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Socio-Economic Condition of Dairy Farmers in Assam: A Study on Golaghat District of Assam

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Abstract: This paper delves into the socio-economic characteristics of dairy farmers in a specific study area, offering comprehensive insights into their demographic profiles, educational backgrounds, gender distribution, family dynamics, caste, marital status, religious affiliations, experience in dairy farming, occupational status, landholding patterns, agricultural production, housing types, and access to electricity. The study employs a detailed survey of 200 households, revealing a slightly female-dominant gender distribution among milk producers and a young demographic with a mean age of approximately 33.85 years. Education levels among the producers are generally high, with a significant portion having completed secondary education or higher.

Keywords- **Dairy farmers, Socio-Economic Condition, Occupation, Diary sector**

I. INTRODUCTION

India's dairy sector holds immense importance in the country's economy by serving as a crucial livelihood source for millions of individuals. This sector can also be regarded as a potential contributor to employment opportunities benefiting the country's rural and urban areas. India is the world's foremost milk producer, boasting a combined cattle population of approximately 535.78 million, with increases of 4.6% over Census 2012, constituting around 19 per cent of the global bovine population *(Livestock Census Report, 2019)*. India also holds the top global milk production, contributing 18.5 per cent of world production. In 2019, the combined bovine population, including the cattle, Buffalo, Mithun, and Yak, reached 302.79 million, reflecting a marginal growth of approximately 1% compared to the preceding census. During the fiscal year 2014-15, it achieved an impressive annual output of 146.3 million tonnes, a significant increase from the 137.69 million tonnes recorded in 2013-14, showcasing a remarkable growth rate of 6.26%. In 2019, the overall count of cattle in the nation reached 192.49 million, indicating a rise of 0.8% compared to the prior census. Nonetheless, as per the Food and Agriculture Organization, global milk production witnessed a mere 3.1% expansion, escalating from 765 million tonnes in 2013 to 789 million tonnes in 2014 (FAO. 2022). India's per capita milk availability also experienced an upward trend from 176 grams per day in 1990-91 to 322 grams per day in 2014-15, surpassing the worldwide average of 294 grams per day in 2013. India's global milk production in 2022 is projected to reach approximately 930 million tonnes, marking a 0.6% increase compared to 2021. This growth is primarily attributed to the increased production in Asia and the slight increase in Central America and the Caribbean. However, an anticipated decline in Europe counterbalances these gains. The value of output from milk at the current price exceeds the value of output from paddy, and even it is higher than the combined value of output from wheat and sugarcane. This highlights a consistent rise in the accessibility of milk and its byproducts to meet the demands of the growing population. Dairy has become a significant source of additional income for numerous rural households engaged in agricultural activities. Milk is a crucial agricultural product, contributing about 5.3 per cent to India's agricultural GDP. India is the world's leading milk producer, contributing 23% to global milk production (Ministry of Fisheries, Animal Husbandry & Dairying, 2022). The productivity of Indian livestock is only half of the global average for milk animals and only twenty per cent compared to the advanced countries. After the implementation of 'Operation Flood' in 1970-71, India witnessed a gradual increase in its milk production. The Indian dairy industry grew substantially from the eighth plan onwards, with a rise in milk production from 58 million tonnes in 1992-93 to 146.3 million tonnes in 2014-15 (*Kalimuthu et al.*). (2021). As a result, India has become the highest milk-producing country in the world. Despite numerous constraints that dairy farmers face, India can be the world's foremost milk producer.

India realized an annual compound growth rate of 1.64 per cent in milk production during the initial decade after its independence. However, during the 1960s, the growth rate declined to 1.15 per cent. In 1950-51, per capita milk consumption in India was a mere 124 grams per day (Ministry of Fisheries, Animal Husbandry & Dairying, 2022). However, by 1970, this amount dropped to only 107 grams per day, significantly lower than the recommended minimum nutritional standards. As a result, this marked one of the lowest milk consumption rates globally. During this period, the Indian dairy industry faced many significant major challenges. Despite boasting the world's largest cattle population, India produces less than 21 million tonnes of milk annually. Government initiatives play a significant positive role in this context, but they still fall short compared to most developed countries. Though India can stand among the leading milk-producing countries like the USA, Russia, Germany and France, the country faces stiff competition from other countries to maintain its leading position in milk production. The

involvement of approximately 120 million rural families participating in milk production sets this system apart, contrasting with the lager specialized dairy farmers commonly found in Western countries. Despite the leading position in milk production, India's per-animal productivity is lower at about 987 kg/lactation, significantly below the global average of 2,038 kg/lactation. This low productivity can be attributed to the gradual genetic deterioration and general neglect of animals over the centuries, resulting in a rise in the population of non-descript cows and buffaloes. Other factors responsible for low productivity also include continuing droughts in some areas of the country, chronic shortages of quality feed and fodder coupled with their inadequate nutritive value and poor fertility of dairy animals, and the inability of the farmers to raise the cows properly, which may be due to their poor financial circumstances. Hence, India's dairy industry faces a twin challenge of raising the milk productivity of animals with limited resources and making the best use of the available milk to high quality.

Dairy farming plays a pivotal role in the agricultural landscape, significantly contributing to the socio-economic fabric of rural communities worldwide. In regions like the Golaghat District of Assam, the dairy sector is a vital source of livelihood and a cornerstone for nutritional security and economic stability. This study delves into the socio-economic profile of dairy farmers in this area, aiming to shed light on the factors influencing their daily lives and operational capabilities.Understanding the socio-economic characteristics of dairy farmers is essential for several reasons. Firstly, it provides insights into the farming community's demographic composition, educational background, and family structures. Such data are crucial for designing targeted interventions to enhance these farmers' quality of life and productivity. Secondly, by examining factors such as landholding patterns, income sources, and access to utilities like electricity, stakeholders can better appreciate the challenges and opportunities faced by dairy farmers in the modern agricultural economy.Furthermore, juxtaposed with the need for modernization and sustainability, the dairy sector's reliance on traditional knowledge and practices necessitates a comprehensive analysis of the existing socio-economic conditions. This study aims to fill this gap by examining the dairy farming community's characteristics, including gender dynamics, age distribution, educational attainment, occupational patterns, and more.

II. NEED OF THE STUDY.

The dairy sector is an integral component of global agriculture, offering substantial contributions to the millions' economy, nutrition, and livelihoods. In developing regions, such as certain parts of Assam, dairy farming is a primary source of income for numerous households and a critical pathway towards achieving food security and poverty alleviation. Despite its significance, the sector faces multifaceted challenges that hinder its potential for development and sustainability. This study emerges from the pressing need to comprehensively understand the socio-economic dimensions influencing dairy farmers, aiming to address several crucial aspects.

III. RESEARCH METHODOLOGY

3.1Population and Sample

The study's location will be the Golaghat District of Assam, and the population will be all the dairy firms of the Golaghat District of Assam. The study is based on both the primary and secondary data. This study analyzes the status of milk production and dairy firms in the study area based on aggregate secondary data collected from various secondary sources. Secondary data were collected from the publications of various organizations, viz. National Sample Survey Organization (NSSO) data, Government of Assam (GoA) publications, Ministry of Small-Scale Industry, Government of India (GoA), Directorate of Economics and Statistics, research publications of individual researchers, institutional reports, etc.

3.2 Data and Sources of Data

The primary data used for the study are collected by undertaking a field survey to investigate the production and productivity of milk farms in the Golaghat district of Assam. The survey was conducted using a multistage sampling (Random sampling) technique in the study area. The multistage sampling technique involves several methods of random sampling. In this study, about 50% of Development blocks were selected initially. In the 2nd stage, from each Development Block, about 50 Dairy farmers were selected. One schedule had been prepared for collecting the primary data from household-level dairy farms. Information related to the production methods and other details were collected by interviewing the household owner whose primary occupation is dairy farming. The primary data were also collected from Dairy Cooperative Societies (DCS) of Golaghat district of Assam. Thus, a total of 200 farmers were selected for the study. A standard schedule of questions was used to carry out these interviews and record the collected information to finalize after several pre-tests in the field.

3.3 Theoretical framework

In this paper, the Capital (K) Labour (L) ratio is initially calculated to determine the factor ratios in production. Labour is measured in terms of total hours worked per day. Capital in dairy farming refers to the physical assets used in production. It is generally categorized into fixed and variable Capital.

Fixed Capital: These are long-term assets that provide value over many years. Buildings and Infrastructure include barns, storage facilities, machinery and equipment, milking machines, feed mixers, and other durable machinery. Measuring fixed Capital usually involves estimating these assets' current value or depreciation over time.

Variable Capital: These inputs change more frequently and are consumed within the year. They include the cost or value of feed consumed by Medicine, veterinary services, and other health-related expenses, as well as regular maintenance costs for machinery and Infrastructure.

Land: The land area is measured in 'Bigha'

IV. RESULTS AND DISCUSSION

4.1 Results of Descriptive Statics of Study Variables

.4.1 Gender Division: The population can be broadly divided into two categories based on the gender of the people. In the following table, we discuss the total population of households surveyed.

Table No. 4.1

Gender Division of the surveyed Household

Sl No	Gender	Total Numbers	Percentage
1	Male	351	44.43%
2	Female	439	55.56%
3	Total	790	100.00%

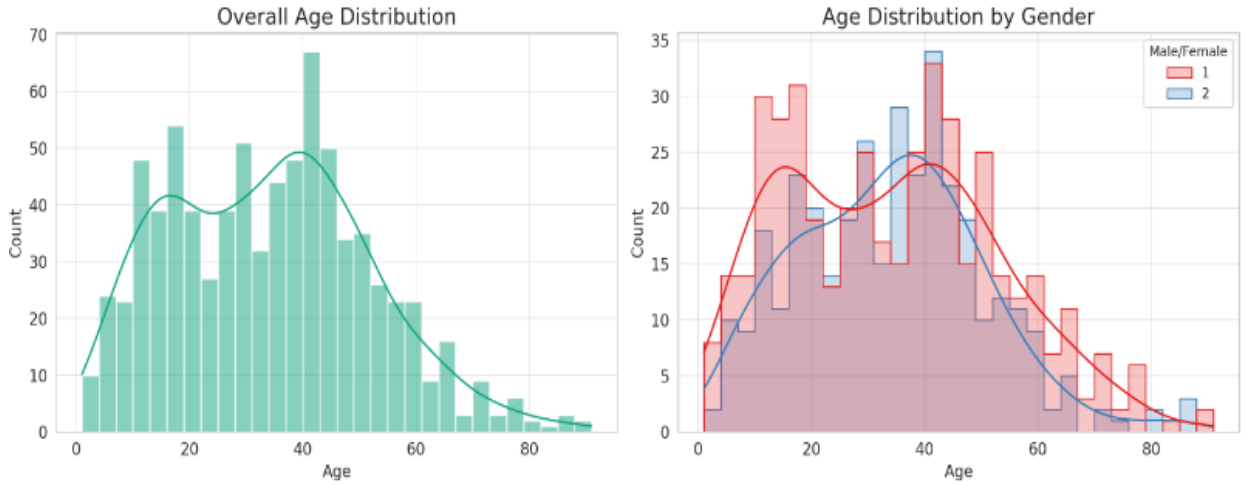
Source: Field Survey

The above table represents the total distribution of the sample population based on the gender of the Milk Producers. The total number of households is 200, and the total population is 790. Out of 790, there are 351 (44.43%) males and 439 (55.56%) females. The female participation rate is found to be encouraging. The gender division presents a slightly higher proportion of females (55.56%) compared to males (44.43%).

4.2 Age Distribution of Population:

The age distribution is depicted below by creating histograms for the overall distribution and for each gender category.

Figure: 1The Age Distribution of Population



Source: Field Study

The distribution appears to be slightly right-skewed, indicating a larger number of younger individuals in the dataset.The second histogram shows the age distribution by gender categories 'Male' and 'Female'. Both distributions follow a similar pattern, which suggests no significant difference in age distribution between the two categories.

Table: 4.2. Kay Statistics of Age Distribution

Table No 4.2

Sl No	Description	Value
1	Total Number of Individuals	790 individuals
2	Age range	1 to 91 years
3	Mean age	33.85 years
4	Standard deviation of age	17.80 years
5	Median age	35 years
6	Most Populated age groups	18 to 40 years
7	Male (Count)	439 individuals
8	Female (Count)	351 individuals
9	Mean age (Male)	33.98 years
10	Mean age (Female)	33.70 years
11	Variance (Male)	358.68
12	Standard Deviation (Male)	18.94
13	Variance (Female)	265.14
14	Standard Deviation (Female)	16.28
15	P-value of t-test	0.822

Source: Field Survey

The ages range from 1 to 91 years.The mean age is approximately 33.85 years, with a standard deviation of 17.80 years, indicating a wide spread of ages.The median age is 35 years, which means half the population is younger than 35, and the other half is older.The most populated age groups are between 18 to 40 years, signifying a significant portion of the population is in early adulthood to middle age.The mean and median ages for both gender categories are similar, with Males having a mean age of approximately 33.98 years and Females having a mean age of approximately 33.70 years. The males have a slightly higher variance and standard deviation (358.68 and 18.94, respectively) compared to females (265.14 and 16.28, respectively), indicating a broader spread of individual ages in the female age group.

4.3. Education Qualification of the Milk Producers: Education is a major social issue, and good quality of education can improve the productivity of any production system. In dairy sector also education is very much significant. In the study area, most of the Milk producers are literate, and some are highly educated. In the table No. 4.00, the educational status of the Milk Producers is discussed.

Table 4.3:
Education Qualification of the Milk Producers

Sl No	Features	Total Numbers	Percentage
1	Illiterate	7	3.5%
2	Primary Education	12	6.0%
3	Ut to Class X	11	5.5%
4	completed X class	56	28.0%
5	Completed XII	82	41.0%
6	Graduation	31	15.5%
7	Post-Graduation	1	0.5%
	Total	**200**	**100.0**

Source: Field Survey

Out of total of 200 Respondents, 7 Milk Producers have no formal education and it indicates a small fraction of the total population is illiterate.Another 12 Milk Producers or 6.00%, have completed only primary education. This suggests that basic literacy and numeracy skills are prevalent among them. 11 respondents replied that they had read up to class X but were unable to succeed in the HSLC examination. A significant portion of Milk Producers completed X class board Examination successfully. The maximum number of milk producers is HS pass, and the number is 82 out of 200. Only 15.5 per cent of Milk Producers are Graduates, and one single Milk Producer found Post Graduate Degree holder.

4.4. Gender of Milk Producers: The local society is mainly male-dominated. More participation in economic activity indicates women's empowerment in the society. When the data on the gender of Milk Producers were collected, the following picture was seen in the study area.

Table No-4.4
Gender Classification of the Milk Producers

Sl No	Gender	Number	Percentage
1	Male	189	94.5%
2	Female	11	5.5%
3	Total	200	100.0%

Source: Field Study

Out of 200 respondent only 11numbers of Milk Producers are founded Female. It is only 5.5% of total respondents. Interestingly all these 11 numbers of Female Milk Producers have the habit Cow only. Rest 189 numbers of respondents are Male and the percentage of Male Milk Producers is 89.56% . The table indicates a very low participation of women in dairy sector.

4.5. Family Size:

The family size reveals insightful patterns about the demographic and social structure of the community. There are two type of family in our society, Nuclear Family and Joint Family. Nuclear family means family consists with only husband with and their children. On the other hand joint families are those families where other members like Grand Mother, Grand Father, Uncle, Unty, Nephew etc also live. In the study area the family composition is founded as mention in Table No- 4.5

Table No- 4.5
Family Size of the Milk Producers

Family Size Category	Frequency	Percentage
Nuclear Family	121	60.5
Joint Family	79	39.5
Total	200	100%

Source: Field Study

The majority of the Milk Producer have Nuclear Family. Out of 200 respondents 121 Milk Producers have the Nuclear Families and it is 60.5% of total Surveyed Milk Producers. On the other Hand 79 numbers of Milk Producers live in Joint Family. Now a day the joint family system in our society had gradually decreased but in the study area a significant numbers of Milk Producers still live in Joint Family.

4.6. Caste of the Milk Producers

Table 4.6

Caste of the Milk Producers.

Caste of Respondents	Total Numbers	Percentage
Schedule Tribe (P)	17	8.50%
Schedule Tribe (H)	0	0.00%
Schedule Caste	19	9.50%
OBC/MOBC	151	80.50%
General Caste	13	6.50%
Total	200	100.0%

Source: Field Study

Most of the Milk Producers of the area are Most Other Backward Caste or Other Backward Caste. Out of 200 respondents 151 numbers of Milk Producers are OBC and MOBC. Interestingly no one milk producers is found among the Schedule Tribe (Hill) community. !9 milk producers are Schedule Caste and 7 Milk producers are Schedule Tribe (Plains). Most of the tribal people are Mishing community. 6.5% open category or General Caste people also founded among the surveyed Milk Producers.

4.7. Marital Status of the Milk Producers

Table 4.7

Marital Status

Sl No	Marital Status	Number	Percentage
1	Married	173	86.5%
2	Unmarried	25	12.5%
3	Widow	0	0.0%
4	Divorce	2	1.0%
	Total	200	100.00%

Source: Field Study

4.8. Religion of the Milk Producers: Religion is one of the significant features of the society. In many case religious faith and believes impact on production of particular commodity. The following table represents the religion wise population structure of the Milk Producers.

Table No. 4.8.
Religion of the Milk Producers

Sl No	Religion	Number	Percentage
1	Hindu	189	94.5%
2	Muslim	11	5.5%
3	Christian	0	0.0%
4	Others	0	0.0%
	Total	200	100.00%

Source: Field Study

Among the 200 respondents, 189 respondents are Hindu by religion. It indicates that the majority of the Milk Producers are Hindu. Interestingly Hindu people considered the Cow as a Holly Animal and they even worship cow. Another 11 numbers of Milk Producers are Muslim. There were no Milk Producer of Christian and other religion in the area.

4.9. Experience of Cow Rearing of the Milk Producers: In any production system, experience is significant. Experience makes the producers more matured and expert on concern subject. Years of experience of cow professionally cow rearing was asked to the Milk Producers and data reveals as stated in the table No. 4.0.0.

Table No. 4.9
Experience of cow rearing

Sl No	Years of Experience	Number	Percentage
1	1 to 5 years	13	6.5%
2	5 to 10 years	51	25.5%
3	10 to 15 years	39	19.5%
4	15 to 20 years	57	28.5
5	Above 20 years	42	21.0%
	Total	200	100.00%

Source: Field Study

Out of 200 Milk Producers only 6.5% Milk Producers has less than 5 years of experience. Another 25 percent Milk producers have 5 to 10 years of experience and 19.5% have 10 to 15 years of experience in dairy sector. A significant percentage of 28.5 percent Milk Producers have 15 to 20 years of experience and remaining 19.5 percent milk producers have more than 20 years of experience of milk production. Among these 21 percent milk producers some are second generation and some other are third generation milk producers.

4.10. Occupational Status (Primary Occupation)

Table 4.10:
Occupational Status of the Milk Producers

Features	Total Numbers	Percent
Agriculture	54	6.8
Adopt dairy as an occupation	101	12.8
Work as a labour	4	0.5
Doing Business	109	13.8
Other Job	70	8.9
Household work	201	25.4
Students	251	31.8
Total	**790**	**100.0**

Source: Field Survey

Table 4.10 explicated the occupation-wise classification of the sample population. From the above table Agriculture: 54 individuals (6.8%) are involved in agriculture, indicating that a small fraction of milk producers also engage in farming activities. 101 producers (12.8%) have chosen dairy production as their primary occupation. This reflects a dedicated segment of the population to dairy farming. A very small number, 4 individuals (0.5%), work as laborers, suggesting that most milk producers do not rely on labor jobs as their primary source of income. 109 individuals (13.8%) are engaged in business activities outside of dairy. This could include a wide range of commercial endeavors and indicates an entrepreneurial spirit among the milk producers. 70 individuals (8.9%) have occupations classified as "other jobs," which could encompass a variety of professional or casual work outside the listed categories. A significant portion, 201 individuals (25.4%), are primarily involved in household work. This could indicate that for many, dairy production is a secondary or supplementary activity. The largest group, 251 individuals (31.8%), are students. The data reveals a diverse range of primary occupations among milk producers, with a significant emphasis on education, as shown by the high percentage of students. The substantial number of individuals engaged in household work suggests that dairy production might be part of a broader set of domestic responsibilities, possibly indicating the involvement of women in milk production.

The presence of producers engaged in agriculture, business, and other jobs highlights the multifaceted livelihood strategies adopted by milk producers. This diversification may help mitigate financial risks and stabilize income.

4.11. Land Holding Pattern of the Milk Producers: Land holding means availability of own land of a particular family. In the study area no milk producer was founded landless. Following table reveals the land holding of the Milk Producers in the study area.

Table 4.11:
Land holding of the Milk Producers

Sl No	Features	Total Numbers	Per centage
1	Landless	0	0.0%
2	Up to 1 Hector	31	15.5%
3	1 to 2 Hectors	77	38.5%
4	2 to 3 hectors	54	27.05
5	More than 3 Hectors	38	19.0%
5	Total	200	100.00%

Source: Field Survey

Land holding pattern of Milk Producers shows diverse character of land holding among the milk producers. 15.5 percent milk producers have less than 1 hector of land but a significant portion of Milk Producers which is 38.5 percent have more than 1 hector but less than 2 hectors of land. Another 19.0 percent Milk Producers have 2 to 3 hectors of land of their own. 38 numbers of Milk producers which is 19 percent of total respondents have more than 3 hectors of land. These are considered as rich in terms of land holding.

4.12. Housing Type of the Milk Producers:

Housing type of the Milk Producers indicate the living standard of the Dairy farmers. The data represent in the table No 4.13 provides a picture of the housing types among milk producers based on a survey of 200 households. This information is crucial for understanding the community's living conditions and level of infrastructure development. Housing types are generally classified into Kutcha, Semi-Pucca, and Pucca.

Table 4.12
Housing Type of Milk Producers

Sl No	Housing Type	Total Numbers	Percentage
1	Pucca	103	51.50%
2	Semi Pucca	84	42.00%
3	Kutcha	13	6.50%
4	**Total**	**200**	**100.0**

Source: Field Survey

The analysis of the type of house revealed that most households have pucca houses (103 households). Another 84 households (42.00%) have Semi Pucca houses, and the remaining 13 houses (6.5 %) are kutcha type. The distribution of housing types among milk producers indicates a diverse range of living standards within the community. This can affect social stratification, resource access, and overall community well-being.

4.13 Access to Electricity: Electric access is a fundamental requirement for modern dairy farming. The access to electricity among milk producers in Golaghat District of Assam is a positive indicator of infrastructural development. It presents a strong foundation for the region's modernization and sustainability of dairy farming. In Table No. 4.0, the availability of electric connections is shown.

Table 4.13
Access to Electricity among the Milk Producers

Sl No	Particulars	Total Numbers	Per cent
1	Electrified	199	99.50
2	Without Electrified	01	0.50
3	**Total**	**200**	**100.0**

Source: Field Survey

199 (99.5%) households have electrified, showing a better household status.The data presented in Table 4.13 on the access to electricity among milk producers in Assam reveals nearly universal access to electricity within the surveyed group. The table indicates that out of 200 milk producers, 199 (99.5%) have access to electricity, while only 1 (0.5%) does not. This high electrification rate among dairy farmers is an excellent infrastructural facility that significantly impacts dairy farming operations and the quality of life for those involved.

V. Conclusion:

The study highlights the critical role of landholding patterns, agricultural production, housing types, and access to electricity in determining the socio-economic well-being of dairy farmers. It underscores the need for targeted policy interventions and support mechanisms to address the diverse challenges faced by this community. The engagement of approximately 120 million rural families in milk production distinguishes the Indian dairy sector from its global counterparts, emphasizing the importance of smallholder farms in the national dairy production landscape.

However, the low per-animal productivity, attributed to genetic deterioration, inadequate feed and fodder quality, and poor animal health management, presents a significant challenge. This underscores the urgency for initiatives to improve livestock quality, enhance fodder availability, and promote modern farming practices among dairy farmers.

In conclusion, this study sheds light on the socio-economic conditions of dairy farmers in Golaghat District. It serves as a microcosm of India's dairy sector's broader challenges and opportunities. It calls for a holistic approach that combines governmental support, technological innovation, and community engagement to empower dairy farmers, enhance productivity, and ensure the sustainability of the dairy sector in Assam and beyond.

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