Agricultural Economics Research Review
Vol. 27 (No.2) July-December 2014 pp 315-318
DOI: 10.5958/0974-0279.2014.00035.4

Research Note

Factors Determining Flock Size of Goats in Bundelkhand Region of Uttar Pradesh

A.K. Dixit* and M.K. Singh

Central Institute for Research on Goats, Makhdoom, Farah, Mathura, Uttar Pradesh, India

Abstract

The study has examined the factors determining flock size of goat using data collected from 194 goat-keeping households in 16 villages of Hamirpur and Mahoba districts in Bundelkhand region of Uttar Pradesh. The flock size has been found negatively and significantly associated with land-size, perhaps due to larger landholders' preference for large ruminants. On the other hand, the flock size is linearly associated with the availability of grazing resources. The coefficient of education of goat-farmers has been found negative. The other factors like age of goat farmers, family size, income and extent of awareness about improved goat practices have been found positive, however non-significant. The capacity building of goat-farmers is pertinent to bring a change in the goat-keepers' attitude towards adoption of critical inputs and improved management practices. The study has observed that support services like credit, improved common grazing resources, veterinary services and marketing of goats are required for increasing flock size of goats in the region.

Key words: Goat flock size, goat keeping, goat farmers, production system, Bundelkhand region

JEL Classification: Q13, Q10

Introduction

Bundelkhand region of Uttar Pradesh shares 11 per cent of the state's gross cropped area and crop failure due to erratic rain and droughts is a recurring phenomenon in this region. Crop production and animal husbandry are the main occupations of the people. Crop production, livestock rearing and seasonal outmigration contribute more than 90 per cent to the rural income in the Bundelkhand region (GoI, 2008). Livestock rearing provides a safety net to counter the recurring crop failures, irrespective of landholding size in this region. Goat farming, particularly among resource-poor people, is an important source of not only livelihood but of employment and nutrition also.

The present paper has studied effect of socio-economic status of goat farmers, availability of grazing sources, and awareness about improved goat practices on the flock size of goats. The study has provided an insight into goat-rearing in the Bundelkhand and other disadvantageous regions and may help the planners in designing goat development programmes for such regions.

Data and Methodology

The study was conducted on 194 goat-keeping households in the Hamirpur and Mahoba districts of Bundelkhand region of Uttar Pradesh under the Sustainable Livelihood Research Project (Component-3) of National Agriculture Innovation Project (NAIP). The baseline data on socio-economic profile, goat production system, production performance and marketing of goats were collected from 16 villages of Rath, Gohand and Muskara blocks of Hamirpur district and Jaitpur, Panwari and Charkhari blocks of Mahoba district through personal interview method for the year 2010-11.

* Author for correspondence
Email: akdixit@cirg.res.in

Multiple regression analysis was carried out to assess the factors determining flock size of goats. The explanatory variables considered to explain the size of flock were: age of goat-keeper (years), family size (numbers), education (schooling years), operational holding size per goat (hectares), annual household income (rupees); extent of grazing (number of active grazing days) and extent of awareness. The extent of awareness about improved goat practices was converted into scores as number of practices aware divided by the total number of practices asked. The extent of grazing was worked out by dividing the number of active grazing days by 365.

The economic *a-priori* of explanatory variables were: size of flock, which was used as the dependent variable in the regression analysis, and was measured in terms of number of goats. The independent variables included in the analysis were specified as age of goat-keeper which is an important determining factor and is positively associated with the accumulated experience and traditional knowledge of goat rearing. Family size was considered as a proxy for the likely household labour supply. The larger was its size, the higher was the availability of labour for goat-rearing; hence was expected to be of a positive sign. Operational landholding-size is one of the important factors determining the size of goats flock. It is considered a proxy of economic status as well as of assured feed and fodder supply of the household**.** However, in the case of goat-rearing, households having large landholdings prefer large ruminants. The variable education (schooling years) of goat farmers was expected to be of positive sign as it helps in adoption of improved management practices. The income of households helps in decision-making and plays an important role in determining the size of livestock holding; hence, was expected to have a positive sign. The extent of grazing was considered as a proxy of availability of grazing resources in the village. Similarly, the variable extent of awareness about improved goat practices was also expected to be of positive sign.

Results and Discussion

Goat Production System

The goat husbandry in the Bundelkhand region is well integrated with crop-livestock production. Nearly 63 per cent households keep goats along with cattle and buffaloes. The average flock size in the Hamirpur and Mahoba districts was 9.17 and 7.6 goats per household, respectively. The flocks were predominated by adult/ yearling females. The breeding bucks were available with merely 2 per cent of the goat keepers, viz. only with large flock owners. The villages with good access to bio-mass in community grazing land have larger flock size. The goats in grazing areas were looked after largely by children, women, aged people and youths. Except in the *rabi* season, the cultivable fields remain available for goat-grazing due to mono-cropping. The farmers who keep large flocks, graze their goats by own, whereas small flock owners rear goats on contract grazing. Kids were allowed suckling twice, in the morning and evening up to the age of 3-5 months. Kids born in a large flock, however, weaned little early (2-3months) and were also sent for grazing as a separate flock up to the age of 5-6 months. The majority of male kids (78%) and aged/low-producing female goats were sold through the middlemen (itinerant traders).The adoption of prophylactic measures, strategic feeding and breeding practices were less than 10 per cent across the goat-keepers.

The rate of contract grazing varied from ₹ 75 to ₹ 100 per goat per month across villages and seasons. The grazing hours varied from 5 to 8, depending upon the flock size, biomass availability and season. Supplementation of concentrate ration was given only to the lactating goats at the rate of 100-150 gram/goat/ day. The concentrate was mostly fed during the winter season when grazing by and large restricted due to crops cultivation. The green fodder was mostly provided in the form of lopped fodder. A large proportion of goat-keepers (47 %) with medium to large flocks and those who reared goats on contract grazing, maintained their goats for the entire year on common grazing lands. However, grazing pressure was continuously increasing on pastures and grazing lands and the productivity of these resources was continuously declining, which was in agreement with that reported by Saran *et al.* (2000) and Dixit *et al*. (2012).

Determinants of Flock Size

The multiple regression equation was fitted for factors determining the flock size. The value of adjusted R^2 was low at 0.236, which indicated that some other

Table 1. Determinants of flock size of goats in the Bundelkhand region

Variable	Coefficient	Standard error	t-value
Constant	0.457	2.720	0.168
Age of goat-keepers	0.058	0.039	1.486
Family size	0.154	0.169	0.913
Operational holding-size per goat	-2.876*	0.684	-4.203
Education	-0.155	0.107	-1.452
Household income	0.002	0.011	0.138
Extent of grazing	9.379*	1.800	5.208
Extent of awareness	0.399	3.060	0.130
Adjusted R^2	0.236		
N	194		

Note: *Denotes significance at 1 per cent level

variables not included in the model, might be important determinants of flock size (Table 1). Amongst different factors, the extent of grazing and operational holding-size per goat turned out to be significant. This might be due to the fact that majority of goats in the villages were being reared on range grazing. The reducing availability of land per goat was significantly reducing the flock size in the region. Contrary to expectations, the coefficient of variable education was negative, which indicated that larger flock sizes were related with less-educated goat-farmers.

Conclusions and Policy Implications

Goat rearing in the Bundelkhand region is well integrated with other livestock species and immensely supports the fragile livelihoods of the people. The flock-size of households varies with to socio-economic status, grazing resources, awareness about the improved goat practices, etc. the operational holding-size per goat and the extent of grazing have a significant effect on flock size. The regression results have shown that the age of the goat-keepers, family size, and extent of awareness have positive effect on flock size. Therefore, the goat farmers having more family members should be encouraged to increase flock size as an additional income source.

The significant effect of number of active grazing days which was proxy of availability of grazing resources, indicated the need of improvement of pasture lands through suitable technologies, measures and protection for sustaining the livelihood from livestock in this region. The existence of pastures and grazing lands is essential for sustainable livestock production for those households which operate on tiny pieces of land and face recurring crop failures, (Birthal *et.al*., 2013). Furthermore, the weakened stake of landless households in this eco-frazil region might be due to the depletion of grazing-based livestock production system. The study has suggested up-gradation of local goats with high potential bucks for prolificacy, milk and meat production, improvement in pastures, custom hiring of livestock feeding and health care services. The capacity building of goat farmers is essential to bring a change in their attitude towards scientific goat-rearing. Simultaneously, the goat keepers should be facilitated with support services like credit and marketing.

Acknowledgements

The authors are thankful to Dr A P Srivastava, National Coordinator (NAIP, Comp-3) for the technical guidance. The financial help provided by National Agricultural Innovative Project (NAIP), Indian Council of Agricultural Research (ICAR), New Delhi, is gratefully acknowledged. They are also grateful to the anonymous referee for providing helpful suggestions.

References

Birthal, P.S, Dikshit, A.K. and Negi, D.S. (2013) Economic and environmental contributions of livestock in mixed farming systems in India. The paper presented at the *National Seminar on New Paradigms in Livestock*

Production: From Traditional to Commercial Farming and Beyond, held at National Dairy Research Institute, Karnal during 28-30 January.

Dixit, A.K., Singh, M.K., Reddy, B.S. and Manohar, N.S. (2012) Potential of wastelands for mixed farming system in India. *Range Management and Agro-Forestry*, **33**: 118-122.

GoI (Government of India) (2008) *Report on Drought Mitigation Strategy for Bundelkhand Region of Uttar Pradesh and Madhya Pradesh*, Inter Ministerial Central Team (nraa.gov.in).

Saran, S., Singh, R.A., Singh, Rajvir, Rani, S. Issabella and Singh, K.K. (2000) Feed resources for rearing livestock in the Bundelkhand region of Uttar Pradesh. *Indian Journal of Animal Sciences*, **70**: 526-529.

Revised received: March, 2014; Accepted April, 2014