



Management Practices of Buffalo Farmers in Rural Areas of Tirunelveli Region of Tamil Nadu

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

The present study was conducted to identify the management practices followed by buffalo farmers in rural areas of Tirunelveli region, Tamil Nadu. A total of 31 buffalo farmers were interviewed by the pre-structured interview schedule and data were tabulated and discussed. The results of the study indicated that majority of the farmers were rearing non-descript buffaloes (77.42%) and practicing natural service to their buffaloes (90.32%). All the respondents surveyed were rearing their animals

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in extensive systems and allowing their animals to graze in common property resources (CPRs) and common range lands. But only, about 35.48 per cent of the respondents were providing green fodder to lactating buffaloes, 19.35 per cent were providing green fodder to heifer and one-sixth of the respondents were providing green fodder to calves. 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. 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 perceived by the farmers. The study concludes that enhancing the efficiency of natural feed sourcing by developing forage resources in community land, strengthening the improvement of resilient buffalo breeds by community-based breeding programmes and developing calendar of prophylaxis will ensure sustenance in buffalo farming.

Keywords: Management practices; buffalo farmers; Tamil Nadu; constraints faced.

1. INTRODUCTION

India is widely acknowledged as a valuable repository of buffalo germplasm resources due to its possession of high productive buffalo breeds. Buffalo farming is an important component of the livestock sector and contributes more than 50 million tons of milk with remarkable 66.3% of the total global buffalo milk volume. In Tamil Nadu state, the Annual Compound Growth Rate (ACGR) for buffalo population during the previous inter-census period (2007-12) stood at -17.23%. 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% [1]. In Tamil Nadu, Buffalo farming land scape is characterised by extensive to semi-intensive rearing, low adoption of scientific technologies, inadequate accessibility to veterinary services and non-remunerative price for milk. Understanding the management practices followed by buffalo farmers is necessary to explore the status and prospects of the rearing systems and to formulate suitable intervention policies. Hence, this study aims in presenting the management practices followed by buffalo farmers, reasons for rearing buffaloes and constraints faced [2].

2. 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 rural areas which has high buffalo population. The data were collected from 31 buffalo farmers of the selected village through personal interview, focussed group discussion

and structured observation. The variables regarding socio-economic variables, different management practices, reason for preferring buffalo rearing and constraints for rearing buffaloes were studied. The collected data were categorised and analysed by using mean, standard deviation, range for interpretation.

3. RESULTS AND DISCUSSION

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

3.1 Socio-personal Profile of Buffalo Farmers

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%) and rest were old aged (35.45%). 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. It is suggested that the knowledge transfer and training programmes should be ensured to ensure the sustainability of farming practices.

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 large herders, 9.68 per cent medium 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. [3] 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 acres) | 21 | 67.74 |
| | 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 21 litres | 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 |
| Mixed farming system | Collegiate | 2 | 6.45 |
| | Yes | 20 | 64.52 |
| Extension agency contact | No | 11 | 35.48 |
| | Veterinarians | 13 | 41.94 |
| | Listening to farm programmes | 3 | 9.68 |
| | Progressive farmer | 6 | 19.35 |
| | Para veterinarians | 2 | 6.45 |
| Social Participation | None | 7 | 22.58 |
| | Yes | 3 | 9.68 |
| | No | 28 | 90.32 |

3.2 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. [4] 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. Hence, there is potential for increasing the efficiency of milk production by addressing reason of inappropriate breeding practices.

3.3 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 green 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 were 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. None of the farmers were supplementing vitamins or minerals for their animals. 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 available crop residues, available concentrates and mineral mixture to improve the performance of the animals.

3.4 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. The findings of the study are contradicting with Mishra et al. [5], Tiwari et al. [6] and Prasanthi et al. [7]. 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/

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 |

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 |
| Type of green fodder | Cultivated fodder | 7 | 22.58 |
| | Bund grass | 8 | 25.81 |
| | Purchased fodder | 4 | 12.90 |
| | 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 |

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 lean seasons leading to low production and reproduction performances. Further, parasitic burden also increased among the animals especially calves were observed. 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. This might be due to non-availability and non-accessibility to the veterinary prophylactic services. Hence, it is suggested that 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 |
| | Kutchra | 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 |

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 |

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

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

3.5 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 [8]; Manohar et al. [9] and Sabapara et al. [10]. All the respondents were using open mouth pail for milking. About two-third of the respondents (67.74%) of the farmers surveyed were practicing knuckling method of milking, 29.03 per cent were practising full hand milking and rest 3.23 per cent of the farmers were 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.

3.6 Reasons for Rearing Buffaloes

A glance at Table 7 revealed that traditional culture (42%), comparatively higher milk price than 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%).

3.7 Constraints Faced by Buffalo Farmers

Constraints expressed by the respondents in rearing buffaloes were displayed in Table 7. 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, non-remunerative price for the milk, management constraints during climatic variations, inadequate supply of inputs such as feed/ fodder seeds were the other constraints faced by the buffalo farmers. The results are in line with the findings of Rajadurai et al. [11].

4. CONCLUSION

The study has enriched the understanding on the buffalo production in the rural areas 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. Family labour and feed resources from CPRs were observed to be the critical inputs used in the buffalo production system. 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. 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.

DISCLAIMER (ARTIFICIAL INTELLIGENCE)

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc) and text-to-image generators have been used during writing or editing of manuscripts.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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