



**AgEcon** SEARCH  
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

*The World's Largest Open Access Agricultural & Applied Economics Digital Library*

**This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.**

**Help ensure our sustainability.**

Give to AgEcon Search

AgEcon Search  
<http://ageconsearch.umn.edu>  
[aesearch@umn.edu](mailto:aesearch@umn.edu)

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

---

## **Bovine Sector in Agriculturally Prosperous and Backward Regions: A Comparative Study**

**S. Subrahmanyam and R. Nageswara Rao\***

### **INTRODUCTION**

The bovine sector has a great potential for income and employment generation in the rural areas. But a number of constraints operate in the realisation of this potential because of its links with agriculture. Hence, the issue is debated considering the various aspects of the bovine sector.

Firstly, is bovine maintenance an important activity for the poor to supplement their income and employment from agriculture and casual labour? It is shown that the distribution of milch animals is less skewed than that of land and 60 per cent of the rural households own milch animals. Further, the landless, marginal and small farmers account for 72 per cent of the bovine owners (Khanna, 1989). But there is a criticism that the scheduled castes and scheduled tribes are not allowed to supply milk to the co-operatives revealing a bias against the weaker sections (George, 1986).

Secondly, does the spread of the bovine activity lead to a higher density of bovines? It is argued that the size of bovine population will be high in dryland agriculture because of the uncertainties involved in it (Patel, 1993). Thus with the development of irrigated agriculture, the bovine density is expected to decline.

Thirdly, is the bovine sector complementary to agriculture because it supplies draught animal power to this sector? The statewide cross-section data reveal positive correlation of the density of draught animal power with rainfall as well as the proportion of small and marginal farmers (Rao, 1994). The relation between the size of land holding and the maintenance of draught animal power is expected to be negative since a decline in the size of holding will not allow a proportionate decline in the draught animal power because of the indivisibilities involved. On the other hand, the proportion of households not maintaining draught animal power increases with a decline in the size of holding (Vaidyanathan, 1988).

The paper attempts to examine the above issues using the field survey conducted in Coastal Andhra, an agriculturally prosperous region and Telangana, an agriculturally backward region in Andhra Pradesh. The field study was conducted in 1993 covering 900 bovine households in each region spread over 60 villages (for details on sampling, see Subrahmanyam *et al.*, 1995).

### **DISTRIBUTION AND DENSITY OF BOVINES**

The distribution and density of bovines are not uniform between the two regions. While two out of every three households maintain bovines in Coastal Andhra, only one-half of the households in Telangana participate in this sector. The participation increases with the size of land holding, but the rate of increase is more rapid in Telangana. Further, the ownership rate of bovines by the landless and marginal farmers is lower in Telangana (13.5 per cent

---

\* Senior Fellow and Associate Fellow, respectively, Centre for Economic and Social Studies, Begumpet, Hyderabad-500 016 (A.P.).

The authors are grateful to P. Venkatramaiah for his suggestions in the preparation of this paper.

and 46 per cent) than in Coastal Andhra (20.6 per cent and 60.3 per cent).

While a larger proportion of households maintain bovines in Coastal Andhra, the average herd size per household is lower. The average size of the herd per bovine household is only 3.1 in Coastal Andhra as against 4.8 in Telangana. This higher herd size in Telangana more than compensates the lower participation rate and results in a higher ratio of bovines to human population. The number of bovines per rural household is higher in Telangana than in Coastal Andhra (2.4 as against 2).

The higher density of bovines relative to human population in Telangana is mainly contributed by the large farmers. Though each land holding group in Telangana has a higher herd size as compared to its counterpart in Coastal Andhra, the difference is very high in the case of large farmers. While the large farmers in Coastal Andhra maintain 5.7 bovines per household, their counterparts in Telangana maintain as high as 9.2 bovines. Thus the bovine sector of the backward region has a narrow base, high inequality and high density (Table I).

TABLE I. MAINTENANCE OF BOVINES BY LAND HOLDING GROUPS

Land holding category (1)	Percentage to total households		Average number of bovines per household		Percentage of pure milch holdings	
	Coastal Andhra (2)	Telangana (3)	Coastal Andhra (4)	Telangana (5)	Coastal Andhra (6)	Telangana (7)
Landless	20.6	13.5	2.2	2.5	83.3	74.2
Marginal	60.3	16.0	2.6	3.2	65.1	31.4
Small	80.7	70.2	3.5	4.0	47.6	18.0
Medium	87.8	83.7	4.0	5.1	47.9	9.3
Large	86.5	91.7	5.7	9.2	46.7	7.0
Overall	66.9	49.5	3.1	4.8	58.1	22.0

Though caste influences the participation in the sector, the differences are much sharper in the backward region. The ownership rates of different caste groups, viz., the scheduled castes and tribes, backward castes and forward castes are closer to the region's average with backward castes having the highest participation in the developed region. On the other hand, in the backward region of Telangana forward castes have the highest participation rate which is far above the overall participation rate. For instance, against the region's average of 49.5 per cent, the maintenance rate is as high as 66.6 per cent among the forward castes, while the rate among the scheduled castes is only 39.5 per cent. This pattern in Telangana is due to the association between caste and land ownership, on the one hand, and between land base and bovine keeping, on the other. Thus the bovine sector of Telangana does not contribute much for the development of weaker sections.

#### EMERGENCE OF BOVINE AS INDEPENDENT SECTOR

The bovine sector may emerge as an independent sector or remain as subsidiary to agriculture. If it is emerging as an independent sector, pure milch animal holdings dominate and if it is subsidiary to agriculture, pure work animal and mixed holdings will predominate.

The bovine sector of Coastal Andhra is emerging as an independent sector with 58 per cent of the holdings being pure milch animal holdings whereas in Telangana this sector is subsidiary to agriculture with 78 per cent of the holdings being mixed and pure work animal

holdings (Table I).

As the size of land holding increases, the bovine sector link between agriculture and the bovine sector is expected to become stronger and hence the proportion of pure milch animal holdings is expected to decline. This association is stronger in Telangana as compared to Coastal Andhra. For instance, while the proportion of pure milch animal holdings is constant around 47 per cent across small, medium and large land holding groups in Coastal Andhra, the corresponding proportion in Telangana falls from 18 per cent among small farmers to 7 per cent for the large farmers.

#### ANIMAL DRAUGHT POWER

It is argued that the decline in the size of land holding results in an increase in the demand for draught animals because of their indivisibility. This need not always be true. While the sub-division of land leads to an increase in the demand for draught power, agricultural development may lead to the development of hire market for animal power and substitution of mechanical power for animal power. The total effect depends on the relative strengths of these two factors. The results for the two regions indicate that the effect of agricultural development dominates the effect of sub-division. For instance, the maintenance of draught power declined from 43 animals per 100 acres in Telangana to 27 animals in Coastal Andhra, though the average size of holding is smaller in Coastal Andhra. This reduction is uniform in each land holding group but sharper in the case of larger farmers (Table II). The share of mechanical power is almost 40 per cent in Coastal Andhra as against 6 per cent in Telangana. Further, the development of hire market for animal power is also very low in Telangana. While one-third of the animal draught power is from the hire market in Coastal Andhra, it is only one-tenth in Telangana. The marginal farmers in Coastal Andhra depend almost completely on animal power but participate actively in the hire market reducing their total requirement. The large farmers, depending mainly on mechanical power, also reduce their requirement of animal draught power. These patterns are absent in the backward region and hence the demand for draught animals is very high.

TABLE II. DRAUGHT ANIMALS AND HIRED DRAUGHT ANIMAL SERVICES IN AGRICULTURE

Land holding category	Draught animals per 100 acres		Percentage of animal power		Percentage of hired-in animal power		Ratio of hired-out to own use	
	Coastal Andhra	Telangana	Coastal Andhra	Telangana	Coastal Andhra	Telangana	Coastal Andhra	Telangana
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Marginal	51	122	94.8	99.7	48.7	18.5	2.0	1.2
Small	37	65	57.6	95.1	37.6	12.2	1.4	1.0
Medium	20	44	81.0	97.2	27.1	7.2	0.1	0.2
Large	7	24	50.2	88.6	34.5	11.0	Neg.	0.1
Overall	27	43	60.5	93.7	32.9	10.5	1.0	0.6

Note: One hour of tractor is taken as 8 hours of bullock pair. Neg.= Negligible.

#### COMPOSITION OF BOVINES

Sex composition of bovines reveals the priority for draught power and milk production. The dominance of adult females in Coastal Andhra and adult males in Telangana reveals their distinct priorities for dairying in the former and draught power in the latter.

The size of land holding influences the bovine sex ratio (females per male) because of the differences in the feasibility for mechanisation, the indivisibility of draught animal units and the priority of the households for dairying as a supplementary source of income and employment. The sex ratios of bovines vary considerably across land holding groups in Coastal Andhra whereas the ratios are more or less the same in Telangana. In Coastal Andhra, the sex ratio declines with the size of land holding upto a point and then increases. This indicates the importance of dairying for very small as well as large land holding groups. For instance, the sex ratio of bovines in Coastal Andhra declines from 2.2 among marginal farmers to 1.6 among small farmers and then it increases to 2.8 among large farmers (Table III). Since the large farmers depend on mechanisation whereas the marginal farmers get the draught power from the lease market, their relative priority for the maintenance of draught power is lower. On the other hand, the small farmers need draught power not only for agricultural operations but also for transport of inputs and output. The sex ratio of bovines in Telangana is very low at 0.9 and it is the same across land holding groups. The low and constant sex ratio accompanied by an increase in the herd size with the size of land holding indicates that the farmers increase both males and females in the same proportion. This is an indication that draught power is the top priority and female animals are maintained mainly for male progeny.

TABLE III. SEX AND BUFFALO-CATTLE RATIOS

Land holding category	Sex ratio		Buffalo-cattle ratio					
			All bovines		Adult males		Adult females	
	Coastal Andhra	Telangana	Coastal Andhra	Telangana	Coastal Andhra	Telangana	Coastal Andhra	Telangana
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Landless	5.5	3.1	6.3	2.0	0.4	0.06	12.5	4.0
Marginal	2.2	0.8	4.1	0.6	0.6	0.06	13.1	2.1
Small	1.6	0.8	3.1	0.6	0.5	0.05	16.0	2.7
Medium	1.8	0.9	2.8	0.6	0.2	0.04	19.0	1.8
Large	2.8	1.1	3.1	0.6	0.2	0.11	8.8	1.6
Overall	2.3	0.9	3.6	0.6	0.4	0.06	10.3	1.9

Sex ratio differences reflecting priorities for draught power and milk production are likely to be extended to the composition of bovines according to the species. While cattle are used for draught power, milk production can be achieved through cow or she-buffalo. The low ratio of buffalo to cattle in Telangana also supports the earlier observation that draught power is the priority in this region. On the other hand, the high ratio of buffalo to cattle in Coastal Andhra indicates high priority for milk production and also the preference for buffalo over cow as milch animal. For instance, the ratio of buffalo to cattle is as low as 0.62 in Telangana, while the corresponding ratio is 3.61 in Coastal Andhra.

There is a difference in the buffalo to cattle ratio between males and females. The ratio is very low among adult males and very high among adult females, indicating that cattle are preferred for draught power and buffalo for milk production. In Telangana where adult males dominate because of the priority for draught power, the ratio of buffaloes to cattle is as low as 0.06 while the corresponding ratio for Coastal Andhra where milk production is the priority is 0.42. Thus Coastal Andhra has a substantial number of buffaloes even among

adult males, indicating that they are also put to productive use in this region. The ratio among adult females is very high at 10.34 in Coastal Andhra as against 1.85 in Telangana, indicating that buffalo is preferred for milk production in both the regions, but because of greater priority for draught power in Telangana, cows are also maintained in substantial number for male progeny. This preference for buffalo for milk production and cattle for draught purpose has significant implications on the herd size in Telangana. With greater dependence on animal draught power and maintenance of cow for male progeny, the maintenance of buffaloes for milk production increases the bovine density in the region. If a male buffalo is also used for draught power or cow is used for milk production, this problem does not arise.

#### ADOPTION OF TECHNOLOGY

The proportion of graded/crossbred bovines is higher in Coastal Andhra than in Telangana (Table IV). In Coastal Andhra, 19.7 per cent of the bovine households maintain crossbred/graded bovines which account for 17.2 per cent of the milch animals. The adoption is so low in Telangana that only 3.1 per cent of the households maintain crossbred/graded bovines accounting for only 7.4 per cent of the milch animals.

TABLE IV. MAINTENANCE OF CROSSBRED AND GRADED BOVINES

Land holding category (1)	Percentage of households		Percentage of crossbred/graded milch animals	
	Coastal Andhra (2)	Telangana (3)	Coastal Andhra (4)	Telangana (5)
Landless	26.6	1.6	26.5	2.4
Marginal	13.5	1.3	14.0	2.4
Small	16.3	2.1	11.7	4.0
Medium	16.4	2.6	11.3	5.2
Large	24.9	8.9	24.1	14.0
Overall	19.7	3.1	17.2	7.4

It is often argued that the poor cannot maintain milch animals of superior breeds because of the financial constraints. The argument is valid only in the backward areas. In Coastal Andhra, the maintenance of superior breeds is the highest among the landless (26.5 per cent), followed by the large farmers (24 per cent) and substantially lower in all the other land holding groups. In the case of Telangana, only the large farmers maintain superior milch animals. Thus the landless benefit from dairying in Coastal Andhra but not in Telangana.

#### CONCLUSION

The bovine activity emerges as an independent sector with a wider base and higher proportion of pure milch animal holdings in the prosperous Coastal Andhra. In the backward Telangana, it is confined to a narrow base with high density and high inequality. Because of the priority for draught animal power, milk production is of secondary importance. The absence of mechanisation of agriculture and low development of hire market for animal draught power are the constraining factors.

## REFERENCES

- George, S. (1986), "Faulty Lactometers I: Village Level Evaluations of Operation Flood", *Economic and Political Weekly*, Vol. 21, No. 22, May 31, pp. 963-971.
- Khanna, R.S. (1989), "A Historical Perspective of Dairy Development in India", *Indian Dairyman*, Vol. 41, No. 10, October.
- Patel, R.K. (1993), "Present Status and Promise of Dairying in India", *Indian Journal of Agricultural Economics*, Vol. 48, No. 1, January-March, pp. 1-33.
- Rao, C.H. Hanumantha (1994), *Agricultural Growth, Rural Poverty and Environmental Degradation in India*, Oxford University Press, New Delhi, Chapter 10.
- Subrahmanyam, S.; M. Jagadeeswara Rao, C. Ratnam and R. Nageswara Rao (1995), *Bovine and Dairy Development in Andhra Pradesh: An Analysis of Regional Variations*, Booklinks Corporation, Hyderabad (forthcoming).
- Vaidyanathan, A. (1988), *Bovine Economy in India*, Centre for Development Studies, Trivandrum.