



July – September 2023, Vol.18 No.2



Sustainable Practices in Dairy Industry



Sponsored by:

Ministry of Environment, Forest and Climate Change, Government of India
Environmental Information, Awareness, Capacity Building and Livelihood
Programme (EIACP) Programme Centre, Resource Partner on:
Environment Literacy - Eco-labelling and Eco-friendly Products

Shri Praful Amin
CERC, Chairman

Uday Mawani
Chief Executive Officer

Editorial Team





Anindita Mehta
Programme Coordinator

Divya Namboothiri
Programme Officer

Karan Thakkar
Information Officer

IZGARA
DESIGN
Design & Graphics

Contents

- Foreword 2
- Dairy practices in India 3 
- Sustainable practices in Dairy industries 4 
- Sustainable Dairy practices in Gujarat 6 
- Events 8 

**F
o
r
e
w
o
r
d**

India is a nation with thriving economy and booming human population. With more mouths to feed, the food industry gets ample of opportunities for getting a good business. But on the other hand, increasing industrial activities to fulfil the purpose of business might get unsustainable for the environment and people. Dairy industries like any other industries will be put to test with the growing demands. Various issues are identifiable at different stages of the dairy chain, viz. Policy environment, Services, Inputs, Production, Marketing/processing, and Retailing. Some of the issues are as follows: Ineffective implementation of policy and projects due to lack of clarity in roles of different agencies, Lack of regulation for quality of feed and medicines, Low productivity due to poor genetic potential etc.

In this newsletter we discuss about the connection of Sustainable development goals with the Dairy industry. Some of the goals are met by the Indian Dairy industry whereas some are yet to be reached. Such discussions can be taken up by the individual industries and institutions for their future sustainable practice, using the UN’s SDGs as a reference. The technological and biological advancement in dairy industry must focus on reducing the emissions of greenhouse gases as well as use initiatives to remove carbon and other gases from the atmosphere.

Dairy Practices in India



Humans have been drinking animals' milk since ancient times. Sanskrit records mentions usage of milk 6,000 years ago. Slowly and gradually, different milk products came into existence such as Cheese making originated in the Middle East, which then spread out to European nations. The modern large-scale dairy industry developed with the refrigerated transportations is growing. Global demand for dairy continues to increase in large part due to population growth, rising incomes, urbanization and westernization of diets in countries such as China and India.

Milk production in India has almost doubled in the last two decades. During the FY 2001-02, the production was 222 million tons which reached to 444 million tons during the FY 2021-22. Owing to the gradual increase in the production of milk, per capita availability of milk is now 221 gm/day per person, which was 84.4 grams in 2001-02. Rajasthan leads the milk production in India with more than 15% of India's total production, followed by Uttar Pradesh, Madhya Pradesh, Gujarat and Andhra Pradesh.

With this increasing demand for dairy, there is growing pressure on natural resources, including freshwater and soil. Dairy cows and their manure produce greenhouse gas emissions which contribute to climate change. Poor handling of manure and fertilizers can degrade local water resources. And unsustainable dairy farming and feed production can lead to the loss of ecologically important areas, such as prairies, wetlands, and forests.

Dairy processing units produce large amount of waste are high in organic loads. During flushing and washing operation of various process equipment,

these nutrients enter the drainage and favor the growth of anaerobic and aerobic bacteria. As a result the waste water can pose a great threat as they have high Biological Oxygen Demand (BOD). The waste load, expressed as BOD depends to a large degree on the style of management. Management practices cover a wide range of water & energy consumptions and process operation activities.

India is the largest producer of Milk with around 24%. For market growth, the dairy industry requires significant infrastructural facility across processing, chilling, logistics, cattle feed etc. Animals like cows, buffaloes, goats are very crucial for the dairy industries. As per the database of ICAR-National Bureau of Animal Genetic Resources, India has 53 varieties of cows in different states. Cattles are infamous for their excessive methane production, which is the second most abundant anthropogenic Greenhouse Gas, after Carbon dioxide.

An average lactating cow or Buffalo emits around 200 liters of Methane Gas, whereas 85-95 liters emission by young animals. According to Intergovernmental panel on climate change, livestock production currently contributes at least 14.5% of all Greenhouse gas emissions. Dairy waste is also a significant source of Nitrogen and Phosphorus that when released in excess can cause contamination of surface water, which can induce a rapid bloom in growth of algal populations that consume dissolved oxygen in water, which causes eutrophication. It can also contaminate ground water through leaching. However, the extent of pollution varies significantly on spatial scale, depending on various factors. In addition, there are many promising opportunities for reducing the pollution caused due to cattle farming and dairy industry.

Sustainable Practices in Dairy Industries



The 2030 Agenda for Sustainable Development, adopted by all United Nations Member States in 2015, provides a shared blueprint for peace and prosperity for people and the planet, now and into the future. At its heart are the 17 Sustainable Development Goals (SDGs), which are an urgent call for action by all countries - developed and developing - in a global partnership. Goal no. 9 emphasizes on Building resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation.

In current global scenario, problems arising due to continuous environmental degradation have been causing a great trouble to growing economies. Cyclone, flooding, drought, and disturbed seasonal patterns are more common now, than ever. This has led to increasing uncertainty in agriculture industry, which is backbone of many agrarian economies like India. Dairy farming is a branch of agriculture that involves breeding, raising and utilization of dairy animals, primarily cows.

UN has defined following 17 goals for Sustainability.



India's dairy sector is unorganised and technology advancements in the sector have been minimal leading to sensitive issues such as poor quality of milk, inadequate infrastructure, lack of storage facilities, wastage, gaps between demand and supply and adulteration to name a few (Kumar, 2022). Even after such impediments, Indian Dairy industry has characteristics which fulfils many of the SDGs. Sustainable development goals relevant to Dairy industry in India are noted below with recent advances and scope of improvement wherever possible.

SDG #1 No Poverty: Dairy sector in India provides direct or indirect livelihood to about 80 million families. It provides them the income sufficient to fulfil their basic needs of food, clothing and shelter.

SDG #2 Zero Hunger: Daily per capita milk availability was 444gm for the financial year 2022 which is 155 gm more than it was before 10 years.

SDG #3 Good Health and Wellbeing: Milk is most important element of staple diet, particularly for vegetarian population and provides almost all the vitamins and nutrients necessary for growth of human body.

SDG #5 Gender equality: It is something which is commendable in Indian dairy industry, as more than 70 percent participation is by women.

SDG #6 Clean Water and Sanitization: Production of Milk requires a large quantity of water for various purpose. Studies have shown that feeding animals in the traditional pattern led to a higher water footprint of milk, since more than 90 per cent of water footprint of milk is attributed to feeding of animals. Animals fed balanced rations, comprising a judicious mix of green fodder, dry fodder and concentrate feed ingredients, had a 14 per cent lower water footprint of milk (1236 vs. 1062 litre/kg). Thus there is substantial scope for reducing water footprint of milk if scientific feeding practices and novel feed delivery systems such as TMR (Total mixed Ration)* are adopted by dairy farmers.

SDG #7 Affordable and Clean Energy: Technological innovations and in Dairy industry can help to optimize milk value chain which goes mainly through four steps: Milking, Transportation, Processing, and retail.

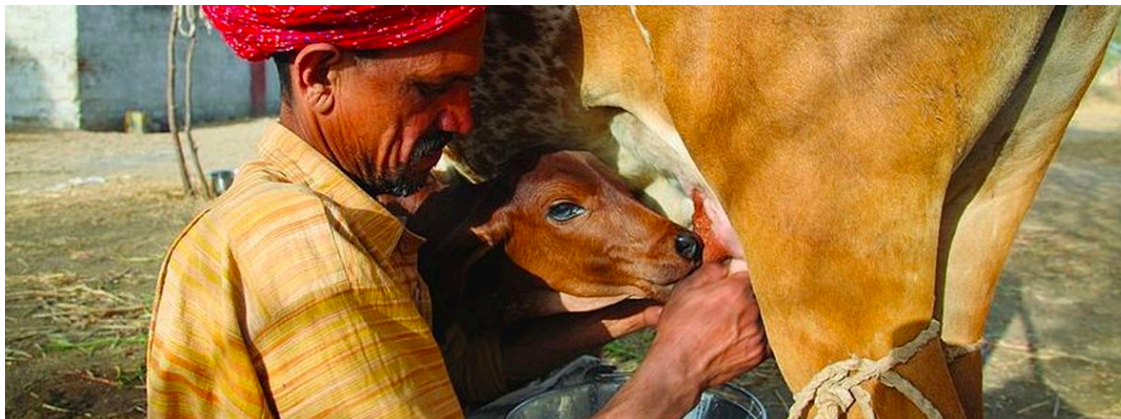
SDG #9 Industry Innovation and Infrastructure: Indian Government announced a creation of Dairy processing and Infrastructure development fund with total scheme outlay of more than 11 thousand crore INR for implementation during 2018-19 to 2022-23.

SDG #12 Responsible Consumption and Production: Milk and milk products needs to be stored under refrigerated conditions in order to avoid it from getting stale. However, refrigeration needs regular electricity supply, which may or may not be available in rural areas. For small scale dairy farmers, investment of refrigeration devices would be too large to ask for. In such cases, it is very likely for the milk to get spoiled and chances of bacterial growth might also increase. Solar-powered cooling systems are sustainable alternatives to common refrigeration solutions which can be promoted to avoid wastage of milk.

Source:

1. Indian food & beverages sectorial system of innovation (ifbssi) - measurement, analysis and policy recommendations unido-dst survey report <https://hub.unido.org/sites/default/files/publications/Food%20SSI%20Report.pdf>
2. Kumar, R. (2022) Information and Communication Technology (ICT) Effect on Supply Chain Performance in the Dairy Industry: A Study in the Indian Context. International Journal of Asian Business and Information Management (IJABIM), 13(1), pp.1-16.
3. <https://pib.gov.in/PressReleasePage.aspx?PRID=1919250>
4. <https://www.nddb.coop/didf/didf-in-brief>
5. <http://ecoursesonline.iasri.res.in/mod/page/view.php?id=5716>
6. https://www.in.gov/idem/files/factsheet_cfo_dairy_disposal.pdf
7. <https://www.fao.org/3/X6114E/x6114e06.htm#b3-4.3.%20Prevention%20of%20waste%20production>
8. Indian food & beverages sectorial system of innovation (ifbssi) - measurement, analysis and policy recommendations unido-dst survey report <https://hub.unido.org/sites/default/files/publications/Food%20SSI%20Report.pdf>
9. Kumar, R. (2022) Information and Communication Technology (ICT) Effect on Supply Chain Performance in the Dairy Industry: A Study in the Indian Context. International Journal of Asian Business and Information Management (IJABIM), 13(1), pp.1-16.
10. <https://pib.gov.in/PressReleasePage.aspx?PRID=1919250>
11. <https://www.nddb.coop/didf/didf-in-brief>

Sustainable Dairy practices in Gujarat in context of UN Sustainability Goals



AmulFed, Gandhinagar



Amul covers most of the sustainable development goals. Approximately 3.6 million cattle farmers are directly connected to Amul. Over the period of last ten years, Amul has achieved 8.94% CAGR which marks the SDG goal of Decent Work and Economic growth. Amul has also been innovative in developing industrial infrastructure for better operation. To reduce inequality, Milk producers associated with Amul, of all strata have been given equal rights of pouring milk in village cooperative society. For responsible consumption and production, state of the art automation technology has been developed which helps in achieving desired operational outcomes. In most of the operations, with the utilization of automated CIP systems, use of water has been reduced from the previous level of 3-4 liters/ Liter of milk handled to almost 1.0-1.2 Liters/ Liter of milk handled. Water treated in

wastewater treatment plants is recycled in several operations like evaporation through cooling towers, crate washer operations, floor cleaning operations etc. The Dairy operations have adopted a high level of automation in packaging technology. This helps in safely packing all milk products with accurate measurements and minimum coverage losses. Amul sources all packaging material from FSC certified material suppliers. It has switched over to use of paper and further compostable straws applied with Amul beverages. Amul also uses ammonia for industrial refrigeration systems which has zero global warming potential. Boilers are equipped with energy recovery systems like economizer, condensing economizer, air pre heater etc. Waste water treatment is also done based on anaerobic digestion, producing biogas from which almost 10% of total fuel consumption is done. Fat recovered from a wastewater treatment plant is dried and used as solid fuel and anaerobic sludge recovered at end of water treatment is used as a manure. Thus, Amul makes significant developments in achieving sustainable goals.

Banas Dairy, Banaskantha:



Banas Dairy, situated in Banas Kantha district of North Gujarat is Asia's largest milk cooperative. It is owned by 4.5 lakh farmers who depend upon the natural resources of water, and fertile soil of Mother Earth for their dairy business, making it the milk-bowl of India. Major sustainability challenges are arid environment with high temperatures, coupled with only 15-20 inches of rainfall. The water table is falling; ground water is over-exploited, and TDS varies from 400-4000 mg/lit. Lowering of water tables has led to drying up of tube wells and doubling in costs of dry and green fodder in last few years only. This increases the costs of dairying and reduces the returns to the farmers. Increase in cattle population and milk procurement in the hinterland has slowed down. There is a real threat of farmers leaving dairying due to low profitability. Another challenge is that of falling soil fertility and Organic Carbon (0.37%) due to poor agricultural practices and decades of chemical farming. Poor soils hold less water and improving soil Organic Carbon content will improve moisture retention and therefore water requirement of the district. Over the years, Banas Dairy has acted upon initiatives that will lead to a better future for the dairy, its stakeholders, and Mother Earth, as follows:

- Recognizing Soil degradation as the core sustainability issue, Banas Dairy has partnered with Isha Foundation to create a successful model of regenerative agriculture to improve soil quality and also returns to farmers.
- Extensive afforestation activity using the dropping of over 80 lakh seed balls annually at Jessore and Gabbar Hills, has been done for past 3 years.
- 1MW solar rooftop setup to power up dairy operations has been done in most Dairy plants
- Under Banas Jal Shakti Abhiyan in a partnership with the local government and the village DCS, 214 ponds have been made to capture surface run off of water creating a storage of 5 crore litres of water.
- A 2000m³ capacity Bio-CNG project has been set up at its Dama location which produces approximately 700 kg of bio-CNG daily, which is sold as a sustainable fuel option for vehicles. The capacity is being expanded to 25000 m³. Bio-fertilizers, viz. PROM and Sendriya khatar, besides liquid fertilizers like Krishi Sanjeevani are being produced. Additionally, the biogas produced at the headquarters is being used for canteen and rabri-processing operations.

- Other initiatives include switching to natural gas from furnace oil at the Banas-II plant to produce steam for boiler usage amongst various other initiatives to reduce and reuse water, besides saving on energy usage as key KPIs for various Production and Utility functions.
- Various other pilots and initiatives are underway like hydroponic fodder cultivation; Solar energy park, Generating and Using Carbon Credits and Water Credits etc.

Flourish Dairy farm

Dairy industry plays a very important role in India's economy as well as nutrition landscape. With increased demands for dairy products, sustainable approach in the dairy industry has become very important. Here are sustainable practices that flourish follows. To assure pesticide-free fodder for cows, the crops are grown with the help of local farmers organically using natural fertilizers. Special emphasis is laid on sourcing feed locally by reducing transportation emission which also supports local economy. A sustainable waste management system is followed that produces organic manure from our cows. Efficient resource management is taken care of, which includes optimizing water use, adopting energy efficient technology by having a solar energy plant, bamboo plantation and organic farming. The cows get their share of music with a surround music system to create a soothing environment. Regular Veterinary check-ups, clean and a hygienic living is provided to cows. In India, the average milk production per cow typically ranges from 1800-2200 Liters annually. However, Flourish cows achieve 5800-6200 Liters per annum. This difference in production arises from proper nutrition and extensive knowledge. While traditional farmers require over 3 kg of dry matter feed to produce 1 liter of milk, Flourish achieves the same (1liter) milk with just 1.15 to 1.25 kg dry matter feed. Our sustainable practices not only boost productivity but also reduce environmental impact. Flourish cows produce less methane from undigested food, due to superior nutrition. As a result, our carbon foot print per liter of milk is 2-3 times lower than traditional farming. Raising awareness among farmers about sustainable practice is crucially important by providing training programs and initiatives in helping increase their knowledge and best practices. The world is embracing sustainability and we too at Flourish are committed to participate responsibly and ethically in the dairy production in India.

Events (July - September 2023)

1. Medicinal Plantation drive at K.R.K Verma School as a part of Celebration of Van-Mahotsav. 50 medicinal plant sapling were sown by the students within the campus.



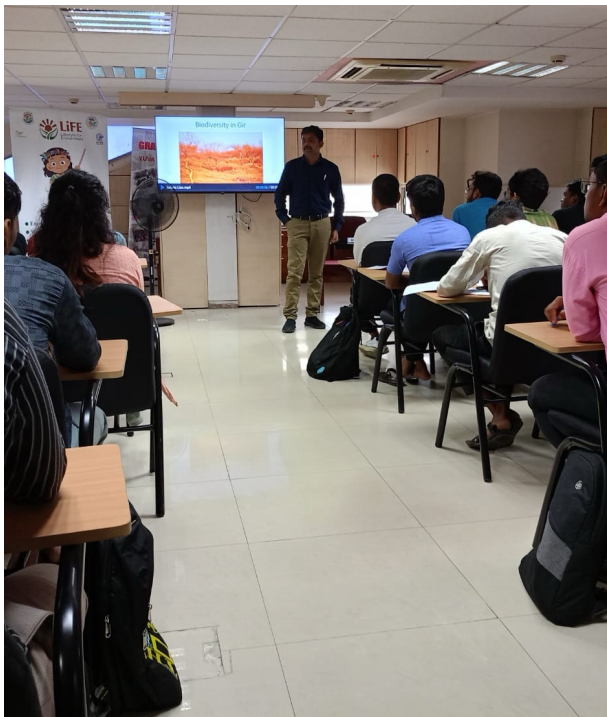
2. 100 saplings of seven plant species were sown at AMC-Greenmosphere Park as a part of van mahotsav week celebration.



3. Lecture sessions on Mission LiFE, Healthy eating habits and Sustainable food systems at K.R.K Verma School, Sola Rd., Ahmedabad. Students from kindergarten to 6th class were addressed by Ms. Divya Namboothiri (Programme officer) and Mr. Karan Thakkar (Information officer).



4. On the occasion of World Lion day on 10th August, expert talk under the title of "Gir and its Lions" was delivered by Mr. Akash Bhatt to the students of MBA Rural management from Gujarat Vidhyapith.



5. The FSSAI Millet Expo where CERC is exhibiting, was inaugurated by the Director General of WHO, Dr Tedros Adhanom.

Other dignitaries included the Cabinet health Minister Dr. Mansukh Mandavia, State Health Minister Rushikesh Patel, CEO FSSAI, Shri Kamala V Rao and Health Ministers & doctors from 75 participating countries.

This was part of the G 20 Global Health Summit on the theme of “One Earth, One Health” and the first WHO Traditional Medicine Global Health Summit.



6. Ms. Divya Namboothiri, Programme Officer, CERC EIACP PC RP held session on Sustainable Lifestyle for women representative of 15 villages of Dhanghadhra Taluka, Surendranagar District on 23 August 2023.



7. CERC EIACP PC RP conducted an awareness session on occasion of World ozone day today at Appollo International School. Students of Standard 6th to 10th were present.



8. CERC-EIACP PC RP celebrated World ozone day by delivering a lecture on ozone layer at Science City, Ahmedabad. Mr. Karan Thakkar addressed 35 students of the Department of zoology, Gujarat University on the same. UV Index and the effect of UV radiation on humans as well as butterflies were highlighted.



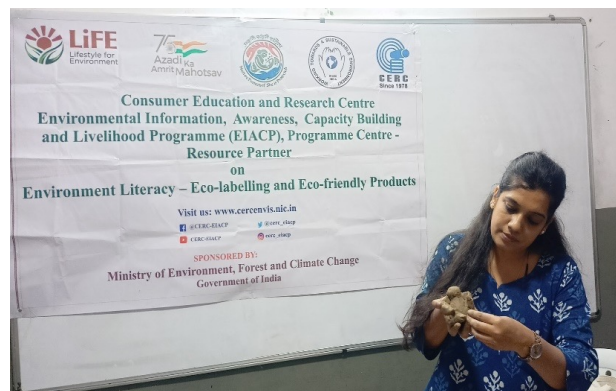
9. Ms. Divya Namboothiri, Programme Officer, CERC EIACP held session on Mission LiFE, Sustainable Food Systems with representative of various food industry on 18th September 2023 at CERC, Ahmedabad.



10. CERC-EIACP PC RP conducted workshop on making of Eco-friendly Ganesh Idol at Kailash Vidyalaya, Saraspur, and Ahmedabad. Students from 11th and 12th were addressed by Ms. Mayuri Tank (IT Officer) on Mission LiFE , Healthy eating habits and Sustainable food systems.



11. CERC EIACP celebrated Green consumers Day with the employees of NTT Data Services - MNC Company. Covered the topics on Mission LiFE, Circular Economy and Eco labels.



Year wise milk production in India, in tonnes



Source: : <https://www.tribuneindia.com/news/features/act-fast-to-minimise-impact-of-climate-change-377645>

Environmental Information, Awareness, Capacity Building and Livelihood Programme acronymed as EIACP erstwhile Environmental Information System (ENVIS) was implemented by the Ministry of Environment, Forest & Climate Change by end of 6th Five Year Plan as a Plan Scheme for environmental information collection, collation, storage, retrieval and dissemination to policy planners, decision makers, scientists and environmentalists, researchers, academicians and other stakeholders. MoEF&CC has identified Consumer Education and Research Centre (CERC), Ahmedabad, as one of the Resource Partner to collect and disseminate information on “Environment Literacy - Eco-labelling and Eco-friendly Products”. The main objective of EIACP Programme centre- Resource Partner is to disseminate information on Environment literacy, Eco-products, International and National Eco-labelling programmes.

Periodical Printed & Published By

Programme Coordinator, CERC-EIACP Programme Centre, Resource Partner On Behalf of Consumer Education & Research Centre, 801, 8th Floor Sakar II Building, B/H Ellisbridge Shopping Centre, Ashram Road, Ahmedabad- 380 006, Gujarat, India.

Phone: 079-353372 62-65

 cerc@cercindia.org
<cerc@cercindia.org>;
 <http://www.cercenvis.nic.in/>

 @CERC.EIACP
 @cerc_eiACP
 @cerc_eiACP
 @CERC-EIACP

Write to us: We value your views and suggestions. Please send your feedback on this issue. We would also like to invite your contributions on the Eco Product and Eco Labelling.

Disclaimer

The material used in this newsletter does not necessarily represent the views of CERC or EIACP. The images and contents provided in the publication are intended solely to provide information from secondary sources.

Printing

Print Express, Ahmedabad.