Socio-Economic Analyses of Dairy Farmers in Raia Village, Salcete-Goa

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DECLARATION BY STUDENT

I hereby declare that the data presented in this Dissertation report entitled, "**Socio-Economic Analyses of Dairy Farmers in Raia village, Salcete-Goa"**, is based on the results of investigations carried out by me in the Department of Economics at the Goa Business School, Goa University under the supervision of my guide Avina Kavthankar and co-guide Ms. Heena Subrai Gaude and the same has not been submitted elsewhere for the award of a degree by me. Further, I understand that Goa University or its authorities will not be responsible for the correctness of observation/ experimental or other findings given the dissertation.

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Place: Goa University

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COMPLETION CERTIFICATE

This is to certify that the dissertation report "**Socio-Economic Analyses of Dairy Farmers in Raia village, Salcete-Goa",** is a bonafide work carried out by Ms. Verifa Difa Dias under my supervision in partial fulfillment of the requirements for the award of the degree of Masters of Arts in Economics in the Department of Economics at the Goa Business School, Goa University.

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PREFACE

My dissertation represents the peak of an intellectual journey that has been challenging as well as rewarding. It reflects my passion for Economics and my dedication to exploring growth and development. Throughout this research aim, I have encountered numerous opportunities for growth, learning and self-discovery.

The inspiration for my dissertation stems from a desire to make a meaningful contribution to the society, human well-being and also opportunities to contribute to development of the society. As I search deeper into the literature and engage with various methodologies, my understanding of the subject yields leading to new insights and perspectives.

Undertaking this research would not have been possible without the guidance. I am deeply grateful to my dissertation guide, Avina Kavthankar, and my co-guide Ms. Heena Subrai Gaude, for their unwavering support, encouragement, and expertise. Their mentorship has been valuable in shaping the direction and methodology of my dissertation.

I also extend my appreciation to my Classmates and Friends for their valuable feedback, suggestions, and comments, which have contributed significantly to the refinement of my dissertation.

Furthermore, I also extend my gratitude to Goa University for providing access to resources, and facilities for my dissertation.

I am deeply grateful to my family for their unwavering love, understanding and encouragement throughout this academic journey. Their constant support and belief in my abilities have been a source of strength and motivation.

Finally, I would like to express my gratitude to all those who have contributed to my dissertation in ways both seen and unseen. Your assistance and encouragement have played an integral role in the completion of my dissertation.

Verifa Difa Dias

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Firstly, I would like to express my sincere gratitude to my parents, friends and to everyone whose support was essential in completion of this dissertation. I wish to acknowledge the Chairman Mr. Durgesh M. Shirodkar and the members of dairy cooperative society in Raia, for their immense support, without their help this would have not been possible. I'm also thankful to all the respondents who patiently answered the questionnaire and provided me with the required information.

I would like to give thanks to my research guide Avina Kavthankar and co-guide Ms. Heena Subrai Gaude for guiding me through their thoughtful advice and recommendations on this dissertation and always willing and enthusiastic to assist in any way they could throughout the research project. Without their persistent help, the goal of this project would not have been realized. I'm also thankful to all other professors and faculty members of economics discipline.

Special thanks are extended to Goa University for providing access to resources and facilities which facilitated the completion of my dissertation.

Finally I would like to express my gratitude to all those who have contributed to my dissertation in ways both seen and unseen. Your assistance and encouragement have played an integral role in the completion of my dissertation.

TABLES

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ABBREVIATIONS USED

Entity	Abbreviations
Dairy cooperative society	DCS
Secondary school certificate	SSC
Higher secondary school certificate	HSSC
Key informant interviews	KII
Focus group discussions	FGD

ABSTRACT

This study analyzes the socio-economic factors affecting dairy farmer's income, focusing on age, gender, education, experience, herd size, milk production, and scheme benefits. The study found that income enhancement can be achieved through scale and productivity improvements, as there is a moderate and statistically significant positive correlation between income and both herd size and milk production per day. However, benefits received from schemes do not have a significant relationship with monthly income, this is because many farmers either did not applied for the scheme or they have not received the benefits even after applying for the scheme. To promote income growth, policymakers and dairy farmers must prioritize awareness campaigns for scheme utilization and implement effective farm management practices.

CHAPTER 1

INTRODUCTION

1.1 Background

Dairy Production and Products: Production, n.d. In many developing countries, small-scale farmers are responsible for producing milk, which serves as a daily source of income and contributes to food security and nutrition. These farmers earn money not only from selling milk but also from other sources such as selling culled animals and young stock, as well as from the sale of manure and direct payments. Overall, milk production plays a crucial role in the livelihood of millions of households globally.

Dairy Production and Products: Production, n.d.Dairy chains involve a series of interconnected activities and participants, ranging from milk production to its delivery to the final consumer. Each stage of this chain contributes to the product's added value, which typically includes production, transportation, processing, packaging, and storage. To enhance the product's value and ensure its smooth journey to consumers, various inputs such as financing and raw materials are incorporated into these activities. Unlike other livestock systems, dairy production requires a significant amount of labor input, which limits economies of scale

Press Information Bureau, n.d. India's dairy sector has played a significant role in the country's growth narrative since its independence, and dairy cooperatives have been an integral part of this success story since the initiation of Operation Flood. Today, India is the largest global contributor to milk production, accounting for 23% of the total output.

However, the situation was quite different in the 1950s and 1960s when India was struggling with negative annual production growth and relied on milk imports. The establishment of the National Dairy Development Board (NDDB) in 1965 was a turning point. The NDDB was tasked with supporting the creation of dairy cooperatives across the country through the phased implementation of the Operation Flood program, also known as the 'Anand Pattern.'

Status of dairy farming in Goa

Govt Spending Crores on Various Schemes to Boost Milk Production, without Any Growth in Production, 2023 The government of Goa has invested a significant amount of money, amounting to crores of rupees, in various initiatives to improve milk production in the region. However, According to records from the National Dairy Development Board (NDDB), milk production in Goa milk production in Goa has remained relatively stagnant over the past few years, with a slight increase from 60,000 to 63,000 liters in 2021-2022. The government's Economic Survey presented by the Government of Goa predicts a marginal increase in milk production to just above 60,000 liters for the year 2022-23. One of the most notable initiatives among the various schemes is the Kamdhenu scheme, which was launched with high expectations.

Description of Raia village

Raia is a very scenic village located in south Goa. Raia is located 7 kilometers from Margao, 35 kilometers from the capital metropolis of Panaji, and around 27 kilometers from the Dabolim airport. The village shares a border with other South Goa villages – Loutolim, Ambora, Rachol, and Maina Curtorim on three sides and the river Zuari on the

opposite. This village is blessed with the splendor of green paddy dotted with coconut timber, colorful traditional Goan homes, and whitewashed churches. The Raia Census town has a population of 10,706 of which five, 256 are men while five, 450 are females according step with a report released by Census India 2011.

1.2) Objectives

1. To analyze the trends in milk production in Goa and the dairy cooperative society in Raia.
2. To analyze the socio-economic factors affecting dairy farmer's income of “Shri Sateri Sahakari Dudh Vya. Saunstha Ltd. Raia, Goa.

1.3) Research Questions

1. What is the trend of milk production in Goa and the Dairy Cooperative Society in Raia?
2. What are the key socio-economic factors influencing the income of dairy farmers?

1.3.1) Hypotheses

- **H0:** The income of dairy farmers is not significantly influenced by socio-economic factors.
- **H1:** The income of dairy farmers is significantly influenced by socio-economic factors.

1.4) Scope of the study

The study of the socio-economic profile of dairy farmers in Raia, Goa holds great

importance as it will help us to understand how dairy farming contributes to Goa's agriculture and the income of farmers. By looking at things like how much milk is produced, how it is sold and its impact on the economy, we learn about the jobs it creates and the money it brings in. This information is important for making good decisions about how to support farmers and make sure the dairy industry continues to grow in a way that is good for everyone.

Chapter 2

Literature review

Popescu, (2014) aimed to study the impact of material and labor costs on milk production returns and profitability in five small dairy farms in Southern Romania. Through methods like cost-benefit analysis and regression functions, the study finds a positive correlation between milk income and both material and labor costs. This suggests that managing these costs effectively is crucial for maximizing returns and ensuring profitability in dairy farming. The Transforming Dairy Sector in Ethiopia | PLOS ONE, n.d.study explains the evolving dairy sector in Ethiopia, focusing on adjustments in manufacturing, intake, and advertising and marketing dynamics. It examines factors riding shifts in dairy farming practices and market integration. Through empirical evaluation, the study identifies key demanding situations and possibilities going through the dairy area's transformation. It emphasizes the position of coverage interventions and institutional help in improving dairy fee chains and improving livelihoods. The findings contribute to expertise in the complexities of agricultural transformation in growing economies like Ethiopia. Mukson et al., (2020) study explores dairy cattle agribusiness improvement in Central Java, Indonesia, focusing on strategies to increase milk production sustainably. Mukson and his team analyze various determinants, including environmental conditions, farming techniques, and cattle health, and genetics. They develop targeted strategies, balancing nutritional needs, healthcare, management practices, and technological innovations. Through their research and implementation of these strategies, they observe a significant increase in milk production across the

region. Their work offers valuable insights for enhancing dairy farming practices and fostering economic and nutritional growth in Central Java. Reichenbach et al., (2021) explored dairy manufacturing in Bengaluru, India, in the context of urbanization. It examines numerous typologies and linkages in dairy farming practices in the megacity. Through qualitative and quantitative methods, it highlights the complexities of dairy production amidst urban expansion. It sheds light on the demanding situations and possibilities for sustainable dairy farming in rapidly urbanizing environments like Bengaluru. The findings contribute to the know-how of city agriculture dynamics and tell coverage interventions for promoting resilient dairy systems in megacities. Shiyani, (1996), studied the influence of dairy cooperatives on milk production in Saurashtra's dryland area. Using data from the Junagadh District Co-operative Milk Producers' Union, the study compares milk yield between cooperative members and non-members across three seasons. Results suggest a positive impact of dairy cooperatives on both buffalo and cow milk production, indicating better input allocation among cooperative members. Advanced statistical methods reveal significant differences in milk production functions between members and non-members, highlighting the cooperative's role in enhancing productivity and income for producers.

Swarnkar et al., (2023) study assesses the cost-benefit ratio of dairy cooperative members in Raipur district, Chattisgarh. Sampled from 10 villages across two blocks, the research involved 150 DCS members. Utilizing content analysis and statistical tools, the study found a favorable benefit-cost ratio of 1:1.61 for DCS members, indicating profitability. This highlights the economic viability and success of dairy cooperatives in

the region, potentially influencing future agricultural policies and practices. Kumar & Parappurathu, (2014) study offers a micro-level evaluation of dairy farming and marketing practices in three key milk-producing states of India: Punjab, Bihar, and Uttar Pradesh. It examines the manufacturing and advertising behaviors of dairy farmers, considering the geographic and institutional diversity within those states. It also identifies the main constraints confronted by dairy farmers and gives some useful recommendations through empirical evaluation as it contributes to expertise on the nuances of dairy farming economics on the grassroots stage. The findings suggest policy interventions for sustainable growth of the dairy zone in India. Perumal, (2018) examines the economic factors of dairy farming in dry farming areas of Tamil Nadu. It highlights dairy farming as a profitable project for rural farmers in Dharmapuri and Tiruvannamalai districts. The paper emphasizes the importance of measures that include advanced feed, animal healthcare, and production control for earnings augmentation. Crossbreed cows are recognized as giant participants in exploiting manufacturing advertising and marketing in the evaluation of buffalo milk. The study indicates promoting research and development for progressed green fodder types to boost milk manufacturing and farmers' profits in dryland regions.

Panchbhai et al., (2017) research investigates constraints faced by cooperative dairy farmers in adopting recommended management practices in Solapur district. Utilizing a purposive selection method, the study covers 10 villages and 20 DCS member producers per village. Findings reveal six major categories of constraints, including reproduction, feeding, management, health, economic, and milk distribution issues, expressed in terms of frequency and percentage. This sheds light on the challenges

hindering the adoption of optimal dairy practices, essential for enhancing productivity and profitability in cooperative dairy farming. Matangaidze et al., (2023) study explores governance factors influencing performance in smallholder dairy cooperatives across Zimbabwe. Examining five dairy systems across different agroecological regions, the research investigates how governance impacts resource allocation, particularly in milk marketing and production. Utilizing qualitative methods like Focus group discussions (FGDs) and Key informant interviews (KII), the study identifies governance challenges, including ineffective board conduct and management, leading to revenue threats and sub-optimal internal processes. Lack of strategic planning and poor pricing exacerbate these challenges, emphasizing the need for improved governance structures to enhance cooperative performance and member interests. Naik et al., n.d. study examines dairy farming practices in Goa, focusing on feeding methods and constraints. Through random sampling of 66 farmers owning around 1170 dairy animals, the research highlights the predominance of agriculture or horticulture as the primary occupation among farmers. Findings suggest a need for scientific interventions to improve traditional feeding practices and enhance the profitability of dairy farming in the region. This underscores the importance of addressing constraints and implementing effective strategies to boost productive and reproductive performance in dairy animals.

Status of Dairy Production in Goa, n.d. research delves into the status of dairy production in Goa, focusing on various aspects of the production system. Through surveys conducted in six talukas, representing different categories of farmers, the study examines housing types, ventilation, and cooling systems. Findings indicate a predominance of small-scale farmers and an emphasis on intensive management

practices. The research highlights key factors influencing dairy production, including feeding practices, milk yields, and prevalent health issues among cattle, underscoring the need for targeted interventions to enhance productivity and sustainability in the sector.

Socio-Economic Analysis of Dairy farmers

Singh et al., (2014) study examines the socio-economic profile of women engaged in dairy farming in Hisar District, Haryana. Utilizing data collected in March 2014, the research focuses on women's participation, their economic status, and the challenges they face in the dairy sector. Findings shed light on the significant role of women in dairy farming, highlighting their contributions and the need for targeted support to enhance their livelihoods and economic empowerment. Yener & Oğuz, (2017) examines how socio-economic factors affect innovation adoption in dairy farms. They used Chi-square analysis to determine the level of adoption and its correlation with variables such as education, income, and farm size. The authors concluded that understanding these factors is crucial for promoting sustainable innovation in dairy farming practices. Their findings provide valuable insights for agricultural development and policy-making by exploring the relationship between socio-economic factors and adoption rates. Another study by Pérez Urdiales et al., (2016) aimed to examine the eco-efficiency of dairy farms in Spain. They gathered data from a survey conducted in 2010, covering 50 dairy farms in the Asturias region. To measure eco-efficiency, they used data envelopment analysis, taking into account environmental pressure indicators such as nutrient balances and greenhouse gas emissions. The research explored the impact of farmers' socio-economic characteristics and attitudes on eco-efficiency scores using

regression analysis and bootstrapping techniques. The study's results indicate that younger farmers, those who plan to continue farming, and those who participate in training programs exhibit higher eco-efficiency levels. Moreover, there is a positive correlation between self-reported environmentally friendly behaviors and actual eco-efficient performance, indicating potential gains in eco-efficiency through targeted interventions.

Ayenew et al., (2011) The study conducted a field survey of 256 farms in the northwestern Ethiopian highlands to analyze the socio-economic features of urban and peri-urban dairy production systems. The research revealed that urban dairy farmers focus on dairy farming as their primary activity while supplementing their income with non-agricultural ventures. On the other hand, peri-urban farmers engage in multiple agricultural activities in addition to milk production. The study also showed that urban farmers tend to use crossbred cows with higher milk yields. Both urban and peri-urban dairy production contributes significantly to food security, family income, and employment opportunities. However, the research identified access to land, education, and input services including training, veterinary, and credit facilities as the primary challenges that may hinder the dairy sector's future development in the region.Another study by Mumba et al., (2012) conducted an econometric analysis of the socio-economic factors impacting smallholder dairy farming profitability in Zambia. Utilizing data from the University of Zambia, the study examines variables such as input costs, milk yield, and market prices to assess profitability. Findings elucidate key determinants influencing smallholder dairy profitability, providing insights for policymakers and stakeholders to enhance sustainability and economic viability in Zambia's dairy sector.

Özçatalbaş et al., (2010) study explores socio-economic factors influencing dairy farming in Antalya Province, Turkey. Utilizing primary data from surveys, the research employs statistical analysis to examine relationships between farmer characteristics, milk yield, and union membership. Findings reveal significant correlations between family size, experience, and high-yielding cows with daily milk yield, as well as farm size, farmer age, and experience with the number of cows. However, no significant relationship is found between union membership and other factors, highlighting the region's complex dynamics of dairy farming. Keerthi et al., (2022) study thoroughly investigates and explores the complex and detailed aspects of the socio-economic situation of women dairy farmers in Guntur District, Andhra Pradesh. It meticulously examines variables like income levels, educational backgrounds, and resource accessibility among these farmers. The findings hold significance for designing tailored strategies to uplift and empower women engaged in dairy farming, thereby contributing to the socio-economic development of the region.

Socio-Economic Profile and Constraints Faced By Dairy Farmers of Wayanad District, India," n.d. study examines the socio-economic profile and constraints encountered by dairy farmers in Wayanad District, India. It investigates factors such as income levels, educational backgrounds, and challenges faced by dairy farmers in the region. The findings aim to provide insights for policymakers and stakeholders to develop targeted interventions to address the identified constraints and improve the socio-economic conditions of dairy farmers in Wayanad District. A study by Raju et al., (2020) examines the socio-financial profile and constraints faced by way of dairy farmers in Cuddalore District, Tamil Nadu, India. It delves into the livelihoods of those farmers, exploring

their monetary conditions, social history, and challenges encountered in the dairy industry. with the aid of assessing elements consisting of profit levels, training, and admission to sources, the research sheds light at the complex dynamics influencing dairy farming and the findings should inform focused interventions to decorate the resilience and prosperity of dairy farming communities.

Research Gap

There are many studies conducted on this topic, but these studies are mostly done on a macro level like by conducting research on the state level or by selecting particular districts. However, in my study, I will be doing research on the micro level that is at the village level by selecting only one dairy cooperative society which is one of the best-performing dairy cooperative societies in Goa.

Chapter 3

Methodology

Research design

A descriptive as well as statistical method was adopted to analyze and interpret the quantitative and qualitative data collected from the concerned field. Such research design helps to fulfill the above-mentioned objectives.

Selection of the study area

There are 174 dairy cooperative societies in Goa. In this study, the researcher selected “Shri. Sateri Sahakari Dudh Vya. Saunstha Ltd., Goa”. This dairy cooperative society (DCS) is located in Raia village in Salcete taluka in South Goa. This DCS is considered an ‘A’ grade DCS in Goa, and they have also received a National Cooperative Development Corporation (NCDC) regional award for cooperative merit in the year 2021, in recognition of their excellent performance and contribution to cooperative development. Also, this DCS has the highest number of active members which is 80 active members, and sells more quantity of milk to Goa Dairy, Ponda.

Sampling procedure and sample size

In this study, only the active members were interviewed and since there were only 80 active members it was possible to interview all the active members. The study covered the total population and therefore no sampling method has been adopted for the study.

Data and Variables

The present study mainly depended upon the primary data. Secondary data was also considered in the present study. Different types of quantitative and qualitative data and information were collected for the present study. Primary data was collected by interviewing dairy farmers. However, secondary data was obtained from DCS Raia, online websites, and journals.

Variables include the monthly income of dairy farmers, education, experience, herd size, scheme benefits, and milk production per day, where monthly income is the dependent variable and all other variables are independent variables.

Method of data collection

A questionnaire was prepared and the survey was conducted to dairy farmers of DCS Raia. A questionnaire was used to get detailed information about the socio-economic condition of the dairy farmers and to know about government intervention. The questionnaire was useful in collecting data on the study population, age, education, and experience in the dairy farming business, nature of dairy farming business, herd size, monthly income, milk production per day, and scheme benefits.

Data analysis and presentation

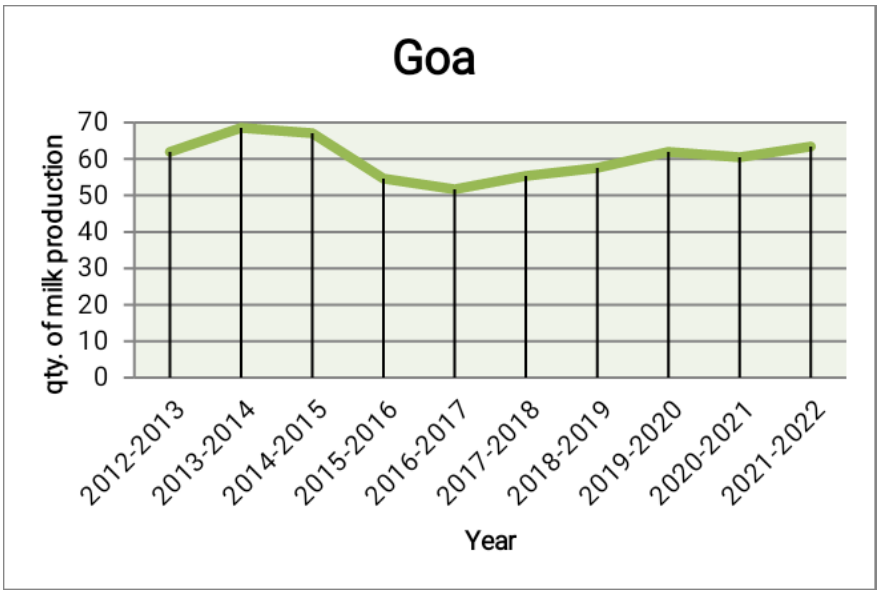
The qualitative and quantitative data obtained from the survey was first processed through validation, editing, and coding. Secondly, this processed data has been presented in tabular form and was imported into R. Simple statistical methods like Spearman's Rank Correlation and scatter plots have been used to analyze and interpret this data. Besides this, descriptive analyses such as bar graphs, and pie charts for secondary data as well as for primary data are used to supplement the presentation of

the findings of the study.

Chapter 4

Data Analyses

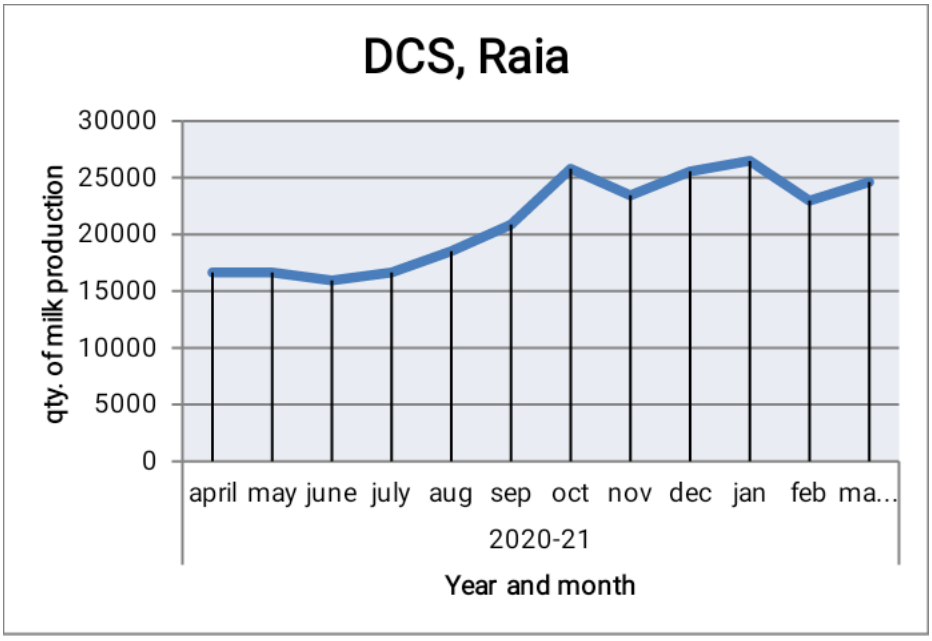
4.1) The following line graph shows trends in milk production (in tonnes) in Goa from the year 2012-2013 to 2021-2022.



Source: Indiastat.com

The above line graph shows trends in milk production in Goa from the year 2012-13 to 2021-22. The y-axis represents the quantity of milk production and the x-axis represents years. In the year 2012-13, milk production was 60 tonnes and shows an increasing trend for the year 2013-14 onwards till 2015-16. However, 2016-17 shows a decreasing trend. The years from 2017-18 to 2021-22 show a slight increase in milk production but have remained stagnant over these years.

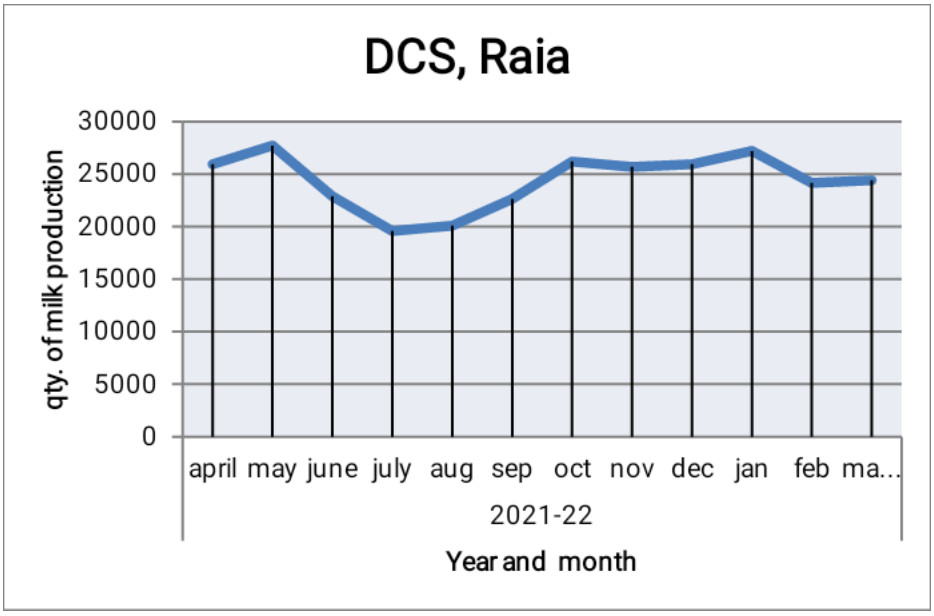
4.2) The following line graph shows trends in milk production (in liters) in the dairy cooperative society in Raia, village for the year 2020-21.



Source: DCS, Raia

Graph 4.2 shows us trends of milk production in the dairy cooperative society in Raia village for the year 2020-21. The y-axis represents the quantity of milk production in liters and the x-axis represents the year and month from April 2020 to March 2021. Here we can see a decreasing trend from April till June. From the month July till March, it shows an increasing trend with slight fluctuations.

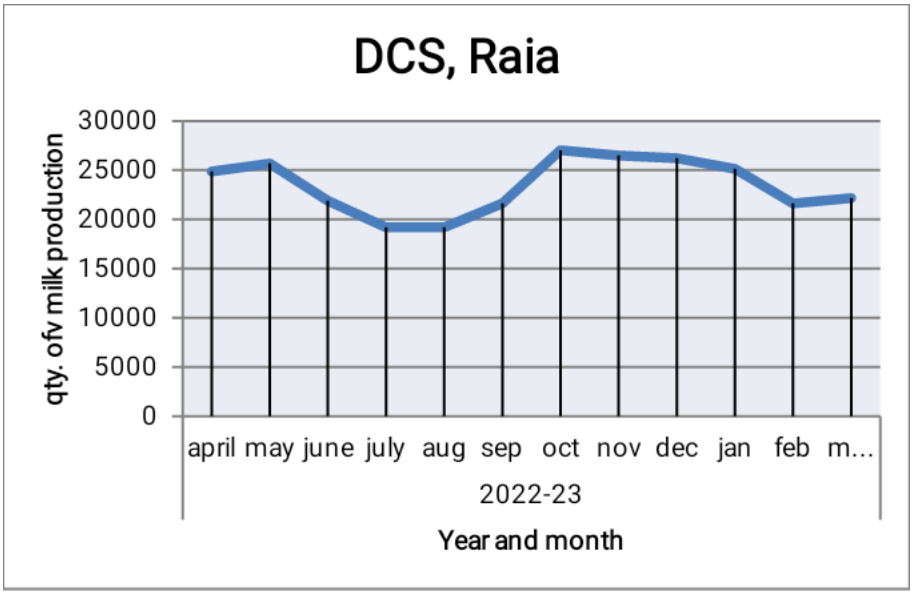
4.3) The following line graph shows trends in milk production in dairy cooperative society in Raia, village for the year 2021-22.



Source: DCS, Raia

Graph 4.3 shows us trends in milk production in the dairy cooperative society in Raia village for the year 2021-22. the y-axis represents the quantity of milk production and the x-axis represents year and month. Here also we see a similar pattern that is during summer season the trend in milk production shows a decreasing trend and during winter it shows an increasing trend with slight fluctuations.

4.4) The following line graph shows trends in milk production in dairy cooperative society in Raia, village for the year 2022-23.

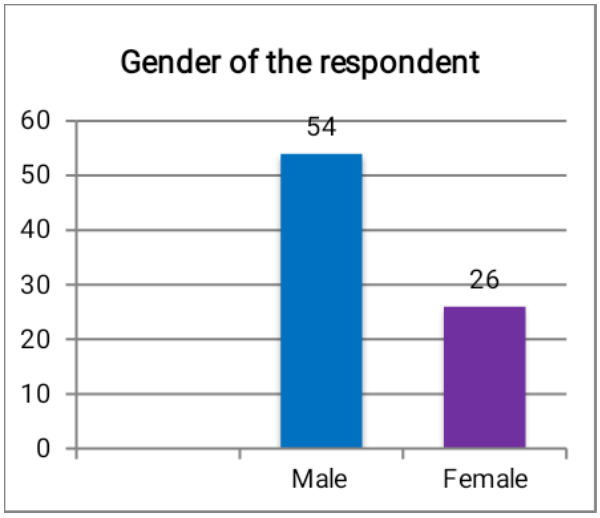


Source: DCS, Raia

Graph 4.4 shows us trends in milk production in the dairy cooperative society in Raia village for the year 2022-23. the y-axis represents the quantity of milk production and the x-axis represents year and month. Here also we see a similar pattern that is during summer season the trend in milk production shows a decreasing trend and during winter it shows an increasing trend with slight fluctuations this is also because milk production depends on the two seasons that is the lean season (summer season) when the production of milk is less and flush season (winter season) when the production of milk is high.

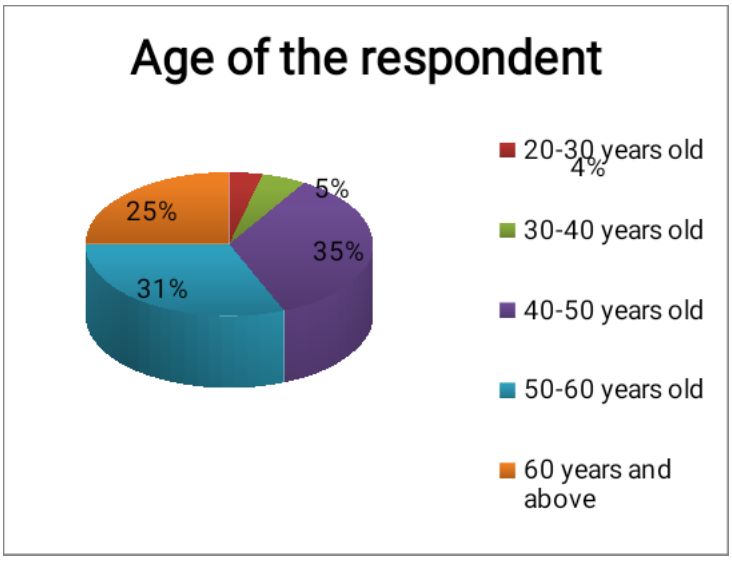
A survey was conducted with the dairy farmers to study the socio-economic profile of dairy farmers. The following bar graph tells us the gender composition of the dairy farmers.

4.5) Gender of the respondents



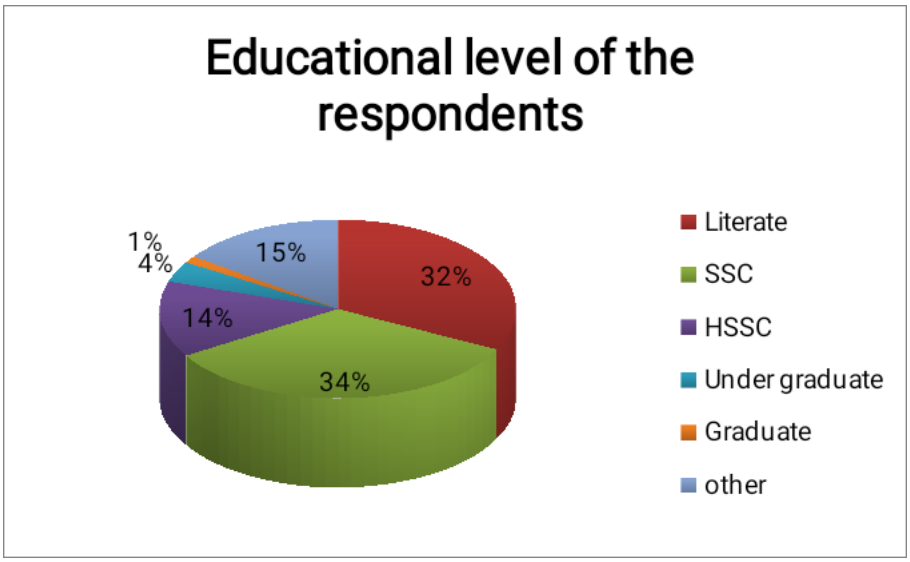
The above bar graph shows that around 67.5% are male dairy farmers that is 54 out of 80 dairy farmers interviewed were male, while 32.5% are female dairy farmers. 26 out of 80 dairy farmers are female.

4.6) Age of the respondents



According to the pie chart above, around 35% of the dairy farmers in Raia are between the ages of 40-50, while 31% are between the ages of 50-60. 25% of them are between the age of 60 years and above. 4% are between the age of 20-30 and 5% are between the ages of 30-40 years.

4.7) Educational level of the respondents



The level of education attained by the dairy farmers can be seen in the above pie chart. It shows that 32% of the dairy farmers are literate, 34% of dairy farmers have done their

SSC, 14% have studied until HSSC, 4% belong to the undergraduate category and only 1% out of the total respondents have completed their graduation and the rest 15% fall into other category.

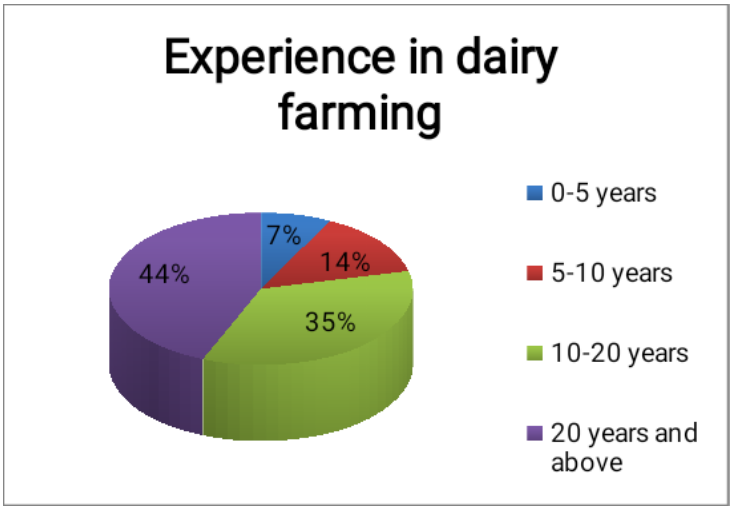
Table no.4.1) Household size of the respondent

Household size	Total
2	1
3	10
4	17
5	21
6	13
7	6
8	4
9	3
10	2
13	2
14	1

In the above, we can see the household size of the farmers. 1.25% belong to a household size of 14, 2.5% have a household size of 13, similarly, another 2.5% have a household size of 10, 3.75% has household size of 9. On the other hand, 5% have a household size of 8, 7.5% have a household size of 7. Around 16.25% has a household

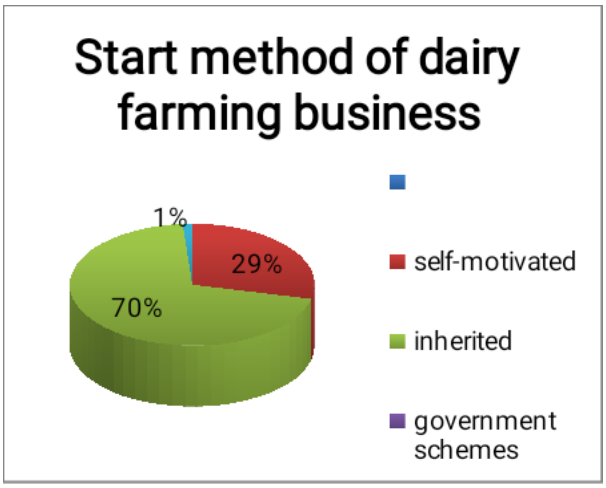
size of 6, and most of them that is around 26.25% has household size of 5, 21.25% has household size of 4, 12.5% has household size of 3 and 1.25% has household size of 2.

4.8) Experience of the respondents in dairy farming



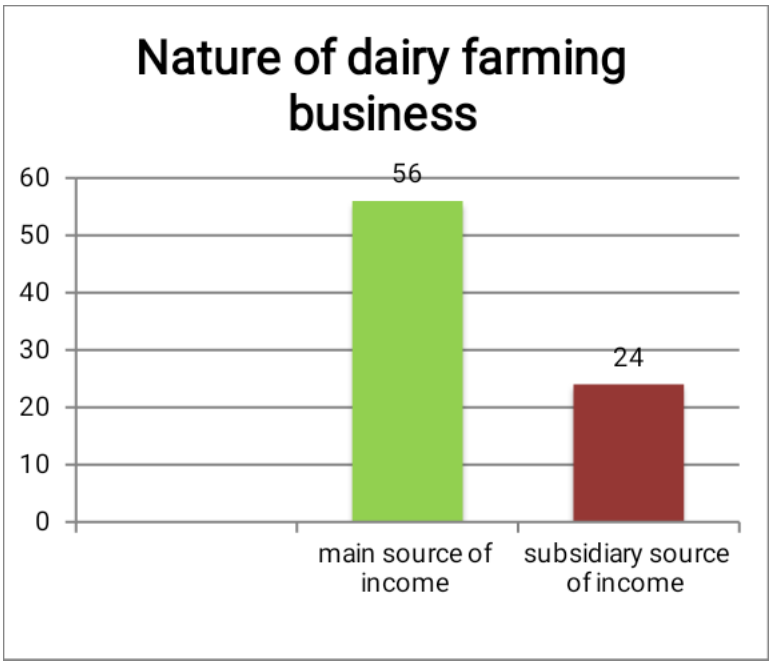
According to the pie chart above we can see that most of the dairy farmers around 44% had experience 20 years and above. Around 35% had experience between 10-20 years, on the other hand 14% had experience between 5-10 years and 7% had experience between 0-5 years.

4.9) Start method of dairy farming business



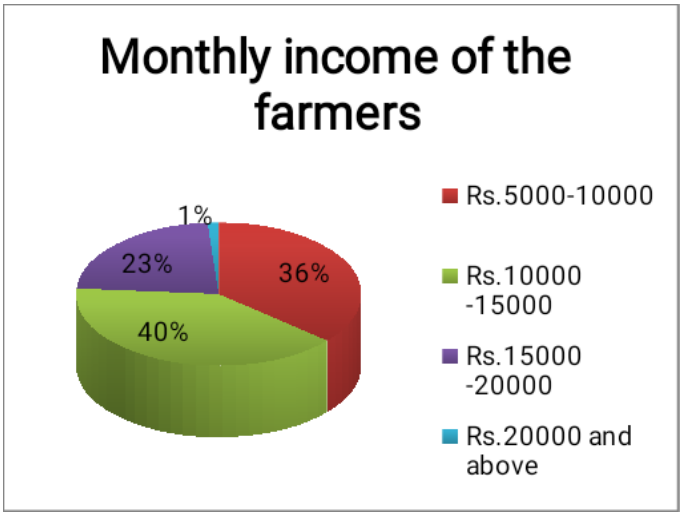
According to this pie chart most of the farmers around 70% had inherited the dairy farming business. 29% started a dairy farming business through self-motivation. And 1% said that they started a dairy farming business because they had either lost their job during covid or couldn't find a job.

4.10) Nature of dairy farming business



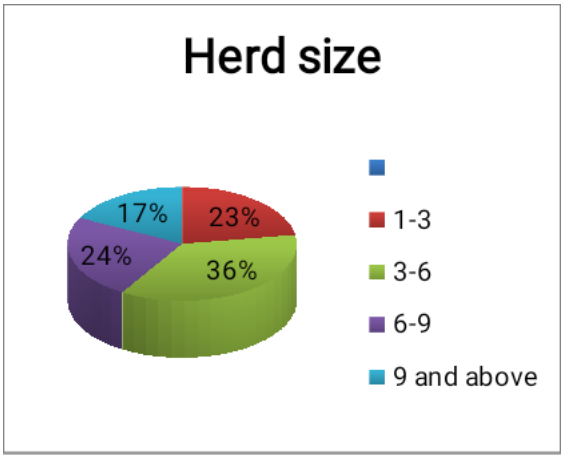
In the above bar graph we can see that most of the dairy farmers that is around 70% had dairy farming business as their main source of income while on the other hand 30% had dairy farming business and they also had other source of income like income from selling agricultural goods and private jobs.

4.11) Monthly income of the respondents



In the above pie chart we can see that 36% of the dairy farmers earned income between Rs.5000-10000. 40% dairy farmers had an income range between Rs.10000-15000, on the other hand few dairy farmers around 23% had earned income between Rs.15000-20000 and only 1% had income Rs.20000 and above.

4.12) Herd size



According to the pie chart above 22% had cattle between the range of 1-3, on the other hand 36% had cattle between the range of 3-6. 24% had cattle between the range of 6-9 and only 18% had cattle in the range of 9 and above.

4.13) Has workers in dairy farm or work shared among family members

The dairy farmers were asked if they have any workers working in the dairy farm or if they share the work among family members. Around 27.5% of the respondents said that they have workers because these dairy farmers had another job besides dairy farming. On the other hand, most of the dairy farmers that is around 72.5% did not have workers and that they shared the work among their family members.

4.14) Aware about government schemes

The farmers were asked certain questions regarding government schemes. Firstly they were asked if they were aware of any government schemes. 95% out of 80 respondents said that they are aware about the schemes. On the other hand, 3.75% said that they are not aware about any of the government schemes and 1.25% said that they never heard about government schemes, especially dairy farmers who started their dairy farming business recently like two years back.

4.15) Applied for any government schemes

The next question that was asked to dairy farmers especially those who were aware about the schemes was whether they have applied for the schemes. Most of the dairy farmers that is around 57.5% said that they did not applied any government schemes especially those who had herd size range between 9 and above because they were happy with the income that they were getting. 42.5% said that they had applied for the government scheme but few respondents said even after applying for the scheme they never received any benefit or support from the government.

4.16) Names of government schemes in Goa

There are schemes that are meant to improve dairy farming in Goa, they are Mukhyamantri Sudharit Kamdhenu scheme, Pashupalan scheme, dairy equipment scheme and community dairy farming scheme. Besides these schemes the milk producers also get incentives from the government. In Shri Sateri Sahakari Dudh Vya. Saunstha Ltd. In Goa, the chairman said that till now the farmers have applied for only two types of schemes : Mukhyamantri Sudharit Kamdhenu scheme and Pashupalan scheme. 55% had applied for Mukhyamantri Sudharit Kamdhenu scheme and 39% had

applied for Pashupalan scheme.

4.17) Benefits received from the schemes

The dairy farmers who had applied for the schemes had received benefits in the form of subsidies and financial support. 85% received benefits in the form of subsidies and the remaining 15% received financial support.

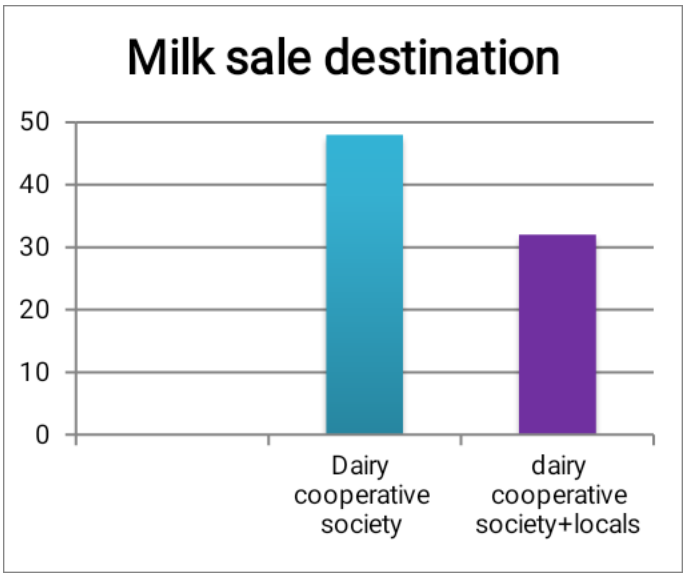
4.18) Source of awareness about the government schemes

Most of the dairy farmers, around 81% came to know about the scheme through the dairy cooperative society. On the other hand, 14% came to know about the scheme through veterinary, 1% came to know about the scheme through social media, another 1% of the respondents were aware about the scheme through panchayat and 3% came to know about the scheme through relatives and friends.

4.19) Government training

The dairy farmers were asked if the government has provided them any training. Most of the respondents , around 86%, said that they have not received any training while on the other hand, 14% of them said that they received training from the government. But these respondents said that they received this training ten years back and now in recent years there was no training given to the dairy farmers.

4.20) Milk sales destination



The above bar graph shows that 60% that is 48 out of 80 respondents sell milk to the dairy cooperative society and 40% out of 32 respondents sell milk to the dairy cooperative society as well as locals.

4.21) Use any advance technology to sell milk

The dairy farmers were asked whether they use any advanced technologies to sell milk like social media. Very few, 11.25%, said that they were using advanced technology like facebook to sell milk. On the other hand, the majority of them, around 88.75%, said that

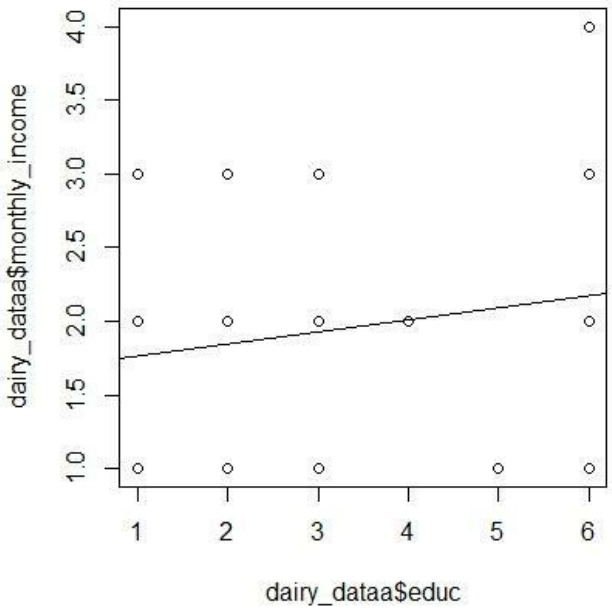
they never used any advanced technology to sell milk.

4.22) Milk production constraints

The dairy farmers were asked if they face any constraints in their dairy farming business. Around 81.25% said that there are many constraints which they face in their dairy farming business. On the other hand 18.75% said that they do not have any constraints in their dairy farming business.

The type of constraints that the dairy farmers face are 38 respondents who said that the cost of concentrate feed (example: corn, wheat) is high. Secondly 19 respondents said that animal disease is another constraint and also there are no proper medicines available. Also 7 respondents said that they receive low milk yield and only 1 respondent was facing the problem of lack of laborers.

4.23)Monthly income and education



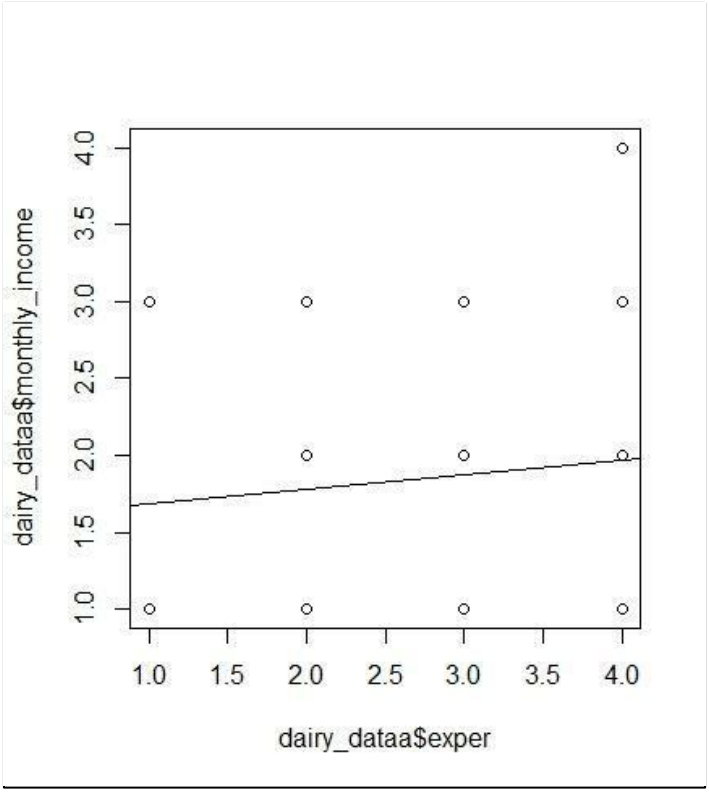
Source: Based on the author's calculation

Null hypothesis: there is no correlation between monthly income and education of dairy farmers.

Alternate hypothesis: there is correlation between monthly income and education of dairy farmers.

In the above scatter plot we can see that the y-axis represents monthly income whereas the x-axis represents education. Since the regression line is moving upwards it indicates a positive correlation between monthly income and education of dairy farmers and therefore we reject the null hypothesis and we can conclude that the alternate hypothesis is true.

4.24) Monthly income and experience



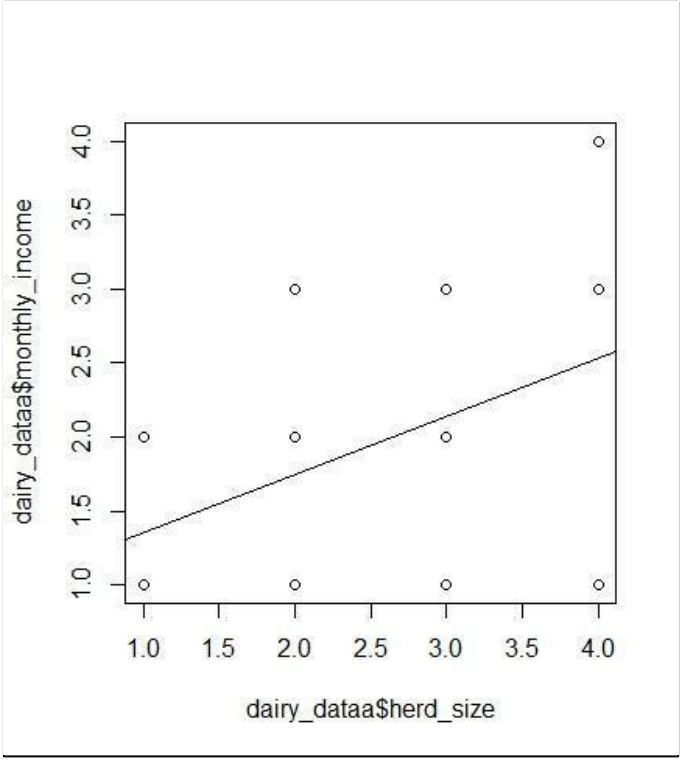
Source: Based on author's calculation

Null hypothesis: there is no correlation between monthly income and experience in dairy farming.

Alternate hypothesis: there is a correlation between monthly income and experience in dairy farming.

In the above scatter plot, we can see that the y-axis represents monthly income whereas the x-axis represents the experience of dairy farmers in the dairy farming business. The regression line is moving upwards which indicates a positive correlation between monthly income and the experience of dairy farmers therefore we reject the null hypothesis. The points are not close to the regression line/curve and this means the relationship between these variables is weak.

4.25) Monthly income and herd size



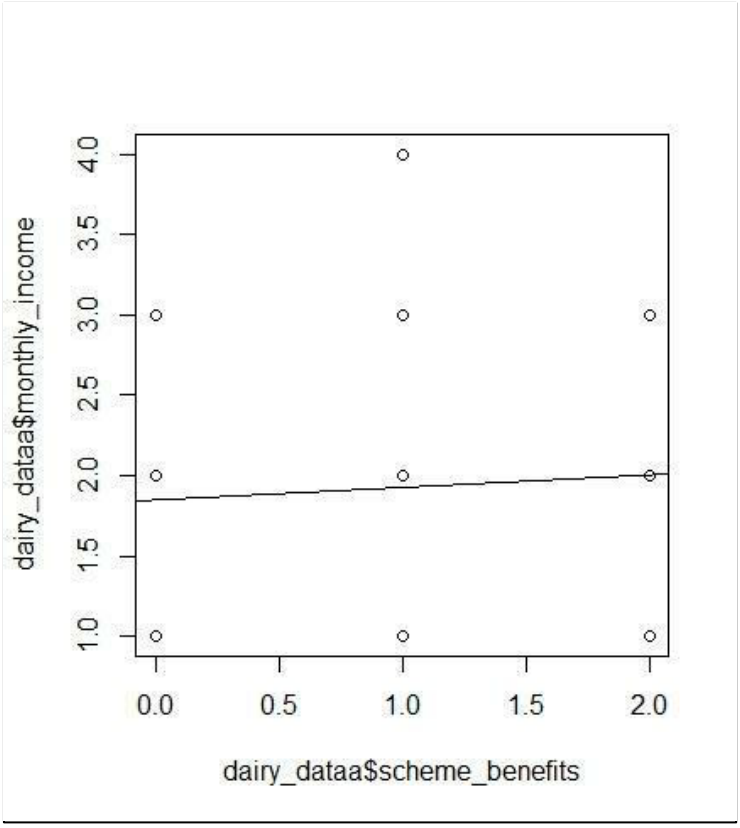
Source: Based on author's calculation

Null hypothesis: there is no correlation between monthly income and herd size.

Alternate hypothesis: there is a correlation between monthly income and herd size.

In the above scatter plot, we can see that the y-axis represents monthly income whereas the x-axis represents the herd size. The regression line is moving upwards which indicates a moderate positive correlation between monthly income and herd size and therefore we have enough evidence to reject the null hypothesis..

4.26) Monthly income and scheme benefits



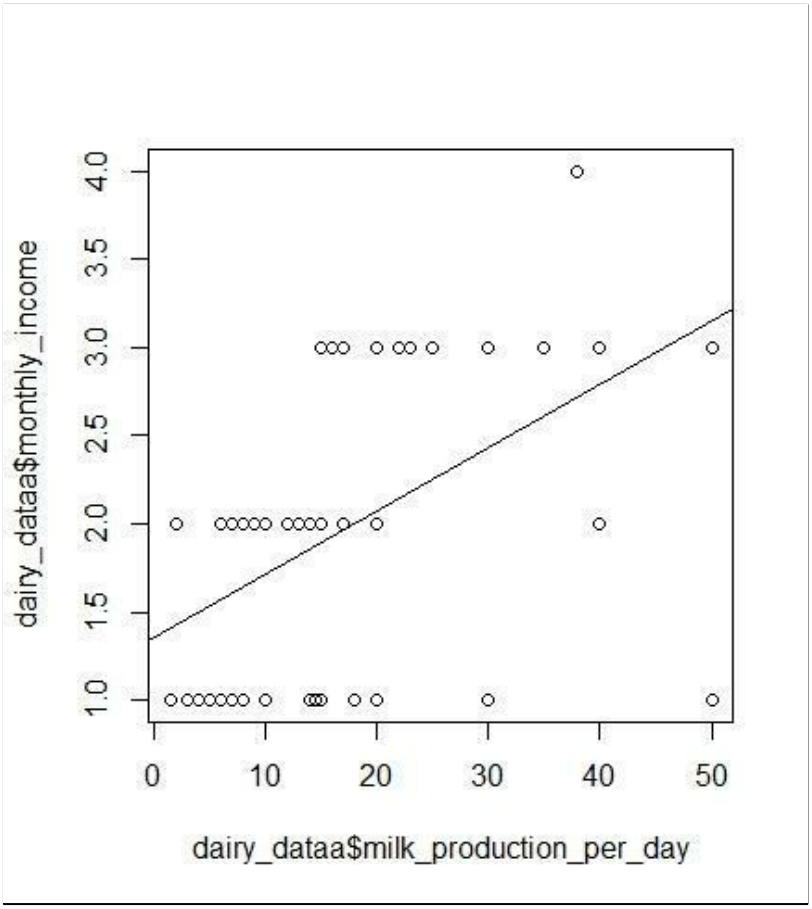
Source: Based on author's calculation

Null hypothesis: there is no correlation between monthly income scheme benefits.

Alternate hypothesis: there is a correlation between monthly income and scheme benefits.

In the above scatter plot, we can see that the y-axis represents monthly income whereas the x-axis represents the scheme benefits. The regression line is moving upwards which indicates a positive correlation between monthly income and scheme benefits and therefore we have enough evidence to reject the null hypothesis. Since the points are not close to the regression line this indicates that the relationship between these variables is weak.

4.27) Monthly income and milk production per day



Source: Based on author's calculation

Null hypothesis: there is no correlation between monthly income and milk production per day.

Alternate hypothesis: there is a correlation between monthly income and milk production per day.

In the above scatter plot, we can see that the y-axis represents monthly income whereas the x-axis represents the milk production per day. The regression line is moving upwards which indicates a moderate positive correlation between monthly income and

milk production per day and therefore we have enough evidence to reject the null hypothesis.

Spearman's rank correlation rho- Monthly income and education

S = 70098, p-value = 0.1133

alternative hypothesis: true rho is not equal to 0

sample estimates:

rho

0.1784122

Interpretation: The above test examines Spearman's rank correlation coefficient (rho) between monthly income and education of dairy farmers. The calculated Spearman's rho is 0.1784, indicating a susceptible effective correlation among the two variables. However, the p-value associated with this correlation is 0.1133, which shows that this correlation is not statistically sizeable at a significance level of 0.05. Therefore we cannot conclude that there is a significant correlation between monthly income and education of dairy farmers.

Spearman's rank correlation rho- monthly income and experience

S = 80249, p-value = 0.6005

alternative hypothesis: true rho is not equal to 0

sample estimates:

rho

0.05943465

Interpretation: The above test examines Spearman's rank correlation coefficient (rho) between monthly income and experience of dairy farmers. The calculated Spearman's

rho is 0.0594, which indicates a very weak positive correlation between the two variables. However, the p-value associated with this correlation is 0.6005, which means this correlation is not statistically significant at the significance level of 0.05. Therefore we cannot conclude that there is a significant correlation between monthly income and the experience of dairy farmers.

Spearman's rank correlation rho- monthly income and herd size

S = 45431, p-value = 1.229e-05

alternative hypothesis: true rho is not equal to 0

sample estimates:

rho

0.4675258

Interpretation: The above test examines the Spearman's rank correlation coefficient (rho) between monthly

Income and herd size. The calculated Spearman's rho is 0.4675, and this indicates a moderate positive

Correlation between the two variables. The p-value associated with this correlation is 1.229e-05, which is

much smaller than the conventional significance level of 0.05, which suggests that this correlation is statistically significant.

Spearman's rank correlation rho- monthly income and herd size

S = 45431, p-value = 1.229e-05

alternative hypothesis: true rho is not equal to 0

sample estimates:

rho

0.4675258

Interpretation: The above test examines the Spearman's rank correlation coefficient (rho) between monthly

Income and herd size. The calculated Spearman's rho is 0.4675, and this indicates a moderate positive

Correlation between the two variables. The p-value associated with this correlation is 1.229e-05, which is

much smaller than the conventional significance level of 0.05, which suggests that this correlation is statistically significant.

spearman's rank correlation rho- monthly income and scheme benefits

S = 80457, p-value = 0.6155

alternative hypothesis: true rho is not equal to 0

sample estimates:

rho

0.05699724

Interpretation: The above test examines Spearman's rank correlation coefficient (rho) between monthly

4.2) Table - Spearman's Rank Correlation

Sr. no.	Variable name	Calculated value	p-value	Significance
1	Monthly income and education	0.178	0.113	Not significant at 0.05
2	Monthly income and experience	0.059	0.600	Not significant at 0.05
3	Monthly income and herd size	0.467	1.229e-05	Significant at 0.05
4	Monthly income and scheme benefits	0.056	0.615	Not significant at 0.05
5	Monthly income and milk production per day	0.516	9.274e-07	Significant at 0.05

Source: Based on author's calculation

The spearman's rank correlation value ranges from positive one to negative one where positive one means perfect association of rank, zero means no association between ranks and negative one means negative association between ranks. Table 4.2 shows us that there is a positive correlation between monthly income and education of dairy farmers. Similarly, there is weak positive correlation between monthly income and

experience of dairy farmers. There is moderate positive correlation between monthly income and herd size. Monthly income and scheme benefits shows weak positive correlation. There is also moderate positive correlation between monthly income and milk production per day.

Chapter 5

Conclusion

5.1) Findings of the study

According to the study, the majority of the respondents were male as compared to females. The respondents were mostly from the middle-aged or older age group. This is also because the younger generation tends to work in the service sector instead of farming. The study also found that most of the farmers had completed their SSC. The analysis of Spearman's rank correlation coefficients and their corresponding p-values reveals some valuable insights into the relationship between monthly income and various factors among dairy farmers. The data indicates that there is a positive correlation between education level and monthly income among dairy farmers, but this relationship is not strong enough to be considered significant. Similarly, there seems to be no significant relationship between years of experience and monthly income. However, there is a moderate and statistically significant positive correlation between monthly income and both herd size and milk production per day. These findings suggest that increasing the herd size and daily milk production could lead to higher monthly incomes for dairy farmers. In contrast, benefits received from schemes show no significant relationship with monthly income. These results could be helpful for policymakers and farm managers in devising effective strategies to enhance the income of dairy farmers.

5.2) Suggestions

Firstly, the farmers who do not apply for these schemes need to be made aware of the schemes as well as the benefits that they can get by applying for this scheme. Also, strategies for optimizing dairy farm management practices, and highlighting policy recommendations and support services are important considerations. There are schemes for dairy farmers in Goa but most of them even after applying do not get benefits and farmers who do not make much profit tend to get de-motivated. The government should provide training for dairy farmers especially on the latest technology that can be used in dairy farming. By addressing these factors, a comprehensive analysis can be provided, which will offer valuable insights for policymakers, practitioners, and stakeholders involved in agricultural development.

APPENDIX

QUESTIONNAIRE

Title of Survey: SOCIO-ECONOMIC ANALYSIS OF DAIRY FARMERS IN RAIA village, SALCETE-GOA

1) Gender:

o Male

o Female

2) Age:

o 20-30 years old

o 30-40 years old

o 40-50 years old

o 50-60 years old

o 60 and above

3) Educational level:

o literate

o SSC

o HSSC

o Graduate

o Under-graduate

o Other, (specify)

4) Household size

5) Number of years in dairy farming

o 0-5years

o 5-10 years

o 10-20 years

o 20- above

6) How did you start dairy farming?

o Self-motivated

o Inherited

o Government schemes

o Other ,(specify)

7) Nature of dairy farming business

o main source of income

o subsidiary source of income

8) Monthly Income levels

○ Rs.5000-Rs.10000

○ Rs.10000-Rs.15000

○ Rs.15000-Rs 20000

○ Rs.20000 and above

9) Number of cattle in the farm (herd size)

○ 1-3

○ 3-6

○ 6-9

○ 9 and above

10) Do you have workers working in your dairy farm?

○ yes

○ no

11) if answered yes, how many ?

○ 1-3

○ 3-6

○ 6-9

○ 9 and above

12) total number of males and females

13) if answered no, then do you all share the work among your family members?

○ yes

○ no

14) Are you aware of any government schemes?

○ yes

○ no

○ never heard

15)Have you availed any government scheme?

○ yes

○ no

16) If answered yes, which one?

○ community dairy farming scheme

○ dairy equipment scheme

○ Mukhyamantri Sudharit Kamdhenu Scheme

○ Pashupalan Scheme

17) How did you come to know about the scheme?

○ Panchayat

○ social media

○ friends/relatives

○ Milk cooperative center

18) what are the benefits received from the scheme?

○ subsidies

○ financial support

○ consultancy services related to machinery

○ others, specify

19) Have you received any training from the government?

○ yes

○ no

20)How many liters of milk do you get per day?

21) To whom is the milk sold?

○ dairy cooperative society

○ middle men

○ others, specify

22) Do you use any advanced technologies like social media /online websites to sell the milk besides dairy co-operative society?

23) Do you think there are any significant constraints to the (dairy) production of the farm?

o Yes

o No

24) If answered yes, which are the main constraints you are facing with your dairy farm ?

o High cost of concentrate feed

o Lack of farm laborer

o Low quality of milk

o Low milk yield

o Low market price of milk

o Animal disease

o Storage capacity

25) Could you provide details on your dairy farm's financial performance in the past years including revenue, expenses and profits? [Year, Materials (cost in rs.) Labour (cost in rs.)Total expenses(in rs.)revenue, profit]

26) Monthly Consumption expenditure levels

○ Rs.5000-Rs.10000

○ Rs.10000-Rs.15000

○ Rs.15000-Rs 20000

○ Rs.20000 and above

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