

A Survey on Livestock Services Use Pattern in Southern Peninsular India

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Abstract: A survey was undertaken in Southern peninsular state of India, Tamil Nadu, to assess the uptake of livestock services by farmers from various types of service providers for getting their animals treated and bovines bred. The study revealed that 51.55% animal ailments were attended to at public veterinary centres, while 31.85% by veterinarians and 9.85% by para-veterinarians through home services. The role of traditional healers, shops dispensing 'over the counter' medicines and private veterinary clinics were limited in rendering animal healthcare services. The treatments were skewed towards cattle among all categories of service providers. Of the cases reported to the public veterinary centres in the study area, the number of acute medical cases was more followed by chronic medical, gynaecological, acute surgical, chronic surgical and obstetrical cases. Considering the cases attended to by veterinarians through home services, acute medical cases followed by obstetrical cases predominantly attracted the role of veterinarians, although a limited number of other categories of cases were also attended to. Para-veterinarians seemed to have been called for treating obstetrical cases, especially for dystocia and retained placenta mostly, followed by acute medical cases and acute surgical cases to a certain extent. Although, the public veterinary centres were the single major animal health care providers, their role appeared to have been lesser than expected. Contrastingly, the public veterinary centres were the major bovine breeding service provider in the study area, while, natural breeding still remained to be an important mode of breeding.

Key words: Livestock services, animal healthcare, bovine breeding, livestock service providers

INTRODUCTION

Livestock has been an integral part of the Indian rural economy and an indispensable tool of income and employment generation to millions of poor households across the country, besides being a major source of protein and supplementary nutrition, draught power, fertilizer, fuel and a store of wealth. Livestock plays a crucial role in national economy, especially for the rural vulnerable landless and women folk, employing over 11 million of them in principal and 8 million in subsidiary status which is about 5% of total working force in the country. However, the livestock production systems across the country are characterized by low input and low productivity, with the system of production by and large being 'extensive'. Majority of livestock owners are only marginal farmers with an average herd size of 3.7 cattle and buffaloes. In case of small ruminants, the production system is either nomadic (30%) or sedentary (70%). There

is also an inverse relationship between land and livestock holdings, excluding landless category (Ravishankar and Birthal, 1999) indicating better equity of farmers with respect to livestock holding. That is, the distribution of livestock is more equitable than that of land, with the bottom 60% of rural households owning 65% of milch animals, leading to a much more equitable distribution of gains from livestock production (Ahuja *et al.*, 2000).

Although, the production potential of livestock depends primarily on the quality of nutrition, genetic upgradation and upliftment of animal health status, these factors, unfortunately, continue to be poor in almost all the states of the country. While the productivity improvement is likely to result in a rapid increase in the demand for quality livestock services, the policies and institutions are yet to get geared up to meet these challenges. While, the policy priorities and directions for service delivery often get determined only by the beliefs of the planners and decision makers, there is a whole

range of livestock services that are needed to enhance the capacity of poor households to exploit the full potential of increased livestock productivity (Ahuja and Redmond, 2001). Effective and efficient delivery of animal health and production services is considered as vital for gainful livestock development and hence, efficient delivery of livestock services has become a subject of rising concern to many national and international organisations including FAO. Livestock services around the world are usually delivered through a system composed of government institutions and to a greater or lesser extent, organisations and individuals belonging to the private sector (Kleeman, 1999). In India, recognising the importance of livestock to the rural poor and their inability to avail the fully paid livestock services, the Governments in centre and the States have been extending these services at a huge subsidy with their vast veterinary institutional network built-up in the past 5 decades through many livestock sector promotion schemes to augment livestock production and productivity. In addition, there are co-operatives, NGOs and private entrepreneurs endeavouring these livestock services to a lesser extent. The key focus all through the past planning periods had been on improving the delivery of veterinary services by strengthening the capabilities and coverage of State Animal Husbandry Departments. Thus, the number of State run veterinary institutions grew from about 2000 in 1951 to over 52000 in 2003. However, all these investments aimed mostly at curative services or livestock development schemes including crossbreeding.

Although, public sector is believed to be the appropriate means of delivering livestock services, serious doubts have also been expressed about the desirability and sustainability of public veterinary service provision in India. Even the steering group constituted by the Government of India observed that free veterinary and artificial insemination services have resulted in an infrastructure that is vast and expensive, which the State governments are finding extremely difficult to sustain (GOI, 1996). In the light of above scenario, this study was undertaken in Tamil Nadu, Southern peninsular India, to assess the uptake of livestock services by farmers from various types of service providers for getting their animals treated and bovines bred.

MATERIALS AND METHODS

The districts of Tamil Nadu state were classified into two categories, viz., Livestock-Developed (LD) and Livestock-Underdeveloped (LUD), based on initial baseline developed. Randomly selected, Coimbatore and Villupuram districts represented LD category, while

Thanjavur and Sivagangai districts represented LUD category. A multistage sampling procedure was adopted to select 320 respondents seeking services from 32 chosen public veterinary centres (10 from each). From the respondents, relevant data were collected through structured and pilot tested interview schedule.

RESULTS AND DISCUSSION

Land and livestock endowments of sample farmers: The chosen sample had more numbers of marginal farmers (145), followed by small (91) and large (84) farmers. The average landholding among large farmers was 8.01 acres, while the small farmers possessed 3.98 acres and marginal farmers had 1.31 acres.

Average number of cattle owned per household was 4.11, which composed of 0.27 indigenous cows, 1.32 crossbred cows, 0.99 bullocks and 1.53 young cattle. However, non-descript buffalo holding (0.32) bulged over graded (0.18) and young buffaloes (0.26). Of the average 2.38 small ruminants possessed, 0.93 was sheep and the remaining (1.45) was goats. In LD districts, the overall average ownership was higher for crossbred cows (1.66) and lower in case of indigenous cows (0.18) and the grand average of graded buffaloes (0.24) was more than that of non-descript buffaloes (0.11), which could be because of improved infrastructural and marketing facilities. The average number of small ruminants in LD districts (1.50) was almost double than that of LUD districts (0.88).

The overall milk price in the study area was Rs.8.09 per litre and no significant difference was found between LUD and LD districts. However, the daily average of milk sold was significantly higher in LD districts (12.43 L) than that of LUD districts (8.32 L) with the overall average being at 10.39 L. Average annual household income was Rs. 65080, with no significant difference between farmers of LUD and that of LD districts. Despite this, livelihood share of livestock, which was calculated as the proportion of income from livestock to the total income, was significantly differing among district categories.

Easy access to public veterinary centres was reported by 98.99% of the farmers in LUD districts and 99.49% in LD districts. The farmers in LD districts had better access to home services of veterinarians (55.35%) and para-veterinarians (57.98%) than those in LUD districts (35.62% and 41.13%, respectively). The quality perception of farmers on livestock services revealed that the home services rendered by veterinarians as the best one (0.83), followed by private veterinary clinics (0.75), home services by para-veterinarians (0.74), public veterinary centres (0.64) and co-operative veterinary centres (0.48).

Use pattern of livestock services

Uptake of animal health care services: In LUD districts the uptake of animal health care services from different service providers by the farmers in LUD is presented in Table 1. Of the 339 cases enumerated in LUD districts, 180 cases (53.10%) were attended to at public veterinary centres, while 104 cases (30.68%) were presented to home services by veterinarians and 28 cases (8.26%) were attended to by para-veterinarians at the farm gate. The cases presented to traditional healers and private veterinary clinics were only meagre, with 15 (4.42%) and three (0.88%) cases, respectively. Farmers themselves have treated their animals in nine occasions (2.65%) by purchasing drugs directly from pharmacy without the advice of any qualified service provider.

Chronic medical cases, counting to 60, dominated the show of all types of cases brought to public veterinary

centres for treatment, followed by acute medical (46), gynaecological (28), acute surgical (26) and chronic surgical (20) cases. Notably, none of the obstetrical cases were brought to public veterinary centres for treatment in LUD districts. Of the 104 cases attended to by veterinarians through home visits, 50 were acute medical cases and the remaining were obstetrical (34), acute surgical (10), chronic surgical (7), chronic medical (2) and gynaecological (1) cases. It is interesting to note that all of the obstetrical cases of large ruminants were attended to by home visits of either veterinarian or para-veterinarian. Although, para-veterinarians were attending to cases by home visits, the number of cases presented to them was only less (8.26% of total cases). Of the 28 cases attended to by para-veterinarians, 16 were obstetrical cases, 7 acute medical cases and 5 acute surgical cases.

Table 1: Uptake of animal health care services by the farmers in lud districts (No. cases)

Disease/ Disorder	Species of animal	Public veterinary centre			Home service by veterinarian			Home service by para-veterinarian			Private veterinary clinic			Ethnic/ Traditional healing			Pharmacy			Total		
		A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
Chronic medical cases																						
	Cattle	51	1.27	72.86	2	2.00	2.86	....	....	....	....	....	....	12	1.00	17.14	5	1.00	7.14	70	1.23	100.00
	Buffalo	6	1.00	100.00	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	6	1.00	100.00
	SR	3	1.00	33.33	....	....	....	....	....	....	....	....	....	2	1.00	22.22	4	1.00	44.44	9	1.00	100.00
	All	60	1.23	70.59	2	2.00	2.35	....	....	....	....	....	....	14	1.00	16.47	9	1.00	10.59	85	1.19	100.00
Acute medical cases																						
	Cattle	42	2.55	43.30	50	1.90	51.55	5	1.20	5.15	....	....	....	....	....	....	....	....	....	97	2.14	100.00
	Buffalo	....	....	....	....	....	....	2	2.00	100.00	....	....	....	....	....	....	....	....	....	2	2.00	100.00
	SR	4	2.00	100.00	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	4	2.00	100.00
	All	46	2.50	44.66	50	1.90	48.54	7	1.43	6.80	....	....	....	....	....	....	....	....	....	103	2.14	100.00
Chronic surgical cases																						
	Cattle	20	2.85	74.07	7	2.00	25.93	....	....	....	....	....	....	....	....	....	....	....	....	27	2.67	100.00
	Buffalo	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
	SR	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
	All	20	2.85	74.07	7	2.00	25.93	....	....	....	....	....	....	....	....	....	....	....	....	27	2.67	100.00
Acute surgical cases																						
	Cattle	24	2.49	63.16	9	2.44	23.68	5	2.60	13.16	....	....	....	....	....	....	....	....	....	38	2.47	100.00
	Buffalo	....	....	....	1	3.00	100.00	....	....	....	....	....	....	....	....	....	....	....	....	1	3.00	100.00
	SR	2	3.00	100.00	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	3.00	100.00
	All	26	2.50	63.41	10	2.50	24.39	5	2.60	12.20	....	....	....	....	....	....	....	....	....	41	2.51	100.00
Obstetrical cases																						
	Cattle	....	....	....	29	1.24	70.73	12	1.33	29.27	....	....	....	....	....	....	....	....	....	41	1.27	100.00
	Buffalo	....	....	....	5	1.40	55.56	4	3.00	44.44	....	....	....	....	....	....	....	....	....	9	2.11	100.00
	SR	....	....	....	....	....	....	....	....	....	....	....	....	1	1.00	100.00	....	....	....	1	1.00	100.00
	All	....	....	....	34	1.26	66.67	16	1.75	31.37	....	....	....	1	1.00	1.96	....	....	....	51	1.41	100.00
Gynaecological cases																						
	Cattle	26	2.69	86.67	1	3.00	3.33	....	....	....	3	1.00	10.00	....	....	....	....	....	....	30	2.53	100.00
	Buffalo	2	3.00	100.00	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	3.00	100.00
	SR	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
	All	28	2.71	87.50	1	3.00	3.13	....	....	....	3	1.00	9.38	....	....	....	....	....	....	32	2.56	100.00
All types of cases																						
	Cattle	163	2.20	53.80	98	1.77	32.34	22	1.59	7.26	3	1.00	0.99	12	1.00	3.96	5	1.00	1.65	303	1.94	100.00
	Buffalo	8	1.50	40.00	6	1.67	30.00	6	2.67	30.00	....	....	....	....	....	....	....	....	....	20	1.90	100.00
	SR	9	1.89	56.25	....	....	....	....	....	....	....	....	....	3	1.00	18.75	4	1.00	25.00	16	1.50	100.00
	All	180	2.16	53.10	104	1.77	30.68	28	1.82	8.26	3	1.00	0.88	15	1.00	4.42	9	1.00	2.65	339	1.92	100.00

A: Number of uptakes; B: Average number of visits required to treat a case; C: Per cent to total with respect to a particular disease; SR: Small ruminants; Not calculated for want of observations

Table 2: Uptake of animal health care services by the farmers in 1d districts (No. of cases)

Type of disease/disorder	Species of animal	Public veterinary centre			Home service by veterinarian			Home service by para-veterinarian			Private veterinary clinic			Ethnic/ Traditional healing			Pharmacy			Total		
		A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
Chronic medical cases																						
	Cattle	33	1.21	73.33	2	1.00	4.44	1	1.00	2.22	1	1.00	2.22	5	1.00	11.11	3	1.00	6.67	45	1.16	100.00
	Buffalo	....	....	....	....	....	....	....	....	....	....	....	....	6	1.00	100.00	....	....	....	6	1.00	100.00
	SR	12	1.00	66.67	....	....	....	....	....	....	....	....	....	4	1.00	22.22	2	1.00	11.11	18	1.00	100.00
	All	45	1.15	65.22	2	1.00	2.90	1	1.00	1.45	1	1.00	1.45	15	1.00	21.74	5	1.00	7.25	69	1.10	100.00
Acute medical cases																						
	Cattle	66	2.11	40.99	79	1.85	49.07	16	1.25	9.94	....	....	....	....	....	....	....	....	....	161	1.89	100.00
	Buffalo	....	....	....	....	....	....	7	1.43	100.00	....	....	....	....	....	....	....	....	....	7	1.43	100.00
	SR	11	2.00	100.00	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	11	2.00	100.00
	All	77	2.09	43.02	79	1.85	44.13	23	1.30	12.85	....	....	....	....	....	....	....	....	....	179	1.88	100.00
Chronic surgical cases																						
	Cattle	6	2.00	75.00	2	2.00	25.00	....	....	....	....	....	....	....	....	....	....	....	....	8	2.00	100.00
	Buffalo	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
	SR	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
	All	6	2.00	75.00	2	2.00	25.00	....	....	....	....	....	....	....	....	....	....	....	....	8	2.00	100.00
Acute surgical cases																						
	Cattle	10	2.90	62.50	6	2.00	37.50	....	....	....	....	....	....	....	....	....	....	....	....	16	2.56	100.00
	Buffalo	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
	SR	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
	All	10	2.90	62.50	6	2.00	37.50	....	....	....	....	....	....	....	....	....	....	....	....	16	2.56	100.00
Obstetrical cases																						
	Cattle	2	3.00	4.17	33	1.12	68.75	13	1.23	27.03	....	....	....	....	....	....	....	....	....	48	1.23	100.00
	Buffalo	....	....	....	8	2.00	72.73	3	2.00	27.27	....	....	....	....	....	....	....	....	....	11	2.00	100.00
	SR	....	....	....	....	....	....	5	1.00	71.43	....	....	....	2	1.00	28.57	....	....	....	7	1.00	100.00
	All	2	3.00	3.03	41	1.29	62.12	21	1.29	31.82	....	....	....	2	1.00	3.03	....	....	....	66	1.33	100.00
Gynaecological cases																						
	Cattle	57	2.65	96.61	2	3.00	3.39	....	....	....	....	....	....	....	....	....	....	....	....	59	2.66	100.00
	Buffalo	5	3.00	100.00	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	5	3.00	100.00
	SR	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
	All	62	2.67	96.88	2	3.00	3.13	....	....	....	....	....	....	....	....	....	....	....	....	64	2.68	100.00
All types of cases																						
	Cattle	174	2.16	51.63	124	1.67	36.80	30	1.23	8.90	1	1.00	0.30	5	1.00	1.48	3	1.00	0.89	337	1.87	100.00
	Buffalo	5	3.00	17.24	8	2.00	27.59	10	1.60	34.48	....	....	....	6	1.00	20.69	....	....	....	29	1.79	100.00
	SR	23	1.48	63.89	....	....	....	5	1.00	13.89	....	....	....	6	1.00	16.67	2	1.00	5.56	36	1.31	100.00
	All	202	2.09	50.25	132	1.69	32.84	45	1.29	11.19	1	1.00	0.25	17	1.00	4.23	5	1.00	1.24	402	1.81	100.00

A: Number of uptakes; B: Average number of visits required to treat a case; C: Per cent to total with respect to a particular disease; SR: Small ruminants; Not calculated for want of observations

This shows that the farmers preferred to call para-veterinarians only during emergency, so as to render first aid services. The number of cases brought to private veterinary clinics operating in the area was only three and that too for gynaecological treatment. The assistance of traditional healers was sought by the farmers to aid in obstetrical cases and to treat chronic medical cases. Although the number of pharmacy dispensed medication was found high (9), it was only for treating chronic ailments.

The average number of visits taken to treat a chronic surgical case in public veterinary centre was more, being at 2.85, followed by gynaecological cases (2.71), acute medical cases (2.50), acute surgical cases (2.50) and chronic medical cases (1.23). However, veterinarians have made two home visits on an average to treat both chronic

surgical and medical cases, while taking only 1.90 visits to treat an acute medical case. The obstetrical cases warranted an average of 1.26 visits for the home visiting veterinarians and acute surgical cases required visit of veterinarians for 2.50 times. However, para-veterinarians took 2.60 visits, on an average, to treat a surgical case, while 1.75 visits to cure an obstetrical case which indicates their poor technical competence vis-à-vis veterinarians attending to either at public veterinary centres or at home. Although, traditional healing appeared to take minimal number of visits to treat a case, the intensity of illness that could be treated by the ethnic healer still remains a question, besides they were not preferred for all types of cases, except for chronic medical and obstetrical cases.

In LD districts: The uptake and the use pattern of animal health services by the farmers in LD districts are presented in Table 2. Similar to LUD districts, in LD districts also, the public veterinary centres were the major service provider followed by home services by veterinarians, home services by para-veterinarians, traditional healers, pharmacy and private veterinary clinics. Of the 402 cases recorded in these districts, 202 cases (50.25%) were treated at public veterinary centres, while 132 cases (32.84%) were attended to by veterinarians and 45 cases (11.19%) by para-veterinarians through home services. Number of cases attended by ethnic/traditional healers was only 17 (4.23%), while the pharmacy dispensed medication was for five cases (1.24%). The results indicated that the role of private veterinary clinics was very meagre in both large and small ruminant health care, although they played a vital role in pet care. It could be understood from the table that all types/categories of cases were taken for treatment in public veterinary centres and veterinarians rendering home services. The use pattern of animal services implied that the veterinarians were preferred over para-veterinarians for treating ailments of farm animals.

Of the 202 cases attended to at public veterinary centres, acute medical cases were more (77), followed by gynaecological cases (62), chronic medical cases (45), acute surgical cases (10), chronic surgical cases (6) and obstetrical cases (2). Although chronic medical and gynaecological cases did not require an emergency visit, they needed follow-up for days together and hence, they outnumbered in public veterinary centres. Overall, the number of cattle taken to medication at public veterinary centres was more compared to buffaloes and small ruminants.

Acute medical cases constituted 79 out of total 132 cases attended to by veterinarians through home visits. The obstetrical cases which warranted an in-house attention were generally attended to by veterinarians. It appeared that the farmers in the LD districts did not prefer their chronic types of cases to get attended to by private service providers, as it levied them more in terms of service fee and drug charges.

The services of para-veterinarians were mostly sought to attend acute medical and obstetrical cases, as they warrant an immediate medical attention. Similar to LUD districts, in LD also, the services of traditional healers were looked for treating chronic medical and obstetrical cases alone, that too, in a restricted number, 15 and 2, respectively. The average number of visits taken to treat a case at public veterinary centres was 2.09, while

the home serving veterinarians took 1.69 and para-veterinarians taking 1.29 visits. The lesser the number of visits by para-veterinarians does not necessarily mean the efficiency, as the average number of visits required depends mainly on the severity of disease condition.

Overall uptake in the study area: Overall use pattern of animal health services by the farmers in the study area is presented in Table 3. Of the 741 cases enumerated during the study, 382 cases (51.55%) were attended to at public veterinary centres, while 236 cases (31.85%) by veterinarians and 73 cases (9.85%) by para-veterinarians through home services. Among the remaining cases, 32 (4.32%) were attended to by traditional healers, 14 (1.89%) cases through over the counter dispensed medication and four (0.54%) by private veterinary clinics. The results implied that the public veterinary centres were the major service providers for all types of cases followed by veterinarians attending to at the farm gate, which means that the key factor, qualified and competent veterinarian, has played a key role in deciding the service of provider to ensure better health of livestock wealth. However, the free service offered at public veterinary centres could never be ignored while inferring on the preference attitude of farmers on choosing the service provider.

As could be seen from the table, the treatments were skewed towards cattle among all categories of service providers. Of the 382 cases reported to the public veterinary centres in the study area, the number of acute medical cases were more (123) followed by chronic medical (105), gynaecological (90), acute surgical (36), chronic surgical (26) and obstetrical (2) cases. The less number of obstetrical cases taken to these centres was due to the nature of the disease or disorder condition so as to ensure restricted movement of animals. Considering the cases attended to by veterinarians through home services, acute medical cases followed by obstetrical cases predominantly attracted the role of veterinarians, although a limited number of other categories of cases were also attended to. Para-veterinarians seemed to have been called for treating obstetrical cases, especially for dystocia and retained placenta mostly, followed by acute medical cases and acute surgical cases to a certain extent. Although overall picture indicated that the public veterinary centres were the single major animal health care providers in the study area, their role appeared to have been lesser than expected vis-à-vis the huge investment made by the government in terms of infrastructure and man power. The findings of this study were similar to the observations of de Haan and Nissen (1985), where they noted that veterinarians were the main livestock service providers and the para-professionals complemented veterinarians in developing countries. Further, as Ramadas and Ghotge (2002) stated, the role of traditional healers in animal health care services was found to be low.

Table 3: Overall uptake of animal health care services in the study area (No. of cases)

Disease/of disorder	Species animal	Public veterinary centre			Home service by veterinarian			Home service by para-veterinarian			Private veterinary clinic			Ethnic/ Traditional healing			Pharmacy			Total		
		A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
Chronic medical cases																						
	Cattle	84	1.25	73.04	4	1.67	3.48	1	1.00	0.87	1	1.00	0.87	17	1.00	14.78	8	1.00	6.96	115	1.21	100.00
	Buffalo	6	1.00	50.00	....	....	....	....	....	....	....	....	....	6	1.00	50.00	....	....	....	12	1.00	100.00
	SR	15	1.00	55.56	....	....	....	....	....	....	....	....	....	6	1.00	22.22	6	1.00	22.22	27	1.00	100.00
	All	105	1.21	68.18	4	1.67	2.60	1	1.00	0.65	1	1.00	0.65	29	1.00	18.83	14	1.00	9.09	154	1.16	100.00
Acute medical cases																						
	Cattle	108	2.28	41.86	129	1.87	50.00	21	1.24	8.14	....	....	....	....	....	....	....	....	....	258	1.99	100.00
	Buffalo	....	....	....	....	....	....	9	1.56	100.00	....	....	....	....	....	....	....	....	....	9	1.56	100.00
	SR	15	1.93	100.00	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	15	1.93	100.00
	All	123	2.24	43.62	129	1.87	45.74	30	1.34	10.64	....	....	....	....	....	....	....	....	....	282	1.98	100.00
Chronic surgical cases																						
	Cattle	26	2.67	74.29	9	2.00	25.71	....	....	....	....	....	....	....	....	....	....	....	....	35	2.50	100.00
	Buffalo	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
	SR	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
	All	26	2.67	74.29	9	2.00	25.71	....	....	....	....	....	....	....	....	....	....	....	....	35	2.50	100.00
Acute surgical cases																						
	Cattle	34	2.59	62.96	15	2.28	27.78	5	2.60	9.26	....	....	....	....	....	....	....	....	....	54	2.50	100.00
	Buffalo	....	....	....	1	3.00	100.00	....	....	....	....	....	....	....	....	....	....	....	....	1	3.00	100.00
	SR	2	3.00	100.00	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	3.00	100.00
	All	36	2.61	63.16	16	2.35	28.07	5	2.60	8.77	....	....	....	....	....	....	....	....	....	57	2.54	100.00
Obstetrical cases																						
	Cattle	2	3.00	2.25	62	1.18	69.66	25	1.28	28.09	....	....	....	....	....	....	....	....	....	89	1.25	100.00
	Buffalo	....	....	....	13	1.76	65.00	7	2.57	35.00	....	....	....	....	....	....	....	....	....	20	2.04	100.00
	SR	....	....	....	....	....	....	5	1.00	62.50	....	....	....	3	1.00	37.50	....	....	....	8	1.00	100.00
	All	2	3.00	1.71	75	1.28	64.10	37	1.49	31.62	....	....	....	3	1.00	2.56	....	....	....	117	1.37	100.00
Gynaecological cases																						
	Cattle	83	2.66	93.26	3	3.00	3.37	....	....	....	3	1.00	3.37	....	....	....	....	....	....	89	2.62	100.00
	Buffalo	7	3.00	100.00	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	7	3.00	100.00
	SR	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
	All	90	2.69	93.75	3	3.00	3.13	....	....	....	3	1.00	3.13	....	....	....	....	....	....	96	2.65	100.00
All types of cases																						
	Cattle	337	2.18	52.66	222	1.72	34.69	52	1.39	8.13	4	1.00	0.63	17	1.00	2.66	8	1.00	1.25	640	1.91	100.00
	Buffalo	13	2.07	26.53	14	1.83	28.57	16	2.00	32.65	....	....	....	6	1.00	12.24	....	....	....	49	1.83	100.00
	SR	32	1.56	61.54	....	....	....	5	1.00	9.62	....	....	....	9	1.00	17.31	6	1.00	11.54	52	1.39	100.00
	All	382	2.12	51.55	236	1.75	31.85	73	1.53	9.85	4	1.00	0.54	32	1.00	4.32	14	1.00	1.89	741	1.87	100.00

A: Number of uptakes; B: Average number of visits required to treat a case; C: Per cent to total with respect to a particular disease; SR: Small ruminants; Not calculated for want of observations

Uptake of bovine breeding services

In LUD districts: Of 385 inseminations/breeding services recorded in LUD districts, 176 were carried out at public veterinary centres, 116 by veterinarian through home services, 44 each through private veterinary clinics and natural breeding and only 5 by para-veterinarians attending to at farms. In all, 333 cattle and 52 buffaloes were found to have got bred (Table 4).

The use pattern of bovine breeding facilities in LUD districts display an interesting feature that only less than half number of AIs were performed at public veterinary centres, while privately procured germplasm for insemination was getting popularised, because the private veterinary clinics and home serving veterinarians were

using frozen semen procured from outside sources such as Central Frozen Semen Production and Training Institute, Bangalore. However, natural breeding is also still in vogue and as ascertained from farmers, they preferred natural breeding for the repeat breeding cows and buffaloes. Concerning the services/number of inseminations per conception, public veterinary centres required an average of 2.59 inseminations, while home serving veterinarians was taking only 1.71 services, private veterinary clinics required 1.91 inseminations and 2.20 times of natural breeding per conception. Although para-veterinarians appeared to take lesser number of inseminations per conception, no conclusion could be drawn as their number in the sample is less.

Table 4: Uptake of bovine breeding services by the sample farmers

Service provider	Species	(No. inseminations or services)		
		LUD districts	LD districts	Overall
Public veterinary centre	Cattle	150 (2.73)	307 (1.98)	457 (2.18)
	Buffalo	26 (2.00)	22 (2.20)	48 (2.09)
	Total	176 (2.59)	329 (1.99)	505 (2.17)
Home service by veterinarian	Cattle	110 (1.72)	10 (2.00)	120 (1.74)
	Buffalo	6 (1.50)	2 (2.00)	8 (1.33)
	Total	116 (1.71)	12 (2.00)	128 (1.73)
Home service by para-veterinarian	Cattle	5 (1.67)	...	5 (1.67)
	Buffalo	...	...	...
	Total	5 (1.67)	...	5 (1.67)
Private veterinary clinic	Cattle	38 (1.90)	14 (2.33)	52 (2.00)
	Buffalo	6 (2.00)	4 (2.00)	10 (2.00)
	Total	44 (1.91)	18 (2.25)	62 (2.00)
Natural breeding	Cattle	30 (3.00)	60 (3.16)	90 (3.10)
	Buffalo	14 (1.40)	27 (1.93)	41 (1.71)
	Total	44 (2.20)	87 (2.64)	131 (2.47)
All	Cattle	333 (2.19)	391 (2.11)	724 (2.15)
	Buffalo	52 (1.73)	55 (2.04)	107 (1.88)
	Total	385 (2.12)	446 (2.10)	831 (2.11)

Figures in parentheses indicate number of inseminations required per conception; ... Not calculated for want of observations

In LD districts: Unlike LUD districts, in LD districts most of inseminations were carried out at public veterinary centres. Of 446 inseminations studied, 329 were carried out in public veterinary centres, while 87 through natural breeding and a meagre eight and 12 through private veterinary clinics and home service of veterinarians, respectively. It becomes imperative to note that the farmers in LD districts preferred AI at public centre. It could be attributed to the disinclination of veterinarians in the area to carry the AI containers for inseminating at farmers doorstep.

The number of inseminations or breeding services required per conception in LD districts indicated that the public veterinary centres outperformed other service providers in the area. In public veterinary centres, the number of services needed per conception was only 1.99 as against 2.00 for home serving veterinarians, 2.25 for private veterinary clinics and 2.64 for natural breeding. The better conception rate in public veterinary centres might be due to the presence of well informed farmers who brought their animals at the right time for insemination.

Overall uptake in the study area: Overall, 831 inseminations/bovine breeding services were carried out in the study area. Of this, 505 were from public veterinary centres, 131 by natural breeding, 128 by the veterinarians through home service, 62 through private veterinary clinics and a meagre 5 by para-veterinarians through home service (Table 4). It could be inferred from the results that the public veterinary centres were the major bovine breeding service provider in the study area. However, natural breeding still remained to be an important mode of breeding. This, in turn, reflects the ignorance

of farmers and or lack of effective extension services in those areas. The common reason attributed by the farmers for choosing natural breeding was repeat breeding if AI is resorted to.

On an average, 2.11 inseminations were required per conception. More specifically, cows required 2.15 services, while buffalo required 1.88 inseminations. The results in case of buffaloes could not be generalized, as the total number of AI observed in buffaloes was only limited. It was found that home services produced better results on conception of animals compared to in-centre services. The possible reason could be that the animals which were inseminated at home were not stressed out, as against the animals brought to the centre which were exposed to physical stress due to transport.

CONCLUSION

Overall use pattern of animal health care services indicated that the public veterinary centres were the major service providers for all types of cases, followed by veterinarians attending at the farm gate. Moreover, the services are skewed towards cattle among all categories of service providers. Of the cases reported to the public veterinary centres, number of acute medical cases was more, followed by chronic medical, gynaecological, acute surgical, chronic surgical and obstetrical cases. Acute medical cases followed by obstetrical cases predominantly attended to by veterinarians through home services, while para-veterinarians were attending to obstetrical cases. The public veterinary centres were the major bovine breeding service provider, doing 2.17 inseminations, on an average, per conception. However, the next major service provider, home servicing veterinarian, required 1.74 inseminations per conception.

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