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

*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.*

Vol XX
No. 1

ISSN 0019-5014

CONFERENCE NUMBER

JANUARY-
MARCH
1965

INDIAN JOURNAL OF AGRICULTURAL ECONOMICS

INDIAN SOCIETY OF
AGRICULTURAL ECONOMICS,
BOMBAY

and production, (3) herd management, (4) labour efficiency and (5) capital efficiency.

There was a considerable range in the degree of efficiency with which the various factors were used. For example, the least efficient group obtained 1,683 litres of milk per buffalo while the most efficient group obtained 1,760 litres. Moreover, the most efficient group obtained higher milk yield at considerably less feed cost per buffalo. There is little difference in the milk yield per lactation per buffalo between the first and the second group but the latter group obtains about the same production at higher feed costs (mainly due to better balanced concentrate mixture). However, while the first group is labour intensive, due to surplus available family labour, the second group is able to manage with a little less than half man-equivalent days per buffalo. The third group though a better utiliser of feeds and obtains highest production per buffalo yet it is less efficient in utilising labour. The cumulative effect of all factors is reflected in the returns which increase with increase in size. The most efficient group had the largest herd and made best use of labour and capital and was feeding most economically.

ECONOMICS OF LIVESTOCK ENTERPRISE: USE OF COWS FOR DRAUGHT PURPOSE

A. R. RAJAPUROHIT

AND

S. W. MURANJAN*

Gokhale Institute of Politics and Economics
Poona-4

I

The use of cows as a source of milk and the supply of bullocks for the power requirements in agriculture are well known. The utility of cow itself as the source of draught power is, however, not yet realised except in a few highly localised regions in the country. Ignorance, bias and social inhibitions seem to be the prime factors which have checked the advancement in the matter in spite of its adaptability under certain conditions.

It is true that no systematic studies have been made in the context of this problem in India; neither do the surveys from southern and eastern India throw any light on the problem in spite of its concentration in those areas. The figures

* We are grateful to Dr. Otto Schiller for pointing out to us the use of cows in West Germany for the draught purpose, which led to the present exploration of the problem in India.

from the Livestock Census of India given in Table I indicate the magnitude of the use of cows in the different States.

TABLE I—PROPORTIONS OF WORKING BULLOCKS AND WORKING COWS IN THE DIFFERENT STATES OF INDIA

	State	Per cent of working bullocks to the number of male cattle over 3 years	Per cent of working cows to the number of female cattle over 3 years	Per cent of working cows to the total number of working cattle
1.	Madras	92·58	16·18	12·48
2.	Mysore	94·23	8·33	7·66
3.	Assam	90·61	7·51	6·82
4.	Orissa	96·86	6·25	4·63
5.	Bihar	97·16	6·96	4·61
6.	Andhra Pradesh	94·06	4·48	3·57
7.	Madhya Pradesh	96·27	3·87	1·74
8.	Kerala	91·90	0·71	1·26
9.	West Bengal	95·90	0·83	0·70
10.	Rajasthan	96·41	0·35	0·44
11.	Bombay	97·04	0·45	0·32
12.	Jammu & Kashmir	97·15	0·09	0·11
13.	Punjab	98·92	0·09	0·07
14.	Uttar Pradesh	98·82	0·02	0·01
15.	Himachal Pradesh	97·07	0·01	0·01
16.	Centrally Administered Territories			
	(a) Manipur	88·98	33·37	28·46
	(b) Delhi	97·49	0·42	0·35
	(c) Tripura	91·85	0·34	0·30
	(d) Andaman & Nicobar	95·26	0·01	0·01
	(e) Laccadive Islands	—	—	—
	India: Total	96·31	3·68	2·85

Source : Indian Livestock Census, 1956, Vol. II (Detailed Tables), Directorate of Economics and Statistics, Ministry of Food and Agriculture, Government of India, pp. 6-35.

It would be observed from Table I that Madras State ranks first in the use of cows for work, wherein 16.18 per cent of the cows are put to work and they account for 12.48 per cent of the working cattle in the State. Next in importance are the States of Mysore, Assam, Orissa and Bihar wherein 6 to 9 per cent of the cows are put to work and they account for 5 to 8 per cent of the total working cattle. In the State of Andhra Pradesh and Madhya Pradesh nearly 4 to 5 per cent of the

cows are put to work whereas in the remaining States the proportions are insignificant. In the Centrally Administered Territories, Manipur is the only area wherein 33 per cent of the cows are put to work and they account for 28 per cent of the working cattle in the area.

If we try to analyse the data further in the districts in those States having some significant proportion of working cows, we get a more detailed picture. The proportions of working cows to the total working cattle in the different districts of the States having a significant proportion, are given in Table II. The districts in a State are also ranked in the table according to the size of the proportion. It would be observed that in some of the districts as Salem in the Madras State and Bangalore in the Mysore State, nearly one-third of the working cattle population consists of cows, whereas in Madurai in the Madras State, Kolar, Mandya, Mysore and Hassan in the Mysore State, Goalpara in the Assam State, Koraput and Phulbani in the Orissa State, Ranchi and Singhbhum in the Bihar State and Bastar in the Madhya Pradesh State, the proportions vary from 15 to 25 per cent. In the light of the male-female ratio of nearly 40-50 : 50-60 in these districts, these proportions indicate that cows are being put to work on quite a sizable scale in these areas. One may get even a more detailed picture if one goes to the taluka or the tehsil level.

TABLE II—PROPORTIONS OF WORKING COWS TO THE TOTAL WORKING CATTLE IN THE DIFFERENT DISTRICTS IN THE SELECTED SEVEN STATES OF INDIA

1	2	1	2	1	2	1	2
Madras		Mysore		Assam		Orissa	
1. Salem	31.90	1. Bangalore	35.00	1. Goalpara	16.58	1. Koraput	20.46
2. Madurai	18.29	2. Kolar	20.41	2. Kachar	10.74	2. Phulbani	18.78
3. North Arcot	12.39	3. Mandya	20.09	3. Lakhimpur	8.03	3. Mayurbhanj	11.38
4. Tiruchirapalli	11.50	4. Mysore	16.18	4. Garo hills	7.95	4. Keonjhar	7.54
5. Coimbatore	11.29	5. Hassan	14.14	5. U.K. & J. Hills	6.33	5. Sundargarh	4.28
6. South Arcot	9.71	6. Tumkur	11.25	6. Darrang	5.75	6. Ganjam	2.42
7. Ramanathapuram	7.63	7. South Kanara	1.91	7. Kamrup	4.74	7. Balasore	0.96
8. Madras	2.57	8. Coorg	1.58	8. Mikir Hills	4.38	8. Kalahandi	0.79
9. Nilgiri	1.31	9. Bidar	1.49	9. Nowgong	3.64	9. Dhenkanal	0.77
10. Chingleput	0.90	10. Chitradurg	1.44	10. Sibsagar	1.80	10. Puri	0.64
11. Kanyakumari	0.72	11. Gulburga	1.42	11. Mizo Hills	0.72	11. Cuttack	0.50
12. Tanjore	0.48	12. Chikmaglur	0.86	Total Assam	6.82	12. Bolangir	0.46
13. Tirunelveli	0.33	13. Bijapur	0.83			13. Sambalpur	0.35
Total Madras	12.48	14. Raichur	0.61			Total Orissa	4.23
		15. Shimoga	0.46				
		16. Dharwar	0.34				
		17. Bellary	0.25				
		18. Belgaum	0.18				
		19. North Kanara	0.11				
		Total Mysore	7.66				

(Contd.)

TABLE II (*Concld.*)

1	2	1	2	1	2
Bihar		Andhra Pradesh		Madhya Pradesh	
1. Ranchi	17.89	1. Nalgonda	12.21	1. Bastar	24.34
2. Singhbhum	16.40	2. Warrangal	11.32	2. Mandla	6.94
3. Santhal Parganas	8.17	3. Chittoor	9.31	3. Seoni	5.37
4. Bhagalpur	4.32	4. Khammam	6.78	4. Chhindwara	2.18
5. Hazaribag	3.39	5. Visakhapatnam	3.09	5. Balaghat	1.20
6. Purnea	3.33	6. Krishna	2.69	6. Morena	0.65
7. Muzaffarpur	2.48	7. Mahabubnagar	2.23	7. Bilaspur	0.48
8. Saharsa	2.34	8. Cuddapah	2.19	8. Gird	0.40
9. Patna	1.90	9. W. Godavari	2.19	9. Dhar	0.35
10. Dhanbad	1.88	10. Karimnagar	2.05	10. Ratlam	0.33
11. Monghyr	1.68	11. Medak	1.56	11. Durg	0.32
12. Gaya	1.66	12. Hyderabad	1.45	12. Ujjain	0.23
13. Darbhanga	1.64	13. Srikakulam	1.32	13. Jhabua	0.23
14. Shahabad	1.09	14. Adilabad	1.30	14. Indore	0.23
15. Champaran	1.08	15. Anantpur	1.38	15. Dewas	0.21
16. Saran	0.40	16. E. Godavari	1.09	16. Jabalpur	0.20
17. Palamau	0.24	17. Guntur	1.03	17. Hoshangabad	0.13
Total Bihar	4.61	18. Nizamabad	0.77	18. Bhind	0.12
		19. Nellore	0.75	19. Raipur	0.12
		20. Kurnool	0.59	20. Raigarh	0.11
		Total Andhra Pradesh	3.57	In the remaining 23 districts, the proportion is either nil or below 0.1 per cent)	
				Total Madhya Pradesh	1.74

1 : State and the District. 2 : Per cent of working cows to the total working cattle.

A further attempt is made to locate the districts in which the proportion of working cows to the total working cattle is nearly 10 per cent or more. The location of these districts clearly indicates that there are three distinct zones in the country, in which a sizable proportion of the cows is put to work. The first zone is almost a triangular block and consists of 13 districts from Southern India. It is bound on the north by Tumkur, Kolar and Bangalore districts of the Mysore State, on the east by Chittoor district of the Andhra Pradesh and the North and

South Arcot districts of the Madras State, on the south by Tiruchirapalli and Madurai districts of the Madras State and on the west by Coimbatore district of the Madras State and Mandya and Hassan districts of the Mysore State. The other zone consists of the elongated narrow strip starting from the north-eastern part of Andhra Pradesh and ending in the Ranchi district of Bihar State after passing through the Madhya Pradesh and the Orissa States. This strip starts from the Nalgonda and the Warrangal districts of Andhra Pradesh and passes through the Bastar district of Madhya Pradesh into the Koraput and Phulbani districts of Orissa. Here it is discontinued for a part by the Keonjhar district of Orissa wherein the proportion is a little less than 10 per cent, *viz.*, 7.54 per cent. It again continues from the Mayurbhanj district of Orissa and ends with the Singhbhum and Ranchi districts of Bihar. The third zone is located in Assam and Manipur where though only two of the districts, *viz.*, Goalpara and Kachar have a proportion of above 10 per cent, there are a number of districts between 5 and 10 per cent and they are spread over the entire State.

The first and the second zones are totally disconnected by the districts of Andhra having a proportion of even less than 1.5 per cent. In between the second and the third zone the Dhanbad, Monghyr and Purnea districts of Bihar and the Darjeeling district of West Bengal give a proportion of nearly 2 per cent whereas in the Santhal Parganas the proportion is as high as 8.17 per cent.

The data from the livestock census clearly indicate that cows are being put to work on a sizable scale even in India though the areas in which this practice is adopted are highly localised. One cannot, however, get an idea of the nature of the work done by these cows in those regions for want of any surveys and studies relating to the problem. A case study conducted by us for one of the villages in the Bangalore district of the Mysore State, given below tries to explore this aspect of the problem in one of the regions.

II

Baginigere, which belongs to Magadi taluka of Bangalore district in Mysore is a small village with 135 households. The village has 534 acres of cultivated land of which 160 acres are irrigated by tank water. *Ragi* is the main crop grown on the dry cultivated land with pulses like horse gram, cow pea, pigeon pea and green gram as line crops. Of the irrigated land, 150 acres are under paddy and 10 acres are under sugarcane. Due to scarcity of water supply during the late winter and the whole of summer, second paddy crop is very rare.

A large majority of the families belong to the *Vakkaliga* caste. They are religious-minded and like other Hindus respect cow as a sacred animal. Still all the farmers in this village were found using cow for draught purpose.

The cow in Baginigere belongs mainly to the Amritmahal breed. The Hallikar breed is also not uncommon and many of the cows and bullocks in the village consist of a mixture of these breeds and their local variants. Table III gives an idea about the extent of use of cow for draught purpose for 37 farm families in this village. The figures in the table reveal the fact that all the cows—dry or milch—are used as draught animals.

TABLE III

Size-groups (in acres)	No. of farm families	No. of farm families owning cows	Total No. of cows	No. of working cows giving no milk	No. of working cows giving milk	No of she-buffaloes giving milk
Up to — 2·50	11	7	7	3	4	—
2·51 — 5·00	8	6	7	4	3	—
5·01 — 10·00	7	7	15	6	9	2
10·01 — 15·00	7	7	23	11	12	6
15·01 — 20·00	4	4	10	4	6	4
Total	37	31	62	28	34	12

Like a bullock, cow's nose is also punched to tie the nose string which is necessary to use an animal for draught purpose. Cow labour is, however, not used for carting purpose. Those who have bigger holdings possess bullocks, along with cows, mainly for ploughing and carting purposes. As there is no lift irrigation, there is no problem of using cattle labour for watering purpose.

In Table IV, figures are given about the percentage of working cows to total working cattle according to the size-group of the farmers. Smaller farmers have reported higher percentages of working cows to total working cattle.

TABLE IV

Size-groups (in acres)	No. of farm families	Cultivated area (acres)	No. of working bullocks	No. of working cows	Total No. of working cattle	Percentage of working cows to total working cattle
Up to — 2·50	11	13·60	—	7	7	100
2·51 — 5·00	8	29·62	—	7	7	100
5·01 — 10·00	7	56·74	6	15	21	71
10·01 — 15·00	7	73·75	14	23	37	62
15·01 — 20·00	4	55·85	8	10	18	55
Total	37	229·56	28	62	90	69

All the big cultivators own both bullocks and cows whereas many small farmers own only cows. Some small farmers, however, own neither cows nor bullocks. The small farmers who wholly depend upon cow labour are self-sufficient in respect of the cattle power supply except that at the time of transporting manure to the fields or bringing the farm produce home, they have to hire a bullock cart or engage labourers to do the job on head load. Those who own single cows co-operate in exchange of cows at the time of work. Six small

farmers, *viz.*, 4 in the first group and 2 in the second group who have neither cows nor bullocks, exchange human labour with cow labour. One man-day's work is considered in this case equivalent to 2 cow-day's work. Similarly a farmer can exchange human labour with bullock labour also. In that case, the rate of exchange is two man-days for two bullock-days. Cow labour got in exchange is used for agricultural operations like ploughing, harrowing, and weeding, whereas the bullock labour in this respect is used for carting purpose only. The cart is given free of any rent for the purpose. Though this is the nature of the general practice in the village, these rates vary according to the supply and demand conditions and the mutual relations. There is, however, no practice of renting the cows for cash.

Cow labour is used for all the agricultural operations—both on dry and irrigated land. As figures in Table V show, farmers in different size-groups growing paddy and *ragi* depend upon cow labour. None of the farmers, however, reported any area under sugarcane. The area under fallow land shows the significance of the practice of keeping the *ragi* land fallow once in 2-3 years to sustain the fertility of the land. The grass grown on the fallow land is used for feeding the cattle. There is no public grazing land in this village.

All the farmers keep the cow for treble purpose use. Firstly, cow is kept for the draught purpose. As pointed out earlier, even the big holders who possess bullocks use their cows also for draught purpose. According to the opinion of the farmers, cow is in no way inferior to bullock for ploughing and other agricultural operations. Cow is generally given an extra feed in the form of soaked horse gram when it is used for work. As none of the farmers own any iron plough, it is not known whether the cows can draw an iron plough. And also, as mentioned earlier, there is no lift irrigation in the village and the farmers do not know whether cows can be used for lifting water.[1]

Secondly, cow is kept for breeding. Since the cows can be used for farming, the male calves are reared for 2 to 3 years and are disposed off in the cattle market at Hassan. As Amritmahal and Hallikar are good draught breeds, the male calves fetch a good price, which may vary from Rs. 400 to Rs. 600 per grown up calf. During the last five years, farmers holding land up to 5 acres disposed off all the male calves which numbered 11 before they reached the age of 3. Those who had holdings from 5-10 acres disposed off 8 out of 10 such calves during the same period. The well-to-do farmers, *viz.*, owning above 10 acres, however, do not dispose off all the male calves. During the last five years, such farmers disposed off 16 out of 25 male calves. Besides, they reported the sale of 4 grown up bullocks during the same period. All the bullocks owned by the big farmers in the village are home-bred.

Thirdly, cow is kept for milk purpose. The milk yield of the Amritmahal cow is, however, very low. On an average, a cow gives only half a seer of milk per day. If the cow has a male calf, the farmer usually stops milking after two months. The milk is mainly home consumed. Besides the cows, 12 big farmers

1. The Salem District Gazetteer, however, reports as follows:—"The 'Tiruchengoda' breed is of a diminutive size, the cows are excellent milkers. The use of cows for ploughing and baling water is not uncommon in the Talaghat." Madras District Gazetteers—District Salem—Vol. I, Part I, 1918, p. 34.

TABLE V—AREA UNDER DIFFERENT CROPS ACCORDING TO SIZE OF HOLDING OF 37 FARM FAMILIES IN BAGINIGERE (1963-64)

Size-groups (in acres)	No. of farm families	Area under (in acres)			
		Ragi with line crops	Paddy	Current fallow	Total
Up to 2·50	11	9·53	2·32	1·75	13·60
2·51 — 5·00	8	17·12	6·50	6·00	29·62
5·01 — 10·00	7	29·00	6·87	20·87	56·74
10·01 — 15·00	7	40·15	13·70	19·90	73·75
15·01 — 20·00	4	27·00	5·90	22·95	55·85
Total	37	122·80	35·29	71·47	229·56

are keeping 12 she-buffaloes. They are supplying the buffalo milk to a co-operative milk collecting centre situated in a neighbouring village. The farmers say that the practice of using milch cows for work purpose does not affect the milk yield.[2] The cow is, however, not available for work during the period of two months approaching the birth of the calf and during the period of one month thereafter. There are, however, cases in this village when the cows were used for work even during these periods.

III

The case study of the village Baginigere indicates that all the cows including even those in milk are used for the draught purpose. The Livestock Census, however, divides the total female cattle population over three years into groups as the cows in milk, dry, not calved, others *and* the cows used *only* for work. It is quite possible that many of the cows used for work in the different districts might have been included in the other classes as cows in milk, not calved, etc. If this is true, the real proportions of working cows to the total working cattle in the different districts and the States might in fact be much higher than those calculated in the first part of the paper.

The case study as well as the enquiries round about indicate that punching of the nose of a cow is a common practice in the area and no discrimination is made between a cow and a bullock in this respect. The cows are not considered in any way inferior to the bullocks in performing the processes which require a low draught power as ploughing with the wooden plough, harrowing, sowing and interculturing. It is, however, doubtful whether they can be used for processes as ploughing with an iron plough, carting and lifting water which require a heavy draught power.

Amritmahal is the breed which is very common in the village Baginigere as well as the Bangalore district. It is solely a draught purpose breed. An

2. We learnt that in West Germany there was a reduction of 25 per cent in the milk yield of a cow in those periods when the cow is made to work on the farm.

Amritmahal cow weighs 700 lbs., that is, only two-thirds of the weight of the bullock. The cows of most of the other breeds have an equal weight or weigh even more in some of the cases. This is indicative of the fact that the bullocks of many other breeds could be easily replaced by the cows for the processes requiring a relatively low draught power.

Under certain conditions as enumerated below, it may be possible, according to one's own convenience, to use the cows for draught purpose. Firstly, many small farmers in India do not possess bullocks mainly because they do not afford to pay for their high prices. Such farmers may be already keeping cows for milk and breeding purposes. Or they may even purchase cows which they afford to do. In Baginigere it is revealed that small farmers are entirely depending upon cows for draught purpose. Such farmers in other parts of India may conveniently adopt the practice of using cows for draught purpose provided the soil conditions and the production practices are suitable.

Secondly, cows can be used for some peak hour demand in agricultural operations like inter-cultivation even by the medium and big holders. As the present conditions show, many farmers experience the shortage of animal power during certain peak hours in farm operations, as they are wholly depending upon bullock power. Use of cows along with the bullocks for such operations may prove convenient for these farmers.

Thirdly, assuming a condition in which heavy operations like deep ploughing, lifting water and carting are mechanized in respect of a big farmer or a co-operative farming society, instead of maintaining some bullocks for lighter operations like harrowing, sowing and inter-cultivation, it may be possible to keep cows for the same.

Besides these, one may think of many other conditions where cow power may be used for farm operations. Further research is necessary for demonstrating to what extent the cow as a dual purpose animal would compete with the bullocks under different conditions.

The present paper simply makes an attempt to bring to light the practice of using cows for draught purpose in a part of the country. Whether the practice would be extended to the other areas would depend amongst other things upon its technical possibility and economic benefits. This would, however, require a more detailed study of the practice in the different zones in which the cow is being used at present for draught purpose as well as experimentation with different breeds under varying conditions.