



National Dairy  
Development Board



Annual Report  
**2018-19**



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# Members of the Board

*As on 31st March, 2019*

**Shri Dilip Rath**

*Chairman*

**Shri Mihir Kumar Singh**

*Joint Secretary*

*(Cattle & Dairy Development)*

*Department of Animal Husbandry,  
Dairying & Fisheries*

*Ministry of Agriculture and  
Farmers Welfare*

*Government of India*

**Shri Rasik Parmar**

*Chairperson*

*Chhattisgarh State Co-operative Dairy  
Federation*

*Chhattisgarh*

**Prof. Guru Prasad Singh**

*Institute of Agricultural Sciences*

*Banaras Hindu University*

*Varanasi*

**Shri Sangram Chaudhary**

*Executive Director*

**Shri Yuvaraj Yashwant Patil**

*Executive Director*

# The Year in Retrospect

Milk Production in the country grew at 6.5 per cent to 187.7 million tonnes in 2018-19 as against 176.3 million tonnes in 2017-18. The per capita availability of milk increased to 394 grams per day.





Average milk procurement by the dairy cooperatives surged by about 15 per cent even during peak summer months when milk production generally declines.

### Domestic dairy scene

With an estimated milk production of 187.7 million tonnes, an increase of about 6 per cent over the previous year, India continued to be the largest milk producing nation. The per capita availability of milk increased to 374 grams per day.

The wholesale price indices of cattle feed, rice bran and oilseed extractions increased by 3-4 per cent during the year. The prices of rice bran extractions, which is a key ingredient in balanced cattle feed rose by about 7 per cent. However, the farm gate prices of milk remained subdued.

The export of dairy commodities revived after five years and about 64,000 tonnes of skimmed milk powder (SMP) and SMP equivalent of casein were exported during the year, which was second highest after record exports in 2013-14.

### International dairy scene

The year started with about 4.0 per cent higher global milk production estimated at of 843.2 million tonnes in 2018 and record powder inventories in Europe and the USA. Many dairy exporting countries had dairy products overstocked, global imports were flat and a good flush was expected in exporting countries. Globally, it appeared to be a challenging year mainly with Skimmed Milk Powder (SMP) prices touching a low of about USD 1,900 a tonne, FOB-Oceania.

Between April and June 2018, global dairy product prices recovered in anticipation of drought and Mycoplasma bovis in dairy herd in New Zealand, heat-wave in Europe, 45 per cent annual inflation in Argentina, phosphate emission reduction

in Europe and hence, the SMP quotes increased to USD 2,100 per tonne. After July 2018, market sentiments again softened amidst good rains and ideal fodder growth which boosted New Zealand's milk production. Hence, dairy products continued to remain surplus and unsold stocks of SMP overshadowed the market.

In November 2018, the incremental milk production from the top five exporting countries fell below the level during corresponding period in the previous year, which coupled with rising imports by China, Mexico and South East Asia revived world dairy market prices. As a result, world SMP prices rose from its April 2018 low of USD 1,900 to USD 2,700 a tonne, FOB-Oceania in March 2019.

Amidst weak international market and sustained growth in domestic milk production during the report period, the export-oriented processing plants in India reduced purchasing milk from farmers. As a result, the surplus milk got diverted to dairy cooperatives resulting into about 7 per cent rise in milk procurement at an average of 508 lakh kg per day. With liquid milk sales by the dairy cooperatives at 352 lakh litres per day registering a modest increase of about 1 per cent, the net surplus of about 187 lakh kg of milk was converted mainly into SMP and butter as these had longer shelf life. In the process, the cooperative dairies started the year with unsold stocks of SMP, butter & ghee valued at about ₹ 60,000 million.

Average milk procurement by the dairy cooperatives surged by about

15 per cent even during peak summer months when milk production generally declines. This led to under utilisation of stocks of SMP and butter for recombination. This, with additional production of the commodities resulted into further increase in stocks. When monsoon in the country set in, major dairy cooperatives had funds blocked in holding unprecedented level of inventories and faced severe liquidity crunch to the extent that few defaulted in making timely payments to dairy farmers for the milk delivered.

During the entire year, market price of SMP remained subdued to levels as low as ₹ 147 a kg, much below the manufacturing cost of ₹ 238 and thus adversely affected the bottom-line of dairy cooperatives. With a thin profit margin of about 5-7 per cent, they had no leverage to absorb interest burden on the working capital loans. Though the Government of India (GoI) and some of the affected State governments provided subsidies on export of SMP, the entire year was challenging for most of the dairy cooperatives.

# Strengthening Cooperative Business

NDDDB remained dedicated to strengthening the operations of the cooperative milk unions and increasing income of the dairy farmers.



NDDDB has been designated as one of the implementing agencies in National Bee-keeping and Honey Mission



Gift a child a better tomorrow

During the year, the cooperative milk unions together covered 1,90,516 village dairy cooperative societies, with a cumulative membership of 16.93 million milk producers. The cooperative milk unions collectively procured an average of 507.69 lakh kg of milk per day as compared to 475.29 lakh kg per day in the previous year, with a growth of about 7 per cent. The sales of liquid milk reached 354.53 lakh litres per day, recording a growth of over 1 per cent over previous year.

As on March 2019, the total number of women members in dairy cooperatives across the country was 5.06 million representing almost 30 per unit of the total membership.

Building on last year's new initiatives, efforts were made to further leverage the strength of the dairy cooperative network. A Pilot project on Solar Pump Irrigators Cooperative Enterprise initiated during the previous year have started to generate monthly additional income for dairy farmers from the sale of solar power.

During the year, an event on dairy innovation award was organised wherein sixty-two Producer Owned Institutions participated for the award showcasing 238 innovations in various domains of dairy value chain. Also a workshop on 'Role of Technology in Doubling Income of Dairy Farmers' was organised wherein around 1,000 farmers across the country participated and learned about various technologies pertaining to the dairy sector.

NDDDB's initiative of manure management is helping women dairy farmers save on monthly fuel expenses by using biogas.

NDDDB continued to promote Scientific Bee-keeping amongst dairy co-operatives by sensitising officers and field staff of milk unions regarding the importance of bee-keeping by organising various workshops and seminars. This was followed by organising one week extensive skill building training programme for interested farmers. As a result, some of the dairy co-operatives are already procuring and marketing honey.

NDDDB has been designated as one of the implementing agencies in National Bee-keeping and Honey Mission (NBHM), a central sector scheme of Government of India, which would further facilitate in promoting this activity through the vast network of dairy cooperatives. NDDDB's wholly-owned subsidiary Mother Dairy Fruit and Vegetable Private Ltd. is also supporting bee-keeping activities by procuring and marketing honey under its brand "SAFAL" through its network of 375 stores in NCR, Bhubaneswar and Varanasi.

NDDDB also took up the responsibility of dairy development in areas where development in this sector has not been significant. NDDDB's efforts in Assam, Jharkhand and Maharashtra are already showing positive results. NDDDB has signed an MoU with the Government of Uttar Pradesh to develop Shahajahanpur Mahila Milk Union Ltd as an all women dairy cooperative.





Ensuring faith and satisfaction of milk producers through Cooperation

### Strengthening Village-Based Milk Procurement System

Village-Based Milk Procurement System (VBMP), one of the major components of the National Dairy Plan Phase I (NDP-I) implemented by NDDDB to promote transparency of operations and enhance quality of milk, continued to achieve the targets as per the approved sub-projects. By March 2019, the number of sub-project plans (SPPs) approved increased to 245 sub-projects, covering 118 District Cooperative Milk Unions and six Producer Companies, with total approved grant assistance of ₹ 6,890.40 million.

By March 2019, 32,540 villages were covered both by forming new and strengthening existing Dairy Cooperative Societies with facilities for milk chilling using Bulk Milk Coolers and advanced milk testing facilities. Approximately 7.80 lakh new members were inducted and 10.30 lakh existing members benefited from improvements in the milk collection system. Of this incremental membership, about 48 per cent are women members. Additional Milk procurement under the Plan has been more than 29.60 lakh kg per day (LkgPD).

A substantial focus has been on increasing women members. This has resulted in formation of 4,171 new all

women DCS. Installation of about 3,000 Bulk Milk Coolers (BMCs) at strategic locations along the milk collection routes has improved the quality of milk. This is evident by the high Methylene Blue Reduction Test (MBRT) results recorded by dairy plants of the End Implementing Agency (EIA) level.

### Management of Dairy Cooperatives

#### West Assam Milk Producers Cooperative Union Ltd.

NDDDB continued to manage West Assam Milk Producers' Cooperative Union Limited (WAMUL) popularly known as Purabi Dairy. During the year, WAMUL procured 32,540 kg of milk per day having around 4.3 per cent Fat and 8.3 per cent SNF from 12,365 dairy farmers through 224 milk collection centres. The average milk procurement price paid by WAMUL to its associated dairy farmers was ₹ 36.00 per kg of milk which is among the highest milk procurement price paid in the country.

During the year, WAMUL had initiated a process of procuring solar-powered village-based automatic milk collection units (AMCUs) under the World Bank aided project - Assam Agribusiness and Rural Transformation Project (APART) so that greater degree of transparency in milk collection and testing process can be established at its milk collection centres. These units will be operated

by AMCS software developed by NDDDB. During the year, under APART, WAMUL recruited key functionaries to carry out operations in the areas of milk procurement, institutional building and input services. The year also saw WAMUL setting up of two biogas units of three cubic metre capacity each at Baksa and Barpeta.

During the year, WAMUL continued to provide various input services such as doorstep AI delivery, distribution of cattle feed and feed supplements at affordable rates. Field demonstrations and training and capacity-building programmes for its dairy farmers were also conducted during the year. WAMUL reported 65,854 AI deliveries and birth of 23,353 calves (of which 12,405 are females) covering over 2,000 villages through a network of 316 mobile AI technicians (MAITs) in the districts falling under the project area of APART.

WAMUL sold around 88 MT of cattle feed and around 7 MT of mineral mixture during the year.

WAMUL conducted a Calf Rally in Borjari village in Morigaon district. The event felicitated the best calves born out of the doorstep AI delivery project of WAMUL. Best performing mobile AI technicians were also felicitated during the event.

During 2018-19, WAMUL sold around 54,000 litres of packed liquid milk per day under the brand 'Purabi' besides selling paneer, sweet curd, plain curd and ghee. During the year, WAMUL continued promoting the concept of milk fortification by selling its toned milk "Purabi Smart" fortified with Vitamins A&D with financial support received under South Asia Food and Nutrition Security Initiative (SAFANSI) project. The year saw WAMUL attaining a growth of around nine per cent over the previous year by registering a sales turnover of ₹ 1,024 million (provisional) as against ₹ 943 million registered in the previous year.

Seeing the turnaround of WAMUL over the last decade under the management of NDDDB, the tripartite agreement signed on 05th February, 2019 between NDDDB, WAMUL and Government of Assam got further extended by a period of three years till May 2021.



### Jharkhand Milk Federation

NDDB continued to manage the Jharkhand State Cooperative Milk Producer's Federation Limited (JMF). The Milk Federation achieved an average daily milk procurement of about 125 TkgPD, from 20,000 milk pourers covering about 2,000 villages spread across Jharkhand. The Federation paid about ₹ 1,274 million towards milk bill payments through Direct Bank Transfer in the individual bank account of milk producers during the year. In addition, about ₹ 17 million (provisional) was paid as price difference to the pourers during the financial year. During 2018-19, the Federation marketed liquid milk including bulk sales averaging 109 TLPD. More than 380 DPMCU's & AMCU's were made operational by the end of the financial year. Considering the potential of dairy development in the state, the Government of Jharkhand approved creation of three new Dairies at Sahebganj, Deoghar and Palamu districts of Jharkhand. The civil work at Sahebganj and Deoghar dairies is under progress.

Jharkhand Milk Federation trained 214 Local Resource Persons who provided feed advisory services to 10,464 milk producers for their 14,218 milch animals covering 225 villages during the year. About 555 milk producers and village level committee members were trained during the year.

Apart from trainings under NDP-I, JMF provided scientific animal husbandry training to around 4,000 milk producers during the year.

A Modern Training cum Demonstration Farm on Indigenous Cattle Rearing & Fodder Management has been set-up by JMF in the campus of Hotwar dairy plant. The objective of this farm is to assess the performance of indigenous breeds such as Rathi (Rajasthan) and Gir (Gujarat) in agro-climatic conditions of Jharkhand. Apart from this, different varieties of green fodder are being showcased such as Napier, Marvel Grass, Moringa, Maize, Bajra, Jowar, Cow Peas, Velvet Beans, Thorn-less Cactus, Oats, Berseem, Rye Grass and Chinese Cabbage to create awareness about green fodder cultivation.

The Federation supplied 3,500 MTs of compound cattle feed to milk producers during the year.

### 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. Projects of POIs with a total outlay of ₹ 1,471 million were approved under the scheme "Providing Financial Assistance for Infrastructure Activities, Skill Development and Trainings". During the year, long-term financial assistance of ₹ 2,017 million was disbursed to POIs.

During 2018-19, NDDB approved working capital facility of ₹ 5,480 million to POIs. So far, working capital facility of ₹ 8,650 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) launched the scheme – "Dairy Processing & Infrastructure Development Fund (DIDF)" during 2017-18. The scheme has a total financial outlay of ₹ 1,08,810 million comprising ₹ 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 ₹ 8,640 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.

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.

The cooperative milk unions collectively procured an average of **507.69** lakh kg of milk per day, registering a growth of about **7** per cent.

As on March 2019, 22 projects of Producers Owned Institutions (POIs) with an outlay of ₹ 31,472 million including loan of ₹ 21,576 million have been approved. Funds of ₹ 4,385 million have been released to the POIs under the scheme. The implementation of the approved projects will enhance the milk processing capacities of POIs by 9.02 million litre per day.

### Dairying through Cooperatives – key to sustainable livelihood

NDDDB prepared a project proposal - “Dairying through Cooperatives - key to sustainable livelihood” with a focus to strengthen the entire dairy value chain of POIs by availing Official Development Assistance (ODA) loan from Japan International Cooperation Agency (JICA). A pilot project has been formulated for improving the livelihood of dairy farmers in backward districts

of the country through various dairy development interventions. Department of Animal Husbandry & Dairying (DAHD), Government of India (GoI) selected 53 socially and economically backward districts in the state of Uttar Pradesh (31 districts) and Bihar (22 districts) that hold promise for stimulating growth given the resources available for dairying.

Under the project, specific interventions have been envisaged for setting-up milk procurement systems, milk processing, marketing & ICT infrastructure along with activities for productivity enhancement of milch animals.

The project will be implemented by National Dairy Development Board (NDDDB) through Participating Institutions (PIs) viz. State Milk Federations, Milk Unions, Multi State Milk Cooperatives and Milk Producer Companies. The total

outlay of the project is ₹ 15,682 million comprising ₹ 9,629 million as loan, ₹ 4,755 million as grant and ₹ 1,298 million as State/Participating Institution's share. Loans under the project has been envisaged to be available at concessional rate of interest.

The project proposal has been appraised and the loan agreement between Government of India and JICA was executed on 21st December, 2018. The project is expected to be rolled out after approvals from the Government of India.

### Dairy Development initiative in Vidarbha & Marathwada regions of Maharashtra

The project focusses on establishing efficient institutional platforms at village level so as to enable dairy farmers in these regions to get optimum value for



their milk and improve the productivity of milch animals through various productivity enhancement interventions.

Mother Dairy Fruit & Vegetable Pvt. Ltd. (MDFVPL), a wholly owned subsidiary of NDDDB, has initiated setting-up of village level institutions along with installation of village level chilling & milk testing facilities so as to provide market access to milk producers for sale of milk. MDFVPL refurbished Nagpur dairy plant, handed over by Government of Maharashtra (GoM) for its operations & management. As on March 2019, Mother Dairy is procuring 2,73,000 litres per day of milk from about 27,275 producer members in 2,246 villages. Payment of about ₹ 3,857 million has been made to milk producers directly in their bank accounts during the year. Milk received from the farmers of the Vidarbha and Marathwada regions is processed in Nagpur dairy plant and is available for consumers in cities like Nagpur, Amravati, Chandrapur and Wardha through Mother Dairy milk parlours and retail network.

Simultaneously, GoM is providing Productivity Enhancement services like animal induction, doorstep delivery of AI services, fodder development support and animal health services in these regions. The project has encouraged farmers to adopt improved and scientific breeding and feeding practices for their milch animals.

The project helps dairy farmers in these drought-prone regions to increase their income by providing fair and transparent milk procurement system along with productivity enhancement services.

### Quality Assurance

After the successful launch of Quality Mark initiative last year, NDDDB continued to strengthen the same by encouraging and handholding various milk unions and federations to align with the updated guidelines. During the year, 21 Cooperative Dairy plants voluntarily applied for Quality Mark. Of these, seven plants have successfully qualified. Surveillance audit was conducted in 16 plants and surprise assessment was done for six plants. Knowledge and experience sharing by the expert panel and providing suggestions to improve

the food safety aspects are the prominent features of Quality Mark assessment process.

NDDDB continued its support to various regulatory, scientific and advisory bodies like the DADF, Codex Alimentarius Commission (CAC) and National Codex Committee (NCC), Food Safety and Standards Authority of India (FSSAI), Bureau of Indian Standards (BIS), Exports Inspection Council of India (EIC) etc. NDDDB provided technical support to the International Dairy Federation (IDF); besides technical support as e-Working Group (eWG) member to committees on Standards of Identity, Microbiological Hygiene, Harmonisation of Microbiological methods, Food labelling and terminology and as Panel members of SPCC, 17 technical committees and 2 Task Force of IDF. NDDDB contributed to CAC working groups like Front-of-Pack Nutrition Labelling (FoPL), Labelling of Non-retail containers of food, Biological Methods and General principles of Food Hygiene and HACCP. Support for evaluation of the dairies export worthiness was also provided to the Exports Inspection Council of India (EIC) as a panellist.

NDDDB continued to conduct education and training programme for farmers, procurement personnel and supervisors, newly recruited dairy staff of various federations and board of cooperatives in quest of achieving highest standards of quality and hygiene in complete value chain from the farm level up to consumer.

“National Seminar on Aflatoxin: Strategies for Reduction and Finding Solutions” was organised to create awareness amongst stakeholders regarding paradigm shift in defining permissible residue limits of contaminants in the milk, that pose significant health hazard. NDDDB also undertakes need-based studies from time to time at the request of co-operative milk unions and federation. Milk solids recovery study at various milk unions of MilkFed, Punjab were conducted to help these cooperatives in setting new benchmarks.

### Milk Producer Companies

During the year, NDDDB Dairy Services (NDS), the wholly-owned subsidiary of

NDDDB, facilitated incorporation of Balinee Milk Producer Company in Jhansi, Uttar Pradesh. Four Milk Producer Companies (MPC) namely Muktaa & Maalav in Madhya Pradesh, Kaushik in Bihar and Indujaa in Maharashtra were operationalised this year. Currently, together, they are procuring about 13,000 LPD from 10,000 milk producers and have a share capital contribution of ₹ 38 lakhs.

Till now, NDS has facilitated operationalisation of 14 Milk Producer companies. Out of the 14 MPCs, six are being supported under National Dairy Plan (NDP), five are getting support from the Tata Trusts and remaining three are being supported by National Rural Livelihoods Mission (NRLM).

Together, these 14 operationalised MPCs have enrolled over 5.15 lakh milk producers as members from about 12,920 villages. Women membership is about 49 per cent of the total. Around 61 per cent of the total members enrolled are small holder milk producers. These companies together procured about 30.3 lakh kg of milk per day during the period. The members of these companies have contributed together about ₹ 12.6 million towards share capital as on date. They are expected to achieve a combined sales turnover of about ₹ 54,380 million during the year 2018-19. Advisory services for ration balancing & fodder development and, delivery of cattle feed and mineral mixture, Artificial Insemination (AI) services were undertaken in the MPCs based on the requirement of the area.

During the year, under the Ration Balancing Programme (RBP), a total of about 0.93 lakh animals were covered in about 3,835 villages, about 8.64 lakh AIs were performed in about 14,670 villages, about 76,630 MT of cattle feed and 409 MT of mineral mixture have also been supplied to members by these MPCs.

To educate the farmers about the best practices in dairying around 100 Dairy farm management trainings and 47 farmer workshops were also conducted. As the animals in the project areas were prone to sub-clinical mastitis, California Mastitis Tests (CMT) was popularised among farmers to detect mastitis and about 27,300 tests were carried out.

NDS has helped in setting up of Model Dairy Farms (MDFs), 6 in Paayas, 5 in Maahi and 28 in Saahaj. These MDFs function as micro training centres, where farmers are trained on best animal husbandry practices including Housing, Access to Water, Calf Care, Vaccination and Deworming, Mastitis Control, Green and Dry Fodder Conservation. During the year, 2,750 farmers were trained in these MDFs.

### MPCs supported under NDP-I at a glance as of March 31, 2019

Particulars	Paayas, Rajasthan	Maahi, Gujarat	Shreeja, Andhra Pradesh	Bani, Punjab	Shaahaj, Uttar Pradesh	Bapudham, Bihar	Total
Date of Operationalisation	01/12/12	18/03/13	15/09/14	06/11/14	12/12/14	02/10/17	
Number of Districts Covered	13	10	4	9	15	3	54
Villages Covered	3201	2470	1126	1218	2823	998	11836
No. of Members	104603	106439	76413	51590	91034	43240	473319
Women Membership %	38	26	100	25	35	54	45
Small Holders %	34	57	92	35	64	92	60
Paid-up Share Capital (₹ In Cr.)	37.41	34.72	15.53	9.78	23.03	1.71	122.18
Average Milk Procurement (TkgPD)	855.7	812	351	277.4	593.7	44.3	2934.2
Avg. Polypack Milk Sales (TLPD)	83.77	312.72	14.86	10.25	4.94	-	426.54
Avg. Butter Milk Sales (TLPD)	771.74	438.36	302.02	257.27	568.24	42.44	2398.07
Un-Audited Turnover 2018-13 (₹ In Cr.)	1304.01	2332.55	437.1876	368.6295	785.92	76.3221	5304.6192

#### NDDB Foundation for Nutrition

NDDB Foundation for Nutrition (NFN) has been maintaining a steady growth in terms of coverage of children across the country for the last three years. During the year, NFN distributed milk to around 48,000 students studying in 110 government schools across seven states. Since inception, NFN has distributed around 62 lakh units of milk.

NFN launched the Giftmilk programme in Nagpur under the CSR assistance of MDFVPL for around 10,000 students studying in 37 Government schools. It also received CSR assistance from India Trade Promotion Organisation (ITPO) for supply of Giftmilk in Delhi during the year.

The Jharkhand government adopted the Giftmilk programme, initiated by NFN in Latehar, for the entire state as PM Giftmilk Scheme.

Further, after completion of a year of distribution of Giftmilk in Jharkhand, an impact study was conducted by Rajendra Institute of Medical Sciences, Ranchi. The findings revealed a significant decrease in number of stunted children, improvement in cognitive parameters as well as increased attendance levels was seen in programme schools due to Giftmilk.

The impact study thus testifies the Giftmilk's endeavour to address malnutrition through milk and also recommends continuing the programme for minimum three years for sustained benefits to the children.

#### Awareness Generation

NDDB has constantly endeavoured to create awareness amongst milk producers about the best animal husbandry practices to ensure clean milk production at the farm level, healthy bovine and maximum returns

to the milk producers. Awareness materials were disseminated through print and digital aids.

In an effort to promote consumption of milk and milk products, two television commercials were developed and telecasted in various TV channels.

NDDB is promoting Ethno-Veterinary medicine (EVM) as a cost-effective, viable treatment method for bovine ailments. Taking this initiative forward, NDDB created brochures on EVM formulations in 12 vernacular languages for farmers on methods of preparation and application of the EVM formulations for the management of common ailments of dairy animals.

NDDB's technological innovations and efforts in dairy development were showcased in various exhibitions and events. A digital campaign promoting NDDB's quality mark for milk and milk products was initiated. The campaign

communicates best practices under Quality Mark related to clean milk production and good manufacturing practices. Furthermore, a film promoting quality mark for cattle feed was also prepared. During the year, extension films on calf care as well as artificial insemination were made in eight vernacular languages and distributed to milk federations and milk unions.



# Enhancing Productivity

One of the notable changes that NDDB introduced lately, is inclusion of 'Breeding values' of young High Genetic Merit bulls, so that a more, reliable criteria can be used by the semen stations. At present, mother's milk production is the criteria for selection of bulls. Implementation of INAPH has scaled up reflecting the interest of the states in identification of their dairy bovines, an essential step in genetic improvement.



Genetic improvement and raising productivity of the Indian bovine population remained the key essence of various animal breeding projects under NDP-I.



Journey towards prosperity

## ANIMAL BREEDING

*Genetic improvement – a key to profitable dairying*

Development and dissemination of superior bovine germplasm is one of the major driver in the direction of profitable dairying. During the year, NDDB continued its efforts for improving the genetic makeup of the dairy bovines of the country. Indigenous dairy animals remained key focus considering their adaptability and disease resistance and low resource dependence. The activities ranged between continuing the activities on breed development (through Progeny Testing and Pedigree Selection programmes) initiated under NDP-I in the previous years to initiating ovum pick

up and *in vitro* embryo production in indigenous breeds. Genomic selection efforts of NDDB has also been scaled up including fine-tuning the microarray genotyping chip viz., INDUSCHIP developed by NDDB for indigenous cattle and their crosses.

### NDP-I

Genetic improvement and raising productivity of the Indian bovine population remained the key essence of various animal breeding projects under NDP-I. Producing high genetic merit bulls through field-based progeny testing (PT) and pedigree selection (PS) programmes, strengthening the semen stations of the country, delivering AI services to the

doorstep of the farmer etc., were the key components. Ensuring strict adherence to Standard Operating Procedures (SOPs) and monitoring activities through appropriate monitoring mechanisms have been key components of implementation of these programmes. One of the notable changes that NDDB introduced lately, is inclusion of 'Breeding values' of young High Genetic Merit bulls, so that a more reliable criteria can be used by the semen stations. Presently, mother's milk production is the criteria for selection of bulls. Implementation of INAPH has scaled up reflecting the interest of the states in identification of their dairy bovines, an essential step in genetic improvement.



### Progeny Testing

*Selection of bulls based on their breeding values on the basis of performance of their daughters*

NDDB continued to implement 14 sub-projects on PT, following standard operating procedures, through 12 EIAs in 9 states for four breeds of cattle and two breeds of buffalo with a total outlay of ₹ 2,035.9 million. Till date, all the PT projects together have put 2,167 bulls under test and made available 2,112 young HGM bulls for distribution to various semen stations for production of quality disease-free semen doses across the country. All the bulls produced and distributed had a confirmed parentage that has been confirmed through DNA testing and were tested free of diseases

like TB, JD, Brucellosis and IBR. They were also tested for genetic disorders and had a normal Karyotype. Breeding values are estimated for various dairy traits like Milk, Fat, SNF & Protein yields and daughter pregnancy rates. Service sire conception rates are also estimated regularly. An expert Committee formed by the Government of India for estimation of Breeding Value of Bulls published breeding values of 394 bulls of PT projects, namely SAG CB HF PT, SAG Murrah PT, Mehsana Milk Union (MU) Mehsana PT, KMF HF PT and TCMPF CBJY.

Till date, 1,607 bulls produced from PT project have been distributed to 50 semen station located in 20 states through Bull Distribution Committee.

Projectwise achievements of PT projects under the National Dairy Plan I is given in the table below:

No.	EIA	State	Breed	No. of Bulls put to test	HGM bulls made available
1	ABRO	Uttar Pradesh	Murrah	270	106
2	HLDB	Haryana	Murrah	186	174
3	PLDB	Punjab	Murrah	156	154
4	SAG	Gujarat	Murrah	148	217
5	APLDA	Andhra Pradesh	CBJY	159	142
6	TCMPF	Tamil Nadu	CBJY	325	271
7	Banas	Gujarat	Mehsana	69	73
8	Mehsana	Gujarat	Mehsana	93	98
9	KLDB	Kerala	CBHF	87	57
10	BAIF	Uttar Pradesh	CBHF	59	92
11	SAG	Gujarat	CBHF	241	353
12	ULDB	Uttarakhand	CBHF	80	72
13	KMF	Karnataka	HF	270	198
14	SAG	Gujarat	Gir	24	105
<b>Total</b>				<b>2,167</b>	<b>2,112</b>

Animal type classification forms an integral part of a PT project. Giving weightage to type traits in selection of animals can add value to evaluation and improves the longevity of animals. Measurement procedures have been developed for important type traits and an appropriate scale has been standardised for CBHF, CBJY, Murrah and Mehsana breeds. The field implementation of typing has been initiated in most of the PT projects.

### Pedigree Selection

*Selection of bulls based on their mother's lactation yield*

Pedigree selection programmes have been initiated for development and conservation of indigenous breeds in their respective native tracts enabling selection of superior genetics within the population and to build infrastructure for AI delivery to promote dissemination of selected superior genetics. Indigenous breeds have ability to tolerate harsh climatic conditions and are affordable to millions of small and marginal farmers with low inputs. Hence, it is important to improve their genetic worth for milk production. NDDB continued its efforts in implementation of nine PS projects for eight breeds through eight EIAs. 359 AI centres have been established under NDP-I, which together carried out 68,569 AIs during the year 2018-19.

Till date, 248 bulls have been produced under these PS projects and 193 have been distributed to 20 semen station located in 15 states through Bull Distribution Committee.



A Gir Cow being inseminated



Projectwise achievements of PS projects during the year 2018-19 is given in the table below:

No.	EIA	State	Breed	HGM bulls made available
1	Banas	Gujarat	Kankrej	48
2	HLDB	Haryana	Hariana	43
3	MLDB	Maharashtra	Pandharpuri	20
4	PLDB	Punjab	Niliravi	14
5	Gangmul	Rajasthan	Sahiwal	25
6	PLDB	Punjab	Sahiwal	28
7	RLDB	Rajasthan	Tharparkar	14
8	SAG	Gujarat	Jaffarabadi	25
9	URMUL	Rajasthan	Rathi	31
<b>Total</b>				<b>248</b>

### Strengthening of Semen Stations

*For producing and supplying disease-free frozen semen doses from high genetic merit bulls*

NDDB continued its efforts to strengthen 28 A and B graded semen stations in 16 states through 25 EIAs with a total outlay of ₹ 2,989.7 million. The major focus remained creation of infrastructure and facilities at the semen station, improving biosecurity

measures, disease screening, vaccination and environmental & social activities, capacity-building to create trained manpower and deployment of Management Information System (MIS) in semen stations. These changes are expected to provide a platform for a big leap in the semen production of the country both in terms of quantity and in terms of quality; which was evident from the semen production of the country during the year.

Till date, all the PT projects together have put

**2,167** bulls under test and made available

**2,112** young HGM bulls for distribution to various semen stations for production of quality disease-free semen doses across the country.



Establishing identity with 12-digit UID tags

Projectwise achievements of Semen Station Strengthening Projects during the year 2018-19 is given in the table below:

Sr. No.	Semen Stations	No. of Bulls under Collection	Semen Production (in million doses)
1	SAG, Bidaj	527	15.97
2	ABC, Salon	323	9.11
3	DLF-Ooty	74	1.81
4	KMF-NSS	139	3.53
5	PLDB Nabha	117	1.45
6	APLDA Banavasi	90	2.13
7	PSK Jagudan-Mehsana	28	1.18
8	Haringhata	93	2.12
9	CFSP&TI	49	0.93
10	Salboni	82	1.95
11	Karimnagar	79	1.47
12	Rishikesh	95	2.54
13	Mattupatty	69	0.92
14	Dhoni	69	0.90
15	Bhopal	115	2.49
16	ARDA Ode	129	3.83
17	BAIF	285	10.26
18	Patan	94	2.52
19	Bassi	114	1.96
20	Dama	78	1.79
21	NJF Ooty	56	1.07
22	Hisar	122	2.91
23	Rohtak	22	0.71
24	Cuttack	90	1.81
25	Anjora	45	0.51
26	Alamadhi	234	7.10
27	Kulathupuzha	20	0.18
28	Rahuri	178	5.01
<b>Total</b>		<b>3,416</b>	<b>88.18</b>

The year also witnessed implementation of Semen Station Management System, a software solution for computerisation of all the aspects of semen production and sales in 24 semen stations.

### AI Delivery Services

*Delivering Artificial Insemination (AI) services at the doorstep of the dairy farmers using semen from bulls of higher genetic merit and following Standard Operating Procedures would contribute to genetic improvement of animals.*

The AI delivery services to the farmers remained the core activity of input delivery services rendered by all

cooperative milk unions. During the year, the cooperative dairy unions together performed around 17 million AIs through 26,300 field AI centres covering some 76,900 villages. Moreover, till date, 1,300 AI centres have been established as a segment of Pilot AI delivery services (PAID) under NDP-I and 7.8 lakh AIs have been conducted during the year 2018-19.

### Genomic Selection

*Selection of animals based on genomic breeding values, the next revolution in genetic improvement programmes.*

“Genomic Selection” is a technology, which would enable earlier selection of potential elite animals with higher accuracies, resulting in faster genetic improvement. The technology can also be used for identifying animals carrying genetic abnormalities. As present, methods of bull selection gives relatively lower accuracies, selecting them based on genomic breeding values with higher accuracies at an earlier age and propagating them through AI, would facilitate faster genetic improvement, by reducing the generation intervals.

NDDDB has initiated activities for implementation of Genomic Selection in various dairy breeds of cattle and buffaloes. INDUSCHIP, a micro array chip suitable for genotyping various Indian cattle breeds and their crosses have been developed and NDDDB is in the process of developing a genotyping chip for buffaloes. Performance of large number of animals of different breeds are recorded and DNA samples from these animals are being collected and stored. Manpower has also been trained to build capacity in analysing genotyping and performance data with latest statistical methodologies.

### Ovum Pick-up and In Vitro Embryo Production

*A technology that can increase the reproductive rates of elite female animals.*

NDDDB has recently taken up a programme on Ovum Pick-up and In Vitro Embryo Production (OPU-IVEP) technology (popularly known as “Test Tube Baby Technology”) in indigenous breeds of animals, which can also be used for production of embryos in laboratory from elite cows and buffaloes (called “donors”) and further transferred in non-elite animals (surrogate/ “recipients”). The technology is gaining popularity worldwide to increase the number of progenies from an elite female animal during its lifetime. Genetic gain per year, apart from other factors, depends on intensity of selection. Normally, one can get one calf from an elite female animal in a year. However, by applying OPU-IVEP technologies one can easily get more than 20 calves from an elite animal in a year. It means that by using this technology, we can produce more number of calves from selected

elite animals. This will provide scope to increase the selection intensity and hasten the rate of genetic improvement. Further, pre-pubertal elite heifers selected through genomic selection can be used for production of calves, which will reduce the generation interval and thereby increase genetic gain per year.

For wider application of this technology, NDDB has established an R&D facility to master the technology and train manpower so that the technology can be used on a larger scale. The facility is housing elite donors of Gir and Tharparkar for OPU-IVEP. The technology of OPU-IVEP has been standardised in the facility and successfully produced calves from IVF embryos. The future

focus of the facility would be to conduct research on developing methods to reduce cost of OPU-IVEP, standardising the procedure for buffaloes and conducting training of personnel involved in OPU-IVEP.

#### **Training and Capacity-Building**

Trained manpower is a key component for success of projects. Continuous capacity building is essential for better implementation of the projects and NDDB continued its efforts in this direction. Under NDP-I, during the year, 1,057 officers and field personnel were trained. Seven programmes for training of trainers on INAPH were conducted in which 127 officers from five states were trained on implementation of INAPH.

During the year, under the NDP-I, 25 officers were also trained at University of Queensland, Australia, through an overseas training, on Genetic Improvement.

#### **AI with Sex Sorted Semen**

NDDB also implemented a Pilot Project on Artificial Insemination with Sex Sorted Semen of indigenous breeds. The project is funded through Rashtriya Gokul Mission of DAHD, Gol. Major aim of the pilot project is to understand the effectiveness of using sex sorted semen in field conditions in different geographical areas. Artificial inseminations using sex sorted semen is carried out in five locations covered under the study.



A superior Gir Calf - a product of OPU-IVF at NDDB, Anand



Fodder Biomass Reaper Liner

## ANIMAL NUTRITION

*Improving productive and reproductive efficiency through feed, feed supplements and nutritional advisories*

### 'Quality Mark' for Cattle Feed and Mineral Mixture

NDDB has mooted the 'Quality Mark' pertaining to cattle feed and mineral mixtures for voluntary adoption by entities in the cooperative, government and semi-government sectors. The presence of the 'Quality Mark' on the bags of the cattle feed is meant to convey that the manufacturer has adopted and implemented all 'Standard Operating Procedures' to ensure that the product conforms to set specifications.

Nine Cattle Feed Plants (CFPs) belonging to the cooperative milk federations/unions of Karnataka, Punjab, Uttarakhand and Bihar have signed a Memorandum of Understanding (MoU) with NDDB for adoption of the 'Quality Mark' during the year.

### Calf Rearing Programme

High mortality rate of new born calves, poor growth rates, delayed sexual maturity and longer calving interval are among the major causes for poor profitability of dairy farms. To address these problems, NDDB has implemented a 'Calf Rearing Programme' (CRP) that encompasses scientific feeding of advanced pregnant animals and female calves in all stages of growth.

Currently, CRP is being implemented in six milk unions of Gujarat, Punjab and Karnataka.

During the year, 1,294 additional pregnant animals were registered and 1,591 calvings were reported, taking the total numbers of pregnant animals and calvings to 5,666 and 4,459, respectively. The average birth weight of Kankrej, Murrah and Crossbred female calves under CRP was 20 per cent higher than the calves born under conventional feeding system. During the initial 12 months period, the average daily body weight gain of scientifically fed female calves was 425g, 428g and 651g in Kankrej, Murrah and Crossbred cows, respectively.

About 198 Kankrej heifers exhibited first heat at an average age of 17 months and 70 heifers were found to be positive for pregnancy after the first insemination. Three Kankrej heifers produced first calves at an average age of 25 months as against the breed average of 47 months. Similar results were observed in Murrah buffaloes where the average age at first heat was reduced to 15 months.

### Ration Balancing Programme (RBP) for improving productivity of milch animals

Balanced feeding is the key to unlock genetic potential of dairy animals. The network of balanced ration advisory services at farmers' doorstep through local resource persons (LRPs) continued to expand its reach under NDP-I. In 2018-19, RBP embraced three new End Implementing Agencies (EIAs) totalling 107 organisations across 18 major dairying states of the country.

1.87 lakh new animals and 1,204 villages became part of the ongoing programme during the year. Overall, 21.4 lakh milk producers received balanced ration advisory services for their 28.4 lakh animals in 33,268 villages, till March 2019. Trained trainers of EIAs imparted RBP basic and refresher training to 774 & 783 LRPs, respectively, during the year. Cumulatively, 31,007 LRPs have been trained and inducted for field implementation.

The LRPs, being key service providers, are pivotal to the programme and capacity building holds key to their effective functioning. To enhance their capabilities and retain them for a longer period, orientation-cum-training programmes were organised for 922 good performers among the LRPs. The topics covered included Calf rearing, feeding strategies for different lactational stages of milking animals, challenge feeding, techniques for fertility improvement, nutritional approaches for enhancement of Fat and SNF content in milk, and fodder production and conservation practices.

### Reducing 'water footprint of milk' through RBP

Traditional feeding practices followed by dairy farmers in the country generally leads to imbalance of nutrients such as energy, protein and minerals. This results

in lower milk production and a high water footprint of milk – defined as the freshwater consumed in different steps of the milk production chain. As 90 per cent of the freshwater consumption for milk production is attributable to feeds, imbalanced rations lead to inefficient usage of freshwater, which is getting scarcer by the day.

To assess the impact of RBP on water footprint of milk, a study was conducted for estimation of water footprint of milk using feeding data of 1,97,224 cows and buffaloes of Gujarat. It was found that feeding balanced rations reduced water footprint of milk by 15 per cent in cows and 13 per cent in buffaloes. Thus adoption of scientific feeding practices can reduce the water footprint of milk.

### Feed supplement to combat heat stress

It has been observed that whenever the Temperature-Humidity-Index (THI) increases above 72 units, the feed intake by animals' drops and consequently milk production is reduced. To minimise the productivity loss in dairy animals during heat stress, NDDB developed a 'Heat-Stress Supplement Pashu Sheetvardhak'. Field studies with this supplement in early lactating animals revealed that the dry matter Intake (DMI) and milk yield improved by 8.8 per cent and 10.5 per cent, respectively, in cows and 2.4 per cent and 5.7 per cent respectively, in buffaloes. The increase in net daily income was ₹ 20 per cow and ₹ 36 per buffalo when fed 'Pashu Sheetvardhak' as compared to control animals.

### Feed supplement to improve Fat and SNF content of milk

Fat and SNF being important milk constituents determine the milk price. Improper feeding causes reduction of Fat and SNF content in milk. Keeping this in view, NDDB developed a feed supplement 'Samvridhhi' for improving Fat and SNF in dairy cows and buffaloes. A feeding trial in early and mid-lactation animals in Anand, Gujarat, showed an average increase in Fat and SNF by 7.2-9.3 per cent and 1.8-2.4 per cent, respectively, in cows and 2.4-3.9 per cent and 1.6-1.8 per cent, respectively, in buffaloes. Consequently, net daily income of farmers improved by ₹ 14-25 in early and ₹ 6-11 in mid stages of lactating cows and buffaloes.

**1.87** lakh  
new animals and  
**1,204** villages  
became part of the  
ongoing RBP programme  
during the year.

### Augmenting Green Fodder Production

Feeding optimum quantity of leguminous and non-leguminous green fodder is indispensable for economical milk production. However, the persistent deficiency of green fodder continues to be a major constraint. Given the limited area under green fodder cultivation, the best option to increase availability of green fodder is the usage of fodder seed of improved varieties, with high potential yields.

### Enhancing availability of 'Quality Fodder Seed'

During the year, 20 Metric Tonne (MT) breeder seed of improved varieties of major fodder crops was obtained from ICAR/SAUs and supplied to registered seed growers of dairy cooperatives. Four newly notified fodder varieties of oat crop (OL 10, JHO 2009-1, JHO 2010-1 and OS 377) were introduced in the seed multiplication chain. Necessary technical support was provided to seed production agencies for fodder seed production programmes as well as for the sale/purchase of certified/truthfully labelled seeds. Many cooperative milk

unions/federations have started using NCDFI's e-portal facility for the purchase of fodder seeds. This e-portal enables transparent sales as well as purchases by cooperatives that ensures timely availability of fodder seed to farmers at reasonable prices.

### Fodder Development Activities

The Fodder Demonstration Unit (FDU) at Anand demonstrates scientific agronomic practices and propagates information about improved varieties of fodder crops to farmers and officials of cooperatives thus creating demand for truthfully labelled breeder seeds. Good Agronomic Practices (GAP) such as cover crops, green manuring, mulching, inter-cropping, mixed sowing of legume with non-legumes, micro-irrigation and use of biogas-slurry were demonstrated to farmers for increased forage production. New maize hybrids for silage and Bajra Napier hybrid (BNH) for high fertile irrigated areas were also demonstrated. Due to high productivity, fast vegetative growth, multi-cut and perennial nature, BNH crop has attracted attention of dairy farmers and about 2,06,780 stem cuttings

were distributed this year. Also 4,000 stem cuttings of Guinea grass and 1,060 cladodes of thorn-less cactus for water deficit areas were provided to farmers. Demonstration of new varieties of major fodder crops were also taken up for awareness creation.

Village-based intensive fodder development activities continued at the model village Mujukuva. For silage and green fodder, 26 farmers cultivated high yielding multi-cut sorghum hybrid CSH 24 MF variety. About 46,000 stem cuttings of perennial grass were provided to DCS for re-vegetation of Gauchar land.

DCS-based low cost silage-making model on commercial lines has been developed and 80 metric tonne (MT) silage was produced during the year. As part of this model, farmers grow fodder crops under contract farming. These are subsequently ensiled and the resultant silage is sold to dairy farmers at a nominal price. The model has proven that silage-making can successfully be taken up by the various DCS for enhancing year-round fodder availability.



Tractor Powered - Chopper Loader

To increase green fodder availability in Wardha and Amravati districts of Vidarbha region, during the year, 8.19 MT fodder seed of improved varieties was distributed in 75 villages. To preserve green fodder 16 silage-making demonstrations were carried out. To create awareness on green fodder production and conservation, two fodder demonstration units were established.

#### Fodder development activities under NDP-I

For effective implementation of fodder development activities, technical support was provided to 28 End Implementing Agencies (EIAs) including seed processing plants. This year, 1,126 MT fodder seed was produced and about 2,724 MT of certified/truthfully labelled seeds was sold by cooperatives. EIAs conducted 30 silage demonstrations and 294 farmers adopted silage-making during the year. Agro Economic Research Centre (AERC), Anand has initiated a study on "Impact Assessment and Evaluation of Fodder Seed Production and Sale activities".

#### Crop Residue-based TMR

The straw densification plants at Sriganganagar, Rajasthan and Kolhapur, Maharashtra set up under NDP-I in previous year have started manufacturing Total Mixed Ration (TMR) pellets/blocks. Due to incorporation of locally available crop residues, the cost of TMR pellets is lower than conventional cattle feed pellets. This has opened up opportunities for the incorporation of vital nutrients such as vitamins and minerals in optimal quantities without a commensurate increase in cost.

In TMR feeding system, roughages, concentrates and feed additives are offered to the animal at one go rather than individually based on animals' requirements. This feeding system ensures the maintenance of optimal rumen PH, and also minimises fluctuations in Fat and SNF content of milk. Variants of TMR have been designed to cater to the nutrient needs in different stages of lactation. A trial with lactating buffaloes in Kolhapur district of Maharashtra has shown significant positive impact on milk yield and fat per cent.

The TMR plants when employed in tandem with devices such as mowers and storage facilities such as bunkers have a significant potential to incorporate crop residues in the diets of dairy animals and minimise field burning of these crop residues.

#### Demonstration of devices for crop residue management

Under NDP-I, thrust continued on educating farmers on reducing wastage of crop residues which is increasing day by day due to enhanced use of grain harvesters in many fodder deficit zones of the country. Simple and cost-effective mowers and straw pick-up devices have been demonstrated in different locations as per biomass needs. These fodder harvesters are high-speed machines designed for efficient harvesting and pick up of fodder from the field. Till date, 622 mowers along with fodder management attachments have been introduced at various locations for village level demonstrations. With the help of these mowers, over 3,351 demonstrations, including 304 in this year, were carried out. To reduce storage losses, biomass bunkers were also introduced at strategic locations.



## ANIMAL HEALTH

*NDDB focusses on activities that help mitigate the problems faced by small and marginal farmers, the quintessential milk producers of India, in dealing with issues related to animal health. With this objective, NDDB plays an active role in propagating cost-effective, efficacious disease control models in pilot scale which help the farmer to significantly reduce expenses, improve productivity and profits and, reduce the use of antibiotics as well as other veterinary drugs.*

NDDB is also involved in building robust database on all interventions in animal health through the Information Network for Animal Productivity and Health (INAPH) software, linking the field with the laboratory, which will be the basis for informed decision-making. Advisory is being provided on biosecurity and disease control to bull production areas and, in and around semen stations in order to ensure production of disease-free semen.

NDDB continued to support its brucellosis control model in 593 villages covering four districts in Gujarat and, in an organised farm covering all the crucial control elements like animal identification,

vaccination, proper disposal of aborted material, awareness creation, disinfection, animal isolation etc. Most importantly, this model is focussing on the one-health concept. As on March 2019, 40,483 cattle and buffalo calves have been vaccinated during this fiscal. More than 1 lakh female cattle and buffalo calves have been vaccinated and ear-tagged since initiation of project in April 2013. NDDB is also collaborating with a medical institute to bring about a much-needed linkage with the medical physicians to tackle the bane of brucellosis in humans viz. livestock farmers and animal husbandry personnel. This zoonosis remains largely under-diagnosed and seriously impedes the working capacity of the farmers. Presently, 19 persons identified by an expert panel of medical physicians are being provided specific treatment regimen of which nine have been completely cured and have regained their pre-disease vitality. The treatment is progressing in the remaining patients. Wide propagation through seminars and, video documentation of success stories is being carried out which gives the farmer more conviction to prevent the disease in animals and, thereby actively participate in the control programme. A

significant increase has been recorded on the awareness levels on brucellosis and its control among the farmers wherever this control model 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.

### Mastitis Control Programme

NDDB's Mastitis Control Popularisation Project (MCP) – continued in over 25 milk unions/Producer Companies across 8 states (Kerala, Karnataka, Tamil Nadu, Andhra Pradesh, Maharashtra, Gujarat, Punjab and Assam). The project has been extended from last year for another 3 years. The total outlay of the project is ₹ 260.5 million with NDDB contributing ₹ 35.6 million. Sub-clinical mastitis (SCM) and antibiotic residues, somatic cell count (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 thus, reducing the possibility of emergence of Antimicrobial Resistance (AMR). Periodic surveys are also being conducted to assess the cost-benefit of the project. A web-based on-line reporting system is being used to



EVM is a very cost-effective, non-invasive and efficacious alternate approach that reduces treatment costs and medicine usage



capture all the data being generated from the project. During 2018-19, a total of 2,18,159 pooled milk samples of the farmers pouring milk at the Dairy Cooperative Society (DCS) were tested initially by California Mastitis Test (CMT) to assess for SCM. Further investigation on the positive samples were carried out by testing at the farmers' homestead 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 considerable reduction in the incidence of SCM along with an increase in average milk production, of around one litre per day in treated animals have been recorded with this management strategy.

### Popularising Ethno-Veterinary Medicines

Documentation of ethno-veterinary medicine (EVM) for several common ailments which reduces milk production, including mastitis, is also being carried out under MCPP. Till date, around one lakh such cases treated by EVM alone have been documented from the project areas with an average cure rate of around 82 per cent. Under MCPP, NDDDB is also encouraging unions to strengthen

their supply chain of EVM so that farmers get good quality preparations at minimal cost. Milk unions those who have earnestly embarked on the use of EVM to manage common ailments have drastically reduced their usage of medicines, especially antibiotics. Use of EVM at farmers' level has also resulted in considerable reduction in requests for visits by the veterinarian.

### IBR Control

NDDDB continued to support the pilot project on Infectious Bovine Rhinotracheitis (IBR) control using inactivated marker vaccine (gE deleted marker vaccine) in 11 villages and one dairy farm located in three different states. The total project outlay is ₹ 34.3 million for a period of two years. Basic objective of this NDP-I project was to assess the field efficacy of gene-deleted inactivated marker IBR vaccine in cattle and buffaloes in controlling IBR under Indian field conditions.

During the current year, around 25,825 vaccinations have been carried out in cattle and buffaloes and, 1,489 sera samples collected for laboratory investigations. Since the inception of

the project in 2017-18, a total of 50,052 vaccinations have been completed.

The results of the pilot study indicate that the vaccine is potent, as sero-conversion was recorded in almost all the vaccinated animals and, above 90 per cent of vaccinated animals remained protected in a highly endemic IBR environment. It was also possible to differentiate vaccinated animals from infected ones by using an appropriate test.

### Implementation of INAPH health module in Kolhapur milk union

With the INAPH health module into the second year of deployment in Kolhapur milk union, there has been a 33 per cent increase from the previous fiscal with 2.35 lakh cases being recorded in the system. It is now an integral part of the veterinary services delivery system of the union and is also linked to the union's medicine inventory. An analysis of the report reveals incidences of digestive and udder-related cases at around 30 per cent each, followed by reproductive issues at 15 per cent, viral diseases at 12 per cent and metabolic diseases at 5 per cent.



Field antibiotic residue tests are a cost-effective and rapid method for easy assessment of milk

# Research & Development

Disease diagnosis that is reliable and prompt is an overarching requirement for disease control and maintenance of disease-free animals in the farms.



The NDDDB R&D laboratory presently caters to 62 agencies from 15 states with an average turnaround time of 6.87 working days for serological investigation



Rapid and precise detection of *Mycobacterial spp.* in biological/environmental specimens through automated system

only 0.26 per cent positivity. Further, 90 serum samples from calves below 6 months age were screened for BVDV RNA by real-time RT-PCR test, but none of the samples were found positive.

## Screening of frozen semen batches

The laboratory continued screening of frozen semen batches produced from IBR sero-positive bulls for the presence of bovine herpesvirus1 (BHV-1) by real-time PCR. A total of 33,830 batches of frozen semen received from different semen stations of the country were screened and 1.34 per cent batches were declared positive. The laboratory also tested 299 frozen semen batches for determination of bacterial load and 90.6 per cent were found to be acceptable as per the cut-off decided in the MSP.

## Quality management system and proficiency testing

The laboratory has put in place appropriate workflows and quality management systems as per international standards and is currently accredited for both ISO 9001:2015 and ISO/IEC 17025:2017.

Participation in proficiency testing (PT) programme is one of the major quality control measures for determining the efficiency of the laboratory in specific tests. During the current year, the

NDDDB has established a state-of-the-art animal disease diagnostic and research facility at Hyderabad with ISO 9001:2015 and ISO/IEC 17025:2017 accreditation. The laboratory has been participating in international proficiency testing programmes with 100 per cent agreement in the test results. The laboratory has received nearly one lakh samples during the year for screening of various bovine diseases namely, brucellosis, infectious bovine rhinotracheitis (IBR), bovine viral diarrhoea (BVD), foot-and-mouth disease (FMD), Johne's disease (JD), bovine genital campylobacteriosis (BGC) and trichomonosis. The laboratory also supports various pilot projects on disease control implemented by NDDDB and has initiated surveillance on antimicrobial resistance (AMR) in bacterial agents causing bovine mastitis.

## Disease monitoring

The NDDDB R&D laboratory, Hyderabad continues to undertake disease monitoring in various semen stations, bull mother farms and village herds covered under progeny testing (PT)/pedigree

selection (PS) areas to enable the procurement of disease-free high genetic merit bull calves. The sexually-transmitted diseases listed in the minimum standard protocol (MSP) for production of frozen semen, Department of Animal Husbandry and Dairying (DAH&D), Government of India, are routinely tested in this laboratory. The laboratory presently caters to 62 agencies from 15 states with an average turn around time of 6.87 working days for serological investigation. The laboratory screened 20,935 and 23,637 sera samples from cattle and buffaloes for diagnosis of IBR and brucellosis respectively. The positivity for IBR and brucellosis turned out to be 15.24 per cent and 2.02 per cent respectively. The prevalence of IBR and brucellosis in the field at the village level (PT/PS project areas) was 36.98 per cent and 5.67 per cent respectively whereas in an organised set-up like semen stations, bull mother farms and dairy farms, it was 26.16 per cent and 0.89 per cent respectively.

As regards BVD, screening of 9,563 samples by BVD antigen ELISA revealed



laboratory participated in the international PT programme provided by VETQAS, Animal and Plant Health Agency, United Kingdom (APHA, UK) for three serological tests, namely detection of antibodies to IBR, brucella and, BVD antigen. The 100 per cent agreement in the results with APHA, UK, on these tests reaffirms the competency of the laboratory.

### Surveillance on anti-microbial resistance (AMR)

Treatment of infectious diseases using antibiotics is now being threatened by the development of multidrug-resistant strains. AMR is emerging as a public health emergency globally and has been attaining the status of a pandemic. The situation may become challenging in developing countries due to high burden of infectious diseases and indiscriminate use of antibiotics. Keeping in view the public health importance, NDDB has initiated surveillance on AMR in the bacterial agents causing bovine mastitis. This is in combination with the implementation of alternative strategies

by NDDB for management of bovine mastitis, thus minimising the use of antibiotics. The antimicrobial resistance pattern of *Staphylococcus aureus*, *Escherichia coli* and *Klebsiella species*, is depicted in Figure 1. The isolates were further screened for the AMR determinant genes for  $\beta$ -lactams, tetracycline, sulphonamides and aminoglycosides. The phenotypic resistance results were corroborated with the auxiliary genotypic profiling of AMR determinant(s) in these isolates to various classes of antibiotics. The determinant of methicillin resistance was recorded in 43 per cent of *S. aureus* isolates. Multidrug resistance was detected in 20 per cent of *S. aureus* and 31 per cent of *E. coli* isolates.

### Study on effectiveness of IBR vaccine in organised dairy herd for control of IBR

The effectiveness of IBR vaccine (inactivated gE deleted marker vaccine) in the control of IBR was evaluated in an highly endemic organised dairy herd where regular vaccination was being

carried out since October 2016. More than 90 per cent of the vaccinated and IBR negative animals remained protected from infection even after two years while being maintained in the endemic herd. On regular vaccination, rate of abortion was reduced from 46 per cent to 22 per cent in this farm.

### Investigation of aetiology of infectious abortion in an organised dairy herd

An increasing trend of sero-positivity was recorded in the farm for brucellosis, leptospirosis, Q fever and BVDV in comparison to the previous year. However, reduction in the incidence of IBR could be achieved by regular vaccination. Investigation of 64 cases of abortion during 5-9 months of pregnancy revealed the involvement of one or more of the following aetiological agents, viz. *Brucella*, BHV-1, BVDV, *Leptospira*, *Coxiella* and *Listeria*. Presence of multiple agents could be detected in 21 out of 64 cases (43.75 per cent).



Studies on AMR by Whole Genome Sequencing of bacterial agents causing bovine mastitis

## PRODUCT AND PROCESS DEVELOPMENT

In the continued endeavour to facilitate diversification of product portfolio and value addition for the dairy cooperatives, a process has been developed to manufacture shrikhand-like product without whey drainage. This process not only addresses the environmental issues arising from whey discharge but also improves the nutritive value by retaining goodness of whey proteins, minerals and other valuable water soluble nutrients.

A fusion frozen dairy product has been crafted encompassing the goodness of fermentation with high protein and the sweetness of ice cream. The final recipe has lower sugar, lower fat and higher protein content as compared to ice cream. Being a fusion product, the existing production line with the dairy can be used thereby improving capacity utilisation.

Having successfully designed a balanced nutritional supplement (Shishu Sanjeevani) for malnourished children ages 3-6 years, a mechanised production line has been created in collaboration with IDMC for manufacture and packing of 1 tonne of the supplement per day. The supplement, to be served in an 80 gm pack, is a high calorie high protein preparation containing essential vitamins and minerals to meet the requirements of growing children. The vitamins and minerals have been added in proportions to provide one-third the daily requirement of essential nutrients as outlined in the NIN and FAO guidelines.

Freeze drying is crucial to successful Ready to Use Culture (RUC) manufacture. It is time-dependent activity, constituting almost half of the

time of production that influences the survival of the RUCs. Hence, modification was made in the formulation to address these to achieve a reduction in freeze drying time without compromising on the survival and activity of the organisms.

A laboratory technique has been successfully developed for production of yoghurt RUC. Of the one hundred isolates of lactic acid bacteria, from indigenous fermented products collected from various corners of the country, four promising isolates have been picked up for RUC development.

Non-RUC propagative type starter cultures for production of dahi, mishtidahi and lassi were supplied to Dimapur Milk Union, Nagaland, and Balaji Dairy, Tirupati Andhra Pradesh, during the year.



# Building an Information Network

NDDDB continued to implement the new “Internet-based Dairy Information System” (iDIS), a web-enabled system with an objective to provide a common platform for the dairy cooperatives for their mutual benefits.



The 4th annual round for External Monitoring & Evaluation for NDP-I was completed with a specific theme on “Entrepreneurial Behaviour of Dairy Farmers”



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Refresher workshops for MIS Officers of Unions of Gujarat, Madhya Pradesh, Rajasthan, Uttarakhand and Uttar Pradesh were conducted during the year. The development of Phase II in the system for additional structured reports with a view to provide further analytical insights has been initiated.

## Detailed Project Report (DPR) for National Programme for Dairy Development (NPDD)

National Programme for Dairy Development (NPDD) – a Central Sector Scheme of Government of India (GoI) provide financial assistance for different dairy development work to the Milk Unions/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. In this background, NDDDB conducted baseline surveys to create baseline indicators on the above parameters for monitoring and evaluation and also

prepared detailed project reports (DPR) for submission to GoI. NDDDB conducted baseline surveys and prepared DPRs at the request of Milk Unions of Tripura, Shimla of Himachal Pradesh, Telangana State Dairy Development Cooperative Federation (TSDDCF), Andhra Pradesh State Dairy Development Cooperative Federation (APDDCF), Puducherry, Kopergaon & Jalgaon of Maharashtra, Dharwad of Karnataka, Shahjahanpur of Uttar Pradesh and Manipur. A total of 28 districts were covered by these Milk Unions and Federations under this project.

## External Monitoring & Evaluation for NDP-I

The 4th annual round for External Monitoring & Evaluation for NDP-I was completed with a specific theme on “Entrepreneurial Behaviour of Dairy Farmers” by an external agency. The major findings of the survey are presented below.

According to the opinion of milk producers, the important aspects to be considered for adopting dairying

as an economic activity were ‘Higher milk yield’ (about 50 per cent), followed by ‘Keep crossbred cows / improved buffaloes’ and ‘Get economic assistance for dairy development’. About three-fourths of dairy farmers felt that the best methods of dairy farming were the new methods with new technologies. About 70 per cent producers believed that the market information related to milk was useful for dairy farmers. Almost half of the respondents opined that dairy cooperatives is better avenue for getting good milk price, followed by private dairies (21 per cent) and individual households (20 per cent). Almost all the respondents unanimously felt that the quality of milk is essential for getting better price. About 50 per cent of dairy farmers estimated the required capital for their enterprise and quantity of fodder well in advance. However, only 16 per cent households prepared their dairy activity calendar well in advance. While ‘Veterinary doctor’ was the most preferred source for dairy management information, the least preferred sources that were never used by dairy households included Agriculture universities & dairy institutes. The main source of information on dairy technologies was electronic media, followed by print media, cattle exhibition, radio, published literature and agriculture exhibitions. Only 16 per cent of households knew about major breeds of cattle and buffaloes.



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The End-term Round of External Monitoring and Evaluation for NDP-I has been taken up this year. The field work for this round by the external agency has been completed and data is being processed.

#### Collaborative study with IFCN

The studies on Dairy Farm Economics for 10 typical dairy farms in 5 regions (North, East, South, West and North-East), 2 each in each region covering Assam, Gujarat, Karnataka, Uttar Pradesh and Odisha have been undertaken in collaboration with the International Farm Comparison Network (IFCN), Germany. The first round was undertaken in 2017-18 and found that the average cost of milk production was ₹ 25 per kg of SCM (Solid Corrected Milk: 4 per cent Fat & 3.3 per cent Protein) and the average realisation was ₹ 30.50 per kg. Of total cost of milk production, the out-of-pocket expense accounted for about two-thirds. The fieldwork for the second round has been completed for 2018-19.

#### Collaboration with Global Agenda for Sustainable Livestock

The Global Agenda for Sustainable Livestock (GASL) Action Network Livestock for Social Development has joined forces with the Global Dairy Platform, FAO, the IFCN Dairy Network, the Dairy Sustainability Framework, ILRI and the National Dairy Development Board (NDDB) to generate awareness on the importance of investing in the dairy sector for achieving the Sustainable Development Goals. A task force of technical experts met in February 2019 at FAO, Rome to develop guidelines for assessing the contribution of the dairy sector to society, defining key elements and indicators to quantify the contribution and reaching consensus on deliverables.

#### Estimation of demand of milk and milk products in India

Under National Dairy Plan I, a comprehensive study has been assigned to an external agency to estimate demand of milk and milk products at

the state level for both urban and rural areas separately and also estimation of city-wise demand for 65 million plus cities (as on 2018) in the country. The study also includes projection of India's demand for milk and milk products till 2030. The study covering "out of home consumption" of milk & milk products also, in addition to household consumption, is expected to be completed by September 2019.

#### Statistical profile on dairying

A series of Statistical dairy profiles for 14 major dairying States have been published till date. The reports provide trends in demographics, livestock population and production; inputs for enhancement of productivity, 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.

# Developing Human Resources

Training programmes support and facilitate human resources to achieve organisational objectives.



More and more women are encouraged to participate in the training

During the year, 14,118 persons were trained under different categories, at NDDDB Anand and its regional training centres.

Ltd. At the request of the Punjab State Cooperative Milk Producers' Federation, more than 400 DCS secretaries were nominated for refresher training, at NDDDB. Mandatory FSSAI training was imparted to milk unions on the guidelines and provisions of the Act.

Responding to the need of young aspirant entrepreneurs in dairy animal rearing, NDDDB initiated Dairy Entrepreneurship Training programme during the year.

Under NDP-I, 927 Local Resource Persons (LRPs) implementing Ration Balancing Programme were re-oriented on the subject. Training on Dairy Animal Management was imparted to well performing LRPs.

Principals from NDDDB Training Centres were part of the Central Monitoring Committee (CMU) formed by DADF, GoI for Accreditation & Evaluation of Artificial Insemination Training Institutes.

During the year, 14,118 persons were trained under different categories, at NDDDB Anand and its regional training centres. About 2,700 women were trained in different programmes.

At the request of VAMNICOM, Pune, an International Training Programme was organised for SAARC nations, in which 21 participants took part from India, Nepal and Sri Lanka.

It is indeed encouraging to witness the changes experienced by the milk producers during the training programme. The learning imparted to participants is not restricted to only Animal Husbandry practices. Broadening the horizon for inclusion of more need based training programmes has been the focus during the year. New training modules were introduced for milk producers as well as professionals in the

milk unions. This year also witnessed the growing realisation of the dairy cooperatives, about the importance of capacity building.

As a step towards strengthening new and existing human resources in the milk procurement sector, 30 days' comprehensive training module was introduced, at the request of the Gujarat Cooperative Milk Marketing Federation





## Training programmes conducted during 2018-19

<b>A. Cooperative Services</b>		
Name of the Programme	No. of Programmes	No. of Participants
Farmer Induction Programme	34	1,127
Farmer Orientation Programme	72	2,555
Dairy Entrepreneurship Programme	3	41
Progressive Farmers' Orientation Programme	2	38
Board of Directors Orientation Programme	16	180
Management Committee members training	28	570
Training for P&I Executives	21	358
New Supervisors training on Producer Relationship Management (PRM)	9	144
Training of Trainers on Business and Producer Relationship Management (PRM)	1	10
Skill Enhancement Programme for Dairy Cooperative Service Consultants	8	196
<b>Total</b>	<b>194</b>	<b>5,219</b>
<b>B. Productivity Enhancement</b>		
Training on INAPH	50	1,355
Training on AHOs	1	27
Customised Programme for Veterinary Officers	2	38
Fodder Production and Conservation Practices	1	35
Training of Project Incharges under MCPP	1	21
Artificial Insemination (Basic)	18	479
Artificial Insemination (Refresher)	6	166
Resource Person Training	94	2,273
Dairy Animal Management	50	1,494
<b>Total</b>	<b>223</b>	<b>5,888</b>
<b>C. Quality Assurance</b>		
Clean Milk Production, Operation & Maintenance of Dairy equipments	4	112
Quality & Food Safety Measures	35	828
Processing & Product manufacturing	1	23
Utilities Operation & Maintenance	9	114
Occupational Health & Safety Assessment Specifications	1	17
Cost Reduction & Energy Management in Dairy Cooperatives	2	65
Analysis of Feed, Milk and Milk Products	1	5
Training on analysis of cattlefeed	1	1
Training in Feed Analysis	1	19
Training in Milk Analysis	1	23
<b>Total</b>	<b>56</b>	<b>1,207</b>
<b>D. Sectoral Analysis and Studies</b>		
Internet Based Dairy Information System (i-DIS)	26	117
GIS Training	1	21
<b>Total</b>	<b>27</b>	<b>138</b>
<b>E. Information &amp; Communication Technologies</b>		
AMCS Training & Demonstration	2	40
SSMS Deployment - End-user Training	20	160
<b>Total</b>	<b>22</b>	<b>200</b>
<b>F. NDP Trainings</b>		
Orientation on World Bank Procurement Procedure	1	16
Training on INAPH	1	65
Training of Field Staff on Animal Breeding and Management	2	50
Training on GPS-enabled SWS to PT Project	2	109
Orientation Programme for LRPs	27	636
Scientific Dairy Animal Management Practices	15	336
<b>Total</b>	<b>48</b>	<b>1,212</b>
<b>G. Other Trainings for Milk Union Personnel</b>		
Achievement Motivation	3	55
Milk Marketing	5	79
Training on Managerial Excellence	2	32
Study Tour on Dairy Cooperative for Junior Secretariate Assistance	2	63
Bee Keeping Trainings	2	25
<b>Total</b>	<b>14</b>	<b>254</b>
<b>Grand Total</b>	<b>584</b>	<b>14,118</b>

## Manpower Development

Major human resource development initiatives, both for NDDB employees and for Dairy Cooperatives and Producer Companies were taken up during the year. The initiatives were focussed on building the organisational capability through investment in development of human resources.

### Launch of Executive Post Graduate Diploma in Rural Management

NDDB supported and promoted the 15 months' Executive Post Graduate Diploma in Rural Management (PGDMX (R)) at the Institute of Rural Management, Anand. This programme will help in preparing the participants to take up leadership roles, a challenge which is currently being faced by majority of Dairy Cooperatives.

### HRD initiatives under NDP-I

NDDB instituted a study on "HR needs assessment of Dairy Cooperatives" under NDP-I to assess the Human Resource (HR) needs, HR gaps and way forward to facilitate development of human capital in the Dairy Co-operatives and Producer Institutions. The study was conducted by the Institute of Rural Management, Anand. A one-day workshop on "Strengthening the HRD and Management Systems in Dairy Cooperatives/Producers Institutions" was organised where the findings of the study were shared. Experts from the field of HR were invited to share their experiences/insights about how HRD impacts organisational performance. NDDB also launched a handbook on "HRD in Dairy Cooperatives" to act as a reference material for HR professionals in Dairy Cooperatives/Producer Institutions. 67 Managing Directors/CEOs from 42 Dairy Cooperatives/Producer Institutions and senior NDDB officers participated in the workshop. Further, to facilitate understanding about the importance of HRD for improving organisational performance and how to establish HRD Departments, four "HRD Facilitators training" for HRD Heads/Officers from Dairy Cooperatives/Producer Institutions were organised.

NDDB also organised two General Business Management Programmes (GBMPs) of 21 days duration for 70

senior management officers from Dairy Cooperatives, Producer Companies, DADF and NDDB at Institute of Rural Management, Anand. The objective of the GBMPs was to provide holistic understanding to the senior management professionals in leadership positions in the areas of financial management, marketing management, human resource management, project management, operations management, strategic management and other critical areas. Both the programmes received very good feedback.

Marketing has emerged as an important area for intervention in dairy cooperatives and producer companies. To address the above need, NDDB organised 4 training programmes on "Marketing" for Marketing Managers and two workshops on "Marketing" for CEOs in Dairy Cooperatives/Producer Institutions under NDP-I. The 4 training programmes for marketing managers were organised in NDDB and facilitated by senior faculty from Indian Institute of Management, Bangalore. The 2 workshops for CEOs on "Marketing" were organised at IIM, Bangalore. In all, 102 Marketing Managers and 40 CEOs from Dairy Cooperatives/Producer Companies were trained in the above training/workshops.

#### HRD initiatives for NDDB employees

Organisational capacity building through employee development remained the focus of HRD initiatives during the year. Need-based functional as well as managerial/behavioural training were facilitated for NDDB employees through in-house customised programmes as well as through sponsorship to training programmes in premier institutions within and outside the country. Training programmes like Dairy for Non-Dairy Professionals, Achievement Motivation, Training the trainers, Basics in Management, Managerial Effectiveness, Creativity and Innovation, Developing Leadership and Communication Skills were organised in collaboration with well-known institutions/experts. All the Staff and workers attended training programme on "Developing emotional intelligence" focussed on developing interpersonal effectiveness through self-awareness. In all, 636 training nominations were processed during the year.

The strength of NDDB and its employees has been their conduct deeply rooted in values, exhibited consistently even in the most challenging situations. To rededicate themselves to its founding values which have been followed and cherished, Chairman, NDDB launched "NDDB Values Document" capturing the 5 core values of NDDB, namely, Integrity, Credibility, Commitment, Professionalism and Innovation. To disseminate the core values, half-day workshops were organised across the organisation covering all the employees. An "NDDB Values Guide Book" has also been prepared capturing the actionable behaviour articulated for each value by NDDB Groups, contextual to their own work domains.

With the focus on organisational capacity building, 12 NDDB officers are undergoing a mentoring programme and four officers underwent sectoral exposure programme at Milk Unions

across the country. Nineteen officers were inducted into NDDB's Future Leadership Development Programme this year. NDDB also provided support to Milk Unions for recruitment of human resources during the year. Another initiative during the year titled "Anubhav" was launched wherein NDDB alumnus were invited to share their experiences with the current employees. To encourage reading culture in the organisation, NDDB celebrated Library Day titled "Pustakalya Parikrama" on the theme "Values – the Fulcrum of Life". Various competitions on values were also organised to reinforce the importance of values in Life. Other important 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 56 students from various institutions to help them gain valuable on-the-job learning as a part of their course curriculum.

#### Training of NDDB employees

Name of the Programme	No. of Programmes	Nominations	
		Total	SC/ST
Achievement Motivation	1	25	7
Basics in Management	1	27	9
Training of Trainers	2	43	10
Managerial Effectiveness	1	30	6
Implementation of ISO/IEC 17025:2017	1	40	4
Communication Skills	1	30	6
Creativity and Innovation	1	23	3
Dairy for Non-Dairy Personnel	1	24	2
Developing Leadership	1	21	2
Developing Emotional Intelligence	5	134	26
Time Management	1	46	6
Other Programmes (employees sponsored for training at premier training institutions)	-	193	16
<b>Total</b>		<b>636</b>	<b>97</b>



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# 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 Bio-Security 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 19 milk unions at an estimated cost of ₹ 44,374.8 million were technically appraised and cleared under DIDF



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Eight projects were completed during the year. These included fully automated 120 MTPD Powder Plant along with 10 LLPD Liquid Milk Plant at Sabarkanta (Gujarat), 10 LLPD Dairy Plant at Jaipur (Rajasthan), 370 TLPD Fermented Product plant at Mohali (Punjab), Automated 100 TLPD UHT plant at Shollinganallur Chennai (Tamil Nadu), 250 TLPD Automated Dairy plant at Udupi (Karnataka), a BSL3 laboratory with Small Animal testing facility at Tanuvus, Chennai (Tamil Nadu) and a New Academic block and Executive Student Hostels at IRMA, Anand (Gujarat).

Apart from the above, NDDB completed validation of seven reports on Quality Assurance & Quality Control of Semen Station projects under the NDP-I. NDDB has also set up Quality Control Laboratory for Jharkhand Milk Federation at Hotwar (Ranchi) and 15 Anchor Labs in Uttar Pradesh for PCDF.

NDDB maintained its emphasis on providing energy-efficient and state-of-the-art technologies for setting up dairy and cattle feed plants for milk unions and federations. In order to improve the efficiencies of the existing plants, studies on infrastructure of dairy plants were carried out and recommendations

submitted to respective milk unions for upgradation of facilities along with estimates of the required capital investment.

The study for feasibility of expansion and improving energy efficiency of dairy plants covered during the year include three dairy plants at Ujjain (Madhya Pradesh), Hyderabad (Telangana) and Pune (Maharashtra).

Project Proposals of 19 milk unions at an estimated cost of ₹ 44,374.8 million were technically appraised and cleared under Dairy Infrastructure Development Fund (DIDF).



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Following are the highlights of major projects executed:

### 120 MTPD Baby Food Powder Plant along with 10 LLPD Automated Liquid Milk Plant at Sabarkanta (Gujarat)

NDDB commissioned an automated 120 MTPD Baby Food Powder plant along with automated liquid milk plant of 10 LLPD in March 2019. The Powder plant is also designed to produce Skim Milk Powder, Whole Milk Powder and Dairy Whitener.

The plant has distinguished features of Bag House bypass, APC (Advance Predictive Control) using upgraded instruments for moisture analysis, online meter for measurement of Total Solids at Evaporator and Pre-treatment/pre-filtration by Activated Carbon Filter & Multi Grade Filter for re-utilisation of Condensate.

### Automated Dairy Plant at Jaipur Capacity 10 LLPD

The fully automated liquid milk plant along with packaging facility was commissioned in October 2018. The plant also has the facility to produce Butter Milk (2 LLPD), Butter (2,400 kg/hr), Ghee (8 MTPD) and Ice Cream (5 kl/shift).

Thermophilic Continuous Stirred Tank Reactor (TCSTR) based Anaerobic Sludge Digester is planned and designed for the treatment of ETP sludge (Primary DAF Sludge & Secondary Aerobic Sludge) at Jaipur Dairy and the same is currently under execution.

### Automated Dairy Plant at Udipi

NDDB commissioned 250 TLPD fully automatic Liquid Milk Plant at Udipi. The plant was inaugurated in January 2019.

### Green Energy Initiations:

#### Concentrated Solar Thermal (CST):

As a policy, all new projects undertaken by NDDB shall have inbuilt component of CST system. Projects in the pipeline are at Udipi, Katraj-Pune, Bhubaneswar and Jharkhand.

**Solar Photovoltaic System:** Following the drop in prices for solar PV panel & components, NDDB would be exploring installation of ground-mounted or



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Rooftop Solar PV in Dairy projects. Project reports for a ground-mounted 400 KWp Solar PV system at Automated Dairy and Powder Plant at Arilo-Govindpur, Odisha & 200 KWp Rooftop installation at Frozen Semen Station Purnea, Bihar has been submitted. In future, NDDB has plans to instal Solar PV system for projects, for Ajmer Dairy to reduce dependence on grid power. NDDB has also apprised project report for 165 KWp Solar PV system for proposed new Dairy at Sinner.

#### Village-level SPV for BMC

NDDB has installed a five KW Solar Photovoltaic system with Thermal storage system to augment village level Bulk Milk Cooler at Mujkuva last year. NDDB is working with MNRE to develop a framework for deployment of the system across India for a grid independent BMC.

#### Green Building Initiative

Structures complying with the standards stipulated for Green Buildings is under execution at Ajmer Dairy. The long-term benefits of Green Building can contribute in energy savings of 30-40 per cent annually, savings in water up to 20-30 per cent, and also reducing Green House Gas emissions with use of low volatile organic compounds.

Sourcing 75 per cent of the building materials within a radius of 500 Km helps in reducing emissions of carbon dioxide and thereby contributing to the cause of reduction in global warning.

NDDB has conceptualised and developed Ajmer Dairy as Green Building, which would be the first Green Dairy in India.

#### Bio-Safe Laboratories

NDDB provides consultancy services for conceptualising, planning & execution of Bio-safety Laboratories (BSL2 & BSL3), Clean rooms, Animal testing facilities, QA-QC Labs, Bio-Pharma units, vaccine manufacturing facilities etc. for the Govt. organisations like ICAR, Department of Animal Husbandry etc.

NDDB has capabilities to design and execute highly complex Bio-safe containment facilities. World over there are limited bio-containment facilities with BSL3+ and higher level laboratories. NDDB has recently completed and commissioned Asia's largest Bio Containment (BSL 3) laboratory at Bhubaneswar, Odisha for ICAR. Planning of a new large Animal Experimentation facility of Bio Containment (BSL 3 Ag) has also been entrusted to NDDB by ICAR.



### Major Biosafety and special projects undertaken:

- Setting up a BSL3 laboratory with Small Animal testing facility (LATU) at Tamil Nadu Veterinary & Animal Sciences University (TANUVAS), Chennai.
- Execution of following projects for Department of Animal Husbandry & Veterinary Services, Government of Tamil Nadu:
  - Anthrax Spore Vaccine Production, Blending and Filling facility with GMP standard and QA/QC lab (GLP standard), and Small animal testing facility at IVPM Ranipet, Tamil Nadu
  - Poultry diagnostics & feed water analysis laboratory (GLP standard) at Palladam, Tamil Nadu.
  - A new state-of-the-art Semen Station of 50 lakh doses/ annum production capacity at Purnea in Bihar for Government of Bihar.
- Establishing Quality Control (QC) Laboratories for 15 dairies across Uttar Pradesh. Supply and installation of lab equipment is in progress.

### On-going Projects

Project	Capacity	Location
<b>Northern Region</b>		
Aseptic Packing Station	200 TLPD	Bassipathana, Punjab
Liquid Milk Plant & Butter Plant	900 TLPD LMP & 10 TPD Butter	Ludhiana, Punjab
<b>Western Region</b>		
Dairy & Product Plant along with Powder Plant	30 TPD PP & 1,000 TLPD LMP	Ajmer, Rajasthan
Dairy Plant Expansion PH II	(Butter Deep Freeze, Effluent Treatment Plant, etc.)	Kolhapur, Maharashtra
New Dairy Plant	500 TLPD	Jalgaon, Maharashtra
New Product Plant	40 TLPD	Jalgaon, Maharashtra
Dairy Expansion and New Product Block	200 – 300 TLPD LMP	Pune, Maharashtra
Cattle Feed Plant Expansion	300 – 450 TPD	Kolhapur, Maharashtra
Cattle Feed Plant	Renovation, Refurbishing a CFP and a New Corporate Office building	Rajkot, Gujarat
<b>Central Region</b>		
Dairy Plant	40 TLPD	Sendhwa, Madhya Pradesh
Dairy Plant Expansion	20 – 100 TLPD	Sagar, Madhya Pradesh
<b>Southern Region</b>		
Ice Cream Plant	30 TLPD	Madurai, Tamil Nadu
Ultra Heat Treatment Plant (Tetrabrik packing)	25 TLPD	Madurai, Tamil Nadu
Anthrax Spore Vaccine Production Facility	GMP – 70 lakh doses/ annum	IVPM, Ranipet, Tamilnadu
QA & QC Lab and small animal testing facility (BSL 3)		IVPM, Ranipet, Tamilnadu
Poultry Disease Diagnostic Facility	Feed & Water Testing	Palladam, Tamilnadu
<b>Eastern Region</b>		
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	Sahebgunj, Jharkhand
Dairy Plant	50 TLPD	Palamu, Jharkhand
Product Plant	10 TLPD	Hotwar, Jharkhand
<b>Procurement Projects</b>		
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 World Bank (IDA) assisted Central Sector Scheme, National Dairy Plan Phase I (NDP-I), has been implemented by the National Dairy Development Board in 18 major milk producing States by a network of 172 End Implementing Agencies. The project with the implementation period 2011-12 to 2018-19 has substantially contributed in achieving its project development objectives of increasing the productivity of milch animals and thereby increase milk production to meet the rapidly growing demand for milk as well as providing rural milk producers with greater access to the organised milk processing sector.



NDP-I has been making immense contribution in improving the livelihoods of small holder milk producers as well as has facilitated women empowerment through dairying.



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Adoption of focussed scientific approach and systematic processes supported by appropriate policy and regulatory measures have been the hallmark of NDP-I and the multi-pronged series of initiatives undertaken under NDP-I include Production of High Genetic Merit (HGM) cattle and buffalo bulls; Strengthening of "A" and "B" graded Semen Stations; Pilot Model for Viable Doorstep AI delivery Services; Ration Balancing Programme; Fodder Development Programme; Strengthening and Expanding Milk Procurement System at Village level and Project Management & Learning.

The project has been rated satisfactory by the Implementation Support Review Mission of the World Bank in achieving the project development objectives as well as for the implementation progress for all the components of the project namely, Productivity Enhancement, Milk Collection and Bulking and Project Management and Learning.

NDP-I has been making immense contribution in improving the livelihoods of small holder milk producers as well as has facilitated women empowerment through dairying. This has been corroborated by the studies undertaken by the external monitoring and evaluation agencies.





## SUB PROJECT APPROVAL

During the financial year 2018-19, 31 sub projects were approved with the grant assistance of ₹ 590 million. Cumulatively till February 2019, 561 sub projects of 172 EIAs from 18 states have been approved with the grant assistance of ₹ 17,529.83 million. The approved sub projects include 82 sub projects for project management and learning activities. Activitywise approved sub projects during the year 2018-19 and cumulative till March 2019 is provided in the table below:

Activity	No. of Approved Sub Projects		Amount in ₹ Million	
			Grant Assistance in the Sub Projects Approved	
	During 2018-19	Cumulative till March 2019	During 2018-19	Cumulative till March 2019
Animal Breeding	3	65	226.85	6,685.09
Bull Production Programme	3	33	226.85	2,922.55
Strengthening of Semen Stations	0	28	0.00	2,989.70
Pilot AI Delivery Services	0	4	0.00	772.84
Animal Nutrition	2	169	28.00	3,024.95
Ration Balancing Programme	0	117	0.00	2,337.09
Fodder Development	2	52	28.00	687.86
Village-Based Milk Procurement System	14	245	185.70	6,838.54
<b>Sub Total</b>	<b>19</b>	<b>479</b>	<b>440.56</b>	<b>16,548.58</b>
Project Management & Learning	12	83	149.42	994.40
<b>Total</b>	<b>31</b>	<b>562</b>	<b>590.03</b>	<b>17,542.98</b>

Apart from undertaking the activities envisaged at the time of inception of NDP-I, several new/innovative activities have also been approved for testing the proof-of-concept for new and promising technologies toward greater dairy productivity and competitiveness. During 2018-19, 1,000 Flexi Bio Gas plants for manure management as well as a community Bio Gas plant for piped supply of Bio Gas in the village were approved by the Project Steering Committee.

**Statewise sub projects approved during 2018- 19 and cumulative till March 2019 is mentioned in the table below:**

Activity	No. of Approved Sub Projects		Amount in ₹ Million	
			Grant Assistance in the Sub Projects Approved during	
	During 2018-19	Cumulative till March 2019	During 2018-19	Cumulative till March 2019
Andhra Pradesh	02	20	46.28	807.70
Bihar	02	32	28.00	622.29
Chhattisgarh	00	04	0.00	110.26
Gujarat	04	61	53.23	3,517.26
Haryana	01	25	5.18	643.17
Jharkhand	00	02	0.00	46.83
Karnataka	02	50	16.70	1,670.68
Kerala	01	17	3.47	429.79
Madhya Pradesh	00	16	0.00	214.61
Maharashtra	02	49	9.87	1,154.43
Odisha	00	22	0.00	264.87
Punjab	01	33	7.73	1,117.96
Rajasthan	01	42	9.45	2,102.53
Tamil Nadu	00	29	0.00	1,072.50
Telangana	01	11	38.65	243.14
Uttar Pradesh	00	29	0.00	1,509.41
Uttarakhand	00	07	0.00	195.49
West Bengal	00	26	0.00	419.90
Centralised	02	04	222.00	405.77
<b>Sub Total</b>	<b>19</b>	<b>479</b>	<b>440.56</b>	<b>16,548.59</b>
Project Management & Learning	12	83	149.42	994.40
<b>Total</b>	<b>31</b>	<b>562</b>	<b>590.03</b>	<b>17,542.99</b>

## PRODUCTION OF HIGH GENETIC MERIT BULLS OF CATTLE AND BUFFALO

Various animal breeding interventions like Progeny Testing Programme, Pedigree Selection Programme, Import of Bulls/ Embryos and bull production through imported embryos have been undertaken

under NDP-I to make available disease-free high genetic merit (HGM) bulls of different breeds for production of high quality disease-free semen doses. These sub projects have made immense contribution in meeting the replacement requirement of HGM bulls for frozen semen stations across the country.

**Activitywise progress of Productivity Enhancement Component is summarised in the table below:**

Activity	Particulars	EoP target till 2018-19	Actual till March 2019
Progeny Testing Programme	HGM Male Calves made available for Distribution (No.)	2,026	2,112
	HGM Male Calves Distributed (No.)		1,607
Pedigree Selection Programme	HGM Male Calves made available for Distribution (No.)	501	248
	HGM Male Calves Distributed (No.)		193
Bull Production Through Imported Embryos	Embryos transferred (No.)		766
	Male Calves born (No.)		88
	Bull Calves made available for Distribution (No.)		59
Strengthening of Semen Stations	Semen Production (million doses per annum)	100.00	88.08
	Exotic		28.35
	Cross Bred		22.94
	Indigenous		12.74
Pilot AI Delivery Services	MAITs Deployed (No.)	2,740	1,330
	Villages Covered (No.)	23,800	11,681
	Als Carried Out (lakh) Annual	38.20	7.83
	AI Conception Rate (%)	45	43

Cumulatively till February 2019, **561** sub projects of **172** EIAs from **18** States have been approved with the grant assistance of **₹ 17,529.83** million.



### Animal Nutrition Component

Under the animal nutrition component interventions like Ration Balancing Programme and Fodder Development are being implemented under the project.

Under RBP, feeding of balanced ration to milch animals through Ration Balancing Programme has been benefiting the milk producers by way of increasing the milk production per animal per day and also by reducing the average cost of feeding. Under the Ration Balancing Programme (RBP), Local Resource Person (LRP) formulates a least cost balanced ration for milch animals from locally available feed resources using the software "Information Network for Animal Productivity and Health (INAPH)".

Further, under Fodder Development Programme, certified/truthfully labelled fodder seeds are being 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 and increase adoption.

### Adopting Ensiling as Entrepreneur in Maharashtra

Silage-making process has gained popularity across western parts of Maharashtra where dairy business has flourished. This further provides opportunity for young entrepreneurs to capitalise the increasing demand of alternative source of fodder. It is well recognised by Shri Vishal Nalawade who owns 25 cows, 8 buffaloes and 6 heifers and is progressive in adopting new technologies and advances. He has studied B.Com and is looking after his dairy farming.

To feed these number of animals, he cultivates green fodder in 3.5 acres of land. During the period of Feb-June, he faces shortage of green fodder which affects milk production as well as cost of milk production. In order to address this issue, he initially started making silage in bags. Fodder officer of Rajarambapu Patil milk union provided required assistance to the Shri Nalawade for making silage.

Later, he also got financial assistance from central sector scheme of DADH for

construction of tower silo. Till last year, he continued filling of green fodder in tower silo. However, he has been facing the issues in filling tower type of silo.

Realising the difficulty of less availability of labour, in 2015, he started trying to manufacture machine to press green fodder required for silage-making. He started it by making use of cylindrical steel container for holding small silage bags for filling. This was followed by adding a feature of screw pressing and later by use of hydraulic press.

Eventually in year 2016, he fabricated silage pressing machine with the help of a local fabricator by using hydraulic press with a capacity of 2 MT and power pack. These two parts cost ₹ 55,000 to him. He assembled it by using stand, drums (2), slider, and bracket for cylinder with the additional cost of ₹ 40,000. In this way, he fabricated silage pressing machine at the cost of ₹ 95,000 which was having capacity to fill fodder in bags of 30 kg. It needs 2 labour for filling and pressing of fodder.



In year 2017, nearby farmers started learning about the machine. On demand, Shri Vishal started providing the machine on rent @ ₹ 1,000 per day, which included machine and one labour to operate that machine. Gradually, this machine got popularity across the region. Shri Nalawade started manufacturing such machines on demand for other farmers. Currently, the cost of fabricating a unit with 5 MT of hydraulic press with capacity to fill 50 kg of bags is around ₹ 95,000. So far, 3 such machines have been fabricated and sold to farmers of Maharashtra and Karnataka state @ ₹ 1.15 lakh per unit. From each unit, he earned around ₹ 20,000.

**Capacity of such unit is pressing 4 MT of green fodder with the help of 2 labourers in a day. By using this machine, cost per MT of silage is given below:**

Requirement Per MT of Silage	in ₹
Green fodder	3,000
Plastic bag	1,000
Labour charges	150
Electricity	10

In future, apart from hydraulic press machines, he has plans to make and supply silages in 50 kg bags. Considering shortage of manpower and increasing need of silages, manufacturing of such machines for farmers is helping them to fulfil the need of green fodder and it can be the good source of income for young educated farmers like Shri Vishal Nalawade.



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**Activitywise progress of Animal Nutrition Component is summarised in the table below:**

Activity	Particulars	EoP target till 2018-19	Actual till March 2019
Ration	Village Coverage (No.)	39,008	33,311
Balancing Programme	Milch Animals Coverage (No.)	28,00,000	28,43,313
	LRPs Inducted (No.)	29,008	31,399
	Fodder Seed Production Support (MT)		12,203.93
Fodder Development Programme	Fodder Seed Sale Support to Farmers (MT)		29,676.80
	Silage-making Demonstrations (No.)	1,050	2,256
	Procurement of Mowers for Demonstrations (No.)	280	667
	Biomass Bunker Silo Constructed (No.)	35	118

### Village-Based Milk Procurement System

Village-Based Milk Procurement System (VBMPS) under NDP-I has been providing rural milk producers with greater access to the organised milk-processing sector by forming and strengthening Dairy Cooperative and Producer Companies. Under this

activity, new societies/pooling points are being formed and existing societies/pooling points are being 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 has

resulted in increased transparency and fairness in milk procurement operations, installation of BMCs has given farmers more flexibility in pouring milk as well as improvement in quality of milk. All these activities have direct relation in increasing farmers' income by providing them fair and transparent milk procurement system and improvement in the raw milk quality.

Progress under VBMPs component is summarised below:

Activity	Particulars	EoP target till 2018-19	Actual till March 2019
Village-Based Milk Procurement System	Village Coverage (No.)	31,900	45,996
	New/Revival Village Coverage (No.)		21,175
	Additional Milk Producers Enrolled (No.)	12,60,000	15,70,813
	Of which, Women (No.)	4,62,000	6,87,273
	Of which, Smallholders (No.)	8,20,000	10,53,492
	Additional Milk Procurement (TkgPD)		5,900.59
	Bulk Milk Coolers (No.)		3,908
	AMCU/ DPMCU (No.)		27,701



## Project Management and Learning

Project Management and Learning activities has put in place ICT-based Management Information System for integration, monitoring, analysis and reporting, to have effective coordination of project activities among various EIAs and to facilitate learning and evaluation. For monitoring and evaluation of NDP-I both internal and external monitoring and evaluation systems are in place.

Project Management & Learning (PM&L) has been of critical importance for tracking progress in the implementation of various project components, identifying problems as they arise, guiding remedial actions to help ensure that the project achieves its intended objectives and assessing the impact of the project. The external M&E is being carried out by external agencies/consultants.

External Monitoring and Evaluation of NDP-I is being undertaken by Development Research and Services (P) Ltd., New Delhi since the year 2012 for the entire duration of NDP-I. The end-

term survey is being undertaken and the final report would be submitted by the External Monitoring and Evaluation Agency by June 2019. The major findings of the Annual Round IV Study (evaluation year 2017-18) are as follows:

- The average milk yield of cattle and buffaloes in the project area increased from 5.03 litres per day during the baseline year 2012-13 to about 6.09 litres per day.
- The proportion of 'in milk' female animals to adult female animals in the project area increased from 63 per cent during the baseline year 2012-13 and to about 68 per cent.
- The proportion of milk sold to total production in the project area increased from 65 per cent during the baseline year 2012-13 to about 67 per cent after taking into account all the increases in milk production and the sale of milk simultaneously.
- The share of milk sold to the organised sector (as share of production) in the project area increased from 45 per cent during the baseline year 2012-13 to 73 per cent.

During the financial year 2018-19, two International exposure visits/trainings were organised under NDP-I:

- "Overseas training cum exposure visit for Animal Breeding and Animal Health activities at University of Queensland, Australia in which 25 officers participated.
- "Training programme on Advances in Dairy Production, Processing and Marketing Program" at Michigan State University, USA in which 21 officers participated.

## Training and Capacity Building

For developing the high quality human resources for timely and efficient implementation of activities under National Dairy Plan Phase I (NDP-I), several human resource initiatives and required training and capacity building programmes have been undertaken to manage the continuous metamorphosis taking place in the dairy sector.

Under NDP-I, the training and capacity building programmes are being organised by both NDDDB and End Implementing Agencies for milk producers, executives of the union, village resource persons and Board members of the union.



During the year 2018-19, till February 2019, 4.3 lakh participants have been trained/oriented in programmes organised by NDDB and EIAs. Cumulatively, 22.2 lakh participants have been trained/ oriented under NDP-I. The details of the training programme organised by NDDB under NDP-I is provided in the table below:

Componentwise NDP-I training conducted by NDDB			
Activity/Training Programme	Component	Category of Participants	Achievement (April 2012 to March 2019)
Farmers Induction*		Milk Producers	28,695
Farmers Orientation*			16,886
Board Orientation	VBMPS-Coops	Board of Directors	1,235
Business Appreciation			2,014
Training of Trainers		Executives	305
New Supervisors Training			843
<b>Sub-total</b>			<b>49,978</b>
Training of Technical Officers on RBP	Ration Balancing Programme-Coops	Executives	332
Refresher training on training of trainers			75
Training of Information Technology on RBP			82
<b>Sub-total</b>			<b>489</b>
Training of Technical Officers on RBP	Ration Balancing Programme-PC	Executives	114
Refresher training on training of trainers			15
Training of Information Technology on RBP			7
<b>Sub-total</b>			<b>136</b>
Fodder production & conservation practices	Fodder Development-Coops	Executives	280
<b>Sub-total</b>			<b>280</b>
Fodder production & conservation practices	Fodder Development-PCs	Executives	48
<b>Sub-total</b>			<b>48</b>
Orientation/refresher to AIOs			45
Orientation/refresher to Project Coordinators	Progeny Testing	Executives	22
Orientation/refresher to District Coordinators			71
Orientation/refresher to Calf Rearing In-charges			22
<b>Sub-total</b>			
Orientation/refresher to Project Coordinators	Pedigree Selection	Executives	16
Orientation/refresher to Area Coordinators			11
<b>Sub-total</b>			<b>27</b>
<b>Total</b>			<b>51,118</b>

\*achievement includes training conducted by EIA





## Environment and Social Management

While implementing the activities under NDP-I, several social inclusion and environment mitigation measures have been undertaken with a focus on increasing participation of women, small holders and scheduled caste and scheduled tribes across the activities as well as for promotion of sustainable dairying practices. Some of the key activities undertaken include:

- **E&S Orientation Session in NDP-I trainings at NDDDB** In 2018-19, 26 sessions were facilitated on both environmental and social management in 13 trainings of EIAs implementing sub projects under NDP-I at NDDDB Anand.

- **Renewable Energy Technology** Biogas plants have been funded to 21 semen stations under NDP-I to demonstrate the effective use of renewable energy from animal waste. The bio-gas produced is used for generating electricity to supplement the electricity for lighting the paths, bull sheds, fans and running water pump sets etc., while the slurry and leftover dung is used for making vermi-compost and manure or used for direct application in the fodder fields by mixing it with irrigation water. Till February 2019, 18 Biogas plants have been commissioned.

Apart from it, 1,000 flexi biogas units have been provided under NDP-I with 50 per cent grant assistance from NDP-I.

- **Solar Energy** Paayas Milk Producer Company, Rajasthan, has installed solar energy systems in all the milk pooling points formed under NDP-I. The solar energy is being utilised for operating the milk testing equipment like DPMCU and for fan and lighting etc. This has helped in reducing the dependency on erratic supply of electricity for running the milk collection operations at societies located in remote locations.

Rooftop Solar PV system combined with a battery backup and inverter has also been approved for 125 Milk Unions/PCs covered under NDP-I which is enabling the DCS/MPI/MPP to function without any hindrance in case of electricity drop.



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- All semen stations under NDP-I have bio-medical waste management systems in place (either through self or with help of external agencies) and the training of staff and workers on proper management of bio-medical waste generated has also been undertaken. 20 Semen stations have already complied with Bio-medical Waste Management Rules 2016 and signed a contract with Common Bio-medical Waste Management Facilities (CBMWTFs) for collection and safe disposal of segregated waste generated.
- **Compendium of Success stories** Quarterly publication on compilation of success stories under NDP-I (Mission Milk Chronicle) is being published and circulated to all the stakeholders including the Milk Unions/PCs under NDP-I, DADF (GoI) & World Bank etc. The main aim of this publication is to recognise the good work done by the individuals and EIAs implementing NDP-I activities and the share the same across different organisations implementing NDP-I sub projects with an objective to enhance cross-learning within and across states participating in NDP-I.
- **Equity Action Plan** An Equity Action Plan (EAP) has been prepared as per the World Bank guideline in order

to increase social integration and ensure social equity in sub projects being implemented under NDP-I. EAP is a guiding document prepared in line with Environmental and Social Management Framework (ESMF) of NDP-I.

## Financial Management

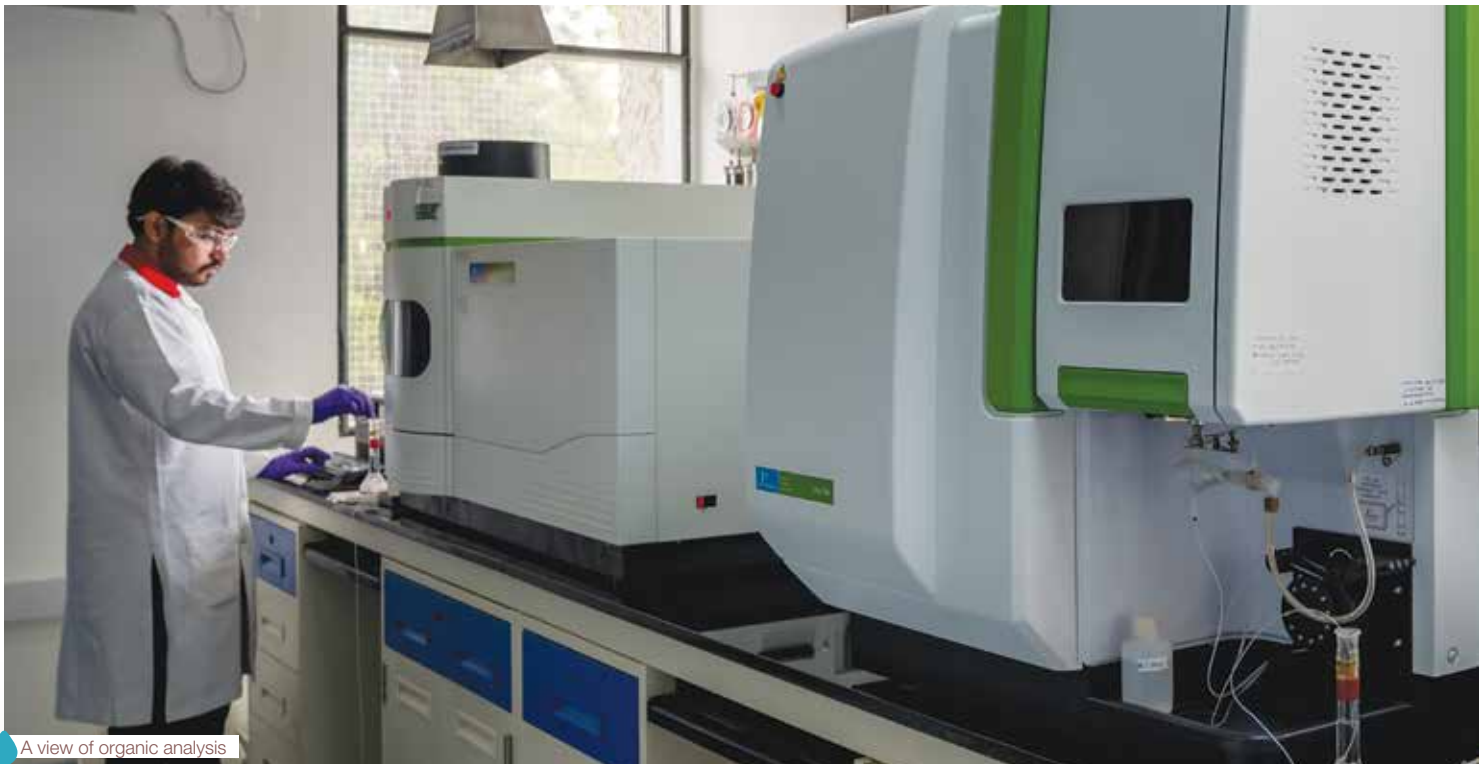
During the financial year 2018-19, ₹ 3,249.10 million has been received from DADF and ₹ 3,500.87 million has been disbursed. Cumulatively till March 2019, ₹ 17,600 million has been received by NDDDB from DADF for implementation of NDP-I and ₹ 16,228.60 million has been disbursed to EIAs as advance and for expenditure on centralised activities.

Total fund utilisation till December 2018 is ₹ 16,244.17 million out of which ₹ 13,376.69 million is NDP-I grant and ₹ 2,867.48 million is contribution of EIAs implementing VBMP sub projects. During the financial year 2018-19, till December 2018, the fund utilisation has been ₹ 2,776.30 million out of which ₹ 2,096.65 million is NDP-I grant and ₹ 679.65 million is contribution of EIAs.

Audit of NDP-I accounts for the financial year 2017-18 has been completed and there has not been any adverse remarks of the auditors. The audit report along with the accounts has been shared with the World Bank.

# Centre for Analysis and Learning in Livestock and Food

Centre for Analysis and Learning in Livestock and Food (CALF) is a notified referral laboratory for Food Safety and Standards Authority of India (FSSAI) for milk and milk products and also recognised by Bureau of Indian Standards and Export Inspection Council of India.



A view of organic analysis

The laboratory is accredited as per ISO 17025 by National Accreditation Board for Testing and Calibration Laboratories (NABL) covering chemical, microbiological and genetics scope of testing for various products. Laboratory received recognition from the Export Inspection Council in 2018 for various products including testing as per the Residue Monitoring Plan (RMP) for milk.

CALF provides analytical services to various sectors of dairy and other food processing industry. CALF offers a wide range of reliable and accurate analytical testing services for dairy products, food, fruit and vegetables, water, animal

feed ingredients, oils & fat and animal genetics. CALF also supports regulatory bodies, academia and industry in research and development, capacity building and works closely with national regulatory bodies.

During 2018-19, the laboratory received about 41,000 samples, 12 per cent higher compared to the previous year. In these samples, laboratory conducted about 4.53 lakh tests in the category of food and milk products, feed and genetics analysis. There has been a growth of about 3 times in the number of milk, milk products and food samples being received for testing and four times

in the number of parameters being tested in 2018-19 as compared to 2017-18.

During the past few years, the authenticity of honey has become an issue in international trade for major importing countries like EU and US.

NDDDB in collaboration with National Bee Board is also setting up a state-of-the-art honey testing laboratory for testing authenticity. Such a facility will develop a world-class honey authenticity testing capability in the country and promote consumer confidence.

The laboratory will help dairy cooperatives associated with bee



NDDB in collaboration with National Bee Board is also setting up a state-of-the-art honey testing laboratory



Fully automated rapid microbial enumeration technique

- CALF is collecting and analysing 200 vegetables samples / month as a part of the ICAR's projects on Monitoring of Pesticide Residues at National Level (MPRNL) at farm level in the states of Gujarat, Madhya Pradesh and Rajasthan. These samples are tested for about 170 pesticides by LCMS/MS and GCMS/MS.
- The Laboratory follows a rigorous quality control programme to ensure accuracy of the analytical results. The quality control data is continuously monitored at various steps of analysis. In 2018-19, the laboratory has successfully participated and qualified in 17 Proficiency Testing (PT) programmes, indicating effective implementation of quality control programmes and competency of laboratory.

keeping to meet domestic and export regulations. Laboratory would help cooperatives to screen their raw material and qualify the finished product, thus ensuring regulatory compliance for facilitating honey business. The facility would be also available to all farmers associated with National Bee Board at subsidised rates.

Further, many new developments were undertaken in 2018 for enhancement in scope of service in the areas of packaged drinking water, nutritional foods, fruits & vegetables and silage. Many new methodologies for analysis of B-complex vitamins, pesticide residues,

antibiotic residues and compositional analysis had been set up during the year.

- The Laboratory closely worked with Food Safety and Standard Authority of India (FSSAI) and supported in organising training on Milk Fortification, evaluation of methods and provided scientific comments.
- The Laboratory also organised two training programmes for Quality Control professionals from dairy cooperatives. These programmes were attended by 42 officers from 25 Cooperatives and Unions.

# Other Activities

## Recognising the commendable efforts in the implementation of the Official Language, NDDB was awarded the Rajbhasha Kirti Puraskar – third prize for the year 2017-18, in Region B.

### Progressive use of Hindi

Focussed efforts were made during the year to promote progressive use of Hindi in the day-to-day official work. NDDB's Annual Report, Reports of Parliamentary Standing Committee (PSC), NDDB website contents, 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 2018-19 issued by the Ministry of Home Affairs, Dept. of Official Language.

To accelerate the pace of usage of Hindi in office work, Hindi Fortnight was organised in all NDDB offices during September 2018. Apart from a lecture by a prominent Hindi scholar on Hindi Diwas, competitions like on-the-spot Hindi Essay Writing, Translation, General Knowledge 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 ₹ 85,900 was distributed as cash prize.

Recognising the commendable efforts in the implementation of the Official Language, NDDB was awarded the Rajbhasha Kirti Puraskar – third prize for the year 2017-18, in Region B. NDDB received this award from the Hon'ble Vice President of India on 14th September, 2018 at Vigyan Bhawan, New Delhi.

NDDB has introduced various incentive schemes for promotion of Hindi in office work. One such scheme is Hindi Noting and Drafting Incentive Scheme. 48 employees participated in this scheme and cash incentive amounting to

₹ 1,37,000 was given to the employees. 11 employees, whose children scored 75 per cent and more marks in Hindi in Class 10th and 12th examination, were given a cash prize of ₹ 2,000 each.

During the year 2018-19, NDDB Anand was associated with Town Official Language Implementation Committee (TOLIC), Anand and actively participated in its first half yearly meeting. During February 2018, a General Knowledge Competition in Hindi was organised and a good number of NDDB employees including TOLIC, Anand members also participated in it.

Training on Microsoft Hindi proof reading and voice typing tool was imparted to the employees. In addition to this, workshop on Hindi Noting & Drafting was also organised to remove the hesitation of employees to work in Hindi. To monitor the progress of Hindi in Metro offices, inspection of NDDB office, Mumbai was done during the year.

NDDB library has a large number of books in Hindi. During the year, books in Hindi, amounting to about ₹ 87,369 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

During the year, SC/ST employees underwent training in functional as well as behavioural programmes focussed on their competency and self-development. Eight SC/ST officers have also been inducted into Future Leadership Development Programme of NDDB to groom them as future leaders. In all, 97 training nominations for SC/ST employees were processed. Welfare measures for SC/ST employees also continued during the year. Meritorious children of SC/ST employees were recognised with cash prize and certificates for their academic achievements. To encourage academic orientation, SC/ST employees were reimbursed expenses incurred on education as well as books for their children.

Ambedkar Jayanti was celebrated in all offices of NDDB as a mark of respect to Dr. BR Ambedkar. Distinguished speakers were invited to share their thoughts on the life and achievements of Dr. Ambedkar.



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# Subsidiaries



Bulk Milk Coolers manufacturing facility



For 2018-19, IDMC reported a total revenue of ₹ 8,096.38 million with a profit before tax of ₹ 280.88 million

## IDMC LIMITED

IDMC, a wholly-owned subsidiary of National Dairy Development Board since 1992, offers processing and packaging solutions to its customers across dairy, cattle feed, pharmaceutical, beverage and thermal management segments.

During the year, IDMC executed and successfully commissioned several projects in the dairy sector. Prominent among them were the supply, installation, testing and commissioning of a dairy project with capacity of ten lakh litres per day to process liquid milk and products such as ghee, butter and fermented milk products, a fully automated fermented products plant of capacity two lakh litres per day, a UHT processing line with aseptic pouch filling, two fully automated butter manufacturing lines, and a RO-based milk concentration plant of capacity 50 KLPH.

IDMC manufactured and supplied a range of processing equipment such as pasteurisers, ice-cream freezers, continuous butter-making machines,

servo-driven cup cone-filling machines and products such as milking machines, Bulk Milk Coolers (BMCs), pumps, valves and fittings. IDMC continued its thrust on the sales of BMCs and indigenously developed milking machines during the year. IDMC also exported its Bulk Milk Coolers.

Under Thermal Management segment, several fully automated ammonia refrigeration systems with capacities ranging from 180 TR to 1,110 TR were commissioned during the year. Apart from this, IDMC also supplied and commissioned several indigenously manufactured Ice Silos having capacity of 3,000 MCAL each. Orders for similar thermal storage systems are under execution.

In the pharmaceutical segment, the company commissioned a plant comprising of two fermentation lines, each of capacity 30 KLPH. This was one of the stages for manufacturing enzyme-related antibiotics. The company is also executing a fully automated

formulation system to produce liquid antibiotics.

The research and development department of IDMC continued to develop new equipment and focussed on making its offerings of products and processes more efficient and competitive. IDMC recently developed UHT milk steriliser has been successfully tested and put into commercial operation.

The plastic segment continued to cater to its existing customers through its product offerings of packaging films for liquid milk and milk products such as ghee, curd, buttermilk, and high barrier laminates for milk powder and other food products. With the enhanced production capacity of a new 3-layer and 7-layer blown film plant, IDMC is now catering to customers in the UHT milk and edible oil segment also and developing new customers in these segments.

For 2018-19, IDMC reported a total revenue of ₹ 8,096.38 million with a profit before tax of ₹ 280.88 million.



Seven Layer Blown film plant

## INDIAN IMMUNOLOGICALS LIMITED

Indian Immunologicals was established by the National Dairy Development Board (NDDB) in 1982. The unit was corporatised as Indian Immunologicals Limited in the year 1999.

In the year 2018-19, Indian Immunologicals Limited (IIL) recorded sales turnover of ₹ 6,047 million. IIL achieved a growth of 21 per cent compared to the previous year. IIL's Institutions and Coop business grew 21 per cent to achieve sales of ₹ 3,196 million. IIL's Human Health Retail business grew 58 per cent to achieve sales of ₹ 802 million. IIL's exports grew by 58 per cent to achieve sales of ₹ 1,006 million. The Animal Health Retail business achieved an all-time high sales of ₹ 875 million.

IIL continues to be the largest supplier of Foot and Mouth Disease (FMD) vaccine in the country. IIL also established itself

as the largest supplier of human anti-rabies vaccine in the country. IIL has commenced supply of Pentavalent vaccine to the Ministry of Health's Universal Immunisation Programme (UIP).

IIL's DSIR-approved Research and Development Centre has many exciting candidate vaccines in its pipeline. A gene-deleted marker vaccine for Infectious Bovine Rhinotracheitis (IBR) has been developed and test licence has been received for the manufacture of batches for field trials. IIL's Classical Swine Fever vaccine has successfully passed the field trials and NOC has been obtained from DADF. Phase 1 clinical trial for Hepatitis A vaccine has been completed successfully. Phase 2/3 clinical trial batches have been made and approval from CDL, Kasauli is awaited. Pre-Clinical Toxicology (PCT) studies for Measles Rubella (MR) combination vaccine has been completed successfully. Phase 1 clinical trials for MR vaccine has been initiated. IIL has completed the procurement of Sabin

Injectable Polio antigens from Sinovac and has completed the formulation study to develop a hexavalent vaccine which includes DPT, Hepatitis B, HiB and Inactivated Polio antigens. PCT for the hexavalent vaccine will be undertaken in 2019. PCT studies for IIL's Dengue vaccine is under progress.

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. IIL has adopted a government school (Laxmapur village, Medak district, 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 schools.



Quality Manufacturing at IIL



## MOTHER DAIRY FRUIT & VEGETABLE PRIVATE LIMITED

Mother Dairy Fruit & Vegetable Pvt Ltd which was set up in 1974 as Mother Dairy, Delhi on behalf of the GoI to meet the liquid milk demand of Delhi was corporatised in the year 2000. MDFVPL is a wholly-owned subsidiary of the NDDB. Since its inception, MDFVPL has been continuously striving to further the vision and mandate of NDDB of “nourishing every Indian with delightful and healthy products while enriching the lives of farmers and the community in which we operate in.”

With the objective of helping the farmers in augmenting their family income, in the year 2018-19, the company strengthened its milk procurement network in the areas of Maharashtra, Uttar Pradesh and Rajasthan by procuring 9 LKGPD milk from 1.1 lakh farmers in 4,600 villages during 2018-19.

The milk procurement activities initiated by MDFVPL in the drought-affected Marathwada and Vidarbha regions of Maharashtra in 2016 have grown into a full-fledged operation associating with 52,000 farmers in 2,300 villages procuring 2.22 LKGPD annual average milk. The farmers in the region were paid ₹ 2,350 million in the form of milk payments during 2018-19.

As part of MDFVPL's strategy to expand its geographical footprint and handle the milk procurement from new areas, MDFVPL has commissioned a 1 LKGPD capacity Dairy Plant at Motihari in Bihar and refurbished Nagpur Dairy Plant and also commissioned Fresh Dairy Products facility at the plant.

Through its Horticulture division, the company embarked upon the journey to extend its farmer connect to the underdeveloped area by providing market access through our new Frozen and Pulp F&V facility at Ranchi to help the farmers of Jharkhand profitably sell their agricultural produce. The company had set-up a new modern IQF processing facility of 4,350 MT in Phase-1 and has commissioned the pulp processing facility of 17,700 MT during 2018-19 at Ranchi. The second phase will help find market access to tomato growers of the

area as well as mango and other fruits grown in the region.

In 2018-19, the company achieved a turnover of ₹ 95,700 million, registering an overall growth of 10 per cent which has been largely driven by 21 per cent growth in Edible Oil & Ghee business and 12 per cent growth in Value-Added Dairy Products.

The milk business has delivered a growth of 5 per cent over last year. Cow milk launched in 2017-18 has become the fastest growing category crossing 8.5 LLPD sales with an annual sales turnover of over ₹ 10,000 million during 2018-19 making it the largest Cow Milk brand in the country. New retail format integrating the Safal F&V, Mother Dairy Milk & Milk Products and Dhara Edible Oil in the form of exclusive and partially exclusive outlets introduced in Varanasi during 2018-19, is slated to be replicated in other areas in the coming year thus offering unmatched convenience to the consumers under one roof.

Value-added Dairy Products business continues to outpace the Industry with this year's imperative being the ramping up of the distribution network across key markets especially for the Long Shelf Life (LSL) category wherein the company made efforts to set up an exclusive distribution channel in newer markets. This resulted in a healthy growth of 35 per cent in the LSL business. MDFVPL also intensified focus on building its portfolio in the Modern Retail Format (MRF), deepening its presence in additional outlets along with enhancing shelf space in existing outlets resulting in 58 per cent growth in the channel.

The Mother Dairy Innovation Centre continues to develop new product categories like Cow Dahi, Kadhi Dahi and Khanti Ghee. The Centre also played a significant role in launching Safal Brand of NPOP certified Organic farm products by connecting with the farmers of Maharashtra, Rajasthan, Telangana, Uttarakhand etc. through proper traceability, authenticity test and regulatory guidelines. The Organic Products are currently available at about 100 safal outlets in Delhi with plans to roll out the offerings in retail channel in the coming year.

In 2018-19, MDFVPL achieved a turnover of **₹ 95,700** million registering an overall growth of **10** per cent which has been largely driven by **21** per cent growth in Edible Oil & Ghee business and **12** per cent growth in Value-Added Dairy Products.

Scientific, Regulatory Affairs and Nutrition (SRAN) at Innovation Centre continued to support through regulatory advocacy, both within Mother Dairy and with external stakeholders and has been recognised by FSSAI for implementation of fortification of milk as per latest regulation and health and wellness initiative.

As part of Mother Dairy Environmental Management System, the company has consistently focussed on resource optimisation have resulted in 3.5 per cent reduction in electricity consumption, 5 per cent reduction in water consumption and 5 per cent drop in carbon emission.

## 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 function as a delivery arm of NDDB for field operations relating to promoting producer companies and productivity enhancement services.

NDS manages the two largest semen stations in the country, Sabarmati Ashram Gaushala in Bidaj, Ahmedabad (Gujarat) and Animal Breeding Centre in Salon, Raebareli (Uttar Pradesh). It owns two mega semen stations in Alamadhi (Tamil Nadu) and Rahuri (Maharashtra).

During the year, the four semen stations together produced about 380 lakh semen doses.

During the year, more than 325 viable embryos have been produced through Embryo Transfer Technology (ETT), predominantly of Indian breeds. The year was a milestone for In-Vitro Fertilisation (IVF) activities as 7 IVF calves were born at Sabarmati Ashram Gaushala, Bidaj Farm.

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 for taking up various activities under NDP-I.

During the year, training on Core Design Principles of the MPC, Trainers training programme, orientation programmes on MPC for field staff were conducted. NDS facilitated various programmes for the Board of Directors (BODs) of the MPCs like policy governance module, Orientation programme, Finance Module and Interface workshop etc. NDS conducted a two-day follow-up workshop on 'Pre-requisites for a sustainable Institutional structure in an

MPC' at NDS-Delhi for the large MPCs for senior officials of the MPCs.

NDS is recognised as one of the support organisations for Deen Dayal Antyodaya Yojana (DAY-NRLM) by Ministry of Rural Development, Govt. NDS has entered into agreements with Madhya Pradesh, Bihar and Uttar Pradesh State Rural Livelihood Missions for setting up Milk Producer Companies approved under NRLM.

NDS facilitated operationalisation of three Milk Producer Companies, namely, Maalav Mahila Milk Producer Company, Rajgarh and Muktaa Mahila Milk Producer Company, Sagar, in Madhya Pradesh, Kaushik Mahila Milk Producer Company, Saharsa, in Bihar and incorporation of one MPC Balinee Milk Producer Company Jhansi, in Uttar Pradesh during the year under NRLM.

Under collaboration agreement with Tata Trusts, NDS facilitated operationalisation of Indujaa Mahila Milk Producer Company, Yavatmal, Maharashtra and assisted the earlier set up MPCs, namely, Sakhi in Alwar and Asha in Pali, Rajasthan, Shwethdara in Pratapgarh, Uttar Pradesh and Ruhaanii in Mansa, Punjab in carrying out finance module trainings and exposure visits for the BODs, various training programmes for the staff of MPCs.

NDS continued to support these MPCs in production enhancement activities like Artificial Insemination and Ration Balancing Programme, as well as other capacity building activities like farmer workshops, dairy farm management trainings etc.



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# Dairy Cooperatives at a Glance

## Dairy Cooperative Societies

(in numbers)<sup>®</sup>

Region/State	80-81	90-91	00-01	10-11	17-18	18-19*
<b>NORTH</b>						
Haryana	505	3,229	3,318	7,019	7,271	7,264
Himachal Pradesh		210	288	740	959	977
Jammu & Kashmir		105	**	**	457	457
Punjab	490	5,726	6,823	7,069	8,018	7,353
Rajasthan	1,433	4,976	5,900	16,290	14,496	14,822
Uttar Pradesh	248	7,880	15,648	21,793	31,133	31,754
Uttarakhand					4,112	4,168
<b>Regional Total</b>	<b>2,676</b>	<b>22,126</b>	<b>31,977</b>	<b>52,911</b>	<b>66,446</b>	<b>66,795</b>

<b>EAST</b>						
Assam		117	125	155	374	402
Bihar	118	2,060	3,525	9,425	21,318	22,261
Jharkhand				53	614	622
Meghalaya					97	97
Mizoram					39	42
Nagaland		21	74	49	52	52
Odisha		736	1,412	3,256	5,857	5,944
Sikkim		134	174	287	497	517
Tripura		73	84	84	101	100
West Bengal	584	1,223	1,719	3,019	4,066	4,117
<b>Regional Total</b>	<b>702</b>	<b>4,364</b>	<b>7,113</b>	<b>16,328</b>	<b>33,015</b>	<b>34,154</b>

<b>WEST</b>						
Chhattisgarh				757	1,082	1,112
Goa		124	166	178	182	183
Gujarat	4,798	10,056	10,679	14,347	19,044	19,853
Madhya Pradesh	441	3,865	4,877	6,216	9,263	9,151
Maharashtra	718	4,535	16,724	21,199	20,647	20,652
<b>Regional Total</b>	<b>5,957</b>	<b>18,580</b>	<b>32,446</b>	<b>42,697</b>	<b>50,218</b>	<b>50,951</b>

<b>SOUTH</b>						
Andhra Pradesh	298	4,766	4,912	4,971	3,274	3,308
Karnataka	1,267	5,621	8,516	12,372	15,817	16,021
Kerala		1,016	2,781	3,666	3,293	3,317
Tamil Nadu	2,384	6,871	8,369	10,079	10,806	10,677
Telangana					2,441	5,189
Puducherry		71	92	102	104	104
<b>Regional Total</b>	<b>3,949</b>	<b>18,345</b>	<b>24,670</b>	<b>31,190</b>	<b>35,735</b>	<b>38,616</b>
<b>Grand Total</b>	<b>13,284</b>	<b>63,415</b>	<b>96,206</b>	<b>1,43,126</b>	<b>1,85,414</b>	<b>1,90,516</b>

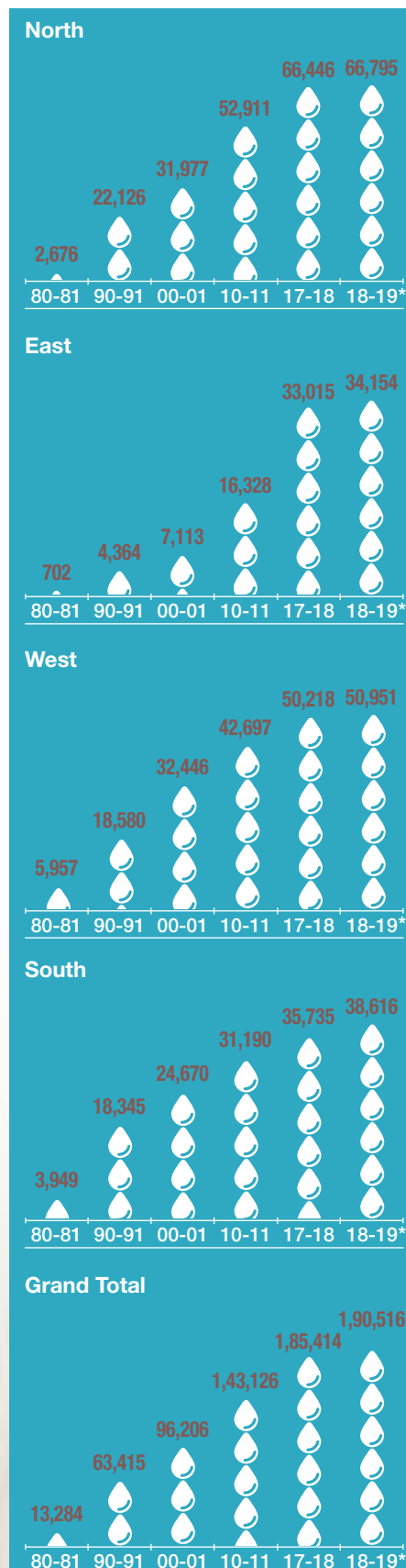
<sup>®</sup> Organised (cumulative), includes conventional societies and Taluka unions formed earlier

\* Provisional

\*\* Not reported

Data for Meghalaya, Mizoram, Telangana & Uttarakhand included from 2014-15

Source: Milk Unions & Federations.



## Producer Members

(in thousand)

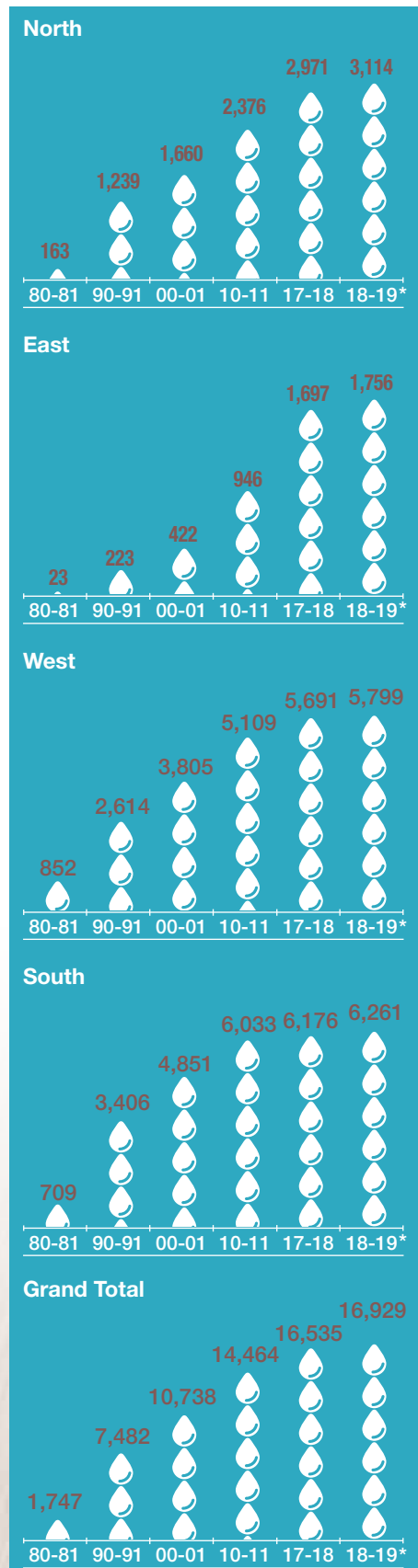
Region/State	80-81	90-91	00-01	10-11	17-18	18-19*
<b>NORTH</b>						
Haryana	39	184	185	313	313	432
Himachal Pradesh		17	20	32	49	43
Jammu & Kashmir		2	**	**	17	17
Punjab	26	304	370	385	410	381
Rajasthan	80	340	436	669	806	827
Uttar Pradesh	18	392	649	977	1,219	1,256
Uttarakhand					157	158
<b>Regional Total</b>	<b>163</b>	<b>1,239</b>	<b>1,660</b>	<b>2,376</b>	<b>2,971</b>	<b>3,114</b>
<b>EAST</b>						
Assam		2	1	4	20	24
Bihar	3	100	184	523	1,102	1,143
Jharkhand				1	21	22
Meghalaya					4	4
Mizoram					1	1
Nagaland		1	3	2	2	2
Odisha		46	111	187	268	276
Sikkim		4	5	10	14	14
Tripura		4	4	6	6	7
West Bengal	20	66	114	213	259	263
<b>Regional Total</b>	<b>23</b>	<b>223</b>	<b>422</b>	<b>946</b>	<b>1,697</b>	<b>1,756</b>
<b>WEST</b>						
Chhattisgarh				31	42	43
Goa		12	18	19	19	19
Gujarat	741	1,612	2,147	2,970	3,507	3,614
Madhya Pradesh	24	150	242	271	336	336
Maharashtra	87	840	1,398	1,818	1,787	1,787
<b>Regional Total</b>	<b>852</b>	<b>2,614</b>	<b>3,805</b>	<b>5,109</b>	<b>5,691</b>	<b>5,799</b>
<b>SOUTH</b>						
Andhra Pradesh	33	561	702	846	566	569
Karnataka	195	1,013	1,528	2,124	2,539	2,536
Kerala		225	637	851	978	987
Tamil Nadu	481	1,590	1,957	2,176	1,884	1,870
Telangana					169	258
Puducherry		17	27	36	41	41
<b>Regional Total</b>	<b>709</b>	<b>3,406</b>	<b>4,851</b>	<b>6,033</b>	<b>6,176</b>	<b>6,261</b>
<b>Grand Total</b>	<b>1,747</b>	<b>7,482</b>	<b>10,738</b>	<b>14,464</b>	<b>16,535</b>	<b>16,929</b>

\* Provisional

\*\* Not reported

Data for Meghalaya, Mizoram, Telangana &amp; Uttarakhand included from 2014-15

Source: Milk Unions &amp; Federations.



## Milk Procurement

(in thousand kilograms per day)#

Region /State	80-81	90-91	00-01	10-11	17-18	18-19*
<b>NORTH</b>						
Haryana	33	94	276	511	562	441
Himachal Pradesh		14	24	60	60	70
Jammu & Kashmir		11	**	**	35	28
Punjab	75	394	912	1,037	1,766	1,640
Rajasthan	138	364	887	1,629	2,845	2,791
Uttar Pradesh	64	382	791	504	361	403
Uttarakhand					194	251
<b>Regional Total</b>	<b>310</b>	<b>1,259</b>	<b>2,890</b>	<b>3,741</b>	<b>5,821</b>	<b>5,624</b>

<b>EAST</b>						
Assam		4	3	5	30	33
Bihar	3	95	330	1,091	1,603	1,891
Jharkhand				5	121	162
Meghalaya					12	13
Mizoram					6	7
Nagaland		1	3	2	3	4
Odisha		41	94	276	508	492
Sikkim		4	7	12	36	38
Tripura		3	1	2	6	6
West Bengal	31	52	204	273	188	226
<b>Regional Total</b>	<b>34</b>	<b>200</b>	<b>642</b>	<b>1,666</b>	<b>2,512</b>	<b>2,871</b>

<b>WEST</b>						
Chhattisgarh				25	79	104
Goa		16	32	38	64	64
Gujarat	1,344	3,102	4,567	9,158	21,093	22,920
Madhya Pradesh	68	256	319	588	1,105	1,012
Maharashtra	165	1,872	2,979	3,053	3,568	3,998
<b>Regional Total</b>	<b>1,577</b>	<b>5,246</b>	<b>7,897</b>	<b>12,862</b>	<b>25,908</b>	<b>28,098</b>

<b>SOUTH</b>						
Andhra Pradesh	79	763	879	1,371	1,199	1,229
Karnataka	261	917	1,887	3,742	7,077	7,475
Kerala		185	646	688	1,260	1,298
Tamil Nadu	301	1,106	1,618	2,097	3,039	3,381
Telangana					657	737
Puducherry		26	45	35	54	55
<b>Regional Total</b>	<b>641</b>	<b>2,997</b>	<b>5,075</b>	<b>7,932</b>	<b>13,287</b>	<b>14,175</b>
<b>Grand Total</b>	<b>2,562</b>	<b>9,702</b>	<b>16,504</b>	<b>26,202</b>	<b>47,529</b>	<b>50,769</b>

# Includes outside State operations

\* Provisional

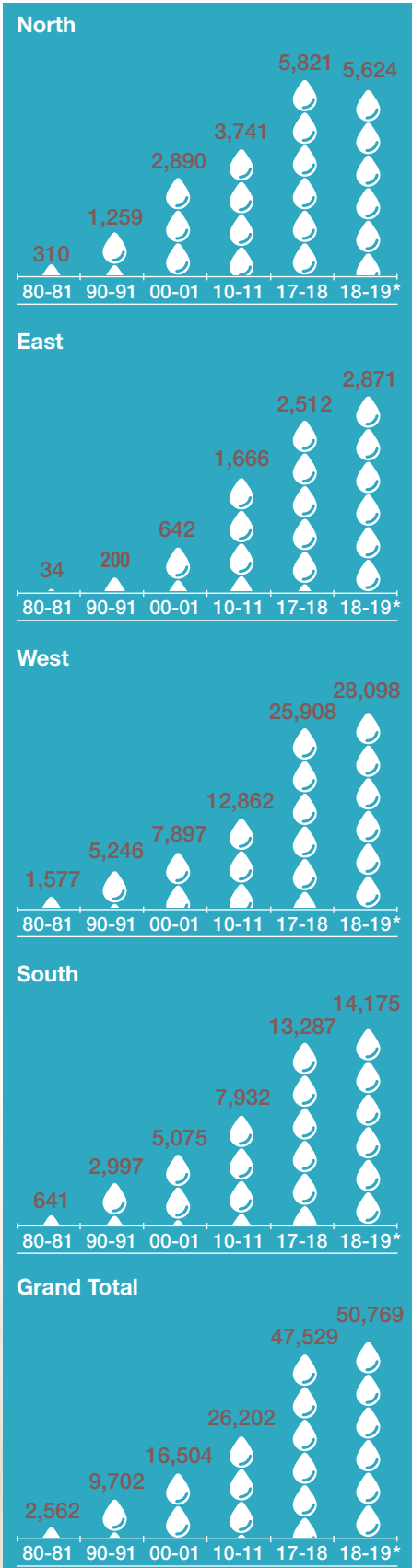
\*\* Not reported

Gujarat's total milk procurement in 2018-19 includes 2,861 TkgPD from outside the State.

In 2017-18, the corresponding figure was 3,502 TkgPD.

Data for Meghalaya, Mizoram, Telangana &amp; Uttarakhand included from 2014-15.

Source: Milk Unions &amp; Federations.



## Liquid Milk Marketing

(in thousand litres per day)<sup>#</sup>

Region /State	80-81	90-91	00-01	10-11	17-18	18-19*
<b>NORTH</b>						
Haryana	2	80	108	362	329	301
Himachal Pradesh		15	20	23	25	22
Jammu & Kashmir		9	**	**	27	25
Punjab	7	139	420	802	991	1,005
Rajasthan	12	136	540	1,505	2,242	2,253
Uttar Pradesh	1	326	436	380	886	990
Uttarakhand					160	157
Delhi	697	1,051	1,524	3,050	6,380	6,558
<b>Regional Total</b>	<b>719</b>	<b>1,756</b>	<b>3,048</b>	<b>6,122</b>	<b>11,040</b>	<b>11,311</b>

<b>EAST</b>						
Assam		10	7	22	51	54
Bihar	8	111	324	454	1,126	1,106
Jharkhand				253	383	391
Meghalaya					12	11
Mizoram					5	7
Nagaland		1	4	3	5	5
Odisha		65	98	290	409	403
Sikkim		5	7	17	35	41
Tripura		6	7	15	12	13
West Bengal	17	26	27	41	32	41
Kolkata	283	526	840	644	1,141	1,102
<b>Regional Total</b>	<b>308</b>	<b>750</b>	<b>1,314</b>	<b>1,739</b>	<b>3,211</b>	<b>3,175</b>

<b>WEST</b>						
Chhattisgarh				34	149	158
Goa		36	83	69	71	67
Gujarat	210	1,052	1,905	3,237	5,256	5,433
Madhya Pradesh	39	279	244	495	876	856
Maharashtra	18	363	1,178	2,023	2,783	2,728
Mumbai	950	1,057	1,390	841	1,952	1,935
<b>Regional Total</b>	<b>1,217</b>	<b>2,787</b>	<b>4,800</b>	<b>6,699</b>	<b>11,088</b>	<b>11,177</b>

<b>SOUTH</b>						
Andhra Pradesh	19	552	733	1,565	1,337	1,308
Karnataka	166	889	1,501	2,661	3,886	4,010
Kerala		223	640	1,092	1,286	1,296
Tamil Nadu	109	405	559	989	1,038	1,022
Telangana					803	830
Puducherry		22	43	93	98	97
Chennai	245	662	725	1,025	1,168	1,227
<b>Regional Total</b>	<b>539</b>	<b>2,753</b>	<b>4,201</b>	<b>7,425</b>	<b>9,616</b>	<b>9,790</b>
<b>Grand Total</b>	<b>2,783</b>	<b>8,046</b>	<b>13,363</b>	<b>21,985</b>	<b>34,954</b>	<b>35,453</b>

<sup>#</sup> Includes Metro Dairies and outside State operations

\* Provisional

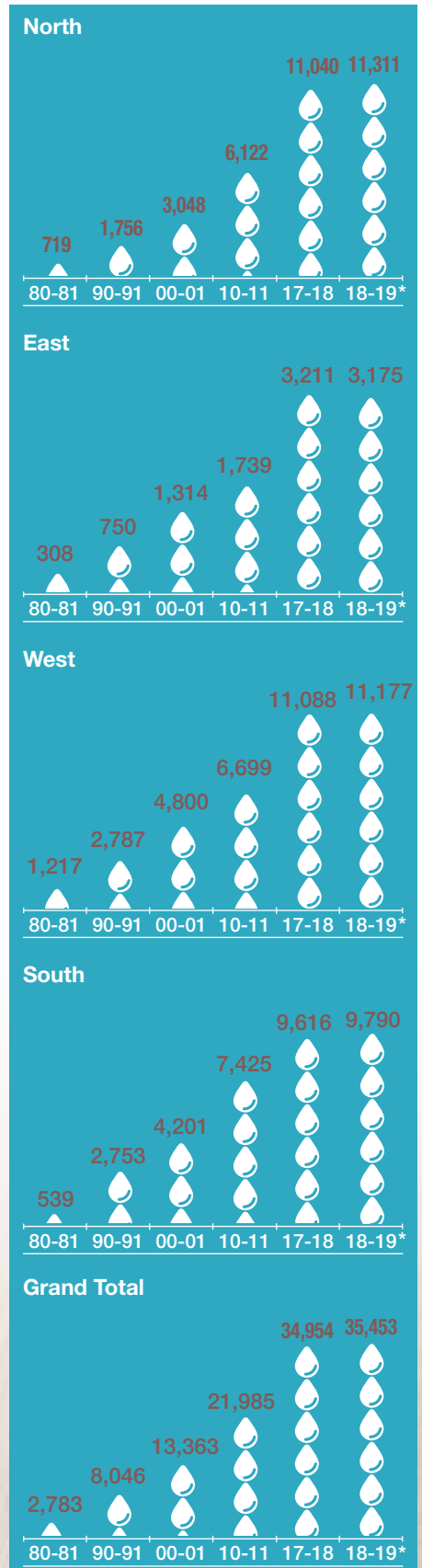
\*\* Not reported

Gujarat's total milk marketing in 2018-19 including outside the State stands at 12,502 TLPD.

In 2017-18, the corresponding figure was 12,059 TLPD.

Data for Meghalaya, Mizoram, Telangana &amp; Uttarakhand included from 2014-15

Source: Milk Unions/Dairies &amp; Federations.



## Dairy Cooperatives' Cold Chain Infrastructure (capacity)\*

(March 2019)

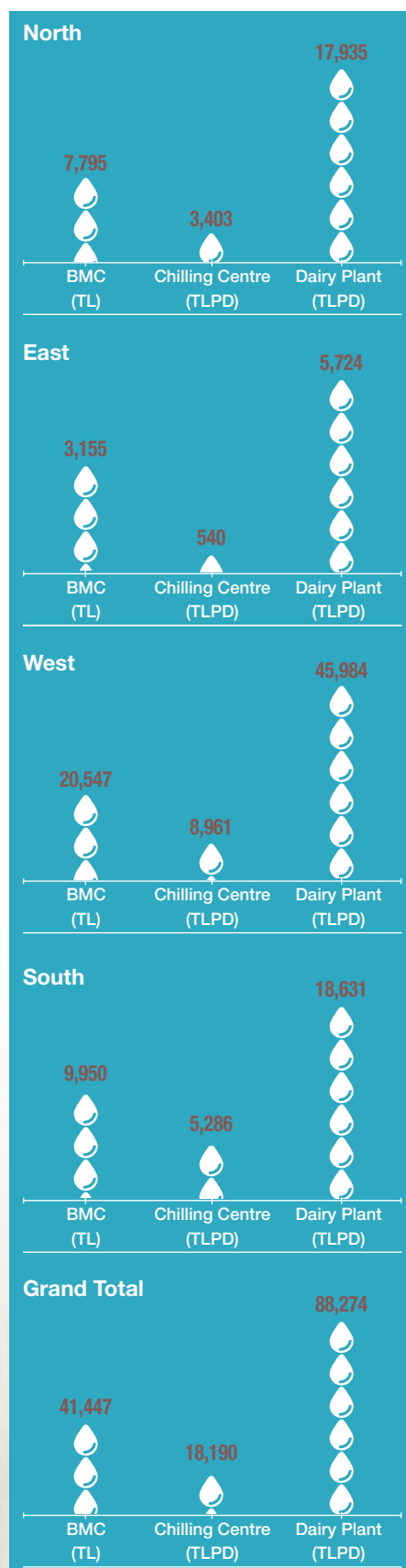
State/Region	BMC (TL)	Chilling Centre (TLPD)	Dairy Plant (TLPD)
<b>NORTH</b>			
Delhi			1,500
Haryana	367	330	6,775
Himachal Pradesh	136	80	100
Jammu & Kashmir	108		100
Punjab	1,826	838	2,185
Rajasthan	4,375	510	3,035
Uttar Pradesh	912	1,580	3,995
Uttarakhand	71	65	245
<b>Regional-Total</b>	<b>7,795</b>	<b>3,403</b>	<b>17,935</b>
<b>EAST</b>			
Assam	20		60
Bihar	1,832	314	2,875
Jharkhand	186	10	690
Meghalaya			26
Mizoram	11		20
Nagaland	2		22
Odisha	785	80	680
Sikkim	9		60
Tripura	7		24
West Bengal	304	136	1,267
<b>Regional-Total</b>	<b>3,155</b>	<b>540</b>	<b>5,724</b>
<b>WEST</b>			
Chhattisgarh	95	72	150
Goa	47		110
Gujarat	17,530	6,435	26,295
Madhya Pradesh	854	599	1,518
Maharashtra	2,021	1,855	17,911
<b>Regional-Total</b>	<b>20,547</b>	<b>8,961</b>	<b>45,984</b>
<b>SOUTH</b>			
Andhra Pradesh	1,979	438	2,705
Karnataka	4,324	2,960	8,525
Kerala	1,368	100	1,910
Tamil Nadu	1,594	1,425	4,121
Telangana	635	363	1,250
Puducherry	50		120
<b>Regional-Total</b>	<b>9,950</b>	<b>5,286</b>	<b>18,631</b>
<b>Grand Total</b>	<b>41,447</b>	<b>18,190</b>	<b>88,274</b>

\*Provisional

TL: Thousand Litres

TLPD: Thousand Litres per Day

Source: Milk Unions/Dairies &amp; Federations.





# Visitors

During 2018-19, NDDB received 1,411 guests from India and abroad.

Overseas invitees came from Australia, Bangladesh, Brazil, Brussels, Denmark, Iran, Myanmar, Nepal, The Netherlands, New Zealand and The United States of America.



Shri Radha Mohan Singh, Minister for Agriculture and Farmer Welfare, Govt of India



Dr. Rajiv Kumar, Vice Chairman, NITI Aayog



Shri Virendra Kanwar, Minister for Rural Development and Animal Husbandry, Himachal Pradesh



Dr. Harsh Kumar Bhanwala, Chairman, NABARD



Ms Caroline Emond, Director General, International Dairy Federation



Shri Tarun Shridhar, Secretary (AHD&F), Ministry of Animal Husbandry and Farmers Welfare, Govt of India

# 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 March 31, 2019, 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, 2019 are prepared, in all material respects, in accordance with the provisions of the Act.

Date: 15 July, 2019  
Place: Mumbai

For **Borkar & Muzumdar**  
Chartered Accountants  
FRN: 101569W  
UDIN: 19109386AAAABO5206

**Devang Vaghani**  
Partner  
M. No. 109386

Tel: 022 6689 9999 / Fax: 022 6689 9990 / Email: [contact@bnmca.com](mailto:contact@bnmca.com) / Website: [www.bnmca.com](http://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 31<sup>st</sup> March, 2019

₹ in Million

<b>PARTICULARS</b>	<b>Annexure</b>	<b>31.03.2019</b>	<b>31.03.2018</b>
<b>LIABILITIES</b>			
NDDB Funds	I	30,596.97	29,854.14
Secured Loans	II	4,636.11	611.92
Current Liabilities and Provisions	III	8,304.92	6,704.88
Deferred Tax Liability	XVI (Note 8)	323.00	290.90
<b>Total</b>		<b>43,861.00</b>	<b>37,461.84</b>
<b>ASSETS</b>			
Cash and Bank Balances	IV	5,005.86	6,410.89
Inventories	V	0.38	0.37
Sundry Debtors		185.50	189.69
Loans, Advances and Other Current Assets	VI	22,191.77	15,972.02
Investments	VII	14,522.49	13,026.63
Fixed Assets	VIII	1,955.00	1,862.24
<b>Total</b>		<b>43,861.00</b>	<b>37,461.84</b>
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

**For and on behalf of the Board,**

**Devang Vaghani**  
Partner  
Membership No. 109386

**Dilip Rath**  
Chairman

**Arun Raste**  
Executive Director

**S Regupathi**  
General Manager  
(Accounts)

Mumbai, 15th July 2019

Anand, 21st June, 2019

**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 31<sup>st</sup> March, 2019

₹ in Million

<b>PARTICULARS</b>	<b>Annexure</b>	<b>2018-2019</b>	<b>2017-2018</b>
<b>INCOME</b>			
Interest		2,432.13	2,216.46
Service Charges	IX	263.41	258.11
Rent		211.61	199.82
Dividend		142.37	227.22
Other Income	X	215.40	465.64
<b>Total (A)</b>		<b>3,264.92</b>	<b>3,367.25</b>
<b>EXPENDITURE</b>			
Interest and Financial Charges		428.39	172.16
Remuneration and Benefits to Employees	XI	874.91	814.04
Administrative Expenses	XII	159.50	147.02
Grants		116.32	20.28
Research and Development		132.45	155.11
Maintenance of Assets	XIII	217.82	231.86
Other Expenses	XIV	160.41	94.66
Bad Debts Written off		-	339.05
Depreciation	VIII	162.98	152.32
<b>Total (B)</b>		<b>2,252.78</b>	<b>2,126.50</b>
<b>Surplus during the year before tax (C) = (A - B)</b>		<b>1,012.14</b>	<b>1,240.75</b>
Less: Provision for Taxation			
Current Tax		228.28	146.70
Deferred Tax	XVI (Note 8)	32.10	51.66
<b>Surplus during the year after tax</b>		<b>751.76</b>	<b>1,042.39</b>
<b>Less: Appropriations to -</b>			
Special Reserve		138.13	148.59
Balance carried to General Funds		613.63	893.80
<b>Total (D) = (B + C)</b>		<b>3,264.92</b>	<b>3,367.25</b>
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, 15th July 2019

**For and on behalf of the Board,**

**Dilip Rath**  
Chairman

**Arun Raste**  
Executive Director

**S Regupathi**  
General Manager  
(Accounts)

Anand, 21st June, 2019

## 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 31<sup>st</sup> March, 2019

₹ in Million

PARTICULARS	ANNEXURE	2018-2019	2017-2018
<b>Cash flow from Operating Activities</b>			
<b>Surplus during the year before tax</b>		1,012.14	1,240.75
<b>Adjustments for :</b>			
Depreciation	162.98		152.32
(Write back)/Provision for inventory obsolescence	-		(0.10)
(Profit)/Loss on sale of investments	(6.90)		(2.44)
Interest income on fixed deposit and bonds considered separately	(1,213.65)		(1,202.76)
Dividend Income considered separately	(142.37)		(227.22)
(Profit)/Loss on sale/ Grant of fixed assets considered separately	(124.29)		(3.06)
Employee Retirement Benefit	86.19		60.08
Interest and financial charges to banks	17.68		4.44
Bad debts written off	-		339.05
Premium Amortised on Bonds and State Development Loans	33.07		16.83
		(1,187.29)	(862.86)
<b>Operating Cash flow before changes in working capital</b>		<b>(175.15)</b>	<b>377.89</b>
(Increase)/ Decrease in Inventories	(0.01)		0.24
(Increase)/ Decrease in Sundry Debtors	4.19		(127.48)
(Increase)/ Decrease in Loans and Advances	(6,159.61)		(2,070.21)
Tax refunded/(paid)	(276.95)		217.61
Increase/(Decrease) in current liabilities	1,522.59		831.62
		(4,909.79)	(1,148.22)
<b>Net cash flow generated from /(used in) operating activities (A)</b>		<b>(5,084.94)</b>	<b>(770.33)</b>
<b>Cash flow from Investing activities</b>			
Interest Income	1,243.42		995.79
Dividend Income	142.37		227.22
Proceeds from maturity of investments (Bonds)	900.00		200.00
Purchase of Investments (Shares)	(18.00)		-
Purchase of Investments (Bonds and State Development Loans)	(2,404.03)		(4,350.29)
Decrease / (Increase) in FDR's with banks more than 90 days (net)	2,686.91		2,942.02
Proceeds from sale of fixed assets	173.23		7.37
Grant received for purchase of Fixed asset	-		45.99
Purchase of fixed assets	(313.61)		(136.78)

₹ in Million

PARTICULARS	ANNEXURE	2018-2019	2017-2018
<b>Net cash flow generated from / (used in) investing activities (B)</b>		<b>2,410.29</b>	<b>(68.68)</b>
<b>Cash flow from Financing activities</b>			
Proceeds / (Repayment) of borrowed funds	4,024.19	561.81	
Interest and financial charges to banks	(17.68)	(4.44)	
<b>Net cash flow from financing activities (C)</b>		<b>4,006.51</b>	<b>557.37</b>
<b>Net Cash flow during the year (A+B+C)</b>		<b>1,331.86</b>	<b>(281.64)</b>
<b>Cash and Cash Equivalents at the beginning of the year</b>		<b>32.96</b>	<b>314.60</b>
<b>Cash and Cash Equivalents at the end of the year</b>		<b>1,364.82</b>	<b>32.96</b>
<b>Cash and Cash Equivalents</b>			
Balances with Banks:			
In fixed deposits		5,000.36	6,377.93
Less: Deposits with original maturity more than 90 days		3,641.04	6,377.93
		1,359.32	-
In current accounts		5.47	32.88
Cash and Cheques on hand		0.03	0.08
<b>Total</b>		<b>1,364.82</b>	<b>32.96</b>
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

**For and on behalf of the Board,**

**Devang Vaghani**  
Partner  
Membership No. 109386

**Dilip Rath**  
Chairman

**Arun Raste**  
Executive Director

**S Regupathi**  
General Manager  
(Accounts)

Mumbai, 15th July 2019

Anand, 21st June, 2019

**NDDB Funds****ANNEXURE I**

₹ in million

	31.03.2019	31.03.2018
<b>General Reserve (Note a)</b>		
Balance as per last balance sheet	3,559.61	3,559.61
<b>Grant for Fixed Assets (Note b)</b>		
Balance as per last balance sheet	70.10	33.06
Add: Grant received during the year	-	45.99
Less: Recoupment of depreciation (Refer Note 4 of Annexure VIII)	8.93	8.95
	<b>61.17</b>	<b>70.10</b>
<b>Special Reserve under section 36 (1) (viii) of the Income Tax Act, 1961</b>		
Balance as per last balance sheet	1,247.84	1,099.25
Add: Transfer from Income and Expenditure Account	138.13	148.59
	<b>1,385.97</b>	<b>1,247.84</b>
<b>Income and Expenditure Account</b>		
Balance as per last balance sheet	24,976.59	24,082.79
Add: Surplus after appropriation during the year	613.63	893.80
	25,590.22	24,976.59
<b>Total</b>	<b>30,596.97</b>	<b>29,854.14</b>

**Note:**

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

**Secured Loans****ANNEXURE II**

₹ in million

	31.03.2019	31.03.2018
Bank Overdraft (Secured against lien on fixed deposits with Banks)	316.11	611.92
Loan from NABARD (Secured against loan given under DIDF scheme)	4,320.00	-
<b>Total</b>	<b>4,636.11</b>	<b>611.92</b>



**Current Liabilities and Provisions****ANNEXURE III**

₹ in million

	31.03.2019	31.03.2018
<b>a) Current Liabilities</b>		
Advances and deposits	43.24	35.58
Sundry creditors	293.79	246.81
Net liability on account of Consultancy Project		
Funds received	18,880.67	14,403.04
Add : Due to suppliers for expenses	1,510.28	1,212.27
	20,390.95	15,615.31
Less : Expenditure incurred	16,292.53	11,394.77
Advance to suppliers	122.20	376.07
	3,976.22	3,844.47
Add : Payable to NDDDB (Per contra, Refer Annexure VI)	64.03	108.21
	4,040.25	3,952.68
<b>b) Fund received for Government of India projects</b>		
Fund Received	1,455.82	-
Add: Interest Accrued	3.96	-
Less: Expenditure incurred	24.21	-
	1,435.57	-
<b>c) Provisions for :</b>		
Non-performing assets (Refer Note 9 of Annexure XVI)	1,075.72	1,082.41
General contingency on Standard Assets (Refer Note 9 of Annexure XVI)	79.28	55.28
Contingency (Refer Note 9 of Annexure XVI)	561.24	585.39
	1,716.24	1,723.08
<b>d) Provisions for :</b>		
Leave encashment (Refer Note 5 of Annexure XVI)	419.02	379.08
Post retirement medical scheme (Refer Note 5 of Annexure XVI)	69.98	71.19
Gratuity (Refer Note 5 of Annexure XVI)	17.58	15.54
VRS monthly benefits	8.97	18.74
	515.55	484.55
Provisions for income tax (net of taxes paid)	260.28	262.18
<b>Total</b>	<b>8,304.92</b>	<b>6,704.88</b>

**Note:** Advances made from fund received for Government of India Projects are shown in Annexure VI

## Cash and Bank Balances

### ANNEXURE IV

₹ in million

	31.03.2019	31.03.2018
Balances with Banks		
In fixed deposits	5,000.36	6,377.93
In current accounts	5.47	32.88
	5,005.83	6,410.81
Cash and cheques on hand	0.03	0.08
<b>Total</b>	<b>5005.86</b>	<b>6410.89</b>

**Note :** Fixed deposits includes

- ₹ 1563.36 million (Previous Year ₹ 2112.80 million) placed with Banks which are under lien for the overdraft facility
- ₹ 498.00 million (Previous Year NIL) which are under lien in favour of NABARD for the DSRA account opened for loans availed under DIDF scheme
- ₹ 0.05 million (Previous Year ₹ 0.05 million) for Bank Guarantee Margin Money.

## Inventories

### ANNEXURE V

₹ in million

	31.03.2019	31.03.2018
Stores, spares and others	1.50	1.44
Project equipments	3.19	3.24
	4.69	4.68
Less : Provision for obsolescence	4.31	4.31
	0.38	0.37
<b>Total</b>	<b>0.38</b>	<b>0.37</b>

## Loans, Advances and Other Current Assets

### ANNEXURE VI

₹ in million

	31.03.2019	31.03.2018
Loans to cooperatives		
Milk - Secured	17,604.46	11,363.13
Unsecured	283.39	345.47
	17,887.85	11,708.60
Oil (including interest accrued) - Unsecured	945.03	945.03
Loans and advances to subsidiary companies / managed units		
Secured	1,313.81	1,238.89
Unsecured	627.45	753.68
	1,941.26	1,992.57
Loans to employees		
Secured	0.66	0.90
Unsecured	6.70	7.49
	7.36	8.39

₹ in million

	31.03.2019	31.03.2018
Interest accrued on -		
Loans and advances	45.70	51.59
Fixed deposits and investments	251.56	231.35
	297.26	282.94
Advances to suppliers and contractors	5.40	8.11
Recoverable on account of turnkey projects (Per contra, Refer Annexure III)	64.03	108.21
Sundry deposits	18.86	19.25
Income taxes paid (net of provisions)	936.90	890.13
Other receivables	87.82	8.79
<b>Total</b>	<b>22,191.77</b>	<b>15,972.02</b>

**Note :**

- Secured loans are secured against the mortgage of assets and/or hypothecation of stocks/assets.
- Secured loans includes ₹ 4186.59 million given under DIDF scheme.
- Other receivables include ₹ 72.29 million against the fund received for Government of India projects.

**Investments****ANNEXURE VII**

₹ in million

	31.03.2019	31.03.2018
<b>Long term investments (at cost) :</b>		
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)	6,389.89	4,897.28
(aggregate market value of bonds is ₹ 6422.15 million (Previous Year ₹ 4868.80 million) as at the balance sheet date)		
State Development Loans (Quoted) (at cost)	3239.80	3254.55
(aggregate market value of State Development Loans is ₹ 3217.49 million (Previous Year ₹ 3180.99) as at the balance sheet date)		
Shares (unquoted) in Co-operatives and Federations	19.00	1.00
Less: Provision for diminution in value of investments	0.10	0.10
	18.90	0.90
<b>Total</b>	<b>14,522.49</b>	<b>13,026.63</b>

## Fixed Assets

### ANNEXURE VIII

₹ in million

Particulars	Gross Block (at Cost)			Depreciation			Net Block	
	As at 01.04.2018	Addition	Deduction/ (adjustments)	As at 31.03.2019	For the year (refer note 4)	Deduction/ (adjustments)	As at 31.03.2019	As at 31.03.2018
<b>FreeHold Land (refer note 1 to 3)</b>	500.66	-	44.21	456.45	-	-	456.45	500.66
Lease Hold Land	64.16	-	-	64.16	0.75	-	13.05	51.11
Buildings and Roads	1,979.65	27.41	7.05	2,000.01	52.38	2.44	1,078.50	921.51
Plant and Machinery	54.07	-	0.35	53.72	0.24	0.35	52.80	0.92
Electrical Installations	172.08	13.34	1.94	183.48	11.32	1.82	121.08	62.40
Furniture, Computers and Others Equipments	962.88	136.95	16.39	1,083.44	92.43	16.39	838.22	200.70
Rail Milk Tankers	206.60	131.12	6.05	331.67	13.11	6.05	213.66	118.01
Vehicles	22.83	2.77	3.10	22.50	1.68	3.10	18.84	3.66
<b>Total</b>	<b>3,962.93</b>	<b>311.59</b>	<b>79.09</b>	<b>4,195.43</b>	<b>171.91</b>	<b>30.15</b>	<b>2,336.15</b>	<b>1,859.28</b>
<b>Previous Year</b>	<b>3,874.76</b>	<b>110.78</b>	<b>22.61</b>	<b>3,962.93</b>	<b>161.27</b>	<b>18.31</b>	<b>1,768.54</b>	<b>1,823.33</b>
Capital Work in Progress including capital advances							95.72	93.70
<b>Total Fixed Assets</b>							<b>1,955.00</b>	<b>1,862.24</b>

#### Note:

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 depreciation ₹ 8.93 million (Previous year : ₹ 8.95 million) on account of recoupment from grants received.

## Service Charges

### ANNEXURE IX

₹ in Million

	2018-2019	2017-2018
Training fees	12.14	7.00
Procurement and technical service fees	239.74	234.49
Fees from consultancy and feasibility studies	9.60	13.43
Royalty and process knowhow fees	1.93	3.19
<b>Total</b>	<b>263.41</b>	<b>258.11</b>

## Other Income

### ANNEXURE X

₹ in Million

	2018-2019	2017-2018
Profit on sale of fixed assets (net)	124.29	6.79
Profit on disposal of investments	6.90	2.44
Excess provision and NPAs written back	6.84	400.26
Miscellaneous income	77.37	56.15
<b>Total</b>	<b>215.40</b>	<b>465.64</b>

## Remuneration and benefits to employees

### ANNEXURE XI

₹ in Million

	2018-2019	2017-2018
Salaries and Wages (including ex-gratia and retainership fees)	691.78	645.89
Contribution to Provident, Superannuation fund and Gratuity	131.06	110.86
Staff welfare expenses	52.07	57.29
<b>Total</b>	<b>874.91</b>	<b>814.04</b>

Remuneration excludes ₹ 26.55 million (Previous year : ₹ 23.11 million) shown as part of Research and Development expenses.

## Administrative Expenses

### ANNEXURE XII

₹ in million

	2018-2019	2017-2018
Printing and stationery	7.12	6.07
Communication charges	9.78	10.71
Audit fees and expenses (including service tax)		
Audit fees	0.83	0.74
Tax audit	0.29	0.29
Fees for other services	0.07	0.16
Out of pocket expenses	0.04	0.07
	1.23	1.26
Legal fees	6.40	5.01
Professional fees	13.29	18.19
Vehicle expenses	2.87	3.05
Recruitment expenses	0.72	0.39
Advertisement expenses	19.28	5.53
Travelling and conveyance expenses	66.97	67.50
Electricity and rent	28.11	26.37
Other administrative expenses	3.73	2.94
<b>Total</b>	<b>159.50</b>	<b>147.02</b>

## Maintenance of Assets

### ANNEXURE XIII

₹ in Million

	2018-2019	2017-2018
Repairs and maintenance		
Buildings	143.67	145.67
Others	64.10	68.27
Rates and taxes	8.42	16.06
Insurance	1.63	1.86
<b>Total</b>	<b>217.82</b>	<b>231.86</b>

## Other Expenses

### ANNEXURE XIV

₹ in Million

	2018-2019	2017-2018
Training expenses	39.52	20.53
Computer expenses	14.77	16.14
Other expenditure	106.12	57.99
<b>Total</b>	<b>160.41</b>	<b>94.66</b>

## 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.
- 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. Fixed Assets 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 fixed assets 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 had made allocation of 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. and Jharkhand State Cooperative Milk Producers’ Federation 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 : ₹ 46.69 million (Previous Year : ₹ 56.55 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) ₹ 987.82 million (Previous Year : ₹ 804.09 million)
  - 2.4. Service tax demands ₹ 922.41 million (Previous Year: ₹ 442.66 million)
  - 2.5. Other Demands

₹ in million

Particulars	Authority	2018-19	2017-18
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	2.22	1.98

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 receipt 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 ₹ 60.35 million (Year ended 31<sup>st</sup> March, 2018 ₹ 58.09 million) for Provident Fund contributions and ₹ 44.47 million (Year ended 31<sup>st</sup> March, 2018 ₹ 39.57 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 <sup>st</sup> March, 2019			Year ended 31 <sup>st</sup> March, 2018		
	Gratuity	Post-Retirement medical benefits schemes (PRMBS)	Leave Encashment	Gratuity	Post-Retirement medical benefits schemes (PRMBS)	Leave Encashment
<b>Components of employer expense</b>						
Current service cost	26.21	-	29.37	24.20	-	23.87
Interest cost	27.67	5.52	27.98	27.16	5.50	27.46
Expected return on plan assets	(26.79)	-	-	(24.62)	-	-
Actuarial losses/(gains)	(0.73)	(1.55)	(1.47)	(11.83)	(2.90)	(8.76)
<b>Total expense recognised in the Statement of Profit and Loss</b>	<b>26.36</b>	<b>3.97</b>	<b>55.88</b>	<b>14.91</b>	<b>2.60</b>	<b>42.57</b>
<b>Actual contribution and benefit payments for year</b>						
Actual benefit payments	(20.72)	(5.19)	(15.94)	(44.72)	(4.78)	(29.67)
Actual contributions	24.32	-	-	32.39	-	-
<b>Net asset / (liability) recognised in the Balance Sheet</b>						
Present value of defined benefit obligation	(389.45)	(69.98)	(419.02)	(357.02)	(71.19)	(379.07)
Fair value of plan assets	371.87	-	-	341.48	-	-
<b>Net asset / (liability) recognised in the Balance Sheet</b>	<b>(17.58)</b>	<b>(69.98)</b>	<b>(419.02)</b>	<b>(15.54)</b>	<b>(71.19)</b>	<b>(379.07)</b>

(₹ in million)

Particulars	Year ended 31 <sup>st</sup> March, 2019			Year ended 31 <sup>st</sup> March, 2018		
	Gratuity	Post-Retirement medical benefits schemes (PRMBS)	Leave Encashment	Gratuity	Post-Retirement medical benefits schemes (PRMBS)	Leave Encashment
<b>Change in defined benefit obligations (DBO) during the year</b>						
Present value of DBO at beginning of the year	357.02	71.19	379.07	362.20	73.37	366.17
Current service cost	26.21	-	29.38	24.20	-	23.87
Interest cost	27.67	5.52	27.98	27.17	5.50	27.46
Actuarial (gains) / losses	(0.73)	(1.54)	(1.47)	(11.83)	(2.90)	(8.76)
Benefits paid	(20.72)	(5.19)	(15.94)	(44.72)	(4.78)	(29.67)
Present value of DBO at the end of the year	<b>389.45</b>	<b>69.98</b>	<b>419.02</b>	<b>357.02</b>	<b>71.19</b>	<b>379.07</b>
<b>Change in fair value of assets during the year</b>						
Plan assets at beginning of the year	341.48	-	-	329.18	-	-
Acquisition adjustment	-	-	-	-	-	-
Expected return on plan assets	26.79	-	-	24.62	-	-
Actual company contributions (Excluding Contribution made by Gratuity Trust and charges deducted by LIC)	24.32	-	-	32.39	-	-
Actuarial gain / (loss)	-	-	-	-	-	-
Benefits paid	(20.72)	-	-	(44.71)	-	-
Plan assets at the end of the year	<b>371.87</b>	-	-	<b>341.48</b>	-	-
Actual return on plan assets	26.79	-	-	24.62	-	-
<b>Composition of the plan assets is as follows:</b>						
Government bonds	50%	-	-	50%	-	-
PSU bonds	45%	-	-	45%	-	-
Equity & Equity related Investments	5%	-	-	5%	-	-
Others	0%	-	-	0%	-	-
<b>Actuarial assumptions</b>						
Discount rate	7.75%	7.75%	7.75%	7.75%	7.75%	7.75%
Expected return on plan assets	8.13%	NA	NA	8.25%	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

(₹ in million)

Particulars					
Experience adjustments	2018-19	2017-18	2016-17	2015-2016	2014-2015
<b>Gratuity</b>					
Present value of DBO	389.45	357.02	362.20	291.71	274.86
Fair value of plan assets	(371.87)	(341.48)	(329.18)	(280.44)	(258.27)
Funded status [Surplus / (Deficit)]	(17.58)	(15.54)	(33.02)	(11.27)	(16.59)
<b>Post-Retirement medical benefits schemes (PRMBS)</b>					
Present value of DBO	69.98	71.19	73.38	76.84	76.86
<b>Other defined benefit plans (Leave Encashment)</b>					
Present value of DBO	419.02	379.07	366.17	280.18	246.31

(₹ in million)

Particulars	For the year ended	For the year ended
	31 <sup>st</sup> March, 2019	31 <sup>st</sup> March, 2018
<b>Actuarial assumptions for long-term compensated absences</b>		
Discount rate	7.75%	7.75%
Expected return on plan assets	8.13%	8.25%
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 2019-20 has not been ascertained.

## 6. Disclosure of related party and Transactions with them for the year ended 31<sup>st</sup> March, 2019 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
- 3) Key management personnel
 

Mr. Dilip Rath	Chairman
Mr. Sangram R Chaudhary	Executive Director
Mr. Y Y Patil	Executive Director

## b) Transactions with related parties

(figures in italic represent previous year figures)

(₹ in million)

Particulars	Interest Income	Purchase of Equity shares	Dividend	Rent (Income)	Sale (others)	Other income	Grant	Other Expenditure	Current Account Balance outstanding Dr/(Cr)	Loan Disbursed	Loan repaid / Adjusted		Loan Balance outstanding Dr/(Cr)
											Principal	Interest	
<b>Subsidiary Companies</b>													
IDMC Limited	35.39	-	24.29	0.55	-	0.13	-	7.57	(7.91)	109.08	160.00	13.39	384.16
	26.30	-	18.22	0.46	-	0.12	-	-	0.25	175.08	-	27.39	435.08
Indian Immunologicals Limited	66.10	-	18.00	26.65	-	0.37	-	5.50	5.75	250.00	124.16	58.45	929.65
	77.61	-	9.00	31.03	-	0.08	-	-	(8.91)	-	212.10	68.28	803.81
Mother Dairy Fruit and Vegetable Private Limited	-	18.00	100.00	110.23	-	1.51	-	0.25	81.71	-	-	-	-
	-	-	200.00	104.84	-	2.42	-	3.15	113.11	-	-	-	-
NDDB Dairy Services	-	-	-	3.17	-	0.62	-	0.64	0.37	-	125.00	-	625.00
	0.01	-	-	2.45	-	1.04	-	-	0.07	-	125.00	-	750.00
<b>Total</b>	<b>101.49</b>	<b>18.00</b>	<b>142.29</b>	<b>140.60</b>	-	<b>2.63</b>	-	<b>13.96</b>	<b>79.92</b>	<b>359.08</b>	<b>409.16</b>	<b>71.84</b>	<b>1,938.81</b>
	103.92	-	227.22	138.78	-	3.66	-	3.15	104.52	175.08	337.10	89.67	1,988.89
<b>Other enterprises where management has significant influence over the management</b>													
The West Assam Milk Producers' Co-operative Union Ltd.	-	-	-	0.97	-	4.50	0.19	0.33	1.71	-	1.23	-	2.44
	0.22	-	-	-	-	1.88	-	0.03	0.79	15.00	16.23	0.22	3.68
Animal Breeding Research Organisation	-	-	-	-	-	0.82	-	-	0.25	-	-	-	-
	-	-	-	0.01	0.01	0.86	-	0.06	0.06	-	-	-	-
Anandalaya Education Society	-	-	-	0.63	-	0.01	-	0.01	0.14	-	-	-	-
	-	-	-	0.45	-	0.01	-	-	0.14	-	-	-	-
Jharkhand State Cooperative Milk Producers' Federation Ltd.	-	-	-	0.25	-	1.26	0.26	0.12	0.66	-	-	-	-
	-	-	-	-	-	1.35	1.00	-	0.43	-	-	-	-
<b>Total</b>	-	-	-	1.85	-	6.59	0.45	0.46	2.76	-	1.23	-	2.44
	0.22	-	-	0.46	0.01	4.10	1.00	0.09	1.42	15.00	16.23	0.22	3.68

**Remuneration to key management personnel**

Mr. Dilip Rath	3.58
	<i>3.54</i>
Mr. Sangram R Chaudhary	4.15
	<i>3.97</i>
Mr. Y Y Patil	3.92
	<i>4.14</i>
<b>Total</b>	<b>11.65</b>
	<b><i>11.65</i></b>

**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 31 <sup>st</sup> March, 2019	Depreciation for the year	Accumulated Depreciation as at 31 <sup>st</sup> March, 2019
Buildings and Roads <sup>#</sup>	1637.69	43.26	910.44
	<i>1621.08</i>	<i>43.01</i>	<i>872.68</i>
Electrical Installations <sup>#</sup>	31.71	1.40	24.80
	<i>31.55</i>	<i>1.24</i>	<i>23.41</i>
Furniture, fixtures, computers, software and office equipment	7.92	0.16	7.66
	<i>7.92</i>	<i>0.16</i>	<i>7.50</i>
Rail Milk Tankers	331.13	13.11	213.12
	<i>194.55</i>	-	<i>194.55</i>
<b>Total</b>	<b>2008.45</b>	<b>57.93</b>	<b>1156.02</b>
	<b><i>1855.10</i></b>	<b><i>44.41</i></b>	<b><i>1098.14</i></b>

# 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. 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 1 <sup>st</sup> April, 2018	Adjustment during the year	Closing Balances at 31 <sup>st</sup> March, 2019
<b>Deferred Tax Assets /(Liability):</b>			
Depreciation	(3.44)	(4.47)	(7.90)
	(8.54)	5.10	(3.44)
Expenditure allowable on payment basis	136.61	23.33	159.94
	127.75	8.86	136.61
Gratuity	5.43	0.71	6.14
	11.43	(6.00)	5.43
Voluntary Retirement Scheme	6.55	(3.42)	3.13
	10.56	(4.01)	6.55
Special Reserve	(436.05)	(48.26)	(484.31)
	(380.43)	(55.62)	(436.05)
<b>Total</b>	<b>(290.90)</b>	<b>(32.10)</b>	<b>(323.00)</b>
	<b>(239.23)</b>	<b>(51.67)</b>	<b>(290.90)</b>

(Figures in *italic* represent previous year figures)

9. 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	1082.41	55.28	585.39
	1,890.89	30.20	610.49
Created during the year from contingency	0.15	24.00	(24.15)
	0.02	25.08	(25.10)
Write-off of interest receivable	-	-	-
	(408.24)	-	-
Reversed/movement during the year	(6.84)	-	-
	(400.26)	-	-
<b>Closing balance</b>	<b>1,075.72</b>	<b>79.28</b>	<b>561.24</b>
	<b>1,082.41</b>	<b>55.28</b>	<b>585.39</b>

(Figures in *italic* represent previous year figures)

10. As on 31<sup>st</sup> March 2019 there were outstanding of ₹ 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.

11. 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, 15th July 2019

**For and on behalf of the Board,**

**Dilip Rath**

Chairman

Anand, 21st June, 2019

**Arun Raste**

Executive Director

**S Regupathi**

General Manager  
(Accounts)

# NDDDB Officers



# NDDDB Officers

(As on 31st March, 2019)

## Head Office, Anand

### Chairman & Chief Executive

#### Dilip Rath

MA (Eco), M Sc (Eco)

### Executive Director

#### Sangram R Chaudhary

M Sc, PGDRM

#### Y Y Patil

B Com, LLB, PGDRDM, ICWA (Inter), SAS (Comm)

### Chief Executive's Office

#### T V Balasubramanyam

SR MGR, B Com, LLB (Gen)

#### Rajesh Kumar

MGR, BA (Eco), PGDRM

### Financial and Planning Services

#### Sanjay Kumar Gupta

GEN MGR, BE (Electrical), MBA (Finance)

#### Dhara N Lakhani

DY GEN MGR, M Com, ACMA

#### K Manek

DY GEN MGR, B Com, AICWA

#### Chintan Khakhariawala

SR MGR, BE (Chem), MBA (Fin)

#### P V Subrahmanyam

MGR, BBM, MBA (Fin)

#### Kahnu C Behera

MGR, B Sc (Agri), PGDRM

#### Smriti Singh

MGR, BA (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

### NDDDB, Anand

#### Rajesh Gupta

DY GEN MGR, B Sc, MSW

#### M Jayakrishna

SR MGR, MA (Eco), M Phil (Eco), Ph D (Eco)

#### Dhanraj Sahani

SR MGR, MBA (Mktg), DPCS

#### Hrishikesh Kumar

MGR, B Sc (Phy), PGDRM

#### Niranjan M Karade

MGR, BE (Mech), PGDRM

#### Sandeep Bharti

MGR, B Sc, PGDDM

#### Bhimashankar Shetkar

MGR, BE (Prod), PGDRDM

#### Denzil J Dias

DY MGR, B Tech (DT), M Tech (DT)

#### Prit Mistry

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

#### Milan Sanghvi

DY MGR, BE (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

#### Suresh Pahadia

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

#### D K Sharma

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

#### 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

### Meenesh C Shah

GEN MGR, B Sc (DT), PGDRDM

### V K Ladhani

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

### M R Mehta

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

### Arvind Kumar

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

### Naveen Kumar

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

### Hemali Bharti

MGR, BE (Power Elect.), MBA (Fin)

### Ashutosh K Mishra

MGR, B Sc (E&I), PGDBA (Fin)

### Sarvesh Kumar

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

### Rajesh Singh

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