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# Determination of socio-economic factors influencing rural household's decision to raise goat in Sindhuli District, Nepal

**Anoj Joshi[1], Praseed Thapa[2*], Anju Adhikari[3], Pragati Dahal[4] and Priyanka Gautam[4]**

[1]Faculty of Management, Saptagandaki Multiple Campus, Bharatpur, Nepal.
[2]Department of Agricultural Economics and Agribusiness Management, Agriculture and Forestry University (AFU), Nepal.
[3]Department of Horticulture and Plant Protection, Nepal Polytechnic Institute, Purbanchal University, Bharatpur, Nepal.
[4]College of Natural Resource Management – Sindhuli, AFU, Nepal.

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**Goat (*Capra hircus*) is one of the important sources of rural economy in Nepal. As various programs are aiming to enhance livelihood of rural denizens through goat promotion, it is therefore crucial to understand socio-economic determinants on decision to raise goats by rural households. So, this study was carried out in two, out of seven, local administrative units (Wards) of Marin rural municipality, Sindhuli using three stage sampling technique. A household survey using pretested questionnaire was administered to a randomly selected sample of 100 respondents of which 59% were females and 41% were males. Multiple linear regression analysis using Stata was performed to ascertain socio-economic determinants (sex, education, income, household size, farming experience (years), membership of saving and credit institution, off-farm activities involvement and land size) of goat raising. Results showed that household size had a positively significant relation ($p<0.05$) whereas farming experience (years) and off-farm activities involvement had a negatively significant relation ($p<0.05$) on goat raising. Rest of the factors had either positive (education, income and membership of saving and credit institution) or negative (sex and land size) relations but were all statistically insignificant ($p>0.05$). The study suggests that the result should be considered by any authorities that aim for goat promotion among rural farmers.**

**Key words:** Goat, multiple linear regression, rural household, socio-economic determinants.

## INTRODUCTION

Nepal, predominantly remaining an agrarian economy, engages about 66% of its total population directly in agriculture sector (FAO, n. d.). This sector alone contributed 28.8% to its total Gross Domestic Product (GDP) in fiscal year (FY) 2016/17 and estimated to be contributing 27.6% in FY 2017/18 (MoF, 2018). Nepalese

*Corresponding author. E-mail: Praseed.Thapa@gmail.com.

agriculture is mostly integrated with livestock (mainly cattle, buffalo, goat, sheep, poultry, pig, etc.) and this livestock contribute approximately 11% to the country's GDP (FAO, 2005; MoLD, 2017) and 25.68% to the agricultural GDP (MoAD, 2014). This shows significant role of livestock in the economy of Nepal.

Among the diverse livestock raised in Nepal, goat (*Capra hircus*) is one of the indispensable components as 49.82% of households (2.79 million of 5.6 million) rear goats with the average holdings of 3.3 per household (CBS, 2012). Additionally, goat alone constitutes 10 – 15% of total livestock population in the country over the last ten years (MoALD, 2020); contributes to national meat production by 20% and has about 12% share in total livestock GDP (HIN, 2012). In terms of size of goat herd (9.2 million) as of 2011, Nepal is ranked eighth in Asia and nineteenth worldwide (Dennis et al., 2014). About 83% of the total population of Nepal live in rural areas (CBS, 2011; MoLD, 2017) where goat is considered to be one of the major sources of livelihood. It provides tangible benefits like cash income, meat for consumption, manure, skins, and fiber (Semakula et al., 2010; Hassen and Tesfaye, 2014) and intangible benefits like savings, insurance and socio-cultural purposes (Dossa et al., 2007; Tadesse et al., 2014). These demonstrate the importance of goats for Nepal.

Past few years, many national (FORWARD, CEAPRED, RIMS Nepal, etc.) and international non-governmental organizations (Heifer International, Dan Church Aid, CARE Nepal, etc.) including government bodies have been promoting goat raising program across Nepal for poverty reduction, income generation, employment, livelihood enhancement, and food and nutrition security. Although goat raising programs prioritized offers a great scope to farmers and also the existence of goat market due to increasing meat demand as it is an income elastic commodity (CBS, 2011), the domestic production is still insufficient. To address this demand and supply gap, significant number of live goats is imported from India and Tibet every year (HIN, 2012). According to MoALD (2020), the number of imports of live goats was 316,049 with an import value of 2.652 billion Nepali rupees (approximately 26.52 million US$) in 2018/2019. Many underlying reasons could be prevailing behind this predicament. However, a comprehensive insight to uncover these reasons would be a prerequisite if its full potential is to attain and make Nepal self-sufficient on goat. For this, farmers' socio-economics have been identified as an instrumental (Aslan et al., 2007). Also, despite various researches have been conducted in many other aspects of goats so far, there still lacks sufficient empirical studies that provide better understanding of socio-economic determinants on decision to raise goats by rural household. Therefore, this study was conducted with an objective to ascertain the socio-economic determinants on decision to raise goats among rural farmers in Sindhuli. This information may provide a basis for the intervention programs of different organizations that aims to increase goat production, and consequently meet the demand from domestically produced goods.

## MATERIALS AND METHODS

### Description of the study area

The study was carried out in September, 2019 in Marin rural municipality of Sindhuli district, Nepal. This rural municipality is situated in west of district headquarter, Sindhulimadi. It was formed by merging former three village development committees viz; Mahadevsthan, Kapilakot and Kalpabrikshya and borders Kamalamai municipality in east, Hariharpurgadhi rural municipality in west, Ghyanglekh rural municipality and Kavrepalanchok district in north and Sarlahi district in south at present. The study area is also known as the bread basket of the Sindhuli district. For the study, only two (6 and 7) local administrative units (Ward) of Marin rural municipality were selected randomly out of seven (Figure 1).

### Sampling procedure and data collection

The respondents were selected through three stage sampling technique. At stage one, Sindhuli District was purposively selected based on the logistic considerations and accessibility to the study areas. At stage two, a simple random technique was applied to select two administrative unit viz ward 6 and 7 where the number of households are 948 and 941 respectively (CBS, 2017). This list of households was used as a primary sampling frame. From that, list of total goats raising farmers was prepared in consultation with the local concerned authorities, which was approximately 50% of total households. This list was used as a sampling frame to select 100 households (50 from each administrative unit) randomly for data collection. Only the heads of household were interviewed. Both primary and secondary data were used. The primary data were collected by household survey using a paper based pretested survey questionnaire in local common language (Nepali). It included information on household demographic data, income level, land size ownership, membership to saving and credit institution, farming experience (years), off-farm involvement and number of goats raised. Similarly, secondary data were collected using related documents from government of Nepal, articles, journals, and online sources, etc. to obtain necessary data and information.

### Data entry and analysis

The data recorded were coded in MS-Excel and analyzed using both MS-Excel and Stata (Version 11.1). MS-Excel was used for descriptive statistics to summarize the findings of the study. Likewise, Stata was used for regression analysis to understand the socio-economic determinants on decision to raise goat among rural farmers. Since the dependent variable for this study is not dichotomous, multiple linear regression analysis was performed which is shown by the following relationship.

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \ldots\ldots\ldots + \beta_8 X_8 + e$$

Y = dependent variable; decision to raise goat
$\beta_0$ = constant
$\beta_1, \beta_2, \beta_3, \ldots\ldots\ldots, \beta_8$ are coefficients of the independent variables e = error term
The description of the variable tested is summarized in Table 1.

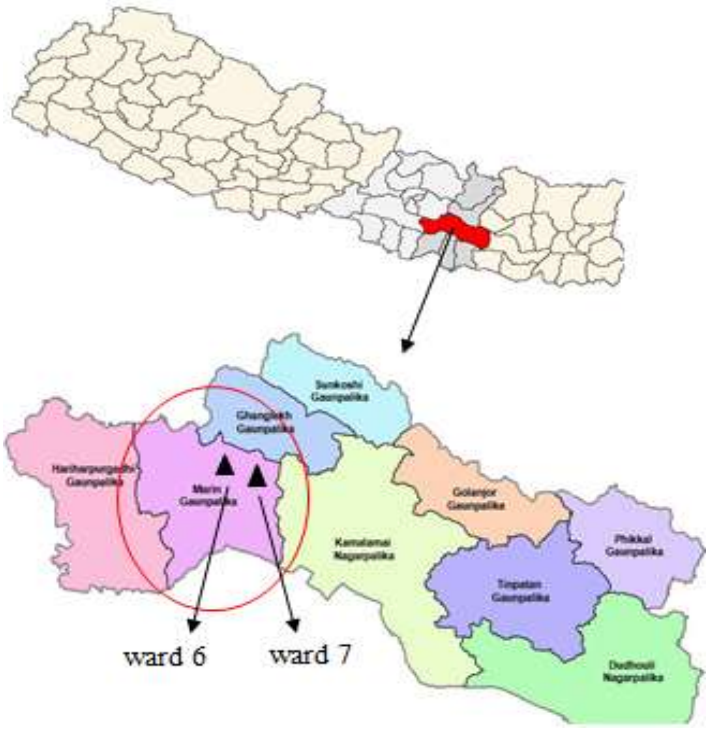


**Figure 1.** Study area.

**Table 1.** Description of variables with their codes.

| Variable | Variable code | Description |
|---|---|---|
| $X_1$ | *sex_c* | Sex of the respondent (male or female) |
| $X_2$ | *edu_c* | Education level (formal education status of respondent) |
| $X_3$ | *income_c* | Income level (per month income level of household) |
| $X_4$ | *HH_size_c* | Household size (Number of persons living in the household) |
| $X_5$ | *experience_c* | Farming experience (in years) |
| $X_6$ | *membership_c* | Membership to saving and credit institution (yes or no) |
| $X_7$ | *off_farm_a_c* | Off-farm involvement (yes or no) |
| $X_8$ | *land_size_c* | Land size owned (Kattha*) |

*One Kattha equals 338 square meters. It is a commonly used local measurement unit.

## RESULTS AND DISCUSSION

### Description of demographic and other characteristics of the respondents

Of the total household/respondents (n = 100) surveyed randomly, 59% were females while 41% were males, with an average age of 48 years. Most of the respondents had no education (57%) followed by primary (27%); secondary (12%) and university level (4%). Majority (64%) were Hindus with diverse ethnic background (Gurung/Magar – 42%, Newar – 19%, Chhetri – 17%, Brahmin – 16%, and Dalits – 6%) whose major source of income was agriculture (79%). Similarly, the majority respondents (50%) had household size of 5 – 7 members compared to household with 2 – 4 members (23%), 8 – 10 members (22%) and > 10 members (5%). Most of the households (71%) had earning < Rs. 10,000 per month followed by Rs. 10,000 – 20,000 (22%), Rs. 15,000 – 20,000 (5%), and > Rs. 20,000 (2%) to sustain livelihood. About 52% are found to be involved in other off-farm activities and 70% are members of saving and credit institution with 64% having farming experience for 5 – 10 years. On an average, each household had seven goats and majority (30%) had land holding 1 – 2 Kattha compared to > 4 (27%), 3 – 4 (16%), 2 – 3 (12%), < 1 (9%), and none (6%). The detail description on demographic and other characteristics of the respondents is presented in Table 2.

**Table 2.** Characteristics of the respondents.

| Particulars | Number of respondents | Percentage |
|---|---|---|
| Average age of respondent (years) | 48 | - |
| **Sex** | | |
| Female | 59 | 59 |
| Male | 41 | 41 |
| **Education** | | |
| No education | 57 | 57 |
| Primary level | 27 | 27 |
| Secondary level | 12 | 12 |
| University level | 4 | 4 |
| **Ethnicity** | | |
| Brahmin | 16 | 16 |
| Chhetri | 17 | 17 |
| Dalits | 6 | 6 |
| Gurung/Magar | 42 | 42 |
| Newar | 19 | 19 |
| **Religion** | | |
| Buddhist | 30 | 30 |
| Christian | 1 | 1 |
| Hindu | 64 | 64 |
| Muslims | 2 | 2 |
| Secular | 3 | 3 |
| **Major income source** | | |
| Agriculture | 79 | 79 |
| Business | 6 | 6 |
| Job/Service | 7 | 7 |
| Remittance | 7 | 7 |
| Other | 1 | 1 |
| **Income in Rupees (month)** | | |
| < 10,000 | 71 | 71 |
| 10,000 - 15,000 | 22 | 22 |
| 15,000 - 20,000 | 5 | 5 |
| >20,000 | 2 | 2 |
| **Household size** | | |
| 2 to 4 | 23 | 23 |
| 5 to 7 | 50 | 50 |
| 8 to 10 | 22 | 22 |
| > 10 | 5 | 5 |
| **Farming experience (years)** | | |
| < 5 | 6 | 6 |
| 5 to 10 | 64 | 64 |
| 11 to 15 | 16 | 16 |
| > 15 | 14 | 14 |
| **Membership in saving and credit institution** | | |
| No | 30 | 30 |
| Yes | 70 | 70 |

**Table 2.** Contd.

| | | |
|---|---|---|
| **Off-farm involvement** | | |
| No | 48 | 48 |
| Yes | 52 | 52 |
| | | |
| **Land size (Kattha)** | | |
| None | 6 | 6 |
| < 1 | 9 | 9 |
| 1 to 2 | 30 | 30 |
| 2 to 3 | 12 | 12 |
| 3 to 4 | 16 | 16 |
| > 4 | 27 | 27 |
| **Average goat holding per household** | 7 | - |

Source: Field Survey (2019).

**Table 3.** Multiple linear regression results of household decision to raise goat.

| **Source** | **SS** | **df** | **MS** | | |
|---|---|---|---|---|---|
| Model | 36.6248476 | 8 | 4.57810595 | Number of obs | 100 |
| Residual | 199.165152 | 91 | 2.18862805 | F(8, 91) | 2.09 |
| Total | 235.79 | 99 | 2.38171717 | Prob > F | 0.0445 |
| | | | | R-squared | 0.1553 |
| | | | | Adj R-squared | 0.0811 |
| | | | | Root MSE | 1.4794 |

| **goat_raising** | **Coef.** | **Std. Err.** | **t** | **P> l t l** | **[ 95% Coef.** | **Interval ]** |
|---|---|---|---|---|---|---|
| sex_c | -0.0159057 | 0.3126888 | -0.05 | 0.96 | -0.63702 | 0.605212 |
| edu_c | 0.0428266 | 0.1877356 | 0.23 | 0.82 | -0.33009 | 0.41574 |
| income_c | 0.0786216 | 0.1802999 | 0.44 | 0.664 | -0.27952 | 0.436765 |
| HH_size_c | 0.3763769 | 0.1871363 | 2.01 | 0.047 | 0.004654 | 0.7481 |
| experience_c | -0.3798391 | 0.1730659 | -2.19 | 0.031 | -0.72361 | -0.03607 |
| membership_c | 0.3927652 | 0.3409909 | 1.15 | 0.252 | -0.28457 | 1.070102 |
| off_farm_a_c | -0.7671639 | 0.3016069 | -2.54 | 0.013 | -1.36627 | -0.16806 |
| land_size_c | -0.0716709 | 0.0920322 | -0.78 | 0.438 | -0.25448 | 0.11114 |
| _cons | 7.67085 | 1.045445 | 7.34 | 0 | 5.594201 | 9.747498 |

## Linear regression model estimates

Table 3 shows the multiple linear regression results of household decision to raise goats. It indicates that of the total eight variables (sex, education, income, household size, farming experience, membership of saving and credit institution, off-farm activity involvement, and land size) tested, only three variables were significant. Household size had a positively significant ($p<0.05$) relation on rural household decision to raise goat in study location, whereas off-farm activity involvement and farming experience (years) had a significant ($p<0.05$) but negative relation. Remaining variables had either positive (education, income, and membership of saving and credit institution) or negative relation (sex and land size) but were all statistically insignificant ($p>0.05$). The F-statistics was significant at 5% and R-squared was estimated to be 0.1553 implying that 15.53% of total variation in the output was accounted for by the independent variables.

The study found that the coefficient of sex *(variable code: sex_c)* is negative (-0.0159057) but was not statistically significant ($p>0.05$). However, similar researches conducted in southern Benin by Dossa et al. (2008) and Jaitner et al. (2001) in Gambia observed that females are more inclined towards goats than males while Jaza et al. (2018) observed the males are more likely to adopt goat raising activity than female. Similarly, the education *(variable code: edu_c)* level of the respondents

was not statistically significant (p>0.05), but had a positive relation (0.0428266). Likewise, income level *(variable code: income_c)* of respondents was not statistically significant (p>0.05), but had a positive relation (0.0786216). With the household size *(variable code: HH_size_c),* it had a positive relation (0.3763769) on decision to raise goat and was statistically significant (p<0.05). This means with every one unit increase in household size, there will be an increase of 0.38. This is contrary to study conducted by Offor et al. (2018) where household size has negative and significant effect on small ruminants raising. Furthermore, farming experience *(variable code: experience_c)* had a negative relation (-0.3798391) on decision to raise goat and was statistically significant (p<0.05). This means that with every one unit increase in farming experience, goat raising decision will be reduced by 0.38. This is in line with the study conducted by Jaza et al. (2018) in Cameroon where they observed that respondents with more farming expereince are less likely to adopt goat raising activity. On the contrary, in a study conducted in Osun State of Nigeria by Fakoya and Oluruntoba (2009), they observed that farming experience had direct and positive impact on small ruminant production. Membership of respondents in saving and credit institution *(variable code: membership_c)* was also not statistically significant (p>0.05) but had a positive influence (0.3927652). In case of off-farm activities involvement *(variable code: off_farm_a_c)*of the respondents', it had a negative relation (-0.7671639) on decision to raise goat and statistically significant (p<0.05). This indicates that with every one unit increase in off-farm activities involvement, goat raising decision will be reduced by 0.77. This is in line with Dossa et al. (2008) where they observed that household member to own small ruminants decreased when they find off-farm employment. On the contrary, the study conducted by Offor et al. (2018) and Fakoya and Oloruntoba (2009) observed that farmers' income from other sources have positive effect on output of small ruminant animals. Land size *(variable code: land_size_c)* had a negative influence (-0.0716709) on goat raising decision but was statistically insignificant (p>0.05).

## CONCLUSION AND IMPLICATIONS

The objective of this study is to understand the socio-economic determinants on decision to raise goat among rural households. This empirical evidence conducted at Marin rural municipality of Sindhuli district showed that household size (positive), farming experience (years) and off-farm activities involvement of farmers (negative) are the main three determinants out of eight among rural farmers. Although researches have proven that goat raising is one of the major sources of living and many concerned stakeholders (governmental, non-governmental, and others) thus are promoting goat program in rural areas as one important intervention to reduce poverty, they should now consider the findings of this study for their relevant future activities, that is, more goat raising program should be only geared towards household having larger members, if the production is to increase and contribute to making Nepal self-sufficient.

## CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

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