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### Demographic and economic status of Khuti dwellers in Assam

<sup>1</sup>Dimpal Gogoi, <sup>1</sup>Bikash Borthakur, <sup>1</sup>Atul Borgohain, <sup>1</sup>Janmoni Shyam and <sup>2</sup>Biju Borah

<sup>1</sup>College of Veterinary Science, AAU, Khanapara, Guwahati, Assam, India

<sup>2</sup>Lakhimpur College of Veterinary Science, AAU, Joyhing, North Lakhimpur, Assam, India

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Corresponding Author: Dimpal Gogoi

#### Abstract

This study assessed the socio-economic status of Khuti dwellers in Assam, focusing on demographic, educational, and economic variables across four districts: Lakhimpur, Dhemaji, Sonitpur, and Biswanath. Stratified random sampling was employed to select 100 respondents from 20 Khuti farms, with data collected through structured questionnaires. Descriptive statistics and Analysis of Variance (ANOVA) were used to examine the relationships between socio-economic variables. Key findings showed that the respondents were predominantly in their economically productive years, with an average age of 43.61 years. The majority of respondents had medium-sized families (86%) and medium education levels (66%), with a significant difference in educational status across the study areas ( $F = 5.195, p < 0.01$ ). The socio-economic status of Khuti dwellers was further influenced by occupation, with buffalo farming being the primary source of livelihood for 68% of respondents, followed by agriculture (22%). The average farming experience was 23.90 years, with significant variation in farming experience across the study areas ( $F = 5.113, p < 0.01$ ). Extension contact and mass media exposure were important factors in enhancing socio-economic conditions, with significant differences observed across the study areas ( $F = 13.60, p < 0.01$  for extension contact;  $F = 4.15, p < 0.01$  for mass media exposure). The mean annual income from buffalo rearing was ₹1,13,200, with significant regional variation ( $F = 13.425, p < 0.01$ ). The study highlights the socio-cultural factors shaping Khuti dwellers' livelihoods, including family size, education, and occupation. It underscores the need for targeted policy interventions to address regional disparities and improve access to resources and services for buffalo farming communities in Assam.

**Keywords:** Buffalo, Khuti dweller, Khuti system, Socio-economic Profile, Assam

#### Introduction

The Khuti system of buffalo rearing is a traditional, community-based livestock management practice predominantly observed in the Brahmaputra valley of Assam. In this system, buffaloes are managed extensively under semi-nomadic conditions, with minimal inputs (Chetry and Kar, 2021) [6]. Large herds owned by multiple farmers are pooled together and kept in open enclosures, typically located on riverbanks, sandbars (chars), or forest fringes. These temporary camps, known as *Khutis*, are migratory in nature and lack permanent infrastructure. While adult buffaloes remain in open spaces without shelter, young calves are often provided minimal thatched housing. The animals graze freely during the day and are milked in the early morning hours (Amonge, 1993; Amonge *et al.*, 1998) [2, 1].

This system plays a crucial role in the rural economy of Assam by contributing significantly to household income through milk production and draft power. It is deeply embedded in the cultural identity and livelihoods of the Khuti dwellers, many of whom belong to indigenous and marginalized communities. The sustainability of this unique system depends heavily on the continued engagement of these communities (Islam *et al.*, 2017) [10].

Despite its importance, there has been a lack of systematic research on the socio-economic profile of Khuti dwellers.

Most livestock-related studies in Assam focus on sedentary or commercial systems, thereby overlooking the unique needs and challenges faced by Khuti-based buffalo rearers. These dwellers often struggle with inadequate access to veterinary care, education, credit facilities, and extension services (Amonge *et al.*, 1998; Komor and Borah, 2015; Chetry and Kar, 2021) [1, 15, 6].

Therefore, the present study was undertaken to assess the socio-economic conditions of Khuti dwellers in Assam. By analyzing variables such as occupation, education, income, access to services, and farming experience, this study seeks to highlight the needs and priorities of these communities. The findings will provide a foundation for developing targeted interventions to support and sustain the Khuti system in the face of changing economic and environmental pressures

#### Methodology

This study aimed to assess the socio-economic status of Khuti dwellers in Assam, focusing on key demographic, educational, and economic variables. The study was conducted in four districts: Lakhimpur, Dhemaji, Sonitpur, and Biswanath, where the Khuti system of buffalo rearing is practiced. A stratified random sampling method was used to select respondents. First, one block from each district was purposively selected based on the prevalence of the Khuti

system. Then, five khutis were randomly selected from each block. From each selected khuti, five farmers were randomly chosen, resulting in a sample size of 100 respondents.

Data collection was done through structured questionnaires, capturing variables such as age, family size, education level, occupation, income, and farming experience. Face-to-face interviews were conducted with the selected farmers to gather primary data. Descriptive statistics were used to summarize the data, and Analysis of Variance (ANOVA) was applied to assess relationships between socio-economic

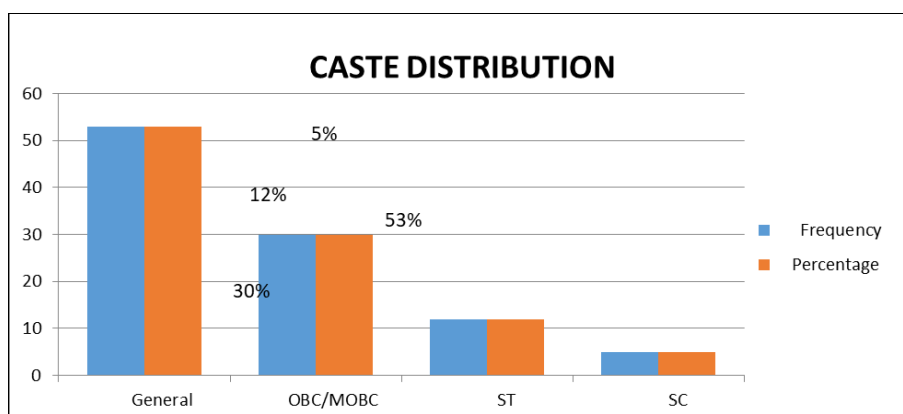
variables and the overall socio-economic status of the respondents. Ethical considerations, including informed consent and confidentiality, were ensured throughout the data collection process.

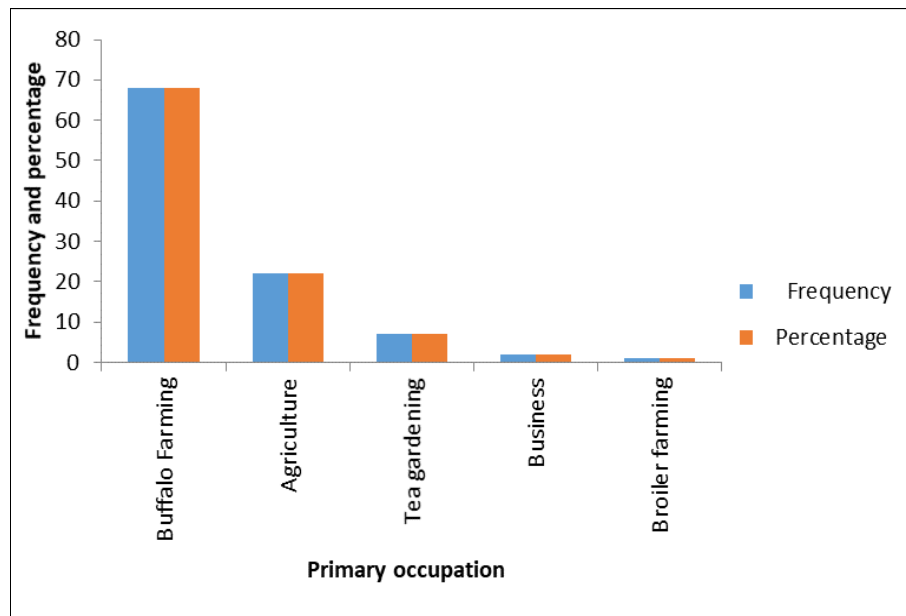
By utilizing stratified random sampling, this methodology allowed for a comprehensive and representative assessment of the socio-economic conditions of Khuti dwellers, providing insights into their livelihood patterns, income sources, and socio-demographic characteristics

**Results and Discussion**

**Table 1: Socio economic status of khuti dwellers**

Variable	Mean	SD	Range	Pooled category			F value
				Low	Medium	High	
Age	43.91	9.472	22-70	22 (22.00) ≤ 35 (Young)	65 (65.00) 36-53 (Middle)	13 (13.00) ≥ 54 (Older)	.047 <sup>NS</sup>
Educational status	2.84	1.31	1-4	24 (24.00) ≥4	66 (66.00) 2-3	10 (10.00) ≤1	5.195 <sup>**</sup>
Family size	5.01	1.494	3 - 12	6 (6.00) ≥ 7	86 (86.00) 5 - 6	8 (8.00) ≤ 4	4.051 <sup>NS</sup>
Farming experience	23.90	9.54	8-45	15 (15.00) ≤ 14	68 (68.00) 15-32	17 (17.00) ≥33	5.113 <sup>**</sup>
Social participation	2.59	0.40	3	74 (74.00) ≤2.19	18 (18.00) 2.20-2.98	8 (8.00) ≥2.99	0.373 <sup>NS</sup>
Extension contact	1.62	0.79	2	19 (19.00) ≤0	0 (0.00) 0-2	81 (81.00) ≥2	13.60 <sup>**</sup>
Mass media exposure	4.32	2.14	0-6	18 (18.00) ≤2	48 (48.00) 3-5	34 (34.00) ≥6	4.15 <sup>**</sup>
Herd Size	9.79	26.23	2-152	39 ≤16	55 17-36	6 ≥ 67	2.60 <sup>NS</sup>
Annual income (from Buffalo)	113.2	64.83	45000-350000	1 (1.00) ≤48	87 (87.00) 49-177	12 (12.00) ≥178	13.425 <sup>**</sup>
Annual income (from A.H.)	86.15	34.64	40000-250000	11 (11.00) ≤51	77 (77.00) 52-119	12 (12.00) ≥120	1.211 <sup>NS</sup>
annual income (from all sources)	158.05	93.735	60000-550000	1 (1.00) ≤ 64	86 (86.00) 65-250	13 (13.00) ≥ 251	9.97 <sup>**</sup>





### Results and Discussion

The socio-economic profile of Khuti respondents, as shown in Table 1, Figure 1, and Figure 2, displayed notable variation across demographic, educational, experiential, and income-related variables. ANOVA was applied to assess differences across study areas, and the key findings are summarized below.

#### Age

The mean age of the respondents was 43.61 years, indicating that most participants were in their economically productive years. A majority (65%) belonged to the middle age group, followed by 22% in the young age group and 13% in the elder group. This age distribution suggests a workforce largely composed of individuals with practical experience, maturity, and sustained involvement in livestock activities. However, the ANOVA results revealed no significant variation in age across the study areas ( $F = 0.047$ , NS). This lack of significance may indicate that the age structure of livestock keepers remains fairly uniform across regions, possibly due to similar socio-cultural and economic dynamics influencing engagement in buffalo rearing. Comparable findings were reported by Schooman and Swai (2011)<sup>[22]</sup> and Rajput *et al.* (2023)<sup>[19]</sup>, who noted that age may not substantially differentiate farming practices or socio-economic outcomes in traditional livestock systems.

#### Family Size

The mean family size of the respondents was 5.01, ranging from 3 to 12 members. A significant majority (86%) of respondents had medium-sized families, with only a small proportion having either small (6%) or large (8%) family sizes. This trend likely reflects rural socio-cultural norms where medium to large families are common and often associated with greater labour availability for agriculture and livestock rearing. Additionally, prevailing religious and cultural beliefs—such as the perception of abortion as a moral or spiritual transgression—may contribute to larger family sizes (Frohworth *et al.*, 2018)<sup>[9]</sup>. However, the ANOVA test indicated no statistically significant variation

in family size across the different study areas ( $F = 4.051$ , NS), suggesting a relatively uniform family size pattern irrespective of location. This finding aligns with the study by Asravor (2017)<sup>[3]</sup>, which also noted that family size, while culturally influenced, does not vary considerably across similar rural contexts, nor does it significantly affect socio-economic status on its own

#### Caste

The buffalo-keeping respondents in Assam were predominantly from the General category, which was mainly composed of Muslims and Nepalis (53%) (Sultan, 2015; Chetry and Kar, 2021)<sup>[30, 6]</sup>. The other categories included OBC/MOBC (30%), ST (12%), and SC (5%), with the latter groups predominantly belonging to the indigenous communities of Assam (Barbaruah, 2012; Borah, 2014)<sup>[4, 5]</sup>. This categorization reflected the diverse ethnic composition within buffalo farming households, and such demographic patterns might have influenced the types of support and interventions these groups might have required, particularly in terms of socio-economic development and livestock management practices.

#### Educational Status

The mean educational status of the respondents was found to be 2.84. Regarding the distribution of education levels, the majority (66%) of respondents had a medium educational status, followed by those with a low level of education (24%), and a small proportion (10%) had a high level of education. The significant difference in educational categories across the study areas ( $F = 5.195$ ,  $p < 0.01$ ) can be attributed to disparities in access to educational infrastructure, socio-economic conditions, and regional development initiatives. Areas with better schooling facilities, economic stability, and supportive policies tend to have higher educational attainment. Conversely, regions with limited access, poverty, or cultural barriers may show lower education levels. These variations explain the observed differences across the study locations. Kirui and Kozicka, 2018<sup>[14]</sup>; Shi and Bangpan 2022<sup>[24]</sup>.

### Occupation

Among Khuti respondents, the majority (68%) were primarily engaged in buffalo farming, reflecting its central role in their livelihoods. Agriculture followed with 22%, indicating a complementary relationship between livestock and crop farming. Other occupations, such as tea gardening (7%), business (2%), and broiler farming (1%), were less common but provided additional sources of income. This occupational diversity suggested a reliance on buffalo farming for economic stability, with secondary activities contributing to livelihood resilience and reducing dependence on a single source of income. The present findings were consistent with the studies conducted by Rajput *et al.* 2023<sup>[19]</sup>, Saikia and Lalnilawma (2024)<sup>[20]</sup>, and Phukan (2024)<sup>[17]</sup>, which further reinforced the observed trends in the occupation patterns of livestock farmers in the region. These studies highlighted the dominance of buffalo farming, followed by agriculture and other livelihoods, reflecting the multi-dimensional nature of income sources in rural Assam.

### Farming Experience

The mean farming experience of the respondents was found to be 23.90 years. In terms of farming experience distribution, the majority (68%) of respondents had medium farming experience, followed by those with high farming experience (17%) and a smaller proportion (15%) with low farming experience. The ANOVA results revealed a significant difference in farming experience levels across the study areas ( $F = 5.113$ ,  $p < 0.01$ ). This suggests that farming experience plays a key role in shaping the socio-economic status of respondents, with more experienced farmers likely benefiting from accumulated knowledge and skills. Singh *et al.* (2020)<sup>[26]</sup> similarly found that farming experience is positively correlated with better decision-making and resource management in farming communities, contributing to higher productivity and economic outcomes. The findings underscore the importance of experience in enhancing farm productivity and improving socio-economic conditions. Moreover, the studies of Ssekibaala *et al.* 2024<sup>[28]</sup> highlighted the significance of integrating traditional practices with modern approaches to support sustainable livestock farming and improve market outcomes.

### Social Participation

The mean social participation score of the respondents was found to be 2.59. Regarding the distribution of social participation levels, the majority (74%) of respondents had low social participation, followed by medium participation (18%) and high participation (8%). The ANOVA results revealed no significant difference in social participation across the study areas ( $F = 0.373$ , NS). This suggests that social participation levels were largely uniform across the study areas, with most respondents being less involved in social activities. The lack of significant variation may reflect limited opportunities for community engagement or barriers to participation such as geographical isolation, cultural factors, or lack of awareness of social programs. As noted by Yedida *et al.* (2022)<sup>[32]</sup>, rural communities often faced challenges in social participation, while Shaban *et al.* (2024)<sup>[23]</sup> emphasized that weak community support systems heightened vulnerability to socio-ecological shocks.

Strengthening producer groups and livestock cooperatives could enhance knowledge-sharing, institutional access, and resilience among these communities.

### Extension Contact

The mean extension contact score of the respondents was found to be 1.62. Regarding the distribution of extension contact levels, the majority (81%) of respondents had high extension contact, followed by low extension contact (19%). The ANOVA results revealed a significant difference in extension contact among the study areas ( $F = 13.60$ ,  $p < 0.01$ ), suggesting that extension services were more accessible to farmers in certain regions. This higher extension contact in specific areas can be attributed to better access to agricultural extension workers, government programs, and local support networks. Extension services play a crucial role in providing farmers with updated information, technology, and resources that can enhance farming practices and improve socio-economic conditions. The variation in extension contact levels across areas highlights the need for more equitable access to these services, especially in remote or underserved regions. Similar findings were reported by Nkosi *et al.* (2022)<sup>[16]</sup>, Rahman *et al.* (2023)<sup>[18]</sup>, and Kazanski *et al.* (2025)<sup>[13]</sup>, underscoring the importance of extension services in improving livestock productivity and livelihoods.

### Mass Media Exposure

The mean mass media exposure score of the respondents was found to be 4.32. In terms of distribution, 48% of respondents had medium exposure, followed by 34% with high exposure, and 18% with low exposure. The ANOVA results revealed a significant difference in mass media exposure across the study areas ( $F = 4.15$ ,  $p < 0.01$ ), indicating that the level of exposure to mass media varied significantly across the regions. This variation can be attributed to differences in the availability and accessibility of mass media platforms, such as television, radio, and digital media, which may have influenced the information channels accessible to the respondents. Higher mass media exposure in certain areas could be linked to better infrastructure, including electricity, internet connectivity, and access to communication technologies. These findings suggest that mass media plays a critical role in shaping the socio-economic conditions and awareness levels of farmers, highlighting the need for targeted information dissemination strategies. Similar reports by Thumbi *et al.* (2019)<sup>[31]</sup> and Stringer *et al.* (2019)<sup>[29]</sup> on ICT impacts on livestock production support these findings, emphasizing the importance of communication technologies in enhancing livestock management practices and overall productivity.

### Herd Size

The mean herd size of the respondents was 9.79, with the majority (55%) falling into the medium category, followed by 39% in the low and 6% in the high category. ANOVA results revealed no significant difference in socio-economic status across these categories ( $F = 2.60$ , NS). The lack of significant variation in herd size across different study areas suggests that regional agricultural practices, resource availability, and environmental factors may not play a distinct role in influencing herd size. Instead, this uniformity

likely reflects shared challenges among Khuti farmers, including limited land, input resources, and veterinary access. Cultural norms and traditional management practices may further contribute to maintaining similar herd sizes. Socio-economic constraints could also lead farmers to prefer moderate herd sizes to balance workload and financial risk. Overall, these findings underscore the need for in-depth studies into the socio-cultural and economic factors shaping herd management decisions in the Khuti system. Similar findings were reported by Chetry and Kar (2021)<sup>[6]</sup>, who observed comparable patterns of herd size stability across buffalo-rearing communities in their study area.

### Annual Income from Buffalo Rearing

Regarding the annual income derived specifically from buffalo rearing, the mean income was ₹1,13,200, with a significant majority of respondents (87%) falling in the medium income category, followed by 12% in the high-income group and only 1% in the low-income group. The ANOVA results revealed a significant difference in economic status across the four study areas ( $F = 13.425$ ,  $p < 0.01$ ), suggesting that income from buffalo rearing was notably influenced by regional variations. This could be attributed to differences in fodder availability, veterinary support, market linkages, and husbandry practices prevalent in specific areas. Respondents in better-served regions likely benefited from improved productivity and sales, thereby achieving higher income levels. These findings were consistent with previous research by Escarcha *et al.*, 2018<sup>[8]</sup>; Dhakal, 2019<sup>[7]</sup>; Jerome *et al.*, 2022<sup>[11]</sup>, who also reported that livestock income was strongly shaped by local infrastructural and resource-based variables. The results highlighted the importance of strengthening buffalo-based livelihood systems through region-specific strategies.

### Total Annual Income (All Sources)

The average annual income of the respondents from all sources was ₹1,58,050, with the majority (86%) falling into the medium income category, followed by 13% in the high and 1% in the low category. The ANOVA analysis revealed a statistically significant variation in income levels across the four study areas ( $F = 9.97$ ,  $p < 0.01$ ), indicating that income-generating potential among Khuti dwellers is not uniform. This disparity may reflect differences in access to markets, agricultural productivity, availability of alternative livelihoods, and the extent of livestock integration. Areas with better infrastructure or proximity to urban centers may offer enhanced opportunities, resulting in higher incomes. Conversely, remote or resource-constrained areas may limit income diversification, thereby constraining economic growth. The present findings get support from the studies of Sarkar *et al.* (2013)<sup>[21]</sup>, Kaur and Singh (2014)<sup>[12]</sup>, Siddiki *et al.* (2015)<sup>[25]</sup>, and Singh and Kaur (2018)<sup>[27]</sup>, who also observed significant income variation linked to local livelihood opportunities and infrastructural access. These results emphasized the need for targeted policy interventions to reduce income disparities and foster inclusive development among traditional livestock-rearing communities.

### Conclusion

The study reveals that Khuti dwellers in Assam, primarily

engaged in buffalo rearing, face socio-economic challenges that are influenced by factors such as age, family size, educational status, and farming experience. While most respondents are middle-aged with moderate educational levels and significant farming experience, variations in income and access to resources were observed across regions. Family size, caste, and social participation showed limited regional differences, indicating cultural and socio-economic uniformity. However, factors like education, extension services, and market access significantly impacted the income and livelihood of respondents. To improve the socio-economic conditions of these communities, it is crucial to enhance educational opportunities, especially in remote areas, and provide targeted vocational training. Strengthening agricultural extension services and improving infrastructure, including market linkages, will help increase productivity and reduce income disparities. Additionally, fostering social participation and supporting local cooperatives can enhance resilience and collective growth in these communities.

### References

1. Amonge TK, Sarker AB, Bora NN, Roy TC. A study of the breeding behaviour of swamp buffaloes under the 'Khuti' system of management in Assam. *Indian Vet J.* 1998;75(10):932-3.
2. Amonge TK. Aspects of productive and reproductive behaviours of swamp buffalo under 'khuti' system of management in Assam. Ph.D thesis. Assam Agricultural University, Guwahati-22; 1993.
3. Asravor RK. Livelihood diversification strategies to climate change among smallholder farmers in Northern Ghana: Diversification strategies to climate change. *J Int Dev.* 2017;30(4):611-30. <https://doi.org/10.1002/jid.3330>.
4. Barbaruah M. Livestock Sector Development in Assam. *The Sentinel (News Paper).* 2012;Vol XXX:3. 10.13140/2.1.2515.1689.
5. Borah M, Halim RA. Dynamics of livestock and poultry sector in Assam: A critical analysis. *Econ Aff.* 2014;59(Special Issue):773-82.
6. Chetry K, Kar N. Khuti - A Traditional Nepali Dairy Farming for Rural Livelihood in Lohit District of Arunachal Pradesh (India). *Eco Env & Cons.* 2021;27(3):1390-8.
7. Dhakal B. Enhancing buffalo production for food and economy. In: *Proceedings of the International Buffalo Symposium; Agriculture and Forestry University, Rampur, Chitwan, Nepal; 15-18 November 2017.*
8. Escarcha JF, Lassa JA, Palacpac EP, Zander KK. Understanding climate change impacts on water buffalo production through farmers' perceptions. *Climate Risk Manag.* 2018;20:50-63. <https://doi.org/10.1016/j.crm.2018.01.004>.
9. Frohwirth L, Coleman M, Moore AM. Managing religion and morality within the abortion experience: Qualitative interviews with women obtaining abortions in the U.S. *World Med Health Policy.* 2018;10(4):381-400. <https://doi.org/10.1002/wmh3.289>.
10. Islam S, Alam S, Kaur G, Gogoi A. On-farm husbandry practices and phenotypic characteristics of indigenous Assamese buffaloes of India. *Indian J Anim Res.*

- 2017;52. <https://doi.org/10.18805/ijar.B-3358>.
11. Jerome DA, Dey A, Punetha M, Makarabbi G, Phand S, Das S, Datta TK. Technological intervention for improving productivity and profitability in buffalo husbandry [E-book]. Hyderabad: ICAR-CIRB, Hisar, Haryana & National Institute of Agricultural Extension Management, Hyderabad, India; 2022.
  12. Kaur I, Singh VP. Report of Project “Economics of milk production and its regular monitoring in Punjab” submitted to Punjab Dairy Development Board, Chandigarh; 2014.
  13. Kazanski CE, Balehegn M, Jones K, *et al.* Context is key to understand and improve livestock production systems. *Global Food Sec.* 2025;45:100840. <https://doi.org/10.1016/j.gfs.2024.100840>.
  14. Kirui O, Kozicka M. Vocational education and training for farmers and other actors in the agri-food value chain in Africa. *SSRN Electron J.* 2018. <https://doi.org/10.2139/ssrn.3206514>.
  15. Komor P, Borah J. Analysis of the traditional Nepali dairy farming (khutti) practice in Naukillo, Lower Dibang Valley, Arunachal Pradesh, India. *The Clarion-Int Multidiscip J.* 2015;4(2):75-83.
  16. Nkosi N, Maake M, Antwi MI, Masafu MM, Rubhara T. Access to extension and advisory services by emerging livestock farmers in uThungulu District Municipality of KwaZulu-Natal. *South Afr J Agric Ext.* 2022;50(2):101-16. <https://doi.org/10.17159/2413-3221/2022/v50n2a12300>.
  17. Phukan D. Socio-economic condition of dairy farmers in Assam: A study on Golaghat District of Assam. *IJNRD - Int J Novel Res Dev.* 2024;9(3):b34-b41. ISSN: 2456-4184. Available at: <https://ijnrd.org/papers/IJNRD2403105.pdf>.
  18. Rahman MS, Sujan MHK, Sherf-UI-Alam M, Sultana M, Akter MS. Adoption of improved management practices of livestock: Case of small-scale farmers in rural Bangladesh. *Heliyon.* 2023 Jul 25;9(8):e18667. doi: 10.1016/j.heliyon.2023.e18667.
  19. Rajput MB, Ashwar BK, Vekariya SJ. Socio-economic status and constraints faced by dairy farmers. *Gujarat J Ext Educ.* 2023;36(2):Article 10. <https://doi.org/10.56572/gjoe.2023.36.2.0010>.
  20. Saikia G, Lalnilawma D. Socio-economic profile of the dairy farmers in rural areas of Kamrup district of Assam. *Alochana J.* 2024;13(3). ISSN: 2231-6329.
  21. Sarkar S, Hossain MM, Amin MR. Socio-economic status of buffalo farmers and the management practices of buffaloes in selected areas of Bagerhat District of Bangladesh. *Bangladesh J Anim Sci.* 2013;42(2):158-64.
  22. Schooman R, Swai ES. A comparison of livestock production systems and their productivity in the Tanga region of Tanzania. *Livest Res Rural Dev.* 2011;23(11).
  23. Shaban A, Kourtit K, Nijkamp P, Das B. Socio-ecological shocks, weak community support systems, and tragic responses of farmers - A modeling study on India. *Reg Sci Policy Pract.* 2024;16(9):100030. <https://doi.org/10.1111/rsp3.100030>.
  24. Shi Y, Bangpan M. Young people’s participation experiences of technical and vocational education and training interventions in low- and middle-income countries: A systematic review of qualitative evidence. *Empir Res Voc Educ Train.* 2022;14(1):8. <https://doi.org/10.1186/s40461-022-00136-4>.
  25. Siddiki MA, Amin MR, Kabir A, Faruque MO, Khandaker Z. Socio-economic status of buffalo farmers and the performances of buffaloes at Lalpur Upojila of Natore district in Bangladesh. *Bangladesh J Anim Sci.* 2015;44(3):157-65.
  26. Singh R, Sharma RK, Babu S, *et al.* Traditional Ecological Knowledge and Contemporary Changes in the Agro-pastoral System of Upper Spiti Landscape, Indian Trans-Himalayas. *Pastoralism.* 2020;10(15). <https://doi.org/10.1186/s13570-020-00169-y>.
  27. Singh VP, Kaur I. Economics of buffalo in livestock production system in Punjab: Current status and future prospectus. *Int J Curr Microbiol Appl Sci.* 2018;7(10):2319-7706.
  28. Ssekibaala G, Ilukor J, Walusimbi S. Opportunities and challenges of a community-based bull breeding programme: A case of the regional pastoral livelihood resilience project in Uganda. *Pastoralism: Res Policy Pract.* 2024;14. <https://doi.org/10.3389/past.2024.13274>.
  29. Stringer A, Christley R, Bell C, *et al.* Associations between sources of information and animal health knowledge of rural farmers in central Ethiopia. *Int J Agric Ext.* 2019;7(2):125-35. <https://doi.org/10.33687/ijae.007.02.2857>.
  30. Sultan H. Muslims of the Char Areas of Assam: Perspectives on identity and belonging. *Cross-Currents: An Int Peer-Reviewed J Humanit Soc Sci.* 2015;1(2):1-12.
  31. Thumbi SM, Njenga MK, Otiang E, Otieno L, Munyua P, Eichler S, *et al.* Mobile phone-based surveillance for animal disease in rural communities: implications for detection of zoonoses spillover. *Philos Trans R Soc Lond B Biol Sci.* 2019 Sep 30;374(1782):20190020. doi: 10.1098/rstb.2019.0020.
  32. Yedida S, Murugan PP, Asokhan M, Kumar AG. A study on the extent of social participation among the rural youth of Andhra Pradesh. *Biol Forum - An Int J.* 2022;14(3):1198-1201.