PASTORALIST PRACTICES OF MECHERI SHEEP IN ITS BREEDING TRACT: AN ECONOMIC STUDY

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Abstract: The human race has been bestowed with significant animal species since the dawn of civilization. For India, sheep is considered as one of the salient species of livestock and devote significantly to the agrarian economy, particularly in locations where crop and dairy farming are not economical. Mecheri sheep is the indigenous breed and their skins are superior and are suitable for higher quality garment or upper valued leathers. The objective of the study is to study the investment, profitability and rate of return from sheep husbandry practices and to identify the constraints faced by the sheep rearers in rearing and marketing. Primary data was collected and analyzed with statistical tools, ratios and Regression Analysis. It was found that the productivity level is low due to lack of technical knowledge besides the satisfactory net return. The market is unregulated and influenced by intermediaries. There is an inevitable need to improve the standard of Sheep pastoralism and shift in the system from conventional practices to inculcation of modern and scientific techniques are recommended. Enriching the Sheep husbandry sector through nurturing the youth agricultural startups and entrepreneurship supportive system that leads to sustainable and simultaneous development of the agrarian economy.

Keywords: Mecheri Sheep, Pastoralism, Economic Analysis, Profitability, Marketing environment

INTRODUCTION

Agri-allied sectors are regarded to be the sustainer of the Indian economy due to their high share in generating employment and enhancing livelihood. 'With a rich history deeply intertwined with the agrarian of the nation, this

sector has emerged as a vital pillar of India's economic landscape' (Madhu *et al*, 2023). The human race has been bestowed with significant animal species since the dawn of civilization for different intentions such as production of milk, meat, wool, egg, skin and hide. Additionally, multifarious animal species are also utilized for draught power, research experimentation, sports, security, companionship, entertainment, etc., and hence the livestock sector holds an indispensable position in the rural economy of every nations.

Sheep Pastoralism in the Indian Agrarian Economy

Sheep are considered to be an important constituent of rural economy especially in the semi-arid, arid and mountainous locations of the nation because of its multifarious utility of meat, skins, wool, milk and manure. They play an inevitable role in the livelihood of a high proportion of small, marginal and landless agriculturists of the agrarian state. 'The Indian sheep are derived both from Urial and Argali stock. They are thin tailed, medium to coarse wool type in North temperate and North Western regions and hairy type in Southern Peninsular and Eastern regions'. The current period Indian breeds are the consequences of thousand years of conscious natural selection and field level cross breeding for adaptation to certain agro-ecological climate. 'The sheep breeds in India have been classified on the basis of agro-ecological regions viz. i) North temperate region ii) North-Western arid and semi-arid region iii) Southern peninsular region and iv) Eastern region' (Overview of Sheep Farming Sector in India, 2019).

Table 1: Populous Sheep Breeds of India

S. No.	Name of the Breed	Habitat distribution
1	Nellore	Andhra Pradesh, Telangana
2	Deccani	Andhra Pradesh, Telangana, Maharashtra
3	Marwari	Rajasthan, Gujarat
4	Bellari	Karnataka
5	Jaisalmari	Rajasthan
6	Mecheri	Tamilnadu
7	Hassan	Karnataka
8	Ramnad White	Tamilnadu
9	Patanwadi	Gujarat
10	Kanguri	Karnataka

Source: Basic Animal Husbandry Statistics (BAHS) 2019, Department of Animal Husbandry, Dairying and Fisheries

For India, sheep is considered as one of the salient species of livestock. They devote significantly to the agrarian economy, particularly in locations where crop and dairy farming are not economical. 'India's livestock sector has continuously provided structural support to the rural economy as an important vocation for rural population, next only to crop raising. On account of favorable socio economic factors such as changing eating habits, higher purchasing power, urbanization, increasing health consciousness towards protein rich diet, preferred meat due to religious preferences, there has been increase in demand for meat and the sector has gained importance in terms of contribution to income, employment and foreign exchange earnings' (Overview of Sheep Farming Sector in India, 2019).

According to the 20th Livestock Census, 2019;

- "The total livestock population in the country is 535.78 million showing an increase of 4.6 percent over the previous census of 2012.

- The total sheep in the country is 74.26 million in 2019, increased by 14.13 percent over the previous census which is the highest percentage of increase when compared to other livestock.

- Sheep population contributes 13.87 percent of the country's total livestock.

- Total meat production of the country is 8.11 million tons of which sheep meat production contributes 8.36 percent i.e. 677.99 thousand tons".

Sheep Pastoralism Practices

In India, sheep are reared by small, marginal and landless farmers through various pastoralist systems. 'Sheep rearing system still continues in a traditional manner in spite of a number of sheep development activities for poor and landless farmers. The different sheep rearing systems are intensive, semi-intensive and extensive for meat and wool production' (Kochewad *et al*, 2017).

1. **Extensive System:** The practice is based on minimum use of resources and thus results in minimum productivity level. This constitutes transhumance and free range pastoralist practices. 'Grazing sheep on Common Property Resources (CPR) relate to hills, mountains, forests, waste lands, etc. This system is preferred by most of the farmers as the input cost is low'.

2. **Semi-Intensive System:** This approach is an amalgamation of restricted free range and feeding in stalls. The nutrition level is just efficient. However, it is appreciable than the previous system.

3. **Intensive System:** It is associated with sheep grazing on developed pastures and/or being fed with only cultivated trees or forage, crop residues and concentrates stored in barns. Intensive sheep farming systems are negatively affected by the use of low technology.

Sheep Pastoralism - Contribution to the Tamil Nadu's Economy

- 'As per the 20th Quinquennial Livestock Census 2019, Tamil Nadu ranks 1st in respect of poultry, 5th in sheep, 7th in goats and 14th in bovines (Cattle and Buffalo) population in the country.

- The Sheep population in the state (as per 2019) is 4.5 million which has decreased when compared to the previous census of 2012 i.e. 4.787 million.

- The decline in sheep population of 6.36% can be attributed to the rapid urbanization of the state with a consequent decrease in grazing lands.

- The total meat production of the state is 633.80 thousand tons and sheep meat production is 60.643 thousand tons (as per 2018-19 data).

- The state stands third in the production of sheep meat next to Telangana and Andhra Pradesh'.

Tamil Nadu has 4.56% of India's livestock, 4.39% of the country's milk, 7.88% of its meat production and 18.29% of its total egg production. As a result, the state provides 5.29% of the country's total animal feed production value. It is worth noting that the state's livestock sector accounts for 45.62% of the state's agricultural production, while the Indian average is only 28.83%. At the same time, the contribution of the state's livestock sector to the total domestic product increased from 2.88 percent to 5.47 percent, and its contribution to agriculture increased from 25.70 percent to 45.62 percent. Livestock farming contributes 5.47% to the Gross State Added Value (GSVA), while agriculture and cooperatives contribute 645.62%. The total value added of animal husbandry in the state (at current rates) was Rs 26,179.44 billion in 2011-12, which increased to Rs 78,744.09 billion in 2018-19.

Characteristics of Mecheri Sheep Breed

- Mecheri sheep is considered to be the best indigenous mutton breed of Tamil Nadu.

- 'The leather made from Mecheri sheep skins have higher tensile, tear and grain crack strengths as compared with leather made from mixed origin. With regard to organoleptic properties of skin, the Mecheri skin is better in quality in terms of softness, grain tightness, fullness, surface smoothness, and uniformity of colour and general appearance.

- The hand evaluation assessment and strength characteristics determination reveals that the Mecheri sheep skins are superior and are suitable for higher quality garment or upper valued leathers.

- The special features of this breed are early sexual maturity, superior skin quality and high dressing percentage' (TANUVAS, 2014).

Mecheri sheep are found in Salem, Tirupur, Namakkal, Erode, Karur and some parts of Dindigul and Dharmapuri districts of Tamil Nadu. The name Mecheri is derived from the Mecheri community of Mettur taluk in Salem district, where it originated. Mecheri is said to be derived from "Mechal Eri" (Mechal – grazing sheep and Eri - Lake). Mecheri lamb has other words like Thuvaramchempuli, Maiylambadi and Kannivadi. Mecheri sheep with morphological characteristics are found in Tharamangalam, Omalur, Kolathur and Mecheri blocks of Salem district.

Mecheri sheep are medium-sized animals with compact and short bodies, furless. Their color is light brown. The contour is a small Roman nose. Mecheri sheep is a hornless sheep breed. Both ram and ewe are polled. The legs are medium sized, straight, of medium length and well fitted to the body. Their hooves are brown or black. It is small, round and fits snugly on the stomach with small conical nipples on each side. The nipples point slightly outwards.

Husbandry Practices in the Selected Study Area

Though Tiruppur is known as the textile city, sheep pastoralism is carried out as an important economic activity in the district. This activity is not only the primary source of livelihood to a majority of landless and marginal farmers but also the provider of supplementary income to small and medium farmers. It provides gainful self-employment, improved nutrition and additional income to poor farmers. Agro-climatic conditions in the district are conducive for this activity. Villages of Dharapuram are well known for its traditional and

growing agriculture and its allied practices. The soil in this area is laterite red soil or with gravel type and water will not stagnate on any amount of rainfall. The region situates in the rain shadow region of Western Ghats. Hence, most of the lands are unirrigated and uncultivable which turned out to be pasture lands, locally known as "Korangadu". The sheep reared is of Mecheri breed, which is the indigenous pure breed of the region and they are reared by traditional methods and allowed to graze in the Korangadu in the day time and penned in the night times on uncultivable lands. The housing pens are made out of Minnamaram and Nochimaram (Farmers cut the branches of these trees and utilize them for making "Tharambu" for constructing sheep shed locally called as "Attupatti").

During the rainy season, the sheep house is covered with "Tarpaulin". During the normal and rainy seasons, the sheep are fed with only grazing and only at the time of drought, they are fed with dry fodders at the most. The major crisis perceived by the sheep rearers is the high mortality rate during the rainy and winter seasons as they are not properly protected from the climate and lack of feed supplements.

Sheep pastoralism in the study area is the principle source of income and livelihood to the farmers irrespective of the land holdings and the traditional methods followed offers low input cost with reasonable returns and less productivity.

STATEMENT OF THE PROBLEM

Compared to other livestock rearing, sheep pastoralism is more beneficial and convenient to the farmers as it provides steady and continuous income to them with low input. The sheep pastoralism stands to be an additional income to the medium and small farmers and principal source of income to the marginal and landless farmers. And also it provides income in three ways i.e., selling matured lambs for meat, sale of matured animals for breeding and sale of manure and skin of the sheep. The sheep flock is considered to be "the most valuable moving assets" by the farmers as they provide regular income throughout their period and easily convertible into cash investment when the rearers become aged.

Among the 44 registered sheep breeds of India, the Mecheri breed stands 6th in India and 1st in Tamil Nadu in terms of population. And also it is known as the best indigenous breed for meat and skin which are highly prized for exports. But the farmers who rear them are not much benefited due to the

technological and commercial challenges. Hence the present study is focused on the Mecheri sheep pastoralism.

OBJECTIVES

1. To associate the conventional pastoralist practices and its economic viability in the study area.

2. To study the investment, profitability and rate of return from sheep husbandry practices.

3. To identify the constraints faced by the sheep rearers in pastoralism and marketing.

SCOPE OF THE STUDY

1. The study of this nature tends to figure out the socio-economic status, investment and returns in the Mecheri sheep pastoralism by which the standard could be increased and leads to upliftment of the sheep husbandry sector.

2. The study will help to find out the difficulties faced by the rearers in the pastoralist practices and marketing and thus assist in formulating more centric policies.

MATERIALS AND METHODS

Nature of the Study: The study is intended to know the socio-economic status of the Mecheri sheep rearers and also to analyze the investment and returns from the sheep pastoralism and aims to find out the constraints faced by the pastoralists while rearing and marketing. Hence the nature of study is both descriptive and analytical.

Selection of the Study Area: Tiruppur district ranks first in the state's sheep population and has a good place in the sheep farm management practices. In the district, Dharapuram is a well-known place for its traditional and growing agricultural practices. Some villages which lies in the rain shadow region and the nature of the land holdings are mostly unirrigated (rain fed) and uncultivable or grazing lands which is conducive for the sheep pastoralism of the local breed of Mecheri. Hence the villages of Dharapuram is selected as the study area where there is more concentration of sheep pastoralism.

Nature of Data: Both primary and secondary data were collected for the study.

Method of Data Collection: The primary data were collected with the help of structured Interview schedule by personal interview method from 90 sheep rearers whose main occupation is sheep pastoralism and were selected by systematic random sampling technique. The secondary data were collected from the published sources and reports of the Department of Animal Husbandry, Dairying and Fisheries of both the Government of India and Government of Tamil Nadu.

Period of the Study: The study covered a period of one year (i.e., financial year) 2023-2024.

Method of Data Analysis: The collected data were analyzed with the help of statistical tools like average and percentage. And to find out the profitability and rate of return, ratios like Net profit ratio and Return on Investment (RoI) were used. Regression Analysis was used to find relationship between inter dependence among the variables.

RESULTS AND DISCUSSION

The socio-economic status of the sheep rearers, sheep rearing details in the selected study area, investment, recurring expenditure and net return from the occupation, marketing channel and the difficulties faced in marketing and the constraints in sheep rearing in accordance with the recent trends are interpreted and presented in this paper.

Table 1: Socio-Economic status of the Pastoralists

Variables	Particulars	No. of Pastoralists	Percentage
Gender	Male	49	54
	Female	41	46
Age	Below 50	28	31
	50-70	48	53
	Above 70	14	16
Education Qualification	Illiterate	26	29
	Primary	36	40
	Secondary	18	20
	Higher Secondary	10	11

Variables	Particulars	No. of Pastoralists	Percentage
Family type	Nuclear Family	70	78
	Joint Family	20	22
Subsidiary Occupation	Agriculture	43	48
	Allied Activities	15	17
	Daily Wages	11	12
	Others	7	8
	No	14	15
Other Livestock Possession	Cow	13	14
	Buffalo	5	6
	Goat	4	4
	Hen	27	30
	No	41	46
Annual Income (in Rs.)	< 2,00,000	65	74
	2,00,000-5,00,000	24	25
	> 5,00,000	1	1
Annual Family Expenditure (in Rs.)	< 50,000	46	51
	50,000-1,00,000	23	26
	> 1,00,000	21	23
Size of Land Holdings	Landless	19	21
	< 2.5 Acres	12	13
	2.5-5 Acres	19	21
	> 5 Acres	40	45
Type of land holdings	Irrigated	4	4
	Unirrigated	33	37
	Gazing (Uncultivable)	53	59
Total		90	100

The personal information and socio-economic status of the selected respondents reveal their general characteristics which primarily influences their pastoralist practices. The data shows that both men and women are equally engaged in this field. The mean age of the selected respondents is found to be 60 years. 81 (90%) of sheep rearer's family members assist them in their occupation. The economic status of the sheep rearers of the selected study area is influenced by the factors like Subsidiary occupation, Livestock possession,

Annual Income, Family Expenditure. Most of the respondents fall into the category of large farmers (i.e., more than 5 acres of land) but is evident that most of their holdings are uncultivable that suits for their pastoralist occupation.

Table 2: Basic Information of the Pastoralist Practices

Variables	Particulars	No. of Pastoralists	Percentage
Experience in Sheep Rearing	< 5	3	3
	5-10	12	13
	11-20	24	27
	> 20	51	57
Selection and Purchase of the Foundation flock	Directly from Farms	11	12
	Weekly Market	18	20
	Mecheri Sheep Market	6	7
	Intermediaries	55	61
Flock Size	< 25	25	28
	25-50	51	57
	> 50	14	15
Method of increasing the flock size	Retaining the ewe lambs	15	17
	Buying adult sheep at regular intervals	75	83
Labour Involved	Family Members	87	97
	Hired Labour	3	3
Total		90	100

The basic information of the Pastoralist Practices include the basic information about their activities which determines their level of occupation. The variables taken here are the years of experience, selection and purchase of the foundation flock, flock size and labour involved. The selection of the sheep for establishing the flock plays a vital role in the sheep pastoralism. The animals of well-established sheep breeds prevailing in the particular area which is adapted are selected. It is desirable to select healthy sheep of 12-18 months of age. The male sheep (Ram) should be of original breed and sound in physical and health condition. The dentition pattern is used to determine the age of the sheep. Usually 2 teeth (nearly 1 year of age) rams are purchased for breeding purpose. The female sheep (Ewes) are preferably young with milk teeth or maximum with 2 permanent teeth. Pregnant sheep are examined by checking the udder and teats and it is told that some kind of liquid (like milky) comes

from the teats of the pregnant sheep. Though the selection process is similar in the selected study area, the channel through which the sheep are purchased differs. The flock size greatly determines the adoption of rearing methods, involvement of labour, investment and recurring expenditure pattern and the average net return. In the method of increasing their flock size, majority of them report that retaining the ewe lambs will cause increase in the pregnancy gap period in the mother sheep and the latter few report that it would not be economical.

Grazing land – the determinant of pastoralism

The majority of the land holdings in the study area is found to be rain fed (as the region lies in the rain shadow region) and uncultivable (due to the gravel nature of the soil) which makes them suitable as grazing lands and are locally called as "Korangadu". The Korangadu is typically a mixture of grass, legumes and tree species including annual and perennials and some of them are Kolukattai grass, Vennampul, Ottanpul, Velamaram, etc. This is the main reason for the high concentration of sheep pastoralism in the selected study area. The fencing of grazing land poses to be a considerable factor as a proper fenced land makes the flock controlled within a territory and hence the hours spent for overlooking and grazing is reduced. Proper fencing of the land is done in two ways, namely, live fencing (Mullu Veli) is done with planting the cuttings of a thorny shrub called "Kiluvai" (Commiphora berryii) and the fencing is also done with steel nets called "Kambi Veli". If the grazing lands are properly fenced, the manual work is reduced and hence the hours of grazing would be high and when the grazing lands are not properly fenced, the hours of grazing is based on the rearers' mentality.

Some unique pastoralist practices

In order to enhance the productivity and the grade of rearing, special and separate care must be given to sheep that are pregnant and weaning and the lambs from the time of birth till the time of sale. In order to enhance the productivity and the grade of rearing, special and separate care must be given to sheep that are pregnant and weaning and the lambs from the time of birth till the time of sale. The lambs are usually separated from the flock during the grazing time mainly for two reasons. One is to take separate care of lambs by providing feed supplements to increase their productivity as the sale of lambs is the principal source of income. And the second reason is that if the lambs

and sheep are grazed together, the pregnancy gap period of the sheep increases which reduces the birth rate.

Feed supplements

Feed supplement are necessary not only for increasing the productivity level but also to manage the flock during the times of rainy seasons when the grazing would be difficult and limited and drought seasons when there arises fodder scarcity. Feed supplements provided to the sheep are broadly classified into three types namely, green fodder, dry fodder and concentrated feed. The green fodder mainly comprises of native Kambu crop, Co4 and Napier variety grasses and they are cultivated throughout the year with well irrigation. The dry fodder comprises of groundnut (Kadalai Kodi), moth beans (Naripayathan Kodi) and Cholam (Chola Thattu). They are mainly cultivated during the monsoon season (October – January) and stored in open places on stones and wooden rods, covered with tarpaulin or steel sheets. The concentrated feed comprises of Cholam seeds, Maize seeds, Rice bran, Oil cake of groundnut and coconut and residuals of different kinds of crops cultivated.

Health management of the flock

The sustainable progress of rearing the sheep mainly lies on the health maintenance of the flock. The precautions or the safety measures taken during the rainy and winter seasons (the disease prone seasons), the commonly affected disease to the sheep, method of curing the disease, proximity to veterinary support and the frequency of medical checkup comes under the heath management practices. The rainy and winter seasons are supposed to be the disease prone seasons for the sheep. Taking necessary precautions and safety measures and preventive measures from the diseases are very much important to protect the flock and productivity. The precautionary measures identified during the study was deworming and deticking, vaccination, covering the sheep pens, reduce the grazing hours and shift in the feed supplements. One veterinary dispensary is setup in the study area and it is revealed that of the selected 90 respondents, everyone i.e., 90 (100%) have the proximity to veterinary support.

The awareness about the government's prevailing welfare schemes and beneficiary policies regarding sheep rearing and updating the changes happening, attending training program and availing government's subsidies, loans or insurance which all stands to be aid in pastoralism. The financial

Table 3: External Factors and Support for Pastoralism

Variables	Particulars	No. of Pastoralists	Percentage
Awareness and updating Government's schemes and Policies	Yes	16	18
	No	74	82
Availing any government's Subsidies/Loans/Insurance	Yes	61	68
	No	29	32
Satisfaction level of the Government's Subsidies/ Loans/ Insurance	Satisfactory	19	31
	Satisfies only in certain things	26	43
	Dissatisfactory	16	26
Ability to get Financial Assistance	Yes	56	62
	No	34	38
Source of Finance	Co-operative Society	51	91
	Bank	4	7
	Money lenders	1	2
Total		90	100

assistance has a distinct role in the establishment and sustainability of any occupation and sheep rearing is not an exceptional one.

The Economics of sheep pastoralism is an indispensable part in the study which analyses and studies the aspects like the initial investment made on the sheep rearing occupation, the expenditure that recurs during the operation, the gross income received from the occupation and the net return gained. These different aspects makes clear the monetary flow in the sheep rearing occupation. The minimum and maximum values obtained from the study for each aspect is depicted in the table 4.

Investment on Sheep rearing

The investment made on sheep rearing depends mainly on the flock size and nature of land holdings, especially grazing land. The total investment made is categorized into six major components. They are establishing the foundation flock, housing of sheep (preparing open pens), setting up of water resource, preparation of grazing land, cultivation of green fodder crops and cultivation and storage of dry fodder crops.

Table 4: Economics of Mecheri Sheep Pastoralism

Variables	Minimum value (in Rs.)	Maximum value (in Rs.)
Investment made		
Establishing the flock	1,00,000	13,00,000
Housing of sheep	1,500	35,000
Water resource	800	15,000
Preparation of grazing land	700	67,000
Cultivation of green fodder crops	1,000	15,000
Cultivation and storage of dry fodder crops	6,000	80,000
Total	1,10,000	15,12,000
Recurring expenditure		
Maintenance of open pens	200	12,000
Feeding expenditure	4,000	80,000
Wages for labour hired	1,09,500	1,82,500
Maintenance or lease for grazing land	800	77,000
Medical expenditure	500	12,000
Total	1,15,000	3,63,500
Gross receipt		
Sale of matured lambs	72,000	11,70,000
Sale of old sheep	1,000	25,000
Total	73,000	11,95,000

Recurring Expenditure

The recurring expenditures are made to continue the operations of the occupation in an even manner. The classification of the expenditure also helps us in cost minimization. Those in the pastoralism are maintenance of the sheep pens, feeding expenditure, wages for labour, maintenance or lease for grazing land and medical expenditure. The recurring expenditures are calculated for a period of one year as they are made yearly and the range is given in the above table. The expenditure made for replacing the aged sheep and buying sheep (to multiply the flock size) cannot be ascertained as they are exchanged by selling the matured lambs and old sheep. The value made for replacement is adjusted with the gross receipt.

Estimated annual expenditure

The calculation of the estimated annual expenditure made for an adult sheep and a lamb till the time of sale makes us more clear about the amount of

expenditure made per head in the flock. The estimated annual expenditure made by the selected sheep rearers for an adult sheep and a lamb is listed in the below table.

Table 4.1: Estimated Annual Expenditure

Particulars (Rs.)	Adult sheep		Lambs (till the time of sale)	
	No. of Pastoralists	Percentage	No. of Pastoralists	Percentage
< 500	37	41	73	81
500 – 1000	49	55	14	16
> 1000	4	4	3	3
Total	90	100	90	100

Gross receipt (per annum)

The gross receipt received from the sheep rearing is from two ways namely, through the sale of matured lambs and the sale of old sheep. The major portion comes from the selling of matured lambs. It is found that the gross receipt increases for those who sell the lambs directly in the market and to butchers when compared to those who sell through intermediaries.

Annual net return per adult sheep

The annual net return per adult sheep is ascertained from dividing the net return (gross return minus recurring expenditures) by the flock size (no. of adult sheep). The annual net return of the selected 90 respondents (without the deduction of wages for self-workers) is ascertained and presented in the table.

Table 4.2: Annual net return per adult sheep

Annual net return per adult sheep	No. of Pastoralists	Percentage
5000 – 6000	47	52
6001 – 7000	12	14
> 7000	31	34
Total	90	100

The income gained from the selling of aged or old sheep and matured lambs depends upon the age. The normal average lifetime of Mecheri breed of sheep is 10 to 12 years. But the aged sheep are sold at different age intervals and young sheep are replaced to maintain the reproductive performance of the flock. The main source of income from sheep rearing is the selling of matured lambs. The matured lambs are sold at different age intervals which greatly

determines the price as the body weight also differs with the age. Among the selected 90 sheep rearers, 52 (58%) of them sell the matured lambs at the age of 90 days i.e., 3 months, 29 (32%) of them sell during the age between 90 and 120 days and 9 (10%) of them sell after the age of 120 days i.e., 4 months.

A Note on the Sheep market in the study area – Kannivadi Sheep Market

'Kannivadi sheep market'is one of the oldest and notable sheep market among the other sheep markets held in Tamil Nadu. This market operates every Friday from early morning till night. The farmers and traders of not only big towns like Coimbatore, Pollachi, Udumalapet, Madurai, Trichy, Chennai but also from other states like Kerala, Karnataka and Andhra Pradesh visit the market and buy the sheep mainly for meat purpose. Also the farmers from nearby villages like Mulanur, Vellakovil, Paramathi and other surrounding villages sell their sheep. The market is famous for the local breed (Mecheri) and sheep of every kind (rams, ewes and lambs) at all age groups all available. Farmers directly sell their sheep to other farmers, traders and butchers and the traders buy from the farmers for both breeding and meat purpose and the butchers buy mainly for meat purpose. Usually, transaction happens in lakhs and during the seasons like Diwali and Bakrid where there is more demand for meat, the transaction also happens in crores. Though it is one of the notable sheep market, still it lacks proper facilities and regulation.

The marketing environment for sheep comprises of the marketing channel, the variables in the price determination of the sheep, reasons for urgent selling and the difficulties faced in the marketing are identified and presented in the table 5.

Table 5: Marketing Environment

Variables	Particulars	No. of Pastoralists	Percentage
Marketing Channel	Through Intermediaries	57	63
	Direct selling in the market	17	19
	Through friends and relatives	7	8
	Direct selling to Butchers	9	10
Reasons for Urgent selling of Sheep/ Lambs	Urgent need of money	17	19
	Fodder scarcity	25	28
	Fear about sickness	13	14
	Difficulty in rearing over a certain period of time	35	39

Variables	Particulars	No. of Pastoralists	Percentage
Difficulties faced in Marketing	Lack of timely transaction	39	43
	Lack of quick financial settlement	17	19
	Improper transportation facilities	7	13
	Fluctuations in the market conditions	9	18
	Others	9	7
Total		**90**	100

Significant variables in the price determination of the sheep

Totally seven significant variables that determine the price of the sheep in the various marketing channels in the selected study area were identified to be age, sex, weight, utility of the animal, festive season, physical appearance and urgency to sell.

Table 6: Constraints in Pastoralism

Constraints	No. of Pastoralists	Percentage
Inadequate finance	13	14
Lack of scientific knowledge	7	8
Insufficient grazing land	5	6
Protection of the flock from wild animals	9	10
Providing feed supplement / Fodder scarcity	10	11
Lack of labour	13	14
Lack of quality breed	12	13
Lack of quality medicine	4	5
Unorganized market sector	17	19
Total	90	100

Recognizing the constraints faced in the sheep pastoralism helps us to solve them to have sustainable productivity and increased profitability. The most severe constraint is the mortality of sheep during the rainy and winter seasons. The mortality is unavoidable as the sheep are quick prone to attack of diseases as their immunity becomes low in those seasons. And the growth of the lambs born during those seasons is also affected. It is found that one in ten sheep would die in the flock which is certain. Apart from mortality of sheep, the other major constraints faced by the selected sheep rearers in that particular study area are pointed out in the above table.

Table 7: Economic Analysis of pastoralism in the Study Area

S.No.	Particulars	Amount (Rs.)
I	Investment	
1.	Establishing the Flock	4,09,450.00
2.	Housing of Sheep (open pen)	6,301.67
3.	Water Resource	3,273.95
4.	Preparation of grazing land	7,316.67
5.	Cultivation of green fodder crops	5,035.72
6.	Cultivation and storage of dry fodder crops	18,104.44
A.	Total	4,49,482.45
II	Recurring Expenditure	
1.	Maintenance of open pens	1,806.67
2.	Feeding expenditure	14,525.56
3.	Wages for labour hired	1,52,083.33
4.	Maintenance or lease for grazing land	7,455.56
5.	Medical expenditure	2,628.89
B.	Total	1,78,500.01
III	Receipt	
1.	Sale of matured lambs	3,05,373.61
2.	Sale of old sheep	5,475.56
C.	Gross Income	3,10,849.17
D.	**Net return** (C – B)	1,32,349.16
E.	Average annual net return per adult sheep	3,577.01

The Economic analysis of the sheep pastoralismis ascertained by calculating the total average investment, total average recurring expenditure, total average gross receipt and the total average net return which is obtained by deducting the recurring expenditure (including labour cost of self-workers) from the gross receipt. The net return per adult sheep is also calculated to know the return from each adult sheep. The average net return per adult sheep for an average flock size of 37 is found to be Rs.3,577.01.

Ratio Analysis for Sheep Pastoralism

From the computation of Net Profit Ratio, the occupation of sheep pastoralism was found to be much profitable with the ratio of 42.58 percent. The rate of Return on Investment shows 29.45 percent which reveals that there is good returns from the investment made in the occupation of sheep pastoralism.

Regression Analysis

$$Y = \beta0 + \beta1\ X1 + \beta2\ X2 + \beta3\ X3 + \mu$$

Where Y = Total Receipt

X_1 = Total Investment

X_2 = Total Expenditure

X_3 = Flock Size

μ = Error Term

The study has taken total receipt as dependent variable and independent variables identified where total investment, total expenditure and flock size. The estimated regression coefficient for total receipt were are given in the table.

Table 8: Regression Analysis

Models	Coefficients	T value	Significance
Constant	-63567.627	-3.562	0.001
Investment	-0.003	-0.410	0.683
Expenditure	0.806	3.195	0.002
Flock size	8531.782	15.335	0.000
R2		0.902	
Adjusted R^2		0.899	
F test		263.977	
Significance		0.000	

The R^2 value came to 0.902 revealing better explanatory power of the variables and it was found that the model estimated F test to be statistically significant.

Among the 3 independent variables, the total expenditure and flock size were found significant revealing that a unit change in total expenditure would result in 0.806 units change in the total receipt and a unit change in flock size would result in 8531.782 change in total receipt.

In general investment has positive effect on receipt but the obtained coefficient of the variable is negative indicating a fall in return as investment increases. Even though the coefficient is negative, it is found statistically insignificant.

CONCLUSION

Livestock sector bears important role in augmenting economic growth by generating income, employment and foreign exchange and contributing to the

food and nutritional security. Livestock rearing in India is a part of whole life of rural people, well integrated with the socio-cultural fabric and the sector accounted for about 6.2 percent of total GDP in 2022 (RBI, 2022). Contribution of livestock in agricultural sector is on increasing trend. This sector is of particular importance for the livelihood of small farmers who are generally constrained in the availability of land for cultivation. Sheep rearing contributes 8.5 percent of total value of output from livestock economy especially in arid, semi-arid and mountainous area where crops and dairy farming are not economical (CSWRI, 2007). Sheep rearing in India is an inseparable component of mixed farming system in view of the prevailing socioeconomic conditions in the country where per capita land holdings is hardly 0.2 hectares.

It was found that the socioeconomic profile of the rearers was good which is conducive for their occupation of sheep rearing. The average land holding size of the rearers was found to be 5.35 acres and majority of their land holdings were non-cultivable (grazing lands) which also suits their occupation. The investment and expenditure pattern depends upon the flock size and the skills of the rearers in the field. It was found that the average annual net return from sheep rearing to be Rs.1,32,349.16 and average net return from an adult sheep to be Rs.3,577.01. Though the net return is satisfactory, the productivity level is low due to lack of technical knowledge. The market is unregulated with poor facilities and has the influence of intermediaries. The major constraints perceived by the sheep rearers is the uncontrolled mortality rate of sheep during monsoon seasons, followed by unorganized market sector, inadequate finance, lack of labour, lack of quality breed, fodder scarcity and lack of scientific knowledge. The Net Profit Ratio and the rate of Return on Investment (RoI) revealed that the sheep rearing occupation is much profitable in the selected study area.

SUGGESTIONS

'Ensuring job security for the rural youth through this pro-poor livestock sector would pave the way for meeting demand of protein of animal origin and nourishment of the increasing human population while ensuring sustainable livelihood security' (Sahoo *et al*, 2015). It was suggested that proper training programs must be organized to enrich the skills of the rearers which in turn increases productivity and induces profitability and also the market structure is needed to be regulated and organized to eliminate the marketing constraints.

There is an inevitable need to improve the standard of Sheep pastoralism and shift in the system from conventional practices to inculcation of modern and scientific techniques are recommended. Enriching the Sheep husbandry sector through nurturing the youth agricultural startups and entrepreneurship supportive system that leads to sustainable and simultaneous development of the agrarian economy.

LIMITATIONS OF THE STUDY

The study was confined to the Mecheri sheep rearers of a particular area which constitute a smaller sample size. Hence the results cannot be generalized.

The market conditions and the value of sheep may vary from season to season, hence the accurate value cannot be ascertained.

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