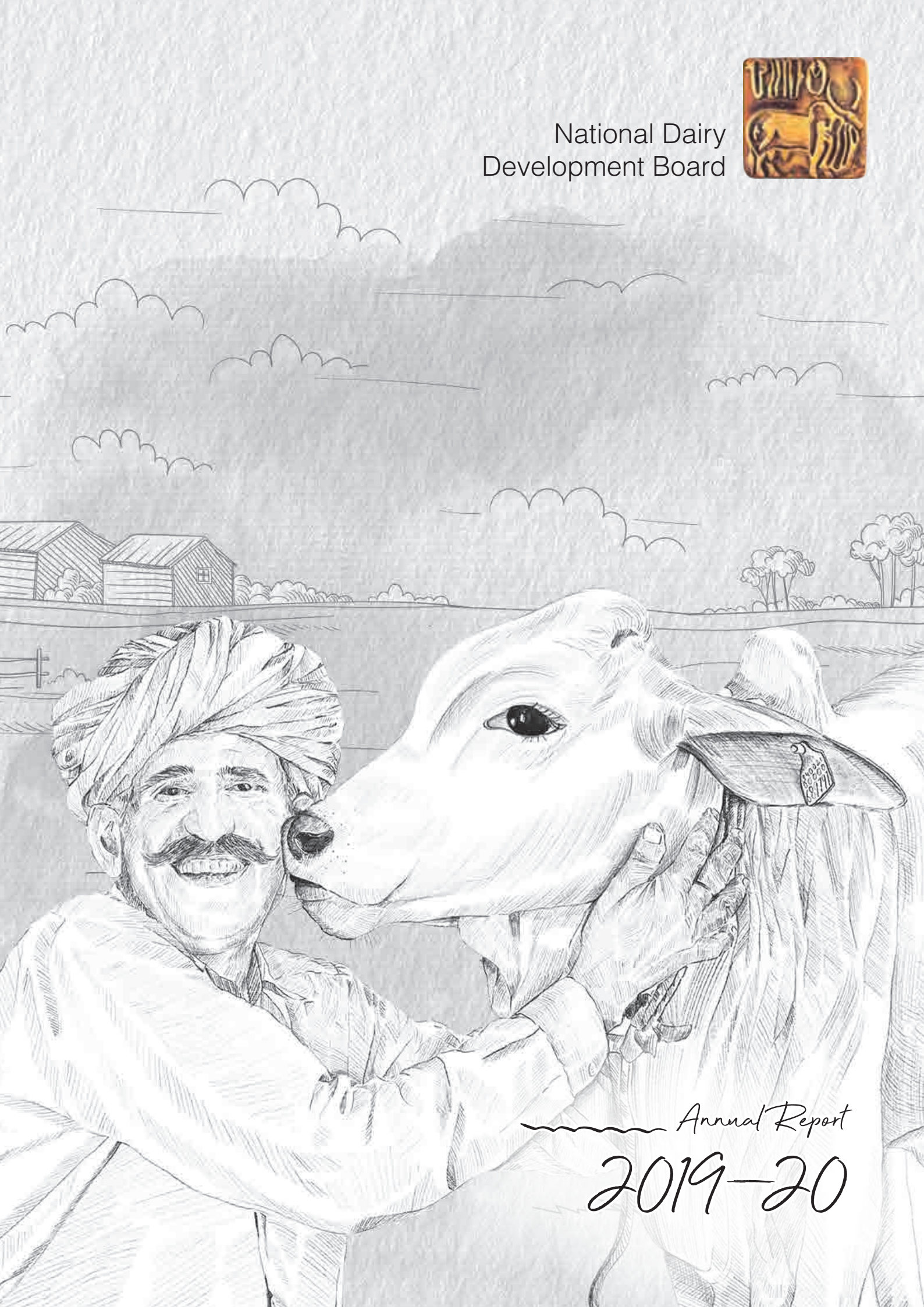
National Dairy
Development Board



Annual Report
2019–20

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Members of the Board

(As on 31st March, 2020)

Shri Dilip Rath
Chairman

Shri Mihir Kumar Singh
Joint Secretary (Cattle & Dairy Development)
Department of Animal Husbandry & Dairying
Ministry of Fisheries, Animal Husbandry & Dairying
Government of India

Prof. Guru Prasad Singh
Institute of Agricultural Sciences
Banaras Hindu University
Varanasi

Shri Rasik Parmar*
Chairperson
Chhattisgarh State Co-operative Dairy Federation

Shri Nihal Chand**
Chairman
Himachal Pradesh State Co-operative Milk Producers' Federation Ltd.

Smt. N. Vijaylaxmi***
Chairperson
Bihar State Milk Co-operative Federation Ltd. (COMFED)

Shri Sangram Chaudhary****
Executive Director

Shri Yuvaraj Yashvant Patil*****
Executive Director

Shri Meenesh C Shah******
Executive Director

* Up to 11th October, 2019
** Up to 26th March 2020
*** With effect from 4th December 2019 to 19th February 2020
**** Up to 30th April 2019
***** Up to 31st May 2019
****** With effect from 19th June 2019

The Year in Retrospect

Visit of Hon'ble Vice President of India

During the year, NDDB was honoured to receive the Hon'ble Vice President of India, Shri M Venkaiah Naidu, at its headquarters in Anand. The Vice President addressed officers and staff from NDDB and Institute of Rural Management, Anand (IRMA). He expressed the need to recognise the immense possibilities for women empowerment offered by rural organisations and supply chains which is amply demonstrated by the dairy cooperative movement.

India has been the largest milk producing country since 1997. The demand for milk and milk products in the country is entirely met by domestic milk production, as India's international trade in dairy commodities is negligible.

The unprecedented weather patterns this year like harsh temperature during summer, delayed onset of monsoon, flash floods, extended monsoon, etc. shifted the flush season for milk procurement by 1-2 months. As a result, the stock of milk powder was low during the flush season when normally, the stock is usually expected to build-up for meeting the liquid milk demand of ensuing summer season. Skimmed Milk Powder (SMP) prices increased from about ₹ 190 per kg in April 2019 to ₹ 330 in March 2020 and white butter prices rose from ₹ 240 to ₹ 330 per kg during the same period.

While wholesale price indices of fodder, cattle feed and oil cake increased by about 10-12 per cent during the year, the average producer price paid by major dairy cooperatives increased by about 10 per cent. The average consumer price of liquid milk sold by dairy cooperatives increased by about 10 per cent.

International Dairy Scene

Global milk production has been estimated at 852 million tonnes for the year 2019, an increase of 1.4 per cent from 2018. The tapered rate of growth in milk production could be attributed to the lower milk production in major milk surplus regions of South America and Oceania, as a result of inconsistent pasture conditions and rise in feed prices.

About 9 per cent of world milk produced is traded globally. The international prices of dairy products started improving this year, especially of SMP. According to FAO, price for SMP had increased by about 28 per cent between January and December 2019. It was because the year had started with the optimism that the European Commission had liquidated almost entire intervention stocks of SMP and there was limited carry-over stocks; the milk supply growth tapered and demand for dairy products from China, Southeast Asia and Mexico revived.

In May 2019, milk production from the top suppliers decreased by about 1 per cent over previous year. Subsequently, with decline in milk production in Australia due to adverse weather conditions and ending of flush season in Europe, the prices of all dairy products started increasing with SMP price touching US$ 2,900 a tonne in November 2019. The prices continued to remain around US$ 2,600-2,900 a tonne during the rest of the year.

The National Dairy Plan

The National Dairy Plan Phase I (NDP I) launched in 2011-12 ended during the year. The major objectives of the scheme were:

1) To increase productivity of milch animals and thereby increase milk production to meet the rapidly growing demand for milk.

2) To help provide rural milk producers with greater access to the organised milk processing sector. The scheme was implemented in 18 major dairying states accounting for more than 90 per cent of milk production as well as feed and fodder resources.

INDIA CONTINUED TO BE THE LARGEST MILK PRODUCING NATION IN THE WORLD

The implementation of NDP I has established the fact that a scientifically planned integrated approach towards dairy development can indeed be successful in a large and diverse country like India. NDP I was able to make available more than 2,456 High Genetic Merit Bulls to A & B graded semen stations across the country which propelled the production of quality disease-free semen. The project also contributed towards lowering the cost of feeding per kg of milk resulting in increase of net daily income of milk producers by ₹ 25.52. Market access was provided to more than 16.8 lakh additionally enrolled milk producers of which 7.65 lakh are women members. The project covered around 59 lakh beneficiaries across 97,000 villages.

Cooperative Conclave

A Cooperative Conclave on "Enhancing Competitive Advantages of Dairy Cooperatives as Business Enterprises" was organised by the National Dairy Development Board in collaboration with National Cooperative Dairy Federation of India Ltd (NCDFI) and IRMA during the year. Dr Rajiv Kumar, Vice Chairman, Niti Aayog, renowned cooperative leaders, professionals, academicians, policy makers and other stakeholders of the dairy cooperative sector deliberated on problems and constraints related to Governance, Professionalisation, and Member Engagement in dairy cooperatives.

Manure Management

NDDB established an efficient manure management model in Mujkuva and Zakariyapura villages of Anand district in Gujarat which will help farmers reduce their monthly cooking fuel expenses and sale of slurry-based bio-fertiliser can enhance income of dairy farmers. The women farmers of both these villages have formed a Village Sakhi Khad Cooperative Society to handle surplus digestate from biogas plants which is used for producing bio fertilisers.

Genotyping Chip

NDDB deveoped INDUSCHIP, a customised genotyping chip for indigenous cattle and their crosses. A de novo genome assembly of riverine buffaloes "NDDB_ABRO_Murrah" was developed by NDDB. To ensure better accuracy of assembly, for the first time a totally different approach i.e. trio binning has been used for separating haplotypes of a buffalo using a father-mother-offspring trio. This newly-developed genome assembly would provide more insights about buffalo genome and desired impetus for implementing Genomic Selection programme in buffaloes to achieve faster genetic progress in Indian buffalo population.

NDDBs Support to Dairy Coops during COVID-19

NDDB launched an awareness campaign, during the start of COVID pandemic in India, to retain faith of all stakeholders. The Dairy Board developed and disseminated exclusive posters (English & Hindi) on COVID-19 preventive measures for ensuring safety & hygiene in the dairy supply chain. These were shared with Department of Animal Husbandry and Dairying (DAHD), Government of India, dairy cooperatives across the country and extensively promoted through the digital media. SMS in regional languages for adopting preventive measures against COVID-19 were sent to milk producers across the country.

Against the backdrop of non-availability of key raw resources for cattle feed production, NDDB provided reformulation support for reformulating cattle feed for many cattle feed product lines using Least Cost Formulation (LCF) software after considering prices/local availability of regular raw materials as well as incorporating novel raw ingredients (such as Corn Gluten Feed) whenever necessary.

During COVID-19 pandemic, NDDB also promoted Pashu Ayurveda based Ethno Veterinary Medicine (EVM), a cost-effective and efficacious alternative approach for the management of some major ailments of milch animals.

Indian dairy sector's endorsement towards UN SDGs

NDDB has developed a Sustainability Framework for the Indian Dairy Sector. The IDF Indian National Committee represented by Secretary, Animal Husbandry & Dairying, Government of India and Chairman, NDDB signed

the Indian dairy sector's endorsement to meet UN Sustainable Development Goals (SDGs) with President and Director General of International Dairy Federation in Istanbul, Turkey.

The Sustainable Development Goals are a collection of 17 global goals set by the United Nations General Assembly for the year 2030. The representation from India on SDG focussed on the initiatives undertaken by the dairy industry to provide decent livelihoods, gender equality, food security and contribution for environment protection by putting use of solar energy and dung for production of bio-gas and bio-fertilisers.

Technical Support to Government of India

NDDB's support to various regulatory or scientific or advisory bodies like the Codex Alimentarius Commission (CAC), International Dairy Federation (IDF), National Codex Committee (NCC), Food Safety and Standards Authority of India (FSSAI) including the Scientific Panel on milk & milk products, Bureau of Indian Standards (BIS), Exports Inspection Council of India (EIC), Department of Animal Husbandry and Dairying etc. continued during the year. NDDB provided technical support to IDF as e-Working group (eWG) member to committees on Standards of Identity, Microbiological Hygiene, Harmonisation of Microbiological methods, Food Labelling and Terminology and Science and Programme Coordination Committee (SPCC). NDDB contributed to CAC working groups like Front-of-Pack Nutrition Labelling (FOPNL), Labelling of Non-Retail containers of food, Biological Methods and General Principles of Food Hygiene and Hazard Analysis and Critical Control Point (HACCP). Support for evaluation of the dairies exportworthiness was also provided to EIC.

Market access was provided to more than 16.8 lakh additionally enrolled milk producers of which 7.65 lakh are women members. The project covered around 59 lakh beneficiaries across 97,000 villages.

Encouraging Cooperative Business

5.33 million

Women membership in dairy cooperatives

NDDB's commitment to provide sustainable livelihood to millions of small and marginal dairy farmers through strengthening of Dairy Cooperatives continued during the year.

During the year, cooperative milk unions covered about 1,94,000 village dairy cooperative societies (DCS) with a cumulative membership of 17.22 million milk producers. The cooperative milk unions procured an average of 48.04 million kg of milk per day compared to 50.75 million kg in the previous year with a decline of about 5.3 per cent. The sales of liquid milk reached 37.08 million litres per day showing a growth of 3.5 per cent over the previous year.

Active participation of women in all spheres of dairy cooperative business and governance is central to dairy development in the country. During 2019-20, the number of women members increased to 5.33 million registering an annual growth of 3.9 per cent over the previous year.

NDDB's interventions for dairy development in Assam, Jharkhand and Maharashtra are already showing positive results.

Strengthening Village-Based Milk Procurement System

Village-Based Milk Procurement System (VBMPS), one of the major components of the National Dairy Plan Phase I (NDP I), implemented by NDDB, achieved targets as per the approved sub-projects. 243 sub-projects, covering 118 Cooperative Milk Unions and six Producer Companies were implemented under VBMPS with a total approved grant assistance of ₹ 6,862.32 million.

Under VBMPS, 52,509 villages were covered by forming new dairy cooperatives and strengthening existing DCS with facilities for advanced milk testing facilities. Approximately 16.88 lakh new members were inducted and 19.78 lakh existing members benefited from improvements in the milk collection system. Of the incremental membership achieved till now, about 49 per cent are women members. Additional milk procurement under VBMPS has been more than 29.65 LKgPD.

Large number of milk producers are benefitting from increased access to organised market, due to VBMPS. A substantial achievement under the NDP I is increase in women membership which is evident from the formation of 4,419 new women DCS. Installation of 4,171 Bulk Milk Coolers (BMCs) at strategic locations along the milk collection routes has improved the quality of milk. This is evident from the high Methylene Blue Reduction Test (MBRT) results.

West Assam Milk Producers' Cooperative Union Limited

NDDB continued to manage West Assam Milk Producers' Cooperative Union Limited (WAMUL) popularly known as Purabi Dairy. During the year,

Cooperative milk unions covered about 1,94,000 DCS with a cumulative membership of 17.22 million milk producers.

WAMUL was associated with around 13,000 dairy farmers through 280 milk collection centres covering around 656 villages that reported an average milk procurement of 30,123 kg per day. During the year, the average milk procurement price paid by WAMUL was ₹ 35.17 per kg.

During the year, WAMUL sold around 54,000 litres of liquid milk per day under the brand 'Purabi' besides selling paneer, sweet curd, plain curd and ghee. WAMUL continued milk fortification with vitamins A & D. WAMUL launched two new variants of its products - plain curd in 400 gram pouches and masala lassi in 200 ml cups. WAMUL registered its brand name "Purabi" and the logo under the Trademarks Act, 1999. During 2019-20, WAMUL attained a sales turnover of around ₹ 1,040 million (provisional), 2 per cent higher than the sales turnover achieved in 2018-19.

During the year, WAMUL had commenced installation and commissioning of solar-powered village based Automatic Milk Collection Units (AMCUs) under the World Bank aided project - Assam Agribusiness and Rural Transformation Project (APART). These units will use AMCS software developed by NDDB.

WAMUL continued to provide various input services such as doorstep Artificial Insemination (AI) delivery, distribution of cattle feed and feed supplements at affordable rates besides arranging field demonstrations, training and capacity building programmes for its dairy farmers.

WAMUL reported 3,04,082 AIs in over 3,000 villages through a network of 492 mobile AI technicians (MAITs) in the districts falling under Assam Agribusiness and Rural Transformation Project (APART). A total of 1,00,275 calves (of which 53,023 are female calves) were born during the year. WAMUL commenced demonstrations of fodder crops, medicinal plants under Ethno-Veterinary Medicines initiatives, silage-making and crop residue management for benefits of the farmers. Several vaccination and health camps were also conducted.

WAMUL executed an agreement with NDDB for setting up a 50 MTPD capacity by-pass protein cattle feed plant and a 12 MTPD capacity mineral mixture plant under financial assistance from RIDF-XXIII scheme of Government of India.

Need-based training programmes were conducted for employees viz., Training of Trainers (ToT), Food Safety Training and Leadership Development Programmes.

Dairy farmers who consistently poured milk to WAMUL were rewarded along with best performing mobile AI technicians during the Purabi Milk Day. Various activities of WAMUL were also exhibited on this day.

Due to the demand for milk and milk products in the major markets of Assam and its neighbouring states, WAMUL plans to expand the capacity of its liquid milk processing plant at Guwahati. A Memorandum of Understanding was signed on 14th February, 2020 between NDDB, WAMUL and The Assam Rural Infrastructure and Agricultural Services Society (ARIAS), Government of Assam to expand the capacity of the aforesaid milk processing plant from 60 TLPD to 150 TLPD. The project will be financed under APART.

Jharkhand Milk Federation

NDDB continued to manage the Jharkhand State Cooperative Milk Producers' Federation Limited (JMF). The milk federation achieved daily average milk procurement of about 117.52 TKgPD from more than 20,000 members covering about 2,326 villages. The Federation paid about ₹ 1,247 million towards milk bill payment through direct bank transfer to the individual bank account of milk producer during the year. JMF marketed liquid milk averaging 111 LLPD during the year. 416 AMCUs have been installed in village DCS to enhance and ensure transparent and efficient operations. Construction of three new dairies of 50 TLPD capacity (expandable to 100 TLPD) each at Sarath, Sahebganj and Palamu is in progress.

JMF is continuously working towards establishing dairying as a sustainable source of income for farmers of its area and their efforts were appreciated in the 48th Dairy Industry Conference at Jaipur organised by IDA. Smt. Babita Devi, a woman dairy farmer associated with JMF, received 'Dairy Women of the Year Award (East Zone)' for exemplary contribution in dairy sector from Dr. Sanjeev Kumar Balyan, Hon'ble Minister of State, Ministry of Fisheries, Animal Husbandry and Dairying.

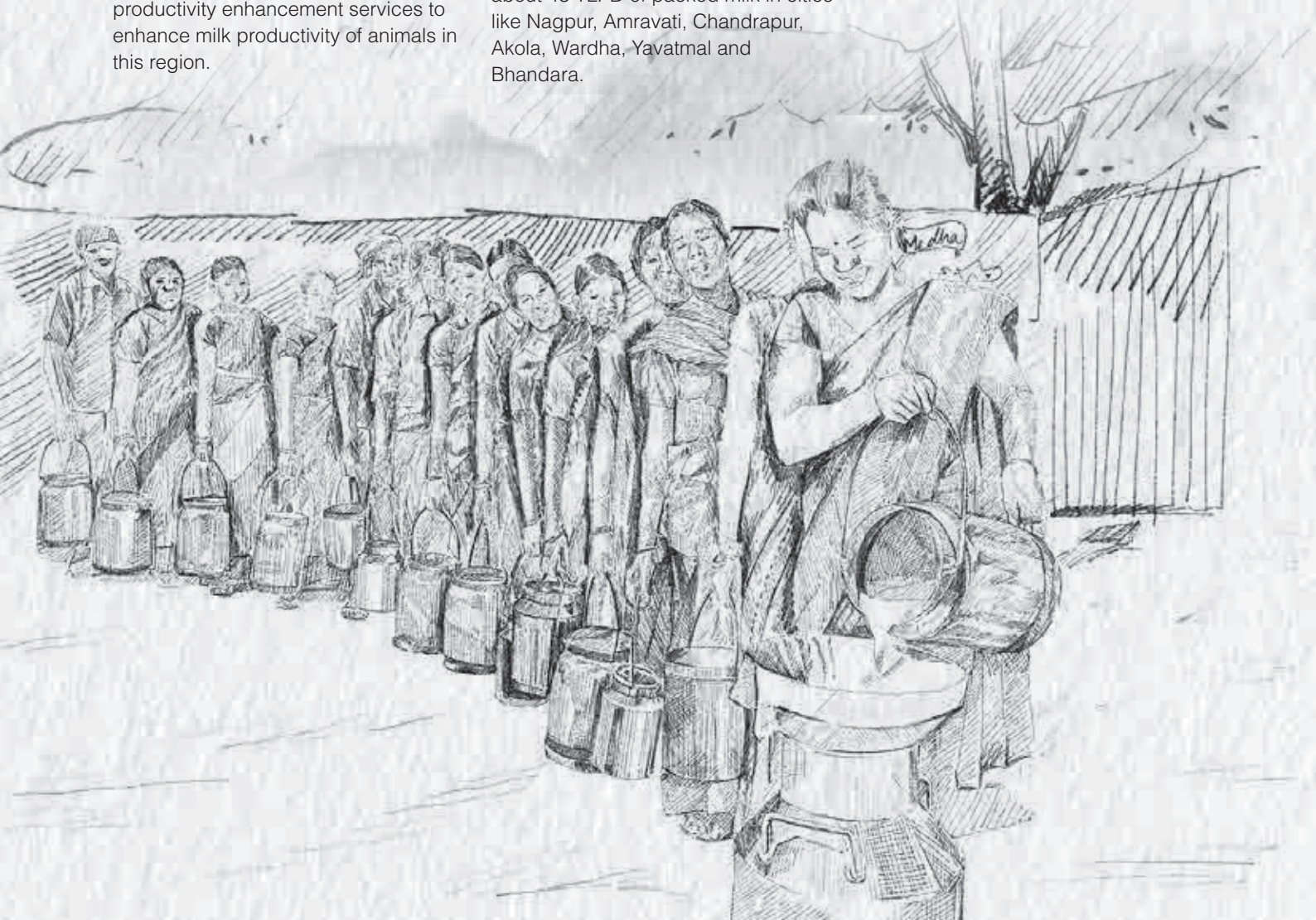
Dairy Development initiative in Vidarbha & Marathwada regions of Maharashtra

To make dairying a source of sustainable livelihood and poverty alleviation in the drought prone Vidarbha and Marathwada regions of Maharashtra, the Vidarbha Marathwada Dairy Development Project (VMDDP) has provided the dairy farmers an efficient institutional platform at village level for sale of their milk at optimum value and various productivity enhancement services to enhance milk productivity of animals in this region.

Mother Dairy Fruit & Vegetable Pvt. Ltd. (MDFVPL), a wholly-owned subsidiary of NDDB, has set-up village level institutions equipped with milk testing and chilling facilities. The project has established a transparent system of milk collection and payment. This has encouraged farmers to adopt dairying as an income-generating activity. As on March 2020, MDFVPL has expanded its coverage to 2,518 villages by establishing 1,474 functional Milk Pooling Points (MPP), and has procured an average of 197 TKPD of milk from about 24,005 producer members. During the year, MDFVPL has made milk bill payments of about ₹ 2220 million directly in the bank accounts of the milk producers, ensuring 100 per cent digital payment.

Milk received from farmers of Vidarbha and Marathwada regions is processed in Nagpur Dairy Plant managed by MDFVPL, where pasteurised packed milk and value-added products such as orange burfi, mishti doi, chhach, and curd are prepared. MDFVPL sold about 43 TLPD of packed milk in cities like Nagpur, Amravati, Chandrapur, Akola, Wardha, Yavatmal and Bhandara.

JMF paid about ₹ 1,247 million towards milk bill payment through direct bank transfer to the individual bank account of milk producer during the year.



In addition to the milk procurement activity, MDFVPL is also making cattle feed and mineral mixture available to the producer members.

While MDFVPL is creating milk procurement network in the project area, simultaneously, Government of Maharashtra (GoM) is providing productivity enhancement services like animal induction, doorstep delivery of AI services, fodder development support, animal health services and Ration Balancing Advisory Services to the milk producers. GoM has appointed MoooFarm Pvt. Ltd. for implementation of Ration Balancing Advisory Services in three districts (Amravati, Nagpur and Wardha) with technical assistance from NDDB.

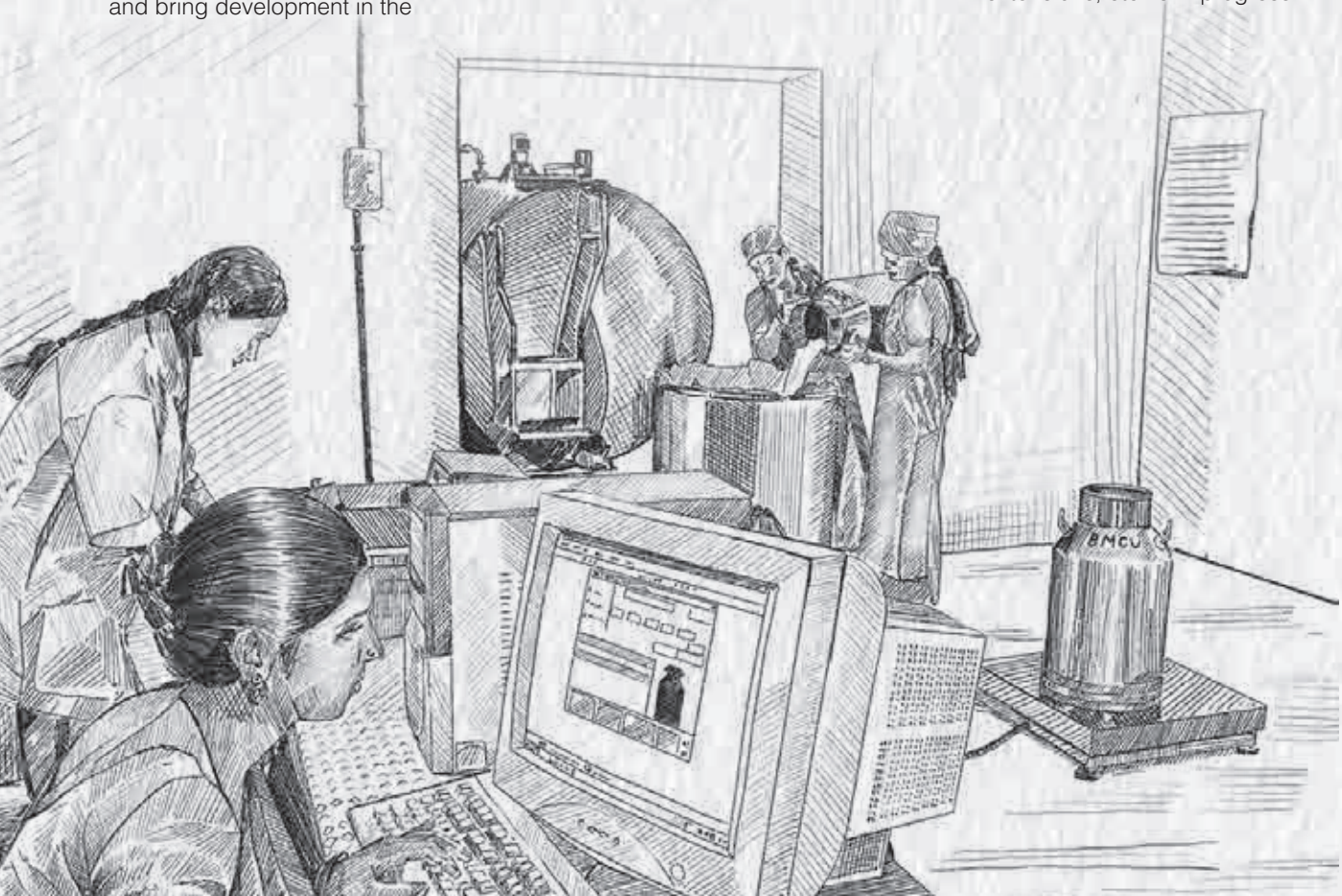
The project is bringing positive change in the lives of milk producers in the drought prone districts by providing an institutional platform at village level for sale of their milk, regular payment of milk bill based on quantity of milk poured and milk solids content apart from enhancing milk productivity of animals through adoption of scientific breeding & feeding practices for their milch animals.

To further the objective of the project and bring development in the regions, NDDB has signed an MoU with Maharashtra Animal & Fishery Sciences University (MAFSU) for scientifically managed production of quality fodder and ethno-veterinary medicinal plants.

NDDB signed an MoU with Maharashtra Animal & Fishery Sciences University for production of quality fodder and Ayurvedic - Veterinary medicinal plants.

Milk production potential in Jammu & Kashmir

The Government of Jammu & Kashmir requested NDDB to conduct a baseline survey to assess the status and prepare a long-term dairy development business plan for the union territory. NDDB thus conducted baseline survey to assess district-wise milk production potential capturing key details such as land holding, milch animal holding, milk production, retention, sale, etc. covering about 1.8 lakh rural households in 608 villages (272 villages in Kashmir region & 336 villages in Jammu region) in all the 20 districts of the Union Territory. Milk production in the 10 districts of Jammu region was estimated at 20.5 lakh litres per day (LLPD) and 25.4 LLPD in the 10 districts of Kashmir region. Subsequently, preparation of a DPR addressing certain concerns of dairy husbandry like animal breeding, feeding & health, fodder development, institutional building, training & extensions, etc. is in progress.



Milk Producer Companies

During the year, NDDB Dairy Services (NDS), the wholly-owned subsidiary of NDDB, facilitated operationalisation of Balinee Milk Producer Company (MPC) in Jhansi, Uttar Pradesh. Balinee MPC was incorporated in January 2019. Balinee MPC has enrolled about 9,000 members in 224 villages and reached an average milk procurement of about 20,000 Kg per day.

Till date, NDS has successfully set-up 15 MPCs, out of which, six were supported under National Dairy Plan - I, five under the Tata Trusts and four under the National Rural Livelihoods Mission (NRLM). Nine of these MPCs have an all-women membership and all the producer-directors on their respective boards are women.

Together, the fifteen MPCs have enrolled around 6.20 lakh milk producers (from 14, 630 villages), of whom about 56 per cent are women, 61 per cent being small holder milk producers. The members of the 15 companies raised around ₹ 1,475 million towards share capital. The companies together procured about 32 lakh kg of milk per day and achieved a gross turnover of more than ₹ 56,000 million during the year.

Advisory services for ration balancing; delivery of cattle feed, mineral mixture and fodder development as well as AI services were also undertaken in the MPCs. During the year, under the Ration Balancing Programme (RBP), about 0.93 lakh animals were covered in more than 3,800 villages. 97,535 MT of cattle feed and 444 MT of mineral mixture were supplied to milk producers. A total of 8.64 lakh AIs were carried out in more than 14,600 villages. In order to educate the farmers about the best practices in dairying, about 100 Dairy Farm Management trainings and 47 workshops were conducted. As the animals in the project areas were prone to sub-clinical mastitis, about 27,300 California Mastitis Tests (CMT) were carried out. Farmers were also educated about detecting mastitis. Improved dairy management practices were introduced in 6, 5 and 28 Model Dairy Farms (MDFs), set up in Paayas, Maahi and Saahaj MPCs respectively. During the year, 2,750 producer members were trained in these MDFs on best animal husbandry practices such as housing, access to water, calf care, vaccination, de-worming, mastitis control etc.

THE COMPANIES TOGETHER PROCURED ABOUT

32 lakh

KG OF MILK PER DAY DURING 2019-20 AND TOGETHER ACHIEVED A SALES TURNOVER OF MORE THAN

₹56,000 million

DURING THE YEAR.

MPCs Progress:

Parameters	Paayas (Rajasthan)	Maahi (Gujarat)	Shreeja (A.P.)	Baani (Punjab)	Saahaj (U.P.)	Bapudham (Bihar)	Total of MPCs
Date of Operationalisation	01-Dec-12	18-Mar-13	15-Sep-14	06-Nov-14	12-Dec-14	02-Oct-17	
No. of Districts#	13	10	7	10	16	5	61
No. of Villages with Members	3,302	2,662	1,335	1,268	2,985	1,143	12,695
No. of Members	1,12,169	1,21,816	82,397	54,715	1,11,074	51,819	5,33,990
Women Membership (%)	39	39	100	27	39	58	49
Small holders (%)	33	55	88	39	67	92	60
Paid-up Share Capital (₹ in Million)	420	320	170	140	300	40	1,390
Average Milk Procurement ('000 Kg Per Day)	879	801	404	281	580	61	3,006
Average Polypack Milk Sales (TLPD)	96	335	20	20	13	NA	484
Average Bulk Milk Sales FYTD (TLPD)	768	446	393	244	551	60	2,462
Gross Turvnover FYTD (In ₹ Million) - Unaudited	15,750	15,760	5,744	4,798	9,490	980	52,522

Districts with >=200 Members have been considered for count of Operational District. District count is based on Census 2001/2011 Code.

Financial Assistance to Producers' Owned Institutions

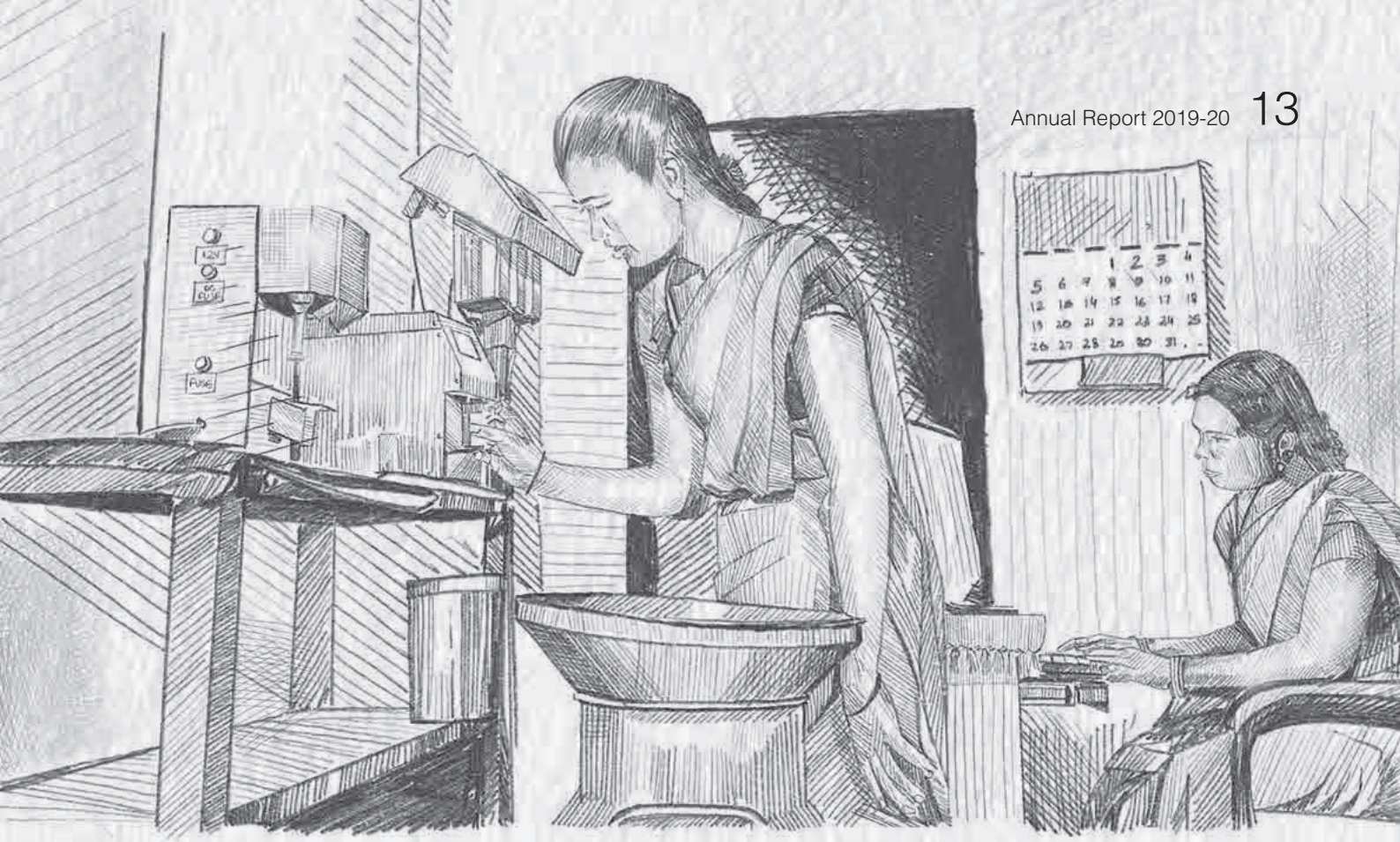
NDDB continued to provide financial assistance to Producers' Owned Institutions (POIs) for enhancing their infrastructure for milk processing, feed manufacturing, solar applications in dairy plants and other activities like skill development. As on 31st March, 2020, projects of POIs with a total outlay of ₹ 12,379 million were approved under the scheme "Providing Financial Assistance for Infrastructure Activities, Skill Development and Trainings". During the year, long-term financial assistance of ₹ 302 million was disbursed to POIs.

During 2019-20, NDDB approved additional working capital facility of ₹ 1,225 million to POIs. Working capital facility of ₹ 7,795 million has been approved under the working capital scheme which was introduced in 2017-18.

Dairy Processing & Infrastructure Development Fund (DIDF)

Government of India (GoI) introduced – "Dairy Processing & Infrastructure Development Fund (DIDF)" during 2017-18. The outlay of the scheme was revised by GoI in 2019-20. The scheme has a revised financial outlay of ₹ 1,11,840 million comprising of ₹ 80,040 million as loan from National Bank for Agriculture and Rural Development (NABARD), ₹ 20,010 million as End Borrower's contribution, ₹ 120 million to be contributed by Implementing Agencies towards Project Management & Learning, and interest subvention of ₹ 11,670 million from Government of India to NABARD. The major components of the scheme are creation, modernisation, expansion of milk processing infrastructure, manufacturing facilities for value added products, setting-up of chilling infrastructure and electronic milk testing equipment at village level.

Dairy Processing & Infrastructure Development Fund has a revised financial outlay of ₹ 1,11,840 million



NDDB is an Implementing Agency for the scheme. The Cooperative Milk Unions, State Cooperative Dairy Federations, Multi-state Milk Cooperatives, Milk Producer Companies and NDDB subsidiaries are the eligible End Borrowers. Assistance under the scheme is available in the form of loan with an interest rate of 6.5 per cent per annum.

As on March 2020, 33 projects of POIs with an outlay of ₹ 40,587 million including loan of ₹ 26,958 million have been approved. Funds of ₹ 9,572 million have been released to the POIs under the scheme. The implementation of the approved projects will enhance milk processing capacities of POIs by 12.17 million litre per day.

Quality Assurance

NDDB continued to strengthen its Quality Mark initiative by encouraging and handholding various milk unions, producer companies and federations to align with the updated guidelines. Since the roll out of Quality Mark in 2016, NDDB received 105 applications from cooperative dairy units for the award of Quality Mark till 31st March, 2020. Out of these, 42 dairy units were found eligible for award of Quality Mark. The remaining 63 dairies were informed about the areas of improvement. During the year, surveillance audit was conducted in 25 dairy plants and surprise audit was done for six dairy plants. Knowledge and experience sharing by an expert panel & providing suggestions to improve the food safety aspects are the prominent features of Quality Mark assessment process to facilitate the process improvement in the entire value chain from producer to consumer.

NDDB continued to conduct education & training programmes for farmers, procurement personnel and supervisors, newly recruited dairy staff of various federations & board of cooperatives in quest of achieving highest standards of quality & hygiene in complete value chain from the farm level up to consumer. Regional workshops on "Importance of traceability and emerging issues of contaminants & its carry over in milk and milk products" were organised at Rohtak, Kolhapur and Dharwad to create awareness amongst stakeholders regarding paradigm shift in residue limits of contaminants in the milk that pose health hazard.

Milk solids recovery study at various milk unions of Karnataka Milk Federation was conducted to help these cooperatives in setting new benchmarks.

33 PROJECTS WITH AN OUTLAY OF

₹ 40,587 million

HAVE BEEN APPROVED UNDER DIDF. THE PROJECT WILL ENHANCE MILK PROCESSING CAPACITIES OF POIs BY

12.17 million

LITRE PER DAY.

An impact study showed regular consumption of milk by school children for two years decreased stunting levels and improved attendance.

NDDB Foundation for Nutrition

During 2019-20, NDDB Foundation for Nutrition (NFN) scaled up its operations to include 4,000 students of government schools in Gadchiroli, Maharashtra under the CSR programme of NBCC India Limited and NBCC Services Limited. It also added 1,000 more government school students to the existing programme schools in Ooty, Tamil Nadu and Anand, Gujarat under the CSR programme of Indian Immunologicals Limited and IDMC Limited respectively.

Till Date, NFN provided Giftmilk to about 60,000 students in 151 government schools in seven states namely, Delhi, Gujarat, Jharkhand, Maharashtra, Tamil Nadu, Telangana, and Uttar Pradesh. Since inception 85 lakh units of milk has been distributed in schools under the Giftmilk programme.

NFN also signed an agreement with REC Foundation and IRCON International Limited to initiate Giftmilk programme for 15,000 students each in Gajapati, Odisha and Muzaffarpur, Bihar and 3,000 students in Malkangiri, Odisha respectively.

To expedite its efforts to address malnutrition, NFN focussed on conducting nutrition awareness events in Government schools. Celebration of National Nutrition Month was one such programme. As a part of the celebration, a week-long awareness drive and distribution of milk was undertaken for 5,000 students of government schools in Anand. Similarly, World School Milk day was celebrated in programme schools in Anand, Bokaro, Nagpur and Telangana wherein quiz, drawing, essay competitions and talks on benefits of milk were organised.

An impact study was conducted by Rajendra Institute of Medical Sciences, Ranchi, in Latehar after two years of distribution of Giftmilk. The study findings showed persistent decrease in stunting levels and improvement in attendance in programme schools, thus establishing the sustained benefits of continuous consumption of milk by children.

Awareness creation

An audio visual 'Principles of silage making under Indian conditions' has been made in Hindi and 10 regional languages to benefit milk producers and unions. Moreover, extension films on Calf Rearing Programme (11 languages), Infectious Bovine Rhinotracheitis (11 languages), Ethno Veterinary Medicine (EVM), Brucellosis, Zakariapura (model village), Women dairy farmers of Katraj Dairy and Milk Fortification were made and distributed through social media platforms.

Interactive content, success stories and advisories on popular social media platforms like Facebook, YouTube were put up to engage, motivate and educate people involved in the dairy sector.

NDDB published brochures for circulation on Solar Cooperatives, CST (Concentrated Solar Thermal), Sudhan (Bio-gas slurry), Bee Keeping and waste management initiatives for farmers to adopt new practices and utilise slurry (a by-product of biogas generation) as an organic manure in their farms. Pamphlets on Moringa were published in Hindi and regional languages to increase awareness about its nutritional benefits. Technological developments for dairy professionals were highlighted through Technews. A user-manual on the use of Information Network for Animal Productivity and Health (INAPH) for FMD control was also published.

"Pashupalan Nirdeshika" – a comprehensive handbook on dairy husbandry and understanding your bovine – a booklet on bovine care and welfare is being constantly updated and translated in regional languages for maximum reach.

NDDB held seminars, workshops and participated in exhibitions across the country to showcase technological advances and innovations in dairy practices and methods that the dairy sector can adopt.

Enhancing Productivity

Animal Breeding

Genetic improvement – coordinated and sustained efforts for accelerating genetic progress in cattle and buffaloes in the country.

PS programmes carried out 4.36 lakh AIs, collected 3.17 lakh milk records and made available

271 HGM bulls

of indigenous breeds.

NDDB continued its efforts to facilitate and provide technical support for producing and distributing top-quality genetics in the country. Producing quality genetics involves selecting genetically superior bulls and bull mothers by implementing scientific genetic improvement programmes such as progeny testing and pedigree selection to produce genetically superior young male calves. Such male calves, after being screened for diseases, are then distributed to various semen stations in the country and used optimally for the production of disease-free frozen semen doses. The semen doses thus produced are then distributed through the existing AI network to provide AI services to farmers at their doorstep. Assistance was provided to semen stations to improve their project monitoring and evaluation procedures. NDDB encouraged them to innovate both for production and dissemination of genetics.

Genetic improvement programmes

The Progeny Testing (PT) and Pedigree Selection (PS) programmes implemented under NDP I were instrumental in bringing about genetic change in the cattle and buffaloes. These programmes helped create an infrastructure for performance recording of a majority of economically important cattle and buffalo breeds. They also put in place processes to evaluate bulls and produce genetically superior bulls for semen production. All PT projects together tested 2,005 bulls, carried out about 40.53 lakh AIs and collected 21.09 lakh milk records under NDP I and made available 2,185 High Genetic Merit (HGM) bulls for country's breeding programmes. Likewise, the PS programmes carried out 4.36 lakh AIs, collected 3.17 lakh milk records and made available 271 HGM bulls of indigenous breeds.

Information Network for Animal Productivity and Health (INAPH) has helped build a huge database on the performance of different breeds of cattle and buffaloes. The PT and PS programmes have become an important source to replenish HGM bulls for semen production in the country. Considering the successful implementation of PT and PS projects under NDP I and realising the importance of sustaining them for achieving steady genetic progress, the Department of Animal Husbandry and Dairying (DAHD), Government of India decided to continue and support PT and PS projects under the Rashtriya Gokul Mission (RGM). The Sahiwal PS project has been converted into a PT programme, and a new PT programme for Jersey breed has been added to RGM.

Progeny Testing – Estimating breeding values of bulls based on the performance of their progenies and selecting the top among them (proven bulls) for producing the next generation of bulls.

Thrust Areas:

- Testing of bulls to assess their genetic worth
- Production of genetically superior male calves

All PT projects together tested 2,005 bulls, carried out about 40.53 lakh AIs and collected 21.09 lakh milk records under NDP I and made available 2,185 HGM bulls for country's breeding programmes.

NDDB continued to implement 14 PT programmes (now under RGM) through 12 EIAs in nine states for three breeds of exotic and crossbred cattle, two breeds of indigenous cattle and two breeds of buffaloes. In the year 2019-20, all PT projects together tested 207 bulls, carried out 4.82 lakh AIs and put 29,280 animals under milk recording. The project produced 154 HGM bulls for the country's breeding programmes during the year. A major thrust has been on selecting bulls based on their breeding values for milk yield after confirming their correct parentage through DNA verification and testing negative for diseases like TB, JD, Brucellosis, IBR, and BVD. Apart from milk yield, breeding values for various important traits like Fat, SNF, Protein yields, open period, and age at first calving are also estimated. Service sire conception rates are estimated regularly for PT projects. Animal type classification forms an integral part of PT programmes. Giving weightage to type traits in the selection of animals improves the longevity of animals.

Measurement procedures have been standardised for important traits and an appropriate scale has been developed for CBHF, CBJY, Murrah, and Mehsana breeds. The field implementation of typing has been initiated in various PT projects.

Pedigree Selection – Estimating breeding value of male calves based on the performance of their parents and selecting top bulls among them for semen production.

Thrust Areas:

- Strengthening of AI infrastructure and popularising AI in the breeding tracts of indigenous breeds
- Performance recording & sensitising farmers in the area on genetic improvement programmes

The aim of Pedigree selection programmes is to initiate field-based conservation and development of indigenous breeds in their respective breeding tracts. This will enable selection of superior animals from within the population and then disseminating their genetics to the larger population of the breeds through building infrastructure for AI delivery.

NDDB continued the implementation of seven PS projects for seven breeds through seven EIAs in five states. Under RGM, 45,275 AIs were conducted and six HGM bulls were produced under the PS projects during 2019-20.

Genomic Selection – Selection of animals based on genomic breeding values using dense genotype markers covering whole genome

NDDB continued to strengthen its DNA repository (> 55,000 animals) of milk-recorded animals in India so that phenotypes of cattle and buffaloes recorded under PT and PS projects could be used for developing and implementing genomic selection procedures.

Under NDP I, Sabarmati Ashram Gaushala, Bidaj (SAGB) implemented a project on the development of genomic selection methodology in cattle with the technical assistance of NDDB. "INDUSCHIP" developed by NDDB was used for genotyping of 9,576 cattle and developing genomic breeding value estimation procedures for Gir, HF crossbred and Jersey crossbreds cattle. Thus, during the year, for the first time in the country, bull calves of Gir, HF crossbred and Jersey crossbreds cattle procured under RGM were selected using genomic estimated breeding values (GEBV).

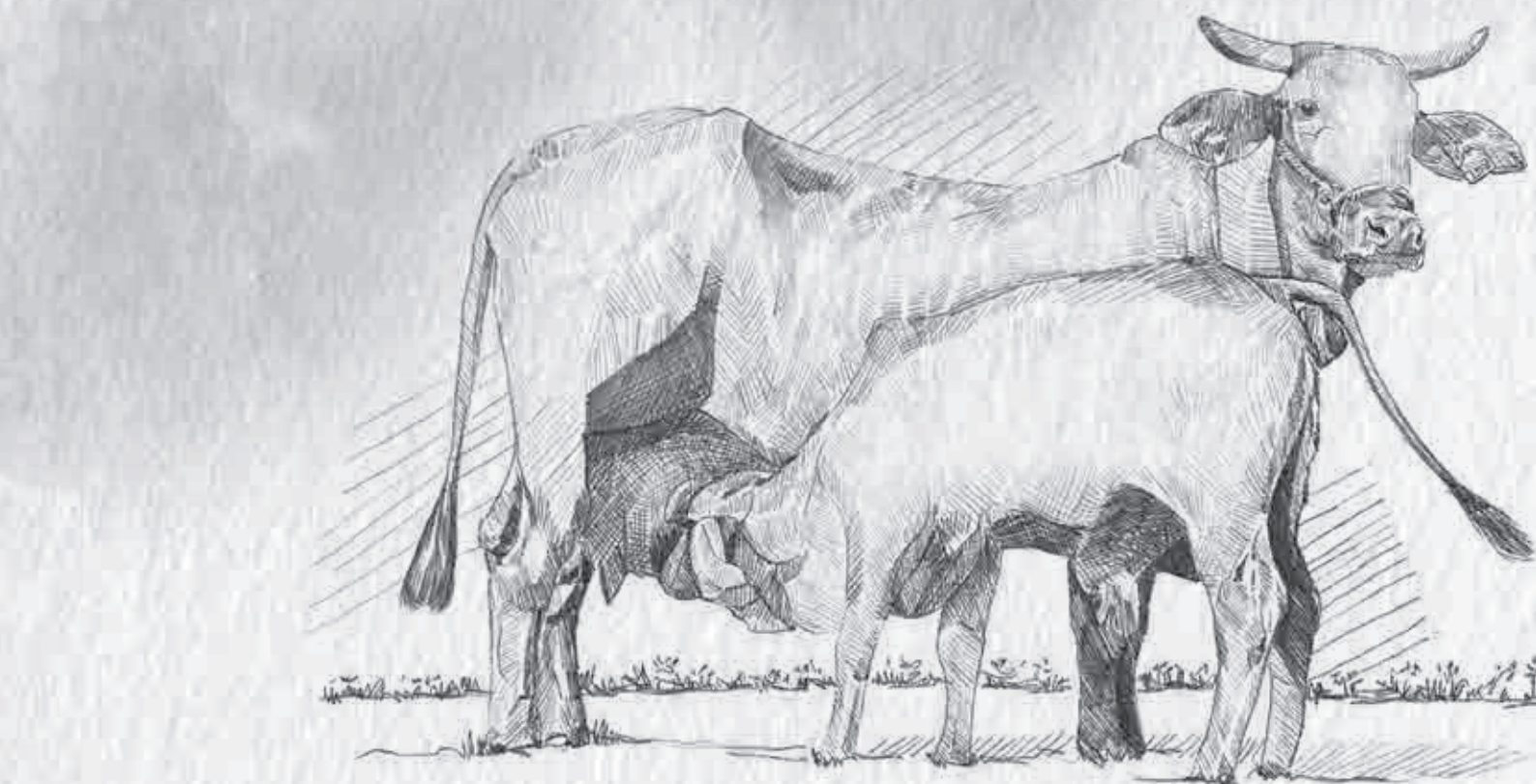
NDDB provided technical guidance for "Developing genotyping microarray chip for buffaloes" under NDP I. A de novo haplotype phased genome assembly "NDDB_ABRO_Murrah" of riverine buffaloes was also developed for the first time. Two hundred and ninety-six animals of nine breeds of riverine and swamp buffaloes were resequenced for identifying Single Nucleotide Polymorphisms (SNPs) to develop a genotyping chip – "BUFFCHIP". This chip is suitable for genotyping of Indian buffalo populations. So far 4,992 Murrah and Mehsana buffaloes have been genotyped using BUFFCHIP. NDDB made a presentation in Plant and Animal Genome (PAG) Conference, 2020 held in San Diego, USA.

Realising the importance of the programme, DAHD, GoI has agreed to support the Genomics Selection Project under Rashtriya Gokul Mission.

Ovum Pick-up and In vitro embryo production – An Assisted Reproductive Technology to multiply the elite germ plasm at a faster rate

Ovum Pick-up and In vitro embryo production (OPU-IVEP) coupled with Embryo transfer holds immense potential to increase selection intensity on the Dam-Sire path under progeny testing programmes as well as to multiply elite dairy animals for herd replacement. Many dairy advanced countries have been using this technology. In India, the major hindrances are the cost of production of embryos and the unavailability of trained and skilled manpower. Hence, NDDB has established a state-of-the-art R&D lab to standardise the technology in some of the indigenous breeds of cattle and buffaloes and to create a pool of specialised professionals.

During the year, for the first time in the country, bull calves of Gir, HF crossbred and Jersey crossbreds cattle procured under RGM were selected using genomic estimated breeding values (GEBV).



493
VIABLE EMBRYOS WERE PRODUCED FROM
168
OVUM PICK-UP SESSIONS

The facility focussed on increasing efficiency of embryo production. During the year, 493 viable embryos were produced from 168 ovum pick-up sessions (2.9 viable embryos/session). One of the Gir cows produced 135 embryos from 22 OPU sessions, with an average of 6.13 viable embryos/session. Sixteen confirmed pregnancies have been achieved from 43 fresh embryo transfers and five calves have been born. To achieve higher pregnancy rates using frozen embryos, NDDB focussed on standardising the freezing protocol of in vitro produced embryos. Protocols for OPU-IVEP in buffaloes was also standardised during the year. Research and Development on using Sex-Sorted semen for IVEP and vitrification of embryos was also pursued during the year. Sixteen veterinarians were trained on OPU-IVEP during the year.

AI with Sex-Sorted Semen

A Pilot Project on Artificial Insemination with Sex-Sorted Semen of indigenous breeds was implemented by NDDB in five select districts in four states. The pilot project, being implemented through four agencies - Gujarat Livestock Development Board; Rajasthan Livestock Development Board; Uttar Pradesh Livestock Development Board and COMFED (Bihar), is funded under Rashtriya Gokul Mission. Till date, 12,500 doses of sex-sorted semen have been distributed under the pilot project in five districts viz., Amreli (Gujarat), Jodhpur (Rajasthan), Shahjahanpur (UP), Varanasi (UP) and East Champaran (Bihar).

Scientific collaboration and publication -

During the year, NDDB collaborated with institutions of international and national repute (Arhus University, Denmark; EMBRAPA, Brazil; ICAR-NDRI, Karnal; AAU, Anand; Kamdhenu University, Gandhinagar) for gaining and sharing technological know-how. NDDB is a member of DNA as well as dairy cattle milk recording working groups of the International Committee of Animal Recording (ICAR).

Rathi breed finds new home at Vidarbha & Marathwada: an NDDB initiative

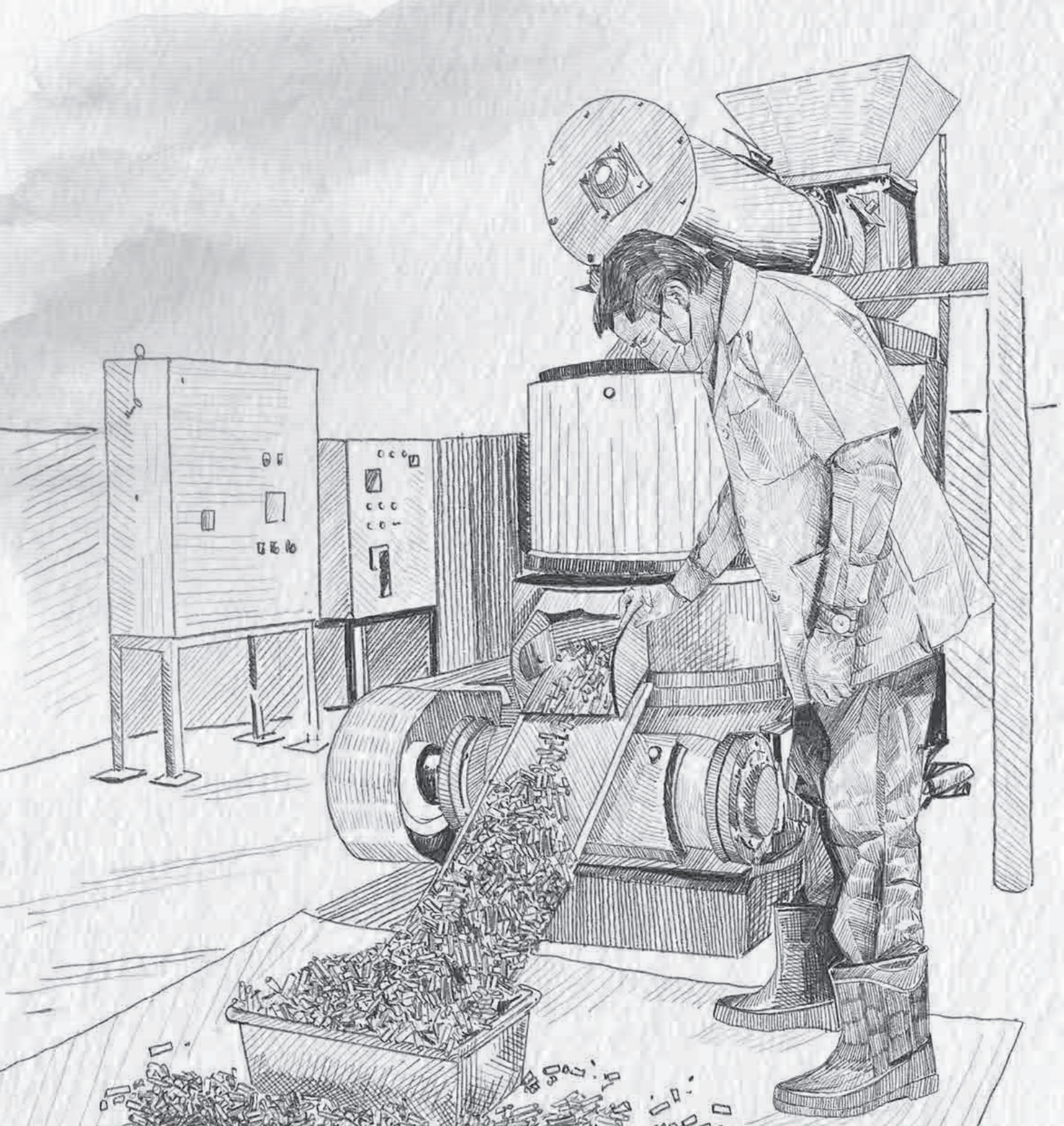
The Vidarbha and Marathwada regions of Maharashtra occupy around 31.6 per cent of total area of the state. The temperature of these regions range from 5-47°C. Rainfed agriculture practices are followed in the region. NDDB initiated the VMDDP as a special project aimed at providing sustainable alternative livelihood to farmers here.

In 2017, NDDB inducted Rathi cows in Wardha and Amravati districts to demonstrate utility of high milk producing Rathi breed promulgating sustainable dairying in the area. Three pregnant Rathi cows were inducted by three farmers of Belora, Digargavhan and Manjarkhed villages. The cows were inducted from breeding tract of Rathi i.e. Bikaner, Rajasthan, where a PS project was implemented in the breed by NDDB under NDP I. The breed performed better than local counterparts. Female calves born from these cows saved cost of animal induction adding to famers' income indirectly. The average milk yield per day was around 8 litres with one of them giving a peak daily yield of 16 litres. Reproductive performance of Rathi was impressive with an inter-calving period of 362 days (producing one calf per year). NDDB also facilitated regular visits of other farmers from the area to these farms and provided orientation programmes. The breed soon became popular in the regions. Later, farmers from Nagpur and Amravati bought another batch of 32 Rathi cows. Impressed with the results, a farmer even went on to induct 88 Rathi cows starting a new concept of Cow Tourism near Nagpur.

The demand for semen doses of Rathi bulls for AI was met by supplying frozen semen doses (FSDs) of quality bulls reared at the District Artificial Insemination Centre, Nagpur.

Animal Nutrition

Scientific feeding of dairy animals is crucial not only for maximising milk production but also for optimising the cost of feeding. Adoption of scientific feeding practices can contribute significantly to profitability of dairy farming and its long-term sustainability.



56,985

Metric Tonnes of cattle feed were produced under the 'Quality Mark'.

Total Mixed Ration pellets

Total Mixed Ration pellets comprise concentrates, essential additives such as minerals and vitamins and locally available dry fodder. Their nutrient composition varies based upon the physiological and lactation stage of animals. Two plants for manufacturing Total Mixed Ration (TMR) pellets are currently functional in Kolhapur and Sri Ganganagar.

A holistic study involving inter alia TMR pellets customised to different lactation stages was taken up at Kolhapur Milk Union on graded Murrah buffaloes. Results of the study indicate that buffaloes in experimental group produced 24 per cent more milk compared to those maintained on traditional feeding system. The average net daily income of farmers improved by 48 per cent. Experimental group animals also showed an improved reproductive performance such as early onset of post-partum oestrus and better conception rate.

'Quality Mark' for cattle feed and mineral mixtures

The 'Quality Mark' for cattle feed and mineral mixtures was promoted during the year. 56,985 Metric Tons of cattle feed were produced under the 'Quality Mark'. Four technical seminars were organised at Patna, Rudrapur, Ludhiana and Amritsar for about 1500 dairy farmers and Milk Union officials to apprise them about the immense benefits of using 'Quality Marked' cattle feed. These seminars are being followed up with village level meetings for generating awareness at grass-root level.

Toxin Binders for addressing problem of Aflatoxin M_1 in milk

The National Milk Safety and Quality Survey of FSSAI in 2018, found the incidence of Aflatoxin M_1 in about 5.7 per cent of the milk samples. The occurrence of Aflatoxin M_1 in milk is directly related to feed quality. Feeds and feed raw materials should not contain more than 20 ppb of Aflatoxin B_1, if the limit of 0.5 ppb of Aflatoxin M_1 in milk is to be complied with.

One of the most effective ways for controlling Aflatoxin M_1 in milk is by the usage of an appropriate toxin binder in feed. NDDB is evaluating various materials and technologies with the objective of finding an effective and economical toxin binder for dairy animals. *In vitro* studies with various materials have been encouraging and *in vivo* studies are currently underway.

Feed Supplements for improving milk quality

Imbalanced feeding of milch animals is very common and often results in sub-optimal fat/SNF levels. This negatively impacts the income of dairy farmers. NDDB developed a feed supplement named "Samvriddhi" for dairy farmers who have been grappling with the problems of low fat/SNF in milk. Feeding this supplement has resulted in increased

Buffaloes in TMR fed group produced 24 per cent more milk compared to those maintained on traditional feeding system. The average net daily income of farmers improved by 48 per cent.

milk fat and SNF by 7.2- 9.3 and 1.8-2.4 per cent, respectively, in cows and 2.4-3.9 and 1.6-1.8 per cent, respectively, in buffaloes. Technical know-how for manufacture of Samvriddhi under NDDB's Quality Mark has been provided to Krishna Milk Union in Andhra Pradesh and Mithila Milk Union in Bihar.

Loss of productivity in dairy animals during heat stress is well-known. NDDB developed a supplement named "Pashu Sheetvardhak" to minimise 'heat stress'. Usage of this supplement has resulted in improved dry matter intake and milk yield by 8.8 and 10.5 per cent, respectively, in cows and 2.4 and 5.7 per cent, respectively, in buffaloes as compared to control group animals. Currently, Jharkhand Milk Federation and Maahi Milk Producer Company are manufacturing this supplement under NDDB's Quality Mark. Approximately, 20,000 doses have been produced as on date.

Calf Rearing Programme

To address the issue of neonatal calf mortality, poor growth rates, delayed sexual maturity and longer calving intervals in dairy animals, NDDB initiated the 'Calf Rearing Programme' (CRP) in seven milk unions of Gujarat, Punjab and Karnataka. During the year, 2,105 additional pregnant animals were registered and 2,262 calvings were reported, taking the total numbers of pregnant animals and calvings to 7,771 and 6,721, respectively.

The average birth weights of Kankrej, Murrah and Crossbred female calves under CRP were 24 kg, 39 kg and 33 kg, respectively, which were about 20-25 per cent higher than the calves born under conventional feeding system. The overall calf mortality was 8 per cent under CRP against 19 per cent reported under conventional system. During the initial 12 months period, the average daily body weight gain of scientifically fed female calves was 403 g, 489 g and 653 g in Kankrej, Murrah and Crossbred cows, respectively.

The average age at first heat for heifers of Kankrej cow and Murrah buffalo was 17 months, whereas it was 14 months for HF cross-breds. The average age at First Calving (AFC) for Kankrej heifers under the programme was 30 months (as against 47 months under traditional feeding management) and 29 months for Murrah buffaloes (as against 42 months under traditional feeding management).

Ration Balancing Programme

Farmer education on balanced feed advisory services at farmers' doorsteps through local resource persons (LRPs) continued during the year.

In 2019-20, 17,324 animals belonging to 11,092 farmers in 106 villages were added to the programme. Overall, 21.57 lakh milk producers received balanced feed advisory services for their 28.65 lakh animals in 33,374 villages. Cumulatively, 31,148 LRPs were trained and inducted for field implementation under the NDP I. Data indicates that balanced ration led to an increase in average daily milk yield of 0.27 kg and milk fat by 0.1 per cent. Cost of feeding was reduced by ₹ 2.30 per kg of milk. The average net daily income of milk producers increased by about ₹ 25.52 per animal.

Additionally the concept of 'challenge feeding' in early lactation was also popularised through LRPs. Challenge feeding of 1,611 early lactating animals in 288 villages showed an increase in average daily milk yield of 0.82 kg and milk fat by 0.13 unit. Cost of feeding remained similar or dropped marginally by ₹ 4.8 per animal/day. The average net daily income of milk producers increased by about ₹ 36.92 per animal. This shows that genetic potential of milking animals can be exploited by a combination of ration balancing and 'Challenge feeding'.

Green Fodder Production Enhancement

High quality green fodder is vital for optimising feed costs. However, area under cultivated fodder crops in India remained static owing to low-priority accorded to it in comparison to food crops. Increase in the fodder area can be achieved by growing dual purpose varieties, inter-cropping and silage crops in food-fodder based cropping sequences. Vertical increase in the fodder productivity can be achieved by use of quality seed of improved varieties in combination with advanced forage production technologies.

Enhancing availability of 'Quality Fodder Seed'

During the year, 16.9 MT breeder seed of improved varieties of green fodder were procured from Indian Council of Agricultural Research / State Agricultural Universities (SAU) by state Dairy Federations/Milk Unions for further multiplication. Three newly notified fodder varieties of oat, berseem and multi-cut perennial sorghum were brought under the seed multiplication chain. For enhancing quality of fodder seed sold to farmers, a "Seed Coating Unit' was set up at Sangam Milk Producers' Company Ltd (MPCL), at Guntur in Andhra Pradesh. Sangam MPCL has started selling fungicide polymer coated seed of multi-cut sorghum to farmers. During the year, 4,000 MT of fodder seed was produced and marketed by dairy cooperatives. The e-portal facility of the National Cooperative Dairy Federation of India is being used by milk unions for purchase of fodder seeds.

DURING THE YEAR

4,000 MT

OF FODDER SEED WAS PRODUCED AND MARKETED BY DAIRY COOPERATIVES

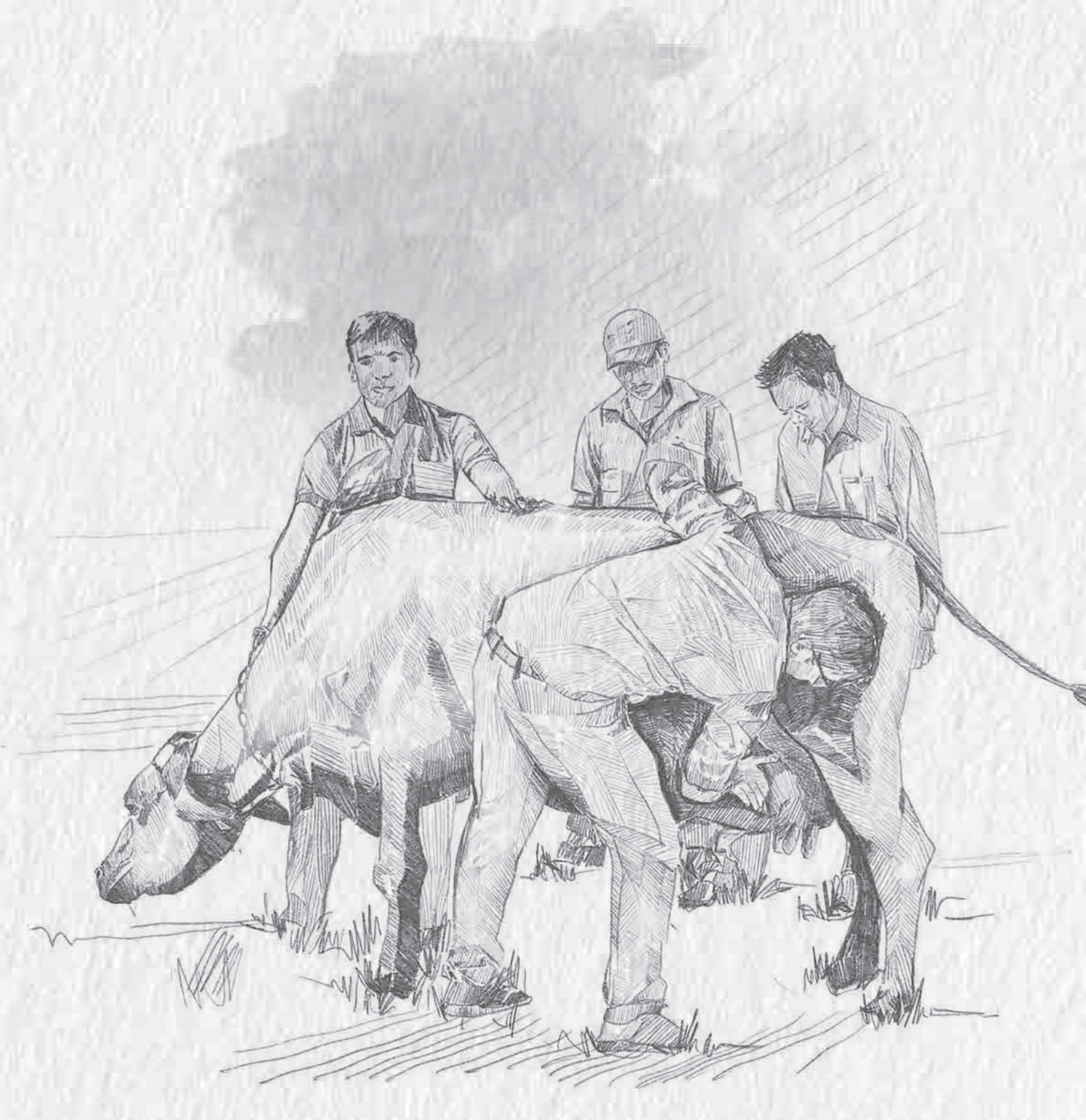
Demonstration of new fodder production technologies

NDDB continued to demonstrate new fodder production technologies to farmers and technical officers from dairy cooperative sector, animal husbandry departments and NGOs. Conservation agriculture practices such as "No-Till" fodder production, sowing fodder crops with crop residue cover, water saving 'Trench Planting', use of drip irrigation with organic manure, bio-fertilisers for thorn-less cactus and moringa fodder production were demonstrated to farmers.

New fodder varieties of berseem (JSBC-1 & BL-43), multi-cut oats (OL-1874), moringa (Thar Harsha) and alley-cropping system of moringa with berseem was demonstrated to farmers. Cultivation of hybrid maize (DMRH-1419, IMHB-1532 & PJMH-1), Tall wheat (C-306), Triticale for silage making and Bajra Napier hybrid (Co-6 & BNH-11) for green fodder in irrigated areas were also demonstrated. Over 2.90 lakh stem cuttings of Bajra Napier Hybrids and 1,500 stem cuttings of Guinea grass were supplied to farmers for trial and demonstration purpose. About 124 cladodes of thorn-less cactus for water deficit areas were provided to farmers.

Animal Health

NDDB is actively involved in propagating disease control models which are holistic, cost-effective, efficacious and easily implementable. These models help the farmer reduce expenses, improve productivity and, thereby increase profits.



57,434

cattle and buffaloes have been vaccinated under the Brucellosis control programme.

NDDB is involved in capacity building of various stakeholders for creating robust databases on all interventions in animal health through its Information Network for Animal Productivity and Health (INAPH). INAPH is being used to record vaccinations under Foot and Mouth Disease and Brucellosis Control being implemented under the aegis of the National Animal Disease Control Programme (NADCP). NDDB trained more than 1,200 veterinarians of the State Animal Husbandry Departments of 27 States and three Union Territories as district level Training of Trainers (ToT) in order to facilitate the deployment of INAPH under NADCP.

NDDB continued to provide consultancy on biosecurity and disease control to bull production areas in and around semen stations in order to ensure production of disease-free bulls/semen.

NDDB continued to support its brucellosis control model in nearly 600 villages covering four districts in Gujarat and in an organised farm. About 57,434 cattle and buffalo calves have been vaccinated during this fiscal. More than 1.5 lakh female cattle and buffalo calves have been vaccinated and ear-tagged since initiation of the project from April 2013. NDDB is also collaborating with a medical institute to bring about a much-needed linkage with the physicians to tackle the bane of brucellosis in livestock, farmers and animal husbandry personnel.

This zoonosis remains largely underdiagnosed and seriously impedes the working capacity of the farmer. A total of 48 persons identified by an expert panel of physicians were provided specific treatment regimen during the year of which all have been completely cured and have regained their pre-disease vitality. A significant increase has been recorded in the awareness levels on brucellosis and its control amongst the farmers wherever this control project is being implemented. The project is for a period of five years with a total outlay of ₹ 113.68 million with NDDB contributing ₹ 54.31 million.

A pilot project on control of Infectious Bovine Rhinotracheitis (IBR) using an inactivated marker (gE deleted) vaccine has been implemented in 10 villages under NDP I (in two states) and also in another village funded by NDDB. IBR vaccination was also carried out in an IBR endemic organised dairy herd. Post-vaccinal sero-conversion was recorded in almost 95 per cent animals without any significant difference between cattle and buffaloes. Differentiation of vaccinated animals from infected one was possible by appropriate ELISA. Maternal antibodies in calves born to vaccinated dams could be differentiated from antibodies due to infection. These maternal antibodies in calves wanes by nine months of age. More than 90 per cent of the IBR negative animals remain uninfected after regular vaccination in endemic situation. The results suggested that inactivated marker (gE deleted) IBR vaccine could be a protective tool for control of IBR.

NDDB trained more than 1,200 veterinarians from 27 State Animal Husbandry Departments and three Union Territories to facilitate the deployment of INAPH under NADCP.

NDDB's Mastitis Control Popularisation Project (MCPP) – continued in over 25 milk unions/producer companies across nine States (Kerala, Karnataka, Tamil Nadu, Andhra Pradesh, Maharashtra, Gujarat, Punjab, Assam and Uttar Pradesh). The total outlay of the project is ₹ 260.5 million with NDDB contributing ₹ 35.6 million. Sub-clinical Mastitis (SCM), antibiotic residues, somatic cell counts (SCC) and bacterial load in milk are being monitored in the project areas and appropriate measures are suggested so as to minimise the use of antibiotics and reduce the possibility of emergence of Antimicrobial Resistance (AMR). Periodic surveys are also being conducted to assess the cost-benefit of the project. During the year, 2,06,904 pooled milk samples of the farmers pouring milk at the Dairy Cooperative Society were tested by California Mastitis Test (CMT) to assess SCM. Further investigation on the positive samples were carried out by testing at the farmers' homesteads to identify animals with SCM and to monitor their progress while being provided with an easy oral regimen costing around ₹ 20/- for a 10-day course. A drastic reduction in the incidence of SCM, and, an average milk yield increase of 10-15% per day in affected animals have been recorded with this strategy. Documentation of Ayurvedic Veterinary Medicine (AVM) for several common ailments which reduce milk production, including mastitis, is also being carried out under MCPP.

Till date, more than two lakh cases treated by AVM have been documented from the project areas of which about 65,000 are for mastitis alone, with an average cure rate of 83 per cent. Under MCPP, NDDB is also encouraging unions to strengthen their supply chain of veterinary ayurvedic formulations so that farmers get appropriate quality of preparations at minimal cost. Milk unions that have embarked on use of AVM have reduced their medicine procurement, especially antibiotics. The number of cases being reported in such unions have also reduced significantly. During the year, more than 200 veterinarians have been trained on AVM.

Implementation of INAPH Health module in Kolhapur milk union

INAPH health module was implemented in Kolhapur milk union during the year. A total of 2.27 lakh cases have been recorded in INAPH. An analysis of reports generated from INAPH revealed that digestive, udder-related cases, reproductive issues, viral diseases and metabolic disorders were 30,15,12 and 5 per cent respectively. The milk union now also has animal-wise data for veterinary services delivered.

Success story 1

Sabarkantha goes the AVM way through NDDB's model for mastitis control

Sabarkantha District Cooperative Milk Producers' Union has been the incubation centre for field testing of NDDB's model of mastitis control which started in 2015. The Milk Union has come a long way since then with more than 49 per cent reduction in positivity of California Mastitis Test (CMT) of pooled milk samples of the farmers, which is indicative of reducing levels of sub-clinical mastitis. To rationalise the use of antibiotics for mastitis and other ailments and to provide a cost effective, eco-friendly and efficacious solution to farmers for management of common ailments in bovines, the Milk Union initiated the use of Ayurvedic Veterinary Herbal Preparations (AVHP) under the mastitis control project. The union is providing ready-made AVHP for common ailments of dairy animals like mastitis, fever, diarrhoea and repeat breeding to the associated milk producers. This has reduced the medicine purchase of the Milk Union by over ₹ 11.2 million in a year. There has also been a reduction in the levels of antibiotic residues in bulk milk to the tune of 60-85 per cent in the mastitis control project villages. More than 75,000 cases of mastitis recorded have been cured by AVHP alone without use of any drugs or antibiotics with a very high cure rate of 82 per cent, at negligible costs. The cure rate for 28 other ailments managed by AVHP is also at an impressive 86 per cent out of 1,55,000 cases recorded by the Milk Union. There has also been an average monthly reduction of around 6,325 cases due to the seeding of AVHP knowledge at grassroots level thereby enabling the farmers to manage common ailments locally. The Milk Union has now started a one of its kind AVHP production facility with the financial support of NDDB to centrally produce and provide AVHP at nominal costs to the member producers. More than 200 veterinarians from over 40 milk unions across the country have been oriented on this concept at Sabarkantha. NDDB's concept of mastitis control and management of other ailments is thus proving to be a feasible and cost-effective model. It can be easily replicated and will contribute to reducing the use of drugs, especially antibiotics and thereby also help in stalling antimicrobial resistance (AMR), which is an emerging public health issue.

Success story 2

How NDDB's one health model of Brucella control is improving lives of dairy farmers.

Smt. Anandiben G Patel, from Kali Talavadi village in Anand district was diagnosed with brucellosis a year ago. Two of her animals had aborted and she had handled the aborted foetus and placenta with bare hands which might have resulted in her getting infected. She had fluctuating fever, back pain, joint pain, weakness, headaches, loss of appetite and was unable to carry out her usual activities. She had been to many doctors and had taken many medications but to no avail. A definitive diagnosis evaded her. Under the NDDB's model of Brucellosis Control that gives equal focus on one health approach, helped in diagnosing her illness during a screening campaign for farmers with animals that tested positive for brucellosis. She was then counselled at the Shree Krishna Hospital, Anand which is collaborating in the control project and provided specific treatment for brucellosis which was then followed up till her complete recovery. Shri. Rajubhai M Thakor, Finav Village, Anand District, Smt. Sudhaben K Patel, Gadia Village, Kheda District and many others have similar stories to tell, having contracted the disease from their animals. It was unlikely that they would have ever been diagnosed and treated appropriately had it not been for the NDDB's brucella control project being implemented through Kaira District Cooperative Milk Producers' Union. This one health approach of linking human cases with that of animals will help diagnose and cure human brucellosis and improve the quality of life of many farmers suffering from it.

Research & Development

NDDB's R&D laboratory, a full-fledged research facility equipped with modern technologies and expertise, has developed cutting-edge proficiency in diagnosis of bovine diseases.

A total of

91,969

specimens were screened during the year 2019-20 for disease monitoring and appropriate advisory was provided for effective disease management.

The laboratory is accredited with ISO 9001:2015 and ISO/IEC 17025:2017 certifications and has established an efficient system of procedures for accurate and prompt diagnoses of important, sexually transmitted bovine diseases. The disease monitoring and surveillance support rendered by the laboratory has been benefiting various bovine breeding entities in the management of disease-free herds viz., semen stations (SS), bull mother farms, bull-calf procurement projects under Rashtriya Gokul Mission (RGM), PT/PS projects and organised dairy farms. The laboratory provides adequate disease screening and monitoring support for the control projects on important diseases viz., Bovine brucellosis, Infectious bovine rhinotracheitis (IBR) and mastitis. Identification of bovine mastitis causing agents and determination of their antimicrobial resistance (AMR) profile has enabled provision of advisories to milk unions under the MCPP for appropriate selection and judicious use of antibiotics and consequently mitigating AMR incidence.

Disease monitoring and surveillance

The sexually-transmitted diseases in organised farms viz., Infectious bovine rhinotracheitis (IBR), Bovine brucellosis (BB), Bovine viral diarrhoea (BVD), Bovine genital campylobacteriosis (BGC) and Bovine trichomonosis were regularly monitored as recommended in the minimum standard protocol (MSP) for frozen semen production by the Department of Animal Husbandry and Dairying (DAHD), Government of India.

A total of 21,212 serum samples were screened for brucellosis that revealed 3.9 per cent positivity. Similarly, testing 18,770 serum samples for IBR showed 19.3 per cent positivity. However, overall prevalence of IBR and brucellosis in semen stations were 23.7 per cent and 0.1 per cent respectively. By strict biosecurity measures, test and removal of positive reactors, most of the SS remained free from brucellosis while some semen stations were IBR free. The overall prevalence of IBR and brucellosis in unorganised dairy farms were 57.1 and 12.1 per cent respectively. The data highlights the importance of systematic disease monitoring, and strict bio-security measures in effective management of these diseases.

The MSP recommends identification and prompt removal of animals persistently infected (PI) with BVD virus (BVDV) as they are continuous shedders and infect other animals. ELISA for the detection of BVDV antigen in 6,712 serum samples revealed only 0.21 per cent positivity. The laboratory also tested 1,521 serum samples from a few farms opting for screening Johne's diseases (JD) by ELISA and about 2.4 per cent were recorded positive. Out of 1,572 preputial wash and 38 vaginal wash samples tested for detection of BGC and Trichomonosis by cultural isolation method, none were found positive.

A total of 30,663 EFS batches were screened for the IBR causing BoHV - 1 virus by real-time PCR tests and only 2.22 per cent batches were found positive.

Screening of frozen semen batches

IBR infected bulls are known to intermittently shed the BoHV-1 virus in semen during reactivation of the latent virus. Thus, MSP recommends screening of all Extended Frozen Semen (EFS) batch samples produced from the IBR sero-positive bulls for BoHV-1 and allows use of only BoHV-1 negative batches of semen for in artificial insemination. During the period under report, a total of 30,663 EFS batches were screened by the real-time PCR tests and only 2.22 per cent batches were found positive. The pattern of BoHV-1 shedding in semen was de-lineated by a four-year (2014-15 to 2018-19) retrospective analysis of the real-time PCR assay results for nearly 1.2 lakh batches of EFS produced by 1,229 sero-positive bulls tested. The analysis revealed shedding was significantly (p<0.001) lower in buffaloes (0.96 per cent) than in cattle (1.3 per cent). Breed and age did not seem to significantly affect the rate of shedding. However, virus could not be detected in any of the EFS batches tested from 59 per cent of IBR sero-positive bulls during the four-year period.

Microbial load in EFS is one of the important indicators of quality. The laboratory trained the personnel of semen stations on the determination of bacterial load in semen. A representative set of EFS batches from semen stations were tested by the laboratory to ascertain the competency of routine bacterial load testing at the semen stations and offered necessary advisory.

Post-vaccination sero-monitoring of Foot-and-Mouth Disease (FMD)

The laboratory processed a total of 5,379 serum samples from pre (0 day) and post (30 day) FMD vaccinated animals in semen stations and appropriate advisory was provided. Protective antibody titres were determined using solid-phase competitive ELISA (SPCE) kits supplied by the Directorate of Foot-and-Mouth Disease (D-FMD), ICAR.

Quality, Proficiency and Digitalisation

Annual external assessments from accreditation bodies certified the steadfast maintenance of quality management systems as per the international standards of ISO/IEC 17025:2017 and ISO 9001:2015. The laboratory emphasises time-bound and accurate diagnostic service. In general serology based testing is completed within seven days and viral detection in EFS batches within 15 days.

In 2019-20, the laboratory participated in international proficiency testing programme for three major diseases viz., IBR (antibody), Brucellosis (antibody) and BVD (antigen detection) and recorded proficiency (100 per cent agreement) in various test methods such as ELISA, serum neutralisation test (SNT) and real-time PCR test.

The laboratory has standardised a laboratory information management system for assisting disease diagnosis. The in-house system called smart laboratory information management

(SLIM) has readied the web portal and documentation modules for online submission of sample details, creation of analysis records, and communication of equitable test results. This online module has been made functional and put to use on a pilot-scale.

Repository

The laboratory maintains a repository of well-characterised isolates (bacteria and viruses) recovered from bovine clinical samples and sera from animals with known disease and vaccination status. These samples are essential for use as reference in diagnostic tests and also for research and validation of novel diagnostic tests and reagents. During this period, several isolates of ruminant *alphaherpesviruses*, *Brucella abortus* and a large number of well characterised serum samples were added to the repository.

Surveillance on antimicrobial resistance (AMR)

A total of 510 mastitis milk samples (394 clinical and 116 sub-clinical) were processed from 11 states of India for isolation of bacterial agents. The AMR profile of these isolates were determined by phenotypic (antibiotic micro-dilution) and genotypic (antibiotic resistance genes by PCR) techniques. The major bacterial agents isolated were *S. aureus* (25 per cent), non-aureus *Staphylococcus* sp (20 per cent), *Enterococcus* sp (14 per cent), *Streptococcus* sp (13 per cent), *Klebsiella* sp (6 per cent) and *E. coli* (6 per cent). AMR analysis of these isolates revealed multi-drug resistance (MDR) in 52 per cent *Klebsiella* sp, 26 per cent *E. coli*, and 21 per cent *S. aureus* isolates judicious selection of antibiotics may help mitigate MDR in the field.

The ability to form biofilms by some bacteria promotes resistance by impeding efficacy of antibiotics. Preliminary evaluation indicated 90 per cent of the *E. coli* and *S. aureus* isolates harboured genetic determinants for biofilm formation. Virulence profiling, phylogenetic characterisation and determination of are underway to determine the underlining risk of transmission to humans.

ANIMAL NUTRITION

Research and Development activities in Forage Crops

Studies were undertaken to evaluate nine indigenous notified Berseem varieties in comparison to imported Berseem variety Miskawi from Egypt and data was statistically analysed. Two notified varieties Hisar Berseem-2 (HB-2) and Berseem Ludhiana-42 (BL-42) were found to be better than exotic Miskawi variety with average green fodder yield (55.62 t/ha), dry matter yield (10.45 t/ha) and crude protein content (17.08 per cent), that was found to be higher than exotic Miskawi variety by 19.88 per cent, 10.62 per cent and 6.97 per cent respectively.

A MoU was executed with the Indian Institute of Maize Research (IIMR) to jointly develop leafy maize hybrids for fodder and silage purpose.

Studies to determine the efficacy of cow urine against major insect pests of Bt-cotton and Cowpea were undertaken during the year and it was found that tank spray of cow urine 75 per cent + 1 per cent neem oil dissolved in water effectively controlled the sucking insects like aphid, jassid, thrips and white fly in cotton and cowpea crops.

Studies with Moringa fodder

A study was undertaken to identify the right method for making silage from moringa fodder. Results showed that moringa harvested at 75-80 days stage can be ensiled by using jaggery or molasses (10 per cent) or in combination with maize fodder (dough stage) in 50:50 or 30:70 ratio.

Moringa spacing trials were conducted at four different spacing (6 x 6, 9 x 9, 12 x 12 and 12 x 4 inches) at NDDB to evaluate fodder yield at different spacings. Sowing was done using PKM 1 variety seed. After three cuttings, it was observed that crop sown at 12 x 4 inches spacing produced the highest green fodder yield of 53.72 tonne per hectare.

A MoU was executed with the Indian Institute of Maize Research (IIMR) to jointly develop leafy maize hybrids for fodder and silage purpose.

PRODUCT AND PROCESS DEVELOPMENT

NDDB continued its endeavour to facilitate dairy cooperatives to come-up with innovative dairy products. To this end, four new products – Chaska podo (a dairy-based baked product), Chaska spread (a dairy-based spread), HiPro (a high protein fermented milk drink containing double the amount of protein present in milk), and a dairy-based soft candy were developed. Building upon the previous efforts, four new variants of Shishu Sanjeevani (a balanced nutritional supplement for malnourished children aged 3-6 years) were developed to provide for regional preferences using different cereals namely wheat, rice, maize and finger millet. Technology for manufacturing these products is now available for commercial production by dairy cooperatives.

The fusion frozen dairy product developed last year was declared a finalist in the 'Best Dairy Dessert' category in the World Dairy Innovation Awards-2019.

On dairy starter culture front, 20 batches of ready-to-use cultures with consistent quality were produced to support production of dahi and mishti doi respectively. Three new yogurt culture combinations were developed in ready-to-use culture format. Mesophilic lactic acid bacteria for flavour development alongside acid development are being tested for RUC development.

In view of the recent reports of Aflatoxin M1 contamination in milk, a study was undertaken for reducing its levels in milk using lactic acid bacteria, yeast and yeast cell wall component as binders. Mannan Oligosaccharides, a yeast cell wall component was found to have good potential for reduction of AFM1 in milk.

In order to address hygiene and sanitisation without using chemicals in the dairy value chain, bactericidal efficacy of Plasma Activated Water was studied against indicator organisms in laboratory and was found encouraging.

On-site support was extended to Himachal Pradesh State Cooperative Milk Producers' Federation Ltd. to improve the textural quality of paneer manufactured at their Duttanagar milk processing plant. Propagative type starter culture for production of dahi, mishti dahi and lassi were provided to Mother Dairy units at Pilkhuwa and Bhiwandi.

Building an Information Network

Information sourced from various published, unpublished, need-based studies and social media are gathered, analysed and interpreted for understanding their implications for planning, policy decisions and furthering the interests of cooperative dairying

Internet-based Dairy Information System (i-DIS)

Refresher workshops for MIS officers of milk unions of Punjab, Rajasthan, Gujarat, Madhya Pradesh, Uttarakhand, Uttar Pradesh, Bihar, Jharkhand, West Bengal, Odisha, Sikkim and Tamil Nadu were conducted during the year.

National Programme for Dairy Development (NPDD)

National Programme for Dairy Development (NPDD) – a Central Sector Scheme of Government of India (GoI) provides financial assistance for different dairy development works to the milk unions and dairy federations in the country. The cooperative milk unions are required to submit a project proposal along with baseline report consisting of details on milk production, productivity of animals, procurement, processing infrastructure and marketing based on primary sample survey. NDDB conducted surveys to create baseline indicators on the above parameters for monitoring and evaluation and also prepared detailed project reports (DPR) for submission to Government of India. NDDB prepared DPRs at the request of Uttarakhand Milk Federation and Akluj Milk Union of Maharashtra.

Collaborative study with IFCN

The studies on Dairy Farm Economics for 10 typical dairy farms in five regions (North, East, West, South and North-East), two in each region covering Assam, Gujarat, Karnataka, Uttar Pradesh and Odisha states have been undertaken in collaboration with the International Farm Comparison Network (IFCN), Germany. The second round in the series was undertaken in 2019-20 and was observed that the average cost of milk production was ₹ 22.70 per kg of SCM (Solid Corrected Milk: 4 per cent fat & 3.3 per cent protein) and the average realisation was ₹ 31.80 per kg. Of the total cost of milk production, the out-of-pocket expense accounted for about two-thirds.

Statistical profile on dairying

Another publication in the series of Statistical dairy profiles for major dairying states was published during the year. Dairy profiles for 15 states have been published till date. The reports provide trends in demographics, livestock population, milk production, etc. through statistical tables and thematic maps. The State dairy profiles, which are useful to the functionaries of the governments, administrators, research institutions, academic and policy-making bodies, were received well by various stakeholders.

NDDB conducted surveys to create baseline indicators for monitoring and evaluation and also prepared detailed project reports for submission to government of India under NPDD.

Developing Human Resources

NDDB's training initiatives for milk producers, policy-makers and executives are focussed on building professional competence for the dairy business.

During the year,

14,016

persons were trained under different categories, at NDDB Anand and its regional training centres.

Trainings scheduled under the NDP I concluded this year. NDDB continued to receive requests from milk unions, government projects and institutions for training programmes. This trend indicates that the stake holders, realise the importance of training and are willing to invest in it.

During the year, 14,016 persons were trained under different categories, at NDDB Anand and its regional training centres.

Customised programmes were conducted for the gazetted officers of Government of India. The trainings showcased the importance of the cooperative business model. Most importantly, the trainees realised that a major part of the rupee spent on cooperative dairy products, goes into enhancing the livelihood of farmers.

There has been an increasing awareness about the need for training women in dairy animal husbandry. More and more women members were nominated by milk unions for Farmers Orientation Programmes (FOP). 40 per cent of the participants during the year were women.

Trainings on milk marketing strategies were organised where Professors of IIM, Bangalore provided valuable inputs on innovative marketing approaches for the dairy sector.

Series of trainings on the INAPH-Animal Health Modules on controlling FMD, were held for district level officers of Animal Husbandry Departments. These training programmes complemented the efforts under the National Animal Disease Control Programme (NADCP) and the National Artificial Insemination Programme (NAIP).

Solution-oriented trainings were conducted for addressing the emerging needs in dairy business. Dairy entrepreneurship programmes and training on reducing contaminants in milk were conducted for milk producers. Strategic dairy cooperative business management programmes were conducted for officials of milk unions in Tamil Nadu.

At the request of VAMNICOM, Pune, an International Training Programme was organised for participants from SAARC nations. Farmers and executives from India and Nepal participated in the programme. Training on Dairy Plant Management was conducted for the newly recruited professionals of Mazoon Dairy, Oman during the year. Trainings were also conducted for delegates from Bhutan and Egypt on Cooperative Dairy Business Model.

At the request of VAMNICOM, Pune, an International Training Programme was organised for SAARC nations. Farmers and executives from India and Nepal participated in the programme.

Training programmes conducted during 2019-20

Name of the programme	No. of programmes	No. of participants
A. Cooperative Services		
Farmers Orientation/Induction Programme	122	4527
Customised Farmers Orientation Programme	23	834
Management Committee Management Orientation	39	728
Board Orientation Programme	9	112
Business Appreciation Programme	2	33
Training of New Supervisors on Milk Procurement & Producer Relationship Management	2	30
Procurement & Inputs-Basics	1	15
Training of Trainers on Participatory Training Methodology	2	14
Orientation Programme for DCS Presidents	1	9
DCS Secretary Basic Orientation Programme	13	223
DCS Secretary Refresher Programme	15	183
Customised DCS Orientation Programme	1	17
Total	**230**	**6725**
B. Training for Innovations		
Orientation Programme on Manure Management	1	22
Slurry-based Fertiliser Products and Application in Agriculture	8	160
Management of Biogas Plant	20	390
Efficient Manure Management through Cooperation	1	39
Dairy Entrepreneurship	7	76
Total	**37**	**687**
C. Productivity Enhancement		
OVUM Pickup and In Vitro Embryo Production	4	16
Customised Farmers Orientation on Animal Nutrition and Cattle Feed	1	18
INAPH TOT Programme for FMD-CP Project	1	9
Training of Trainers (ToT) on Animal Health module of INAPH under NADCP	33	1223
Training on Ethno Veterinary Medicine	9	248
Training of Technical Officers, Trainers and VLEs on Ration Balancing	1	24
Artificial Insemination (Basic)	17	372
Artificial Insemination (Refresher)	3	54
Local Resource Person Orientation	7	169
Scientific Dairy Animal Management Practices for LRPs	6	114
Dairy Animal Management	55	1864
Total	**137**	**4111**
D. Quality Assurance & Dairy Plant Management		
Clean Milk Production Programme for Milk Producers	1	21
Reduction in contaminants carry over in milk	1	28
Clean Milk Production, Operation & Maintenance of Dairy Equipment for Milk Union Personnel	5	122
Training of Trainers Clean Milk Production & Operation & Maintenance of AMCU and BMCU	1	16
Operation & Maintenance of Bulk Milk Cooler Unit	2	25
Food Safety Training & Certification (FOSTAC)	1	13
Food Safety Supervisor	12	246
Boiler - Operation & Maintenance	2	31
Dairy Plant Management	2	29
Effective Milk Processing & Packaging	1	24
Efficient Operation of Refrigeration Plant	1	8
Energy Conservation & Management	1	2
ETP & Waste Management in Dairy	1	20
Operation & Maintenance of Dairy Plant Equipment	4	83
Hygiene & Sanitation for Dairy Plant	1	24

Name of the programme	No. of programmes	No. of participants
Instrumentation & Automation in Dairy	1	23
Operation & Maintenance of Electrical Systems	1	20
Quality & Food Safety for Dairy Plant	1	14
Total Quality Management	1	11
Occupational Health & Safety Management in Dairy Sector	1	16
ISO/IEC standard 17025:NABL-Awareness & Internal Auditor Programme	1	11
Training in Microbiology	1	19
Training in Analysis of Milk & Milk Products	1	23
Training in Feed Analysis	1	10
Total	**45**	**839**
E. Sectoral Analysis and Studies		
Internet-based Dairy Information System	16	58
Internet-based Dairy Information System-Refresher	5	97
Training on Geographical Information System	1	18
Total	**22**	**173**
F. Other Trainings for Milk Union Personnel's & Govt Officials		
Soft Skills for Enhancing Productivity	1	22
Understanding Basic HR Function	2	30
Customised Programme on Human Resource Development	2	117
Excellent Employees	1	17
Workforce Efficiency for Workplace Productivity	2	33
Executives, Efficiency & Organisational Excellence	2	32
Soft Skills for Enhancing Efficiencies	1	18
Skill Enhancement Programme for Dairy Cooperative Services Consultants	6	145
Marketing of Milk and Milk Products	3	33
Building Blocks of Marketing for Managers	1	24
Milk Marketing Strategies	1	16
Basics Sales & Distribution Management in Dairy Sector	2	41
Building Sales Acumen	1	14
Achievement Motivation	5	58
Strategic Dairy Cooperative Business Management	2	15
Cost & Management Accounting in Dairy Sector	1	24
Finance for Non-Finance Executives	1	13
Developing Emotional Intelligence for Inter-Personal Relations & Personal Effectiveness	1	20
Financial Excellence through Financial Performance	1	16
PFMS - EAT Module (under RGM)	1	18
Advanced GST	3	61
Labour Laws	1	11
Applicability of Direct Tax Provisions in Dairy Sector	1	16
Management Development Programme for Women Executive	1	18
Business Development Programme	1	9
General Management Programme	2	49
Project Management for Dairy Development	1	15
Basics of Supply Chain Management in Dairy Sector	1	12
Orientation Programme on Dairy Cooperatives	1	10
Scientific Animal Husbandry Practices for Vidarbha-Marathwada Project	10	215
Training in Advanced Dairy Farming and Entrepreneurship Development	2	51
Training of Veterinary Officers on Recent Developments in Animal Husbandry	1	9
Exposure visit to Paravets and Farmers	6	124
Study Tour on Dairy Cooperatives	4	126
Total	**72**	**1432**
G. Trainings for Overseas Participants	**3**	**49**
Grand Total	**546**	**14016**

A town hall themed "Samvad" was organised during the year, wherein Chairman interacted with NDDB employees and shared the achievements and learnings from Operation Flood, Perspective Plan and the NDP I.

Manpower Development

Need-based trainings for NDDB officials, employees of dairy cooperatives and producer companies were arranged during the year.

Sponsorship of officers to Post Graduate Diploma in Rural Management

NDDB had taken a significant initiative of launching a 15-month Executive Post Graduate Diploma in Rural Management (PGDMX (R)) at the Institute of Rural Management, Anand (IRMA). The first batch of PGDMX (R) successfully completed their programme in March 2020. 33 officers, including officers from Dairy Co-operatives have enrolled for the second batch which commenced in January 2020.

Initiatives for NDDB employees

A town hall themed "Samvad" was organised during the year, wherein Chairman interacted with NDDB employees and shared the achievements and learnings from Operation Flood, Perspective Plan and the NDP I. The need for remaining committed to the mandate of NDDB enshrined in the NDDB Act and to uphold the culture and values of the organisation were emphasised by the Chairman. Employees shared innovative ideas and suggestions during their interaction with the Chairman.

NDDB employees came together to share their experiences in a programme themed "NDDB Values: Putting Organisation First". Employees shared their inspiring experiences and stories about how NDDB values had helped them and their families.

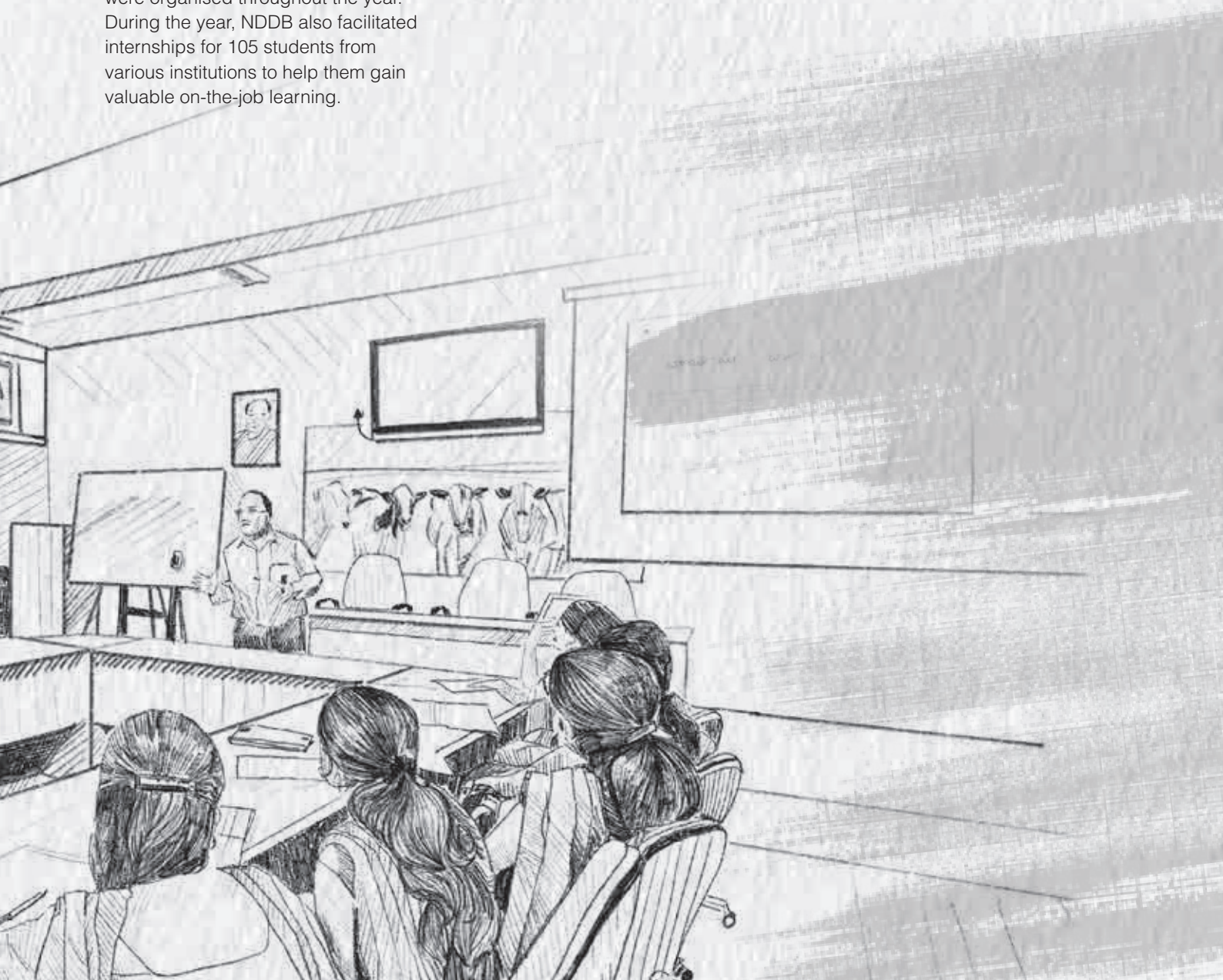
Training in functional and behavioural domains were organised for NDDB employees. Major training programmes facilitated for NDDB employees included Dairy for Non-Dairy Professionals, Creativity and Innovation, Managerial Effectiveness,

Communication Skills, Effective Time Management, Team Building and Developing Leadership. Staff and workers attended training programme on “Holistic Stress Management”. In all, 682 training nominations were processed during the year.

With the focus on organisational capacity building, nine officers participated in the one year mentoring programme and another nine officers underwent two months long sectorial exposure programme at milk unions across the country. Forty nine officers inducted into NDDB’s Future Leadership Development Programme underwent training in identified areas and are working on innovative projects. Employee engagement initiatives like talks on contemporary themes, book review and inspirational videos were organised throughout the year. During the year, NDDB also facilitated internships for 105 students from various institutions to help them gain valuable on-the-job learning.

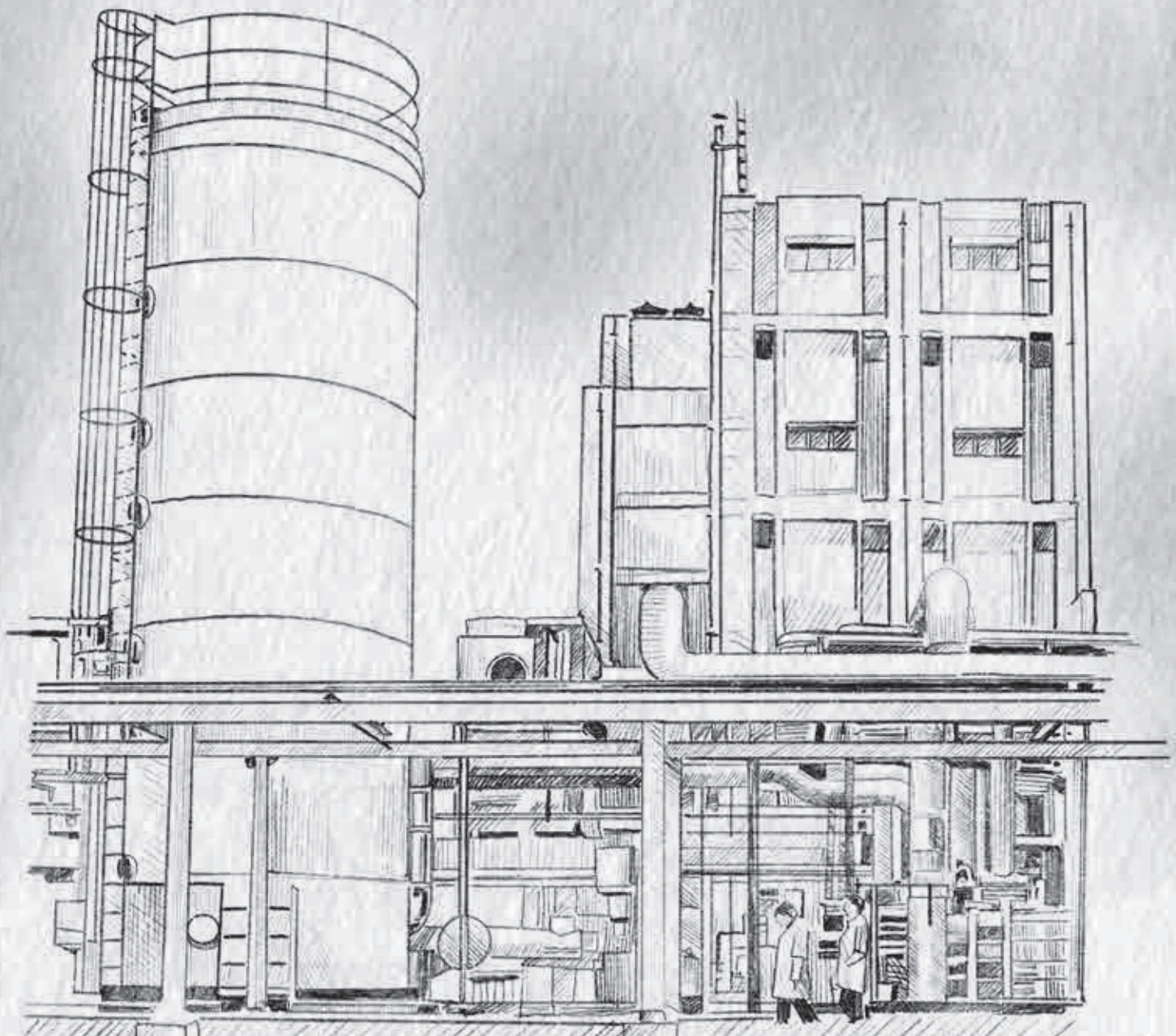
Trainings of NDDB Employees

Name of the Programme	No. of programmes	Nominations	
		Total	SC/ST
Managerial Effectiveness	1	17	2
Team Building	1	30	5
Creativity and Innovation	1	29	5
Communication Skills	1	17	1
Dairy for Non-Dairy Personnel	1	24	5
Leadership Skills	1	23	5
Effective Time Management	3	94	24
Holistic Stress Management and Self Development	4	109	19
I Love Mondays	4	210	38
Other Programmes (employees sponsored at training programmes at outside institutions)	-	129	7
Total	**-**	**682**	**111**



Engineering Projects

NDDB provides consultancy services for execution of projects to dairy cooperatives across the country, creating new processing infrastructure and expanding existing facilities for dairy and cattle feed plants. Services are also being extended for planning, execution and validation of Biosecurity Labs, Animal Vaccine Production Facilities, Animal Experimentation Facility and Frozen Semen Stations. NDDB also undertakes study of existing plants for refurbishing and upgrading infrastructure to improve efficiency, ensuring food safety and to reduce product handling losses.



Project proposals of nine milk unions at an estimated cost for

₹ 7,991 million

were technically appraised and cleared under DIDF

Five projects were completed during the year. These included fully automated 500 TLPD Liquid Milk Plant at Jalgaon (Maharashtra), 40 TLPD Dairy Plant at Sendhwa (Madhya Pradesh), expansion of Cattle Feed plant from 300 MTPD to 450 MTPD at Kolhapur (Maharashtra) and Poultry diagnostics & feed water analysis laboratory (GLP standard) at Palladam, Tamil Nadu and Phase II of Kolhapur Dairy, Maharashtra.

Validation of 11 reports on Quality Assurance & Quality Control of Semen Station projects under the NDP I was completed during the year.

NDDB maintained its emphasis on providing energy-efficient and state-of-the-art technologies for setting up dairy and cattle feed plants. To improve the efficiency of existing dairy plants, studies were carried out and recommendations for upgradation of facilities along with estimates of the required capital investment and payback period were submitted to respective milk unions during the year.

Studies for feasibility of expansion and improving energy efficiency of dairy plants at Nainital (Uttarakhand), Dehradun (Uttarakhand), Barauni (Bihar), Guwahati (Assam), Bhilwara & Dudu (Rajasthan) and one Cattle Feed Plant at Vijayawada (Andhra Pradesh) were completed during the year.

Project proposals of nine milk unions at an estimated cost of ₹ 7,991 million were technically appraised and cleared under DIDF and seven milk unions at an estimated cost of ₹ 2,964.7 million under NPDD.

Major projects executed:

300 TLPD - 500 TLPD Liquid Milk Plant at Jalgaon, Maharashtra

Modernisation and expansion from 300 TLPD to 500 TLPD Liquid Milk processing plant was taken up at Jalgaon Dairy. The fully automated liquid milk plant along with packaging facility was commissioned in July 2019.

40 TLPD Milk Processing and Packing Plant at Sendhwa, Madhya Pradesh

NDDB set up a 40 TLPD milk processing & packing station, at Sendhwa. It has facility to receive milk in cans (18 TLPD) & road milk tanker (22 TLPD). Plant was inaugurated in February 2020.

300 MTPD to 450 MTPD Cattle Feed Plant Expansion Project at Kolhapur, Maharashtra

NDDB completed expansion of cattle feed plant from 300 MTPD to 450 MTPD in September 2019. The plant has facility for Raw Material Storage in Silo System of 4,000 MT capacity and Molasses tank of 5,000 MT capacity along with high precision laboratory equipment for Quality Analysis and Quality Control.

NDDB maintained its emphasis on providing energy-efficient and state-of-the-art technologies for setting up dairy and cattle feed plants.

Poultry Diagnostics & Feed Water Analysis Laboratory at Palladam, Tamil Nadu

NDDB completed a poultry diagnostics & feed water analysis laboratory (Good Laboratory Practice Standards) at Palladam in July 2019.

Pro-Environmental activities (Green Energy Initiations)

Concentrated Solar Thermal (CST): As a policy, all new projects undertaken by NDDB shall have inbuilt component of CST system. NDDB installed 14 lakh kcal/day capacity of CST during 2019-20.

Solar Photovoltaic System: NDDB is exploring installation of ground-mounted or Rooftop Solar PV in Dairy projects. NDDB has submitted a DPR for Sagar Dairy, Madhya Pradesh. NDDB also appraised a project report for 165 kWp Solar PV system for the proposed new dairy at Sinner.

Bio-Safe Laboratories

NDDB provides consultancy services for conceptualising, planning & execution of Biosafety Laboratories (BSL2 & BSL3), clean rooms, animal testing facilities, QA-QC Labs, Bio-Pharma units, Vaccine manufacturing facilities etc. for government organisations.

The major Biosafety and special projects undertaken by NDDB during 2019-20 are:

- Setting up a new BSL3 laboratory with Small Animal testing facility (LATU) at Tamil Nadu Veterinary & Animal Sciences University (TANUVAS), Chennai. The facility has been completed and commissioning is in progress.
- Anthrax Spore Vaccine Production, Blending and Filling facility with Good Manufacturing Practice standards and QA/QC lab (GLP standard), and small animal testing facility at Institute of Veterinary Preventive Medicine, Ranipet, Tamil Nadu for the Department of Animal Husbandry & Veterinary Services, Government of Tamil Nadu
- A new state-of-the-art semen station of 50 lakh doses/annum production capacity at Purnea for Government of Bihar.

Dairy Laboratories

Establishment of Quality Control (QC) Laboratories for 15 dairies across Uttar Pradesh. Supply and installation of lab equipment is in progress.

NDDB is setting up IVF/ETT Laboratories with associated infrastructure like donor/recipient sheds etc. at CCBF's at Hessarghatta, Alamadhi, Dhamrod, Suratgarh, Andeshnagar, Chiplima and Sunabeda.

Ongoing Projects

Project	Capacity	Location
Northern Region		
Aseptic Packing Station	200 TLPD	Bassi Pathana, Punjab
Liquid Milk Plant & Butter Plant	500 TLPD LMP & 10 TPD Butter	Ludhiana, Punjab
Fermented Product Plant	200 TLPD	Jalandhar, Punjab
Western Region		
Dairy & Product Plant along with Powder Plant	30 TPD PP & 1,000 TLPD LMP	Ajmer, Rajasthan
New Dairy Plant	500 TLPD	Bhilwara, Rajasthan
New Product Plant	40 TLPD	Jalgaon, Maharashtra
Dairy Expansion and New Product Block	200 – 300 TLPD LMP	Pune, Maharashtra
Cattle Feed Plant	Renovation, Refurbishing a CFP and a New Corporate Office building	Rajkot, Gujarat
Central Region		
Automated Dairy Plant Expansion	20 – 100 TLPD	Sagar, Madhya Pradesh
Southern Region		
Ice Cream Plant	30 TLPD	Madurai, Tamil Nadu
Ultra Heat Treatment Plant (Aseptic packing in multilayer paper)	25 TLPD	Shivakasi, Tamil Nadu
Automated Cattle Feed Plant Expansion	150 MTPD to 300 MTPD	Vijayawada, Andhra Pradesh
Anthrax Spore Vaccine Production Facility	GMP – 70 lakh doses/annum	IVPM, Ranipet, Tamil Nadu
QA & QC Lab and small animal testing facility (BSL 3)		IVPM, Ranipet, Tamil Nadu
Eastern Region		
Automated Dairy and Milk Powder Plant	500 TLPD & 20 TPD	Arilo-Govindpur, Odisha
Frozen Semen Station	5 million doses /year	Purnea, Bihar
Dairy Plant	50 TLPD	Deogarh, Jharkhand
Dairy Plant	50 TLPD expansion	Sahibgunj, Jharkhand
Dairy Plant	50 TLPD	Palamu, Jharkhand
Cattle Feed Plant	50 MTPD Bypass Protein & 12 MTPD Mineral Mixture Plant	Changsari, Assam
Artificial Insemination Training Institute (AITI)	-	Guwahati, Assam
Other Projects		
IVF/ETT Laboratories with associated infrastructure	7 locations	
Quality Assurance Laboratory Equipment for setting of QC Lab for 15 anchor unit of PCDF	-	15 Dairies in Uttar Pradesh

TLPD – thousand litres per day TPD – tonnes per day PP – Powder Plant LPD – Litres per day

The National Dairy Plan

The dairy sector in India plays a crucial role in the socio-economic development of rural households. Dairying provides livelihood to more than 63 million households, constituting mostly small, marginal and landless farmers with 1-2 animal holdings. Milk contributes significantly to income of milch animal owning households.

Dairying provides livelihood to about

63 million

households

Within agriculture, livestock subsector contributes about 4.2 per cent of India's GDP. Milk has become the single largest agricultural commodity in terms of the value of commodity produced, surpassing the total value output from foodgrains in 2018-19.

In the last four decades, India's small holder system has ensured substantial growth in milk production and the country has continued to be the largest producer of milk in the world.

However, with sustained economic growth and rising income levels, it was anticipated that the demand for milk would grow at a much faster rate and was expected to be about 150 million tonnes by 2016-17 and between 200 and 210 million tonnes by 2021-22.

To meet the growing demand for milk, it was imperative that a scientifically planned multistate initiative be launched.

Overview of the project

NDP I was launched in 2011-12. Initially, it was planned for a period of five years, but was later extended up to 2018-19. The total outlay of the project was ₹ 22,420 million comprising ₹ 15,840 million as International Development Association (IDA) credit, ₹ 1,760 million as Government of India share, ₹ 2,820 million as share of End Implementing Agencies (EIAs) for carrying out the projects in the participating states and ₹ 2,000 million contribution from National Dairy Development Board and its subsidiaries for providing technical and implementation support to the project.

Objectives of the Scheme

The major objectives of the scheme were:

- To help increase productivity of milch animals and thereby increase milk production to meet the rapidly growing demand for milk
- To help provide rural milk producers with greater access to the organised milk-processing sector

Major components

The major components of the scheme included:

A) Productivity Enhancement

- Production of disease-free HGM cattle and buffalo bulls through PT and PS programmes and import of live bulls/equivalent embryos of Jersey/HF breeds for production of exotic Jersey/HF Bulls for semen production
- Strengthening existing semen stations for producing high quality disease-free semen doses
- Setting up a pilot model for viable doorstep AI delivery services based on Standard Operating Procedures [SOPs]
- Enabling milk producers for providing balanced ration to their milch animals to produce milk commensurate with their

In the last four decades, India's small holder system has ensured substantial growth in milk production and the country has continued to be the largest producer of milk in the world.

genetic potential and reduce methane emissions

- Initiatives to increase fodder yields by making available quality fodder seed to farmers, propagation of scientific fodder conservation & preservation techniques by demonstration of silage-making and construction of biomass bunkers etc.

B) Village-based milk procurement systems for weighing, testing quality of milk received and making payment to milk producers

- Milk weighing, testing and collection
- Milk cooling
- Support for creating institutional structure
- Training

C) Project Management and Learning

- ICT-based MIS
- Learning & Evaluation

Project Area

NDP I focussed on the 18 major milk producing states, which include Andhra Pradesh, Bihar, Gujarat, Haryana, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Odisha, Punjab, Rajasthan, Tamil Nadu, Uttar Pradesh, West Bengal, Telangana, Uttarakhand, Jharkhand and Chhattisgarh. Together, these states account for over 90 per cent of the country's milk production. However, the benefits of the project accrued to all the states across the country.

Implementation arrangement

NDP I was implemented by NDDB through a network of EIAs. The EIAs were identified across the states. These primarily included state cooperative dairy federations; district cooperative milk producers unions; cooperative form of enterprises such as producer companies; state livestock development boards; central cattle breeding farms (CCBF), Central Frozen Semen Production and Training Institute (CFSP&TI), Regional Stations for Forage Production and Demonstration (RSFP&D); Registered Societies/Trusts (NGOs); Section 25 Companies, subsidiaries of statutory bodies, ICAR Institutes and Veterinary/ Dairy Institutes/Universities that meet the eligibility criteria for each activity as per the Project Implementation Plan (PIP) or as may be decided by the National Steering Committee (NSC).

NDP I focussed on the 18 major milk producing states. Together, these states account for over 90 per cent of the country's milk production.

The category of EIAs eligible for various activities under NDP I are listed in the table below:

Activity	End Implementing Agencies
Bull Production	EIAs having own semen stations graded A or B or an arrangement with a semen station graded A or B in their latest evaluation.
Semen Production	Semen stations awarded grade 'A' or 'B' by DAHD's CMU (Central Monitoring Unit) in their latest evaluation
Ration Balancing Programme	Milk Unions/Federations/Producer Companies /ICAR Institutes
Fodder Development Programmes	Milk Unions/Federations/Producer Companies/Trusts (NGOs)/Regional stations for forage production and demonstration/ICAR institutes/Veterinary Universities
Village Based Milk Procurement Systems	Milk Unions/Federations/Producer Companies

Pattern of funding of the Scheme

NDP I was funded through a line of credit from the IDA, which along with the share of the GoI flowed from DAHD to NDDB and in turn to eligible EIAs.

Pattern of funding under the scheme was 100 per cent grant-in-aid for nutrition and breeding activities. In case of VBMPS, 50 per cent of the cost of capital items was to be shared by the EIAs.

Key Result Indicators

NDP I consists of a multi-pronged series of initiatives and the key envisaged outputs under the programme are mentioned in the table below:

Activity	Key Outputs
Breed Improvement	
Production of HGM cattle and buffalo bulls	• Production of 2,500 HGM bulls • Import of 400 exotic bulls/equivalent embryos
Strengthening of "A" and "B" graded Semen Stations	• Production of 100 million semen doses annually in the terminal year
Pilot Model for Viable Doorstep AI Delivery Services	• 3,000 MAITs carrying out annual 4 million doorstep AIs by the terminal year
Animal Nutrition	
Ration Balancing Programme	• Coverage of 2.7 million milch animals in 40,000 villages
Fodder Development Programme	• Production of 7,500 tonnes of certified/ truthfully labelled fodder seed • 1,350 silage-making/fodder conservation demonstrations
Village-Based Milk Procurement System	
Strengthening and Expanding Milk Procurement System at Village level	• 23,800 additional villages to be covered • 1.2 million additional milk producers
Project Management and Learning	
Project Management & Learning	• Monitoring, Learning and Evaluation system for collection of data, its analysis and interpretation

Under the breed improvement programmes, 2,456 HGM bulls were made available for distribution.

Project Outputs and Outcomes

NDP I achieved most of its envisaged targets. The achievements of the scheme under major components are given below:

A. PRODUCTION OF HIGH GENETIC MERIT BULLS OF CATTLE AND BUFFALO

Various animal breeding interventions like PT programme, PS programme, Import of Bulls/Embryos and Bull Production through imported embryos were undertaken under NDP I to make available disease-free HGM bulls of different breeds for production of high quality disease-free semen doses. These subprojects have made immense contribution in meeting the replacement requirement of HGM bulls for frozen semen stations across the country.

Progeny Testing Programme: To make available HGM bulls of major dairy breeds of cattle and buffalo to semen stations for production of high quality disease-free semen doses, 14 subprojects of 12 EIAs are under implementation in nine states. The cattle breeds covered under PT programme were Pure Holstein Friesian, Crossbred Holstein Friesian, Cross-bred Jersey and Gir while in buffaloes the breeds covered were Mehsana and Murrah.

Under the subprojects, 2,185 HGM bulls were made available for distribution to semen stations from various PT subprojects, of which 1,933 have been distributed to different semen stations.

HGM bulls produced under these subprojects are expected to increase the productivity of animals of future generations as well as the availability of the performance records would not only facilitate the comparisons and selection of bull mothers but will also provide a valuable reference population for initiating genomic selection programme.

Pedigree Selection Programme: To conserve and promote indigenous breeds of cattle and buffalo in their native tracts by making available HGM bulls for semen production, nine sub projects of eight EIAs from five states are under implementation through PS Programme. The various breeds covered under PS Programme were Kankrej, Hariana, Rathi, Tharparkar, Sahiwal in cattle and Jaffarabadi, Pandharpuri and Nili Ravi in buffaloes.

Under the sub projects, 271 HGM bulls were made available from various Pedigree Selection subprojects, of which 239 were distributed.

Import of Bulls/equivalent embryos: Additionally, to meet the requirement of pure Jersey and Holstein Friesian bulls for production of high quality disease-free semen doses, 171 bulls were imported for semen production. 835 imported embryos were transferred from which 239 calves were born out of which 75 male calves were already distributed.

Strengthening of Semen Stations: Under NDP I, 28 “A” or “B” graded semen stations covering 25 EIAs across 16 states were supported with expansion and upgradation of their facilities to meet the increasing demand of frozen semen doses for AI.

The Semen Station Management System (SSMS) developed and rolled out under NDP I linked all the activities of semen station ranging from bull management, semen production, fodder production, stock management, asset management and sale of semen doses. SSMS was made live in all the 28 semen stations strengthened under NDP I.

Considering the importance of creating a ‘National Link’ for all the semen stations in the country, additionally 10 ‘A’ and ‘B’ graded semen stations in the country were provided with the SSMS software under NDP I.

Pilot Doorstep AI Delivery Services: Under NDP I, three subprojects were implemented by the producer companies to set up a pilot model for doorstep AI delivery services operating in a financially self-sustainable manner and using SOPs, including, animal tagging and performance record.

These pilot subprojects have cumulatively covered 12,322 villages through 1,330 mobile AI technicians and have carried out 7.83 lakh artificial inseminations during 2018-19. To increase the awareness about the benefits of artificial inseminations and other aspects related to animal breeding, 32,000 farmer meetings were organised along with 9,880 infertility management camps & 1,317 calf shows. 25 lakh inseminations were carried out under the project which led to/will lead to birth of an estimated 4.5 lakh superior female progenies.

Ration Balancing Programme:
Feeding balanced ration to milch animals through RBP has benefited milk producers by increasing milk production per animal per day and also by reducing the average cost of feeding. Under RBP, LRP formulates a least cost balanced ration for milch animals from locally available feed resources using the INAPH software.

Under this programme, 117 subprojects of 105 EIAs from 18 states were approved. Under these subprojects, advice on balanced ration was provided for 28.65 lakh milch animals in 33,374 villages.

The interventions have resulted in reducing the cost of feeding per kg of milk by more than 11.8 per cent on an average. As a result of this, farmers have realised increase in net daily income of ₹ 25.52 per animal, substantially contributing in increasing farmers' income. Other benefits of this intervention include, better animal health, increase in lactation length, decrease in inter calving period as well as more than 13.3 per cent reduction in methane emissions by lactating cows and buffaloes.

Fodder Development Programme:
Under Fodder Development Programme, certified/truthfully labelled fodder seeds were promoted to increase fodder production. Field demonstrations of mowers, silage making and biomass storage silos have been carried out to popularise these technologies among farmers. 52 fodder development subprojects in 13 states have been implemented.

Under the Fodder Development subprojects, support was provided for production of 13,038 MT of fodder seeds and sale of 30,557 MT of certified/truthfully labelled fodder seeds. 2,143 silage demonstrations were organised, 669 mowers have been procured and 128 biomass storage silos have been constructed.

In the 20 Micro Training Centres (MTC) set up with 10 EIAs, 44,076 farmers have been trained on improved fodder production & conservation technologies.

Around 20 lakh farmers participated under Fodder Development Programme.

B. VILLAGE-BASED MILK PROCUREMENT SYSTEM

VBMPS under NDP I provided rural milk producers with greater access to the organised milk-processing sector by forming and strengthening Dairy Cooperatives and Producer Companies. Under this activity, new societies/pooling points were formed and existing societies/pooling points were strengthened by providing village level capital items like Bulk Milk Coolers, Automated Milk Collection Units (AMCU), Data Processor based Milk Collection Units (DPMCU), Milk Cans, etc. While installation of DPMCUs and AMCUs resulted in increased transparency and fairness in milk procurement operations, installation of BMCs gave farmers more flexibility in pouring milk as well as improved the quality of milk.

Under VBMPS, 243 subprojects from 17 states have been implemented by 123 EIAs in 52,509 villages and have enrolled 16.88 lakh additional milk producers. Out of the total members enrolled, 7.64 lakh (45 per cent of total) are women members and 11.35 lakh (67 per cent of total) are smallholders.

Under NDP I,4,171 BMCs were installed at the village level which created chilling capacity of 124.94 LLPD across the country, leading to improvement in the keeping quality, saving transportation cost and increase in milk procurement volume.

Training and Capacity Building:

For developing high quality human resources for timely and efficient implementation of activities under NDP I, several human resource initiatives and required training and capacity building programmes were organised to manage the continuous metamorphosis taking place in the dairy sector.

Under VBMPS, 243 subprojects from 17 states have been implemented by 123 EIAs in 52,509 villages and have enrolled 16.88 lakh additional milk producers.

The training and capacity building programmes were organised by both NDDB and EIAs for milk producers, executives of the union, village resource persons and board members of the union.

Almost 26 lakh participants have been trained and oriented under NDP I. The trainings conducted at NDDB level included:

- 47,953 milk producers, 1,216 board of directors, 3,174 executives were trained under VBMPS component.
- 1,239 executives were trained under animal nutrition component (947 under RBP & 292 under fodder development).
- 179 executives of various categories were trained under PT and PS programmes.
- 72 officers from dairy cooperatives and producer companies attended training programmes on Marketing facilitated by resource persons from

Indian Institute of Management, Bangalore during the year. Two General Management Programmes of 21 days duration were also organised for 66 officers from Dairy Cooperatives and Producer Companies at the Institute of Rural Management, Anand. Four training programmes on strategic leadership roles and change management, catering to 89 participants from Dairy Cooperatives and Producer companies were organised at premiere management institutes during the year.

The trainings conducted at the EIA level included:

- 22,69,501 milk producers, 1,21,714 management committee members of new DCS, 17,513 secretaries of existing DCS, 12,816 secretaries of new DCS, 35,096 VRPs and 7,374 executives have been trained by EIAs.
- 39,452 LRPs were trained under RBP & 48 executives were trained under seed production technology.
- Seven managers, 7,258 village resource persons & 521 supervisors of various categories were trained under PT & PS respectively.
- 24 managers, 230 executives, 117 technicians & 2,212 village resource persons were trained under strengthening of semen station.
- 2,979 village resource persons & 1,939 executives were trained by producer companies under pilot AI delivery systems.

Further, virtual classroom sessions were conducted. Use of ICT tools have resulted in reducing carbon footprints by eliminating travel and reducing costs.

Environment and Social Management: While implementing the various activities under NDP I, several social inclusion and environment mitigation measures have been undertaken with a focus on increasing participation of women, smallholders and schedule caste & schedule tribes for promotion of sustainable dairying practices. Some of the key inclusions are:

- Coverage of beneficiaries under NDP I
- Promoting Renewable Energy like Solar and Biogas
- Bio-Medical Waste Management at Semen Stations
- Implementing Environment and Social Action Plan (ESAP)

OVER

26 lakh

PARTICIPANTS HAVE BEEN TRAINED UNDER NDP I.

Financial Outputs

Under NDP I, 577 subprojects with the total grant assistance of ₹ 17,599.73 million were approved. The approved subprojects included 103 subprojects on Project Management and Learning activities with a total outlay of ₹ 1,030.05 million.

Out of the cumulative receipt of ₹ 17,600 million from DAHD, ₹ 16,580.04 million has been released by NDDB to EIAs till March 2020 and the fund utilisation till March 2020 has been ₹ 16,381.44 million.

As against the NDP I project outlay of ₹ 22,420 million, ₹ 22,383.32 million was utilised till March 2020 (including NDDB and its subsidiaries contribution of ₹ 1,944.73 million).

Further, NDP I has been successful in maximising pooled resources which is evident from the contribution of ₹ 4,057.15 million from the EIAs as against the target of ₹ 2,820 million EIA contribution, which is 44 per cent higher than what was envisaged.

UNDER VBMPS

52,509 villages

COVERING ABOUT

16.88 lakh

PRODUCER MEMBERS WERE INCLUDED AS DIRECT BENEFICIARIES.

The activity-wise and state-wise financial status is provided in the tables below:

Activity-wise NDP I Financial Status:

Activity	No. of approved sub projects	Amount in ₹ Million	
		Grant Assistance	Fund Utilisation till Mar 2020
Animal Breeding	**62**	**6,645.25**	**6,183.16**
Progeny Testing Programme	14	2,035.38	1,974.54
Pedigree Selection Programme	9	341.87	327.13
Strengthening of Semen Stations	28	2,949.76	2,870.14
Pilot AI Delivery Services	4	772.84	759.70
Import of Bulls	1	279.27	129.32
Import of Embryos/ Semen/ BPTIE	6	266.13	122.33
Animal Nutrition	**169**	**3,062.11**	**2,974.62**
Ration Balancing Programme	117	2,342.40	2,280.13
Fodder Development	52	719.71	694.49
Village Based Milk Procurement System	**243**	6,862.32	6,404.79
Sub Total	**474**	**16,569.68**	**15,562.57**
Project Management & Learning	103	1,030.05	818.87
Total	**577**	**17,599.73**	**16,381.44**

State-wise NDP I Financial Status:

State	No. of approved sub projects	Amount in ₹ Million	
		Grant Assistance	Fund Utilisation till March 2020
Andhra Pradesh	20	846.00	818.91
Bihar	32	623.59	598.15
Chhattisgarh	4	110.26	78.53
Gujarat	61	3,485.41	3,307.33
Haryana	25	643.27	608.64
Jharkhand	2	46.83	43.92
Karnataka	50	1,717.59	1,630.60
Kerala	17	433.99	418.27
Madhya Pradesh	16	218.96	207.66
Maharashtra	49	1,158.19	1,113.61
Odisha	22	223.02	206.40
Punjab	32	1,105.44	1,029.74
Rajasthan	41	2,113.59	2,050.23
Tamil Nadu	29	1,065.90	1,042.81
Telangana	11	246.23	240.11
Uttar Pradesh	29	1,513.96	1,482.72
Uttarakhand	7	198.49	194.24
West Bengal	26	413.20	361.37
Centralised	1	405.77	129.32
Sub total	**474**	**16,569.68**	**15,562.57**
Project Management & Learning	103	1,030.05	818.87
Total	**577**	**17,599.73**	**16,381.44**

The implementation of NDP I came to an end on 29th November, 2019 and the total utilisation under NDP I as on 31st March, 2020 was ₹ 22,383.32 million.

Project Management and Learning

The project supported and encouraged EIAs to use and adapt various information and communications technology enabled tools for reporting and monitoring. The project management and learning component was quite robust and supported more than 16 external studies on various aspects of project implementation in the country.

Under this component 103 subprojects were taken up as part of centralised project management & learning activities.

Under Learning and Evaluation section of PM&L, 16 external studies were undertaken based on the emerging needs during implementation of the project. These studies were carried out by specialised agencies/ external consultants for monitoring and evaluation of different activities under NDP I and their impact. It helped in determination of project level indicators, evaluation of the outcome and impact of various interventions taken up under the project, validation of the project implementation progress made, and course correction of the project if required.

Project Development Objectives-(Outcomes)

For monitoring and evaluation of the project development objectives of NDP I, Development Research & Services (P) Ltd., New Delhi was appointed as the external consultant following the World Bank Procurement Guidelines. The agency carried out Baseline, Mid-term, End-term (M&E) and four intermediate Annual Surveys for the entire duration of NDP I and the results are provided below:

Project Development Indicators (Endline survey-2018-19)

Sl. No.	Indicators	Unit of Measure	Baseline	End of Project Target	Achievement
1	Milk production/animal	Litres/ day	5.03	5.53	5.80
2	Proportion of “in-milk” female animals to adult female animals	Per cent	63	66	67
3	Proportion of total milk sold to total production	Per cent	65	65	66
4	Share of milk sold to the organised sector (as a share of production)	Per cent	45	56	59

As per the M&E endline survey results as mentioned below, NDP I has achieved the targets as envisaged under the PDO level indicators.

A total of 16 studies were conducted by hiring external consultants. The detailed list of studies and the major findings have been summarised in the table below:

Sr. No.	Intervention/Activity	Consultant	Major Findings
1	Methane Emission Measurement Study (NR)	NDRI, Karnal	Balanced feeding has an effect on enteric methane emission by maintaining an appropriate rumen environment suitable for microbial proliferation, which is required for improving feed efficiency and decreasing methane emission per unit of milk yield.
2	Methane Emission Measurement Study (WR)	AAU, Anand	
3	Special studies on strengthening women empowerment	IRMA, Anand	The programme village women were found to be 5 per cent more likely to participate in village level infrastructure discussions and 6 per cent more likely to demand fair wages for public works and protest misbehaviour by authorities and elected representatives.
4	RBP Impact Study (NR and WR)	NDRI, Karna & IRMA I	**North and West (NDRI)** Average milk productivity has increased by 13 per cent in cattle (in both Gujarat & Punjab) through RBP, while productivity improvement in buffaloes due to RBP was 5.5 per cent & 17 per cent respectively in Gujarat and Punjab states. There was decrease in cost of feeding the cows by 18-19 per cent in both the states while it was 2.5-2.6 per cent in case of buffaloes in both the states . The estimates of incremental gains to dairy farmers due to enhanced milk production and decreased feed cost worked out to be between ₹ 20-40 per day per animal in most cases.
5			**South (IRMA)** The RBP households produced about 470 ml more milk per animal per day on an average as compared to the non-RBP households. One out of every three RBP animal required one less insemination for conception. The feeding cost of per animal per day on an average declined by about ₹ 6 in the state of Karnataka whereas it increased by about ₹ 12 in the state of Kerala. At the aggregate level, the feeding cost increased by about ₹ 3 per animal per day.
6	Contribution of NDP I in inclusion, equity and income of Dairy farmers	IEG, New Delhi	In case of cow, an average dairy farmer's milk production per day in intervention villages was 14.5 litres vis-à-vis 11.7 litres per day in control villages. Similarly, the average buffalo milk production per dairy farmer in intervention and control villages was 9.4 and 6.0 litres per day respectively. The gross receipt from cow milk production in intervention and control villages was found to be ₹ 393 and ₹ 310 per day respectively. The gross receipt from buffalo milk in intervention and control villages was ₹ 276 and ₹ 198 per day respectively.
7	Sustainability of Dairy Cooperative Societies organised under NDP I	IRMA	The composite index was developed that consists of (i) Physical technical support (supply chain), (ii) DCS ability (finance & payment), (iii) Governance & management, (iv) Allied support (state/central govt.) and (v) Common support (amenities) When the index value is found very high, it tends to lead to a counter-productive effect.
8	Understanding the existing knowledge/ skill level and attitude/ perception of rural youth towards dairying in NDP I villages	IEG, New Delhi	Basic awareness regarding dairy-farming was found to be high among young dairy farmers (67.5 per cent) **Willingness to choose dairy as a career option:** The willingness to engage in dairy sector is noticeable (about three times) higher among female youth (65.2 per cent) compared to male youth (23.1 per cent). Constraints in shifting to dairy, i.e. loan facility, risk-taking ability, uncertain markets, intensive labour required etc.

Sr. No.	Intervention/Activity	Consultant	Major Findings
9	Assessment of HRD issues in the Dairy Coops	IRMA	Shortage of manpower due to stoppage of recruitment in most of the EIAs and substantial increase in milk handling. To bridge the gap, most of the sample EIAs have been employing workers and/or professionals on short-term basis, often through labour contracts.
10	**Special Study:** Impact Assessment and Evaluation of Fodder Seed Production and sales under NDP I	AERC, Anand	On an average, the availability of fodder increased by around 43 per cent over base year. The fodder seed growers have noted around 33 per cent increase in productivity of fodder. Around 87 per cent of total selected households have reported that due to availability of fodder after the implementation of FDP, milk productivity has increased by 43 per cent.
11	External Monitoring and Evaluation of NDP I	DRS (P) Ltd., New Delhi	Average milk yield of cattle and buffaloes in the project area increased from 5.03 litres (baseline) to about 5.8 litres in Endline survey Proportion of 'in-milk" female animals to adult female animals in the project area increased from 63 per cent (baseline) to about 67 per cent as per Endline survey. Proportion of milk sold to total production in the project area from 65 per cent (baseline) to 66 per cent as per Endline survey. Share of milk sold to the organised sector in the project area increased from 45 per cent (Baseline) to 59 per cent (Endline).
12	**Special Study:** Social inclusion impact of NDP I with regard to empowerment of Schedule caste and Tribal population	XISS, Ranchi	The result of the access of SC and ST communities to DCS enrolment and services of automated Milk Collection Units (AMCUs) were found not to be significantly different as compared to that of non-SC/ST households. This implies that SC/ST Beneficiary households were provided access equal to that of non-SC/ST households to DCS enrolment and its services
13	Estimation of Demand for Milk and Milk Products	Neilsen India Pvt. Ltd, New Delhi	Total consumption (2019): 161 MMT; Total household consumption: Rural (96 MMT) 60 per cent and Urban (65 MMT) 40 per cent; Consumption: 65 million + cities: 30 MMT (19 per cent); Total demand in 2030: 267 MMT; Urban: 152 MMT (57 per cent), Rural: 115 MMT (43 per cent)
14	Study on socio-economic impact of dairy development in India and Economic and Financial analysis of NDP I	NCAER, New Delhi	The availability of milk during the NDP-I period had perceptibly increased considerably in the project villages (55.9 per cent) as compared to their control counterparts (33.7 per cent). The average household income in the project area (₹ 43,710 per annum) was higher than the control area (₹ 39,646 per year). The Financial Rate of Return (FRR) for the project was 70.3 per cent and the Economic Rate of Return (ERR) was 81.9 per cent as against the ex-ante FRR of 22.1 per cent and ERR of 23.5 per cent.
15	Roadmap and strategies to promote export of dairy products for the organised dairy sector	IIFT, New Delhi	Two product categories have been identified on the basis of India's dairy product positioning in the world market and trade value. These categories are named "Potential Thrust Products" and "Retain Existing Products". With an aim to increase India's dairy export to 5 per cent of total world's trade (US$ 5.5 billion) by 2030, market expansion in 3 different phases was envisaged.
16	Breakeven Analysis in Dairy farm Enterprises and Strategies for its Sustainable Growth	AERC, Anand	Break-even output of milk was lowest for buffaloes and was the highest for cross bred cows during the lactation period. Sensitivity analysis shows that feeding interventions by feeding balanced feed applying the Total Mixed Ration (TMR) concept can significantly improve the net income of farmers and lower the breakeven point.

New/Innovative Initiatives under Project Management & Learning

An "Innovation Fund" was established under NDP I from which competitively selected proposals were financed for testing proof-of-concept for new and promising technologies towards greater dairy productivity and competitiveness.

The objective and progress of activities approved under New/Innovative activities is provided below:

Developing genomic selection methodology for various cattle breeds in India:
The objective was to establish a channel for biological sample collection from performance recorded animals under NDP I and to develop genomic selection procedures for HFCB, JCB, Gir and Kankrej cattle breeds and use Genomic Breeding Values for accurate selection of bulls.

The project envisages use of INDUSCHIP for genotyping recorded animals of cattle breeds under NDP I and 9,768 cattle samples were genotyped. The project also standardised the method of estimation of GEBV using chromopainting in CBHF and CB Jersey cattle.

Developing and validating genotyping microarray chip for buffaloes for genomic selection:
Develop genotyping microarray chip for genomic selection of Buffaloes and to validate the chip's performance and explore possibilities for developing genomic prediction equation. Whole Genome Sequencing of 296 buffaloes of 10 major Indian buffalo breeds was performed to study the variation in Indian Buffaloes and the First de-novo near complete haplotype phased (parent-wise) genome assembly of river buffalo (Bubalus bubalis) was developed under the project. A medium density microarray chip "BUFFCHIP" was developed and 4,992 buffalo samples have been genotped.

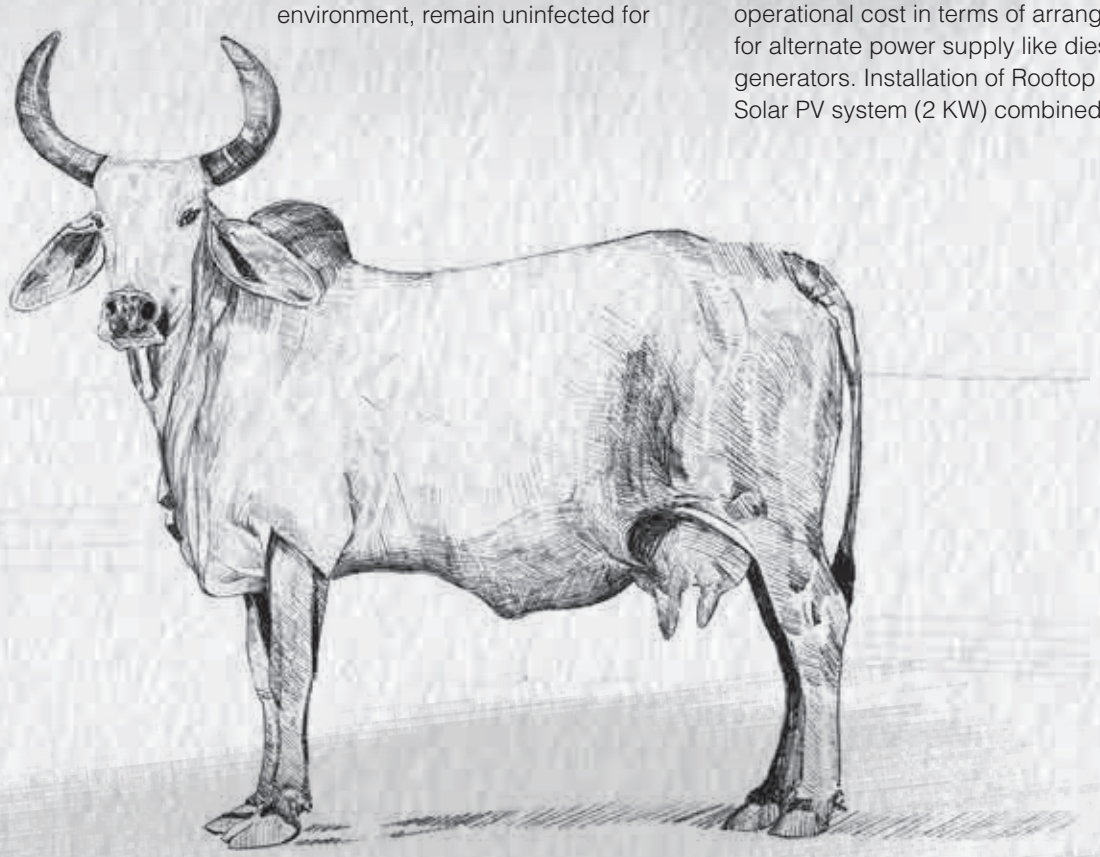
Popularisation Infectious Bovine Rhinotracheitis (IBR) control using inactivated marker vaccine
To test the efficacy of the inactivated marker vaccine more than 9,500 animals were vaccinated in ten villages of three different districts located in two states. Altogether, 47,562 doses of vaccine have been administered.

More than 98 per cent of the IBR vaccinated animals housed in endemic environment, remain uninfected for IBR during the study of approx. 2,875 blood samples for analysing the sero-conversion.

Provision of data loggers on a pilot basis for the Bulk Milk Coolers installed at village level dairy cooperative societies under NDP I
Installation of data loggers on BMC provided under NDP I on a pilot

basis helped monitor and control the performance of the BMCs on a real-time basis. Provision of SMS alerts and web portal based information through data loggers helped effective remote performance monitoring. It also helped in planning for preventive breakdowns and addressing breakdown maintenance in minimum time lag for BMCs. 69 data loggers were installed covering 69 milk unions/PCs across the country.

Installation of Rooftop Solar PV system at new/strengthened village DCS/MPPs under NDP I
Village DCS/MPPs depend on electricity or diesel generators set for power consumption. Due to their location in the interior parts of the country, these village DCS/MPPs are faced with irregular power supply which not only hampers their operations but also increases their operational cost in terms of arranging for alternate power supply like diesel generators. Installation of Rooftop Solar PV system (2 KW) combined



with a backup battery & inverter would encourage adoption of clean alternate sources of energy at affordable cost.

61 solar rooftop panels were installed at DCS' across states in the country on a pilot basis to reduce dependency on grid connected power supply.

Plants under the Manure Management Initiative of NDP I

The main objective of the initiative was to promote use of biogas as clean fuel for cooking, use of bio-digested slurry as fertiliser input for agriculture, sale of surplus slurry at remunerative price and contribution towards the Swachh Bharat Mission of GoI.

A total of 1,000 Flexi-Biogas Plants were provided on pilot basis to promote affordable & easy-to-use clean energy alternative at village level to 32 milk unions across the country.

Community Biogas Plant implemented by Chhattisgarh State Cooperative Dairy Federation Ltd

A community biogas plant is sanctioned in khairkhunt village of chhattisgarh for creating a DCS based ownership model. The project has been successfully completed and the Biogas Plant of 100 Cubic meter capacity has been installed by Chhattisgarh State Cooperative Dairy Federation Ltd. The plant presently supplies gas to 130 families at Rs 210 per family/month.

Pilot Project on Moringa Cultivation to be implemented by Mysore Milk Union

Moringa- has potential to perennially produce enormous biomass, rich in nutrients - protein, minerals & vitamins for our dairy animals. To maximise fodder yield in select varieties of Moringa which would help in identifying the right variety and spacing that could be standardised for cultivation. Trails are being carried out by the Mysore milk union and the data is regularly analysed by experts.

Innovative procurement practices adopted

About 150 EIAs across the 18 participating states of India required some standard items repeatedly (for example, Bulk Milk Cooling Unit). Because of this and the varying capacity among the EIAs, NDDB proposed the use of Framework Agreements (FA) for such items. Under NDP I, FA were centrally set-up by NDDB but was being operated by EIAs, who issued purchase orders and released payments. As the EIAs had never used FA in the past, a series of training workshops were organised for them. Time taken in placing POs under FA is 18-25 days (in comparison to National Competitive Bidding or NCB, which is around 120 days and shopping which is around 30 -45 days).

It was also noted that on average 4.9 proposals were received for FA, which is higher than average for NCB in most Bank-financed projects.

Use of FA has not only resulted in accelerating procurement process but also in monetary saving up to 20 per cent in many cases. Further, a web-based procurement management information system (MIS) was developed to help NDDB monitor utilisation of FA set up by it as well as overall progress on decentralised procurement. The MIS also helped EIAs in sharing data among each other.

Lessons Learnt

The main lessons learned during project implementation are as follows:

1) In any project involving farmer controlled institutions like cooperatives or milk producer companies, an understanding of the proper role of government in project implementation is crucial. Taking into account the learnings from NDP I, future project emphasis should be on implementation of the policy and regulatory measures rather than adoption.

2) In project design, especially in the case of complex development programmes, particular attention should be paid to assessing existing situation and to devise ways to overcome or manage existing impediments. Under NDP

I, the same was done during the implementation stages wherein based on the feedback from EIAs and after assessing their requirements, emphasis was made on providing village level chilling and testing facilities to manage the increased inflow of milk to DCS/ MPPs. Also, many interventions in the field of Animal Genetics, Animal Health, Feed and Fodder and Renewable & Clean energy resources were made under NDP I based on the overall assessment of the dairy sector and the existing impediments therein.

3) The external studies conducted under NDP I have highlighted that about 75 per cent of milch animal population comprising crossbred cows and buffaloes together accounted for about 90 per cent of total milk production. The marginal farmers dominated in both programme and control area (43-45 per cent). They also accounted for the largest share of milch animals (41-44 per cent). However, the average milk yield per in-milk animal was the highest in case of semi-medium farmers in both programmes and control areas. The average milk yield, in general, was better in programme area. The average in-milk yield of animals increased with the rise in herd size in the project area. Any future programme in the dairy sector should focus on inclusion of small and marginal farmers as they constitute the largest share of milch animals and face greater challenges in terms of productivity and dairy economics.

4) Properly planned interventions at the village level help in creating market access with remunerative price for the milk supplied by the farmers. Under NDP I, as per the external studies it was observed that the average milk production and sale per milk producing household was better in programme area (production -10.9 litres & sale-8.1 litres) than that in the control area (production-9.4 litres & sales-6.8 litres). Expectedly, the average milk production and sale per household increased with growing herd size. Cash payment remained the major mode of payment to MAHs by both private dairies and cooperative sector (around 85-86 per cent and 73 per cent respectively) in both areas. The milk payment cycle for cooperative and private players was relatively shorter than Dudhia (Milk Vendor). Therefore, interventions like NDP I are an important tool to empower the dairy farmers with better pricing and transparent systems so that they are not manipulated by middlemen.

5) Out of all the animals that received any breeding service during the last two years, about three-fifths of animals received only AI service, about 30 per cent received only natural service and around one-tenth received both AI service and NS in the study area. It may be mentioned that the coverage of AI reported under NDP I project area was more than double than the same at the national level. Given the proliferation of AI operators across India (now over 1,30,000), it is important to ensure widespread SOP adoption and, more importantly, how the Breeding Bill will be implemented in the context of improved AI.

   NDP I has made significant progress with genomic approaches and has developed the first genotyping microarray chip for buffalos (BUFFCHIP) for use in genomic selection. It is estimated that genomics nearly doubles the rates of genetic progress, compared to PT/PS programmes.

6) Under NDP I, across all MAHs, the awareness about the certified/ truthfully labelled seeds was higher in programme area (38 per cent) as compared to control area (31

per cent). However, if only fodder growing households were taken, the awareness level has been reported quite high. Almost 8 out of 10 fodder growing households informed that they had knowledge about Certified/ Truthfully labelled seeds. Among fodder cultivating households, almost all of them reported using certified/truthfully labelled seeds in both programme and control areas. This was a welcome change in the project area.

7) About 70 per cent of the MAHs in RBP surveyed villages had reported that they knew about RBP programme. Almost all of them reported to have been approached by an LRP to advise them to feed their animals as per RBP. Nearly 79 per cent of MAHs, approached by LRP, had reported coverage of their animals under RBP. On average 1.4 animals per MAH were covered under RBP.

   Average milk yield per animal in Endline survey which was 5.2 litres per day before RBP advisory had gone up to 6.3 litres per day post advisory. Similarly, average feeding cost per animal in Endline survey was ₹ 143 per day before RBP advisory. It has reduced to ₹ 136 per day post advisory.

8) Benefits of VBMPS reported by MAH in the project areas included better milk price (88 per cent); followed by no wastage of milk (74 per cent); time saved in marketing of milk (43 per cent); advantage of getting longer time for milk pouring (27 per cent); availability of better AI service (27 per cent); and subsidised cattle feed (20 per cent).

   The success of the intervention among the farmers was witnessed in terms of the participation of more than 26 lakh farmer producers in the various training programmes conducted under the component. The activity has firmly established the fact that multi-pronged benefits can be accrued through interventions at the village level which is reflected in participation of women under NDP I which was almost 45 per cent of the total 16.88 lakh members enrolled. Greater social integration in terms of participation of 67 per cent smallholders was achieved under the component. We have realised that with the establishment of fully functional dairy cooperative societies at the village level, improves the overall economic activity of the area.

9) Data collection and analytics can successfully drive project implementation, anchor-needed course correction and allow transparent and objective assessment of impact.

10) It is one of the most important aspects of successfully implementing a project of such magnitude and scale with diverse geographical locations and multitude of EIAs. Under NDP I, a multi-approach of project management both at the EIA level and at NDDB was followed. NDDB conducted more than 17 meetings of National Steering Committee and 30 Project Steering Committee meetings in addition to more than 35 regional review meetings at the state level. These meetings ensured that there was proper feedback mechanism in place and the bottlenecks as highlighted by the EIAs were addressed immediately duly supported by policy level interventions if required.

    Further, the Project Management Committee and Project Management Cell constituted as part of the subprojects ensured smooth implementation of the subprojects at the project level. In addition to this, NDDB followed a decentralised mechanism of monitoring through a network of Monitoring Officers from NDDB who were assigned a set of projects for review and monitoring.

    Policy reform as an element of project design can significantly strengthen the enabling environment for project execution. For any development sector project, it is important to ensure timely and prompt policy and technical support for smooth implementation of the projects and the model adopted under NDP I is a testimony to the success of this approach.

CALF

CALF is a multi-disciplinary analytical laboratory of National Dairy Development Board, which helps food and feed industries to comply with National and International food safety standards. CALF offers highly advanced analytical testing services which fulfil the requirement of Dairy products, Food, Honey, Water, Fruits, Vegetables, Animal feed and Genetic analysis.

During 2019-20,
CALF analysed about

25,000 samples

These samples were analysed for
7.43 lakhs tests

During 2019-20, CALF analysed 25,000 samples. These samples were analysed for 7.43 lakh tests comprising 7.21 lakh tests for chemical analysis of milk products, fruits, vegetables, fats, oils, feed and premixes; 7,600 tests for microbiological analysis and 14,500 tests for animal genetics. Significant annual growth of 41.4 per cent has been achieved in the receipt of samples of food and dairy products.

Laboratory accreditation was renewed as per the ISO 17025: 2017 in 2019 by the National Accreditation Board for testing and calibration Laboratories (NABL) for Chemical and Biological testing (Microbiological & Genetic analysis). The accredited scope of analysis has increased to about 2,800 tests in this assessment, resulting in more than threefold enhancements in accredited scope. CALF was also assessed and recognised by:

a) Food Safety and Standards Authority of India (FSSAI) for testing of Dairy products & Analogues, Fats, Oils and Fat emulsions, Fruit and Vegetable products, Cereal and cereal products, sweetening agents including Honey, Beverages (other than Dairy and Fruit & Vegetable based) and Proprietary Food.

b) Export Inspection Council (EIC) for Milk and milk products, Honey, Food and agricultural products, Water and Animal feed.

c) Agricultural and Processed Food Products Export Development Authority (APEDA) for Fruits (Pomegranate, Grapes, Mango, Apple, Banana and other fruits) and Vegetables (Okra, Cabbage, Bottle Gourd, Brinjal, Potatoes, Leafy Vegetables etc).

d) Bureau of Indian Standards (BIS) for testing of Milk products.

CALF is recognised as a National Reference Laboratory (NRL) by FSSAI for Dairy and dairy products based upon state-of-the-art infrastructure, technical competency, accreditation, publications, resources and research & development.

As NRL, CALF had successfully conducted analytical development on various food safety challenges i.e. detection of adulteration in Ghee and effect of preservatives on analysis of fortificant vitamins in Milk.

CALF had also conducted four Proficiency Testing Programs in Chemical and Biological analysis as per ISO 17043:2010, wherein various analytical laboratories participated and have been evaluated.

During the year, laboratory acquired highly sophisticated world-class analytical instruments like Elemental Analyser Isotope-Ratio Mass Spectrometer (EA-IRMS), Liquid Chromatograph Isotope-Ratio Mass Spectrometer (LC-IRMS), and Triple Quadrupole Inductive Coupled Mass

Laboratory accreditation was renewed as per the ISO 17025: 2017 in 2019 by the National Accreditation Board for testing and calibration Laboratories (NABL)

Spectrometer hyphenated with HPLC (QQQ-ICPMS-LC) with financial assistance from National Bee Board (NBB) and FSSAI respectively.

CALF has developed and validated methods as per 2002/657/EC on LC-MS/MS for analysis of antibiotics and veterinary drugs (28 different compounds) in Milk as per Food Safety and Standard Authority of India (FSSAI).

The facility for testing of various new products as per FSSAI regulations was standardised at the laboratory during the year:

a) **Microbiology testing:** Cereal, pulses & cereal products, Coffee & cocoa products, Cultures for baking & brewing, Dairy starter cultures, Probiotics cultures, Edible salt, Herbs & spices, Honey & honey products, Jam, Juices & Sauces, Nut & Nut products, Oil seeds, Snacks & instant mixes (ready-to-eat products), Sugar & sugar products, Air monitoring & Swab testing.

b) **GMO testing:** Cotton, Maize, Soya, Spice, Rice, Rapeseed and Wheat.

c) **Chemical testing:** Cereal, pulses & cereal products, Herbs, Spices & condiments, Honey & honey products, Nut & nut products, Sugar & sugar products, Nutraceuticals & functional foods, Ready-to-eat products.

CALF developed and validated a methodology on QQQ-ICPMS-LC for estimation of methyl mercury in milk and milk products food and feed. This is the only NABL accredited facility in the country

The laboratory is associated with Monitoring of Pesticides Residues at National Level, where farm gate and market samples of various fruits & vegetables, milk, pulses and spices are collected every month from seven locations in three states. These samples are analysed for approx. 178 pesticides by using LC-MS/MS and GC-MS/MS.

CALF organised four training programmes for the laboratory personnel of dairy cooperatives/dairy professionals in the following fields:

- Analysis of Milk and Milk Products
- Microbiology Analysis
- Feed Analysis

These training programmes were attended by 68 participants. CALF collaborated with Gujarat State Biotech Mission (GSBTM), Gandhinagar to provide six months industrial biotech summer internship program to deserving candidates.

The laboratory participated in 18 Proficiency Training Programmes (National & International) and four ILC program for various parameters in Honey, Food, Water, Genetics & Dairy products. The laboratory qualified satisfactorily in most of the tests, indicating a high level of accuracy and competency standards maintained at the laboratory.

Other Activities

45 employees participated in this scheme and cash incentive amounting to ₹ 1,32,000 was given to employees.

Progressive use of Hindi

Focussed efforts were made during the year to promote progressive use of Hindi in day-to-day official work. NDDB's Annual Report, NDDB website content, training material, Power Point Presentations and other documents were prepared in Hindi. Besides, concrete steps were taken to achieve the targets specified in Annual Programme for 2019-20 issued by the Department of Official Language, Ministry of Home Affairs.

Recognising the commendable efforts of NDDB in the implementation of the Official Language, NDDB was awarded the Rajbhasha Kirti Purashkar – Third prize for the year 2018-19, in Region B. Shri Dilip Rath, Chairman, NDDB received this award from the Hon'ble Home Minister of India on 14th September, 2019 at Vigyan Bhawan, New Delhi. Besides, NDDB received first prize from Town Official Language Implementation Committee (TOLIC) Anand for excellent Hindi implementation work in Anand Town.

During the year 2019-20, NDDB, Anand was associated with TOLIC, Anand and actively participated in its half yearly meetings. NDDB organised a poetry recitation competition in which a good number of employees from organisations associated with TOLIC, Anand had participated.

To accelerate the pace of usage of Hindi in office work, Hindi Fortnight was organised in all NDDB offices during September 2019. Apart from a lecture by a prominent Hindi scholar on Hindi Diwas, competitions like on-the-spot Hindi Essay Writing, Translation and Poetry Recitation were organised during the year for promoting use of Hindi. A large number of employees participated in these competitions and an amount of ₹ 76,800 was distributed as cash prize.

NDDB has introduced various incentive schemes for promotion of Hindi in office work. One such scheme is Hindi Noting and Drafting Incentive Scheme. 45 employees participated in this scheme and cash incentive amounting to ₹ 1,32,000 was given to employees. 12 employees whose children scored 75 per cent and more marks in Hindi in Class 10th and 12th examination, were given a cash prize of ₹ 2000/- each.

Training on Microsoft Hindi proof reading and voice typing tool was imparted to the employees.In addition to this, a workshop on Hindi Noting & Drafting was also organised to motivate employees to work in Hindi.

NDDB library has a large collection of Hindi books. During the year, books in Hindi, amounting to about ₹ 1,22,643/- were added to the library.

All national programmes viz., Republic Day, Independence Day, Gandhi Jayanti, Shastri Jayanti and Dr. Ambedkar Jayanti etc., were organised in Hindi.

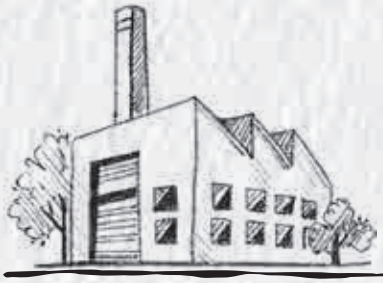
Welfare of SC/ST Employees

Training in functional as well as behavioural areas was facilitated for SC/ST employees during the year. SC/ST officers inducted into Future Leadership Development Programme of NDDB participated in various training programmes, sectoral exposure and cross-functional training. In all, 111 training nominations for SC/ST employees were processed. Welfare measures for SC/ST employees also continued during the year, including recognition for meritorious children of SC/ST employees for their academic achievements through cash prize and certificates. To encourage academic orientation, SC/ST employees were reimbursed expenses incurred on education as well as books for their children.

All offices of NDDB celebrated Ambedkar Jayanti as a mark of respect to Dr. BR Ambedkar. Renowned speakers shared their thoughts on the life and contributions of Dr. Ambedkar.

NDDB was awarded the Rajbhasha Kirti Purashkar – Third prize for the year 2018-19, in Region B.

Subsidiaries



Supply, installation, testing and commissioning of a

10 lakh

litre per day fully automated liquid milk processing plant

IDMC Limited

Indian Dairy Machinery Company was established in 1978. It is incorporated as IDMC Limited under the Companies Act 1956. IDMC offers processing and packaging solutions to its customers across dairy, cattle feed, pharmaceutical and thermal management lines of business under its Metals and Plastics segments. IDMC reported a total revenue of ₹ 7,109.38 million for the year.

During the year under the Metals segment, IDMC executed and successfully commissioned several projects in the dairy sector. Prominent among them were the supply, installation, testing and commissioning of a 10 lakh litre per day fully automated liquid milk processing plant, two fully-automated dairies with capacity to handle 5 lakh litres per day, three fully automated continuous table butter lines with one of capacity 100 MT per day and two lines of capacity 50 MT per day. The company is also executing a project of setting up Milk Chilling Centres in Oman. The company also commissioned an in-house manufactured Multi-Product UHT steriliser of capacity 6,600 litres per hour, suitable for processing various products like Milk Cream Lassi, Chocolate milk and Kadai (Caramelised) Milk - a first of its kind.

In the Thermal Management sector, several fully automated ammonia refrigeration systems with capacities ranging from 335 TR to 1,400 TR were commissioned during the year for various customers. Apart from this, IDMC also manufactured and supplied nine energy-efficient Ice Silos to various dairy plants. IDMC is the only indigenous manufacturer of such thermal storage systems.

Under the pharmaceutical line of business, projects were completed for various customers. The company commissioned a fully automated formulation system to produce biosimilar for treatment of cancer. The company also commissioned a fully-automated effluent decontamination system for a veterinary research laboratory. A large fermentation project comprising two fermentation lines, each of capacity 100 KL for manufacturing multiple products like Insulin, Immunosuppressant's and Carcinogens is under execution.

IDMC continued to manufacture and supply processing equipment such as pasteurisers, ice-cream freezers, continuous butter-making machines, servo driven cup cone filling machines, and products such as milking machines, BMCs, pumps, valves and fittings. IDMC kept up its thrust on the sales of indigenously developed milking machines during the year and consolidated its position.

The research and development department of IDMC remained active in developing new equipment besides focussing on making its offerings of existing products and processes more efficient and competitive.

The Plastic segment of the company continued to cater to the existing customers through its product offerings of packaging films for liquid milk and milk products such as ghee, curd, buttermilk, high barrier laminates for milk powder and other food products. IDMC expanded its printing capacity and this has enhanced its capability to cater to customers in new segments such as UHT milk, edible oil, etc. and contribute to the growth. During the difficult period of lockdown due to COVID-19, the unit was operational and ensured availability of packing material to all its customers, for liquid milk, which is an essential commodity.

Indian Immunologicals Limited

Indian Immunologicals Limited (IIL) was established in 1982. It is incorporated under the Companies Act 1956. In the year 2019-20, IIL recorded revenue of ₹ 9,060 million. IIL achieved a phenomenal growth of 48 per cent compared to the previous year. IIL's Institutions and Coop business grew 50 per cent to achieve all-time high sales of ₹ 4,795 million. IIL's Human Health Retail business grew by 36 per cent to achieve all-time high sales of ₹ 1,095 million. IILs International business grew by 88 per cent to achieve all-time high sales of ₹ 1,890 million. The Animal Health Retail business grew 15 per cent and achieved an all-time high sales of ₹ 1,000 million.

IIL continues to be the largest supplier of FMD vaccine in the country. IIL also established itself as the largest supplier of human anti-rabies vaccine in the country. IIL has continued to supply Pentavalent vaccine, DPT vaccine to the Ministry of Health's Universal Immunisation Programme (UIP).

IIL's Department of Scientific and Industrial Research (DSIR) approved Research and Development Centre has many exciting candidate vaccines in its pipeline. IIL received marketing approval for Classical Swine Fever Vaccine which was developed in collaboration with Indian Veterinary Research Institute (IVRI). A gene deleted marker vaccine for Infectious Bovine Rinotracheitis (IBR) has been developed and currently undergoing tests in IVRI. Phase 1 clinical trial for Hepatitis A vaccine has been completed successfully and Phase 2/3 trials are in progress. Phase 1 clinical trial for Measles Rubella (MR) combination vaccine has been completed successfully. Phase 2/3 trials is to commence for MR vaccine. PCT studies for IIL's Dengue vaccine has been completed successfully.

IIL is in the forefront of farmer's education and awareness programmes. The company has actively participated in various Krishi Melas in several parts of the country to create awareness amongst farmers. As a part of its Corporate Social Responsibility (CSR) initiative, IIL continues to provide health coverage to more than a lakh cattle in Gaushalas across the country. IIL has adopted three government schools (2 schools in Laxmapur village and one school in Karakapatla village, Telangana state) and has created infrastructure for the well-being of students and also provided them with uniforms, school bags and notebooks. Being a sponsor of the "Giftmilk for Nutrition", IIL provides students with flavoured milk daily at various Government schools in Telangana and Tamil Nadu.

Mother Dairy Fruit & Vegetable Private Limited

Mother Dairy, Delhi was established in 1974 to meet the liquid milk demand of Delhi NCR. It is incorporated as Mother Dairy Fruit & Vegetable Pvt Ltd. under the Companies Act 1956. In 2019-20 the company achieved a turnover of ₹ 1,03,500 million, registering an overall growth of 9 per cent which has been largely driven by 14 per cent growth in Edible Oil business and 12 per cent growth in Liquid Milk business.

With the objective of helping the farmers in augmenting their family income, in the year 2019-20, MDFVPL strengthened its milk procurement network in areas of Maharashtra, Uttar Pradesh and Rajasthan by increasing the coverage to 1.22 lakh farmers (1.1 lakh - LY) in 5,850 villages (4,600 - LY) procuring 8.89 LKGPD milk.

As part of MDFVPL's strategy to expand its geographical footprint and handle milk procurement from new areas, MDFVPL has commissioned a 3 LLPD capacity polypack milk and 100 MTD Fermented Product Capacity Plant at Bhivandi, Maharashtra in November 2019.

The Milk Business has delivered a volume growth of 7.4 per cent over last year. Cow milk continued to show a strong growth of 21 per cent over last year with sales volume of over 9 LLPD and 14,000 million, making it the largest Cow Milk brand in the country. During the year, milk operation expanded into new markets in North Bihar and Indore region of Madhya Pradesh.

MDFVPL has been promoting the use of token milk to raise awareness on the benefits of its environment-friendly plastic packaging free milk (Bulk Vended Milk) in Delhi NCR. BVM helps in saving use of over 1,000 MT plastic every year.

Value-added dairy products business especially the Fresh Dairy category outpaced the Industry with a healthy growth of 18 per cent. Modern Retail format including E-commerce continued to maintain a healthy growth momentum of over 30 per cent with increased marketing intervention and key account management. With the aim to delight larger set of consumers, the MDFVPL also embarked into the journey of building sweets category with the launch of Rasmalai, Milk Cake, Gulab Jamun, Rasgulla and Orange Burfi.

The Mother Dairy Innovation Centre continues to come up with new product categories like Mithais (Orange Burfi, Rasmalai, Gulab Jamun, Rasgulla), range of indulgent ice cream variants (Ekdum Santra, French Vanilla, Afghan Nutty Delight, Firdaus-E-Phirni) and affordable range of ice creams (Choco mini bar, Choco sparkle bar and Butterscotch mini cone). R&D Centre also came up with Sugar-free Dietz ice cream, Mishti Doi Lassi, ambient stable fortified DTM, Frozen Chilli Garlic Nuggets and new variants of oil like Gingelly Oil and Extra Virgin Olive Oil.

MDFVPL's Quality Assurance System was recognised by various National committees like FSSAI – Dairy FoSTaC "National Resource Person" (NRP), Confederation of Indian Industry (CII)- Senior Assessors for "CII Food Safety Award", Bureau of Indian Standards (BIS) - convenor for FAD 19 committee etc.

MDFVPLs efforts to introduce energy-saving, non-renewable and natural resources have resulted in in-house generation of 10.86 lakh units of electricity, reduction of 869 tonnes of CO2 emission and reduction of PNG consumption by about 48,000 SCM during 2019-20. Initiatives like water recycling, condensate recovery, etc. have resulted in 8.1 per cent reduction in water consumed per KL milk handled in FY 2019-20 (1.02 KL/KL of throughput) over FY 2018-19 (1.11 KL/KL of throughput).

Safal successfully managed the challenges posed due to COVID-19 pandemic. Confronted with market disruption it quickly aligned its supply chain to manage sourcing from different states. COVID-19 safety measures were also followed at farmers point, plant operations and booths. All activities were done without compromising on quality and delivery to customers.

NDDB Dairy Services

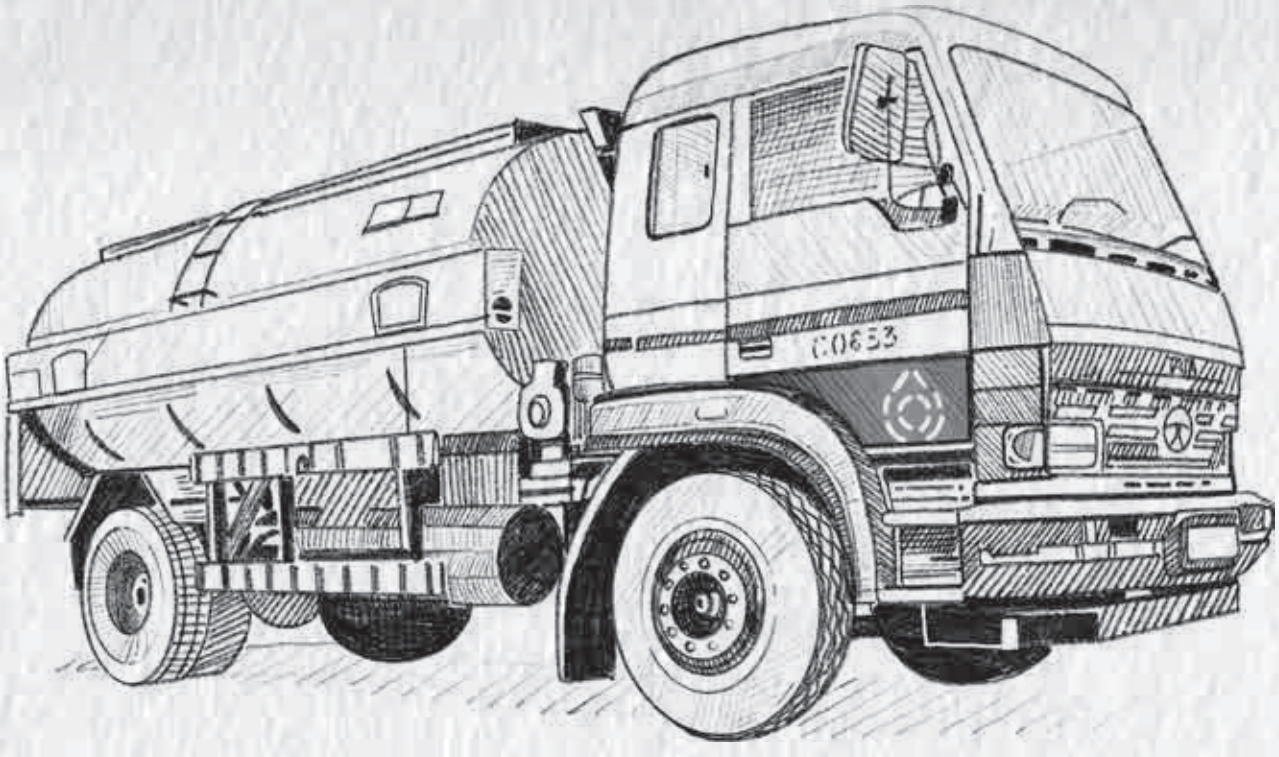
NDDB Dairy Services (NDS) was incorporated in 2009 as a not-for-profit company under Section 8 of the Companies Act to promote famer-owned and managed milk producer companies and productivity enhancement services. NDS manages the four largest semen stations in the country - Sabarmati Ashram Gaushala in Bidaj, Ahmedabad (Gujarat), Animal Breeding Centre in Salon, Raebareli (Uttar Pradesh), Alamadhi Semen Station (Tamil Nadu) and Rahuri Semen Station (Maharashtra)

During the year, the four semen stations together produced and sold about 360 lakh semen doses. About 175 and 520 viable embryos, predominantly of Indian breeds, have been produced through conventional Embryo Transfer Technology (ETT) and In Vitro Fertilisation (IVF) technique respectively. During the year, IVF laboratory at SAG, Bidaj has been upgraded and now, has a capacity to produce around 12,000 embryos annually.

NDS continued to provide technical assistance to Milk Producer Companies (MPCs) namely, Paayas in Rajasthan, Maahi in Gujarat, Shreeja in Andhra Pradesh, Baani in Punjab, Saahaj in Uttar Pradesh and Bapudham in Bihar.

During the year, NDS facilitated programmes such as Policy Governance module, Business Orientation and Finance Module for Board of Directors (BoDs) of the MPCs. NDS facilitated trainers' training and orientation programmes for field staff of the large MPCs.

NDS is recognised as one of the support organisations for Deen Dayal Antyodaya Yojana (DAY-NRLM) by Ministry of Rural Development, GoI. Under agreements with Madhya Pradesh, Bihar and Uttar Pradesh State Rural Livelihood Missions,



NDS has set up four Milk Producer Companies approved under NRLM, namely, Maalav Mahila MPC, Rajgarh and Muktaa Mahila MPC, Sagar in Madhya Pradesh, Kaushikee Mahila MPC, Saharsa in Bihar and Balinee MPC, Jhansi in Uttar Pradesh. NDS facilitated the operationalisation of Balinee MPC by assisting in recruitment and training of professionals and field personnel, and setting up infrastructure for milk procurement and forward linkages. Under a collaborative agreement with the Tata Trusts, NDS has set up Sakhi Mahila MPC, Alwar and Asha Mahila MPC, Pali in Rajasthan, Shwetdhara MPC, Pratapgarh, in Uttar Pradesh, Ruhaanii MPC, Mansa in Punjab and Indujaa Mahila MPC, Yavatmal in Maharashtra. NDS provided skill enhancement and institution building support to the MPCs through various training programmes.

NDS has assisted the MPCs supported by the Tata Trusts as well as NRLM in implementation of activities which aim at enhancing productivity through AI delivery, feeding practices, animal health and improved animal management practices. To promote antibiotic-free milk, NDS has also initiated the use of ethno-veterinary practices in these MPCs.

Dairy Cooperatives at a Glance

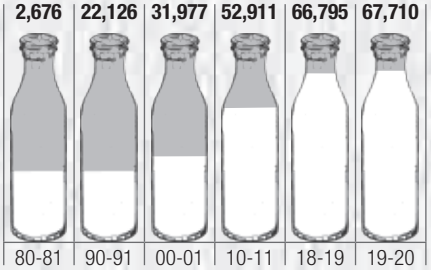
Dairy Cooperative Societies

(in number)[@]

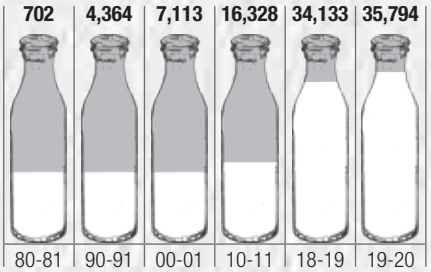
Region/State	80-81	90-91	00-01	10-11	18-19	19-20 *
NORTH						
Haryana	505	3,229	3,318	7,019	7,264	7,500
Himachal Pradesh		210	288	740	977	1,011
Jammu & Kashmir		105	**	**	457	620
Punjab	490	5,726	6,823	7,069	7,353	7,385
Rajasthan	1,433	4,976	5,900	16,290	14,822	15,067
Uttar Pradesh	248	7,880	15,648	21,793	31,754	31,958
Uttarakhand					4,168	4,169
Regional Total	**2,676**	**22,126**	**31,977**	**52,911**	**66,795**	**67,710**
EAST						
Assam		117	125	155	402	457
Bihar	118	2,060	3,525	9,425	22,261	23,510
Jharkhand				53	622	690
Meghalaya					97	97
Mizoram					42	42
Nagaland		21	74	49	52	52
Odisha		736	1,412	3,256	5,946	6,053
Sikkim		134	174	287	517	540
Tripura		73	84	84	100	117
West Bengal	584	1,223	1,719	3,019	4,094	4,236
Regional Total	**702**	**4,364**	**7,113**	**16,328**	**34,133**	**35,794**
WEST						
Chhattisgarh				757	1,112	1,106
Goa		124	166	178	183	183
Gujarat	4,798	10,056	10,679	14,347	19,985	20,144
Madhya Pradesh	441	3,865	4,877	6,216	9,151	10,094
Maharashtra	718	4,535	16,724	21,199	20,652	20,762
Regional Total	**5,957**	**18,580**	**32,446**	**42,697**	**51,083**	**52,289**
SOUTH						
Andhra Pradesh	298	4,766	4,912	4,971	3,308	3,299
Karnataka	1,267	5,621	8,516	12,372	16,021	16,416
Kerala		1,016	2,781	3,666	3,317	3,331
Tamil Nadu	2,384	6,871	8,369	10,079	10,677	10,076
Telangana					5,189	5,176
Puducherry		71	92	102	104	104
Regional Total	**3,949**	**18,345**	**24,670**	**31,190**	**38,616**	**38,402**
Grand Total	**13,284**	**63,415**	**96,206**	**1,43,126**	**1,90,627**	**1,94,195**

[@] Organised (cumulative), includes conventional societies and Taluka unions formed earlier
* Provisional
** Not reported
Source: Milk Unions & Federations

NORTH



EAST



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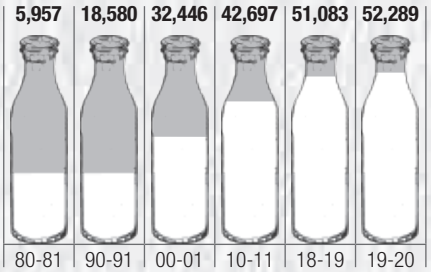

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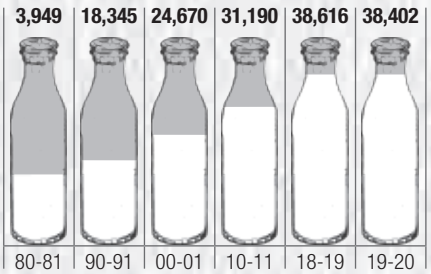
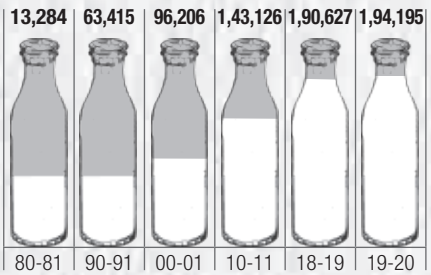


GRAND TOTAL



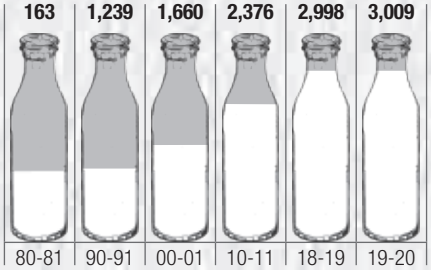
Producer Members

(in thousands)

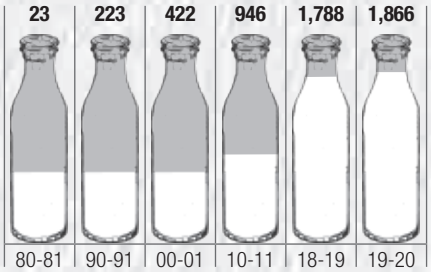
Region/State	80-81	90-91	00-01	10-11	18-19	19-20 *
NORTH						
Haryana	39	184	185	313	316	319
Himachal Pradesh		17	20	32	43	46
Jammu & Kashmir		2	**	**	17	27
Punjab	26	304	370	385	381	373
Rajasthan	80	340	436	669	827	827
Uttar Pradesh	18	392	649	977	1,256	1,258
Uttarakhand					158	157
Regional Total	**163**	**1,239**	**1,660**	**2,376**	**2,998**	**3,009**
EAST						
Assam		2	1	4	24	29
Bihar	3	100	184	523	1,143	1,205
Jharkhand				1	22	21
Meghalaya					4	4
Mizoram					1	1
Nagaland		1	3	2	2	2
Odisha		46	111	187	308	314
Sikkim		4	5	10	14	14
Tripura		4	4	6	7	8
West Bengal	20	66	114	213	264	268
Regional Total	**23**	**223**	**422**	**946**	**1,788**	**1,866**
WEST						
Chhattisgarh				31	43	43
Goa		12	18	19	19	19
Gujarat	741	1,612	2,147	2,970	3,601	3,610
Madhya Pradesh	24	150	242	271	336	341
Maharashtra	87	840	1,398	1,818	1,787	1,794
Regional Total	**852**	**2,614**	**3,805**	**5,109**	**5,787**	**5,808**
SOUTH						
Andhra Pradesh	33	561	702	846	569	581
Karnataka	195	1,013	1,528	2,124	2,536	2,628
Kerala		225	637	851	987	993
Tamil Nadu	481	1,590	1,957	2,176	1,870	2,030
Telangana					266	259
Puducherry		17	27	36	42	42
Regional Total	**709**	**3,406**	**4,851**	**6,033**	**6,270**	**6,533**
Grand Total	**1,747**	**7,482**	**10,738**	**14,464**	**16,843**	**17,216**

* Provisional
** Not reported
Source: Milk Unions & Federations

NORTH



EAST



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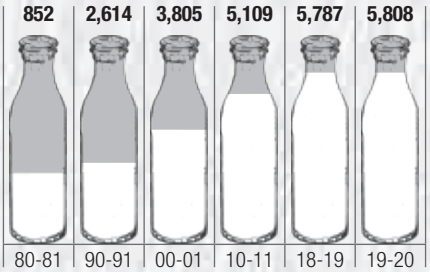

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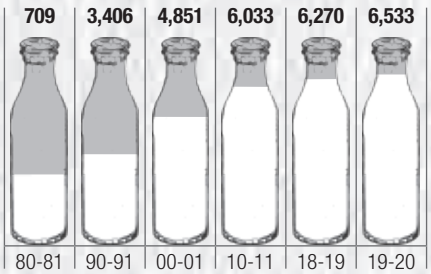
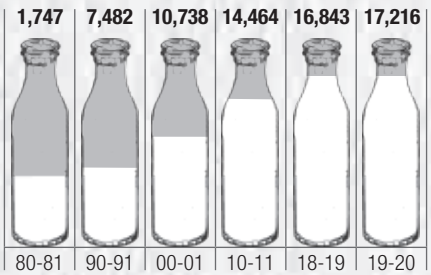


GRAND TOTAL



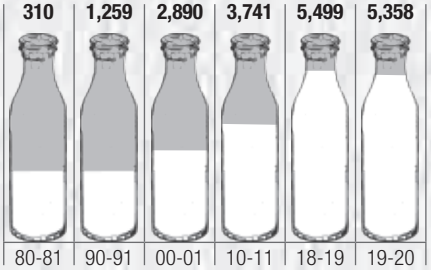
Milk Procurement

(in thousand kilograms per day)#

Region/State	80-81	90-91	00-01	10-11	18-19	19-20 *
NORTH						
Haryana	33	94	276	511	441	457
Himachal Pradesh		14	24	60	70	79
Jammu & Kashmir		11	**	**	28	37
Punjab	75	394	912	1,037	1,634	1,600
Rajasthan	138	364	887	1,629	2,791	2,668
Uttar Pradesh	64	382	791	504	329	332
Uttarakhand					206	185
Regional Total	**310**	**1,259**	**2,890**	**3,741**	**5,499**	**5,358**
EAST						
Assam		4	3	5	33	30
Bihar	3	95	330	1,091	1,894	1,749
Jharkhand				5	162	146
Meghalaya					13	15
Mizoram					7	6
Nagaland		1	3	2	4	4
Odisha		41	94	276	492	443
Sikkim		4	7	12	38	36
Tripura		3	1	2	6	8
West Bengal	31	52	204	273	225	232
Regional Total	**34**	**200**	**642**	**1,666**	**2,873**	**2,669**
WEST						
Chhattisgarh				25	103	88
Goa		16	32	38	64	58
Gujarat	1,344	3,102	4,567	9,158	22,978	21,570
Madhya Pradesh	68	256	319	588	1,021	875
Maharashtra	165	1,872	2,979	3,053	3,956	3,323
Regional Total	**1,577**	**5,246**	**7,897**	**12,862**	**28,122**	**25,914**
SOUTH						
Andhra Pradesh	79	763	879	1,371	1,307	1,360
Karnataka	261	917	1,887	3,742	7,475	7,441
Kerala		185	646	688	1,298	1,272
Tamil Nadu	301	1,106	1,618	2,097	3,381	3,392
Telangana					737	572
Puducherry		26	45	35	55	57
Regional Total	**641**	**2,997**	**5,075**	**7,932**	**14,254**	**14,094**
Grand Total	**2,562**	**9,702**	**16,504**	**26,202**	**50,748**	**48,035**

Includes outside State operations
* Provisional
** Not reported
Gujarat's total milk procurement in 2019-20 includes 3,011 TKgPD from outside the State and in 2018-19, the corresponding figure was 2,861 TKgPD.
Source: Milk Unions & Federations

NORTH



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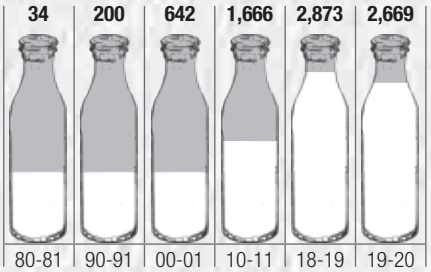
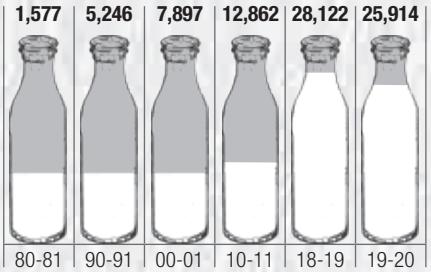
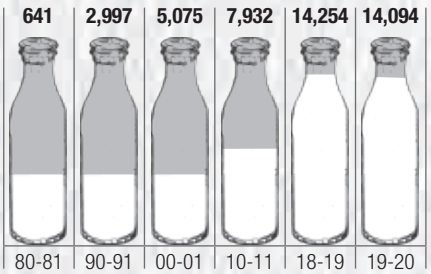


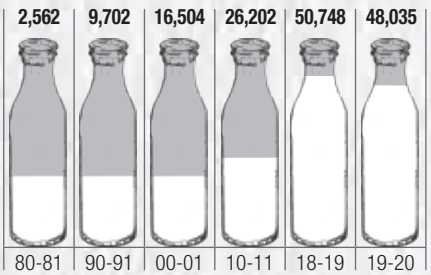
WEST



SOUTH



GRAND TOTAL



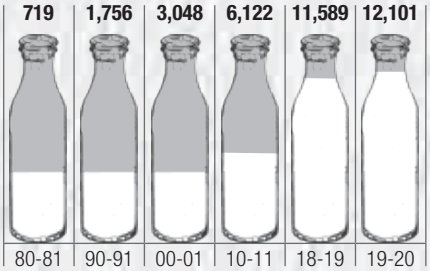
Liquid Milk Marketing

(in thousand litres per day)#

Region/State	80-81	90-91	00-01	10-11	18-19	19-20 *
NORTH						
Haryana	2	80	108	362	301	335
Himachal Pradesh		15	20	23	21	21
Jammu & Kashmir		9	**	**	25	50
Punjab	7	139	420	802	1,005	1,098
Rajasthan	12	136	540	1,505	2,254	2,425
Uttar Pradesh	1	326	436	380	1,004	1,208
Uttarakhand					162	168
Delhi	697	1,051	1,524	3,050	6,817	6,796
Regional Total	**719**	**1,756**	**3,048**	**6,122**	**11,589**	**12,101**
EAST						
Assam		10	7	22	54	54
Bihar	8	111	324	454	1,109	1,207
Jharkhand				253	389	392
Meghalaya					11	13
Mizoram					7	5
Nagaland		1	4	3	5	5
Odisha		65	98	290	402	406
Sikkim		5	7	17	41	44
Tripura		6	7	15	13	12
West Bengal	17	26	27	41	41	61
Kolkata	283	526	840	644	1,102	1,104
Regional Total	**308**	**750**	**1,314**	**1,739**	**3,175**	**3,302**
WEST						
Chhattisgarh				34	158	175
Goa		36	83	69	67	62
Gujarat	210	1,052	1,905	3,237	5,445	5,522
Madhya Pradesh	39	279	244	495	859	878
Maharashtra	18	363	1,178	2,023	1,823	1,839
Mumbai	950	1,057	1,390	841	2,865	2,923
Regional Total	**1,217**	**2,787**	**4,800**	**6,699**	**11,216**	**11,399**
SOUTH						
Andhra Pradesh	19	552	733	1,565	1,347	1,358
Karnataka	166	889	1,501	2,661	4,010	4,305
Kerala		223	640	1,092	1,296	1,328
Tamil Nadu	109	405	559	989	1,074	1,078
Telangana					823	898
Puducherry		22	43	93	98	94
Chennai	245	662	725	1,025	1,182	1,214
Regional Total	**539**	**2,753**	**4,201**	**7,425**	**9,829**	**10,275**
Grand Total	**2,783**	**8,046**	**13,363**	**21,985**	**35,809**	**37,077**

Includes Metro Dairies and outside State operations
* Provisional
** Not reported
Gujarat's total milk marketing in 2019-20 including outside the State stands at 13,028 TLPD and in 2018-19, the corresponding figure was 12,514 TLPD.
In 2010-11, break-up of sales volume by Maharashtra Milk Unions in Mumbai not available
Source: Milk Unions & Federations

NORTH



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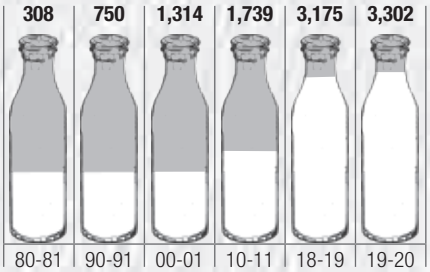
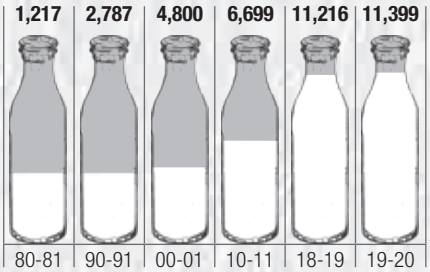
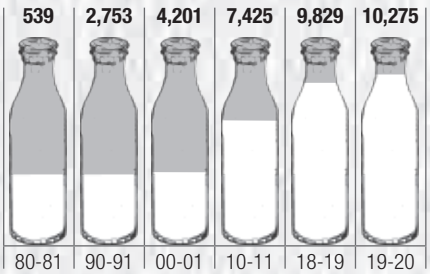


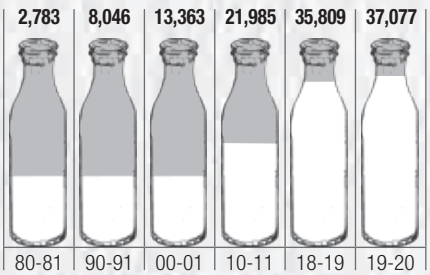
WEST



SOUTH



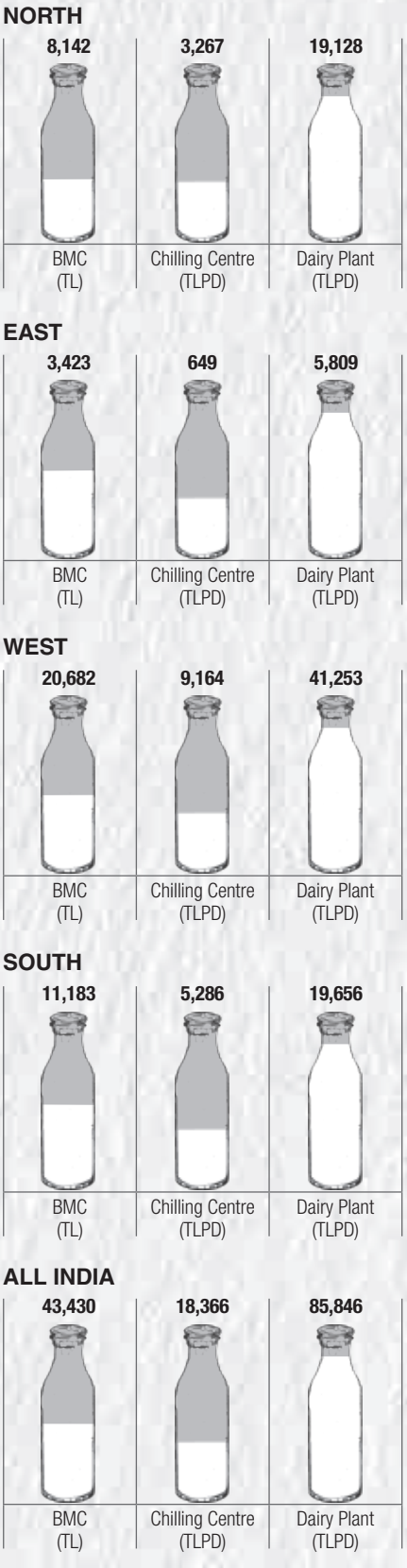
GRAND TOTAL



Dairy Cooperatives' Cold Chain Infrastructure (capacity)* (March 2020)

Region/State	BMC (TL)	Chilling Centre (TLPD)	Dairy Plant (TLPD)
NORTH			
Delhi			1,500
Haryana	406	344	7,125
Himachal Pradesh	136	80	100
Jammu & Kashmir	150		100
Punjab	2,057	643	2,485
Rajasthan	4,410	555	3,160
Uttar Pradesh	912	1,580	4,413
Uttarakhand	71	65	245
Regional Total	**8,142**	**3,267**	**19,128**
EAST			
Assam	26		60
Bihar	2,001	325	2,955
Jharkhand	216	10	690
Meghalaya			26
Mizoram	11		20
Nagaland	2		22
Odisha	828	80	680
Sikkim	19		65
Tripura	7		24
West Bengal	314	234	1,267
Regional Total	**3,423**	**649**	**5,809**
WEST			
Chhattisgarh	100	70	150
Goa	47		110
Gujarat	17,530	6,435	27,895
Madhya Pradesh	854	599	1,518
Maharashtra	2,151	2,060	11,580
Regional Total	**20,682**	**9,164**	**41,253**
SOUTH			
Andhra Pradesh	2,154	438	2,705
Karnataka	4,989	2,960	9,525
Kerala	1,498	100	1,935
Tamil Nadu	1,781	1,425	4,121
Telangana	711	363	1,250
Puducherry	50		120
Regional Total	**11,183**	**5,286**	**19,656**
Grand Total	**43,430**	**18,366**	**85,846**

* Provisional
TL: Thousand Litres
TLPD: Thousand Litres Per Day
Source: Milk Unions/Dairies & Federations



Visitors

Hon. Damien O'Connor, Minister of State for Trade and Export Growth and Ministry of Agriculture, Biosecurity, Food Safety and Rural Communities, New Zealand

Dr Dhan Singh Rawat, Minister of State (I/c) for Cooperatives, Higher Secondary Education, Dairy Development and Protocol, Government of Uttarakhand

Mr Siebe Schuur, Netherland Counsellor of Agriculture in India

Mr Somnath Poudal, Former Minister of Food Security, Agriculture Development, Horticulture and Cash Crops Development, Animal Husbandry, Livestock Fisheries and Veterinary Science, Sikkim

Dr. PS Goel, Chairman, National Innovation Foundation

Major General Arvind Katoch

Dr. Uzi Moallem, HOD of Ruminant Science, Institute of Animal Science, Israel

Ten-member delegation from Brazilian Association of Zebu Breeders (ABCZ), Brazil

Accounts

Borkar & Muzumdar
Chartered Accountants

INDEPENDENT AUDITOR'S REPORT

TO THE BOARD OF DIRECTORS OF NATIONAL DAIRY DEVELOPMENT BOARD

Report on the Financial Statements

We have audited the accompanying financial statements of **National Dairy Development Board** ("the Board"), which comprise the Balance Sheet as at 31st March, 2020, the Income and Expenditure Account and the Cash Flow Statement for the year then ended, and notes to the financial statements, including a summary of significant accounting policies.

Management's Responsibility for the Financial Statements

Management is responsible for the preparation of these financial statements in accordance with the financial reporting provisions of National Dairy Development Board Act, 1987 ("the Act"). This responsibility includes the design, implementation and maintenance of internal control relevant to the preparation of the financial statements that are free from material misstatement, whether due to fraud or error.

Auditor's Responsibility

Our responsibility is to express an opinion on these financial statements based on our audit. We conducted our audit in accordance with the Standards on Auditing issued by the Institute of Chartered Accountants of India. Those Standards require that we comply with ethical requirements and plan and perform the audit to obtain reasonable assurance about whether the financial statements are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on the auditor's judgement, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the Board's preparation and fair presentation of the financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Board's internal control. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of the accounting estimates made by management, as well as evaluating the overall presentation of the financial statements.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

Opinion

In our opinion and to the best of our information and according to the explanations given to us, the financial statements of the Board for the year ended 31st March, 2020 are prepared, in all material respects, in accordance with the provisions of the Act.

For **Borkar & Muzumdar**
Chartered Accountants
FRN: 101569W
UDIN: 20109386AAAAEB8062

Devang Vaghani
Partner
Membership No.: 109386

Date: 6th August 2020
Place: Mumbai

Tel: 022 6689 9999 / Fax: 022 6689 9990 / Email: contact@bnmca.com / Website: www.bnmca.com
21/168, Anand Nagar, Om CHS.,Anand Nagar Lane, Off Nehru Road,Vakola, Santacruz (East), Mumbai - 400 055
Branches: Ahmedabad, Bengaluru, Bhopal, Bhubaneshwar, Bilaspur, Delhi, Goa, Jabalpur, Mira Road, Nagpur, Patna, Pune, Raipur

NATIONAL DAIRY DEVELOPMENT BOARD ("NDDB" or "the Board")
(A Body corporate constituted under the National Dairy Development Board Act, 1987)

BALANCE SHEET as at 31st March, 2020

₹ in million

Particulars	Annexure	31.03.2020	31.03.2019
LIABILITIES			
NDDB Funds	I	31,266.01	30,596.97
Secured Loans	II	13,737.72	4,636.11
Current Liabilities and Provisions	III	8,769.55	8,232.63
Deferred Tax Liability	XVI (Note 9)	235.39	323.00
Total		**54,008.67**	**43,788.71**
ASSETS			
Cash and Bank Balances	IV	10,633.35	5,005.86
Inventories	V	0.52	0.38
Sundry Debtors		223.72	185.50
Loans, Advances and Other Current Assets	VI	24,700.61	22,119.48
Investments	VII	16,574.20	14,522.49
Property, Plant and Equipment	VIII	1,876.27	1,955.00
Total		**54,008.67**	**43,788.71**
Significant Accounting Policies	XV		
Notes to Accounts forming part of Financial Statements	XVI		

In terms of our report of even date attached.

For Borkar & Muzumdar
Chartered Accountants
Firm's Reg No. 101569W

Devang Vaghani
Partner
Membership No. 109386

Mumbai, 6th August 2020

For and on behalf of the Board,

Dilip Rath
Chairman

Arun Raste
Executive Director

S Regupathi
General Manager
(Accounts)

Anand, 21st July, 2020

NATIONAL DAIRY DEVELOPMENT BOARD ("NDDB" or "the Board")
(A Body corporate constituted under the National Dairy Development Board Act, 1987)

INCOME AND EXPENDITURE ACCOUNT for the year ended 31st March, 2020

₹ in million

Particulars	Annexure	2019-2020	2018-2019
INCOME			
Interest		2,581.10	2,432.13
Service Charges	IX	228.65	263.41
Rent		219.64	211.61
Dividend		46.87	142.37
Other Income	X	295.01	215.40
Total (A)		**3,371.27**	**3,264.92**
EXPENDITURE			
Interest and Financial Charges		526.12	428.39
Remuneration and Benefits to Employees	XI	1,051.25	874.91
Administrative Expenses	XII	137.65	159.50
Grants		34.68	116.32
Research and Development		113.25	132.45
Maintenance of Assets	XIII	213.39	217.82
Other Expenses	XIV	187.34	160.41
Provision for contingency		150.00	-
Depreciation	VIII	164.03	162.98
Total (B)		**2,577.71**	**2,252.78**
Surplus during the year before tax (C) = (A - B)		**793.56**	**1,012.14**
Less: Provision for Taxation			
Current Tax		213.53	228.28
Deferred Tax	XVI (Note 9)	(87.61)	32.10
Surplus during the year after tax		**667.64**	**751.76**
Less: Appropriations to -			
Special Reserve		110.72	138.13
Balance carried to General Funds		556.92	613.63
Total (D) = (B + C)		**3,371.27**	**3,264.92**
Significant Accounting Policies	XV		
Notes to Accounts forming part of Financial Statements	XVI		

In terms of our report of even date attached.

For Borkar & Muzumdar
Chartered Accountants
Firm's Reg No. 101569W

Devang Vaghani
Partner
Membership No. 109386

Mumbai, 6th August 2020

For and on behalf of the Board,

Dilip Rath
Chairman

Arun Raste
Executive Director

S Regupathi
General Manager
(Accounts)

Anand, 21st July, 2020

NATIONAL DAIRY DEVELOPMENT BOARD ("NDDB" or "the Board")
(A Body corporate constituted under the National Dairy Development Board Act, 1987)

CASH FLOW STATEMENT for the year ended on 31st March, 2020

₹ in million

Particulars	Annexure		2019-2020	2018-2019
Cash flow from Operating Activities				
Surplus during the year before tax			793.56	1,012.14
Adjustments for :				
Depreciation		164.03		162.98
(Profit)/Loss on sale of investments		-		(6.90)
Interest income on fixed deposit and bonds considered separaterly		(1,298.44)		(1,213.65)
Dividend Income considered separaterly		(46.87)		(142.37)
(Profit)/Loss on sale of fixed assets considered separately		(56.89)		(124.29)
Employee Retirement Benefit		199.94		86.19
Interest and financial charges to banks		21.68		17.68
Premium Amortised on Bonds and State Development Loans		44.12		33.07
			(972.43)	**(1,187.29)**
Operating Cash flow before changes in working capital			**(178.87)**	**(175.15)**
(Increase)/ Decrease in Inventories		(0.14)		(0.01)
(Increase)/ Decrease in Sundry Debtors		(38.22)		4.19
(Increase)/ Decrease in Loans and Advances		(2,391.75)		(6,159.61)
Tax refunded/(paid)		(225.49)		(276.95)
Increase/(Decrease) in current liabilities		190.17		1,522.59
			(2,465.43)	**(4,909.79)**
Net cash flow generated from /(used in) operating activities (A)			**(2,644.30)**	**(5,084.94)**
Cash flow from Investing activities				
Interest Income		1,046.61		1,243.42
Dividend Income		46.87		142.37
Proceeds from maturity of investments (Bonds)		200.00		900.00
Purchase of Investments (Shares)		-		(18.00)
Purchase of Investments (Bonds and State Development Loans)		(2,295.81)		(2,404.03)
Decrease / (Increase) in FDR's with banks more than 90 days (net)		(6,540.06)		2,686.91
Proceeds from sale of fixed assets		69.69		173.23
Grant received for purchase of Fixed asset		18.38		-
Purchase of fixed assets		(115.08)		(313.61)
Net cash flow generated from /(used in) investing activities (B)			**(7,569.40)**	**2,410.29**

₹ in million

Particulars	Annexure	2019-2020	2018-2019
Cash flow from Financing activities			
Proceeds / (Repayment) of borrowed funds		9,101.61	4,024.19
Interest and financial charges to banks		(21.68)	(17.68)
Net cash flow from financing activities (C)		**9,079.93**	**4,006.51**
Net Cash flow during the year (A+B+C)		**(1,133.77)**	**1,331.86**
Cash and Cash Equivalents at the beginning of the year		**1,364.82**	**32.96**
Cash and Cash Equivalents at the end of the year		**231.05**	**1,364.82**
Cash and Cash Equivalents			
Balances with Banks:			
In fixed deposits		10,622.82	5,000.36
Less: Deposits with original maturity more than 90 days		10,402.30	3,641.04
		220.52	**1,359.32**
In current accounts		10.50	5.47
Cash and Cheques on hand		0.03	0.03
Total		**231.05**	**1,364.82**
Significant Accounting Policies	XV		
Notes to Accounts forming part of Financial Statements	XVI		

Note : Cash Flow Statement has been prepared under the "Indirect Method" as set out in Accounting Standard - 3 on Cash Flow Statements.

In terms of our report of even date attached.

For Borkar & Muzumdar
Chartered Accountants
Firm's Reg No. 101569W

Devang Vaghani
Partner
Membership No. 109386

Mumbai, 6th August 2020

For and on behalf of the Board,

Dilip Rath
Chairman

Arun Raste
Executive Director

S Regupathi
General Manager
(Accounts)

Anand, 21st July, 2020

NDDB Funds

ANNEXURE I

₹ in million

Particulars		31.03.2020	31.03.2019
General Reserve (Note a)			
Balance as per last balance sheet		3,559.61	3,559.61
Grant for Fixed Assets (Note b)			
Balance as per last balance sheet	61.17		70.10
Add: Grant received during the year	18.38		-
Less: Recoupment of depreciation (Refer Note 4 of Annexure VIII)	16.98		8.93
		62.57	**61.17**
Special Reserve under section 36 (1) (viii) of the Income Tax Act, 1961			
Balance as per last balance sheet	1,385.97		1,247.84
Add: Transfer from Income and Expenditure Account	110.72		138.13
		1,496.69	**1,385.97**
Income and Expenditure Account			
Balance as per last balance sheet	25,590.22		24,976.59
Add: Surplus after appropriation during the year	556.92		613.63
		26,147.14	25,590.22
Total		**31,266.01**	**30,596.97**

Notes :

a. To promote, plan and organise programmes for development of dairy and other agriculture based and allied industries and biologicals as per the NDDB Act, 1987.

b. In accordance with Accounting Standard - 12 - 'Accounting for Government Grants'.

Secured Loans

ANNEXURE II

₹ in million

Particulars	31.03.2020	31.03.2019
Bank Overdraft (Secured against lien on fixed deposits with Banks)	3,640.83	316.11
Loan from NABARD (Secured against loan given under DIDF scheme)	10,096.89	4,320.00
Total	**13,737.72**	**4,636.11**

Current Liabilities and Provisions

ANNEXURE III

₹ in million

Particulars			31.03.2020	31.03.2019
a)	**Current Liabilities**			
	Advances and deposits		50.53	43.24
	Sundry creditors		366.52	293.79
	Net liability on account of Consultancy Project			
	Funds received	19,702.42		18,880.67
	Add : Due to suppliers for expenses	1,692.33		1,510.28
		21,394.75		**20,390.95**
	Less : Expenditure incurred	17,924.26		16,292.53
	Advance to suppliers	160.82		122.20
		3,309.67		**3,976.22**
	Add : Payable to NDDB (Per contra, Refer Annexure VI)	186.60		64.03
			3,496.27	**4,040.25**
b)	**Fund received for Government of India projects**			
	Balance as per last balance sheet	1,363.28		-
	Fund Received	1,388.83		1,455.82
	Add: Interest Accrued	50.59		3.96
	Less: Expenditure incurred	137.84		24.21
	Less: Advance to End Implementing Agencies	174.12		72.29
			2,490.74	**1,363.28**
c)	**Provisions for :**			
	Non-performing assets (Refer Note 10 of Annexure XVI)	1,039.59		1,075.72
	General contingency on Standard Assets (Refer Note 10 of Annexure XVI)	90.58		79.28
	Contingency (Refer Note 10 of Annexure XVI)	736.07		561.24
			1,866.24	**1,716.24**
d)	**Provisions for :**			
	Leave encashment (Refer Note 5 of Annexure XVI)	128.63		419.02
	Post retirement medical scheme (Refer Note 5 of Annexure XVI)	81.01		69.98
	Gratuity (Refer Note 5 of Annexure XVI)	31.21		17.58
	VRS monthly benefits	1.31		8.97
			242.16	**515.55**
Provisions for income tax (net of taxes paid)			257.09	260.28
Total			**8,769.55**	**8,232.63**

Cash and Bank Balances

ANNEXURE IV

₹ in million

Particulars		31.03.2020	31.03.2019
Balances with Banks			
In fixed deposits	10,622.82		5,000.36
In current accounts	10.50		5.47
		10,633.32	**5,005.83**
Cash and cheques on hand		0.03	0.03
Total		**10633.35**	**5005.86**

Note :

Fixed deposits includes

a. ₹ 5,911.76 million (Previous Year ₹ 1,563.36 million) placed with Banks which are under lien for the overdraft facility.

b. ₹ 700.20 million (Previous Year ₹ 498.00) which are under lien in favour of NABARD for the DSRA account opened for loans availed under DIDF scheme.

c. ₹ 0.05 million (Previous Year ₹ 0.05 million) for Bank Guarantee Margin Money.

d. ₹ 2,485.83 million (Previous Year ₹ 1,359.32 million) of fund received for Government of India projects.

Current accounts includes ₹ 5.00 million of fund received for Government of India projects.

Inventories

ANNEXURE V

₹ in million

Particulars		31.03.2020	31.03.2019
Stores, spares and others	1.64		1.50
Project equipments	3.19		3.19
	4.83		4.69
Less : Provision for obsolescence	4.31		4.31
		0.52	0.38
Total		**0.52**	**0.38**

Loans, Advances and Other Current Assets

ANNEXURE VI

₹ in million

Particulars		31.03.2020	31.03.2019
Loans to cooperatives			
Milk - Secured	14,862.46		17,604.46
Unsecured	1,690.93		283.39
		16,553.39	**17,887.85**
Oil (including interest accrued) - Unsecured		945.03	945.03
Loans and advances to subsidiary companies / managed units			
Secured	1,663.13		1,313.81
Unsecured	4,070.83		627.45
		5,733.96	**1,941.26**
Loans to employees			
Secured	0.39		0.66
Unsecured	6.25		6.70
		6.64	**7.36**
Interest accrued on -			
Loans and advances	16.69		45.70
Fixed deposits and investments	282.19		251.56
		298.88	**297.26**
Advances to suppliers and contractors		4.13	5.40
Recoverable on account of turnkey projects			
(Per contra, Refer Annexure III)		186.60	64.03
Sundry deposits		17.57	18.86
Income taxes paid (net of provisions)		945.65	936.90
Other receivables		8.76	15.53
Total		**24,700.61**	**22,119.48**

Notes :

a. Secured loans are secured against the mortgage of assets and/or hypothecation of stocks/assets.

b. Secured loans includes ₹ 7,604.66 million (Previous Year ₹ 4,186.59 million) given under DIDF scheme.

Investments

ANNEXURE VII

₹ in million

Particulars		31.03.2020	31.03.2019
Long term investments (at cost) :			
Equity Shares (unquoted) in subsidiary companies:			
Mother Dairy Fruit and Vegetable Private Limited (MDFVPL)	2,500.00		2,500.00
IDMC Limited (IDMC)	283.90		283.90
Indian Immunologicals Limited (IIL)	90.00		90.00
NDDB Dairy Services (NDS)	2,000.00		2,000.00
		4,873.90	**4,873.90**
Bonds (Quoted) of Government companies, financial institutions and banks (at cost)		8,456.39	6,389.89
(aggregate market value of bonds is ₹ 8,547.96 million (Previous Year ₹ 6,422.15 million) as at the balance sheet date)			
State Development Loans (Quoted) (at cost)		3,225.01	3,239.80
(aggregate market value of State Development Loans is ₹ 3,359.16 million (Previous Year ₹ 3,217.49) as at the balance sheet date)			
Shares (unquoted) in Co-operatives and Federations	19.00		19.00
Less: Provision for diminution in value of investments	0.10		0.10
		18.90	18.90
Total		**16,574.20**	**14,522.49**

Property, Plant and Equipment

ANNEXURE VIII

₹ in million

Particulars	Gross Block (at Cost)				Depreciation				Net Block	
	As at 01.04.2019	Addition	Deduction/ (adjustments)	As at 31.03.2020	As at 01.04.2019	For the year (refer note 4)	Deduction/ (adjustments)	As at 31.03.2020	As at 31.03.2020	As at 31.03.2019
FreeHold Land (refer note 1 to 3)	456.45	-	-	456.45	-	-	-	-	456.45	456.45
Lease Hold Land	64.16	-	-	64.16	13.05	0.75	-	13.80	50.36	51.11
Buildings and Roads	2,000.01	12.54	9.66	2,002.89	1,078.50	52.43	5.07	1,125.86	877.03	921.51
Plant and Machinery	53.72	0.11	0.01	53.82	52.80	0.25	0.01	53.04	0.78	0.92
Electrical Installations	183.48	1.32	1.60	183.20	121.08	9.23	1.41	128.90	54.30	62.40
Furniture, Computers and Others Equipments	1,083.44	124.60	20.42	1,187.62	838.22	97.72	12.40	923.54	264.08	245.22
Rail Milk Tankers	331.67	52.88	-	384.55	213.66	18.40	-	232.06	152.49	118.01
Vehicles	22.50	2.75	2.46	22.79	18.84	2.23	2.46	18.61	4.18	3.66
Total	**4,195.43**	**194.20**	**34.15**	**4,355.48**	**2,336.15**	**181.01**	**21.35**	**2,495.81**	**1,859.67**	**1,859.28**
Previous Year	*3,962.93*	*311.59*	*79.09*	*4,195.43*	*2,194.39*	*171.91*	*30.15*	*2,336.15*	*1,859.28*	*1,768.54*
Capital Work in Progress including capital advances									16.60	95.72
Total Fixed Assets									**1,876.27**	**1,955.00**

Notes :

1. Land for FMD Control Project amounting to ₹ 0.39 million is obtained from Government of Tamil Nadu by alienation.
2. Freehold land includes land for Oil Tank farm, Narela amounting to ₹ 17.94 million which has been obtained on perpetual lease for which lease deeds are yet to be executed.
3. Land amounting to ₹ 65.98 million at Kannamangala Horticulture Farm received from Agriculture and Horticulture Department, Government of Karnataka is in the name of the subsidiary company Mother Dairy Fruit and Vegetable Private Limited and transfer of title is pending.
4. Depreciation for the year in Income and Expenditure account excludes deprecition ₹ 16.98 million (Previous year : ₹ 8.93 million) on account of recoupment from grants received.

Service Charges

ANNEXURE IX

₹ in million

Particulars	2019-2020	2018-2019
Training fees	16.55	12.14
Procurement and technical service fees	197.10	239.74
Fees from consultancy and feasibility studies	13.26	9.60
Royalty and process knowhow fees	1.74	1.93
Total	**228.65**	**263.41**

Other Income

ANNEXURE X

₹ in million

Particulars	2019-2020	2018-2019
Profit on sale of fixed assets (net)	56.89	124.29
Profit on disposal of investments	-	6.90
Excess provision and NPAs written back	-	6.84
Miscellaneous income	238.12	77.37
Total	**295.01**	**215.40**

Remuneration and benefits to employees

ANNEXURE XI

₹ in million

Particulars	2019-2020	2018-2019
Salaries and Wages (including ex-gratia)	806.27	691.78
Contribution to Provident, Superannuation fund and Gratuity	175.47	131.06
Staff welfare expenses	69.51	52.07
Total	**1,051.25**	**874.91**

Remuneration excludes ₹ 25.65 million (Previous year : ₹ 26.55 million) shown as part of Research and Development expenses.

Administrative Expenses

ANNEXURE XII

₹ in million

Particulars		2019-2020	2018-2019
Printing and stationery		5.80	7.12
Communication charges		9.42	9.78
Audit fees and expenses (including goods & service tax)			
Audit fees	0.70		0.70
Income Tax audit	0.25		0.25
Goods & service tax audit	0.20		-
Fees for other services	-		0.06
Out of pocket expenses & goods & service tax	0.11		0.22
		1.26	**1.23**
Legal fees		3.98	6.40
Professional fees		12.58	13.29
Vehicle expenses		3.59	2.87
Recruitment expenses		0.70	0.72
Advertisement expenses		5.84	19.28
Travelling and conveyance expenses		63.63	66.97
Electricity and rent		26.96	28.11
Other administrative expenses		3.89	3.73
Total		**137.65**	**159.50**

Maintenance of Assets

ANNEXURE XIII

₹ in million

Particulars	2019-2020	2018-2019
Repairs and maintenance		
Buildings	141.21	143.67
Others	60.70	64.10
Rates and taxes	9.32	8.42
Insurance	2.16	1.63
Total	**213.39**	**217.82**

Other Expenses

ANNEXURE XIV

₹ in million

Particulars	2019-2020	2018-2019
Training expenses	35.34	39.52
Computer expenses	14.14	14.77
Other expenditure	137.86	106.12
Total	**187.34**	**160.41**

NATIONAL DAIRY DEVELOPMENT BOARD ("NDDB" or "the Board")

Significant Accounting Policies forming part of financial Statement

ANNEXURE XV

1. Basis of preparation

The financial statements are prepared on accrual basis, using the historical cost convention and Generally Accepted Accounting Principles ("GAAP") in India including accounting standards issued by the Institute of Chartered Accountants of India, as applicable to the Board. The financial statements are presented in Indian Rupees rounded off to the nearest million, unless otherwise stated.

2. Use of Estimates

The preparation of financial statements in conformity with the GAAP requires the management to make estimates and assumptions that affect the reported amounts of assets and liabilities, revenues and expenses and the disclosure of contingent liabilities as at the date of the financial statements. Such estimates and assumptions are based on the Management's evaluation of relevant facts and circumstances as on the date of the financial statements. Management believes that the estimates used in the preparation of the financial statements are prudent and reasonable; however the actual outcome may diverge from this estimate which is recognized prospectively in the current and future periods. Any changes in such estimates are recognized prospectively in current and future period.

3. Asset Classification and Provisioning

NDDB being a Public Financial Institution follows the guidelines of Reserve Bank of India (RBI) for asset classification applicable to "Systemically Important Non-Banking Financial (Non-Deposit Accepting or Holding) Companies Prudential Norms, 2015". Provision for Non-Performing and Standard Assets is made at the rates approved by the Board.

4. Revenue Recognition

Interest income on standard assets in accordance with the RBI guidelines is recognized on an accrual basis. Interest income from non-performing assets classified in conformity with the guidelines is accounted on cash basis upon realisation.

Interest income on fixed deposits with Bank and investment in Bonds is recognized on a time proportionate basis.

Income from Services to co-operatives etc. is recognized on proportionate completion basis and in accordance with the terms of relevant agreement.

Sale of milk commodities is accounted for on transfer of substantial risk and rewards, which is on dispatch of the commodities from the warehouse.

Dividend income is accounted for when unconditional right to receive income is established.

Other income is recognized when there is no uncertainty as to its ultimate collectability.

5. Grants

a. Grants relating to fixed assets are initially credited to Grant for Fixed Assets under the General Fund. This amount is recognized in the Income and Expenditure Account on a systematic basis over the useful life of such fixed asset as a recoupment of depreciation on such assets.

b. Revenue grants received during the year are recognized in the Income and Expenditure Account.

c. Grants received for specific projects are credited to the Project Funds and is utilized by disbursements for these projects.

6. Research and Development Expenditure

Research and Development Expenditure (other than cost of fixed assets acquired) are charged as expenses in the year in which they are incurred. Fixed assets used for the Research and Development purpose with alternate use is depreciated over its useful life based on the Board's policy.

7. Employee Benefits

a. Defined Contribution Plan: Contribution to Provident Fund and Superannuation Fund is made at a predetermined rate and is charged to Income and Expenditure account. Shortfall if any, between the rate prescribed by the Employees' Provident Fund Organisation and actual earnings of National Dairy Development Board Staff Provident Fund Scheme, is contributed by the Board as debit to Income & Expenditure account.

b. Defined Benefit Plans: The Board's liabilities towards gratuity, compensated absences and post-retirement medical benefit schemes are determined using the projected unit credit method which considers each period of service giving rise to an additional unit of benefit entitlement and measures each unit separately to build up final obligation. Actuarial gains and losses based on actuarial valuation done by the independent actuary carried out annually are recognized immediately in the Income and Expenditure account as income or expense. Obligation is measured at the present value of estimated future cash flows using a discounted rate that is determined by reference to the market yields at the Balance sheet date on the Government bonds where the currency and terms of Governments bonds are consistent with the currency and estimated terms of defined benefit obligation.

Compensated absences: The Board has a scheme for compensated absences benefit for employees, the liability for which is determined on the basis of an actuarial valuation carried out at the end of the year.

The Board has funded its liability towards gratuity by participating in Group Gratuity cum Life Assurance Scheme of Life Insurance Corporation of India.

8. Property, Plant & Equipment (PPE) and Depreciation

Tangible fixed assets are carried at cost less depreciation and impairment loss. Cost comprises of purchase price, import duties and other non-refundable taxes or levies and any directly attributable costs to bring the asset ready for its intended use.

Depreciation on PPE costing more than ₹ 10,000 each is charged on Straight Line Method basis at the rates fixed by the Board. Depreciation is charged for the full year in the year of capitalization and no depreciation is charged in the year of disposal. Each asset costing ₹ 10,000 or less is depreciated at 100 percent in the year of purchase. Depreciation rates, as approved by the Board, for various classes of assets are as under:

Assets	Rate (in %)
Factory buildings, Godown and Roads	4.00
Other buildings	2.50
Cold storage	15.00
Electrical installation	5.00
Computers (including software)	33.33
Office and Lab equipment	15.00
Plant and machinery	10.00
Solar equipment	30.00
Furniture	10.00
Vehicles	20.00
Rail milk tankers	10.00

Leasehold Land is amortized over the duration of lease. Depreciation on the assets located on leasehold land shall be at lower of lease duration or useful life of that asset.

Capital assets under installation / construction are stated in Balance Sheet as "Capital Work in Progress".

9. Impairment of Assets

The carrying value of assets at each Balance Sheet date is reviewed for impairment of assets. If any indication of such impairment exists, the recoverable amount of such asset is estimated and impairment is recognized, if the carrying amount of these assets exceeds the recoverable amount. The recoverable amount is greater of net selling price and their value in use. Value in use is arrived at by discounting their future cash flows to their present value based on appropriate discount factor. When there is indication that an impairment loss recognized for an asset in prior accounting periods no longer exists or may have decreased such reversal of impairment loss is recognized in Income and Expenditure Account.

10. Investments

Long-term investments are valued as under:

a) Shares in Subsidiaries, Co-operatives and Federations – at cost of acquisition;

b) Debentures / bonds in Government Companies, Financial Institutions and Banks / State Development Loans - at cost of acquisition net of amortised premium, if any.

Current investments are valued at lower of cost or market value.

Long term Investments are valued at cost. In case cost price is higher than the face value, the premium is amortised over the remaining period of maturity of the underlying security. Such investments are stated in Balance Sheet at acquisition price less amortised premium.

Provision for any diminution other than temporary in value of investments is made in the year in which such diminution is assessed.

11. Inventories

Inventories including stores and project equipment are valued at cost or net realizable value whichever is lower, cost being worked out on first-in-first-out basis. Provision for obsolescence is made, wherever necessary.

12. Foreign Currency Transactions

Transactions in foreign currencies are recorded at the exchange rate prevailing on the date of the transactions.

Monetary items denominated in foreign currency and outstanding at the Balance Sheet date are translated at the exchange rate prevailing at the year-end. Non-monetary items are carried at historical cost.

Exchange differences arising on foreign currency transactions are recognised as income or expense in the period in which they arise.

13. Accounting for Voluntary Retirement scheme

The cost of voluntary retirement scheme including ex-gratia is charged to the Income and Expenditure Account in the period of separation of employees. A provision for Monthly Benefit Scheme is made for the employees opting for the voluntary retirement scheme in the period of separation of employees and the same is adjusted against the payments made.

14. Taxes on Income

Current tax is the amount payable on the taxable income for the year as determined in accordance with the provisions of the Income Tax Act, 1961.

Deferred Tax is recognized on timing differences, being the differences between the taxable income and the accounting income that originate in one period and are capable of reversal in one or more subsequent periods.

Deferred Tax Assets in respect of unabsorbed depreciation and carry forward losses are recognized if there is a virtual certainty that there will be sufficient future taxable income available to set-off such tax losses. Other deferred tax assets are recognized when there is reasonable certainty that there will be sufficient future taxable income to realize such assets.

15. Leases

Lease arrangements where the risks and rewards incidental to ownership of an asset vest substantially with the lessor are recognized as operating leases. Lease rent under operating leases are recognized in the Income & Expenditure Account with reference to lease terms.

16. Provisions and Contingencies

A provision is recognized when the Board has a present obligation as a result of past events and it is probable that an outflow of resources will be required to settle the obligation, in respect of which a reliable estimate can be made. Provisions (excluding retirement benefits) are not discounted to their present value and are determined based on the estimate required to settle the obligation at the Balance Sheet date. These are reviewed at each Balance Sheet date and are adjusted to reflect the current best estimates. Contingent liabilities are disclosed in Notes to Accounts.

The Board created provisions in respect of loans and other assets prior to the year 2001-02. Based on the movement in underlying assets for which such provision was created, Board reallocates / write back, such provisions based on identified events. Accordingly, the Board creates additional provision or makes allocation of existing contingency provision for possible diminution in value of its asset or for unforeseen events leading to such liability.

NATIONAL DAIRY DEVELOPMENT BOARD ("NDDB" or "the Board")

Notes to Accounts forming part of the Financial Statements

ANNEXURE XVI

1 At the request of the concerned authorities, the NDDB has been managing West Assam Milk Producers' Co-operative Union Ltd., Jharkhand State Cooperative Milk Producers' Federation Ltd. and Shahjahanpur Mahila Dugdh Utpadak Sahakari Sangh Ltd. These are separate and independent entities and their accounts are maintained by the respective authorities and audited separately.

2 Contingent Liabilities:

2.1. Principal amount of claims not acknowledged as debt : ₹ 29.36 million (Previous Year : ₹ 46.69 million)

2.2. Guarantees outstanding :₹ 0.05 million (Previous Year : ₹ 0.05 million)

2.3. Income tax demands (excluding interest and penalty applicable under respective statutory provisions) ₹ 1085.56 million (Previous Year : ₹ 987.82 million)

2.4. Service tax demands ₹ 916.50 million (Previous Year: ₹ 922.41 million)

2.5. Other Demands

₹ in million

Particulars	Authority	2019-20	2018-19
Settlement of Land dues	Land and Land Reform Department, Siliguri	0.39	0.39
Demand for Municipal Tax for Land at Itola	Taluka Development Officer, Vadodara	4.73	4.73
Demand for Property Tax for Oil Tanks	Brihan Mumbai Mahanagar Palika	0.00	2.22

Demands presented hereinabove at 2.3 to 2.5 have been contested by the Board before appropriate forums. Future cash flows in respect of the same are determinable only on outcome of judgment / decision of the forums where the demands are contested.

3 Funding for National Dairy Plan – I (NDP-I) is through a line of credit from International Development Association, which along with the share of Government of India, flows from the budget of Department of Animal Husbandry, Dairying and Fisheries to the Project Management Unit (PMU) in NDDB as "Grant-in-aid for onward distribution to the End Implementation Agencies". A separate bank account is being maintained for receipt of funds. Separate Project accounts are being maintained for NDP-I funds which are audited by the statutory auditors of NDDB.

4 Segment information:

NDDB is a body corporate constituted under the National Dairy Development Board Act, 1987. As per the objectives set out in the Act, all the activities of NDDB revolve around the Dairy/Agriculture sector which in terms of Accounting Standard-17 on "Segment Reporting" constitute a single reportable segment.

5 Disclosure as per Accounting Standard 15 (Revised 2005) regarding Employee Benefits is as under:

Employee benefit plans

Defined Contribution Plans

The Company makes Provident Fund and Superannuation Fund contributions to defined contribution plans for qualifying employees. Under the Schemes, the Company is required to contribute a specified percentage of the payroll costs to fund the benefits. The Company recognised ₹ 64.44 million (Year ended 31 March, 2019 ₹ 60.35 million) for Provident Fund contributions and ₹ 43.25 million (Year ended 31 March, 2019 ₹ 44.47 million) for Superannuation Fund contributions in the Income and Expenditure Account. The contributions payable to these plans by the Company are at rates specified in the rules of the schemes.

Defined Benefit Plans

The Company offers the following employee benefit schemes to its employees:

i. Gratuity

ii. Post-Retirement medical benefits schemes (PRMBS)

iii. Leave Encashment

The following table sets out the funded status of the defined benefit schemes and the amount recognised in the financial statements:

₹ in million

Particulars	Year ended 31 March, 2020			Year ended 31 March, 2019		
	Gratuity	Post-Retirement medical benefits schemes (PRMBS)	Leave Encashment	Gratuity	Post-Retirement medical benefits schemes (PRMBS)	Leave Encashment
Components of employer expense						
Current service cost	31.23	-	33.07	26.21	-	29.37
Interest cost	30.18	5.42	32.47	27.67	5.52	27.98
Expected return on plan assets	(28.18)	-	(16.50)	(26.79)	-	-
Actuarial losses/(gains)	34.70	9.34	68.21	(0.73)	(1.55)	(1.47)
Total expense recognised in the Statement of Profit and Loss	**67.93**	**14.76**	**117.25**	**26.36**	**3.97**	**55.88**
Actual contribution and benefit payments for year						
Actual benefit payments	(36.26)	(3.73)	(30.70)	(20.72)	(5.19)	(15.94)
Actual contributions	54.30	-	388.14	24.32	-	-
Net asset / (liability) recognised in the Balance Sheet						
Present value of defined benefit obligation	(449.30)	(81.01)	(522.08)	(389.45)	(69.98)	(419.02)
Fair value of plan assets	418.09	-	393.45	371.87	-	-
Net asset / (liability) recognised in the Balance Sheet	**(31.21)**	**(81.01)**	**(128.63)**	**(17.58)**	**(69.98)**	**(419.02)**
Change in defined benefit obligations (DBO) during the year						
Present value of DBO at beginning of the year	389.45	69.98	419.02	357.02	71.19	379.07
Current service cost	31.23	-	33.08	26.21	-	29.38
Interest cost	30.18	5.42	32.47	27.67	5.52	27.98
Actuarial (gains) / losses	34.70	(3.73)	68.21	(0.73)	(1.54)	(1.47)
Benefits paid	(36.26)	9.34	(30.70)	(20.72)	(5.19)	(15.94)
Present value of DBO at the end of the year	**449.30**	**81.01**	**522.08**	**389.45**	**69.98**	**419.02**

₹ in million

Particulars	Year ended 31 March, 2020			Year ended 31 March, 2019		
	Gratuity	Post-Retirement medical benefits schemes (PRMBS)	Leave Encashment	Gratuity	Post-Retirement medical benefits schemes (PRMBS)	Leave Encashment
Change in fair value of assets during the year						
Plan assets at beginning of the year	371.87	-	-	341.48	-	-
Expected return on plan assets	28.18	-	16.51	26.79	-	-
Actual company contributions (Excluding Contribution made by Gratuity Trust and charges deducted by LIC)	54.30	-	388.14	24.32	-	-
Benefits paid	(36.26)	-	(11.20)	(20.72)	-	-
Plan assets at the end of the year	**418.09**	**-**	**393.45**	**371.87**	**-**	**-**
Actual return on plan assets	28.18	-	-	26.79	-	-
Composition of the plan assets is as follows:						
Government bonds	50%	-	50%	50%	-	-
PSU bonds	45%	-	45%	45%	-	-
Equity & Equity related Investments	5%	-	5%	5%	-	-
Others	0%	-	0%	0%	-	-
Actuarial assumptions						
Discount rate	6.75%	6.75%	6.75%	7.75%	7.75%	7.75%
Expected return on plan assets	8.14%	NA	7.70%	8.13%	NA	NA
Salary escalation	8.50%	3.00%	8.50%	8.50%	3.00%	8.50%
Attrition	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%
Medical cost inflation	NA	5.00%	NA	NA	5.00%	NA
Mortality tables	Indian Assured Lives (2006-08) ultimate Mortality Rates	Indian Assured Lives (2006-08) ultimate Mortality Rates and LIC Annuitants (1996-98) ultimate Mortality Rates	Indian Assured Lives (2006-08) ultimate Mortality Rates	Indian Assured Lives (2006-08) ultimate Mortality Rates	Indian Assured Lives (2006-08) ultimate Mortality Rates and LIC Annuitants (1996-98) ultimate Mortality Rates	Indian Assured Lives (2006-08) ultimate Mortality Rates

Experience adjustments

₹ in million

Particulars	2019-20	2018-19	2017-18	2016-17	2015-16
Gratuity					
Present value of DBO	449.30	389.45	357.02	362.20	291.71
Fair value of plan assets	(418.09)	(371.87)	(341.48)	(329.18)	(280.44)
Funded status [Surplus / (Deficit)]	(31.21)	(17.58)	(15.54)	(33.02)	(11.27)
Post-Retirement medical benefits schemes (PRMBS)					
Present value of DBO	81.01	69.98	71.19	73.38	76.84
Other defined benefit plans (Leave Encashment)					
Present value of DBO	522.08	419.02	379.07	366.17	280.18
Fair value of plan assets	(393.45)	-	-	-	-
Funded status [Surplus / (Deficit)]	(128.63)	-	-	-	-

Particulars	For the year ended 31 March, 2020	For the year ended 31 March, 2019
Actuarial assumptions for long-term compensated absences		
Discount rate	6.75%	7.75%
Expected return on Gratuity plan assets	8.14%	8.13%
Expected return on Leave Encashment plan assets	7.70%	0.00%
Salary escalation	8.50%	8.50%
Attrition	1.00%	1.00%

The discount rate is based on the prevailing market yields of Government of India securities as at the Balance Sheet date for the estimated term of the obligations.

The estimate of future salary increases considered, takes into account the inflation, seniority, promotion, increments and other relevant factors.

The contribution expected to be made by the Board during FY 2020-21 has not been ascertained.

6 Disclosure of related party and Transactions with them for the year ended 31st March, 2020 as per Accounting Standard 18

a) Related Party and their relationship

1) Wholly owned subsidiaries

IDMC Limited

Indian Immunologicals Limited

Mother Dairy Fruit and Vegetable Private Limited

NDDB Dairy Services

Pristine Biologicals (NZ) Limited (wholly owned subsidiary of Indian Immunologicals Limited)

2) Other enterprises where management has significant influence over the management

The West Assam Milk Producers' Co-operative Union Ltd.

Animal Breeding Research Organisation (India)

Anandalaya Education society

Jharkhand State Cooperative Milk Producers' Federation Ltd.

NDDB Foundation for Nutrition

Shahjahanpur Mahila Dugdh Utpadak Sahakari Sangh Ltd.

3) Key management personnel

Mr. Dilip Rath	Chairman
Mr. Sangram R Chaudhary	Executive Director upto 30th April 2019
Mr. Y Y Patil	Executive Director upto 31st May 2019
Mr. Meenesh Shah	Executive Director w.e.f. 02nd May 2019

b) Transactions with related parties

(figures in italic represent previous year figures)

₹ in million

Particulars	Interest Income	Purchase of Equity shares	Purchase of Fixed Assets	Dividend	Rent (Income)	Other income	Grant	Other Expenditure	Current Account Balance outstanding Dr/(Cr)	Loan Disbursed	Loan repaid / Adjusted		Loan Balance outstanding Dr/(Cr)
											Principal	Interest	
Subsidiary Companies													
IDMC Limited	35.80	-	-	24.29	0.84	0.11	-	0.15	0.06	165.01	27.46	35.80	521.71
	35.39	-	-	*24.29*	*0.55*	*0.13*	-	*7.57*	*(7.91)*	*109.08*	*160.00*	*35.39*	*384.16*
Indian Immunologicals Limited	77.52	-	-	22.50	26.65	0.39	-	5.17	4.44	224.23	88.16	77.52	1,065.72
	66.10	-	-	*18.00*	*26.65*	*0.37*	-	*5.50*	*5.75*	*250.00*	*124.16*	*66.10*	*929.65*
Mother Dairy Fruit and Vegetable Private Limited	21.59	-	-	-	126.37	4.81	-	0.13	35.55	3,500.00	-	21.59	3,500.00
	-	*18.00*	-	*100.00*	*110.23*	*1.51*	-	*0.25*	*81.71*	-	-	-	-
NDDB Dairy Services	-	-	0.12	-	8.72	1.02	-	0.03	6.55	-	55.40	-	569.60
	-	-	-	-	*3.17*	*0.62*	-	*0.64*	*0.37*	-	*125.00*	-	*625.00*
Total	**134.91**	**-**	**0.12**	**46.79**	**162.58**	**6.33**	**-**	**5.48**	**46.60**	**3,889.24**	**171.02**	**134.91**	**5,657.03**
	101.49	***18.00***	**-**	***142.29***	***140.60***	***2.63***	**-**	***13.96***	***79.92***	***359.08***	***409.16***	***101.49***	***1,938.81***
Other enterprises where management has significant influence over the management													
The West Assam Milk Producers' Co-operative Union Ltd.	0.57	-	-	-	0.94	4.37	0.16	0.49	0.05	24.14	4.65	0.57	21.93
	-	-	-	-	*0.97*	*4.50*	*0.19*	*0.33*	*1.71*	-	*1.23*	-	*2.44*
Animal Breeding Research Organisation	2.06	-	-	-	-	2.22	-	0.01	8.08	55.00	-	2.06	55.00
	-	-	-	-	-	*0.82*	-	-	*0.25*	-	-	-	-
Anandalaya Education Society	-	-	-	-	0.76	-	-	0.03	0.15	-	-	-	-
	-	-	-	-	*0.63*	*0.01*	-	*0.01*	*0.14*	-	-	-	-
Jharkhand State Cooperative Milk Producers' Federation Ltd.	-	-	-	-	0.26	1.65	0.08	0.02	0.67	-	-	-	-
	-	-	-	-	*0.25*	*1.26*	*0.26*	*0.12*	*0.66*	-	-	-	-
Total	**2.63**	**-**	**-**	**-**	**1.96**	**8.24**	**0.24**	**0.55**	**8.95**	**79.14**	**4.65**	**2.63**	**76.93**
	-	**-**	**-**	**-**	***1.85***	***6.59***	***0.45***	***0.46***	***2.76***	**-**	***1.23***	**-**	***2.44***

Remuneration to key management personnel

₹ in million

Particulars	
Mr. Dilip Rath	3.57
	3.58
Mr. Sangram R Chaudhary	0.92
	4.15
Mr. Y Y Patil	8.41
	3.92
Mr. Meenesh Shah	4.32
	-
Total	**12.90**
	11.65

7 Disclosure as per Accounting Standard 19 – 'Leases' (Refer Annexure VIII): Operating lease arrangements entered into by the Board as a Lessor for following assets:

a) Nature of Assets leased

₹ in million

Class of Asset	Gross value of assets as at 31st March, 2020	Depreciation for the year	Accumulated Depreciation as at 31st March, 2020
Buildings and Roads#	1629.79	42.98	947.30
	1629.79	*43.06*	*904.32*
Electrical Installations#	30.86	1.17	25.12
	30.86	*1.40*	*23.95*
Furniture, fixtures, computers, software and office equipment	7.92	0.16	7.82
	7.92	*0.16*	*7.66*
Rail Milk Tankers	361.61	16.16	228.55
	331.13	*13.11*	*213.12*
Total	**2030.18**	**60.47**	**1208.79**
	1999.70	***57.73***	***1149.05***

including staff quarters and cold storage

(Figures in italics represent previous year figures)

These arrangements are cancellable with prior notice to the lessee.

b) Initial Direct cost relating to leasing arrangements is charged to Income and Expenditure account in the year of arrangement of lease.

c) Significant Leasing arrangements:

All assets mentioned above are leased out to subsidiaries, federations and others with an option to renew or cancellation of the agreement.

8 Other expenses include an amount of ₹ 49.60 million being provision created towards investments held by National Dairy Development Board Staff Provident Fund Scheme.

9 Deferred tax assets have been recognised as per Accounting Standard 22–'Accounting for Taxes on Income'. Details are as under:

₹ in million

Particulars	Opening Balance as at 1st April, 2019	Adjustment during the year	Closing Balances at 31st March, 2020
Deferred Tax Assets /(Liability):			
Depreciation	(7.90)	(11.94)	(19.84)
	(3.44)	*(4.47)*	*(7.90)*
Expenditure allowable on payment basis	159.94	(6.99)	152.95
	136.61	*23.33*	*159.94*
Gratuity	6.14	1.71	7.85
	5.43	*0.71*	*6.14*
Voluntary Retirement Scheme	3.13	(2.80)	0.33
	6.55	*(3.42)*	*3.13*
Special Reserve	(484.31)	107.63	(376.68)
	(436.05)	*(48.26)*	*(484.31)*
TOTAL	**(323.00)**	**87.61**	**(235.39)**
	(290.90)	***(32.10)***	***(323.00)***

(Figures in italic represent previous year figures)

10 Disclosure as per Accounting Standard 29 – 'Provisions, Contingent Liabilities and Contingent Assets' is as follows:

₹ in million

Particulars	Non-Performing Asset (NPA)	General Contingency on Standard Assets	Contingency
Opening balance	1,075.72	79.28	561.24
	1,082.41	*55.28*	*585.39*
Created during the year from contingency	0.15	11.30	(11.45)
	0.15	*24.00*	*(24.15)*
Created during the year for contingency	-	-	150.00
	-	-	-
Reversed/movement during the year	(36.28)	-	36.28
	(6.84)	-	-
Closing balance	**1,039.59**	**90.58**	**736.07**
	1,075.72	***79.28***	***561.24***

(Figures in italic represent previous year figures)

11 Based on the information collected by the Management of NDDB, as on 31st March 2020 there were outstanding of ₹ 4.22 million (Previous Year: ₹ 1.87 million) and no overdue to the entities that are classified as Micro and Small Enterprises under the Micro, Small and Medium Enterprises Development Act, 2006.

12 The figures of the previous year have been regrouped/re-arranged wherever necessary.

In terms of our report of even date attached.

For Borkar & Muzumdar
Chartered Accountants
Firm's Reg No. 101569W

Devang Vaghani
Partner
Membership No. 109386

Mumbai, 6th August 2020

For and on behalf of the Board,

Dilip Rath
Chairman

Arun Raste
Executive Director

S Regupathi
General Manager
(Accounts)

Anand, 21st July, 2020

NDDB Officers

(As on 31st March, 2020)

Head Office, Anand

Chairman & Chief Executive

Dilip Rath
M A (Eco), M Sc (Eco)

Executive Director

Meenesh C Shah
B Sc (DT), PGDRDM

Arun Raste
B A, Dipl in Mktg Mgt,
PGD in Comm. & Journalism

Chief Executive's Office

T V Balasubramanyam
SR MGR, B Com, LLB (Gen)

Rajesh Kumar
MGR, B A (Eco), PGDRM

Financial and Planning Services

Sanjay Kumar Gupta
GEN MGR, B E (Electrical),
MBA (Finance)

Dhara N Lakhani
DY GEN MGR, M Com, ACMA

Chintan Khakhariawala
SR MGR, B E (Chem), MBA (Fin)

P V Subrahmanyam
MGR, BBM, MBA (Fin)

Kahnu C Behera
MGR, B Sc (Agri), PGDRM

Smriti Singh
MGR, B A (Eng), PGDM (Mktg & HR)

Chandan Singh
MGR, B Sc (Zoo), PGDM (Mktg & Fin)

Rohan B Buch
MGR, B Com, MBA (Fin)

Chandani C Patel
MGR, B Com, PGDBM (E-Com),
MBA (Fin)

Shilpa P Behere
MGR, BMS, PGDRM

Saurabh Kumar
MGR, B Tech (Elect & Comm), PGDM

Reeti
MGR, B Sc (Zoo), PGDM (Fin & Mktg)

Shweta N Ramteke
DY MGR, B PTh, PGDRM

Ashish Sijeria
DY MGR, BE (Electronics), PGDRM

Cooperative Services

NDDB, ANAND

Rajesh Gupta
DY GEN MGR, B Sc, MSW

M Jayakrishna
SR MGR, M A (Eco), M Phil (Eco),
Ph D (Eco)

Dhanraj Sahani
SR MGR, MBA (Mktg), DPCS

Hrishikesh Kumar
MGR, B Sc (Phy), PGDRM

Vishal Kumar Mishra
MGR, B A, M A (SW)

Denzil J Dias
DY MGR, B Tech (DT), M Tech (DT)

Prit Mistry
DY MGR, B Sc (Biotech),
M Sc (Med Biotech), PGDRM

CS-MARKETING CELL

G G Shah
DY GEN MGR, M Sc (Stats)

Harshendra Singh
SR MGR, B E (Elect & Power Engg),
MBA (Mktg)

CS-IPM CELL

Niranjan M Karade
MGR, B E (Mech), PGDRM

Sandeep Bharti
MGR, B Sc, PGDDM

Rajesh Singh
MGR, BCA, PGDM (Mktg & Fin)

K B Pratap
MGR, BIBF (Int Business), PGDDM

Bhimashankar Shetkar
MGR, B E (Prod), PGDRDM

Milan Sanghvi
DY MGR, B E (Elect & Comm), PGDRM

Quality Assurance

D K Sharma
GEN MGR, M Sc (Dairy Micro),
Ph D (Dairy Bacteriology)

R S Lahane
GEN MGR, B Tech (Chem), PGDRM

M K Rajput
SR MGR, B Sc,
B E (Food Engg & Tech)

Suresh Pahadia
SR MGR, B Tech (DT),
M Sc (Dairying)

Jyothis J Mazhuvanchery
DY MGR, B Tech (Dairy Sc & Tech),
M Sc (DT)

Jagadish Nayaka
DY MGR, B Tech (DT),
M Tech (Food Tech)

Naveenkumara AC
DY MGR, B Tech (DT),
M Tech (Dairy Micro)

Product & Process Development

A K Jain
SR MGR, B Sc (DT), M Sc (Dairying)

Jitender Singh
SCI II, B Sc, M Sc (Micro),
Ph D (Dairy Micro)

Sougata Das
SCI II, B Tech (DT), M Sc (Dairy Micro)

Harendra P Singh
SCI II, B Tech (DT), M Sc (Dairy Chem)

Vishalkumar B Trivedi
SCI I, B Tech (DT), M Tech (DT)

Lalita Modi
SCI I, B Tech (DT), M Tech (DT)

Coordination & Monitoring Cell

V K Ladhani
DY GEN MGR, M Com, SAS (Comm),
ICWA (Inter)

Arvind Kumar
SR MGR, B Sc (Agri),
M Sc (Agri Mktg & Coopn)

Naveen Kumar
SR MGR, M Sc (Env Sc),
M Tech (Env Sc & Engg),
M Sc (Env Mod & Mgmt)

Sarvesh Kumar
MGR, B Sc (Agri & AH),
M Sc (Dairy Eco), Ph D (Dairy Eco)

Ravindra G Ramdasia
MGR, M Com, CA, CS

Nikit Bansal
DY MGR, B Com, CA

Sudarshana
DY MGR, M Com, CA

Frederic Sebastian
DY MGR, MA (Dev Studies), PGDDM,
PGCMRDA

Human Resource Development

Lalit P Karan
GEN MGR, B Sc, PGDPM

S S Gill
SR MGR, B Sc (Geo), MSW, Ph D (SW),
Dipl (Trg & Dev)

Mohan Chander J
SR MGR, B E (Mech), M Tech (HRD)

Rakesh B
MGR, B A, MSW, PGD-HRM

Sameer Dungdung
DY MGR, B Com, PGDM-HRM

Administration

S K Kothari
SR MGR, BA (Eng), M A (Hindi),
PGDM (PM & LW)

S S Vyas
SR MGR, B Com,
LLB, MLS

D C Parmar
MGR, M Com, LLB (Gen), MSW,
PGDHRM

Janardan Mishra
MGR, MA (Hindi), M Phil (Translation
Tech), PGD in Mass Comm &
Communicative Hindi

Admin-Utility

S C Surchowdhury
DY GEN MGR, B E (Elect)

R B Shah
SR MGR, DEE

Rupesh A Darji
MGR, B E (Elect)

Vipul L Solanki
MGR, B E (ECE)

Jay Nagar
MGR, B E (Civil)

Brijesh Kumar
DY MGR, B Tech (Civil)

Cooperative Training

Ashok Kumar Gupta
DY GEN MGR, M Sc (Agri), PGCHRM

Gulshan Kumar Sharma
SR MGR, B A, Dipl (Hotel Mgmt)

Anindita Baidya
SR MGR, B Sc (Bot), PGDRD

R Majumder
SR MGR, B Sc (Agri), PGDRM

S Mahapatra
MGR, B A (Psy), LLB, PGDM (HRM)

T Prakash
MGR, M A (Dev Admn)

Nimmi Topno
DY MGR, B Com, PGDM-HRM

Rahul R
DY MGR, B Tech (CS), MBA (Systems)

MANSINH INSTITUTE OF
TRAINING, MEHSANA

S S Sinha
DY GEN MGR, B E (Elect)

Hitendrasinh Rathod
MGR, DEE

Dushyant Desai
MGR, B Tech (DT)

Arvind Kumar Yadav
DY MGR, B Tech (Mech), MBA (Infra)

Hitendrakumar B Raval
DY MGR, B Tech (Dairy & Food Tech),
M Tech (DT)

REGIONAL DEMONSTRATION & TRAINING CENTRE, ERODE

M Govindan
DY GEN MGR, M A (SW), MBA

T P Aravinth
SR MGR, BVSc & AH, MVSc (Vet Micro)

Karuppanasamy K
MGR, BVSc & AH, MVSc
(Vety Gynecology & Obstetrics)

REGIONAL DEMONSTRATION & TRAINING CENTRE, JALANDHAR

Parag R Pandya
SR MGR, BVSc & AH, MBA (HRM)

Narayan K Nanote
SR MGR, Dip in Agri, BVSc & AH

Ramesh Kumar
DY MGR, BVSc & AH, MVSc (LPM)

REGIONAL DEMONSTRATION & TRAINING CENTRE, SILIGURI

Srikant Sahoo
SR MGR, B Sc, BVSc & AH, MBA

Chaitali Chatterjee
MGR, B A,
M A (Comparative Literature)

Kamlesh Prasad
MGR, DMLT, B Sc, BVSc & AH

Rituraj Borah
MGR, BVSc & AH, MVSc

Information & Communication Technologies

AV Ramachandra Kumar
GEN MGR, B E (Comp Engg), PGDM

S Karounanithy
SR MGR, DEE

R K Jadav
SR MGR, B Sc (Phy), MCA, PGDM

Supriya Sarkar
SR MGR, B Sc (Maths), MCA

Vipul Gondaliya
SR MGR, B E (Electronics)

B Senthil Kumar
SR MGR, B Sc, PGDCA, B Ed,
MCA, MBA

Reetesh K Choudhury
MGR, B E (Comp Sc), PGDBM

Rakesh R Maniya
MGR, B E (ECE)

Mitesh C Patel
MGR, B E (IT)

Anil M Adroja
MGR, B E (IT)

Ashok Kumar Sahani
MGR, B E (CSE)

Saqib Khan
MGR, MCA

Sohel A Pathan
DY MGR, B E (IT), ME (CSE)

Jay Y Barot
DY MGR, B Tech (Comp Engg)

Sectoral Analysis & Studies

G Chokkalingam
GEN MGR, M Sc (Agri Stats),
PGD (Agri Stats)

S Mitra
DY GEN MGR, B Sc (Elect Engg),
PGDRM

J G Shah
SR MGR, B E (Elect), MBA,
Ph D (Mgmt), Dipl (Exp Mgmt)

Arun Chandhok
SR MGR, B Sc, PGD (IRPM),
DCS, MBA

Ashutosh Singh
MGR, M A (Eco), Ph D (Eco)

Biswajit Bhattacharjee
MGR, B Sc (Agri), M Sc (Agri Eco)

Mukesh R Patel
MGR, B Sc, M Sc (Agri)

Darsh K Worah
MGR, B Sc (Micro), M Sc (Env Sci),
Cert GIS

Vinay A Patel
MGR, B Tech (Biomed), MBA (Mktg)

Ayush Kumar
MGR, B Tech (Genetic Engg), PGDM

Purchase

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GEN MGR, B Tech (Chem), MBA (Fin)

Nitin M Shinkar
DY GEN MGR, B E (Metlg),
MPBA (O & M Mgmt)

B Sekar
DY GEN MGR, M Com, PGDMM

Sougata Bhar
SR MGR, B E (Mech)

Narendra H Patel
SR MGR, B E (Mech)

Krishna SY
SR MGR, B E (Mech),
M Tech (Produ. Mgmt.)

Mena H Paghadar
SR MGR, B Sc, MCA

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SR MGR, DME, B E (Mech)

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MGR, B E (Prodn)

Bhadrasinh J Gohil
MGR, B E (Mech)

Hemali Bharti
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Amol M Jadhav
MGR, B E (Mech)

Nidhi Trivedi
MGR, B Sc (Bot), MSW

Bharat Singh
MGR, B Tech (Mech)

Himanshu K Ratnottar
MGR, B E (Prod), PGD (Opern Mgmt)

V Sudharshan
DY MGR, B E (Mechanical)

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DY GEN MGR, B Sc, LLB, PGDRD

Basuman Bhattacharya
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Divyaraj R Brahmbhatt
MGR, BA (Eng), PGDBA, MBA (PR)

Dipanakar Mukherjee
DY MGR, B Sc, M A (Mass Comm), PGD (Journalism and Mass Comm)

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GEN MGR, B E (Civil)

P Saha
DY GEN MGR, B Tech (Agri Engg)

Santosh Singh
DY GEN MGR, B Tech (Civil)

S Goswami
DY GEN MGR, B E (Mech), PGDRDM

U B Das
DY GEN MGR, B E (Mech)

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DY GEN MGR, B Tech (Civil)

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DY GEN MGR, B E (Civil)

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DY GEN MGR, B Tech (Mech)

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Manoj Gothwal
MGR, B E (Civil)

Subrata Chaudhuri
MGR, DCE, AMIE (Civil)

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MGR, B E (Civil)

Manoj Kumar
MGR, B Tech (Mech)

D B Lalchandani
MGR, B E (Mech), MBA (Oprn)

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MGR, B E (Inst & Cont Engg)

Shreyas Jain
MGR, B E (Elect)

Abhishek Gupta
MGR, B E (Mech)

Prakash A Makwana
MGR, B E (Elect)

Bibhash Biswas
MGR, Dip (Civil), DBM

Vatsal Patel
DY MGR, B E (Mech)

Pratik K Agrawal
DY MGR, B E (Civil)

Vivek Jaiswal
DY MGR, B E (Civil)

Sumeet Shekhar
DY MGR, B E (Mech)

Shantanu Kr Shukla
DY MGR, B Tech (Env Engg), MBA (EMS)

Sachin A Sarvaiya
DY MGR, B E (Mech)

Alark S Kulkarni
DY MGR, B Tech (Instr), M Tech (Biotech)

Rahul Kumar
DY MGR, B E (Elec)

AJMER DAIRY EXPANSION PROJECT, AJMER

P Balaji
MGR, B E (Civil)

Aditya Sharma
MGR, B Tech (Civil), M Tech (CPM)

Balbir Sharma
MGR, DEE, B Tech (Elect)

Satendra Singh Gurjar
MGR, B E (Mech)

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Shashikumar B N
DY GEN MGR, B E (EEE), PGDRDM

F Pradeep Raj
DY MGR, BE (Civil), M Tech (Civil)

Syed Abdul Rashid
DY MGR, B E (Mech)

ASCEPTIC PACKAGING STN., BASSI PATHANA

Jasdev Singh
MGR, B Tech (Elec),
M Tech (Power Engg)

Prudhvi Pathaneni
DY MGR, B Tech (Civil),
M Tech (Quality Mgmt)

BHUBANESWAR DAIRY PROJECT, BHUBANESWAR

R Soundhararajan
SR MGR, AMIE (Mech)

Bibhu Prasad Jena
MGR, B E (Civil)

Soumya Ranjan Mishra
DY MGR, B E (Elect)

Abhishek Singhal
DY MGR, B Tech (Civil)

CATTLE FEED PLANT PROJECT, RAJKOT

Gautam Kumar Jha
DY MGR, BE (Civil)

DEOGHAR DAIRY PROJECT, SARATH

Dharmendra K Behera
MGR, B E (Mech), MBA (Mktg & Syst)

Gaurav Singh
MGR, B Tech (Civil)

FROZEN SEMEN STATION PROJECT, PURNIA

Ashish Ravi
DY MGR, B Tech (Civil)

Santosh Patidar
DY MGR, B E (Civil)

KATRAJ DAIRY PROJECT, PUNE

Rabindra K Behera
MGR, B E (Civil)

JAIPUR DAIRY EXPANSION PROJECT, JAIPUR

Akshay Mandora
DY MGR, B E (Mech)

JALGAON DAIRY EXPANSION PROJECT, JALGAON

Balram Niboriya
MGR, B Tech (Civil)

Surjeet K Choudhary
DY MGR, B E (Mech)

LUDHIANA DAIRY EXPANSION PROJECT, LUDHIANA

S K Nasa
DY GEN MGR, B E (Civil)

Krishan Dev
DY MGR, B Tech (Civil),
M Tech (Geotechnical)

PALAMU DAIRY PROJECT, PALAMU

Pradip Layek
MGR, B Tech (Elect)

Nikunjkumar N Parmar
DY MGR, B E (Civil)

SAGAR DAIRY PROJECT, SAGAR

Sudhir Kumar Gangal
MGR, DCE, B E (Civil)

Shailesh S Joshi MGR
B E (Mech)

SAHEBGANJ DAIRY PROJECT, SAHEBGANJ

Dhiraj B Tembhurne
MGR, B E (Civil)

Tushar S Chavan
DY MGR, B E (Mech)

JALANDHAR DAIRY PROJECT, JALANDHAR

Charan Singh
MGR, Dip (Civil), B Tech

SENDHWA DAIRY PROJECT, SENDHWA

Anshul Chaurasia
DY MGR, B E (Mech)

POWDER PLANT & DAIRY PROJECT SITE, HIMMATNAGAR

Dhaval A Panchal
MGR, B E (Elect)

ICE CREAM PLANT,
AAVIN MADURAI DAIRY PREMISES, MADURAI

U Sundara Rao
MGR, DEE, B Tech (EEE)

Tarak Rajani
MGR, B E (Civil)

UDUPI AUTOMATED DAIRY PROJECT, UPPOOR

Asutosh Samal
DY MGR, B Tech (Civil)

Animal Breeding

R O Gupta
GEN MGR, BVSc, MVSc (Med)

G Kishore
DY GEN MGR, BVSc, M Sc (Dairying, Ani Gen & Brdg)

S Gorani
DY GEN MGR, BVSc,
MVSc (Vety Gynecology & Obstetrics), PGDMM

Sujit Saha
SR MGR, B Sc (Agri), M Sc (Dairying), Ph D (Ani Gen & Brdg), MBA (Mktg)

N G Nayee
SR MGR, BVSc, MVSc (Anim Brdg)

V P Bhosale
SR MGR, BVSc & AH, MVSc (Med)

Santosh K Sharma
MGR, BVSc & AH, PGDRM

A Sudhakar
MGR, BVSc, MVSc, Ph D (Ani Brdg)

Ranmal M Ambaliya
MGR, B.E (Comp Engg)

Swapnil G Gajjar
MGR, BVSc, MVSc (Animal Gen & Breeding)

Krushna M Beura
MGR, BVSc & AH, MBA (Rural Mgmt)

Shiraj M Sherasia
MGR, BVSc & AH, MBA (Agri Bus)

Surabhi Gupta
MGR, BVSc & AH, PGDRM

Siddhartha S Layek
MGR, BVSc & AH, MVSc (LPM), Ph D (LPM)

ASSAM LIVESTOCK DEVELOPMENT AGENCY (ALDA), GUWAHATI

Pankaj Deori
MGR, BVSc, MVSc (Animal Gen & Breeding)

Animal Health

S K Rana
GEN MGR, BVSc & AH, MVSc (Micro), Ph D (Micro)

A V Hari Kumar
SR MGR, BVSc & AH, MVSc (Micro)

K Bhattacharya
SR MGR, BVSc, MVSc (Micro)

Pankaj Dutta
MGR, BVSc & AH, MVSc (Micro)

Shroff Sagar I
MGR, BVSc & AH, MVSc (Micro)

Sandeep Kumar Dash
DY MGR, BVSc & AH, MVSc (Micro), Ph D (Vet Micro)

AH-INAPH CELL

M R Mehta
DY GEN MGR, M Sc (Stats), Dipl (Comp Sc)

R K Srivastava
SR MGR, B Sc (Maths), PGDCA, MCA

B Vasanth Naik
MGR, B Tech (CS & IT), M Tech (CSE)

NDDB R&D LABORATORY, HYDERABAD

Ponnanna N M
SCI III, B Sc (Agri), M Sc (Micro), PhD (Biotech)

Laxmi Narayan Sarangi
SCI I, BVSc & AH, MVSc (Vety Micro), Ph D (Vet Virology)

K S N L Surendra
SCI I, B Sc, M Sc (Biotech)

Amitesh Prasad
SCI I, BVSc & AH, MVSc (Micro)

Vijay S Bahekar
SCI I, BVSc & AH, MVSc (Micro)

Animal Nutrition

V Sridhar
GEN MGR, BVSc & AH,
MVSc (Anim Nutn), MBA

A K Verma
DY GEN MGR, B Tech (Agri Engg)

A K Srivastava
DY GEN MGR, M Sc (Agri)

Rajesh Sharma
SR MGR, M Sc (Agri), Ph D (Agro)

Digvijay Singh
SR MGR, M Sc (Agri), Ph D (Agro)

N R Ghosh
SR MGR, BVSc & AH,
M Sc (Anim Nutn)

Pankaj L Sherasia
SCI III, BVSc, MVSc (Anim Nutn),
PhD (Anim Nutn)

Pritam K Saikia
MGR, BVSc & AH, MVSc (Anim Nutn)

Mayank Tandon
MGR, B Sc, M Sc Ag (Anim Nutn),
Ph D (Anim Nutn)

Bhupendra T Phondba
SCI II, BVSc & AH, MVSc,
Ph D (Anim Nutn)

Alok Pratap Singh
MGR, BVSc & AH, MVSc (Anim Nutn)

Chanchal Waghela
MGR, BVSc & AH, MVSc (AN)

Vinod Uikey
MGR, B Sc (Agri), M Sc (Agronomy)

Alka Choudhari
MGR, B Sc (H) (Agri),
M Sc (Agronomy)

Abhay Sihag
DY MGR, B Tech (Agri Engg)

Centre for CALF Analysis & Learning in Livestock & Food

Rajesh Nair
Director, B Sc, M Sc (Analy Chem),
Ph D (Chem)

Rajiv Chawla
SR SCI, B Sc, M Sc (Anim Nutn),
Ph D (Anim Nutn)

S K Gupta
SCI III, M Sc (Agri)

Swagatika Mishra
SCI II, B Sc (Bot), M Sc (Micro)

R P Dodamani
MGR, B Com, LLB

Amol S Khade
SCI II, BVSc & AH, MVSc (Animal Gen & Breeding)

Dnyaneshwar R Shinde
SCI I, B Tech (DT),
M Tech (Dairy Chem)

Sushil G Gawande
SCI I, B Tech (DT),
M Tech (Dairy Chem)

Hriday B Darji
SCI I, B Tech (DT), M Tech (DT)

Swati S Patil
SCI I, B Sc (Food Tech & Mgmt) M Sc (Food Tech)

Pudota Rohith Kumar
SCI I, B Sc (Chem), M Sc (Food Chem)

Subhadeep Mukherjee
SCI I, B Sc (Chem), M Sc (Agri Chem & Soil Sc), Ph D (Agri Chem & Soil Sc)

G Thirumalaisamy
SCI I, B V Sc & A H (Veterinary Science), M V Sc (AN), PhD (AN)

Shruti Mishra
SCI I, B Sc (Chem), M Sc (Chem),
PhD (Chemistry)

Karmraj R Jaiswar
SCI I, B. Sc, M. Sc (Microbiology),
Certificate course in Bioinformatics

Legal

Chandaka TVS Murthy
DY GEN MGR, B Com, BL, LLM, PGD (Trnsp Mgmt), PGD (Cyber Law & IPR)

Pallavi A Joshi
MGR, B Com, LLB

Accounts

S Regupathi
GEN MGR, M Com, ICWA, PGDRDM

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SR MGR, B Com, CA

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SR MGR, B Com, ICWA

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SR MGR, B Sc (Maths), PGDCA,
PGDTP, ICWA

Kalpeshkumar J Patel
MGR, BBA, M Com, ICWA, CS

Ashutosh K Mishra
MGR, B Sc (E&I), PGDBA (Fin)

Vipin Namdeo
MGR, M Com, PGDCA, ICWA

R Arumugam
MGR, M Com

Rashmi Prateesh
MGR, M Com, ICWAI

Brajesh Sahu
MGR, B Com, CA

Swapnil Thaker
MGR, M Com, CA

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DY MGR, B Com, ICWAI

Dipen R Shah
DY MGR, BBA, MBA (Fin), ICWAI

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DY MGR, B Com, CA

Hardi B Takolia
DY MGR, B Com, CA

Regional Office, Bangalore

S Rajeev
DY GEN MGR, B Tech (Industrial Engg), PGDRM

S D Jaisinghani
DY GEN MGR, B Sc (DT), PGDHRM

G C Reddy
DY GEN MGR, M Sc (Stats), M Phil (Populn Studies)

T T Vinayagam
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M N Sathish
SR MGR, M Sc (Stats)

S S Nyamagonda
SR MGR, M Sc (Agro)

M L Gawande
SR MGR, BVSc, MVSc (Vet Med)

Pankaj Singh
SR MGR, M Sc (Agri)

Latha Siripurapu
SR MGR, B Com, PGDBA (Fin)

Rajni B Tripathi
MGR, B Sc (Bot), MSW, PGDIRPM

Nidhi Negi Patwal
MGR, B Sc, M Sc (Chemistry), PGDRM

Thungayya Saliyan
MGR, B A, MSW, PGD-HRM

Divya TR
MGR, BVSc & AH, MVSc (Animal Rep Gynecology & Obstetrics)

NDDB OFFICE, ERODE

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SR MGR, B Sc (Agri), MA (Rural Dev)

NDDB OFFICE, TRIVANDRUM

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SR MGR, M Sc (Agri)

NDDB, VIJAYAWADA

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SR MGR, M Sc (Agri)

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SR MGR, M Sc (Eco), M Phil (Eco)

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MGR, BVSc & AH, MVSc (Vety Gynaec & Obst)

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MGR, BCA, PGDM (HR & Mktg)

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DY GEN MGR, M Com

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MGR, BVSc & AH, MVSc (Anim Nutn)

Regional Office, Mumbai

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MGR, B Sc (Agri Mktg & Coopn), M Sc (Agri Eco)

Swati Srivastav
MGR, B Sc (Phy), PGDRM

Rahul Tripathi
MGR, B.Com, MBA (Fin)

Manojkumar B Solanki
MGR, B Tech (DT), M Tech (Dairy Chem)

NDDB OFFICE, BHOPAL

Subhankar Nanda
MGR, BVSc & AH, MVSc (AN)

NDDB OFFICE, NAGPUR

Atul C Mahajan
MGR, BVSc & AH, MVSc (Animal Gen & Breeding), Ph D (Animal Gen & Breeding)

Chandrashekhar K Dakhole
MGR, BVSc & AH, MVSc (AN)

Regional Office, Noida

Ananthapadmanabhan S N
DY GEN MGR, B Sc, BGL, PGD (PM & IR), PGDRDM

Anil P Patel
SR MGR, M Sc (Agri), PGDMM

NDDB OFFICE, BIKANER

Manoj Kumar Gupta
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Jitendra Singh Rajawat
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Dhanraj Khatri
MGR, B A, MA (SW)

Satyapal Kurrey
MGR, D Pharm, BVSc & AH, MBA

Ruminpal Singh Bali
MGR, BVSc & AH, MVSc (Animal Rep Gynecology & Obstetrics)

NDDB OFFICE, JAIPUR

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MGR, B E (Mech), PGDRM

NDDB OFFICE, LUCKNOW

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MGR, B A, PGDDM

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MGR, BVSc & AH, MVSc (Anim Nutn)

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MGR, B Com, PGDDM

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Surbhi Pawar
DY MGR, BBA, PGDM-RM

Vishnu Deth G
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Ph D (Agro)

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Sanjay Kumar Yadav
MGR, B Sc, MBA (RD)

Shelly Topno
MGR, B A (Hons), M A (SW)

Priyanka Toppo
MGR, B Com, PGDRM

Sachin S Shankhpal
MGR, BVSc & AH, MVSc (Anim Nutn), Ph D (Anim Nutn)

Prakashkumar A Panchal
DY MGR, B Tech (DT), M Sc (ICT-ARD)

ON DEPUTATION

ON DEPUTATION TO MDFVPL

Sangram R Chaudhary
M Sc, PGDRM

ABBREVIATIONS

GEN MGR:
General Manager

DY GEN MGR:
Deputy General Manager

SR SCI:
Senior Scientist

SR MGR:
Senior Manager

SCI III:
Scientist III

MGR:
Manager

SCI II:
Scientist II

DY MGR:
Deputy Manager

SCI I:
Scientist I

Glossary

AI	- Artificial Insemination
AMR	- Antimicrobial Resistance
APART	- Assam Agribusiness and Rural Transformation Project
ARIAS	- The Assam Rural Infrastructure and Agricultural Services Society
AVM	- Ayurvedic Veterinary Medicine
BB	- Bovine Brucellosis
BCP	- Brucellosis Control Programme
BVD	- Bovine Viral Diarrhoea
BGC	- Bovine Genital Campylobacteriosis
BIS	- Bureau of Indian Standards
BMC	- Bulk Milk Cooler
CAC	- Codex Alimentarius Committee
CCBF	- Central Cattle Breeding Farms
CFSP&TI	- Central Frozen Semen Production and Training Institute
CMT	- California Mastitis Test
CRP	- Calf Rearing Programme
CST	- Concentrated Solar Thermal
DAHD	- Department of Animal Husbandry and Dairying
DCS	- Dairy Cooperative Society
DIDF	- Dairy Infrastructure Development Fund
DPMCU	- Data Processor based Milk Collection Units
DPR	- Detailed Project Report
EAP	- Equity Action Plan
EFS	- Extended Frozen Semen
EIAs	- End Implementing Agencies
EIC	- Exports Inspection Council
ESAP	- Environment and Social Action Plan
eWG	- e-Working Group
FMD	- Foot and Mouth Disease
FMD-CP	- Foot and Mouth Disease Control Programme
FOPNL	- Front-of-Pack Nutrition Labelling
FSSAI	- Food Safety and Standards Authority of India
GEBV	- Genomic Estimated Breeding Values
GoI	- Government of India
GOM	- Government of Maharashtra
HACCP	- Hazard Analysis Critical Control Point
HGM	- High Genetic Merit
IBR	- Infectious Bovine Rhinotracheitis
ICAR	- Indian Council of Agricultural Research
IDA	- International Development Association
IDF	- International Dairy Federation
i-DIS	- Internet Based Dairy Information System
IFCN	- International Farm Comparison Network
INAPH	- Information Network for Animal Productivity and Health
IRMA	- Institute of Rural Management, Anand
IVEP	- In Vitro Embryo Production
JMF	- Jharkhand Milk Federation

Kg	- Kilogram
LCP	- Least Cost Formulation
LKGPD	- Lakh Kilograms Per Day
LLPD	- Lakh Litres Per Day
LRP	- Local Resource Person
MAFSU	- Maharashtra Animal & Fishery Sciences University
MAITs	- Mobile AI Technicians
MCPP	- Mastitis Control Popularisation Project
MDFVPL	- Mother Dairy Fruit & Vegetable Pvt. Ltd.
MPC	- Milk Producer Company
MSP	- Minimum Standard Protocol
MTC	- Micro Training Centres
MTPD	- Metric Tonne Per Day
NADCP	- National Animal Disease Control Programme
NCC	- National Codex Committee
NCDFI	- National Cooperative Dairy Federation of India Ltd
NDP I	- National Dairy Plan 1
NFN	- NDDB Foundation for Nutrition
NPDD	- National Programme for Dairy Development
NRLM	- National Rural Livelihoods Mission
NSC	- National Steering Committee
OPU	- Ovum Pick-up
PC	- Producer Company
PIP	- Project Implementation Plan
POI	- Producer Owned Institution
PS	- Pedigree Selection
PT	- Progeny Testing
RBP	- Ration Balancing Programme
RGM	- Rashtriya Gokul Mission
RSFP&D	- Regional Stations for Forage Production and Demonstration
SCC	- Somatic Cell Counts
SCM	- Sub-Clinical Mastitis
SMP	- Skimmed Milk Powder
SNF	- Solids Not Fat
SNPs	- Single Nucleotide Polymorphisms
SNT	- Serum Neutralisation Test
SOPs	- Standard Operating Procedures
SPCC	- Science and Programme Coordination Committee
SS	- Semen Stations
SDGs	- Sustainable Development Goals
TLPD	- Thousand Litres Per Day
TMR	- Total Mixed Ration
ToT	- Training of Trainers
VAF	- Veterinary Ayurvedic Formulation
VBMPS	- Village Based Milk Procurement Systems
VMDDP	- Vidarbha Marathwada Dairy Development Project
WAMUL	- West Assam Milk Producers' Cooperative Union Limited

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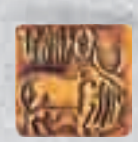

Head Office
PB No. 40, Anand 388 001
Telephone: (02692) 260148/260149/260160
Fax: (02692) 260157
E-mail: anand@nddb.coop

Offices

PB No. 9506, VIII Block,
80 Feet Road, Koramangala,
Bengaluru 560 095
Telephone: (080) 25711391/25711392
Fax: (080) 25711168
E-mail: bangalore@nddb.coop

DK Block, Sector II,
Salt Lake City, Kolkata 700 091
Telephone: (033) 23591884/23591886
Fax: (033) 23591883
E-mail: kolkata@nddb.coop

PB No. 9074, Western Express
Highway, Goregaon (East),
Mumbai 400 063
Telephone: (022) 26856675/26856678
Fax: (022) 26856122
E-mail: mumbai@nddb.coop

Plot No. A-3, Sector-1,
Noida 201 301
Telephone: (0120) 4514900
Fax: (0120) 4514957
E-mail: noida@nddb.coop

www.nddb.coop

Concept & Design WYATT Prism COMMUNICATIONS (info@wyatt.co.in)