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Socio-economic status and breeding constraints of local buffalo farmers in the Bastar region of Chhattisgarh

[1]Varsha Jain, [2]K Mukherjee, [3]Deepti Kiran Barwa, [4]Kaiser Parveen, [5]Naveen Sahu and [6]P Satheeshkumar

[1]Ph.D. Scholar, Department of Animal Genetics and Breeding, College of Veterinary Science and Animal Husbandry, Anjora, DSVCKV, Durg, Chhattisgarh, India

[2]Professor and Head, Department of Animal Genetics and Breeding, College of Veterinary Science and Animal Husbandry. Anjora, DSVCKV, Durg, Chhattisgarh, India

[3]Professor and Head, Department of Animal Genetics and Breeding, College of Veterinary Science and Animal Husbandry. Anjora, DSVCKV, Durg, Chhattisgarh, India

[4]Assistant Professor, Department of Animal Genetics and Breeding, College of Veterinary Science and Animal Husbandry. Anjora, DSVCKV, Durg, Chhattisgarh, India

[5]M.V.Sc., Department of Animal Genetics and Breeding, College of Veterinary Science and Animal Husbandry. Anjora, DSVCKV, Durg, Chhattisgarh, India

[6]Assistant Professor, Department of Animal Genetics and Breeding, Veterinary College and Research Institute, Theni, Tamil Nadu, India

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Corresponding Author: Varsha Jain

Abstract

A field survey was conducted to evaluate the socio-economic status of 96 buffalo farmers from peri-urban and rural areas of Jagdalpur, Dantewada, and Narayanpur districts of the Bastar Plateau, Chhattisgarh. Data were collected using a structured, pre-tested questionnaire through personal interviews. Variables studied included farmer demographics, family structure, education, landholding, herd size, and management practices. Results showed that most respondents (63.54%) were under 55 years of age, predominantly male (80.21%), and belonged to Scheduled Tribes (69.79%). Illiteracy was high (73.95%), and 64.58% of respondents lived in joint families. Agriculture was the primary occupation for 76.04% of households, while 68.75% engaged in labour as a secondary occupation. Nearly half (50%) maintained medium-sized buffalo herds (6-10 animals), and the majority of buffaloes were medium (2-5 liters/day) milk yielders (62.5%). Most farmers owned less than 1 ha of land (36.45%), while only 13.54% were large landholders (>4 ha). The study identified major constraints to buffalo rearing in the region, including the scarcity of genetically superior stock, poor feeding practices, limited access to veterinary services, and the low educational status of farmers. Targeted interventions such as farmer-oriented extension programs, literacy and training initiatives, provision of improved germplasm, and better veterinary support could enhance buffalo productivity and strengthen livelihood security among tribal farming communities in the Bastar Plateau.

Keywords: Socio-economic status, breeding constraints, buffalo, field survey

Introduction

Livestock contributes substantially to the Indian economy and rural livelihoods, with buffaloes (*Bubalus bubalis*) playing a central role as both dairy and draught animals. They are valued for their adaptability, resilience, and productivity, making them integral to mixed farming systems across the country. India accounts for nearly 57% of the world's buffalo population and contributes over 49% of global buffalo milk production (DAHDF, 2019) [5]. Globally, buffaloes are the second-largest contributors to milk production after cattle, supporting food and livelihood security in many developing nations (FAO, 2023) [6].

Despite India's leading role in buffalo production, productivity remains low due to the prevalence of non-descript, low-yielding animals, prolonged calving intervals, and suboptimal feeding and management practices. Several studies (Tiwari *et al*., 2007; Ahirwar *et al*., 2010; Bhanderi *et al*., 2013) [15, 1, 2] have reported widespread deficiencies in scientific feeding knowledge, resulting in poor reproductive and production performance. Farmer education is a critical determinant in this context. Studies suggest that higher educational attainment positively influences adoption of improved practices, milk yield, and overall decision-making in dairying (Sagar *et al*., 1986; Tripathi & Kunzru, 1992; Meena & Chauhan, 1999; Singh & Singh, 2002) [12, 16, 9, 13].

Given these challenges, assessing the socio-economic status of buffalo farmers at the district level is essential. Understanding demographic characteristics, landholding patterns, herd size, and management practices provides the foundation for designing effective extension programs. This

study, therefore, investigates the socio-economic profile of buffalo farmers in the Bastar Plateau of Chhattisgarh, with a focus on identifying constraints and opportunities for sustainable buffalo-based dairying systems.

Materials and Methods

Study Area and Sampling

The study was conducted in three districts of the Bastar Plateau zone: Jagdalpur, Dantewada, and Narayanpur. From these districts, three blocks each from Bastar and Dantewada, and two from Narayanpur were purposively selected based on buffalo population density and accessibility. From each block, two villages were chosen, making a total of 16 villages. With the help of local veterinary staff, lists of buffalo owners with at least one adult female buffalo were prepared. From each village, six farmers were randomly selected, yielding a total sample size of 96 respondents.

Data Collection

Data were collected using a pre-tested, structured questionnaire administered through personal interviews. Information gathered included: age, sex, caste, family type, education, occupation, landholding, herd size, experience in buffalo rearing, feeding and milking practices, and sources of information on buffalo husbandry.

Statistical Analysis

All data were subjected to descriptive statistical analysis to derive measures such as mean, percentage, and standard deviation. Microsoft Excel 2016 was used for data entry, tabulation, and calculation of descriptive measures, while GraphPad Prism version 8.0.2 was employed for preparation of graphs.

Results

Socio-demographic Profile of Respondents

The socio-demographic distribution of respondents is summarized in Table 1. The majority (63.54%) of the respondents were in the middle age group (35-55 years), followed by 23.95% in the old age group (>55 years), and 12.5% in the young age group (<35 years). Most of the respondents were male (80.21%), and female participation was limited (19.79%). Caste-wise distribution revealed that the majority belonged to Scheduled Tribes (69.79%), followed by Other Backward Classes (20.83%). Only 4.16% each were from Scheduled Castes and General Castes. A considerable proportion of farmers belonged to joint families (64.58%), while 35.42% were from nuclear families. Regarding family size, most households (57.29%) had medium-sized families (4-8 members), followed by small-sized (22.91%) and large-sized (19.79%) families. Educational status indicated a low literacy rate, with 73.95% of respondents being illiterate and only 26.04% reporting some level of education.

Occupation and Experience in Buffalo Rearing

Agriculture was the primary occupation of most respondents (76.04%), followed by labour (10.41%), service (7.29%), and business (5.20%). Secondary occupation was largely labour (68.75%), with 21.87% engaged in agriculture and 9.36% in business. Experience levels in buffalo rearing showed that 60.41% of farmers had 10-30 years of experience, 33.33% had more than 30 years, and only 6.25% had less than 10 years (Table 2).

Landholding and Herd Size

The landholding distribution (Table 2 & Figure-1) showed that most respondents were small farmers (36.45%) with <1 ha of land, followed by medium farmers (25.0%), marginal farmers (17.7%), large farmers (13.54%), and landless farmers (8.33%). Herd size data revealed that 50% of respondents maintained 6-10 buffaloes, 39.58% kept 1-5 buffaloes, and only 10.41% maintained more than 10 buffaloes.

Sources of Information on Buffalo Husbandry

As shown in Figure **2**, the majority (60.41%) of buffalo owners relied on *chaupal* (village gatherings) as their primary source of information. Radio/TV (18.75%), internet (12.5%), and newspapers (10.41%) were also reported as additional sources of information.

Milking and Production Status of Buffaloes

Milking practices revealed that most farmers (81.25%) milked their buffaloes once a day, while 18.75% milked twice daily. Production status indicated that 62.5% of buffaloes were medium yielders (2.5-5 L/day), 37.5% were low yielders (<2.5 L/day), and none exceeded 5 L/day (Table 4 & Figure-3).

Discussion

The socio-economic profile of respondents reflected that buffalo rearing in the study area is dominated by middle-aged male farmers**,** consistent with previous findings (Rathod *et al*., 2013; Dar *et al*., 2018; Singh *et al*., 2021) [11, 3, 14]. Limited involvement of young people may be attributed to migration and preference for non-agricultural occupations. The caste distribution confirmed that Scheduled Tribes are the major stakeholders in buffalo farming, which corroborates earlier studies in tribal regions (Dar *et al*., 2018) [3] but differs from reports where general caste dominated dairy farming (Yadav, 2018; Kumar *et al*., 2021) [17, 8]. Family type and size indicated that joint families with medium household sizes predominate, which may contribute positively to labour availability in dairy work. This finding aligns with Rachna *et al*. (2017) [10] and Kumar *et al*. (2021) [8]. The high illiteracy rate (73.95%) highlights a key limitation to adopting modern husbandry practices, as pointed out by Debasish *et al*. (2010) [4]. However, reliance on *chaupal* and mass media suggests potential avenues for effective dissemination of extension services.

Occupational data showed the strong dependence of farmers on agriculture and labour, confirming that buffalo rearing is a complementary activity for livelihood security, similar to findings of Kumar *et al*. (2021) [8]. The majority having more than 10 years of buffalo-rearing experience further emphasizes traditional knowledge in managing herds. Landholding patterns and herd sizes revealed that small and medium farmers dominate buffalo rearing. Similar results were noted by Gautam *et al*. (2007) [7] and Singh *et al*. (2021) [14]. This indicates that buffalo rearing is particularly crucial for smallholders and marginal farmers in ensuring income and nutritional security. Milking and production

trends showed dominance of medium-yielding buffaloes, while high-yielding animals were absent. This can be attributed to poor feeding and management practices, confirming the low productivity potential of buffaloes in Bastar Plateau.

Constraints in Buffalo Breeding in the Bastar Plateau, Chhattisgarh

The major constraint reported was breeding/low-yielding parental stock (75%), followed by fodder scarcity and high feed cost (66.67%). These findings indicate the need for genetic improvement programs and better fodder management. Disease incidence (60.42%) and veterinary care shortage (52.08%) were also significant, highlighting health management challenges in the region. Low milk yield (47.92%) and marketing issues (41.67%) further limit farmers' income, while labour shortage (10.42%) was the least important constraint (Figure-4). Overall, improving breeding services, fodder availability, and veterinary infrastructure can enhance buffalo farming sustainability in the Bastar Plateau.

Table 1: Socio-demographic profile of buffalo farmers (Age, Sex, Caste, Family type, Family size, Education)

Category	Sub-category	Frequency (n=96)	Percentage
Age (in years)	Young (Up to 35)	12	12.50%
	Middle (35-55)	61	63.54%
	Old (Above 55)	23	23.96%
Sex	Male	77	80.21%
	Female	19	19.79%
Caste	General	4	4.17%
	OBC	20	20.83%
	SC	4	4.17%
	ST	67	69.79%
Type of family	Nuclear	34	35.42%
	Joint	62	64.58%
Family size	Small (2-4)	22	22.92%
	Medium (4-8)	55	57.29%
	Large (above 8)	19	19.79%
Education	Illiterate	71	73.96%
	Literate	25	26.04%

Table 2: Occupational profile, experience in buffalo rearing of respondents.

Category	Sub-category	Frequency (n=96)	Percentage
Primary Occupation	Agriculture	73	76.04%
	Business	5	5.21%
	Labour	10	10.42%
	Service	7	7.29%
Secondary occupation	Agriculture	21	21.88%
	Business	9	9.38%
	Labour	66	68.75%
Experience in buffalo rearing (in years)	Low (0-10)	6	6.25%
	Medium (10-30)	58	60.42%
	High (>30)	32	33.33%

Table 3: Landholding size, and herd size of Buffalo Farmers in the Study Area

Category	Sub-category	Frequency (n=96)	Percentage
Land holding	Landless	8	8.33%
	Small (<1 ha)	35	36.46%
	Marginal (1-2 ha)	17	17.71%
	Medium (2-4 ha)	24	25.00%
	Large (>4 ha)	13	13.54%
Herd size	Small (1-5)	38	39.58%
	Medium (6-10)	48	50.00%
	Large (11-15)	10	10.42%

Table 4: Milking frequency and milk yield of buffaloes in Bastar Plateau.

Category	Sub-category	Frequency (n=96)	Percentage
Frequency of milking	Once in a day	78	81.25%
	Twice in a day	18	18.75%
Milk yield	<2 liter per day	36	37.50%
	2-5 liter per day	60	62.50%
	>5 liter per day	0	0.00%

Table 5: Ranking of Constraints in Buffalo Breeding in the Bastar Plateau, Chhattisgarh

Constraint	No. of Farmers (n=96)	Percentage (%)	Rank
Scarcity of fodder/High feed cost	64	66.67	2
Disease incidence	58	60.42	3
Veterinary care shortage	50	52.08	4
Breeding/Low yielding parental stock	72	75.00	1
Low milk yield	46	47.92	5
Labour shortage	10	10.42	7
Marketing difficulties	40	41.67	6

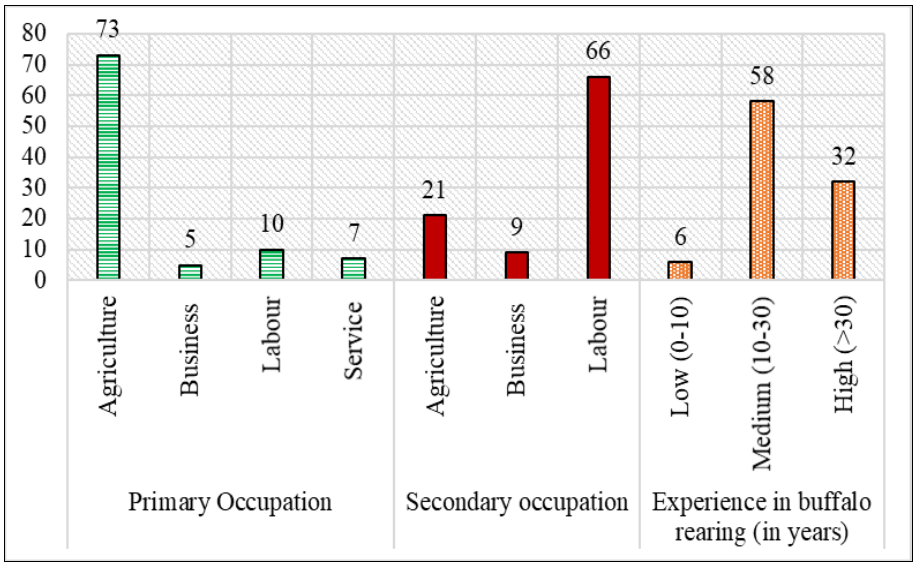

Fig 1: Occupational profile, experience in buffalo rearing of respondents.

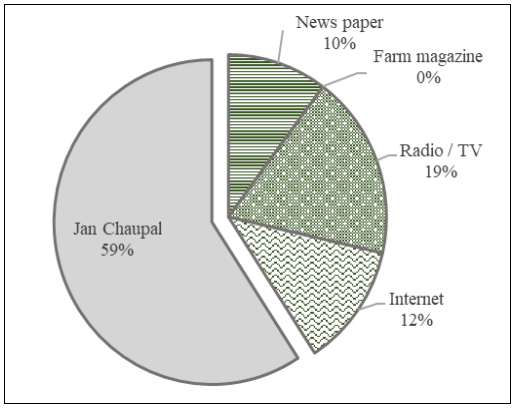

Fig 2: Sources of Information on Buffalo Husbandry

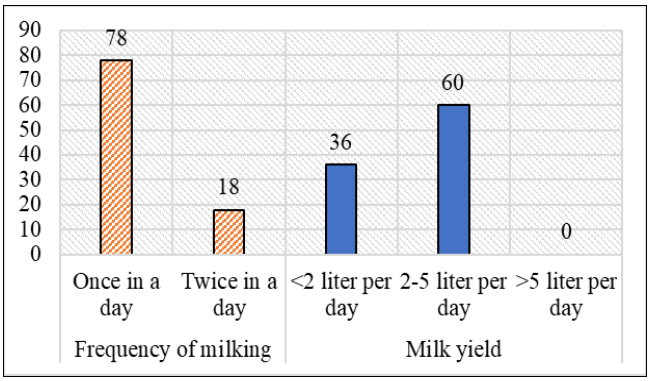

Fig 3: Landholding size, and herd size of Buffalo Farmers in the Study Area

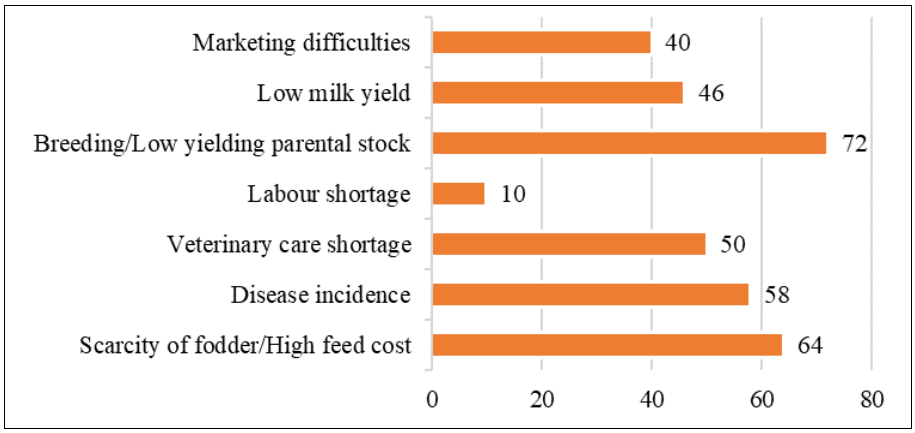

Fig 4: Major Constraints in Buffalo Breeding in the Bastar Plateau, Chhattisgarh

Conclusion

Buffalo rearing in the Bastar region serves as an indispensable livelihood source for small and medium tribal farmers. However, its potential is limited by widespread illiteracy, inadequate extension support, predominance of low-yielding animals, and restricted access to veterinary and technical services. The predominance of medium- to low-yielding buffaloes reflects both the lack of genetically superior germplasm and the limited adoption of scientific feeding and management practices. Strengthening buffalo husbandry in this region requires a multi-pronged approach:

1. Farmer-centric extension programs tailored to the socio-cultural context of tribal communities.
2. Promotion of literacy and hands-on training in scientific dairying practices.
3. Access to improved germplasm and breeding services to enhance genetic potential.
4. Strengthening veterinary care and input delivery systems to reduce disease burden and improve productivity.

By addressing these critical gaps, buffalo husbandry in Bastar can be transformed into a more productive and sustainable enterprise, thereby enhancing livelihood security and improving the socio-economic well-being of tribal farming households in Chhattisgarh's Bastar Plateau.

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