indicate the presence of strong social strata in the village where still backward communities fear to interact freely with the higher caste people. When asked about the vanishing of inferiority complex, 36.66% agreed, 32.5% undecided and 29.16% disagreed to the statement. So the goat farmers are still having the inferiority complex of the backward in the community in spite of increase of their income. But majority (89.1%) of the respondents expressed their freeness to interact with government officials because of increased exposure and repeated interaction. Similarly, 67.5% farmers are comfortable in extending advisory services to other goat farmers of the area. 50.3% goat farmers expressed their strong desire to increase the strength of the farm due to high returns. But when question of family expenditure comes they are unsure whether they can meet their expenses. 50.3% respondent agreed, 20.8 % undecided and 1.6% disagreed. 75.83% of the farmers agreed to develop self-image in the village because of goat farming whereas 3.3%were undecided and 3.3% disagreed to the statement. Majority (91.66%) of the respondents agreed that they have developed confidence of doing by self because of increased income, 5.8% disagreed to development of confidence of doing by self. Majority (92.5%) of the respondents feel self-secured and think on their own for the solution of a problem whereas 2.5% disagreed to the statement. The overall mean score for psychological impact comes to 36.22.The analysis of data related to distribution of respondents on the basis of level of psychological impact revealed that there is high level of impact on 23% of beneficiaries, medium level of impact on 71% of the beneficiaries and low level impact is on 6% of the beneficiaries. Overall analysis of data related to psychological impact on beneficiaries revealed that all the farmers are free to interact with government officials, comfortable in extending advisory services to the goat farmers and have a strong desire to increase the strength of their farm. But most of them were unsure or disagreed about their self-image, courage to interact freely with higher caste people and ability to act on their own to think of solution to problems. So the beneficiaries need repeated exposure in order to make them more psychologically confident. Similar types of findings were reported by Sarangi and Swain (2017) in their study on goat farming.

Fig 5.6 Researcher interaction with respondents

5.3.5. Comparison of means of impact

Mean scores of various impacts revealed that psychological impact has highest score of 36.22 followed by 34.43 for economic impact. Social impact has mean score of 34.17, impact on communication and extension behavior has lowest mean score of 32.16.The overall mean score for impact on beneficiaries is 38.24. Mean scores on various impacts reported by Sarangi and Swain (2017) indicate that the impact of communication and extension behavoiur was highest followed by economic, psychological and social impact in their study.

So the results of the present study reveal that Psychological impact has highest impact due to more income from goat rearing which help them to develop self-confidence, courage to interact freely with either economically higher people, developed confidence to take care of family, increased interest to increase strength of goat farms. The second highest impact is economic impact which shows that from goat farming farmers are able to construct semipucca or pucca house,to spend money for education, health care, foods, clothing, etc., for their family members. It also helps them to invest for purchase of additional goats and ultimately their profit from goat farming increased. Social impact has second lowest value because of non-association with various social organization and Government functionaries in paying proper attentions to them. Impact on communication and extension behavior has lowest score

may be because of not getting proper exposure to mass media, unavailability of proper extension support like training and exposure visits.

5.3.6 Correlation Analysis of selected socio-economic variables of respondents and impact on respondents

The analysis revealed that there is no significant correlation between social variables and impact on beneficiaries. Only occupation was found having positive and significant relationship with the psychological impact on beneficiary. Similar types of findings were reported by Sarangi and Swain (2017) in their study in Odisha. They reported that there is no significant correlation between socio-economic variables like age, education, family type, family size, caste, occupation, types of house, no of goats owned and annual income of the beneficiaries with the economic, social, communication and psychological impact of goat rearing on livelihood of the goat beneficiaries.

Fig 5.7.Goat shed of a goat farmer

5.4 Analysis of Constraints faced by Goat Farmers

The constraints faced by beneficiaries regarding financial, operational, extension support, socio-cultural and marketing are analyzed.

5.4.1 Analysis of Financial Constraints

The analysis presented in the data revealed that no incentives from government for goat rearing secured first rank followed by insufficient subsidy from the Government. Initial heavy investment for construction of shed and purchase was ranked third and unavailability of credit from banks and other financial institutions for supporting the scheme was ranked fourth by the beneficiaries. My poverty restricts me to participate proactively in the programme ranked fifth. As most of the goat rearers from backward and disadvantaged sections of the society, the Government should provide incentives for goat rearing to support livelihood in the rural areas. Goat farmers should be reasonable supported to construct the goat shed and purchase the animals to start the goat farming.

5.4.2 Analysis of Operational Constraints

While analyzing the operational constraints, it was revealed that unavailability of feed supplements in nearby area secured first rank followed by unavailability of kids for starting a farm. Difficulty in construction of goat shed was ranked third and low level of knowledge on goat management was ranked fourth. Irregular health advisory services by the department was ranked fifth by the respondents. Therefore, provision may be made to provide feed and fodder to the goat farmers for their maximum benefit from the business.

5.4.3 Analysis of Extension Support Constraints

The analysis of extension support constraints faced by the beneficiaries revealed that lack of idea about goat farming secured first rank followed by lack of training to goat farmers as second most constraint. Lack of exposure to successful goat farms were ranked third and no regular visit of officials of veterinary department was ranked fourth by the respondents. Unavailability of extension literature materials on goat farming ranked fifth. Extension support is the application of scientific research and new knowledge to animal husbandry practices through farmer education. The field of extension now encompasses a wider range of communication and learning activities organized for rural people. It includes training, exposure visit,

distribution of leaf lets, folders, campaign through posters, newspapers, radio, TV, etc. Training is teaching or developing skills and knowledge related to useful competencies. It is absolutely necessary to start a scientific farming. Exposure visit enables farmers from different regions to interact with and learn from each other, allowing them to view practical examples of successful integration of sustainable practices in farming communities like their own. It is very much essential in order to gain a practical experience. Extension literature or farm publication is class of publications prepared by the extension agency in printed form, containing information relating to improvement of farm income. It includes leaflet, folder, newsletter, etc. Distributing the extension literatures in local languages to the farmers will go a long way in improving their knowledge on goat farming and also can be kept for future reference. Non provision of training, exposure visit and literature are viewed seriously by the respondents and Similar findings were reported by De Vries (2008), Kosgey, *et. al*. (2006) and Sarangi and Swain (2017). So, it is suggested to include training, exposure visit and distribution of literature materials to encourage the goat farming in the rural areas as a livelihood option.

5.4.4. Analysis of Socio cultural Constraints

The analysis of socio-cultural constraints faced by the respondents revealed that goat farming is considered as the occupation of low caste people secured first rank followed by mutton is not preferred by large sections of the people because of health awareness ranked second. Unavailability of professionals butchers for slaughtering of goats in rural area was ranked third and there are certain beliefs that goat keeping in house will restrict the prosperity in the family was ranked fourth by the respondents. The non-cooperation of neighbours for goat farming ranked last by the respondents. Socio-cultural constraints are used to define the constraints faced by the farmers arising out of surrounding individuals and specifically by their surrounding social and cultural factors due to goat farming. Although goat rearing is an integral part of the livestock sub sector and has been playing a significant role to improve food and nutritional security, poverty alleviation but still these are reared by the weaker and backward sections of the society. The farmers mainly raise their goats through semi-intensive system where goats mainly depend upon open grazing with little supplementation of concentrates either in the early morning or evening. So, the presence of adequate grazing land in the vicinity plays a major role in growth and prosperity of goats. But many of the grazing areas are now threatened with

degradation and encroachment by the better off families of the village. As a result of population pressure, and policies which favour cropping, much of the best pasture is being turned over to crops. Besides now days a majority of grazing land has been acquired for certain developmental projects. Not only is the area of grazing reduced by increased cropping and developmental projects but keeping the animals for too long in same grazing area also reduces the quality of grazing land. Reducing grazing land was viewed seriously by the respondents. Similar findings were reported by Naidu, *et al*(2016*).*So it may be suggested to identify the grazing land surrounding the villages and allow the animals to graze on it periodically thereby maintaining the quality of grazing land. Similar suggestions were proposed by Sarangi and Swain (2017). The farmers maintain their goats in the goat shed only during the night. But rest of the time either the goats are out for grazing or tied in the farmer's backyard which is not fenced in most of the cases. This creates a major problem for the neighbours. Although majority of the people prefer goat meat than any other meat, but they do not prefer goats in their neighborhood. Browser by nature, the goats prefer to dine on leaves, shrubs and small trees. In most of the cases, if the goats are not tied, they let loose and feed on valuable trees and crops of the neighbour often leading to arguments and fighting with neighbours. Similar findings were reported by Chander,*et al.* (2012) who proposed that goats often cause conflict when these stray in the crop fields of other farmers. This is one of the deterrents for goat rearing especially for landless and small scale farmers. The bad smell of bucks and goat manure also create a problem for the neighbours. Often neighbours blame the animals nearby for transmission of disease to their children. So it may be suggested to maintain the goats in a fenced patch of land. Goats are mainly reared by low caste people of the village and often they do not find social recognition. Although they have money but still they are not accepted by the other people in the village as their counterparts. Slaughtering and dressing of goats is a very professional job and requires a lot of skill. One cannot simply slaughter the goat and sell it for meat purpose. This is the reason the professional butchers are not available in every village. So, the farmers mostly sell the goats to middlemen who in turn sell the goats to professional butchers available in urban areas. This was highlighted by the farmers and was ranked third. The goat meat is preferred by large sections of the society. Though the goat meat is costly and has some health concerns due to high cholesterol content but it is accepted widely. The respondents do not have superstition that rearing goats will affect the prosperity of their family. Rather they are of the view that

the amount earned from goat rearing will enhance their economic status. So it was ranked as low as fourth. This finding contradicts the findings of Lebbie (2004) who reported that unfound prejudices limit goat development.

5.4.5. Analysis of Marketing Constraints

While analyzing the marketing constraints faced by the beneficiaries, it was revealed that high transportation cost to distant market ranked first followed by inability to sell the goats at doorstep ranked second. High bargaining of goat price by middleman was ranked third and unregulated marketing was ranked fourth by the respondents. No community managed goat business centres was ranked fifth.

Goat marketing system plays an important role in assuring better income and benefit for producers. Market constraints refer to factors that hinder the price andpromotion of goat meat. There is no regulated market for goats in the study areas. Goats are sold mainly between goat keepers and middlemen/professional traders through mutual compromise. There is no auction or other systems of marketing of goats. Absence of any regulated marketing system results in harassment of producers. As the producers do not have access to open market, they mostly sell their goats to middlemen at a price fixed by the middlemen. So in majority of cases they sell their goats below the market price thus leading to reduced profit. So this constraint is ranked third by the respondents. Similar findings were reported by Singh, *et al.* (2013) and Sarangi and Swain (2017) who proposed that more than 90% goats were sold by goat keepers in their villages to butchers/middlemen. These middlemen moved round the year in the villages and further sell these goats to itinerant traders resulting in less profitable business for goat farmers. Most of the farmers view the absence of community managed goat business centres as a reason for their harassment and therefore ranked fifth by the respondents. Many of the households confirm that long distance of market is the cause of selling goats at doorstep as transport cost will be too high for selling small number of goats (one or two) in a distant market place. But most of the respondents do not feel any difficulty in selling the goats at doorstep and also of the view that in spite of high price of goat meat, the market demand remains the same. The demand becomes very high during festive season resulting in better pricing of goats. The finding contradicts the findings of Mutabazi, *et. al.* (2013) who reported that the main constraints to goat farming are low prices and lack of market for the animals.

It is evident from the above discussion that goats are mostly sold at door step to middlemen resulting in reduced profit to producers. In order to encourage efficient marketing systems of goats and their products, there is need for making investment to create physical infrastructure in the markets. Developed physical infrastructure will promote the linkage between producer, processor and consumer. For efficient marketing, there is also need for regulatory and legal frameworks. The village committee must play a major in fixing the pricing of goats as per the market demand, thus preventing the harassment of producers by the middlemen. There is also need to encourage small animal rearers to integrate with agribusiness firms.

5.4.6 Analysis of Overall Constraint

The analysis of overall constraints faced by the respondents revealed that extension support constraint was ranked first by the respondents followed by financial constraints, which was ranked second. The operational constraint was ranked third and marketing constraint was ranked fourth by the respondents. The socio cultural constraint faced by the respondents was ranked fifth. Verma *et al.* (2014) also identified that inadequacy of basic facilities like marketing, credit and veterinary services for goat keepers are major constraints of goat farming. Extension support is the application of scientific research and new knowledge to animal husbandry practices through farmer education. The field of extension now encompasses a wider range of communication and learning activities organized for rural people. It includes training, exposure visit, distribution of leaf lets, folders, campaign through posters, newspapers, radio, TV etc. Training is teaching or developing skills and knowledge related to useful competencies. It is absolutely necessary to start a scientific farming. Exposure visit enables farmers from different regions to interact with and learn from each other, allowing them to view practical examples of successful integration of sustainable practices in farming communities like their own. It is very much essential in order to gain a practical experience. Extension literature or farm publication is class of publications prepared by the extension agency in printed form, containing information relating to improvement of farm income. It includes leaflet, folder, newsletter etc. Distributing the extension literatures in local languages to the farmers will go a long way in improving their knowledge on goat farming and also can be kept for future reference. Non provision of training, exposure visit and literature are viewed seriously by the respondents. So extension support constraint ranked 1st. Financial constraints pertaining to initial heavy investment for construction of goat

shed and purchase of goats for starting the farm which according to the beneficiaries was not subsidized adequately by the government. This prevents them to participate proactively in the programme. Also nonexistence of concrete criteria for selection and unavailability of goats of prescribed age at prescribed price are viewed seriously by the respondents. Non provision of training, exposure visit and distribution of literatures restricts their exposure. Rapidly reducing grazing land and absence of regulated marketing system pose as major threats to the goat farming.

CHAPTER-VI

SUMMARY AND CONCLUSION

The research study entitled **"Economic Impact of Goat Rearing in Nabarangpur District of Odisha"** was conducted with the following objectives.

Objectives

1. To study the socio - economic profile of goat farmers.
2. To analyze production and productivity of goats.
3. To analyze the impact of goat farming on livelihood of respondents.
4. To find out the constraints faced by respondents.

Two blocks of Nabrangpur district were selected. From each block, 12 GPs were selected and from each GP, one village was selected. From each village 5 respondents were selected. So in total 120 respondents in Nabrangpur district were selected for the study purpose.

1. The analysis of age revealed that 52.51 percent of the respondents belonged to middle age group, i.e. between 36-50 years. This shows that most of the goat rearing activities is done by middle age group persons. In total 31.66 percent of the respondents belong to young age group. So, the young age group persons take interest in tradition of goat rearing. Results also revealed that the mean age of beneficiaries was found to be 40.8 years with a SD of 9.4.
2. The analysis of education of respondents revealed that in total 46.66% of the goat farmers had non schooling followed by 3.33% of respondents are functionally literate. Only 10.83% respondents are primary school level of education followed. So, education status of this district is not so high.
3. The analysis of caste category revealed that 72% of the total respondents belonged to ST category while 12.5% belonged to schedule caste category. Only 13.3% of the category belonged to OBC category. This corroborates the fact that goat farming is a low caste profession and not generally reared by general caste people.

4. The analysis of data related to family type revealed that in total 58.33% of the respondent have nuclear family where as only 41.6% have joint families. There is not much difference between percentage of nuclear and joint family. The incidence of the 41.6% percentage of joint family in goat farming business corroborates the fact that goat farming is an age old business of the community members and family members including old father and mother take care of goats.

5. The analysis of family size data revealed that in total 75% of the respondents have family members more than five. Only 25% of the respondents are have family members between 3 to 5 members. Since most of the families are joint families, so they have members more than five.

6. Analysis of data related to house types revealed that 60.3% respondents have semipucca house. So it indicates that farmers can able to construct good houses out of goat farming.

7. Analysis of data related to livestock possession reveals that more than 50% respondents are having others livestocks with goats also. It indicates that besides goats they are keeping cattle, sheep, poultry etc for their livelihood.

8. Analysis of data related to numbers of goats owned reveals that 42.55 farmers are keeping goats ranging 21-30. It implies that most of goat farmers are keeping good numbers of goats.

9. Analysis of data related to years of goat rearing revealed that in total 56.66% o has experience of 5-10 years of goat rearing. Only 16 have more than 10 years of experience of goat rearing. This implies that majority of the farmers have more than 5-10 years of experience of goat rearing and they inherit the goat farming from their parents.

10. Analysis of data related to occupation revealed that in total 52.5% of the respondents had mentioned goat rearing as their primary occupation. It implies that goat rearing has a positive effect on their livelihood.

11. Analysis of data related to annual income revealed that in total 85% respondents have annual income between Rs 50,000 to one lakh.

12. The analysis of data related to beneficiaries revealed that age is negatively and significantly co-related with education of the beneficiaries. However, the education is positively and significantly co-related with occupation and no of goats owned by the farmers. Family size was found negatively co-related with education and occupation of the goat farmers. Whereas, occupation of the goat farmers was found positively and significantly co-related with no of goat owned and annual income of the farmers. Annual income of the farmers was positively and significantly correlated with the possession of goats by the farmers

13. Around 60% of respondents reported that they are having kids of birth weight ranging between 1-2 kg followed by 28.33% and 11.66% respondents are having kids of more than 2 kg birth wt and less than1 kg, respectively. It indicates good health status of flocks.

14. Analysis of data related to weight of goat at marketing age, we found that 65% respondents reported that they sell their goats at 10-15 kg body weight whereas 25% and 10% respondents reported that they sell their goats at more than 15kg and less than 10 kg, respectively. were having more than15 kg and less than10kg weight at marketing age, respectively.

15. Analysis of data related to frequency of deworming reveals that that 80% respondents reported that they give deworming medicine more than 3times per year whereas 20% respondents are giving less than 3times deworming medicines to their goats per year. It indicates people of this district properly vaccinate their goats.

16. Analysis of data related to frequency of vaccination per year reveals that 81.66% of respondent reported that are giving more than 3times vaccination per year whereas 1% of respondents are giving less than 3times vaccination per year. It indicates vaccination is done in right time in this district.

17. Data related to kid mortality analysis reveals that 48.33% respondent reported that their kid mortality was 10-15% whereas 41.66% are having their kid mortality of 10-15% and 10% respondents are having their kid mortality of more than15%. It indicates there is not much more mortality of kids due to proper health care and management.

18. Analysis of data related to adult mortality reveals that 58.33% of respondent reported that their adult mortality was 20-30% whereas 31.66% and 10% are having their kid mortality less than 30% and more than 30%, respectively. It indicates there is not much more adult mortality. It may be due to proper deworming, vaccination and other managemental conditions.

19. The data related to distribution of respondents as per economic impact revealed that 69% of the respondents had medium level of impact due to goat farming followed by 18% and 13% respondents were having high level and low level impact, respectively. Overall analysis of economic impact of goat farming revealed that there is definitely increase in the level of income of the goat farmers from goat rearing so that they were able to construct house, save money in the banks, purchase goats for expansion of the farms, medical expenses, food and cloth etc.

20. The data related to distribution of respondents as per social impact revealed that75% of the respondents had medium level of impact due to goat farming followed by 11% and 14% respondents were having high and low level of social impact, respectively. Overall analysis of social impact revealed that though the goat farmers are being consulted by various other farmers in the village and recognized by government officials because of their selection, but they are not accepted and recognized socially as a progressive person. So, government must take some steps in uniting the villagers to accept goat farming as a business enterprise and start publicizing efforts of progressive farmers in order to make them more acceptable to the society.

21. The overall analysis of impact on communication and extension behavior of respondents revealed that 70% of the respondents had medium level of communication and extension impact due to goat farming followed by 3% and

27% respondents were having high and low level of communication and extension behavoiur impact, respectively. It indicates that there is a strong improvement in communication ability of beneficiaries with the department officials, PRI members, feed and medicine dealers and also with goat meat retailers. They also started watching more agriculture related activities in mass media. All these have a direct impact on livelihood as they will be able to save a lot of money by buying from wholesaler shops, bargain for better pricing of goats and also improve the productivity of goats through improved management practices. Overall, the beneficiaries are satisfied as they have maintained a perfect interrelationship among the various stakeholders. Communication is both interpersonal and intrapersonal. So the respondents has better ability to take correct decisions. The analysis related to distribution of respondents on the basis of level of impact on communication and extension behavior of beneficiaries revealed that there is medium level of impact on 70% of the respondents and low level impact is on 27% of the respondents. So there is significant improvement in the communication abilities of respondents.

22. The analysis of data related to distribution of respondents on the basis of level of psychological impact revealed that71% of the respondents had medium level of psychological impact due to goat farming followed by 23% and 6% respondents were having high and low level psychological impact, respectively. Overall analysis of data related to psychological impact on respondents revealed that all the farmers are free to interact with government officials, comfortable in extending advisory services to the goat farmers and have a strong desire to increase the strength of their farm. But most of them were unsure or disagreed about their self image, courage to interact freely with higher caste people and ability to act on their own to think of solution to problems. So the respondents need repeated exposure in order to make them more psychologically confident.

23. Mean scores of various impacts revealed that psychological impact has highest mean score of 36.22 followed by 34.43 for economic impact. Social impact has mean score of 34.17, impact on communication and extension behavior has lowest mean score of 32.16.The overall mean score for impact on beneficiaries is 38.24.

24. The analysis revealed that there is no significant correlation between social variables and impact on beneficiaries. Only occupation was found having positive and significant relationship with the psychological impact on beneficiary. Similar types of findings were reported by Sarangi and Swain (2017) in their study in Odisha.

25. The analysis of financial constraints revealed that no incentives from government for timely completion of scheme secured first rank followed by insufficient subsidy from the Government. Initially heavy investment for construction of shed and purchase was ranked third and unavailability of credit from banks and other financial institutions for supporting the scheme was ranked fourth by the beneficiaries. My poverty restricts me to participate proactively in the programme ranked fifth. So Government should look into it.

26. While analyzing the operational constraints it was revealed that unavailability of feed suppliments in nearby area secured first rank followed by unavailability of kids for starting a farm. Difficulty in construction of goat shed was ranked third and low level of knowledge on goat management was ranked fourth. Irregular health advisory services by the department were ranked fifth .

27. The analysis of extension support constraints faced by the respondents revealed that lack of idea about goat farming secured first rank followed by lack of training to goat farmers, which was ranked second. Lack of exposure to successful goat farms were ranked third and no regular visit of officials of veterinary department was ranked fourth by the respondents. Unavailability of extension literature materials on goat farming ranked fifth.

28. The analysis of socio-cultural constraints faced by the respondents revealed goat farming is considered as the occupation of low caste people secured first rank followed by mutton is not preferred by large sections of the people because of health awareness which was ranked second. Unavailability of professionals butchers for slaughtering of goats in rural area was ranked third and there are certain beliefs that goat keeping in house will restrict the prosperity in the family was ranked fourth by the respondents.

Conclusion

Goats are among the major economically important livestock in the world. They play an important role in the livelihood of resource poor farmers. The economic contribution of small ruminants to poor farm households and livelihood systems is high. The traditional goat husbandry system operates with the rearing of indigenous species in small numbers or in small flocks by individual families. The inputs in terms of financial investment for such type of venture are nearly zero and therefore, the productivity is also low in this conventional small holder system. The results of this study indicated that there is definitely increase in productive parameter of goats reared thereby increasing socio-economic conditions of the respondents. On the basis of present research work the following recommendations or suggestions may be drawn.

1. Government must take necessary steps for popularization of goat rearing in all the government departments and also through all mass media channels about importance of goat rearing so that farmers get benefited.

2. Goat rearing is still seen as a profession of low caste people who are not accepted socially in the village by upper caste and higher status people. So, the government must take some steps in uniting the villagers to accept goat farming as a business enterprise and start publicizing efforts of progressive farmers in order to make them more acceptable to the society.

3. All the goat farmers must be oriented through regular trainings, exposure visits to nearby successful farms and exhibitions, supplementation of farm literatures in order to make them aware of modern rearing practices which will make them confident about their profession.

4. Financial support should be given by government for different aspect in goat rearing.

5. Unavailability of kids (female of 3-5 months of age and male of 5 months of age) for starting the farm is a major concern expressed by the beneficiaries. So, the government should take steps for the supply of requisite number of kids at the low from different government run goat farms in the state.

6. A district level committee should be appointed to engage the insurance company in order to insure the goats.
7. Proper training and exposure visit should be given to farmers regarding goat rearing.
8. Reducing grazing land was viewed seriously by the respondents. So, it may be suggested to identify the grazing land surrounding the villages and maintain it properly by planting fodder trees like Soobabool and allow the animals to graze on it periodically thereby maintaining the quality of grazing land.
9. Most of the farmers view the absence of community managed goat business centres as a reason for their harassment by middlemen. The village committee must play a major role in fixing the pricing of goats as per the market demand, thus preventing the harassment of producers by the middlemen. There is also need to encourage small animal rearers to make agreement with agribusiness firms.
10. The goat farmers should also be given due importance and regular health camp must be conducted for their goat. The goat farmers should also be oriented through regular training and exposure visit in order to adopt modern farming practices.

Future Research related to this study

- The present study was undertaken in Nabarangpur district of Odisha . Keeping in view, this type of study could be taken in other parts of the state especially backward districts in order to know the changes in socio-economic status of the beneficiaries.
- An in-depth study can be carried out in the specific area such as socio-cultural constraints faced by the goat farmers in order to know the reasons for low social status of goat farmers than dairy farmers.
- BAIF is also implementing goat development programmes in parts of the state. So similar parallel studies may be carried out to compare the changes in socio-economic status of the beneficiaries.

This types of study can be done by taking sheep rearing,pig rearing, backyard poultry rearing and their effect on livelihood of farmers can be studied.

FIELD PHOTOGRAPHS

Block – Papdahandi

GP- Patri Village-Bheja

Padlam Jena

Chitta Gauda

Sonumati Gauda

GP-Semala Village-Usigam

Maniram Jani

Niladri Jani

Rajkisore Jani

GP-Sirsi Village-Palpur

A.W Khan

M.D.Asin

Rajendra Naik

GP-Tumberla Village-Mahuli

Kamdhenu Harijan

Krushna Chandra Harijan

Usabati Harijan

GP- Dengaguda Village- Kharki

Giriram Pujari

Tibru Harijan

Benudhar Harijan

GP – Hatibeda Village - Hatibeda

Bhima Harijan

Lakman Harijan

Narayan Harijan

GP- Pandikote Village- Gumidora

Baisakhi Muduli

Burundi Muduli

Jamuna Muduli

GP-Dangra Village-Dangra

Debaki Jani

Haria Jani

Narima Jani

GP- Papdahandi Village-Dokraguda

Bhanumati Naik

Chanchala Naik

Kesab Naik

GP- Jatabal Village-Chingudisar

Pramila Naik

Niladri Naik

Kesab. C. Naik

GP- Kantamal Village - Botokoari

Arjun Gauda

Purni Jani

Rameswar Jani

GP - Maidalpur Village - Aumli

Ghuma Muduli

Jitamani Muduli

Nilamani Mudul

Block - Raighar

GP - Parua Village - Chatabeda

Abhay Naik

Bijay Naik

Jogendra Naik

GP - Hatabarandi Village-Jhatirpara

Butu Gund

Dolsai Gund

Pagnibai Gund

GP-Kurabeda Village-Kaliapadar

Brijesh Gauda

Jaggannath Muduli

Kamala Gauda

GP-Kundei Village-Kanadhi

Hemant Harijan

Laxmikant Harijan

Sukanti Harijan

GP - Debagam Village - Kurubela

Bhabri Harijan

Ramani Harijan

Sukanti Harijan

GP - Ganjapara Village - Kusumpur

Nirmati Harijan

Sebati Harijan

Shyamasundar Harijan

GP - Bobai Village - Mahulbata

Chakradhar Harijan

Kisore Harijan

Nalima Harijan

GP - Kaudela Village - Tarangpur

Benu Naik

Indira Naik

Nilakanta Harijan

Gp - Jodenga Village - Kukurkuan

Narmada Jani

Penku kumar Harijan

Susama Jani

Gp - Nakitsemeda Village - Ganranji

Beldhar Gauda

Lachma Gauda

Chandrama Jani

Gp - Turudi Village-Odandi

Krisna Jani

Reta Jani

Sunia Jani

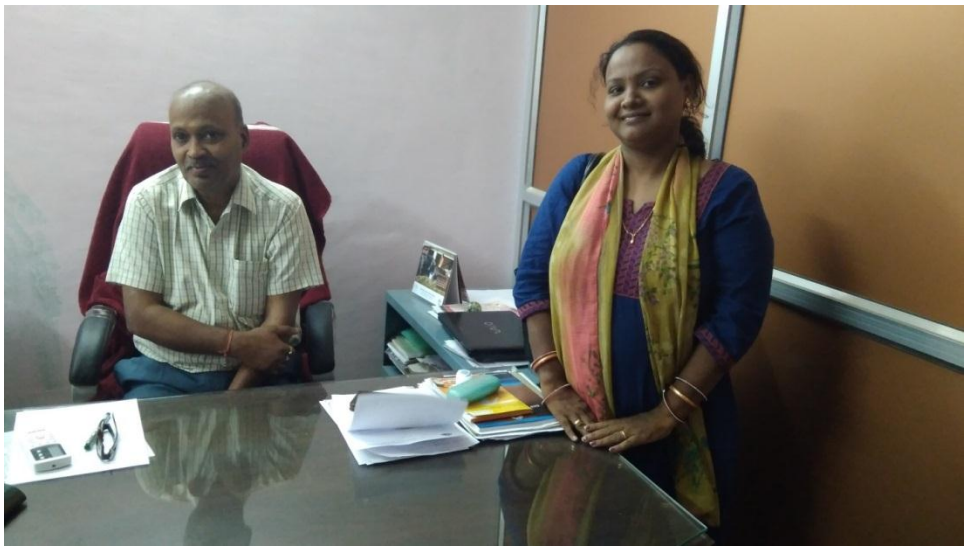
GP - Kaskanga Village - Sagirpara

Ramesh vatara

Sudhakar Vatara

Setu Vatara

RESEARCHER VISITED TO OFFICE OF CDVO OF NABRANGPUR DISTRICT



Researcher Interaction with CDVO, Nabrangpur

Veterinary Doctor of District Headquarter, Nabrangpur

Researcher Interaction with Veterinary Assistant Surgeon, Raighar Block

Researcher Interaction With Veterinary Assistant Surgeon and LI of Papdahandi Block

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Annexure - 1

Economic Impact of Goat Rearing on Livelihood of the Goat Farmers in Nabarangpur District of Odisha

Interview Schedule

Schedule No._____

Date:_____

Name of the farmer: _____

Name of the village: _____

Name of GP: _____

Name of Block: _____

Distance of village from GP HQ _____

Distance of village from LI centre _____

Distance of village from Veterinary Dispensary: _____

A.Socio-economic profile of farmers:

1. Age of the Respondent (in chronological years): _____

Category	**Response**
Young Age (up to 35 years)	
Middle Age (36-50 years)	
Old Age (Above 50 years)	

2. Education of the Respondent: _____

Category	**Response**
No schooling	
Functionally Literate	
Primary School	
Middle School	
High School	
College Education	

3.Caste :(a) SC (b) ST (c) OBC (d)GEN(e)Specific Caste_____

4. Marital Status: (a) Married (b) Unmarried

5. Family Type: - a) Nuclear b) Joint

6. Family size: a) Adult (> 18 Yrs) ____ b) Children (<18 Yrs) ____

7. Type of House Owned: (a) Pucca(b) Semi Pucca(c) Kutcha

8. Type of major asset owned;

(a) Bicycle (b) Television (c) Radio (d) Bike/scooter (e) Bed/sofa (f) Mobile

9. **Livestock possession** : Cattle_____ Buffalo_____

Goat_____Sheep_____Pig_____Poultry_____

10. Breeds of Goat: Ganjam_____ Black Bengal_____ Others_____

11. No. of years of goat rearing: _____

12. Land holding (ac);_____

13. **Status of Agricultural Land:**

(a) Own Land(b) Tenant(c) Both Own Land and Tenant(d) Land less

14.**Occupation:**

(a) Primary occupation_____

(b) Secondary occupation_____

15. **Sources of income**

a.Agriculture_____/Annum

b.Livestock_____/Annum

c. Goatery in particular_____/Annum

d. Wages/labour_____/Annum

e. Others_____/Annum

B. HEALTH CARE AND PRODUCTION TRAITS OF GOATS

Sl. No	Traits	Response
1	Birth weight	
2	Weight of goats at marketing age	
3	Frequency of deworming per year	
4	Frequency of vaccination per year	
5	Kid mortality %	
6	Adult mortality%	

C.Impact on Livelihood due to goat rearing

i) ECONOMIC IMPACT:

Sl no	**STATEMENTS**	**SA**	**A**	**UD**	**DA**	**SD**
1	Increased in personal savings in the bank account					
2	Constructed/renovated apucca/semi pucca house on my own land from the profit of goat business.					
3	Able to spend the required money for my children education.					
4	Able to spend money for emergency medical care of my family members					
5	My spending on food items has increased than before					
6	Now I am able to spend more on clothing of my family members.					
7	Now I am not borrowing money from private money lenders					
8	My lending money on credit has increased					
9	Able to invest for purchase of additional goats and inputs for expansion of the farm.					
10	My profit from goat rearing has increased					
ii	**SOCIAL IMPACT**					
1	I am associated with various social organisation					
2	I am contacted by the people for various activities in the village					
3	I am participating in different celebrations of my village without any inhibition					
4	During various social functions I have been contacted for mutton supply with an invitation to attend the function					

5	Now I am able to mobilise some of my community members to take up goat rearing as a means of social security					
6	Villagers consulting me about goat farming and other social issues					
7	Government functionaries at the village and block level are paying attentions towards me					
8	I get marriage proposals for me /my brothers/sisters/son/daughter from families higher to my level					
9	Goat rearing is no more barrier for me in mixing with higher caste people					
10	Villagers take my opinion while deciding on important issues					
iii	**IMPACT ON COMMUNICATION AND BEHAVIOUR**					
1	My exposure to radio, TV, Newspaper, etc has increased					
2	Frequency of contacting veterinary and PRI officialshas increased					
3	My visit to town has increased than before					
4	Frequency of watching krishi related programmes in TV is increased					
5	Ability to interact with medicine and feed dealers is developed					
6	Ability to approach bank and other financialinstitution for availing credit is developed					
7	Capability to bargaining with goat meat retailers for better pricing of my goat is developed.					
8	I am able to travel to districts headquarter and state head quarter for attending agricultural exhibitions					
9	Able to demonstrate and speak better					

	managemental practices of goat farming to villagers.					
10	The skill of interpersonal relationship among the stakeholders has been developed					
iv	**IMPACT ON PSYCHOLOGICAL STATUS**					
1	I have developed self confidence					
2	I developed courage to interact freely with economically sound and higher caste people of the village					
3	Now I do not have inferiority complex					
4	I feel free to interact with the Government officials and other strangers coming to my village					
5	I feel comfortable in extending advisory services to the goat farmers of my village					
6	I developed interest to increase strength of my goat farm					
7	I developed confidence to take care of family					
8	I developed self image in the society					
9	I developed the feeling "I can do"					
10	I developed the confidence to think on my own for the solution of a problem					

D. CONSTRAINTS FACED BY GOAT FARMERS:

Rank the following constraints considering the level of difficulty which you face, assigning Rank-I for the most difficulty followed by less and lesser

D.I. Financial Constraints

Sl.No	Type of Constraint	Rank
1	Heavy investment for construction of shed and purchase of kids	
2	Lack of financial support from government to start a goat farm	
3	Unavailability of credit from Banks and other financial institutions for goat farming	
4	My poverty restricts me to participate proactively in the programme	
5	High interest rate for loan	

D.II. Operational Constraints

Sl. No	Type of Constraint	Rank
1	Difficulty in construction of goat shed	
2	Unavailability of kids for starting the farm	
3	Unavailability of feed supplements in nearby area	
4	Low level of knowledge on goat management	
5.	Irregular health advisory services by the department	

D.III. Extension Support Constraint

Sl.No	Type of Constraint	Rank
1	Lack of training to goat farmers	
2	Lack of exposureto successful goat farms	
3	Unavailability of extension literature materials on goat farming	
4	Lack of idea about the benefit of goat farming	
5	No regular visit of Officials of veterinary department	

D.IV. Socio-Cultural Constraints

Sl.No	Type of Constraint	Rank
1	Goat farming is considered as the occupation of low caste people	
2	There are certain beliefs that goat keeping in house will restrict the prosperity in the family.	
3	Mutton is not preferred by large sections of the people because of health awareness	
4	Unavailability of professional butchers for slaughtering of goats in rural area	
5	Noncooperation of neighbours for goat farming	

D.V. Marketing Constraint

Sl.No	Type of Constraint	Rank
1	Inability to sell the goats at door step	
2	High bargaining of goat price by middlemen	
3	High transportation cost to distant market place	
4	Unregulated marketing	
5	No community managed goat business centres	

D.VI. Overall Constraint Ranking by goat farmers

Sl.No	Type of Constraint	Rank
	Financial Constraint	
	Operational Constraint	
	Extension Support Constraint	
	Socio-Cultural Constraints	
	Marketing Constraint	