Visvesvaraya Technological University
Belagavi, Karnataka, 590 014.

A Mini Project Report on

"Title"

Submitted in partial fulfillment of the requirements for the award of

Bachelor of Engineering

in

Computer Science and Engineering

Semester V

(18CSL58)

Academic Year 2022-23

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CERTIFICATE

Certified that the mini project work entitled **"Title"** is a bonafide work carried out by **Mr. Name,** bearing USN number **2KE00CS000**, in partial fulfillment for the award of degree of **Bachelor of Engineering** in **V Semester, Computer Science and Engineering** of **Visvesvaraya Technological University**, Belagavi, during the year **2022-23**. It is certified that all corrections/suggestions indicated for internal assessment have been incorporated in the report deposited in the department library. The mini project report has been approved as it satisfies the academic requirements in respect of mini project work prescribed for the said degree.

Signature of the Guide	**Signature of the HOD**	**Signature of the Principal**
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ACKNOWLEDGEMENT

The mini project report on **"Mini Project Title"** is the outcome of guidance, moral support and devotion bestowed on me throughout my work. For this I acknowledge and express my profound sense of gratitude and thanks to everybody who have been a source of inspiration during the project work.

First and foremost I offer my sincere phrases of thanks with innate humility to our **Principal Dr. S. G. Joshi** who has been a constant source of support and encouragement. I would like to thank our **Dean Academics Dr. Manu. T. M.** for his constant support and guidance. I feel deeply indebted to our **H.O.D. Dr. Yerriswamy T.** for the right help provided from the time of inception till date. I would take this opportunity to acknowledge our **Guide Mr/Mrs/Dr. Guide Name,** who not only stood by us as a source of inspiration, but also dedicated his/her time for me to enable me present the project on time. I would be failing in endeavor, if I do not thank our **Coordinator Mr. Pradeep Surasura** who has helped me in every aspect of my mini project work.

Last but not the least, I would like to thank my parents, friends & well wishers who have helped me in this work.

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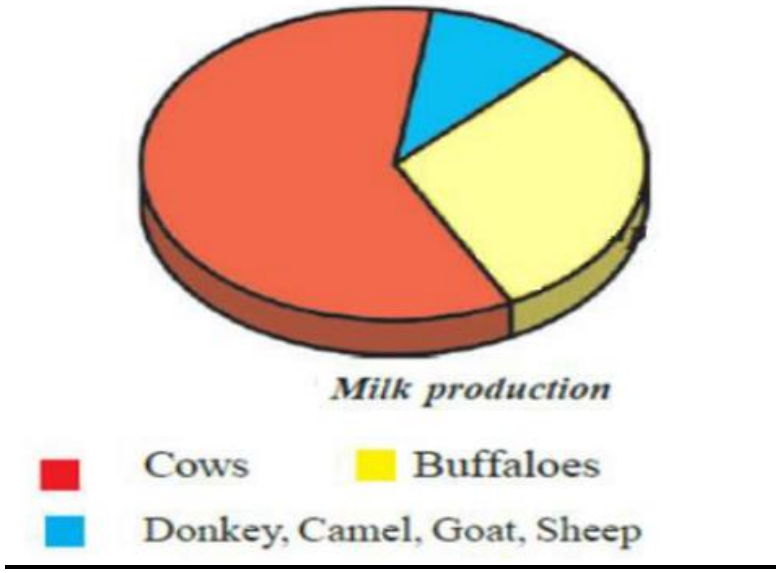
ROLE OF DAIRY FARMING TO DOUBLE VILLAGE INCOME

1.Introduction

Animal husbandry is the most important component of Indian agriculture supporting livelihood of more than two-thirds of the rural population especially marginal, small and landless farmers (Singh et al., 2018). There is immense scope in animal husbandry which can help in doubling farmer's income. In the case of livestock, improvement in herd quality, better feed, increase in artificial insemination, reduction in calving interval and lowering age at first calving are the potential sources of growth. In animal husbandry, the dairy sector has always played an important role (Saxena et al., 2002). Doubling farmer's income by 2025 is quite challenging but it is needed and is attainable. This is quite evident from the words of Nanda Kumar, Chairman National Dairy Development Board (NDDB) that ―Doubling farmers' income is impossible without dairy farming. Dairy farming has become a commercial enterprise now and not only provides nutrition but also helps farmers to improve their economic condition and welfare. Major source of income for farmers is through sale of milk along with milk products and sale of dairy animals itself.

Milk is a wholesome food among all the animal products. It contains in proper proportions the various essential food ingredients required by human body in an easily digestible form. Inclusion of milk in the human diet increases the digestibility of other types of food as well. The productivity of milk varies in different countries, as some countries are surplus in production, some are deficit in production, and in some of the countries, availability matches their requirement. The annual milk production in India in 2015–16 was 155.5 million tonnes and the per capita availability of milk was 337 grams per day. The demand for milk is constantly increasing in cities as well as small towns and rural areas.



The factors influencing this increased demand are — rapid increase in population, spread of education, growing nutritional awareness and improved purchasing power of consumers. Dairy farming in India has evolved from just an agrarian way of life to a professionally managed industry. A large number of rural families in India are engaged in dairy production, for whom this is an important source of secondary income. In India, raw milk is perceived to be fresh by most consumers and has a large market. Conventional dietary habits in India account for about 60 per cent of milk consumption in liquid form, and the remaining in the form of ghee, cheese, curd, paneer, ice cream, dairy whiteners and traditional sweets. Dairying provides a source of daily income with a relatively low level of risk. Most of the dairy farmers in India raise animals at a small scale in traditional ways. The productivity of these farmers can be enhanced if they run their business in a scientific manner. Most of such farmers are not aware of the modern methods of dairy farming. As a result, some farmers lose their investment instead of making profit. To ensure maximum production and profits from dairy farming, it is essential that these farmers adopt proper business plans and good dairy management practices. Nearly 43 per cent of Indian farmers are small cultivators, and about 26 per cent are agricultural labourers who have one or two milch animals (Planning Commission, GOI, 2009).

2.Current Dairy Scenario.

Agriculture contributes 17 % of India's total gross domestic product (GDP) out of which livestock sector contributes highest, around 25.6% and thereby contributing 4.11 % to total GDP during 2012-13. The livestock sector is being considered as one of the promising sector for enhancing farmer's income.

Dairying contributes significantly to the livestock sector in terms of share in gross value added and animal population. The dairy farming in India has shown remarkable development in the past decade and India has now become world largest producers of milk accounting for 20% of world production. In 2016-17 India producing 163.7 million tonnes of milk with the growth rate of 5.3 % providing per capita availability of 352 gram/day (BAHS, 2017). As per 19th livestock census India possesses about 118.59 million milch dairy animals, cattle and buffalo account for 37.28% and 21.23% of the livestock population with 190.90 and 108.70 million in numbers respectively. According to estimates of the Central Statistics Office (CSO, 2015-16), the value of output livestock sector at current prices was about 5,91,691 crore which is about 28.5% of the value of output from agricultural and allied sector.

At constant prices the value of output from livestock is about 29% of the value of the output from total agriculture and allied sector (DAHDF, 2016-17). Within Livestock sub-sector, dairying constitutes the major share about 67% in value of outputs from agriculture (Jaiswal et al., 2018). Livestock sector provides employment to 8.8% of population which largely comprises of landless and unskilled population.

Milk Production

The increased production of milk has improved the per capita milk availability to 250 grams per day. The demand of milk and milk products in India is projected to increase to 142.9 million tones in 2015 and further to 191.3 million tones in 2020. At the existing rate of growth in milk production, in next ten years, supply will fall short of the demand. Together with the increase in domestic demand of milk, at the international level, particularly in developing countries, the three drivers of demand - population growth, urbanization and income growth- are very strongly in operation.

For instance, the import demand of milk and milk products has shown tremendous increase in several developing countries notably China, South Korea, Singapore, Srilanka and several other Asian countries many of whom have become buoyant economies after opening up of the world market.

Thus, buoyant markets and trade liberalization have opened new vistas of international trade for the Indian dairy sector. However, for tapping the economic benefits of growing demand of milk and milk products and to compete with the traditional milk exporting countries viz; Australia and New Zealand the Indian dairy sector has to gear itself to meet the following challenges:

- Increase the milk production at the rate that is higher than the existing growth
- Increase the production of value added dairy products
- Provide complete quality assurance.

Housing management aspect of the new breeds/ strains of high yielding dairy animals developed in the country also needs to be addressed adequately as it is essential to realize the high milk production potential. Animal's shelter requirement varies according to the agro climatic conditions of the region and the socio-economic condition of its farmers. The pattern of traditional animal, shelters also varies from region to region. In order to make specific recommendations it is essential to take into consideration the physiological, behavioural and other related aspects of the animal comfort.

It is, therefore, essential to carry out the detailed investigation on type and system of housing required for different agro climatic regions and suggests ideal shelter systems based on these objective criteria. Together with the increase in domestic demand of milk, at the international level, particularly in developing countries, the three drivers of demand - population growth, urbanization and income growth- are very strongly in operation. For instance, the import demand of milk and milk products has shown tremendous increase in several developing countries notably China, South Korea, Singapore, Srilanka and several other Asian countries many of whom have become buoyant economies after opening up of the world market.

3.Significance of Dairy Farming in India

India is not only the largest milk producer, but also is one of the fastest growing and lowest cost milk producers in the world. The characteristic feature of an indian dairy industry is that it is rural based and large amount of milk production comes from small milk producers (Gangasagare and Karanjkar, 2009). Dairying in India is an occupation of small farmers and about half of the rural population own milch animals. More than 70 million rural households engaged in milk production, the majority being small and marginal farmers (Hemme et al., 2015). It provides regular income to the livestock farmers through sale of milk. Nearly 70% of agriculture farmers double up as dairy farmers, and keep a large part of the milk they get for their own consumption (CII, 2017). Indian dairying has a large and growing domestic market in which the consumption of milk has been rising proportionate with increase in the purchasing power of people.

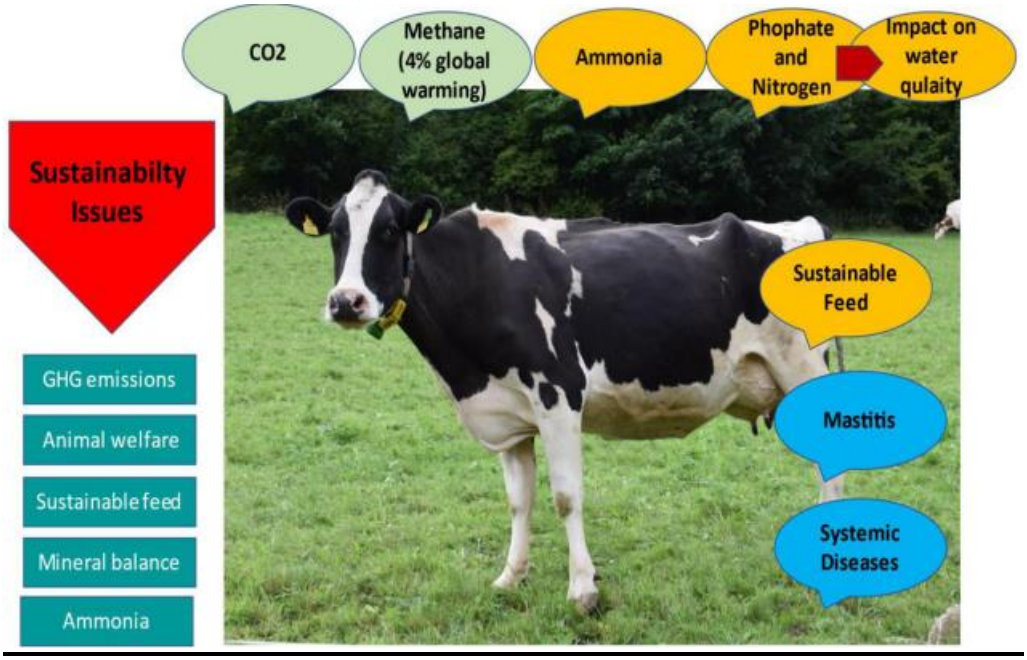
As per 66th round of the NSSO, milk and milk product commanded a share of 7.6 % and 6.9% of consumer expenditure in rural and urban India respectively. Livestock in general and dairying in particular play a vital role in the Indian economy and also in the socio-economic development of millions of rural households. Dairy is one of the biggest agri- businesses in India and a significant contributor to Indian economy. It is the largest single agricultural commodity with ~4 per cent share in economy. India is the largest producer of milk globally with an ~188 million MT production in 2019-20. A key factor has been the proliferation of private dairy enterprises that now account for more than 60 per cent of dairy processing capacity in the country. Indian dairy industry has grown at ~12 per cent during last 5 years, with value-added products driving market growth. It is a significant contributor to farmers' income as approximately 70 million farmers are directly involved in dairying. Dairy is the only agri-product in which around ~70-80 per cent final market value is shared with farmers and it accounts for approximately one-third of rural household income in India.

It serves wide range of consumer needs too – from protein supplements and health foods to indulgence foods such as yogurt and ice creams. When it comes to agricultural value chains that can simultaneously deliver on multiple development goals, few agri-products can rival dairy, which improves farmer livelihoods, creates jobs, supports agricultural industrialization and commercialization, and enhances nutrition for the masses. The development of India’s dairy sector started through a program called ―Operation Flood‖ launched on 13 January 1970, which was the world's largest dairy development program and a landmark project of India's National Dairy Development Board (NDDB). It spurred a phased, multipronged approach that included tax incentives, food quality standards, subsidies on inputs, infrastructure provisions such as cold chain and electrification. Against this backdrop of broad government support for farmers and allied intermediaries, dozens of private dairies have emerged. Dairy sector in India is fairly organised to the tune of ~35 per cent compared to fruits and vegetables sector where we see processing levels to be around 3-5 per cent. This increased

organised market drives multiple benefits for the sector. We find improved quality dairy products due to adherence to FSSAI guidelines. Good quality products ensure expanded market reach. India exported dairy products worth $ 187 Million in 2019-20. In the organised sector, private dairy companies are investing in developing an efficient milk procurement network as well as marketing of liquid milk and valued added products.

We observe that means of production and consumption are modernizing as the market evolves toward industrial packaged products and product variety. The rapid growth of private sector shows that the sector is prospering in dairy sector with a focus on value added products. Indian markets with the greatest growth potential are also among the least developed in infrastructure and consumer awareness. Supply chain has become increasingly complex in cities with multiple retail outlets. In metro cities, new value-added segments and alternative products have taken off with surprising speed, intensifying competitive pressures and the need to innovate constantly. For dairy processors, creating value comes with many challenges. Different product segments yield very different levels of margins.

The key to success in dairy therefore lies in finding the sweet spot of growth and margins. It takes an understanding of the market's unique characteristics and supply-and-demand dynamics to innovate constantly in Indian market. Investment and return potential vary significantly with choice of product-mix and type of processing segment focused on. We observe EBIT margins of ~3 per cent in commodity segments (Milk and SMP) while value added segments such as ice cream, yogurt, cheese and whey show EBIT margins of ~20 per cent.

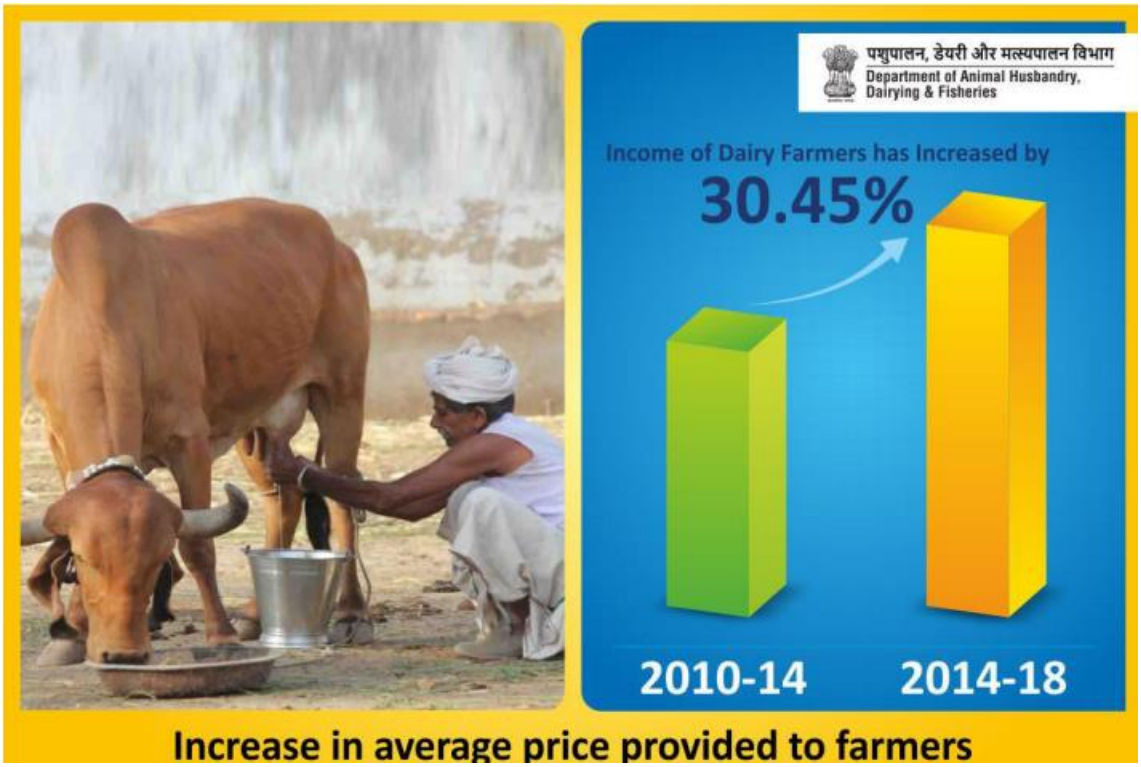


4.Income of an Indian farmer

In India around 70% farmers are marginal (owning less than one hectare), and 77% of them earn even a miserable income of Rs.6,067 per capita a year (Paroda, 2018). Further, animal holding has been found to be more equitable as compared to land holding as 85% of the Indian farmers, who are marginal and small, own only 45% of farm land but 75% of bovines (Planning commission Report, 2007-2012). According to ―Situation Assessment Survey‖, the livestock sector contributes significantly to rural income about 26 % in case of the poorest households and about 12% in case of overall rural income. Doubling real income of farmers till 2022-23 requires annual growth of 10.41% in farmer's income.

As per NSSO (70th Round) for agricultural households, 63.5% income comes from cultivation, 3.7% from livestock, 1% from other agricultural activity, 4.7% from non-agricultural enterprises, 22% from salaried employment, 1.1% from pension, 3.3% from remittances and 0.7% from others.

The economic Survey of India 2017-18 tabled in Parliament indicates that over a period of 10 years, the share of income of farmers from crop production increased by only 1% while it increased by 7% for livestock.



5.Drivers Enhancing Income from Dairy Farming

5.1Processed Milk Products.

Proper utilization of dairy-product has direct impact on the economy condition of the farmers. If the daily amount of fresh milk is limited, it is more economical to process the milk into less perishable products, store them and sale later in larger quantities. Generally the price of processed milk products is high as compared to raw milk. If a farmer is reluctant to sale the milk because of getting lower price then he can take initiative to sale processed dairy products such as ghee, paneer, curd, butter etc. Sometimes, there may not be availability of market nearby so in such cases sale of preserved products may bring greater financial gain.

5.2. Increased Consumer

Today the dairy world is serving over 7 billion consumers and providing livelihoods for approximately 1 billion people which either live on dairy farms(Hemme et al., 2015). The growing demand for milk and milk products offers opportunities for smallholders to enhance their income by increasing the efficiency of their milk production (Kumar et al., 2014).

5.3. Dairy Wastes

Saving money is a kind of earning money. Cow dung has been considered as a Gold Mine, along with cow urine it can be used as fertilizer in the field of agriculture and energy resource to save money. Besides, cow dung can be used in making money from Panchgavya, Gau-mutra ark, various medicines and cosmetics.

In addition to that government of India implemented Gobar Dhan scheme, the online trading of cow dung is one of the way to generate wealth from cow dung. These wastes are not just wastes, it adds to the economy of farmers to a large extent.

5.4. Milk Cooperatives

Milk production activity takes place on individual farms of different sizes in India. This characteristic of milk production system along with perishable nature of milk is a matter of great concern. In the interests of livelihood and economic well-being of the milk producers, it is essential to provide rural milk producers with greater access to the cooperative milk.

The role of dairy cooperatives in procurement of milk and providing services to the farmers is remarkable as evident from the Gujarat Cooperative Milk Marketing Federation. The dairy farmers selling the milk to dairy cooperatives get fair price of their product. The cooperatives also provide financial security and give the money to farmers at certain intervals. Over 60% of close to 11 million farmer members in about 100,000 village milk cooperatives all over the country are small, marginal and even landless producers (Jaiswal et al., 2018).

Currently, on average producers pour about 2.8 litre of milk per day at dairy cooperative society and earns a gross income of Rs.85/day. However, feeding cost itself comprises of about 70% of the total milk price. Overall, farmer earns 20-30 % of milk price as net daily income which comes about Rs.516/month (NAP vision, 2022)

5.5. Breeding Policy

India has been made efforts to increase milk production through selection and cross-breeding of non-descript and low producing cattle with exotic germplasm. Door step delivery of artificial insemination as well as conservation and improvement of indigenous cattle and buffalo breeds has been improving productivity and cost efficiency in dairy farming and income of farmers.

5.6. National Action Plan

Plan Government of India initiated National Action Plan to create infrastructure for handling of increased milk production to meet the demand of milk and milk products and help in achieving the objective of doubling the farmers' income.

5.7. Livestock Extension Services

The livestock extension services enable farmers to identify and analyse their production problems thereby increase income. It has been found that the net income has increased by 80% when farmers used livestock extension services (Dinani et al., 2018).

6. Issues in Doubling Farmer's Income

Livestock diseases like FMD, BQ, HS and mastitis acts as negative influence on the production system results, low income. Mastitis is considered as major economic important disease in India, according to one study the total annual economic losses due to mastitis was calculated is 7165.51 crore rupees (Bansal and Gupta, 2009).

Inadequate quantity and quality of feeds affects dairy farming system. As per estimate the deficit of dry fodder, concentrates and green fodder currently is 10, 33 and 35 % (Planning commission, 2012) respectively. Low productivity of milk animals, poor access to breeding, seasonality in production, limited use of manufactured cattle feeds, lack of good quality animal husbandry and farming practices, animal health and credit services and high cost of Artificial Insemination (AI) services are the other issues.

7. Conclusion

Dairying helps in rising income and employment among rural households. With a good strategy, well designed programmes, adequate resources and government initiatives, the country can achieve the goal of doubling farmer's income by the year 2025. Strong measures will be needed to harness all possible sources of growth in farmer's income within as well as outside agriculture sector.

Here dairy farming play a significant role in doubling farmer's income and it needs to maintain an annual growth rate of 5.3 % in milk Production. Farmers should be aware of recent technologies interventions and focus on keeping healthy animals for producing good quality and quantity of milk. Switching over to organic dairy farming and IFS is very good alternative for obtaining additional gains. In order to double the farmer's income at individual level, it is imperative that in-milk animal productivity is enhanced further, milk price paid to farmers also need to be raised and develop more cooperatives. Thus dairy farming has that untapped potential whose improvement can help achieving the target.

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