

Building sustainability, nutritional and livelihood security in India through dairying: A situational analysis in G20 perspective

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Dairying is an imperative agricultural enterprise undertaken by a majority of agrarian communities in India forming a backbone for supporting livelihood and nutritional security in a sustainable manner. Dairying provides a path towards developing integrated farming systems with minimal losses and optimum utilization of various resources. Thus, providing year-round employment (especially for women) and steady income thereby supporting the livelihood which in turn leads to women empowerment and paves the way for gender equality. Yet it has a challengingly long way to go ahead in terms of improving the per capita availability and export of milk. This requires improvement in quality and quantity so that the profitability of the venture may increase which can be achieved through intervention of G20, as it underpins agriculture and climate change as focus areas. Thus, it can serve as a powerful instrument for the alleviation of Indian agriculture in general and dairying in particular in terms of productivity and marketing at the global level by a conglomeration of various stakeholders at national as well as international levels who may be motivated to undertake climate-resilient dairy practices to improve dairying with minimal impact on climate.

Keywords: Dairying, Integrated farming, Livelihood security, Nutritional security

DAIRY sector is a fulcrum in leveraging the prospects of employment, food and nutritional security and facilitating the achievement of livelihood security. Evidently, dairying contributes to 5% of the Indian economy and provides direct employment to more than 8 crore farmers. Dairying integrates livestock with agriculture, creating an integrated farming system that maximises resource use with minimal waste. It also provides consistent employment for small holders throughout the slack agricultural season, increasing income from the additional products.

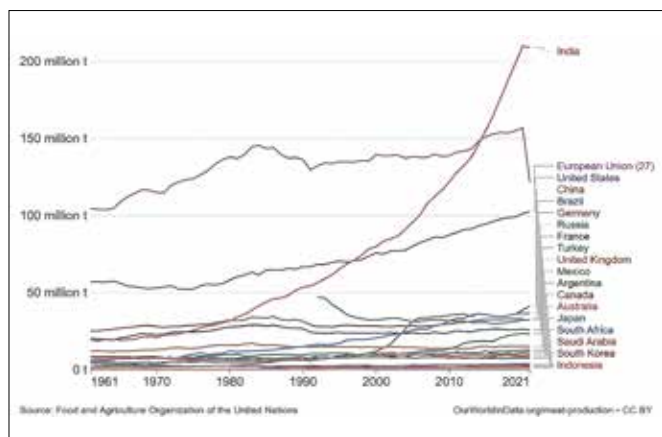
G20 comprising of 19 nations and a European union is a forum for discussing the economic issues at the global level. In the recent past, it has widened its scope by involving various domains which include agriculture and climate change along with sustainability. Internationally, the G20 has shaped global architecture and governance. The G20 represents over 75% of worldwide trade, 85% of global GDP, and 2/3 of the global population, demonstrating its importance. Collaborative approach of the partner nations may assist develop regulations that maximise industry growth while addressing environmental and climatic

concerns. These shall also benefit progressive and small and marginal farmers at the grassroots level, who are directly affected by policy implementation.

Importance of dairying in promoting sustainability, livelihood security and nutritional security

Dairying is an important source of livelihood as well as a major sector which contributes to the GDP of India. Further India tops the global chart in milk production. Dairy has been observed to grow by 9–11% in 2022. Dairy ensures year-round employment to the farmers who otherwise may stay seasonally unemployed if undertaking a single enterprise. Moreover, it facilitates the active involvement of a greater proportion of women and employs them. Along with these, it assures food security as well as nutritional security for a large chunk of the Indian population. Thus, dairy can be seen as an active instrument for empowering rural women as well as achieving gender equality. Dairy is also a major source of additional income other than that received from agricultural production. This helps in the alleviation of livelihood security of the farmers.

Dairy diversifies the agricultural economy and adds



Current milk production scenario of the nations involved in G20 organization.

animals to agriculture, enabling integrated farming. The dairy enterprise provides various products such as milk which can be sold directly or used further as an input in the processing industry. Moreover, products like cow dung act as an organic source of nutrients to the soil as well as can help generate gobar gas which can be used as a fuel. It aids in reducing the dependence on chemicals for providing nutrition to the soil. It may reduce cultivation costs and soil deterioration, boosting farmers' enterprise profits. Moreover, the wastage which can occur otherwise in a single enterprise, can be effectively reduced by recycling wastes from one enterprise into another. Thus, dairy improves enterprise sustainability and reduces environmental and climate degradation.

Dairy has the potential to provide nutritional security to the rural as well as urban population. As of 2020, around 811 million populations has been suffering from hunger, in answer to which dairy products and milk can help to achieve the aim of zero hunger. Milk and processed dairy products contain several micronutrients and can help alleviate hidden hunger by supplying nutrients not found in other diets. Milk can help underprivileged mothers and children overcome food and nutritional scarcity by providing complete nourishment.

Dairying and sustainability

Livestock contributes more than 9% of total anthropogenic greenhouse gas emissions across the globe. Thus, while dairy is needed to improve food security, increased greenhouse gas emissions may accelerate climate change in the future, posing a serious threat. Hence, to improve the sustainability of the enterprise towards the environment, there is a need to enhance the efficiency of livestock production and dairying. Research from India and around the world suggests that climate-resilient practices and dairy efficiency increasing practices like providing energy rich feed and fodder, improving livestock fertility, and health interventions can reduce GHG emissions by reducing livestock requirement per unit product. Since combating climate change comes under the purview of the G20 summit, efforts may be taken to tackle the issues

related to balancing the dairying against climate and environment-related concerns. Various climate-related declarations may be undertaken by various nations for reducing the carbon footprint observed in agricultural and allied sectors through the G20 summits organised. The various stakeholders involved may be motivated to undertake climate-resilient dairying practices in such a way that globally as well as at the national level, dairy can be operated profitably with minimal impact on climate. Moreover, the scope of initiatives may be widened towards the inclusion of dairy to integrate climate resilience with dairying to achieve the ulterior goal of making the dairy enterprise sustainable.

Undertaking sustainable dairying practices is highly crucial in the current scenario wherein ecologically sound practices can lead to a balance and a better health of animals as well as humans, thereby promoting one health. One health may ensure better resilience of dairy animals towards diseases. This in turn may again lead to lesser requirements of livestock per unit of product thereby checking the GHG emissions. Sustainable practices may lead to better conservation of genetic resources and biodiversity for food and agriculture. Sustainably managed livestock systems can contribute efficiently towards numerous ecological functions like soil carbon sequestration, nutrient recycling and maintenance of agri-landscapes.

Dairy and livelihood security

Since operation flood, the dairy sector along with animal husbandry emerged as a primary income source thereby supporting a huge number of households residing in the rural area. As per a report by FAO, around 500 million rural poor have a dependency on dairying and livestock of which a majority is constituted of marginal and small farmers. Since India is a developing economy, the dairy sector in India is scattered and unorganised which leads to huge marketing losses as a whole while reducing the profit margin due to the meddling of various middlemen. Dairy has a greater potential for employment generation. The dairy sector can generate employment for more than 1.2 crores of the population in the coming decade. Since the market growth of milk production in India is 5% against the global rate of 1.8%, it is quite evident that such growth will not only help in generating income but also contribute significantly to poverty alleviation. A study conducted in Alwar district of Rajasthan revealed a positive relationship between cooperatives and employment generation, which shows the importance of the organisation of dairy sectors in voluntary cooperatives to generate better income prospects. Since a greater shift towards consumption of processed dairy products has been observed in the last decade, it paves the way for the enlargement of the milk-food processing markets. Due to the presence of varieties of foods developed by the processing of milk, there is a greater scope for establishing product-specific enterprises. Thus, more benefits may be accrued in the form of budding entrepreneurship as well as generating employment for the rural population in general and

rural women in particular. Thus, the ultimate goal of poverty alleviation and empowerment may be achieved.

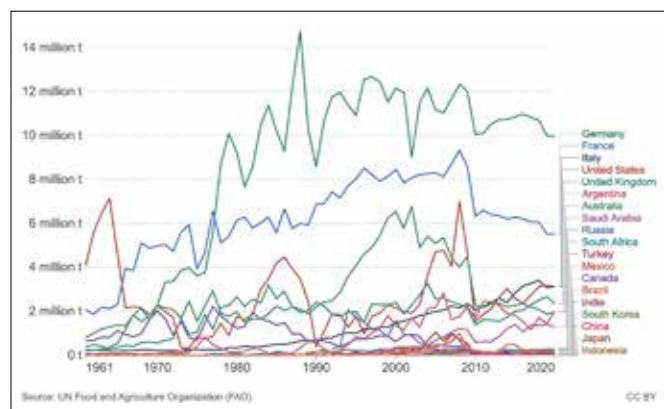
However, a major impediment to this process lies in the fact that due to the unorganised nature of dairy sector, farmers fail to fetch appropriate prices for their products and hence always settle the negotiations at a lesser price. Along with this, among the various challenges faced by the dairy sector in India, a major constraint arises from the fact that a large number of dairy holdings are scattered among a huge proportion of small dairy farmers which is coupled with the unorganised nature of these dairy undertakings. This leads to various challenges like fragmented supply chain, price sensitivity, unorganised nature, data deficiency, poor returns and competition from alternatives. The laggard and sceptical behaviour of small dairy farmers coupled with the financial crisis makes them more hesitant to undertake new technologies to enhance dairy production efficiency. Moreover, due to smallholding of dairy animals, it is impractical and non-feasible to invest in high-cost technologies. Also, for small and marginal farmers, it is difficult to get bank loans for animals. These factors gravely affect production, productivity as well as quality due to lack of financing. Compromise in quality thereby leads to fetching of lower prices creating a vicious cycle of low income due to losses followed by the inability to bring changes to dairy enterprises in terms of new technologies. This drooping of milk quality affects the milk export scenario of India despite of highest milk production in the world. Moreover,

environmental factors and climate change affect livestock health as well as the production of milk. Also changing climate creates a shortage of feed and fodder. Moreover, there is a lack of efficiency in handling milk in small-scale dairy farming which again affects the quality of milk production.

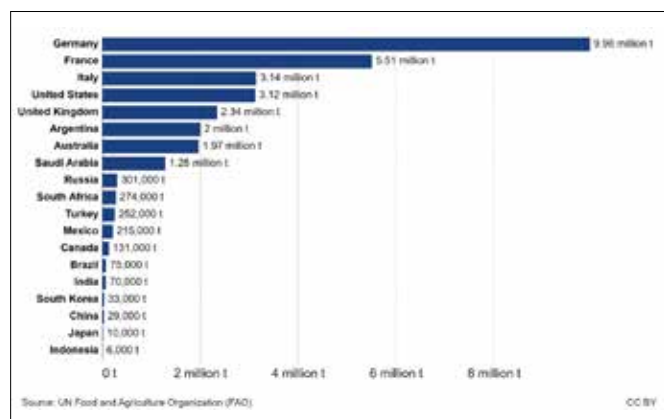
India is contributing to 22% of the world's milk production surpassing that of the US, with a greater projected increase in the near decades, which makes it imperative to integrate various stakeholders and communities through policy formulations in such a way that Indian milk production becomes market ready for competing in the global arena. This can be achieved through the use of sustainable and hygienic practices, appropriate advisory systems for dairy farmers and governance-based efforts to organise the milk producers in cooperatives. This altogether may facilitate achieving social justice.

Dairying and nutritional security

Dairy products are rich in key elements such as protein, calcium, vitamins, and minerals, all of which are vital to human health. Nutritional security refers to the constant availability, affordability, and accessibility of safe, nutritious, and culturally acceptable food to meet the nutritional needs of all individuals. Despite higher production of milk in India and higher nutritional value of milk and dairy products, India have comparatively lower per capita consumption of milk since 1961 and still there has been no significant change in the scenario.



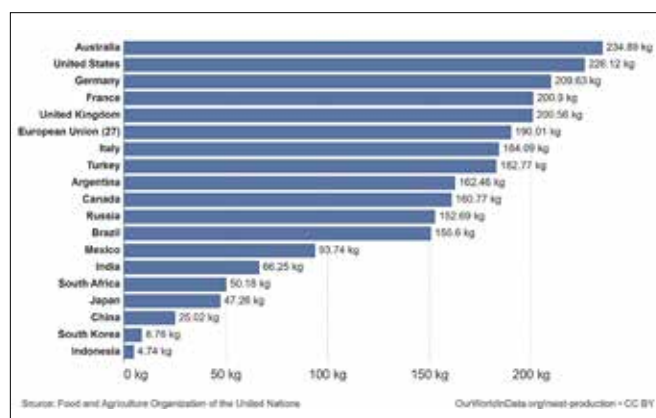
Milk export scenario of the G20 nations from 1961–2020



Current ranking of all the G20 nations by the quanta of milk export in the year 2020



Disparity in trend in per capita milk consumption among the top and least milk consuming nations in G20 from 1961–2020



Ranking of G20 nations by per capita milk consumption for year 2020

Achieving nutritional security is crucial for the overall health and wellbeing of individuals, communities, and nations. Malnutrition, which can be caused by a lack of access to nutritious foods, can lead to stunted growth, impaired cognitive development, and increased risk of disease, among other health problems.

Dairying has the potential to play a significant role in achieving nutritional security, as dairy products are an excellent source of essential nutrients. In many parts of the world, dairy products are a staple food and a significant source of dietary protein, calcium, and other micronutrients. Moreover, dairy products are versatile and can be consumed in a variety of forms, such as milk, cheese, yogurt, and butter. Dairy products can make a significant contribution to the human diet, especially in areas where access to other sources of high-quality protein and essential nutrients is limited. Dairy foods play an important part in providing nutrient and energy dense sources of calories for infants and children. In many parts of the world, dairy products are the major source of food, and they provide a significant portion of the daily caloric intake. For example, in India, milk and milk products contribute to about 10% of the daily caloric intake and about 30% of the daily protein intake. Dairy products can also play a crucial role in alleviating malnutrition, which is a significant public health concern worldwide. Malnutrition can result from inadequate intake of essential nutrients, poor absorption, or excessive loss of nutrients due to illness or disease. Dairy products can provide essential nutrients that are often lacking in the diets of malnourished individuals, especially in developing countries. For example, milk and milk products have been used to treat malnutrition in children with positive outcomes in countries like India.

During climatic hazards and emergencies such as floods, droughts, or other natural disasters, access to food can be severely restricted, leading to malnutrition and other health problems. In such situations, dairying can play a crucial role in ensuring nutritional security and providing essential nutrients to the affected population. Milk and milk products can be an important source of nutrition during emergencies due to their high nutritional value and long shelf-life. Milk powder, for example, can be easily transported and stored for long periods, providing a reliable source of nutrition for affected populations. Additionally, dairy products such as cheese, yogurt, and butter can be made from milk and can provide essential nutrients in various forms. Furthermore, dairying can be an important source of income and livelihood during emergencies. Dairy animals such as cows, goats, and sheep can provide milk and other dairy products that can be sold or used for personal consumption. This can provide a source of income and help families to maintain their nutritional security during emergencies.

Pathways for nutritional and food security in India through dairying

In India, millions of poor people are supported

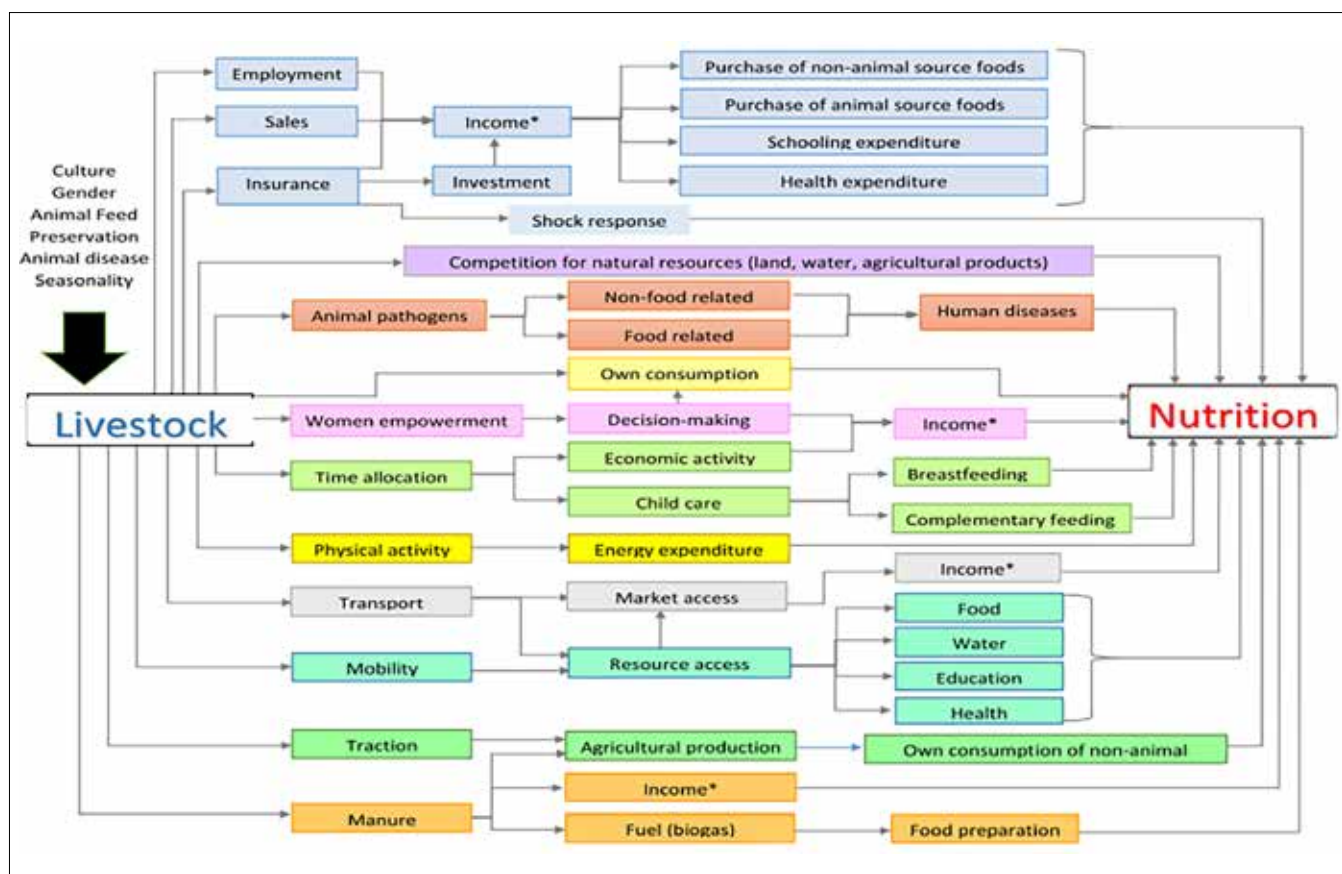
by the dairy business, and for many, it is their only source of income, putting money in their hands twice a day throughout the year. In India, as in many other developing countries, the distribution of cattle among the poor is significantly more equitable than the allocation of land. Therefore, livestock play a crucial role in supporting and sustaining the livelihoods of a substantial number of poor individuals. As common property resources are increasingly appropriated for private gain, livestock is often the only subsistence option available to those without land. Rural dairy businesses in India are considered a “treasure” of the economy. There are numerous paths leading from dairying or animal keeping in general to the security of food and nutrition, both positive and negative. Dairy production directly affects household earnings, which raises the affordability of buying more food and a larger variety of foods. About 69% of India’s farming population considers dairying to be a secondary occupation. It generates almost one-third of the gross income of rural households and nearly half of the gross income of those without land, allowing people to get nutritious foods and ensuring food security. Additionally, it facilitates poor people’s access to a ready supply of meat and milk, providing them with a reliable source of animal proteins.

Accomplishing gender equality through dairying

The gender gap in food and nutrition security is expanding. Dairy farming is an important tool for achieving socioeconomic change and sustainable rural development among the poor. The nutritional benefits of milk and milk products for women have been extensively discussed and proven. Women who consumed more than one serving of plain milk per day were less likely to be obese. Studies report that women’s income is spent on their family’s nutrition. Dairying has an undeniable potential to improve women’s access to resources, a healthy diet, and health habits because it is a reliable source of income and has a greater participation rate of women. Women are important actors in smallholder farmer milk production in emerging economies. Dairying has the ability to improve food security and provide women more economic power. Therefore, there is a need to strengthen the acceptance of and encouragement for women’s roles as livestock owners, processors, etc.

Role of G20 summit in improving dairy sector

The G20 Summit, which brings together leaders of the world’s largest economies, addresses global issues like economic growth, trade and sustainability. The G20 countries are home to some of the world’s top dairy producers and consumers, and they can help meet the UN Sustainable Development Goals (SDGs), particularly SDG 2, which aims to end hunger, achieve food security and improve nutrition. In developing nations with insufficient food safety systems, dairy-related foodborne diseases constitute a major public health issue. To assure dairy product safety and quality,



Impact pathways through which livestock can affect nutrition

Source: Dominguez-Salas et al. (2019)

the G20 countries can improve food safety standards and promote excellent manufacturing practices. They can encourage animal health programmes and increase veterinarian services to prevent and control animal diseases. Transfer of technology and training of skills by G20 nations will enable sustainable dairy expansion and capacity building. The G20 can promote fair, transparent trade policies and remove trade barriers to help dairy farmers increase their markets and profits.

SUMMARY

Dairy sector is an important contributor to sustainability, livelihood security, and nutritional security, particularly in the context of the G20 countries. The G20 Summit provides an opportunity for the

world's largest economies to work together to address the challenges facing the dairy sector and promote sustainable dairy development. Through collaborative efforts to address issues such as climate change, food safety, animal health, technology transfer and trade, the G20 countries can ensure that the dairy sector remains a critical component of the agricultural sector and contributes to achieving the United Nations Sustainable Development Goals. By promoting sustainable dairy development, the G20 countries can ensure that the sector continues to provide essential nutrients, generate income and promote economic growth, and development for millions of people around the world.

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Jai Kisan, Jai Vigyan

- A total of ₹ 788.33 crores have been sanctioned for opening six new agricultural colleges for eastern India under Central Agricultural University, Imphal, and a new Central Agricultural University in Meghalaya.
- For the establishment of two new agricultural research institutes in Asom and Jharkhand, a sum ₹ 100 crores is allocated.
- First academic session of the Rani Lakshmibai Central Agricultural University has been allocated for four new agricultural colleges in Ditiya and Jhansi.
- An Memorandum of Understanding was signed for transforming the Rajendra Central Agricultural University, Pusa, Samstipur, Bihar. A proposal of ₹ 400 crores is submitted in EFC.
- Post-Graduate Institute of Horticulture is being established in Amritsar, Punjab.
- Foundation stone of the Indian Institute of Agricultural Biotechnology is laid at Ranchi for promoting agricultural biotechnology.