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Original Research

Effect of Goat Rearing on Farmers' Income

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Abstract

The present study was formulated to assess the role of goats in augmenting farmers income. According to the availability of individuals belonging to weaker sections, four villages namely Qutab Nizam, Chohala, Gagian and Kadyal of R.S. Pura Block of Jammu District were selected purposively for the study. Farmers belonging to scheduled caste category sustaining below poverty line were selected. The action research methodology clubbed with pretest-posttest research design was used for assessing the impact of goats in augmenting farmer's income. Two adult does of Beetal breed were provided to each of 32 selected beneficiaries along with one buck in each village for breeding purpose. The significant differences ($p<0.01$) in income level of farmers were observed even when the goats were kept on sub-optimal production conditions. Significant value of t-test suggested the significant increase of income by introduction of goats to the rural farmers. The study was concluded with the impression that goat rearing has significant effect in augmenting farmers' income.

Keywords: Beetal, Economic, Empowerment, Farmers, Goats, Income

Introduction

India being largely an agriculture-based nation has seen unprecedented growth in grain production through green revolution. But crop productivity is vastly restricted by uneven rainfall, shortfall of irrigation measures and deteriorating soil health. Whereas, livestock has been an integral segment of rural life and inextricably linked to the rural economy. India being a nation with varying climatic zones and livestock aggregation has the largest inventory of livestock in the world and derives 4.9 percent of its Gross Added Value (GAV) at current prices from livestock sector (BAHS, 2019; Singh, 2020; Singh *et al.*, 2020). Goats has been considered as 'poor man's cow' and utilized as a source of sustenance for the economically weaker sections of the society. According to 20th Livestock Census, the total livestock population in India is 536.76 million whose 27.74 percent i.e. 148.88 million are goats. Goats contribute 3 percent to total milk production and 13.35 percent to total meat production in India (BAHS, 2019). India is the home to second largest goat population of the world after China (Singh, 2020). The demographic dependence on goats for livelihood and food security is huge. In Indian context, 87.7 percent of the farmers are marginal, small or semi-medium, therefore, the role of goats increase manifolds (Singh, 2020). Out of total 138 million rural households, 33.01 million (24%) are maintaining goats. Marginal and small farmers (possessing <2 ha of land) owns more than 76 percent of the total goats of the country (Singh *et al*. 2018). As far as the Union Territory of Jammu and Kashmir is concerned, goats have imminent role in augmenting the income of the poorest of poor community of the UT through milk, meat, hair and other products (Kour *et al.*, 2018). Multifarious roles has been played by the goats benefitting rural people by means of availing them with income, food security, employment, supporting crop production and mitigating unforeseen risks in farming thereby leading to socio-economic empowerment (Singh *et al.*, 2018).

As per the report of Economic Survey (2019), sheep and goats are primarily reared by resource poor farmers which supplement their income during lean seasons. The small ruminants have higher survival rates under inclement conditions compared to large ruminants and because of their high prolificacy and short generation interval, the flocks multiply more rapidly. As far as the goats are concerned, high water economy, varied consumption pattern, lesser housing demands, short kidding interval, high incidence of multiple births, high demand of chevon and more hardiness makes it potential animal for rural households to boost their economy (Boyazoglu *et al*. 2005). According to International Fund for Agriculture Development (IFAD, 2018), goat rearing is an income-generating activity that has enormous potential to increase income especially in remote, tribal and ecologically vulnerable areas.

Analyzing the demand and supply gap regarding goat and its products, it becomes evident that though in the past decade, the goat meat production has doubled and a growth rate of 31.53 percent was noticed in goat milk. Apart from milk and meat, goats provide quality skins and precious fibre like Pashmina and contributes 8 percent to the livestock gross domestic product (GDP), still we are not able to meet the ever-increasing demand of goat products (DAHD, 2017). The demand-supply gap creates a lucrative arena for the goat husbandry sector which can be tapped by bringing more rearers under the ambit of goat farming and developing entrepreneurship caliber among masses. Looking at the contribution of goat husbandry in national economy, Government of India has announced to eliminate Paste des Petites Ruminants (PPR) in sheep and goats by 2025 (PIB, 2020). Keeping in mind the above points, the present study was formulated to understand the profits associated with goat-farming and to assess the role of goats in augmenting farmer's income.

Objective

To generate additional income of resource poor farmers through goat rearing

Hypothesis

Null Hypothesis: Goat rearing does not have significant effect in augmenting farmer's income
Alternate Hypothesis: Goat rearing has significant effect in augmenting farmer's income

Materials and Methods

Locale of Study and Sampling

The present study emphasizes on the role of goats in augmenting farmers' income. The study was conducted under

the project titled "Economic Empowerment of Rural Goat Farmers through Scientific Intervention in Block R.S. Pura of Jammu Division" which was taken up from 2015 to 2019. Purposive sampling was done for the present study and for the convenience of research and availability of individuals belonging to weaker sections; R.S. Pura block of Jammu District was selected for the study. In the first phase of project starting on 2015, beneficiaries were selected from two villages namely *Qutab Nizam* and *Chohala* of R.S.Pura block. Seven beneficiaries from the village *Qutab Nizam* belonging to Scheduled Caste (SC) category having below poverty line (BPL) economic status were selected randomly. Eight beneficiaries were randomly selected from village *Chohala* belonging to SC category and BPL status. In the second phase of project starting on 2017, ten beneficiaries from village *Gagian* and seven beneficiaries from village *Kadyal* belonging to SC category with BPL status were selected for the study.

Training and Exposure of Beneficiaries for Goat Rearing

Before distribution of goats, training to the selected beneficiaries were imparted wherein expert lectures on managemental practices, parasitic, gynecological, common surgical affections and bank facilities available for availing various types of loans under entrepreneurship programme were given. Exposure visits to animal fare and *Kisan Melas* organized by the Directorate of Extension, SKUAST-J were also conducted for the beneficiaries. The beneficiaries reared their goats on sub-optimal production conditions *i.e.* zero-input with scientific interventions from the investigator's end.

Purchase of Goats and Distribution

A committee of experts comprising of experts from animal breeding and project members was framed for the purchase of animals. Surveys for the purchase of animals were conducted in three Tehsils of Jammu division namely Samba, Bishnah and R.S.Pura and the animals were purchased based on their phenotypic merit belonging to Beetal breed. Beetal breed was opted due to its high reproductive efficiency and regional adaptability (Ahmad *et al.*, 2019). Each selected family was given two goats between age group of 1 to 2.5 years and in each village one buck was given for breeding purpose. In total 32 animals *viz.* 30 female goats (does) and two male goats (bucks) were distributed in the first phase. In the second phase, 34 does and two bucks were distributed among the selected beneficiaries. In total, 64 does and 4 bucks were distributed among 32 beneficiaries for assessing the effect of goat rearing on augmenting farmer' s income.

Research Design

The study was conducted on the lines of action research whereby the weaker sections of the society were identified and roadmap was finalized for augmenting their income practically by means of goat farming. The pretest-posttest methodology was also used to compare the incomes before and after goat rearing. Data was collected by using semi-structured interview schedule. Regression (B) and correlation (r) estimates were calculated between income from goat farming and other independent variables to understand the magnitude of variation in income from goat farming and independent variables. For testing hypothesis, t-test statistic was used.

Results and Discussion

The results pertaining to socio-economic and personal profile of the beneficiaries is provided in Table 1. The results elicited that the average age of beneficiaries was 46.15 years and majority (53.00%) of the beneficiaries were young (35-46 years). As far as the education was concerned, majority (34.00%) of the beneficiaries were middle passed followed by primary (31.00%) level of education and only 3 percent of the beneficiaries were having higher secondary level of education. The average experience of the beneficiaries regarding goat rearing was 5.09 years and average family size was 5 members. Majority (40.63%) of the beneficiaries were having moderate (Rs. 7001-14000) level of income from the sale of goats followed by 25 percent having medium (Rs. 14001-21000) level, 6.25 percent beneficiaries each were having low and high income from sale of goats. About 15.62 percent beneficiaries were found to be having high level (Rs. 28001 and above) of income from the sale of goats. As the beneficiaries were provided with two goats, therefore, the average annual income from two goats was Rs. 17193.00 which almost half of the income generation from other sources annually. This signifies a major augmentation of income of the beneficiaries through goat farming. The average annual income of beneficiaries from other sources was calculated to be Rs. 38438.00.

Table 1: Socio- personal and economic profile of beneficiaries

Variables	Frequency (n=32)	Percentage
Age categories (in years)		
Range 35-68 years		
Young (35-46)	17	53
Middle (46-57)	11	34
Old (57-68)	4	13
Education		
Illiterate	5	16
Primary	10	31
Middle	11	34
High School	5	16
Higher Secondary	1	3
Income from sale of goats (Rs)		
Low (Below 7000)	2	6.25
Moderate (7001-14000)	13	40.63
Medium (14001-21000)	10	31.25
High (21001-28000)	2	6.25
Very High (28001 and above)	5	15.62
Averages of various variables		**Mean ± S.E**
Average age (years)		46.15±1.63
Average experience in goat rearing (years)		5.09±0.83
Average family size		5.00±0.22
Average annual income from sale of two goats (Rs)		11593.00±1751.00
Average annual benefits provided to beneficiaries in terms of healthcare, nutrition, breeding and prevention of disease losses (for 2 goats) (Rs)		5600
Net average annual income from rearing two goats (Rs)		**17193**
Average annual income (From other sources) (Rs)		38438.00±2998.00

The results of the present study are in accordance with the findings of Roy and Tiwari (2016) wherein the average age of the goat farmers was around 41 years and partially in line with the results of education status. The same research reported that majority of the farmers were having very low income from goat farming (Rs. <12,000) whereas in the present study, though the majority of farmers were having moderate income but the amount of income ranged from Rs. 7001 to Rs. 14000. The experience in goat farming reported by Roy and Tiwari (2016) also differs from the results reported in the present study. Further, the results of the study are not in line with those of Singh *et al*. (2018) where majority of the farmers were middle aged and illiterate. However, the results of the cited study were perfectly in line with the current study as far as the income and experience of goat farmers are concerned. Sahoo *et al*. (2018) reported the average age of goat farmers to be around 45 years, family size of around five members and medium level of income from goat farming which is in accordance with the results of present study. Further, Gamit *et al*. (2020) has reported similar results regarding age and education of the goat farmers. The study also reported that the annual income of 52 percent respondents was more than Rs. 25,000 from goat rearing which is partially in line with the results of the present study. While studying the demographic parameters of goat farmers in Punjab, Singh *et al*. (2020) have reported that most of the goat farmers were middle aged, illiterate with medium level of family size which is partially in line the results of present study.

There were certain benefits which were obtained by the beneficiaries directly as well as indirectly from the project which are summarized in Table 2. The benefits were calculated per year according to the methodology and data provided by Senthilkumar *et al.* (2008); Ganesh Kumar, (2010); Singh *et al.* (2013) and Awasea *et al.* (2013). The benefits were attributed to healthcare, nutrition, breeding and economic gain through deterring disease losses by a margin of Rs. 1200, Rs. 400, Rs. 400 and Rs. 3600 respectively, thus totaling to Rs. 5600 per beneficiary per year per two goats.

Table 2: Other benefits provided to beneficiaries for two goats

Healthcare including vaccination	Nutrition	Breeding	Economic gain through deterring disease losses	Total benefits (in Rupees)
1200	400	400	3600	**5600**

Senthilkumar et al. (2008); Ganesh Kumar, (2010); Singh et al. (2013) and Awasea et al. (2013)

Regression (B) estimates were calculated between income from goat farming and other independent variables to understand the magnitude of variation in income from goat farming and independent variables and are provided in Table 3. The statistical resolute presented in the study has been affirmed by various scientists working on the behavioural aspects of caprines. Experience in goat farming, contact of female goats with male goat, feeding of concentrate diet and browsing was found to be having highly significant relationship with income ($p<0.01$). Rearing of livestock other than the goats provided to the beneficiaries was also having a significant ($p<0.05$) effect on the income. Browsing habit of goats was significantly ($p = 0.000$) regressing upon income from goat farming by a magnitude of 12913.72 units which means that with 1 unit increase in browsing, there will be increase of 12913.72 units in income. It can be stated for the project area that farmers taking their goats for browsing can earn an extra sum of Rs. 12913.72 over those which are not pursuing this practice. It may be due to that fact that browsing is the natural feeding behaviour of goats and when they follow their natural behavior, they tend to gain more weight and hence more income can be obtained from them. The findings of the present study are supported by those of Sanon and Sanou (2012), wherein browsing has been stated as the prominent feeding behavior of goats and goats tend to increase body weight when obtain feed through as per their natural tendency.

Table 3: Relationship analysis between income from goat farming and independent variables

Independent Variable	r	B	p-value
Age	-0.029	-31.06	0.875
Education	0.333	3164.983	0.062
Experience in goat farming	**0.498****	**1045.74****	**0.004**
Family size	-0.14	-1116.56	0.445
Annual income	-0.058	-0.034	0.754
Contact with male	**0.629****	**13227.27****	**0**
Diet	**0.841****	**21012.82****	**0**
Browsing	**0.661****	**12913.72****	**0**
Land holding	0.3	13955.3	0.096
Already rearing livestock	**0.353***	**9474.07***	**0.048**

*r: Coefficient of Correlation; B: Regression coefficient; p-value: Probability value; ** significant at p<0.01; * significant at p<0.05*

Further, contact of does with male was having highly significant regression ($p = 0.000$) on income levels and it has been estimated that introduction of buck to does can increase the income levels by 13227.27 units. It is because of the 'male effect' as goats tends to come to heat in the presence of male and can be bred effectively, thus resulting in better conception rates. This is in line with the findings reported by Neto *et al*. (2016) regarding male effect. Feeding of diet (like concentrates, green fodder, etc.) was found to be having highly significant ($p = 0.00$) regression on income from goat farming and feeding of good diet was found to be increasing income by 21012.82 units. Feeding has a profound effect on body weight gain which ultimately gets reflected when the goats are sold based on their body weight. Sahu *et al*. (2013) have reported that feeding of concentrates have positive effect on the body condition of goats and hence indirectly on the income generation as well as per the findings of the present study. Experience in goat farming was found to be enhancing the income from goats by 1045.74 units and was having a highly significant ($p = 0.004$) effect on income. Rearing of livestock other than goats provided to beneficiaries was also found to be having positive effect on income as one unit increase in livestock unit tends to increase income by 9474.07 units. Age, family size and annual income were found to be regressing the income from goats negatively. With increase in all such independent variables, a person tends to care for the goats less effectively, making up his time for other activities.

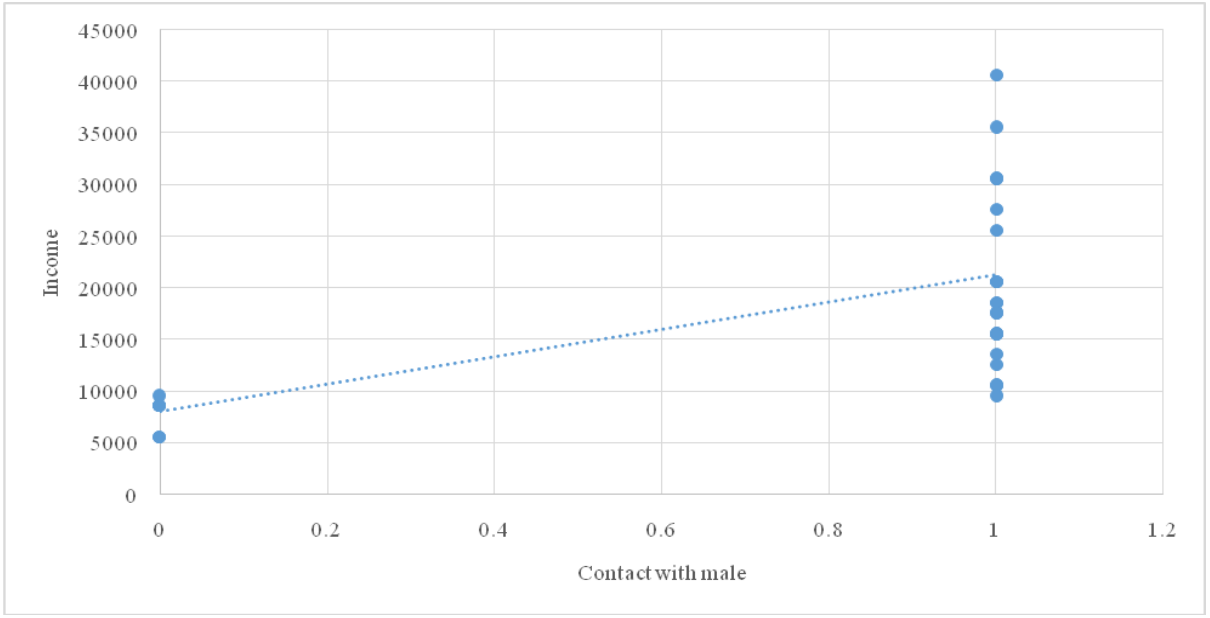

Figure 1: Relationship between income through goat farming and contact with male, positive slope of trendline shows the positive effect

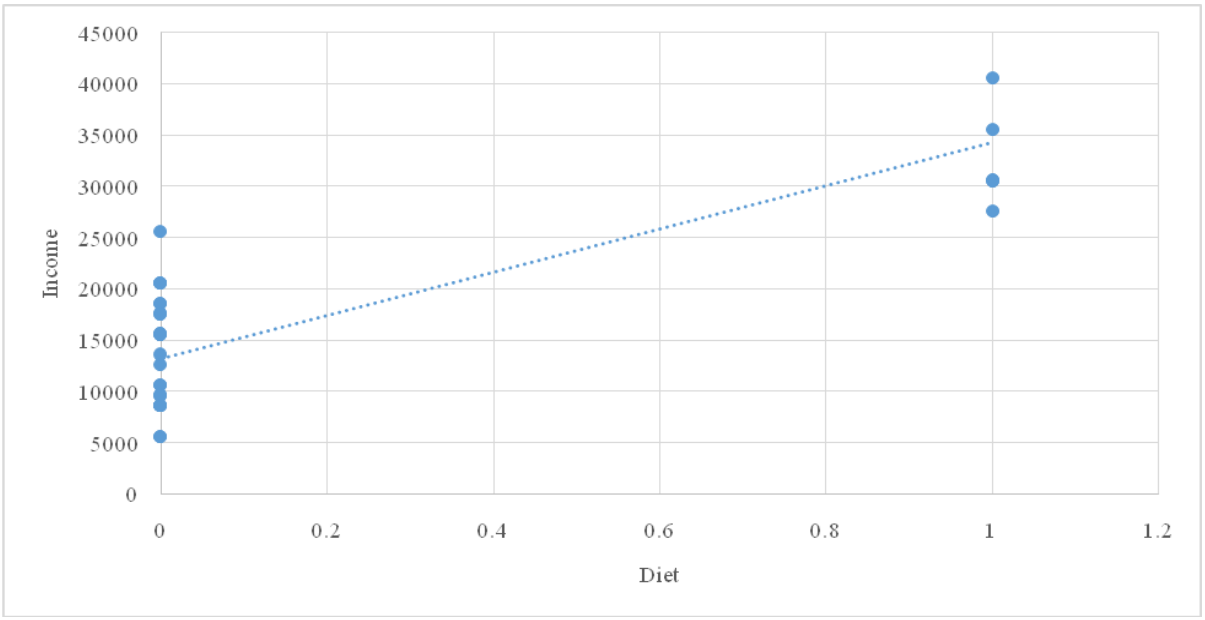

Figure 2: Relationship between income through goat farming and diet, positive slope of trendline shows the positive effect

A pre and post intervention t-test analysis was carried for analyzing the increase in income levels of rural goat farmers. The t-test value was found to be -4.013 which was found to be highly significant ($p = 0.001$) at 1 percent level of significance. Significant value of t-test suggests the significant increase of income by introduction of goats to the rural farmers. Based on the t-test statistic, the null hypothesis is rejected and alternate hypothesis is accepted. The increase in income levels before and after the introduction of goats to the rural farmers is provided in Figure 4. The trendline in the Figure 4 depicts an upward trend in the income pre and post intervention. The results are in accordance with Singh *et al*. (2018), Sahoo *et al*. (2018) and Gamit *et al*. (2020) wherein goat farming have supplemented the annual income of the farmers.

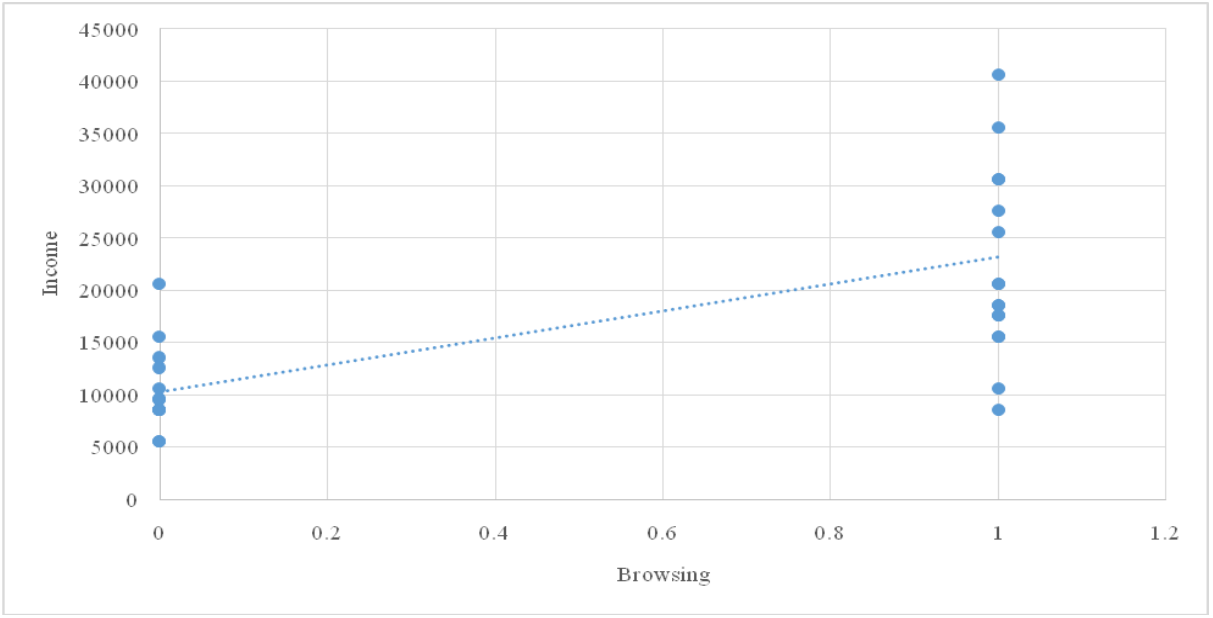

Figure 3: Relationship between income through goat farming and browsing, positive slope of trendline shows the positive effect

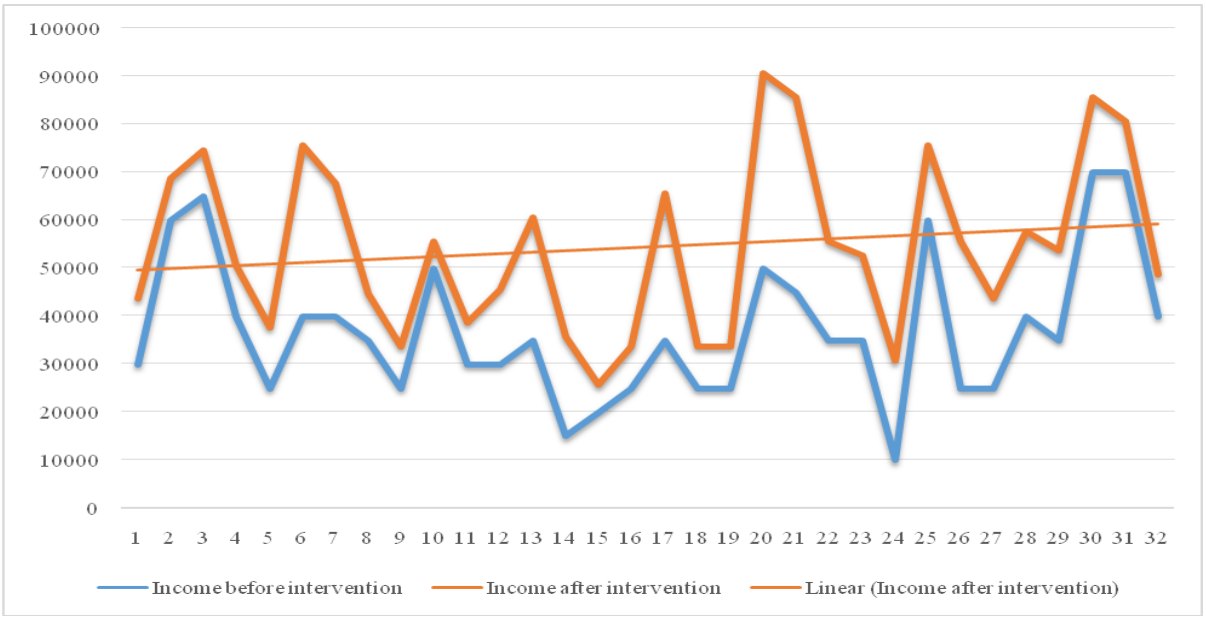

Figure 4: Income levels of rural goat farmers before and after intervention

Conclusion

Since time immemorial, goat farming has been a chosen way for under privileged and weaker sections of the society for sustaining their livelihood. The present study has also shown the evidence that goat farming has the potential for augmenting the farmer's income. Introduction of goats among weaker sections of the society have led to their economic empowerment. The income was found to be having synergism and complementarity with experience in goat farming, contact with male, diet and browsing behavior of goats. All the aforesaid variables need to be considered for enhancing the farmer's income. Further, there is need to introduce goats along with other species of livestock so that farm distress can be reduced. Farmers should be trained and exposed for rearing goats for augmenting their income. Diversification of livestock rearing practices along with integrated farming approaches can further boost the farm economy.

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Conflict of Interests

There is no conflict of interest.

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