Original Research Article

Management practices followed by buffalo farmers of Tirunelveli region of Tamil Nadu – An Empirical Analysis

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Abstract

A study was carried out to identify the prevailing management practices followed by buffalo farmers of Tirunelveli region of Tamil Nadu. A total of 31 buffalo farmers were interviewed by the pre-structured interview schedule and data were tabulated and discussed. Nondescript buffaloes were the predominant breed of the study area and rearing system was characterised by extensive system of rearing, flock mating, relying on common property resources for meeting nutritive requirement and low adoption of prophylactic measures. The major reason for rearing buffaloes were the traditional practices (42 %), comparatively higher milk price then cows (42 %) and easy maintenance of buffaloes when comparing to dairy animals (35.48 %). Inadequate veterinary services, lack of space for shed construction, High cost for availing treatment services from the service providers, non-remunerative price for the milk, management constraints during climatic variations and inadequate supply of inputs such as feed/ fodder seeds were the critical constraints faced by the farmers of the study area. Recommendations include enhancing the efficiency of natural feed sourcing by developing forage resources in community land, effective supplementary feeding, bolster the improvement of resilient buffalo breeds by community-based breeding programmes, and providing forward linkages in milk marketing. Also, buffalo development programmes should focus on creating awareness and increasing access to extension services among livestock farmers on adoption of scientific technologies and promotion of prophylactic measures which include deworming and vaccination

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Key words: Management Practices, Buffalo farmers, Tamil Nadu, constraints faced

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Introduction

Buffalo farming is an important component of the livestock sectorand contributes more than 50 million tons of milk and 1.43 million tons of meat in addition to high valued hides, bones and draft power for agricultural operations.India is widely acknowledged as a valuable repository of buffalo germplasm resources due to its possession of all the officially

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recognized and highly productive buffalo breeds. Within the Indian dairy industry's transformative shift, the buffalo sector plays a significant role in the overall milk production landscape. In fact, it stands alone in contributing a remarkable 66.3% of the total global buffalo milk volume. Over time, Tamil Nadu's portion of the national buffalo population has dwindled from 5.29% to 0.72% between 1951 and 2012, accompanied by a decline in buffalo milk production from 4.01% to 0.46% between 2001-02 and 2015-16. Between 1951 and 2012, the proportion of Tamil Nadu's contribution to the national buffalo population experienced a decline from 5.29% to 0.72%, while buffalo milk production in the region decreased from 4.01% to 0.46% between 2001-02 and 2015-16. Notably, the Annual Compound Growth Rate (ACGR) for buffalo population in Tamil Nadu during the previous inter-census period (2007-12) stood at -17.23%. Notable negative growth was observed in the North Eastern and Cauvery Delta agro-climatic zones of Tamil Nadu(Anonymous 2023). Furthermore, in the Southern zone, the Annual Compound Growth Rate (ACGR) of buffalo milk production witnessed a substantial decrease of -27.37% from 2011-12 to 2015-16. This rate was slightly less negative but still significant at -21.72% in the North Eastern zone and -20.93% in the Cauvery Delta zone, culminating in an overall ACGR of -16.85%. Regarding buffalo milk productivity, Tamil Nadu exhibited an ACGR of 0.61% from 2001-02 to 2015-16, in contrast to India's higher rate of 1.58%. (Vignesh *et al* 2023).Buffalo farming is characterised by extensive to semi-intensive rearing, low adoption of scientific technologies and inadequate accessibility to veterinary services and non-remunerative price for milk. Further, there is a smaller number of comprehensive research studies documenting the prevailing management practices followed by buffalo farmers and factors associated with rearing system. Hence, this study aims in presenting the management practices followed by buffalo farmers, reasons for rearing buffaloes and constraints faced by them

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Materials and Methods

The present *ex-post facto*study was conducted purposefully in Mayamankurichi village in Alangulam block of Tirunelveli district as this is one of the villages which has high buffalo population which is reared by 31 buffalo rearers. The data were collected from 31 buffalo farmers of the selected village through personal interview, focussed group discussion and observation techniques. The variables regarding socio-economic variables, different management practices, reason for preferring buffalo rearing and constraints for rearing buffaloes were included in the schedule and data were collected. The collected data were categorised and analysed by using mean, SD, range for interpretation.

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Results and Discussion

Socio-personal profile of buffalo farmers was presented in Table 1. Status of managemental practices viz., breeding, feeding, general and health care, milking practices and marketing were presented from table 2 to 5.

1.Socio-personal profile of buffalo farmers

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The socio-personal profile of the respondents was presented in Table 1. About fifty per cent of the buffalo farmers (51.61 %)were middle aged followed by young (13 %) and35.45 per cent were old aged. The data regarding schooling of the buffalo farmers indicated that 45.16 percent had primary level of education, 32.26 per cent had no schooling, 12.90 per cent had high schooling and rest of them (16.13 per cent) had tertiary education. All the respondents except one had nuclear family. Buffalo rearing was the primary occupation for high majority of the respondents (87.10 %) surveyed, rest (12.90 %) had agriculture as the primary occupation. About 45.16 per cent of the respondents had more than 20 years of experience, 48.39 % had 10 to 20 years of experience and about one-third of the respondents had less than 10 years of experience in buffalo farming. It is evident from the study that farmers were attracted towards buffalo rearing in the last decade.

About two-third of the respondents were marginal farmers, 22.58 per cent were landless farmers and 9.68 per cent were small farmers. About one-sixth of the respondents (16.13 %) were large herders, 29.03 per cent were medium herders, 9.68 per cent small herder. On the other hand, about one-third of the respondents (35.48 %) were small herders. About three-fourth of the respondents (77.92 %) were contacting their peers, veterinarians, paravets to avail any information related to buffalo rearing and rest of the respondents (22.58 %) were not contacting any change agents to avail information. Only two respondents were member in any of the social organisations in the village.Sangameswaran *et al* (2017) suggested that socio-economic determinants should be an inbuilt component while framing policies to promote sustainable and profitable dairying.

Table:1 Socio-personal profile of buffalo farmers (n=31)

Variables	**Categories**	**f**	**%**
Age	Young (Up to 34)	4	12.90
	Middle (35 to 45)	16	51.61
	Old (More than 45)	11	35.48
Land holding	Landless	7	22.58
	Marginal (less than 2.5	21	67.74

	acres)		
	Small (2.5 -5 acres)	3	9.68
	Medium and Large (More than 5 acres)		0.00
Income	Less than 20,000	30	96.77
	20,001-40,000	--	0.00
	more than 40,000	1	3.23
Experience in buffalo rearing	Less than 10 years	2	6.45
	10-20 years	15	48.39
	More than 20 years	14	45.16
Herd size	Small (0-10)	11	35.48
	Medium (11 to 20)	3	9.68
	Large (21-30)	9	29.03
	Very large (More than 31)	5	16.13
Milk production	Less than 10 litres	13	41.94
	10-20 litres	12	38.71
	More than 21 litres	6	19.35
Milk sales	Less than 10 litres	14	45.16
	10-20 litres	11	35.48
	More than 21litres	6	19.35
Occupation	Livestock rearing	27	87.10
	Agriculture	4	12.90
Type of family	Nuclear	30	96.77
	joint	1	3.23
Education qualification	Illiterate	10	32.26
	Primary	14	45.16
	Secondary	4	12.90
	Higher Secondary	1	3.23
	Collegiate	2	6.45
Mixed farming system	Yes	20	64.52
	No	11	35.48
Extension agency contact	Veterinarians	13	41.94
	Listening to farm programmes	3	9.68
	Progressive farmer	6	19.35
	Para veterinarians	2	6.45
	None	7	22.58
Social Participation	Yes	3	9.68
	No	28	90.32

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2. Breeding management

Breeding Management practices followed by buffalo farmers were presented in Table 2. About three-fourth of the respondents(77.42 %) were rearing non-descript buffaloes, and 22.58 % were rearing graded buffaloes. This is similar to the findings of Kishore *et al* (2013)

who reported that rearing non-descript animals is predominant in Khammam District of Rajasthan. A high majority of the farmers surveyed (90.32 %) were practicing natural service to their buffaloes. All the respondents were rearing bulls for breeding purpose.The results are similar to the findings of Sawarkar *et al* (2001) and Kishore et al (2013).

Most farmers possessing large buffalo herds were maintaining their own breeding bull for natural breeding. The ratio of breeding male: female in the study area was 1:30, which didn't suit the recommended male female ratio of 1:15 to 1:20. The major reasons as expressed by the respondents for preferring natural service were high conception rate and difficulty in restraining their animals while artificial insemination. Small buffalo herders hardly had any breeding bull and were dependent on other farmers for breeding purpose. Only 4 out of 31 respondents were practicing artificial insemination. The respondents were not aware about importance of AI in grading-up of their non-descriptive buffaloes.None of the respondents were observing their buffaloes for estrus symptoms regularly. None of the respondents were diagnosing the pregnancy. The farmers were not aware about the time of mating as the animals were mated during grazing. There was wide gap in adoption of breeding management practice due to the fact of lack of awareness and conviction towards the practices. It is a well-known fact that inappropriate breeding practices will adversely affect the productivity and sustainable buffalo production systems.

Table 2: Breeding Management Practices followed by buffalo farmers (n=31)

Practices	**Categories**	**f**	**%**
Method of breeding	Natural service	28	90.32
	Artificial Insemination	3	9.68
Type of bull reared	Descriptive	7	22.58
	Non-descriptive	24	77.42
Buffaloes for service	Own Bull	31	100.00
	Other/stray Bulls		0.00
Pregnancy Diagnosis	Yes	7	22.58
	No	24	77.42
Age at first calving	1.5 -2 years	6	19.35
	2-3 years	21	67.74
	More than 3 up to 4 years	4	12.90

3. Feeding management

Feeding management practices followed by buffalo farmers were presented in Table 3.The major source of drinking water for buffaloes were lake (61.29 %), pond (22.58 %) and

canal (12.90 %).About one-third of the respondents (35.48%) were supplementing green fodder to their animals. Out of which 22.58 per cent of respondents were cultivating green fodder and 12.90 per cent were purchasing green fodder. One-fourth of respondents were providing bund grass collected from agricultural fields. About 35.48 per cent of the respondents were providing green fodder to lactating buffaloes, 19.35 per cent were providing greed fodder to heifer and one-sixth of the respondents were providing green fodder to calves. Majority of the respondents (61.29 %) were providing concentrates to lactating buffaloes, 51.61 per cent were providing concentrates to heifer and 19.35 % were providing concentrates to calves. Majority of the respondents (64.52 %) were providing dry fodder to lactating buffaloes, 32.26 per cent were providing dry fodder to heifer and 19.35 % were providing dry fodder to calves. About 42 per cent of the respondents where providing bund grass to their buffaloes followed by providing cultivated green fodder and only respondent was purchasing fodder for their animals.

None of the respondents surveyed were cultivating hybrid Napier or sorghum or tree fodders for their animals. But they were collecting naturally grown grasses in the bund for their animals. All the respondents were allowing their animals to graze in common property resources (CPRs) and common range lands. The buffaloes were highly dependent on CPRs for meeting their feed and nutrient requirements. Concentrate ingredients such as wheat bran, rice Bran, cotton seeds were used as a concentrate's supplements for the animals. None of the farmers were supplementing vitamins or minerals for their animals. Most of the respondents were feeding concentrates to their lactating buffaloes but only a smaller number of respondents were feeding concentrates to heifers, dry animals and calves. It is observed from the study that proper nutrition was not provided for the animals to reap maximum genetic potential. This is attributed to the fact that farmers had lack of knowledge about importance of providing green fodder and supplementary feeding.There is scope of preparing complete feeds by blending crop residues, available concentrated and mineral mixture to improve the performance of the animals with reduced cost per kg of produce.

Table 3: Feeding Management Practices followed by buffalo farmers (n=31)

Practices	**Categories**	**f**	**%**
Source of drinking water	River	4	12.90
	Lake	19	61.29
	Pond	7	22.58
Providing Green fodder	Lactating Buffalo	11	35.48

	Heifer	6	19.35
	Calf	5	16.13
Providing concentrates	Lactating Buffalo	19	61.29
	Heifer	16	51.61
	Calf	14	45.16
Providing Dry fodder	Lactating Buffalo	20	64.52
	Heifer	10	32.26
	Calf	6	19.35
Type of green fodder	Cultivated fodder	7	22.58
	Bund grass	8	25.81
	Purchased fodder	4	12.90

4. Health care and Housing management

Distribution of respondents based on health care and housing of buffaloes were presented in Table 3. All the respondents surveyed were rearing their animals in extensive systems. Majority of the respondents were rearing buffaloes under the tree shade followed by kutcha houses respectively on the other hand only 5 respondents surveyed were rearing their animals in the pukka house. As the animals were reared in open area, sufficient ventilation and adequate spacing were available for animals. No special care was provided for the buffaloes during summer such as splashing/ sprinkling of water on animals. During grazing animals were allowed for wallowing in the pond or canal. Hence, buffaloes reared under extensive systems are generally confronted with nutritional deficiencies especially during leans seasons causing nutritional deficiencies leading to low production and reproduction performances. Further, parasitic burden also increased among the animals especially calves leading to neonatal mortality. None of the respondents were disposing the manure in the proper area.

More than three fourth of the respondents (77.42%) were practising cutting and disinfection of navel cord and all the respondents were providing colostrum immediately after birth. About three- fourth of the respondents (74.19%) were not vaccinating the animals and 22.58 per cent of respondents were vaccinating the animals against Foot and Mouth Disease (FMD) and Haemorrhagic Septicaemia (HS). None of the respondents were taking precautionary steps against tick infestation.

About 50 per cent of the buffalo farmers surveyed reported that there was no disease outbreak in their herds. On the other hand, 50 per cent of buffalo farmers reported that there

was disease incidence. 3 out of 31 respondents reported that their animals were not affected by any ailments. Rest of the respondents reported that the animals were affected by different ailments. The major ailments affecting buffaloes were foot and mouth disease, pyrexia and vitamin deficiency. The above finding is attributed to the fact that farmers were not adopting prophylactic measures to prevent infectious diseases in their farm. This might be due to non-availability and non-accessibility to the veterinary prophylactic services. Based on participatory learning, a calendar of prophylaxis should be developed.

Table 4: Health care Practices followed by buffalo farmers (n=31)

Practices	**Categories**	**f**	**%**
Health care management practices			
Cutting and Disinfection of navel cord	Yes	7	22.58
	No	24	77.42
Providing Colostrum immediately after birth	Yes	31	100.00
	No	0	0.00
FMD & HS vaccination	Yes	7	22.58
	No	23	74.19
Deworming done	Regular	5	16.13
	Occasional	3	9.68
	Not at all	13	41.94
Control of Ectoparasites	Yes	0	0.00
	No	31	100.00
Housing management practices			
Housing type	Tree shade	17	54.84
	Kutcha	4	12.90
	Semi pucca	4	12.90
	Pucca	5	16.13
Adequacy of space for animals	Adequate	31	100.00
	Inadequate	0	0
Adequate ventilation to the Animal	Available	31	100.00
	Not available	0	0
Use of disinfectants for shed cleaning	Regular	0	0
	Rare	31	100.00
Summer management	Splashing of water on animals	0	0

	Wallowing during grazing	31	100
Manure disposal	Exclusive manure pit	0	0
	Nearby to Shed	31	100

5. Milking practices

Clean milk production practices followed by buffalo farmers were presented in Table 5. All the respondents surveyed were milking their animal twice a day and almost all the respondents were practicing the splashing of water on the teats before milking and also washing their hands before milking which is similar to the findings of Kumar and Mehla (2011); Manohar *et al.* (2013) and Sabapara*et al.* (2015). All the respondents were using open mouth pail for milking. About two-third of the respondents (67.74 %) of the farmers surveyed where practicing knuckling method of milking, 29.03 per cent were practising full hand milking and rest 3.23 per cent of the farmers where following stripping method of milking. None of the respondents were not practising clean milk production techniques. None of the respondents were using antiseptics as teat dip before and after milking. None of the respondents were cleaning the milk utensils in a proper /scientific way. The above findings were suggestive of lack of awareness about the importance of clean milk production and best method to prevent mastitis.

Table 5: Clean Milk Production Practices followed by buffalo farmers (n=31)

Practices	**Categories**	**f**	**%**
Frequency of milking	Twice	31	100.00
	Thrice	0	0.00
Splashing of water on teat before milking	Yes	31	100.00
	No	0	0.00
Milking method	Full hand	9	29.03
	Knuckling	21	67.74
	Stripping	1	3.23
Wipe the udder and teats just after milking	Yes	31	100.00
	No	0	0.00
Milking pail used	Open mouth pail	31	100.00
	Scientific milking pail	0	0.00
Teat dipping followed	Yes	0	0.00
	No	31	100.00

Milking utensils cleaned by scientific way	Yes	0	0.00
	No	31	100.00
Test for mastitis/ sub-clinical mastitis	Yes	0	0.00
	No	31	100.00

6. Reasons for rearing buffaloes

A glance at table 7 revealed that traditionalculture (42 %), comparatively higher milk price then cows (42 %) and easy maintenance of buffaloes when comparing to dairy animals (35.48 %) were the major reasons for rearing buffaloes. The other reasons stated by the respondents for rearing buffaloes were their perception as profitable venture (16 %) and resistance to disease and climatic variations (16 %).

Table 6: Reasons for rearing buffaloes

Reasons for buffalo rearing	**f***	**%**
Traditional culture	13	41.94
High milk price	13	41.94
Easy maintenance	11	35.48
Resistance to disease and climatic variations	5	16.13
Profitable venture	5	16.13

***Multiple responses**

7. Constraints faced by buffalo farmers

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Constraints expressed by the respondents in rearing buffaloes were displayed in Table 8. Inadequate veterinary services and lack of space for shed construction were the major constraints faced by the buffalo farmers. The dairy farmers preferred to have services delivered at their doorsteps for the obvious reason of the difficulty of taking the animal to the established centres. High cost for availing treatment services from the service providers, non-remunerative price for the milk, management constraints during climatic variations were the other constraints faced by the buffalo farmers. The last constraints faced were inadequate supply of inputs such as feed/ fodder seeds. The results are in line with the findings of Rajadurai *et al* 2022 who reported that low price of milk, unavailability of A.I. facility, Lack of space for construction were constraints faced by the buffalo farmers of Kallakurichi district of Tamil Nadu, India.

Table 7: Constraints faced by respondents in buffalo rearing (n=31)

Constraints	f*	%
Inadequate veterinary services	11	35.48
Lack of space for shed construction	10	33.33
Management during climatic variations	5	16.13
Non-remunerative price for milk	5	16.13
High cost for treatment	5	16.13
Inadequate supply of inputs	2	6.45

***Multiple responses**

Conclusion

The study has enriched our understanding on the buffalo production in the semi-arid parts of Tirunelveli district and demonstrated that buffalo rearing in an economically viable rural enterprise.Buffalo herders in the study area is strongly favoured by their own extensive system of rearing wherein buffaloes were completely dependent on common property or open access resources for grazing. However, the continuous use of common grazing/feed resources in the absence of efforts for their re-generation will result in depletion of grazing resources. Family labour and feed resources from CPRs were observed to be the critical inputs used in the buffalo production system. The direct benefits from buffalo rearing were the sale of milk, manure and increment in flock inventory. In order to increase buffalo production, efforts should be taken to improve the natural feed source efficient supplementary feeding, resilient breed improvement and promoting adoption of prophylactic practices by the stakeholders. Awareness has to be created among the buffalo herders about scientific proven practices / technologies to augment their income.

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