Japan International Cooperation Agency

Preparatory Survey for the Project for Dairy Sector Livelihood Improvement through Cooperatives

Final Report

May 2019

Kaihatsu Management Consulting, Inc.
Nippon Koei Co., Ltd.
PADECO Co., Ltd

Map of the Study Area and Project Area
(India)

Executing Agency Location

Survey Implemented States

Table of Contents

List of Tables

List of Figures

Abbreviation

AI	Artificial Insemination
AMCS	Automatic Milk Collection System
AMCU	Automatic Milk Collection Unit
AMUL	Anand Milk Union Ltd.
BM	Business Management
BMC	Bulk Milk Cooler
CAAA	Controller of Aid Accounts and Audit Controller
CD	Capacity Development
CEO	Chief Executive Officer
CIP	Cleaning in Place
COMFED	Bihar State Milk Cooperative Federation
CPSC	Central Project Steering Committee
CRP	Calf Rearing Programme
CT	Cooperate Training Group, NDDB
DCS	Dairy Cooperative Society
DIDF	Dairy Processing and Infrastructure Development Fund
DoAHD	Department of Animal Husbandry & Dairying
DoDD	Directorate of Dairy Development
DPMCU	Data Processor Milk Collection Unit
DPR	Detailed Project Report
DSCR	Debt Service Coverage Ratio
EEC	European Economic Community
EIA	Export Inspection Agency
ETP	Effluent Treatment Plant
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
FBO	Food Business Operator
FMD	Foot-and-Mouth Disease
FPS	Financial and Planning Services Group, NDDB
FS	Food Safety
FSSAI	Food Safety and Standards Authority of India
FSMS	Food Safety Management System
FSSC	Food Safety System Certification
FUR	Fund Utilization Report
GCMMF	Gujarat Cooperative Milk Marketing Federation Ltd.
GDP	Gross Domestic Product
GoI	Government of India
HACCP	Hazard Analysis and Critical Control Points
HF	Holstein-Friesian
HTST	High Temperature Short Time
IAS	Indian Administrative Service
ICB	International Competitive Bidding
ICT	Information and Communication Technology
IDMC	Indian Dairy Machinery Company
IMARC	International Market Analysis Research & Consulting

INR	Indian Rupee
ISO	International Standard Organization
IMC	Implementation and Monitoring Cell
IT	Information Technology
JICA	Japan International Cooperation Agency
LCB	Local Competitive Bidding
LLPD	Lakh Liter Per Day
MD	Managing Director
MPCDF	Madhya Pradesh State Cooperative Dairy Federation Ltd.
MoFPI	Ministry of Food Processing Industries
MoSPI	Ministry of Statistics and Programme Implementation
MPC	Milk Producer Company
MPCE	Monthly Per Capita Expenditure
MPI	Milk Producers Institution
MPP	Milk Pooling Point
MT	Metric Ton
MU	Milk Union
NABARD	National Bank for Agriculture and Rural Development
NAP	National Action Plan
NCCD	National Center for Cold Chain Development
NCDC	National Center for Disease Control
NCR	National Capital Region
NDDB	National Dairy Development Board
NDP	National Dairy Plan
NDS	NDDB Dairy Services
NGO	Non-Governmental Organization
NOC	No Objection Certificate
NPBB	National Program for Bovine Breeding
NPDD	National Program for Dairy Development
ODA	Official Development Assistance
OECD	Organization for Economic Cooperation and Development
PCDF	Pradeshik Cooperative Dairy Federation Ltd.
PCMC	Programme Coordination Management Cell
PI	Participating Institution
PMC	Project Management Consultant
PSC	Project Sanctioning Committee
QA	Quality Assurance
ROA	Return on Asset
ROE	Return on Equity
Rs.	Rupees
SLTMC	State Level Technical Management Committee
SMP	Skimmed Milk Powder
SNF	Solid Not-Fat
SPIC	Sub-Project Implementation Cell
TKgPD	Thousand Kilogram Per Day
TLPD	Thousand Liter Per Day
UHT	Ultra High Temperature
UT	Union Territory

WAMUL	West Assam Milk Producers' Cooperative Union Ltd.
WHO	World Health Organization

INR 1 (Rs. 1) = JPY 1.62

USD 1 = JPY 111.0

(As of April 2019)

1 lakh = 100,000

1 crore = 10,000,000

PART I PROJECT FORMULATION

1. OUTLINE OF THE SURVEY

1-1. Background of the Project

The volume of buffalo and cow milk productions in India has reached to 170 million tons in 2017, accounting for 20% of total global milk production[1]. Milk production and processing is a highly important industry in India as livestock sector's ratio of value added to India's GDP has been increasing and 70% of value added of the livestock sector is attributed to the dairy sector.

In India, Operation Flood, a dairy development project, was implemented with the support of the World Bank through International Development Agency (IDA) and International Bank of Reconstruction and Development (IBRD) loans and commodity aid from the European Economic Community (EEC) between 1970 and 1996. The institution that implemented the project was the National Dairy Development Board (NDDB), and the project has been implemented with the objectives to increase the milk production, augment rural income, make available milk to consumers in cities at reasonable prices and channeling milk from surplus to deficit areas through National Milk Grid. Under Operation Flood the cooperative model of Anand Milk Union Ltd. (AMUL) known as "Anand Pattern" was extensively used to establish dairy cooperatives across the country. The "Anand Pattern" is an integrated three-tier cooperative structure for procuring, processing, and marketing of milk and milk products. The three-tier structure consists of the Dairy Cooperative Society (DCS) at the village level, the District Milk Union at the district level, and the Milk Federation at the state level, as summarized in Table 1-1.

Table 1-1: Three-tier cooperative structure

Level	Outline
Village dairy cooperative society (DCS)	It is formed by milk producers in villages. It procures milk from its producer members. The milk of every member is tested for quality, with payments based on it.
District milk union	District-level milk unions are formed by member DCSs. They buy milk from their member DCSs, then process and market the milk and milk products in their operational area.
State Milk federation	The milk unions in a state form a State Milk Federation, which is responsible for marketing the surplus milk and milk products of its member milk unions within and outside the state.

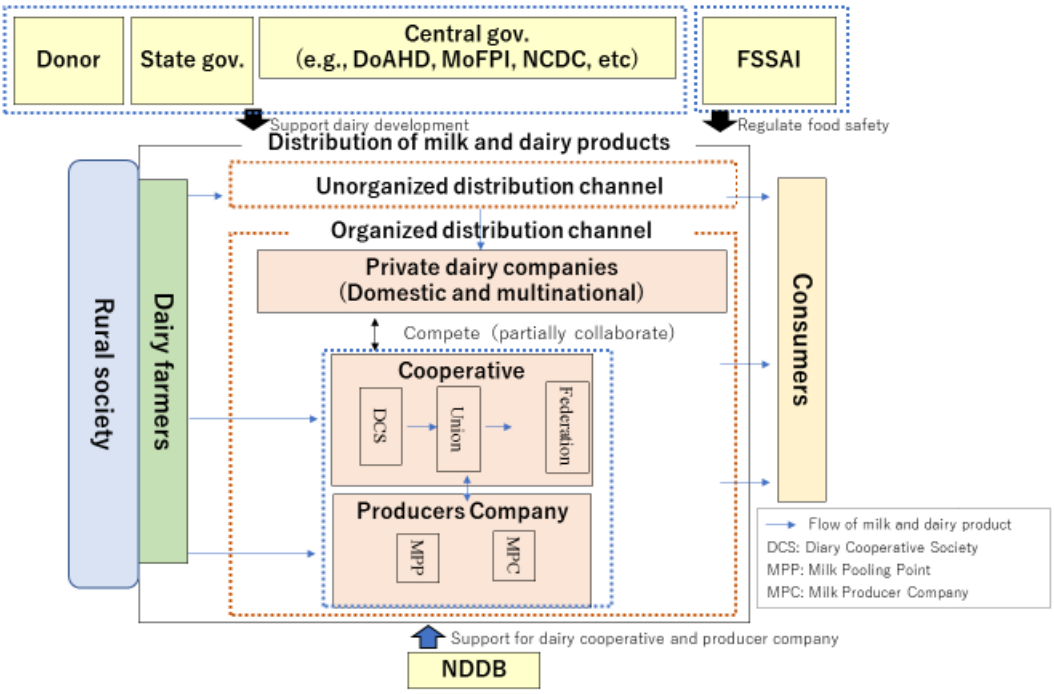
Source: NDDB (2017) Detailed Project Report (DPR) on Dairying through Cooperatives- Key to sustainable livelihood

1 FAOSTAT.

As the dairy cooperatives extended to various regions, it led to establishment of dairy value chains extending from the production to the processing &marketing of milk & milk products, and increase in milk production in rural areas.

In India, the intensification of milk production has not progressed; the percentage of farmers who own more than four milking cows/buffaloes is only 8%. Furthermore, 70% of total milk production is by small and marginal farmers with fewer than 2 ha of landholdings. Compared to agricultural activities, which are significantly influenced by climate and generates income from seasonal crop production, dairy activities can be undertaken round the year, and can be a stable source of income. For these small and marginal farmers who have limited amounts of assets, livestock can not only be a source of cash income but also an asset which stabilizes their livelihood; thus, the importance of dairy activities is greater for poor farmers. The Government of India targets to double the income level of farmers by 2022. Based on these situations, the Government of India requested the Japanese government to fund the project "Dairying Through Cooperatives- *Key to sustainable livelihood*" as an international yen loan project.

The basic value chain structure of the dairy sector and its major actors in India are shown in Figure 1-1, based on the survey results of "Data Collection and Confirmation Study on Dairy Sector", which was conducted in 2017. The major actors in the organized dairy sector are private dairy firms and dairy cooperatives/milk producer companies. In the recent years, Milk Producer Companies (MPC), which are cooperative form of enterprises set up under the Companies Act 1956, are also being promoted. MPCs have flexibility to operate with greater professionalism and autonomy and would not have the constraints faced by dairy cooperatives which function under state cooperative laws.



Source: Survey Team

Figure 1-1: Outline of stakeholders in dairy sector in India[2]

1-2. Objectives and Scope of the Survey

The objective of the Survey is to analyze the contents of the proposed "Project for Dairy Development" (also referred as *"Dairying through Cooperatives- Key to sustainable livelihood"* in the documents of Government of India) by collecting information and data necessary to set the details of the proposed bilateral loan project between the Government of India and Japan. The survey will focus to examine the incorporation of trainings and capacity development programmes to the components of the proposed two-step loan (TSL) project. During the survey, the Survey Team has consulted the Implementing Agency (i.e. NDDB) and developed suitable contents and ways to incorporate the training and capacity development programmes in the project. Simultaneously, the Survey Team also collected and analyzed information necessary for the implementation of the project, such as the contents of the project components, implementation schedule, institutional structure, ways for procurement (purchase), and costs of the project.

The survey has been conducted between July 2018 and February 2019, through 5 survey visits to India by the JICA survey team and one invitation programme to Japan which was attended by the officials from India's dairy sector.

The main task of the first survey visit, which was conducted during 22 July 2018 to 12 Aug

2 MPP stands for Milk Pooling Point.

2018, was to review the actual situation of dairy sector in India and identify issues to improve, with special focus on business management and food safety, taking into account the whole value chain of the sector. To achieve this objective, the study team first visited Federation and Milk Union in Gujarat to examine the Anand Pattern which have been used as a benchmark to examine different milk unions and federations in other states. During the first survey visit, the team also visited federations and milk unions in Madhya Pradesh and Uttar Pradesh.

The second survey visit was conducted during 26 September to 3 November 2018. Although the survey team also continued the field visit to Rajasthan and partly to Bihar, the main objective was to analyze the collected data to identify the important issues to improve in terms of business management and food safety, to determine the principles and philosophy of the capacity development component to be included in the project.

Between the second survey and the third survey, JICA invited 11 dairy-sector officials from India to Japan from 12 to 21 November 2018 as part of this survey. The participants visited Obihiro, Nagano and Tokyo, to observe the dairy sector in Japan and to identify the possible capacity development resource that could be useful for India. During the invitation programme, JICA and the survey team organized a workshop in Tokyo where participants discussed with different Japanese companies that manufactures dairy-sector-related products.

During the third survey visit which was held during 2 Dec to 15 Dec 2018, the survey team concentrated mainly on preparing the detailed outlines of each training programmes, in consultation with National Dairy Development Board (NDDB). The fourth survey visit was implemented during 20 Jan to 6 Feb 2019. The main objective was to prepare the draft of project operation manual, incorporating the components of sub project and contents and procedures of capacity development for the PIs.

The last survey visit was held during 19 to 23 Feb 2019, to present the Draft Final Report of the Survey and receive comments from DoAHD, NDDB and JICA, to reflect them in the final report.

1-3. Structure of the Report

This final report consists of two parts: “Part I: Project Formulation” where the background and processes of the project formulation are explained, and “Part II: The Project” where the contents and details of the project are described. Both parts reflect the observations and results of the survey.

As the survey has been focused primarily on how to incorporate the capacity development component to the project, especially in the first stage of the survey, “Part I: Project Formulation” is composed by three stages: The first stage (Chapter 2) examines the capacity development needs in the target states of the project especially in the field of business management, marketing, quality

assurance and food hygiene (Demand-side analysis). The second stage (Chapter 3) examines the existing institutions which offer training courses and capacity development services in the above-mentioned field both in India and in Japan (Supply-side analysis). The third stage (Chapter 4) presents the direction and principles of the proposed capacity development, derived by the result of the second stage analysis (demand-side) and the third stage analysis (supply-side). Part of Chapter 4 also includes other points regarding the project formulation process, such as the fund management capacity of the stakeholders and the identification of similar schemes to seek synergy with them.

"Part II: The Project" is also composed mainly by three stages: The first stage (Chapter 5 to 8) focuses on the main two step loan project itself, describing its objective, scope and operation procedures. The second stage (Chapter 9 to 11) focuses on the Sub Project components of the project, describing its terms and conditions and operating procedures. The third stage (Chapter 12 to 14) focuses on the capacity development component, incorporating its curriculum, organizational arrangement, implementing schedule and operating procedures.

The report will conclude with some observations and recommendations from the survey team.

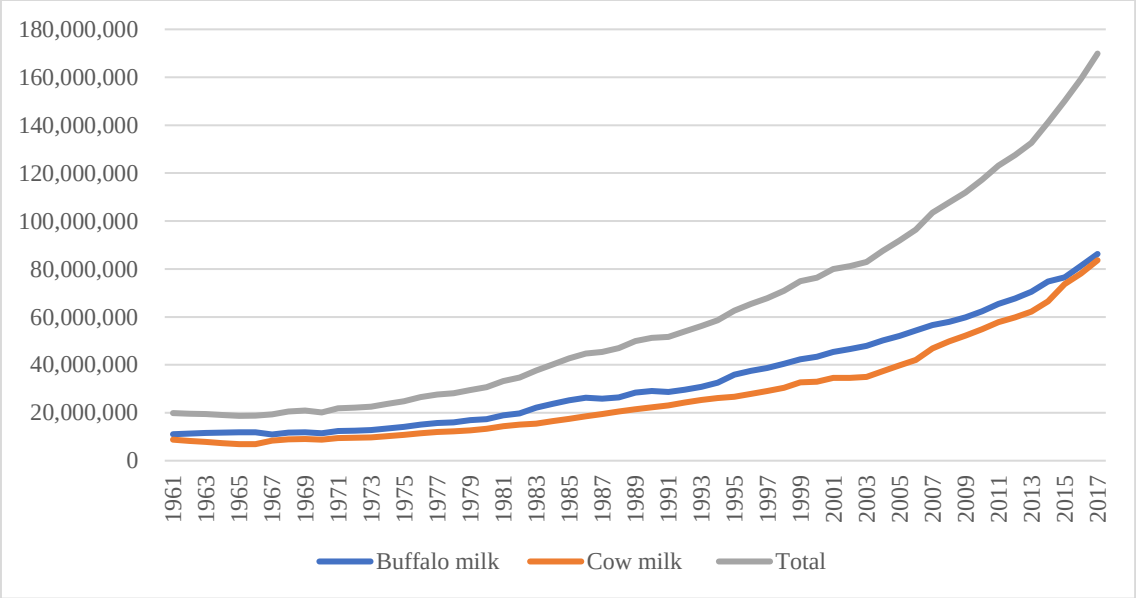
2. OUTLINE OF DAIRY COOPERATIVE: ISSUES AND WAYS TO IMPROVE

2-1. Overview of the Dairy Sector in India

2-1-1. Supply and Demand of Milk in India

(1) Milk Production in India

Figure 2-1 depicts the trend of buffalo and cow milk productions in India which is growing consistently in the last 50 years. In 2017, buffalo and cow milk production in India reached to 170 million tons, consisting of about 86 million tons of buffalo milk and about 84 million tons of cow milk. The share of buffalo milk is about 51 % which is slightly greater than cow milk.



Source: FAOSTAT

Figure 2-1: Buffalo and cow milk production volume in India (1961-2017) (ton)

(2) Characteristics of Milk Producers

Table 2-1 shows the distribution of rural households and livestock for the different category of land holdings. Small & marginal farmers and landless households represent more than 90% of rural households and own more than 80% of total livestock[3].

3 Accordinng to Birthal, "Linking Smallholder Livestock Producers to Markets, 2008", small & marginal farmers and landless households are estimated to produce nearly 70% of the total milk production in India.

Table 2-1: Distribution of rural households and average number of cattle/buffalo holdings (2012)

Land holding criteria	Landless	Marginal	Small	Medium	Large	Total
(Land holding: ha)	(-0.002ha)	(0.002-1ha)	(1-2ha)	(2-10ha)	(10ha-)	
Household distribution (%)	7.4	75.4	10.0	6.9	0.2	100.0
Average cow/buffalo holding (head)	1.6	1.5	2.6	3.6	4.4	1.8
Livestock holding distribution (%)	0.03	57.67	20.45	20.40	1.46	100.00

Note: "Household distribution" indicates how many percent of households are classified into each criterion and "livestock holding distribution" indicates how many percent of livestock are hold in each criterion.

Source: Ministry of Statistics and Programme Implementation (MoSPI) (2013) Livestock Ownership in India, 2013

(3) Consumption of Milk in India

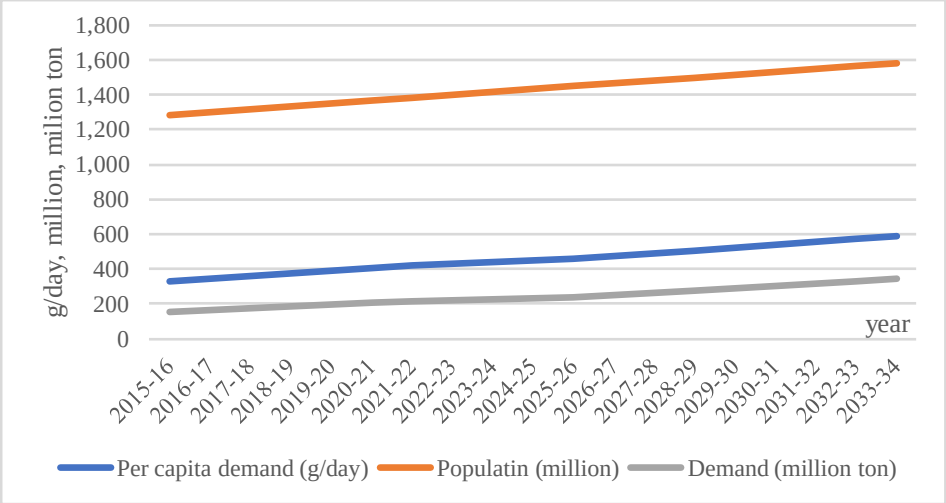
The consumption of dairy products has increased in India due to population growth, income growth, and urbanization. The Table 2-2 shows the dynamics of monthly per capita liquid milk consumption in India.

Table 2-2: Monthly per capita liquid milk consumption (liter)

Year	Rural	Urban
2004–05	3.866	5.107
2009–10	4.117	5.358
2011–12	4.333	5.422

Source: MoSPI (2011-12) Key Indicators of Household Consumer Expenditure in India

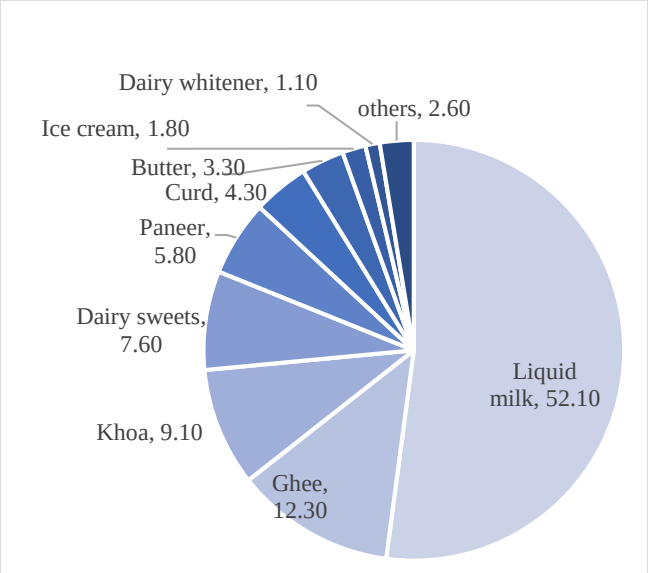
The volume of the liquid milk consumption is expected to continue to grow in the future. The Government of India has estimated that daily per capita milk availability will increase from 337g in 2015-16 to 590g in 2033-34, as indicated in Figure 2-2.



Source: Department of Animal husbandry, Dairying and Fishery (DoAHD) (2017) Vision 2024, National Action Plan for Dairy Development

Figure 2-2: Estimated daily per capita milk availability, population, and milk demand

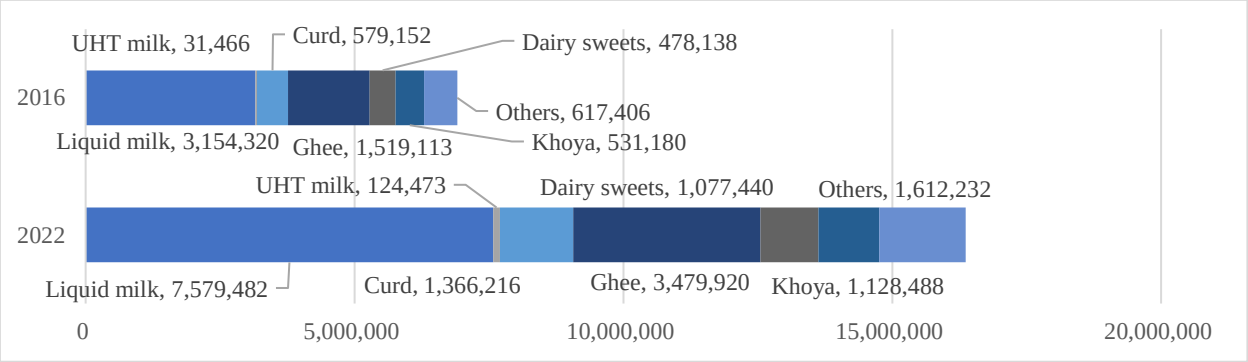
Figure 2-3 depicts the current utilization pattern of milk and milk products. The figure shows that about 52.10% of milk is used as liquid milk, and the rest is processed into dairy products such as ghee, Khoa, and other products.



Source: IMARC (2017) Dairy Industry in India 2017 edition

Figure 2-3: Utilization pattern for milk and milk products (%)

Figure 2-4 depicts the current situation of and forecast (2022) for the milk and dairy products market. It shows that sales of both milk and dairy products are expected to be more than double by 2022.



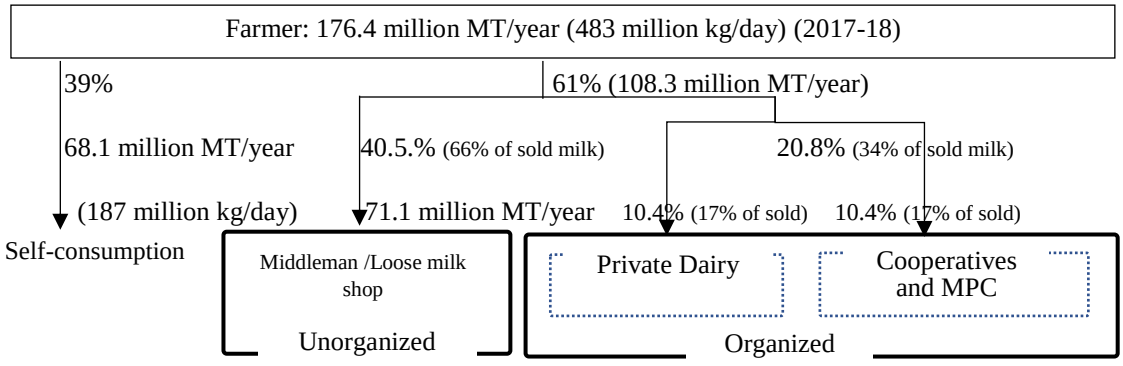
Source: IMARC (2017) Diary Industry in India 2017 edition

Figure 2-4: Sales of milk and dairy products in 2016 and 2022 (million rupees)

2-1-2. Organization of the Dairy Sector in India

(1) Unorganized and Organized Sector in Dairy Sector

About 48% of the milk produced is self-consumed or sold to non-producers in rural areas, and 61% of produced milk is available for sale to consumers in urban centers. About 34% of the milk sold is handled by the organized sector (16% by dairy cooperatives, 1% by producer companies, and 17% by private dairy companies), and the remaining 66% is handled by the unorganized sector, as summarized in Figure 2-5.



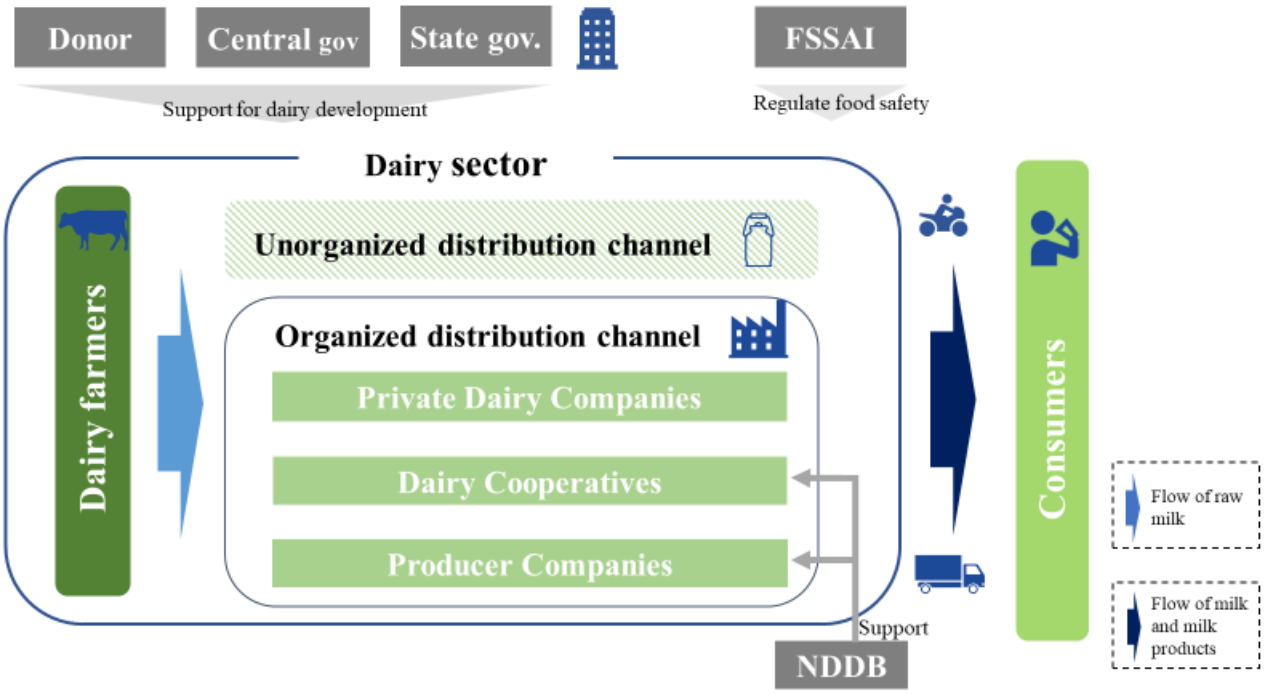
Source: NDDB

Figure 2-5: Outline of the distribution of milk in India

(2) Stakeholders in the Dairy Sector

The value chain structure and key actors in the dairy sector are shown in Figure 2-6. The major players in the modern distribution channel can be broadly divided into private dairy companies and dairy cooperatives. Apart from these, producers' organizations, called "milk producer companies (MPC)," established under the Part IX-A of the Companies Act 1956 have been increasing in recent years with the support of the NDDB[4]. Private dairy companies and dairy cooperatives are competing for milk collection, processing, and sale of milk & milk products. In some cases, dairy cooperatives use the facilities of the private companies for conversion of surplus milk to skimmed milk powder after paying them conversion charges. For example, dairy cooperative union of Samastipur subcontracts milk powder processing to private dairy companies.

For the development of the sector, support is mainly provided by the Government of India (via the Department of Animal Husbandry and Dairying (DAH&D), MoFPI, and National Cooperative Dairy Corporation (NCDC)), state governments, and international donors such as World Bank. Food Safety and Standards Authority of India (FSSAI), which is under the jurisdiction of the Ministry of Health and Family Welfare, regulates the food safety and lays down the quality standards for food items in India. NDDB supports producer-owned and controlled organization such as dairy cooperatives and milk producer companies.



Source: Survey Team

Figure 2-6: Outline of stakeholders in dairy sector in India

4 Organizations and histories of the dairy cooperative and producers company will be described in the following sections.

2-1-3. Basic Descriptions of Dairy Cooperatives

(1) History of Dairy Cooperatives in India[5]

Dairy cooperatives in India have been established by replicating "Anand Pattern", a framework developed in Anand, Gujarat state. It is a three-tier integrated cooperative structure for procuring, processing and marketing milk. The basic framework of the Anand Pattern comprises the following three closely related but financially independent institutions:

- Dairy Cooperative Society (DCS):[6] This is formed by village milk producers and procures milk from its producer members. Members' milk is tested for quality, and payment is based on it.
- Milk Union: District-level milk unions are formed by member DCSs. The union buys milk from its member DCS, then processes and markets the milk and milk products in their operational area.
- State Milk Federation: The milk unions in a state form a state federation, which is responsible for marketing the surplus milk and milk products of its member milk unions within and outside the state.

The Anand Pattern was replicated to other states of India by the NDDB through Operation Flood programmes, which helped establish 73,000 DCSs in 22 states between 1970 and 1996. When the programme ended in 1996, 9 million milk-producing households had come under the fold of dairy cooperatives, and total milk production increased from 21.2 million tons in 1968-69 to 69.1 million tons by the end of 1996-97. Also, the number of dairy processing plants and processing capacities had increased significantly during the period of the programme. The table below shows the historical progress of the number of organized DCS, the number of processing plants, and processing capacities of dairy cooperatives all over India.

Table 2-3: Historical progress of the number of organized DCS, number of processing plants, and processing capacity of dairy cooperatives

Financial Year	Organised DCS (thousand)	Number of plants	Processing capacity (million litre per day)
1971-72	1.8	N.A	N.A
1981-82	18.4	N.A	4.86

5 The term "dairy cooperative" is used as a collective term for state federations, milk unions, and DCS in this report.

6 In cases of village-level dairy cooperation, a Milk Producers Institute (MPI) is often established. If the management of the MPI becomes stable, it usually becomes a DCS. While the DCS is registered with the designated department of the state government, the MPI is not. Otherwise, there is no real difference between a DCS and MPI in terms of management or the rights of members.

Financial Year	Organised DCS (thousand)	Number of plants	Processing capacity (million litre per day)
1991-92	64.4	133	21.40
1995-96	73.0	133	21.60
2001-02	1,00.8	168	29.97
2011-12	1,47.9	228	46.46
2015-16	1,73.5	297	65.68
2017-18	185.4	332	73.34

Source: NDDB

(2) Value chains of dairy cooperatives in India

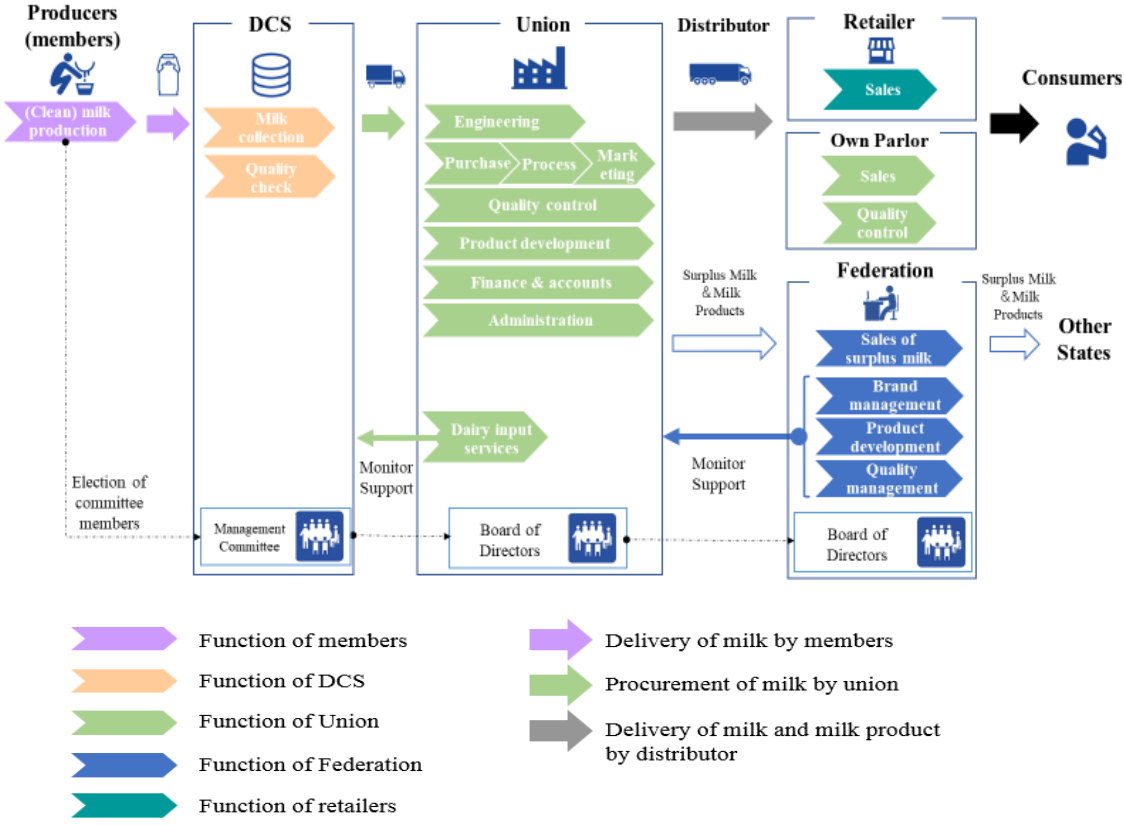
Figure 2-7 describes the value chains of dairy cooperatives. Producer members bring their milk to the DCS where the quality of milk (such as fat and SNF content) is checked. For maintaining the quality of raw milk, it is chilled in bulk milk coolers (BMC) and chilling centers and transported through insulated milk tankers to the dairy plant of the Milk Union (A certain % of milk is also transported in milk cans). The raw milk is processed and packed in the dairy plants of unions. Within the union, there are other functions such as dairy input services, engineering, quality control, finance & accounts, purchase, marketing, and administration. Marketing department deals with the sales of milk & milk products and manages the distributors and retailers. They also deal with the complaints of consumers. Procurement department of the union monitors the activities of DCS and provide various support to its members. After milk is processed and packed, liquid milk, and milk products such as yogurt and sweets are delivered to retailors and cooperative milk parlors through distributors. The main role of the state level milk federation is to coordinate and support its member unions for brand management, quality assurance, and product development. Moreover, the surplus milk & milk products are sold in other states through the state level milk federation[7].

The members of the dairy cooperatives have rights to elect the members of Management Committee in case of DCS and Board of Directors (which are the supreme decision-making bodies) in case of Milk Unions and State Level Milk Federations. The Board of directors of the State Level Milk Federation typically consists of elected producer members of the Milk Unions as well as nominated members, who mostly represent various bodies of state governments and NDDB.

It is important to note that some of the dairy cooperatives have expanded their business to outside of their home states, where they collect, process, and sell milk. Dairy Cooperatives of

7 State Milk Federations sell milk & milk products in coordination with the District level Unions, to cater to the demand of milk & milk products in various parts within the State.

Karnataka state sell 15% of its packed liquid milk in other states such as Tamil Nadu and Maharashtra. In addition, milk unions in Maharashtra state are also selling milk in the northern part of Karnataka, and milk unions in Bihar state sell their products in the eastern part of Uttar Pradesh state.



Source: Survey Team

Figure 2-7: Value-chains of dairy cooperatives

(3) Milk Producer Company

The formation of milk producer companies (MPCs) is a significant recent phenomenon in India's dairy sector. MPCs are producer-owned enterprises incorporated under Part IX A of the Companies Act whereas Milk Cooperatives (DCS, milk unions and State Milk Federation) are registered l under the Cooperative Societies Act of each state. MPCs have flexibility to operate with greater professionalism, freedom & autonomy like private companies while possessing unique characteristics of cooperative which is based on principles of mutual assistance and would not have the constraints of the cooperatives, which functions under state cooperative laws. The formation of MPCs was prompted due to failure of the cooperatives to provide proper market access to milk producers and also giving them remunerative prices for their produce.

MPCs are expected to avoid the above-mentioned problems due to the following characteristics of the management of MPCs[8].

- While the Cooperative Societies Act is enacted by the state governments, the Companies Act is legislated by the central government.
- They do not rely on subsidies from state governments in order to avoid interventions.
- The members of the MPCs are the shareholders of the MPC. They belong and can convey direct voices to the management of the MPC. The managements of the MPCs are thought to be more autonomous than those of dairy cooperatives.
- As per the provision of the Act there can be Expert Directors (professionals) on the board limiting to one-fifth of the total board-positions.

There are more than 150 producer companies all over India in the dairy sector, and 14 of them have received the technical support of NDDB Dairy Services (NDS), a subsidiary of the NDDB. The support areas by NDS to MPCs generally include the following areas and activities:

- Formation of MPCs (4-5 months)
  - Identification of potential geographical areas where MPCs are formed by assessing the current situation of production and sales of milk[9]
  - Identification of potential initial shareholders (20-30 farmers)
  - 2 days trainings for the potential initial shareholders
  - Formation of business plan
  - Incorporation of MPCs
- Support to start the business (4-6 months)
  - Technical support to prepare necessary infrastructure
  - Support to hire executive and professional staff
  - Support to form the board of directors
- Initial development of the business (About 2 years)
  - Technical support to the executive and professional staff

8 These points were raised during the interview with the NDDB Dairy Services (NDS), a subsidiary of the NDDB.

9 The formation of MPCs are generally encouraged where DCS are not present or have weak coverage, which is written in the Project Implementation Paper of the National Dairy Plan project. Conversion from existing Cooperative to Producer company is possible as per Part IX of the Companies Act. However, it is voluntary for milk cooperatives to convert into MPC.

These support of NDS to MPCs are provided only if necessary financial support is provided for the formation of MPC (which include the service fees to NDS) and request NDS for technical support. Table 2-4 provides basic descriptions of the 14 MPCs as given below:

Table 2-4: Basic description of MPCs which are supported by NDS

Source of funding	Name of MPC	State	Number of members	Volume of milk procurement (TKgPD)	Turnover 2017/18 (million rupees)	Date of incorporation
National Dairy Plan	Paayas	Rajasthan	112,460	650	128.2	19/05/2012
	Maahi	Gujarat	99,913	633	114.4	07/06/2012
	Shreeja	Andhra Pradesh	67,883	270	34.4	03/07/2014
	Baani	Punjab	40,805	180	35.7	11/08/2014
	Saahaj	Uttar Pradesh	91,085	345	77.3	17/10/2014
	Bapu Dham	Bihar	15,814	22	17.4	12/04/2017
Tata Trusts	Sakhi	Rajasthan	7,142	15	2.6	19/03/2016
	Asha	Rajasthan	4,954	15	2.4	21/03/2016
	Shwetdhara	Uttar Pradesh	3,791	7	0.8	25/04/2016
	Ruhaanii	Punjab	2,770	9	1.1	21/10/2016
	Indujaa Mahila	Maharashtra	NA	NA	NA[10]	11/07/2018
National Rural Livelihood Mission (NRLM)	Muktaa	Madhya Pradesh	2,039	3	NA[11]	01/08/2017
	Maalav	Madhya Pradesh	3,268	7	NA	18/08/2017
	Kaushikee	Bihar	2,292	0.8	NA	22/09/2017

Source: NDDB Dairy Services

Figure 2-8 depicts the dairy value chain of MPC. MPC members bring their milk to the Milk Pooling Point (MPP) where the quality of milk (such as fat and SNF content) is checked. Milk so collected at MPPs is transported to Bulk Milk Cooler (BMC)/ Milk Chilling Centers (MCC) for immediate chilling. Currently, the above mentioned 14 MPCs do not have their own dairy plants, so the processing of raw milk is done at the hired plants (plants taken on rent)[12] wherever MPCs are selling milk in retail. Within the MPC, there are other functions such as input services, quality control, marketing, finance & accounts, purchase and HR & administration. Quality assurance department monitors the quality of products at hired plants. Marketing department deals with the sale of milk & milk products and manages the distributors

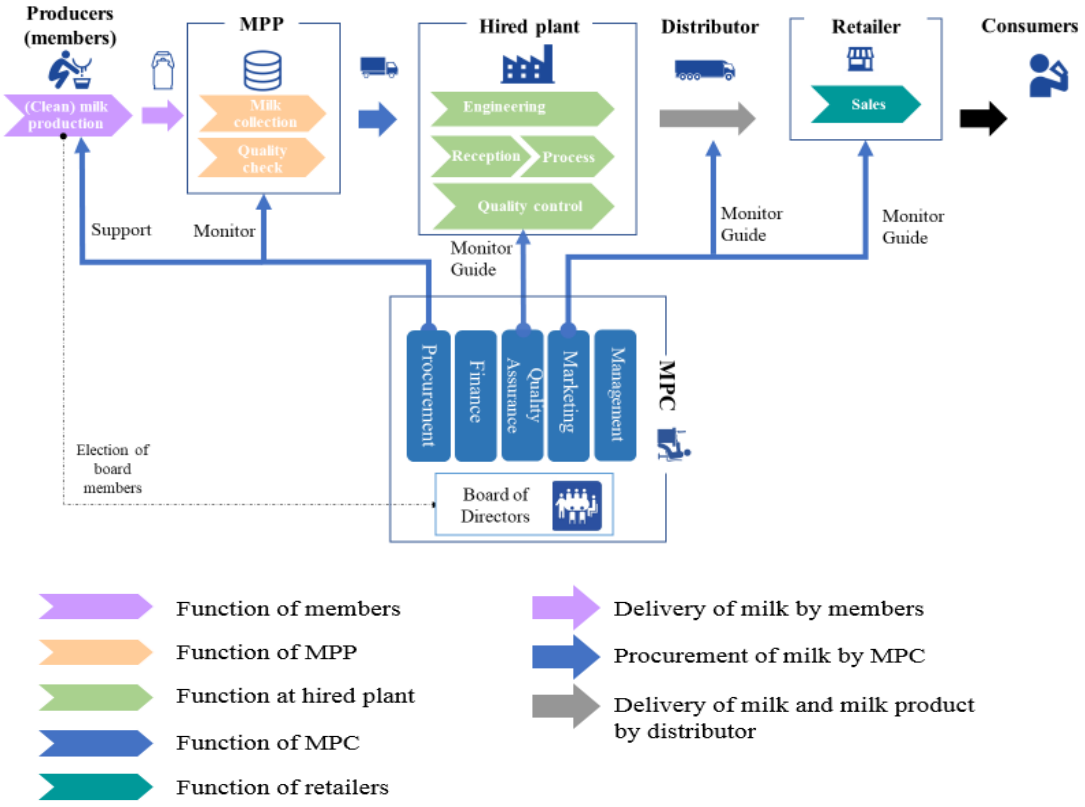
10 The data of number of members, procurement volume, and turnover are not available for Indujaa Mahila as it has not been started their business at the time of the Survey.

11 The data of turnover in 2017/18 for Muktaa, Maalav, and Kaushikee are not available as they started their operation in the middle of the year of 201718.

12 Maahi and Shreeja are renting the plants of Mother Dairy, and 12 MPCs are renting the plants of private firms.

and retailers. They also deal with the complaints of consumers. Procurement department monitors the activities at MPP and provide various supports to members.

The organization of MPC is 1-tier system. The members of the MPC elect the board of directors (which is the supreme decision-making body) of MPC. The board members typically consist of members elected by the members as their representatives as well as Expect Directors, who are business professionals appointed by the Board of Directors.



Source: Survey Team

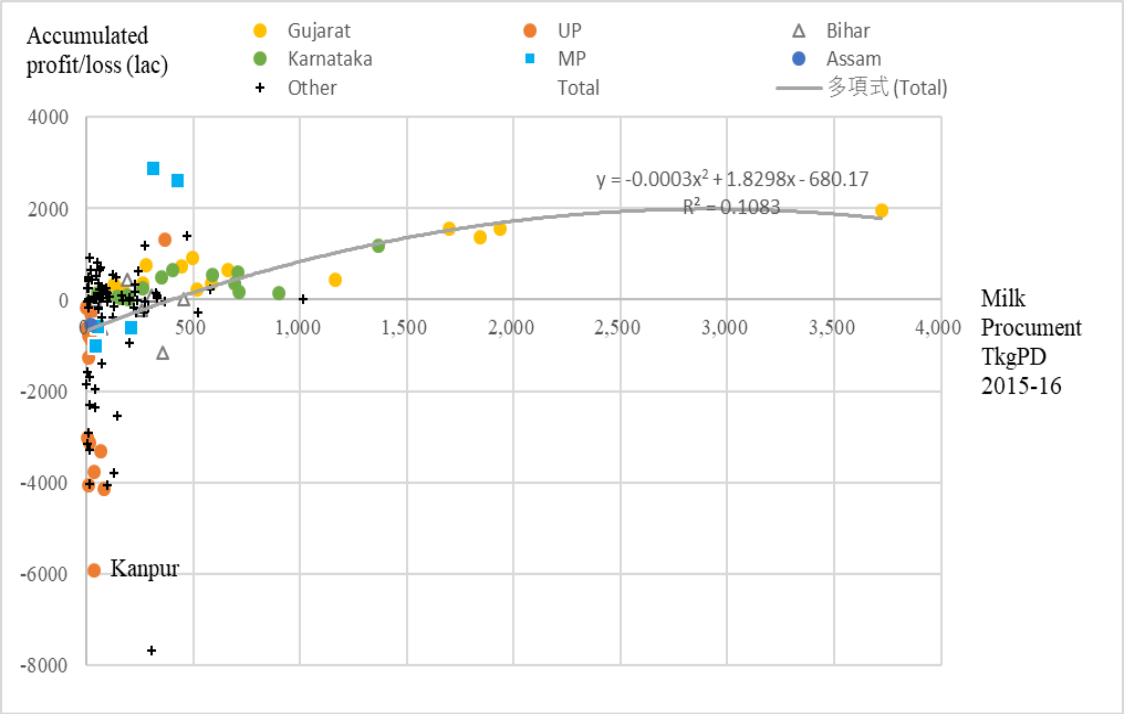
Figure 2-8: Value-chains of MPC

(4) Financial Situations of Cooperatives

One important factor that influences their financial condition is the scale of procurement and production volume. Figure 2-9 shows the relation of the average volume of milk procurement to the accumulated profits and losses of milk unions and MPCs.[13] One can also see that the amounts of accumulated profits do not increase significantly as the procurement volume increases. This is

13 There are more than 220 milk unions and MPCs in India, but Figure 2-9 include the 156 unions and MPCs for which the relevant data are available.

due to the fact that a large portion of union profits are passed on to producer members in the form of bonuses, price difference, various services, and welfare funds.



Source: NDDB

Figure 2-9: Relation between accumulated profit/loss and milk procurement volumes (all unions)

(5) Importance of capacity development of dairy cooperatives while expanding their businesses

A few large milk unions have the capacity to invest and expand their business operations with their own resources. These unions have gained this capacity by increasing their procurement, production, and sales volumes simultaneously. Small milk unions tend to find it difficult to stabilize their business operations, as their small scale of production does not allow them to invest in processing and cold-chain infrastructure. Thus, financial support is typically required for small dairy cooperatives. It is, thus, important to improve the capability of dairy cooperatives by investing in its entire dairy value chains while expanding the volumes of procurement, production, and sales.

The field of activities where the capacity development is especially needed for dairy cooperatives are business planning, marketing, and product development. The details of it will be discussed in Section 2.2

2-1-4. Food Safety in India

The food-borne diseases are of concern to public health. The Government of India had established the Food Safety Standard Authority of India (FSSAI) and consolidated all food related laws and regulations to establish a single reference point for all matters relating to food safety and standards, by moving from multi-level, multi-departmental control to a single line of command. All the milk unions and federations put a lot of effort to comply with the rules and regulation of the FSSAI. However, there is always a scope for improvement in hygiene management.

(1) The Law and Regulation for Dairy Sector and Food Safety

1) The Food Safety and Standards Authority of India[14]

The Food Safety and Standards Authority of India (FSSAI) has been established under the Food Safety and Standards Act, 2006 which aimed to consolidate various acts and orders that have handled food related issues in various ministries and departments. The FSSAI was created with the aim to lay down science-based standards for articles of food to regulate their manufacture, storage, distribution, sale and import to ensure availability of safe and wholesome food for human consumption.

(a) Mandates of the FSSAI

Mandates of the FSSAI includes followings.

- Framing of regulations to lay down the standards and guidelines in relation to articles of food and specifying appropriate system of enforcing various standards thus notified.
- Laying down mechanisms and guidelines for accreditation of certification bodies engaged in certification of food safety management system for food businesses.
- Laying down procedure and guidelines for accreditation of laboratories and notification of the accredited laboratories.
- Providing scientific advice and technical support to the Central Government and State Governments in the matters of framing the policy and rules in areas which have a direct or indirect bearing of food safety and nutrition.
- Collecting and collating data regarding food consumption, incidence and prevalence of biological risk, contaminants in food, residues of various, contaminants in foods products, identification of emerging risks and introduction of rapid alert system.
- Creating an information network across the country so that the public, consumers, Panchayats etc. receive rapid, reliable and objective information about food safety and issues of concern.
- Providing training programmes for persons who are involved or intend to get involved in

14 The FSSAI website: https://www.fssai.gov.in/home/about-us/introduction.html

food business.

- Contributing to the development of international technical standards for food, sanitary and phyto-sanitary standards.
- Promoting general awareness about food safety and food standards.

(b) Enforcement structure and procedure of FSSAI

The enforcement structure and procedure of FSSAI are stated in the Food Safety and Standards Act, 2006 and the Food Safety and Standards Rules, 2011. The FSSAI and the State Food Safety Authorities have responsibility for the enforcement of the Act, and the Commissioner of Food Safety appointed by the State Government has responsibility for efficient implementation of food safety and standards and other requirements in the state.

The powers and duties of the Commissioner of Food Safety in each state are stated in the Food Safety and Standards Act, 2006 as following:

- To prohibit in the interest of public health, the manufacture, storage, distribution or sale of any article of food, either in the whole state or specified in the order notified in this behalf in the official gazette.
- To carry out survey of the industrial units engaged in the manufacture or processing of food in the state to find out compliance by such units of the standards notified by the food authority for various article of food.
- To conduct or organize training programmes for the personnel of the office of the commissioner of Food Safety and, on a wider scale, for different segments of food chain for generating awareness on food safety
- To ensure an efficient and uniform implementation of the standards and other requirements as specified and also ensure a high standard of objectivity, accountability, practicability, transparency and credibility
- To sanction prosecution for offences punishable with imprisonment under the Food Safety and Standards Act, 2006

(c) Outline of Standards Regulations

The FSSAI has a series of standards regulations. As of November 2018, the major standards regulations published on their website are listed below[15].

1) Food Safety and Standards (Licensing and Registration of Food Businesses) Regulation, 2011
2) Food Safety and Standards (Food Product Standards and Food Additives) Regulation, 2011

15 The FSSAI website: https://fssai.gov.in/home/fss-legislation/fss-regulations.html

3) Food Safety and Standards (Prohibition and Restriction on Sales) Regulation, 2011
4) Food Safety and Standards (Packaging and Labelling) Regulation, 2011
5) Food Safety and Standards (Contaminants, Toxins and Residues) Regulation, 2011
6) Food Safety and Standards (Laboratory and Sampling Analysis) Regulation, 2011
7) Food Safety and Standards (Food or Health Supplements, Nutraceuticals, Foods for Special Dietary Uses, Foods for Special Medical Purpose, Functional Foods and Novel Food) Regulations, 2016
8) Food Safety and Standards (Food Recall Procedure) Regulation, 2017
9) Food Safety and Standards (Import) Regulation, 2017
10) Food Safety and Standards (Approval for Non-Specified Food and Food Ingredients) Regulations, 2017.
11) Food Safety and Standards (Organic Food) Regulation, 2017.
12) Food Safety and Standards (Alcoholic Beverages) Regulations, 2018
13) Food Safety and Standards (Fortification of Foods) Regulations, 2018
14) Food Safety and Standards (Food Safety Auditing) Regulations, 2018
15) Food Safety and Standards (Recognition and Notification of Laboratories Regulations, 2018)

6) Advertisement & Claims

7) Packaging Regulations

Major standards regulations in dairy sector are summarized below:

i) Licensing and registration of food businesses

The Food Safety and Standards (Licensing and Registration of Food Businesses) Regulations regulates all food business operators in India to be registered or licensed. So-called "petty food business operators" who procure or handle milk up to 500 liters per day have to register, 501 to 50,000 liters per day of milk or 2.5 metric tons to 2,500 metric tons of milk solids per annum shall obtain license from the state authority. Dairy units including milk chilling units equipped to handle or process more than 50,000 liters of liquid milk per day or 2,500 MT of milk solid per year have to have a license of the FSSAI at national level. To provide assurance of food safety, the FSSAI has been enforcing food business operators to implement an effective food safety management system (FSMS) based on Hazard Analysis and Critical Control Point (HACCP). As per the condition of the license under the FSSAI, every food business operator applying to the FSSAI must have a documented FSMS plan. The guideline of FSMS specified by the FSSAI encompasses the requirement of quality management system along with HACCP that is equivalent to ISO22000 certification. Based on this regulation, dairy cooperatives have acquired or are in

process of acquiring ISO22000[16].

ii) Food product standards and food additives

The Food Safety and Standards (Food Products Standards and Food Additives) Regulations regulates general standards for major food items including milk and dairy products. General standards of milk are summarized as following.

- Fat and solid non-fat (SNF) contents: Minimum 5.0% or 6.0%[17] fat and 9.0% SNF contents for buffalo milk and 3.2% fat and 8.3% SNF contents for cow milk
- Contaminants, toxins and residues: It is regulated in the Food Safety and Standards (Contaminants, Toxins and Residues) Regulations which is produced below as per sr. no. (iii).
- The total urea contents: Not more than 700ppm.
- Microbiological contents such as aerobic plate count, coliform counts, staphylococcus aureus, yeast and mold count, Escherichia coli, Salmonella sp., listeria monocytogenes, bacillus cereus, sulphite reducing colostridia, and Enterobacter sakazakii are regulated.

iii) Contaminants, toxins and residues

The Food Safety and Standards (Contaminants, Toxins and Residues) Regulations regulated limits of following items.

- Metal contaminants: Lead, copper, arsenic, cadmium, mercury, methyl mercury, chromium, and nickel
- Crop contaminants and naturally occurring toxin substances: aflatoxin
- Residues: aldrin, dieldrin, chlordane, D.D.T., fenitrothion, heptachlor, hexachlorocycle hexane and its isomers, chlorienvinphos, chlorpyrifos, 2,4D, ethion, formathion, paraquat dichloride, trichlorfon, carbendazim, benomyl, carbofuran etc.
- Antibiotic and other pharmacologically active substances: The tolerance limits have been notified in July 2018.
- Other contaminants: Melamine

(d) Current status of food safety: milk and dairy products

FSSAI took up a large-scale survey on safety and quality of milk in the country in 2018. The survey was conducted in 29 states and 7 union territories covering almost all major towns with

16 The JICA study team confirmed majority of dairy cooperatives in Gujarat, Madya Pradesh and Uttar Pradesh have HACCP or ISO22000 certificates. All 75 plants in India under Gujarat Cooperative Milk Marketing Federation (GCMMF) have HACCP and ISO. Five out of six dairy cooperative union in Madya Pradesh have ISO22000 and remaining one is under proceeding to be certified by ISO22000. Eight out of 14 dairy cooperatives in Uttar Pradesh have ISO22000.

17 In Assam, Bihar, Chandigarh, Delhi, Gujarat, Haryana, Jharkhand, Maharashtra, Meghlaya, Punjab, Sikkim, Uttar Pradesh, Uttarakhand, and West Bengal, buffalo milk require 6.0% fat contents while one in other states/UTs require 5.0% fat contents.

population of more than 50,000 with sample size of 6,432 analyzed qualitatively for two quality parameters (fat and SNF) and 13 adulterants. The survey was conducted over a period of six months between May to October 2018. The report is still at interim stage and the result is not well verified, but the certain percent of processed milk do not comply the requirement of FSSAI and are identified as non-compliant with safety issues. The processed milk includes not only products of dairy cooperatives but also products of other private players, and it is not clear that how much dairy cooperatives contribute to the non-compliant samples in this survey. However, as assuming consumers may think processed milk is not safe, dairy cooperatives need to work for quality control to dispel consumers concerns. In addition, contamination of Aflatoxin and antibiotics are strictly controlled in developed countries such as Japan. If dairy cooperatives export or plan to export their products abroad, especially to developed countries, they need to control those contaminations.

Table 2-5: Result of National Milk Safety and Quality Survey 2018 (Interim)

Criteria	Sample number	Processed milk		Raw milk		Overall %
		Sample number	%	Sample number	%	
Total numbers sampled	6,432	2,607	41.0%	3,825	59.0%	--
(a) Compliant sample	3,289	1,388	53.2%	1,905	49.7%	51.1%
(b) Non-compliant (NC)	3,143	1,219	46.8%	1,924	50.3%	48.9%
(i) NC without safety issues	2,505	769	29.5%	1,736	45.5%	39.0%
NC for fat	1,261	348	13.3%	913	23.9%	19.6%
NC for SNF	2,165	729	28.0%	1,436	37.5%	33.7%
(ii) NC with safety issues	638	450	17.3%	188	4.9%	9.9%
NC for Aflatoxin M1	368	227	8.6%	141	3.7%	5.7%
NC for antibiotics	77	42	1.7%	35	0.8%	1.2%
NC for pesticides	1	Nil	Nil	1	< 0.1%	< 0.1%

Source: FSSAI (2018) National Milk Safety and Quality Survey 2018 interim report

2) Enforcement of the FSSAI

The parliamentary committee has emphasized the need for strengthening the enforcement by FSSAI to enhance food safety in compliance with food safety standards.

(2) Comparison of Law and Regulations between India and Japan

In order to analyze the strictness of the current laws and regulations in India's dairy sector, this section will summarize the comparison between the laws and regulations in Japan and India.

(a) Laws and regulation for milk and dairy products in Japan

The laws and regulations for milk and dairy products in Japan is stipulated in the Ministerial Ordinance on Milk and Milk products Concerning Compositional Standards, etc. based on the

Food Sanitation Act under the Ministry of Health, Labour and Welfare. The ordinance was regulated in 1951 and has been revised occasionally. However, the standard level of such as fat % contents and bacteria counts specified in the ordinance is relatively low. Therefore, dairy related organizations such as cooperatives and private companies set up their own strict quality control standards when procuring or selling milk.

(b) Comparison between India and Japan

The comparison of law and regulation between India and Japan, as well as an example of a standard which a dairy related organization in Japan set up, are summarized in the below table.

Table 2-6: Comparison of law and regulations between India and Japan

	India	Japan	
		The Ordinance	Own standard by cooperatives etc.
Raw milk			
Fat %	Minimum 5.0% or 6.0% for buffalo milk and 3.2% for cow milk	Minimum 3.0%	Minimum 3.5%
SNF %	Minimum 9.0% for buffalo milk and 8.3% for cow milk	Minimum 8.0%	Minimum 8.3%
Gravity	No	Minimum 1.028	-
Acidity	No	Maximum 0.18%	-
Bacteria count	(As recommendation, the Indian Standard Bureau set standard of total plate count[18])	4 million/ml or less	200,0000/ml or less for drinking milk 1 million/ml or less for processing[19]
Somatic cell count		-	400,000/ml or less
Antibiotics	FSSAI notified the regulation in July 2018.	Not included	No included (all tankers are checked. If contaminated, milk is discarded)
Milk temperature	No as of December 2018, but it will be notified soon (less than 5 degree)	10 degree or less when reception	-
Processing			
Pasteurization	At least 63 degree/30 minutes or at least 72 degree/15 seconds, or any other temperature-time combination, sufficient to give a microbicidal effect equivalent to the above defined temperature-time combination and serve to give a negative Phosphatase Test that is applicable to milk immediately after Pasteurization only; cooling it immediately to a temperature of 4°C, or less.	At least 63 degree/30 minutes or other conditions which can kill more bacteria than the above condition (e.g. 75 degree/15 seconds or 120-130 degree/2-3 seconds.	-

18 The Indian Standard Bureau (IS: 1479-1977, Part III): set grading of milk as poor (total plate count /ml > 5million), fair (1000,001/ml to 5 million/ml), good (200,000/ml to 1 million/ml), very good (< 200,000/ml)

19 According to a source of dairy industry in Japan, they hardly identify milk with more than 100,000 bacteria count in raw milk nowadays.

	India	Japan	
		The Ordinance	Own standard by cooperatives etc.
Packing materials	No (FSSAI have draft notified regulations on packaging material as of December 2018. Relevant standards of advisory nature published by Bureau of Indian Standards is in use)	Elastomers and plastics shall conform to regulations under the Ministry of Health, Labour and Welfare, Japan.[20]	The industry set own regulations.
Pasteurized milk			
Bacteria count	Maximum 30,000 ml in case of 2-class sampling plan (50,000/ml in case of 3-class sampling plan)	Maximum 50,000/ml	
Food business operator			
Food safety management system	Currently ISO with HACCP is in use and FSMS guidance document is under development to ensure that critical food safety aspects are addressed.	HACCP will be mandatory in near future by Food Sanitation Act of Ministry of Health, Labour and Welfare, Japan	

Source: Compiled by the survey team based on FSSAI's standards and regulations, interview with NDDB, the Food Sanitation Act in Japan and interviews with resource person of Japanese dairy industry

In Japan, the measurement frequency of the antibiotic is not regulated in the law or ordinance. However, dairy related organizations seriously concern the preface of the ordinance which mentioned that antibiotics shall not be included. Once antibiotics is detected in their products, they have to recall their products from market. In order to avoid contamination of antibiotics, the dairy related organizations conventionally check every tank lorry which ship raw milk. According to a source of the dairy industry in Japan, when dairy plants receive milk from tank lorry, they check contamination of antibiotics with paper disk methods as well as simple methods such as snap methods and charm methods which can show the result within several minutes. Once the result of simple method shows the milk is negative of antibiotics, the plants accept milk from tank lorry. Then after confirming the result of paper disk methods which take four hours to get its result, the plants can start processing the milk.

(3) Social responsibility of dairy cooperative as a food business operator

Despite of more strict laws and regulation under well-developed monitoring system, the food poisoning incidents have been occurring in even developed countries. Therefore, food business operators as well as governments even in developed countries need continuous effort to improve

20 Elastomers shall conform to the regulations of the Ministry of Health and Welfare, notification No.85. Plastics shall conform to the codes and standards of the Food Sanitation Act, Chapter 3, Article 15 to 18, and the regulations of the Ministry of Health and Welfare, notification No. 370, and the Ministry of Health, Labor and Welfare, Notification No. 201.Elastomers inside machine form abroad, even if they have the certification of Europe or USA, also shall conform to the regulations of the Ministry of Health and Welfare, Notification No.85, and need to acquire a Japanese certification through the test which is a boiling and eluting test to measure residual substances.

their food safety practice and regulations.

In Japan, one of major dairy companies caused a collective food poisoning accident affecting 14,780 people in 2000. The cause of the collective food poisoning was that the plant didn't discard the residual raw material which contained Enterotoxin A developed under 20 degree during three hours of power outage. Because of this collective food poisoning accident, all products produced by the company and its group companies were removed away from market. The management of the company and its group companies deteriorated financially so that the group companies had to be dissolved or reorganized.

As shown in Table 2-5, processed milk including dairy cooperatives in India violated against laws and standards at certain level. It is not clear how much violations caused by dairy cooperatives. However, considering the social responsibility as the leading food business operators, dairy cooperatives need a continual improvement of their food safety management system by tightening internal rules and regulations in order to minimize the possibility to cause collective food poisoning.

2-2. Business Management

2-2-1. General Situation of Business of Dairy Cooperatives and MPC

As briefly discussed in Section 2-1-4, business performances of the dairy cooperatives vary among themselves. Table 2-7 shows the comparison of major indicators of the business of milk unions (or state level summaries) and MPC visited by the Survey Team. Figure 2-10 is a graphical representation of the major indicators among these unions and MPC. One can see that the scales of business in terms of annual turnover for cooperatives of Gujarat is exceptionally large.

Cooperatives in Rajasthan and Madhya Pradesh have very high market shares in liquid milk segment in their states. They also hold strong brand powers in their states. Dairy cooperatives in both states have also shown positive growth in sales in 2017-18.

Paayas MPC, which started its dairy business in 2012, shows significant growth in its sale of milk & milk products. Since, "Paayas" brand is in initial stages of brand building in consumer market, most of its sales are done to the institutional buyers such as Mother Dairy.

Capacity utilization of the plants are quite high for all the unions except for those in Uttar Pradesh.

Performances of dairy cooperatives in Uttar Pradesh are quite poor for any of these indicators, as they face fierce competitions in sales and procurement and the problem of internal governance[21].

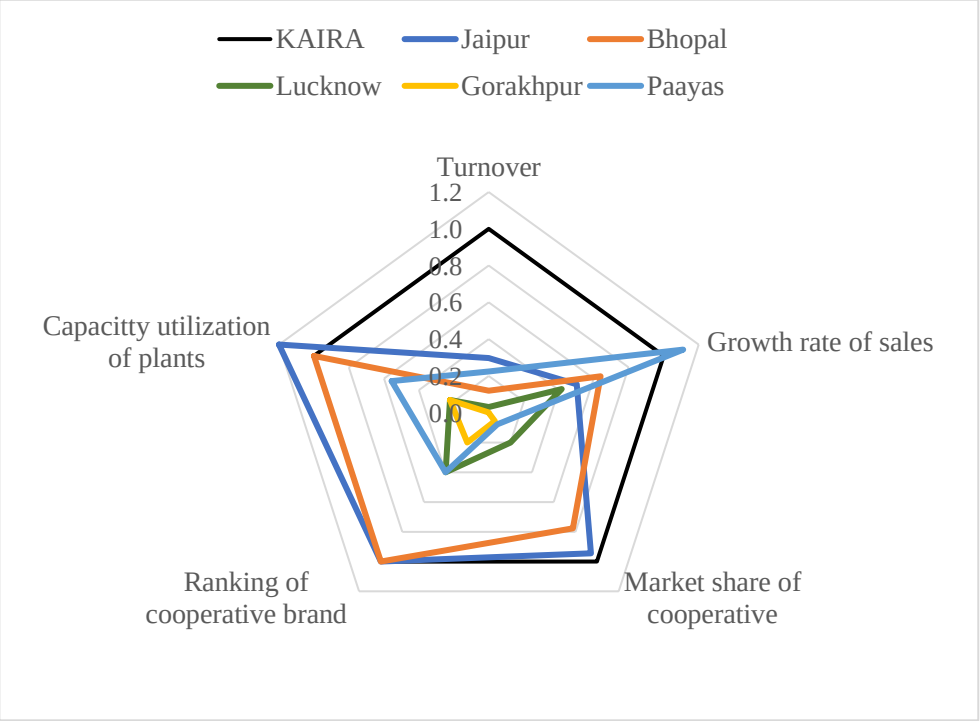
21 See JICA's report on "Data Collection and Confirmation Study on Dairy Sector", March 2018, for the details of the problem.

Table 2-7: Comparisons of major business indicators among dairy unions and MPC

	Gujarat	Rajasthan	Madhya Pradesh	Uttar Pradesh	Paayas (MPC in Rajasthan)
Accumulated loss/profit (mil.Rs.) (union level)	154 (2015/16 KAIRA)	1,192 (2015/16 Jaipur)	261 (2015/16 Bhopal)	-62 (2015/16 Lucknow) -332 (2015/16 Gorakhpur)	431 up to 2017-18
Net Profit (mil. Rs.) (union level)	154 (2015/16 KAIRA)	359 (2015/16 Jaipur)	265 (2015/16 Bhopal)	-35 (2015/16 Lucknow) -2 (2015/16 Gorakhpur)	Rs 259 for the year 2017-18
Turnover (mil. Rs.) (state level)	292,403 (2017/18 Federation)	47,630 (2016/17 all unions)	17,750 (2017/18 all unions)	5,980 (2015/16 all unions)	
Turnover (mil. Rs.) (union level)	57,221 (2016/17 KAIRA)	17,000 (2017/18 Jaipur)	6,869 (2017/18 Bhopal)	1,737 (2016/17 Lucknow) 112 (2017/18 Gorakhpur)	12,820 (2017/18)
Growth rate of sales (state level)	7%: (2017/18 Federation)	5% (2017/18 All unions for liquid milk)	3% (2017/18 All unions)	-2% (2015/16 all unions)	
Growth rate of sales (union level)	18% (2016/17 KAIRA Union)	0.07% (2017/18 Jaipur union)	5% (2017/18 Bhopal)	-3% (2016/17 Lucknow) -18% (2017/18 Gorakhpur)	22% (2017/18)
Share of pasteurized milk in the total marketable surplus (estimates)	30%	40% (Rajasthan total) 60% (Jaipur)	20%	20% (UP total) 30% (Lucknow district) 25% (Gorakhpur district)	
Market share of cooperative in pasteurized milk markets (estimates)	90%	80% (Rajasthan) 85% (Jaipur)	70%	18% (Lucknow district) 5% (Gorakhpur district)	7% (Jaipur district)

	Gujarat	Rajasthan	Madhya Pradesh	Uttar Pradesh	Paayas (MPC in Rajasthan)
Degree of competition in the state	Low (No major competition within the state)	Low (No major competitor within the state)	Medium (There are some major competitors such as Nalanda, Amur, Reliance, Haldhaun)	High (There are some competitors whose sales volume exceed cooperatives such as Amul, Ananda, Ghan, Namaste India)	Medium (They are competing with Saras, dairy cooperatives of Rajasthan and other smaller private firms such as Parabhat and Udaipur dairy)
Ranking of cooperative brand in the packed milk market in the state	1st	1st	1st	4th (Lucknow district) 5th (Gorakhpur district)	4th (Jaipur district)
Sales outside of the state	・More than 50% of the fresh products are sold outside of the state. ・About 20% of non-fresh products are sold outside of the state. ・Exporting to more than 20countries	・Mother dairy (60,000LPD) ・NCR (18,000LDP through Alwar)	Negligible	None	None
Capacity utilization rate of the plants	70%: lean period 110%: flush period (KAIRA)	150% (Jaipur union)	93-117% (2017/18 Bhopal)	20% (all unions in UP) 36% (Lucknow) 20% (Gorakhpur)	*50% (at the hired plant)*
Defection rate of processing liquid milk	Less than 1% (KAIRA union)	Less than 1% (Jaipur union)	Less than 1% (Bhopal union)	Less than 1% (Lucknow)	Unknown

Source: Survey team based on data collected in each union and MPC



Source: Survey team based on data collected in each union

Figure 2-10: Comparisons of the major indicators of business among unions and MPC (index where the indicator of KAIRA is 1.0)

Even though some of the dairy cooperative unions and state level federations show sound financial and sales performances, the Study found that capacity level of business management[22] for most of the unions and federations are quite low except for some of the dairy union and federation in Gujarat[23]. It is especially significant for the fields of business and strategic planning, marketing, and product development. The details of these points will be indicated and discussed in Section 2-2-2 to 2-2-4.

Compared to these three fields of the business of dairy cooperatives (business and strategic planning, marketing, and product development), dairy unions typically possess strong capabilities in the procurement of milk due to the continuous public supports in this field. NDP I has focused on the enhancements of the productivities of milk at the farm level and procurement networks of milk of the district unions. There have been also other various schemes of the central and state governments for the production and procurement of district unions. One of results of all these efforts are the increase in the productivity. Also, the dairy cooperatives in most of the states have

22 The term "business management" here indicates the overseeing and supervision of all the aspects of business operations of dairy cooperatives which include procurement and distribution of raw milk, processing, marketing and sales, finance, quality control, product development, and strategic planning.

23 A couple of large unions of Karnataka also possess high level capabilities of marketing and product development. See the report of the Previous Study for the details of it.

established a vast network of raw milk procurement collection system which consists of a large number of DCS and cold chains of BMC, milk tankers, and chilling centers. Furthermore, the staff of the procurement departments of the district unions have accumulated the knowledge and experiences on the formation and the managements of DCS since the founding of dairy cooperatives in each state.

The following section looks at the current conditions of dairy cooperatives and MPC in the fields of business and strategic planning, marketing, and product development, in which the developments of their capacities are needed.

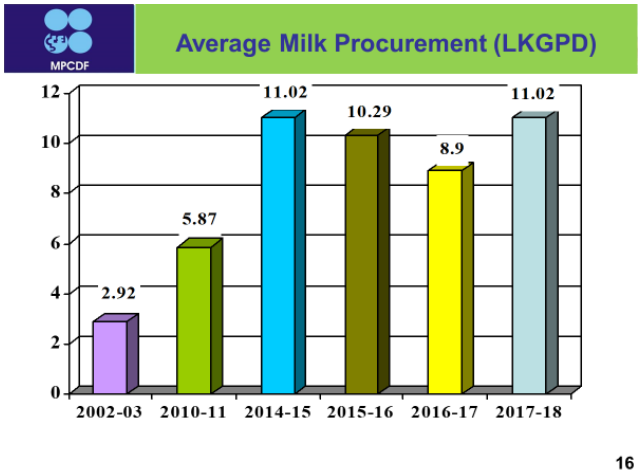
2-2-2. Business and strategic planning

One significant characteristic of packed liquid milk, which is the major product of milk unions, is its very short shelf life. Thus, the coordination of the supply (procurement of raw milk) and demand (order from buyers) is significantly important for managing this business. This requires not only day-to-day management of business, but also seasonal and long-term planning & coordination. As the milk production typically fluctuates seasonally (low in the summer season and high in the winter season), the milk unions generally convert the excess milk received during flush season into skimmed milk powder and white butter for using it during the lean season. Medium and long-term business plans based on proper forecasts need to be prepared by the Milk Unions for deciding investment in dairy processing and cold chain infrastructure.

The coordination of supply and demand is even more difficult for the dairy cooperatives as they have limited capacity to control supply since they are bound to buy all the milk collected at the DCS/MPP. Accordingly, the district unions and federations often face the problems of surplus milk at the times of abundant milk production. Examples of these include the followings:

- As the productions of milk in India have been quite high in 2017 and 2018 and thus there are huge surplus of milk powder, the Gujarat government decided to provide export subsidy to Gujarat Cooperative Milk Marketing Federation Ltd (GCMMF).
- The dairy cooperatives of Madhya Pradesh have faced the fluctuations of procurement volumes of raw milk in recent years as can be seen in Figure 2-11. The procurement volumes tend to increase when the milk production volume increases which results in decrease in price of raw milk, which happened in 2014/15 and 2017/18.

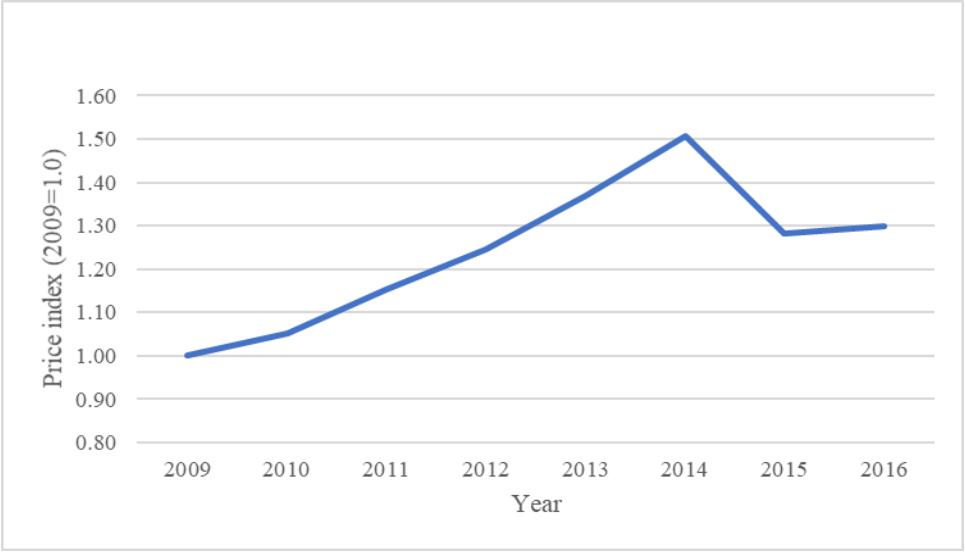
  The dairy cooperative unions in Madhya Pradesh procured more raw milk than their capacities to process to liquid milk and milk powder in 2017/2018, they have been forced to consign private firms to process their milk to milk powder which have taken high conversion and transportation costs.



Source: Presentation by Madhya Pradesh State Cooperative Dairy Federation Limited (MPCDF)

Figure 2-11: Annual trend of daily milk procurement volume (lakh KG per day) for all the dairy unions in Madhya Pradesh

- One dairy cooperative union recorded the net loss in 2015/16. A major cause of this was the huge loss incurred by the sales of milk powder whose price sharply decreased in 2015 and 2016 due to the glut of SMP supply in the international markets (see Figure 2-12 for the trend of price of skimmed milk powder in India). Its selling price of powder decreased to Rs.140/Kg at the minimum in that year where its product cost was Rs.220-230/Kg[24].



Source: IMARC (2017) Dairy Industry in India 2017 edition

Figure 2-12: Consumer price of skimmed milk powder (2009=1.00)

24 As Samastipur union do not have milk power factory, it subcontracts milk powder processing to private dairy companies, which increased the cost of production.

In spite of these, most of the district union and state federation lack the systematic management procedures and capabilities to manage these risks and challenges. Table 2-8 summarizes the capabilities and activities of dairy unions and federation and MPC in the field of business and strategic planning. One can see that most unions and federations, except for Gujarat and Paayas MPC do not formulate medium-term and annual business plans which are based on external & internal analysis and strategic planning. Instead, these unions and federations set annual sales and procurement targets based on past trends only.

For the implementation of these targets, monitoring and evaluations of the individual departments and staff are usually made based on company's targets. However, the collection and analysis of sales, production, and procurement data which are essential for strategic planning, are found to be limited for some of the dairy cooperatives (among those that were surveyed by the Survey Team). For example, most of the sales departments of some of these dairy unions collect sales data only in volumes not in monetary terms, and thus it is difficult to find out the product wise sales values.

Under the circumstances where the dairy cooperatives are required to respond to difficult tasks to coordinate demand and supply of dairy products and the increasing competitions in the markets, they are expected to formulate of the effective medium-term and annual business plans and implementation mechanism which involve the following elements.

Formulation of business plans:

- Understanding of market, competitors and forecasts
  -identification of major factors that affect their business and collection of necessary information
- Understanding of their position and capacities in the market
- Extraction of proper strategy based on these analysis
- Formulation of coordinated plans among various departments
- Identification and formulation of important indicators of their business (profit, sales turnover, capacity utilization, etc.) for monitoring

Implementation of the plan

- Monitoring system (indicators, targets)
- Linkage to performance appraisals of the staff
- Proper coordination among departments

As the topic is highly connected to the organizational strategy, capacity development for the managing directors and heads of departments will be crucial.

Table 2-8: Comparisons of the capabilities and activities in business and strategic planning among dairy unions and MPC

	Gujarat	Rajasthan	Madhya Pradesh	Uttar Pradesh	Paayas
Formulation of business plan	5 years and annual plans are formulated.	Sales and procurement targets based on past trends only.	Sales and procurement targets based on past trends only. No external and internal analysis and strategic planning is done.	Sales and procurement targets based on past trends only. The targets are generally unrealistic. No external and internal analysis and strategic planning is done.	Business and marketing strategies are formulated by professionals and approved by the company's Board.
Supply chain management	Monitor the details of sales and distribution using ERP.	Collection of relevant data is not done.	Relevant data are collected and analyzed but manually.	Collection of relevant data is not done.	Monitor the details of sales and distribution using ERP.
Collection and analysis of relevant performance indicators*	Detailed sales, production, and procurement data are collected and analyzed systematically.	Analysis of relevant data are done regularly but its effectiveness is limited, as sales values data for some products are not available which hinders systematic analysis.	Detailed sales, production, and procurement data are collected and analyzed.	Analysis of relevant data are done regularly but its effectiveness is limited, as sales values data for some products are not available which hinders systematic analysis.	Detailed sales, production, and procurement data are collected and analyzed.
Implementation of the plan	Targets of the individual departments and staff are made based on business plans.	Targets of the individual departments and staff are made based on company's targets.	Targets of the individual departments and staff are made based on company's targets.	Targets of the individual departments and staff are made based on company's targets.	Targets of the individual departments and staff are made based on company's targets.
Monitoring and appraisal of the targets	Monitoring and appraisal of the performance are made regularly.	Monitoring and appraisals of the targets are done regularly.	Monitoring and appraisal of the performance are made regularly.	Monitoring and appraisals of targets are done regularly but do not function effectively, as targets are rarely achieved, and performances rarely affects the merits of the staff.	Monitoring and appraisals of the targets are done regularly.

Source: Survey Team

2-2-3. Marketing capabilities

As discussed earlier, most of the dairy cooperatives in India have sufficient capabilities and infrastructure in the procurement of raw milk. On the other hand, the efforts to enhance the marketing capabilities are relatively neglected in most of the dairy cooperatives. Table 2-9 shows the current situations of the capabilities and activities in marketing among dairy unions and MPC. One can see that there are very limited number of staff who have professional background in marketing and are capable of formulating strategic marketing plans or conducting systematic marketing research within many of the dairy cooperatives, except for Gujarat. The dairy cooperatives understand the importance to strengthen their brands, yet they typically do not have clear brand strategy and/or communication strategy, except for increasing the budget for advertisement.

Even though many of the dairy federations and milk unions do not have enough capacity for preparation of strategic marketing plans and systematic marketing research, most of the milk unions have enough number of sales staff (often called as supervisor or field staff) who conduct day to day sales and customer relations activities, as shown in Table 2-10. Also, as indicated in Table 2-10, many of dairy unions have their own sales network and marketing infrastructure (such as their own parlors and/or booths).

Table 2-9: Comparisons of the capabilities and activities in marketing among dairy unions and MPC

	Gujarat	Rajasthan	Madhya Pradesh	Uttar Pradesh	Paayas
Formulation of marketing plan or strategy	Yes.	Sales targets based on past trends only. No external and internal analysis and strategic planning is done. Plan to expand the sales in NCR	Sales targets based on past trends only. No external and internal analysis and strategic planning is done.	Sales targets based on past trends only. No external and internal analysis and strategic planning is done.	Market strategy that specifies the target markets are formulated by its professionals.
Utilization of marketing tools	Marketing frameworks are readily used for strategic planning	Evidence of the utilization is not found.	Evidence of the utilization is not found.	SWOT analysis of its brand has been done.	Evidence of the utilization is not found.
Regular marketeering research/survey	A large-scale customer expectations survey is done every year.	No regular formal survey has been done.	No regular formal survey has been done.	No regular formal survey has been done.	Market surveys are done as and when required.
Availabilities of marketing professionals	Around 30 staff in the marketing department of the Federation. They are capable of formulating strategic plans by utilizing marketing frameworks and SAP.	4 managers in Federation with marketing experiences and/or background.	4 managers in Federation with marketing experiences and/or background.	3 managers in the marketing departments of the Federation and all unions in the state.	All the 25 staff of the marketing departments are new to dairy business, but they have been getting extensive training in marketing and other business-related topics.
Collection and analysis of sales data	Detailed sales data are collected and analyzed systematically, using SAP.	Analysis and utilization of relevant data are limited.	Detailed sales data are collected and analyzed.	Analysis and utilization of relevant data are limited.	*SAP*
Existence brand strategy	Yes	No. (Quality control)	No	No	No.
Spending on advertisement	*Not known*	Estimated to be Rs.20,000,000-30,000,000 per year (Jaipur union)	Rs.5,000,000-10,000,000 per year (Bhopal union)	*Not known*	*Not known*

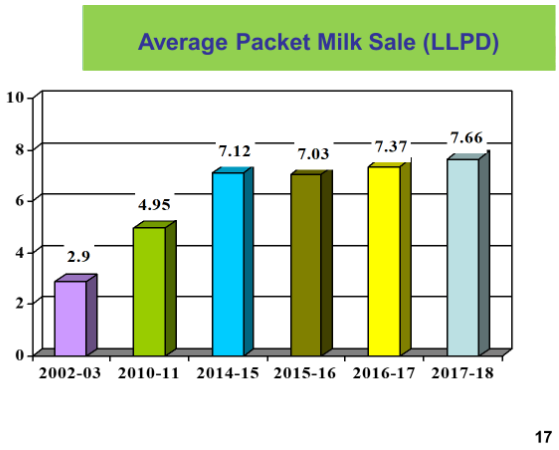
Source: Survey team

Table 2-10: Comparisons of the capabilities and activities in sales among dairy unions and MPC

	Gujarat	Rajasthan	Madhya Pradesh	Uttar Pradesh	Paayas
Resources and capacities of sales forces (union level)	Around 30 sales forces in Gandhinagar union	30-40 sales forces in Jaipur union	*Not known*	4 sales forces in Gorakhpur union.	Around 20 staff in the marketing department who do sales activities.
Existence of good customers	Relevant information is not disclosed.	85% of UHT is sold to army.	Sweetened Flavored Skimmed Milk is supplied to schools since 2015, which is 3.5% of total sales. Government offices and army.	No	90% of the liquid milk are sold to Mother Dairy.
Sales channels (state level)	10,000 distributors 100,000 retailers (Total Amul)	*Not known*	475 milk distributors 328 product distributors 5,648 retailors 3,675 inhouse hops (Total Sanchi)	*Not known*	125 distributors 4,000 retailors (sales areas are several districts of Rajasthan around Jaipur)
Sales channels (union level)	100 distributors 2,400 retailers (KAIRA union)	18 distributors sell to 4,800 retailers. No direct sales to retailors. 70 parlors (4 are owned by union)	135 milk distributors 12 product distributors 500 retailors 1,225 inhouse shops 60-70% of the total sales are through own booth and parlors. (Bhopal union)	13 distributors 1,166 retailors -Direct delivery 738 -Through distributors 230 -ATM/FRP 73 (Lucknow district) 10 distributors 200 retailers (Gorakhpur union)	
Marketing infrastructure (state level)	59 sales offices in India	Federation does not own sales infrastructure.	756 booths/depots 827 city parlors 56 railway parlors 10 Jus Sanchi parlors 1 Sanchi plaza (Total Sanchi)	Federation does not own sales infrastructure.	To maintain cold chain, 475 deep-freezers/Visi-coolers have been provided.
Marketing infrastructure (union level)	4 parlors are owned by KAIRA	4 parlors are owned by Jaipur union.	450 booths/depots 186 city parlors 14 railway parlors 5 Jus Sanchi parlors 1 Sanchi plaza (Bhopal union)	3 parlors are owned by Lucknow union 15 parlors are owned by Gorakhpur union.	

Source: Survey team

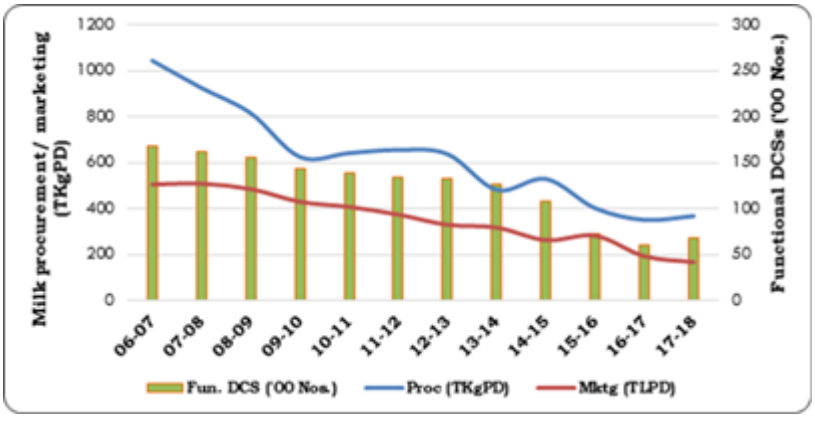
The problem in the gaps between the marketing and production/procurement capacities of the milk union had not been addressed in recent years due to the steady growth in consumption of liquid milk and other dairy products. Yet one can find a few cases where the problem of this gap is visible. For example, the sales of liquid milk by one district unions have been stagnated, as shown in Figure 2-13.[25]



Source: Survey Team

Figure 2-13: Trend of average sales of liquid milk one dairy cooperative union (lakh liter per day)

Also, the market share of one cooperative brand has continuously decreased since 2005 after the entry of other brands into the market, losing its market share against these competitors, as depicted in Figure 2-14. This results in various problems such as low capacity utilization of the plant.



Source: NDDB

Figure 2-14: Trend of milk procurement, sales, and functional DCS of the dairy cooperatives in one state

25 Based on the field survey of the Survey Team.

As the milk production, procurement capacity of dairy cooperatives, and market competition among dairy cooperatives and private firms are likely to increase in the future, possibilities of similar problems are likely to arise in other states. The development of marketing capabilities is thus imminent for the sustainability of dairy cooperatives.

To implement a coherent strategic marketing plans and systematic marketing research, it requires capacity development of both the managing directors and the staffs of the marketing department. The managing directors will have to improve the skills to incorporate the consumer's preferences and needs to the strategic management of the institution. The head of marketing department and its staffs will have to change their mindset from "sales staffs" to "marketing officers", extending their skills to obtain customers' needs information on different dairy products, to diversify, differentiate and add values to the existing dairy products, and inform those market information to the managers.

2-2-4. Product development

The product development capacity is one of the significant factors to deal with the two problems mentioned above: short shelf life and the difficulty to coordinate supply and demand. The major product of the dairy cooperatives is liquid milk, which is a low margin product. Thus, too much dependence on liquid milk in sales exert serious risk for dairy cooperatives. As can be seen in Table 2-11, the percentage of the sales of liquid milk out of total turnover for GCMMF is estimated to be about 40%. On the other hand, shares of liquid milk in the total turnover for many other dairy cooperatives is quite high. Furthermore, the product range of these unions outside of Gujarat is very small and usually extend to only liquid milk, yogurt, butter and ghee, and traditional sweets, as shown in Figure 2-15. Some of the dairy cooperatives lack the enough experienced personnel and resources for product development and there are not many cases of successful new product development. Compared to these dairy cooperatives, dairy cooperatives of Gujarat, has vast product range which include chilled and frozen products, as shown in Figure 2-16. As a systematic procedures or functions of product development, GCMMF has integrated the process of new product development in the daily work of various departments. Any personnel of any department in GCMMF can propose and present ideas and concept of new product in a periodical event. This systematic procedure enables GCMMF to develop new product every two weeks on average.

2-2-5. Reasons of the differences in performance

The analysis of this section made clear that there are significant gaps between the dairy cooperatives of Gujarat and those of Madhya Pradesh, Rajasthan, and Uttar Pradesh in terms of the business performances and the capabilities (especially in the fields of business planning, marketing, and product development). The causes of these differences mainly stemmed from the historical background of the dairy cooperatives of these states. The dairy cooperatives in Gujarat have started their sales activities in 1940s and gradually expanded their activity areas and scale of operation. In the course of its expansion, it had already faced the issue of excess supply of raw milk by the mid-1980s. To deal with this issue, Amul had worked hard to improve marketing and product development capacities. One of the results of these efforts was its success to expand their butter and ice cream sales to extensive areas in India, which was one of the factors for Amul to be a national brand[26].

On the other hand, many of the dairy cooperatives in other states started their operation in the 1970s and 1980s under Operation Flood programme, and their main target was the expansion of village coverage in their operational areas and production volumes that would meet the

26 Based on the discussion with marketing managers of Amul.

increasing demands of liquid milk[27]. The awareness for the needs to improve their marketing and product development capacities have thus not been raised until very recently. Accordingly, the dairy cooperatives of these states face the issues like the lack of business and marketing strategy, insufficient professionals in marketing, and systematic procedures or functions of product development.

To improve the product development capacity, it requires both institutional strong intention or motivation to introduce new products, and technical product development skills. In most of the cases, the first one is crucial. GCMMF has developed a systematic way to collect new ideas from all personnel. One milk union in Bihar has developed different new dairy products through an active commitment and strong leadership of the managing director. Thus, capacity development on marketing strategy for the managing directors and heads of the departments will be crucial to promote and nurture the culture of new product development, rather than introducing a detailed and technical methods, also because most of the milk unions do not have product development department nor personnel for this purpose.

27 The marketing and sales performances of the dairy cooperatives of Karnataka, Madhya Pradesh, and Punjab are relatively good, so they are thought to be exceptions for this statement.

Table 2-11: Comparisons of the capabilities and activities in product development among dairy unions and MPC

	Gujarat	Rajasthan	Madhya Pradesh	Uttar Pradesh	Paayas
Product range other than standard products[28]	Ice cream, milk powder, chocolates, lactose free milk, sour cream, probiotic yogurt, protein malt drinks, frozen and chilled products.	Milk powder and ice cream.	Milk powder.	None.	Ghee, Curd, Chaas, Lassi.
Share of liquid milk sales in total turnover	Estimated to be about 40%.	60% (Jaipur union)	80%	77% (Lucknow union) 75% (Gorakhpur union)	93%
Share of other major products in total turnover	Shares of non-fresh products (chilled, frozen, ambient) are more than 50%	Ghee:15% SMP:10% (Jaipur union)	Ghee: 15% Traditional sweets: and others: 5%	Ghee: 6% Butter: 5% Traditional sweets and others: 12% (Lucknow union)	Ghee and other dairy products 3%
Past records of new product development	A new product is developed every two weeks on average.	No recent record of new product development.	There are couple of recent record of new product development. For example, recently developed traditional sweet product became quite popular in the market. Also, coffee mix product will be launched shortly.	No recent record of new product development	No

Source: Survey team

28 The standard products include liquid pouched milk, flavored milk, butter, ghee, yogurt, and traditional sweets which most of the dairy unions have capacity to produce.

Source: MPCDF

Figure 2-15: Products of the dairy cooperatives in Madhya Pradesh

Source: Amul

Figure 2-16: Products of the dairy cooperatives in Gujarat (Amul)

2-3. Food Safety

2-3-1. General Situation of Food Safety in Dairy Sector

The list of milk unions and plants visited by the Survey Team during the first, second and third field visit are summarized in the table below.

Table 2-12: List of plants visited by the Survey Team during the first, second and third field visit

State	Plant operator	Plant
First visit		
Gujarat	Kaira MU	Milk processing plant, Anand
	Vidya Dairy	Milk processing plant and others, Anand
Madhya Pradesh	Bhopal MU	Milk processing plant, Bhopal
Uttar Pradesh	Lucknow MU	Milk processing plant, Lucknow
Second visit		
Rajasthan	Jaipur MU	Existing milk processing plant, Jaipur (UHT and Packaging room only)
		New milk processing plant, Jaipur
Uttar Pradesh	Gorakhpur MU	Existing milk processing plant, Gorakhpur
		New milk processing plant, Gorakhpur
Gujarat	Amul Fed Dairy (GCMMF)	Milk processing plant, Gandhinagar
Third visit		
Gujarat	Banas MU	Milk processing plant, Palanpur (Entrance system and on-line checking system only)

Source: Survey team

As mentioned above, the JICA study team has visited ten plants in total, and with regard to existing plant, the most important findings on food safety is that all plants put a lot of effort to comply with FSSAI and they seem far better than unorganized distribution channel. However, as compared with dairy plants in developed countries such as Japan, many of these plants can be improved to have enough or satisfactory hygiene awareness and design. The detail will be described in Section 2-3-3 on plant design and plant management. It is not easy for existing plants to modify the design mostly because the modification needs to be done not to affect daily regular production and its facilities line, and also because modification requires some additional investment. However, some points related to operational practices such as worker's awareness, working style or effective utilization of entrance system can be improved at low cost. As for new plant, the situation is fine and relatively better because they are designed considering hygiene improvement such as dry floor, pressurized filling room, and closeness of filling room. However, there are still many rooms to be improved. The following session summarizes the detail.

2-3-2. Policy and vision for food safety and hygiene management

(1) Policy and Vision

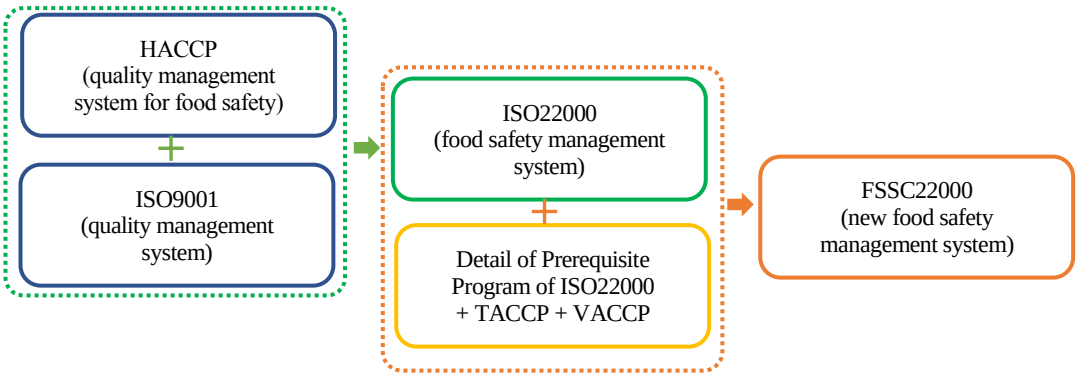
In order to control food safety, the vision or policy for each food operators is essential. In this regard, FBOs certified by ISO with HACCP/ FSMS/ FSSC have food safety policy and vision document. Regarding domestic law on food safety, which is FSSAI, all milk unions comply with it well.

(2) FSSAI

All milk unions visited by the JICA study team put a lot of effort to comply with FSSAI. However, as summarized in Section 2-1-4, the interim report of the National Milk Safety and Quality Survey conducted by the FSSAI indicates that 46.8% of processed milk don't comply with FSSAI. The report is still at interim version and it doesn't identify how much dairy cooperatives contribute to non-compliant samples. However, in order to dispel consumer's doubt on processed milk, dairy cooperatives need to keep working to comply with FSSAI. In addition, if the dairy cooperatives export their products abroad especially to a hygienically advanced countries like Japan where higher standards are applied as a law or industrial standard, they need to keep improving their hygiene and quality. Some milk unions in Gujarat introduced price incentive system for low bacteria counts although there is no FSSAI standards and regulations on bacteria count in raw milk as summarized in Table 2-6 in Section 2-1-4. Moreover, the FSSAI has been tightening their standards and regulations from time to time. Therefore, milk unions may strive to improve their quality management practices beyond the current FSSAI standards and regulations.

(3) Knowledge and certificate

The difference among visited milk unions was found on knowledge and certifications such as ISO9001, ISO22000, Food Safety System Certification 22000 (FSSC22000), European Hygienic Engineering and Design Group (EHEDG), Global Food Safety Initiative (GFSI), Export Inspection Agency (EIA) and NDDB quality mark. Milk unions in Gujarat seem to have better knowledge and application on food safety. All 18 milk unions under GCMMF are already certified by ISO and seven are certified by FSSC22000. Ratio of ISO certificate in Rajasthan, Madhya Pradesh, and Uttar Pradesh are in the range of 52% to 83% of total number of milk unions in these states respectively, and none of milk unions in Rajasthan, Madhya Pradesh, and Uttar Pradesh are certified by FSSC22000. The relation among HACCP, ISO9001, ISO22000, and FSSC22000 are summarized in below figure. ISO22000 is known as an international certificate for food safety management, while FSSC22000 is recognized as an international certificate for food safety management further developed than ISO22000.



* TACCP: Assessment and Critical Control Points
* VACCP: Vulnerability Assessment and Critical Control Points

Source: Based on Sadao Komemushi (2012) "Introduction of ISO2200 food safety management system", the JICA study team modified the contents.

Figure 2-17: Brief of relation among HACCP, ISO9001, ISO22000, and FSSC22000

As mentioned in Section 2-1-4, business operators applying for license to the FSSAI must have a documented FSMS encompassing the requirement of quality management system along with HACCP. The documented FSMS is equivalent to ISO 22000 certification. That is why NDDB recommends milk unions to get a certification of ISO22000, some of the milk unions already have this certification or are in process of obtaining it.

HACCP is recognized as a part of FSMS or ISO22000 as mentioned above. NDDB has also been promoting introduction of HACCP to milk unions since long time. For example, NDDB published handbook for introduction of HACCP for pasteurized milk in 1998. Dairy cooperatives apply HACCP as a part of FSMS to hold FSSAI license. However, the JICA study team found there are many risks of food safety at milk unions which already have certification of ISO22000. According to the HACCP handbook published by NDDB, preventive measures do not seem to be adequate to prevent potential hazard from international food safety and hygiene point of view. For example, during sachet filling, microbiological contamination is identified as potential hazard, and its preventive measure is "cleaning and disinfecting according to confirmed procedures, and maximum temperature is 5 degree C". The JICA study team observed that some milk unions additionally need to ensure proper conditions of processing/filling room and dry floor as possible preventive measures.

In order to improve food safety of dairy cooperatives, NDDB has launched a new initiative "NDDB Quality Mark" certificate which checks not only documents (not like HACCP and ISO certificate) but evidence of their practices in milk unions visited for this certification. During such visits, NDDB also provide suggestions on HACCP documentation and implementation.

Table 2-13: Comparisons of concrete vision and knowledge on food safety among milk unions visited

	Gujarat	Rajasthan	Madhya Pradesh	Uttar Pradesh
Policy	Policy for food safety is not shared to the JICA study team.	(Same as left)	(Same as left)	(Same as left)
FSSAI	Complied	(Same as left)	(Same as left)	(Same as left)
Knowledge and certificate of ISO9001, ISO22000, FSSC22000, EHEDG, GFSI, EIA (EU and non-EU), NDDB quality mark	All 75 plants under GCMMF are certified by ISO (100%).	Eleven out of 21 unions are certified by ISO (52%).	Five out of six unions are certified by ISO (83%).	Eight out of 14 unions are certified by ISO (57%).
	Seven out of 75 plants are certified by FSSC22000 (9%).	None is certified by FSSC22000 (they don't know FSSC22000 well) (0%).	(Same as left)	(Same as left)
	They have knowledge and Vidya dairy, a member of GCMMF, is a member of EHEDG.	They have heard of EHEDG, but don't know the detail. (IDMC Engineer working at new plant of Jaipur milk union knows it).	They have heard of EHEDG, but don't know the detail.	(Same as left)
	They know GFSI.	They don't know GFSI.	(Same as left)	(Same as left)
	They have EIA license (for EU)	One union has EIA license.	(Same as left)	(Same as left)
	Some milk units have NDDB quality mark.	One milk union are awarded with NDDB quality mark.	None has NDDB quality mark (Some milk unions are under process).	N/A
Implementation of ISO and HACCP (documentation)	Well done because they have been renewing certifications. In addition, they keep proper records which imply that they have been carrying out necessary periodical check and calibration of majoring devices. (at Kaira MU)	Well done because they have been renewing certifications. (at Jaipur MU)	Well done because they have been renewing certifications. In addition, they keep proper records which imply that they have been carrying out necessary periodical check and calibration of majoring devices. (at Bhopal MU)	Well done because they have been renewing certifications. In addition, they keep proper records which imply that they have been carrying out necessary periodical check and calibration of majoring devices. (at Lucknow MU)
Claims and complaints management	N/A	N/A	Product management for food safety should be improved; several claims for sour milk and about 100 claims for leakage claims are reported daily	Complaint handling, such as just noting down complaints on blank papers and binding them with clip, needs to be improved at Lucknow MU.

Source: Survey team

2-3-3. Plant design and management

The milk processing plant of Kaira milk union, handles huge production volume with modern machines from Europe or some other sources, which are well designed and working. However, from hygiene point of view, there is a scope of improvement for example, storage milk temperature, floor sanitation, worker's clothing and so on. In this section, the outline of the observation during the plant visits, major areas to be improved on plant design and management are summarized.

(1) The Outline of the observation during the plant visits

As summarized in Table 2-12, the JICA study team visited 10 plants in total. Milk processing plants of Lucknow and Bhopal milk union are in relatively poor condition. However, some plants such as Vidya dairy, Jaipur milk union, Gorakhpur milk union, Amul Fed and Banas Dairy have remarkable points which can be referred. The detail observations of those plants are summarized as following.

1) Vidya dairy

Vidya dairy is a small dairy plant which was established for education purpose for Anand Agriculture University (AAU). About 60 AAU students are trained every year. They produce many kinds of products, such as packed milk, Ghee, ice-cream, Paneer and cheese. They have automated processing line using valves, Plate Heat Exchanger (PHE) for raw milk cooler, gravity-used filling machine. They have certification of ISO9001, ISO14000, and ISO22000, as well as a corporate membership of European Hygienic Engineering and Design Group (EHEDG). They pay a lot of attention to the hygiene practices. They realize the importance of dry floor, gradient floor, wearing proper shoes and hair net. They have two kinds of uniform for workers and students separately so that they can be easily identified whether a person is a worker or a student in the plant. As the result, their plant, especially the ice cream production room, is very clean. They have R&D function for product development in collaboration with GCMMF. The result of R&D is used for large scale production under Amul brand. Vidya dairy trains AAU students for one year with 12 modules of OJT hands-on-hands program. They also provide training to participants from other institutions including foreigners (trainees from Kenya and Afghanistan have also received training at Vidya Dairy).

2) Jaipur milk union

At Jaipur milk union, the JICA study team visited UHT Plant and new dairy processing plant. As for the UHT plant, main equipments i.e. UHT equipment and aseptic packaging machine, were imported from Europe. Layout of facilities, piping, product flow, sensors and controllers are well hygienically installed, but workers' outfit was not proper; they do not wear uniform, cap, mask, and shoes. A "best before" date and a "consume by" date is 120 to 180 days, and it is longer than the same products manufactured in Japan. As for the new plant, its layout is well designed for efficient product flow, and its floor is designed to keep it dry. The equipment of milk pasteurization and packaging are already in service. In pasteurization machine, there is a Cooling Diversion Valve (CVD) which is unique. The usage of CVD indicates that they

pay attention to cooled milk temperature. However, some facilities were still under construction when the JICA study team visited the plant in September 2018.

3) Gorakhpur milk union

At Gorakhpur milk union in Uttar Pradesh, there was one existing old plant and a new plant is under construction. The building and equipment of the existing plant were quite old. The workers do not wear proper outfit. As for the new plant, as it was under construction, it was still not in service when the JICA study team visited in September 2018. However, the building itself and some of equipment such as milk-can receiving, silo tanks, pasteurizer, butter machine, raw milk tanks, pasteurized milk tanks, CIP tanks, pouch filling machine and overall facilities were already installed. The basic design of the plant is similar to Jaipur Milk Union's new plant, because this is a turnkey project of IDMC Ltd. . The new plant is well designed from the hygiene management point of view such as dry floor, pressurized filling room, and closeness of processing room as well as from the point of effective flow of materials and workers. However, entrance of the plant needs to be improved.

4) Amul Fed.

As for Amul Fed. Plant of Gujarat Cooperative Milk Marketing Federation (GCMMF) which is one of the biggest dairy plants in India, they have many equipment from Europe, and these machines are working well. However, as the plant was established in 1994, there is some scope of improvement in design of the plant, for example wet floor, thermometer's location and pump sanitation.

5) Banas Dairy

Banas Dairy is said to be the only plant to have an air shower at entrance of production room. The air shower system at Banas Dairy is well designed and satisfactory, but it needs to be improved. For example, the facilities themselves must be arranged in series setting not in parallel setting, because it has a possibility to pass by. In addition, some contractors were wearing sandals. The situation of hygiene management depends on circumstance, e.g. production items and process. As for in-line packing system, Banas Dairy has good automatic printers and detectors. This is helpful for capacity development, but some systems need to be improved in Banas Dairy to be considered as a model plant.

6) Conclusion

Major difference among MUs was observed from hygiene point of view. Firstly, from point of view of year of construction. Amul milk processing plants we visited are not new ones. Plant system and process at each union do not have correct installation of equipment, for example, pumps, valves, process measuring devices such as thermometers etc. It may be noted that new dairy plant is well designed and constructed from hygiene point of view. It is mainly because NDDB has detailed knowledge and technology on hygiene plant design. Almost all the MUs heavily depend on NDDB for basic plant design and engineering. At the end of new plant construction, NDDB transfers the necessary technology information to the person in charge at the MU.

(2) Major areas to be improved on plant design and management

The plant design and management have many divergences as far as food safety concerns. The major areas identified during the field visit to be improved from hygiene point of view in each state are summarized below.

1) Hygiene engineers

The plants have operators, utility engineer, QA staff but do not have dairy engineers related to process, hygiene, mechanics, and electronics. Therefore, the plants cannot be managed as good as those in hygienically advanced countries.

2) Entrance

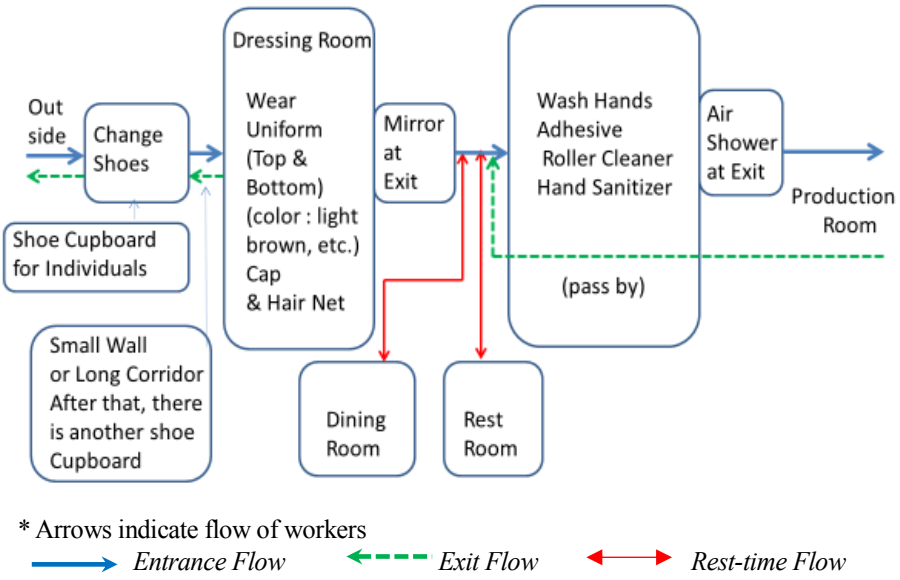
From the food safety point of view, special attention needs to be given on entrance of plant for workers including engineers and contractors, and filling room. Currently many workers who are required to follow this, do not follow the rules. At the entrance of the plant, they have to wear uniform, shoes, mask, and hair net, wash hands and shoes, use adhesive roller cleaner and air shower, which in some cases are not followed strictly. Some kinds of obstacles, such as low wall and shoe cupboard back and forth or long corridor that they need to get though when enter, are probably helpful to carry out the system thoroughly. Only cheese production unit of Banas dairy is equipped with air shower. Air shower is essential to remove human hair, which is the most difficult foreign matters to detect. Every milk plant has to have air shower and use adhesive roller cleaner to remove dust from wares.

Only some MUs provide uniform to employees. Wearing mask, cap, and shoes avoid communicable disease and contaminants of foreign matter to their products, and wearing uniform can help workers to identify any dust on their body. Proper outfit can improve hygiene level with small investment. In addition, it also provides physical safety for workers as avoiding getting their cloth or hair caught by machines or protecting workers with shoes and caps from falling objects.

Air shower at cheese production room of Banas dairy

Outfit to enter cheese filling room at Banas dairy

The above figure is a typical example of Japanese factory entrance system. To develop better system for Indian Dairy, further discussion is required.



Source: Survey team

Figure 2-18: Example of factory entrance system in Japan

3) Dry floor and floor inclination

Dry floor, elimination of contamination source and flow of workers are required to keep facilities sanitary and clean.

4) Pump and cocks after pasteurization

Pump and cocks are not recommended to be used after pasteurization. Because it is risky or difficult to clean pump and cocks well, further, bacteria and microorganism tend to grow there. However, many plants visited by the JICA Study Team have installed pump and cocks after pasteurization.

5) Processing unit

Each processing unit must follow well designed layout from raw product to final product. In addition, it is desirable to keep distance between raw and final product or have barrier between them. These units have to be installed with enough space from the floor so that it would be easy to clean under the units. Newly constructed plants are well designed in these aspects.

Measuring devices such as thermometer and pressure gauge need to be hygienically installed as for location, direction and reaction speed, but it was not found to be adequate in some of the visited plants. In case of some devices, it could not be checked because their location and setting cannot be observed from its outside. They could not explain about reaction speed of thermometer which is important to detect the temperature fluctuation.

6) Control of temperature and humidity at production area

The production/filling room must be closed from outside as well, and the temperature and humidity must be well controlled. However, except the cheese production room of Bans dairy, it is not applied by plants visited by the JICA Study Team.

7) Openness of processing and filling area

Although MUs pay attention at the entrance points of processing and filling area, however, some places are open to outside environment. In order to avoid foreign matter contamination, separation of processing and especially filling area from outside environment is critical. It is important to keep the filling room clean from food safety point of view. Some MUs have air curtain to separate the room from outside, but it is still not adequate. At the new plant of Jaipur milk union, they equipped pressurized room, and at Banas dairy, they have moisture and temperature control at cheese production room, and air pressure control at UHT milk unit. There are signs of "HYGIENE AREA" for production room and "HIGH HYGIENE AREA" for filing room. These signs can be applied to other milk unions.

8) Packaging

Automatized packing machine itself has problems of leakage, which is a frequent issue. For example, all the MUs receive claims every day because of this leakage. It occurs at many unions. More maintenance of machine, stabilization of voltage or uniform thickness of film must be done.

Some kind of inspection machines after packaging are also needed to confirm that products have not been contaminated by foreign matters. However, except at Banas dairy, it was not observed among plants visited by the JICA study team. Banas dairy have automatic production date printer, metal (Fe, non-Fe, and Aluminum), foreign matter and physical particle detector, weight checker after cheese packaging. The machines are made in Europe, and they seem to be of good quality and well-maintained.

9) Cleaning and CIP (Cleaning in Place)

CIP performance also has big influence on food safety; each MUs have good CIP procedures, but sometimes have many differences and inconsistent condition among them in terms of temperature and strength. CIP training and deep understanding of principle of cleaning technology are absolutely necessary.

10) Others

(a) Milk temperature control

Although it is said that the temperature of milk in tanks is kept at 4 to 6 degrees Celsius, in some milk unions it was 7 or 8 degrees Celsius. It indicates that temperature control is not fully maintained. There are enough monitoring systems introduced for raw milk acceptance and pasteurized product to be transported, but in some cases the milk temperature is not cool enough.

(b) Maintenance and recording

Based on ISO certification and food safety management system required by FSSAI license, these things are well done.

Table 2-14: Comparisons of plant design and management on food safety among milk unions visited

	Gujarat	Rajasthan	Madhya Pradesh	Uttar Pradesh
Hygiene engineer	There have few.	Temporarily, IDMC takes care of it at Jaipur MU.	No	No
Entrance	Air shower system is installed. Hand-wash is well practiced by employees at Banas dairy.	No proper system	No proper system	No proper system
Dry floor and floor inclination	Poor (wet floor) at Kaira MU	Good, even outside has gradient, was well paid attention (Jaipur new processing plant)	Poor (wet floor)	Poor (wet floor)
Pump and cocks after pasteurization	N/A	Mostly well equipped. (Jaipur new processing plant)	There are many points to be improved such as location and direction of thermometer, length of foot of equipment, response time of temperature, location of flow diversion valve (FVD), surface of equipment, tank corners, self-drainage of tank, automatic value usage methods.	
Processing unit	N/A	Mostly well equipped. (Jaipur new processing plant)	It needs to be improved	(Same as left)
Control of temperature and humidity at production/filling area	It needs to be improved (no control of temperature and humidity).	N/A (Jaipur new processing plant was not fully operated in September 2018)	It needs to be improved (no control of temperature and humidity, and open from outside)	(Same as left)
Air pressurized room, ventilation and filtration of filling room	Only UHT milk filling room at Banas dairy has air pressurized system. Aseptic filter (Hepa filter). Except it, it needs to be improved.	(Same as left)	(Same as left)	(Same as left)
Online checking after packing	Weight checker and metal detector are introduced at Banas dairy (cheese plant).	No proper system	No proper system	No proper system

Source: Survey Team

In addition to the current situation of the major areas to be improved from hygiene point of view depicted in the above table, the below table summarizes ideal situation, current situation, and countermeasures in each area.

Table 2-15: Major areas, ideal situation, current risk and possible countermines

Major areas	Ideal situation	Current risk	Countermeasures
Hygiene engineer	Milk unions have well-trained hygiene engineers.	Food safety risk is high without experts.	Milk unions assign or train person in charge.
Entrance	Air shower system is installed. Hand-wash before the entrance and proper outfit such as waring cap, mask, uniform, and changing shoes are well practiced by employees.	The chance of hair and dust coming into their products is increased.	Milk unions provide necessary outfit to employees and train them to ware it properly. If installing air shower is costly, cleaning outfit as using adhesive cleaner can be applied to remove dust.
Dry floor and floor inclination	Floor should be dry.	The chance of contaminated products is increased since bacteria and microorganism can grow in water.	If modification for inclination floor is costly for milk unions, they can modify in and around drain at least to improve drainage. They also wipe water out manually for dry floor.
Pump and cocks after pasteurization	Pump and cocks are not recommended to be used after pasteurization. Because it is difficult to clean pump and cocks well, bacteria and microorganism tend to grow there.	The chance of contaminated products with bacteria and microorganism is increased.	If modification for production line is costly for milk unions, they can regularly disassemble and check cleanness of those parts.
Processing unit	It is well equipped, and flow lines for works and products is efficient.	Flow of processing products as well as people is not well designed so that the efficiency is reduced, and the chance of contamination is increased because of unnecessary access to production/filling unit.	Milk unions modify the flow if possible. If it is not feasible, they pay more caution for entering filling room from hygiene point of view.
Control of temperature and humidity at production area	The production/filling room is closed from outside well, and the temperature and humidity are well controlled.	The chance of contaminated products with dust, bacteria, and microorganism etc. is increased.	Milk unions modify their production area (at least closed room).
Air pressurized room, ventilation and filtration of filling room	Preferably a filling room is pressurized enough, and it uses ventilation and filtration with sterile paper (Hepa filter) for cleaning air.	The chance of contaminated products with dust, bacteria, and microorganism etc. is increased.	Milk unions modify their filling room if affordable.
Online checking after packing	Weigh checker and metal detector are introduced.	The chance of contaminated products with metal is increased.	Milk unions introduce metal detectors.
CIP	The CIP is properly implemented.	The condition of CIP such as kinds of detergent, acidity / alkalinity ratio, temperature, and time are different. If it is not clean enough, the chances of contaminated products is increased.	CIP procedures need to be verified by experts. NDDB may provide SOP for CIP.

Source: Survey Team

2-3-4. Quality control techniques and practices

Many unions test the same items as that in Japan except for radioactivity. Amul inspection system is well prepared and extensive. On the other hand, some of the MUs have devices that is old and with less checking frequency compared to that in Japan. Thus, new devices may be needed. Their analytical accuracy also may need to be updated. Introducing new inspection devices from Japan, such as antibiotics, must be helpful. Banas dairy have sophisticated analyzing device at their lab. They invest in these analyzing devises in addition to above-mentioned in-line checking machines after packing.

Acceptable criteria points or figures for pasteurized milk also have the same standard as that in Japan as well as global standard namely Codex standard. At each MU, the quality assurance people are well informed. MUs don't have hygienic engineers as these activities are being carried out by the Food Safety Team Leader (FSTL)/ Management Representatives (MRs) having good knowledge of hygiene practices.

Table 2-16: Comparisons of quality control techniques and practices among milk unions visited

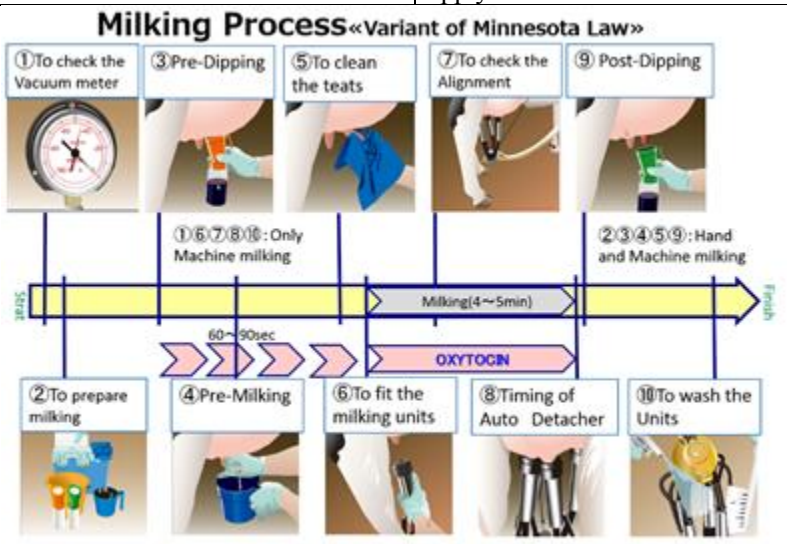
	Gujarat	Rajasthan	Madhya Pradesh	Uttar Pradesh
Analyzed items for raw milk and products	Same as Japan except radioactivity	(Same as left)	(Same as left)	(Same as left)
Critical points or figure of each ingredient or contaminants	Critical points or figures are same as Japan	(Same as left)	(Same as left)	(Same as left)
Daily management methods such as bacteria testing, calibration of measuring instruments and accuracy control of inspection value	N/A	New processing plant at Jaipur MU has just started. No detailed data acquired. (Existing plant have HACCP and ISO, and got EIA license)	N/A	N/A
Devices at lab	N/A	New and modern devices are provided.	Since some devices are pretty old, new devices are needed to improve accuracy.	(Same as left)

Source: Survey team

2-3-5. Improvement for Overall Value Chain

Milk unions, NDDB, and the Government of India have put in a lot of effort to improve milk quality. However, there is still some scope of improvement in dairy value chain. For the reference, the comparisons from farm to plant between India and Japan are summarized in the below table.

Table 2-17: Comparisons of process farms to plants between Japan and India

	Japan	India
Milk quality inspection	Fat, protein, SNF, TPC (total plate count), SPC (standard plate count), SCC (somatic cell count), alcohol test (negative), no contamination of antibiotics	Fat, SNF and testing for adulterants randomly
Milking process	Apply variant of Minnesota Law (machine milking)	Although milking by hand, 1) pre-dipping, 2) pre-milking, 3) to clean the teats, and 4) post-dipping are recommended to apply for better management, but farmers don't apply
	 Source: Orion Machinery Co. Ltd. **Figure 2-19: Milking procedure**	
Milking equipment and BMC washing	Water hardness: less than 100ppm Temperature: more than 70 degree C Detergent: Alkaline, Acid, and Hypochlorite	Water hardness: unknown (a few DCS installed water softener devises) Temperature: about 40 degree C (for milking equipment) and about 50 degree C (for BMC) Detergent: Alkaline and sometimes Acid (for BMC) and Neutral detergent (Milking equipment like a bucket)
Chilling after milking	All farmers have own BMC at farm. Farmers use milking machine, and milk go to BMC through SS pipe and milk filter. Milk don't get out in the open air. They can chill the milk immediately after milking. They have to decrease the milk temperature to 10 degree within one hour after start milking, and to 4.4 degree within one hour after start milking.	After milking, farmers bring milk with milking vessel/bucket to DCS or MPP. In case DCS has BMC, the collected milk is directly poured in the BMC, otherwise milk from DCS is transported to nearest Milk Chilling Centre (MCC). It seems it takes at least 30min from starting of milking to reach the BMC,

	Japan	India
		whereas in case of the MCC, it takes up to 3 hours. After getting into BMC, it takes about 2hours to decrease it to 4 degree C. It means that it takes 5 and half hours to get milk to 4 degree C after milking in case of MCC.
Pre-chilling devises for BMC	Some farmers installed pre-chilling devise to avoid milk temperature in BMC increased after adding milk to BMC	Any pre-chilling devises is not observed.
Temperature record	Some milk unions required to share temperature record before receiving milk form farmers.	Thermometer is installed, but any temperature recording system is not observed.
Filtering	Milk is filtered from milking machine to BMC by disposal nonwoven fabric which can be filtered out somatic cells.	Milk is filtered with cotton cloth (washed and reused)
Milk collecting inspection at BMC.	Before collection the following items are confirmed when lorry receives milk from BMC ・ Milk temperature record ・ Alcohol test ・ Smell and color test. If no problem, lorry collects milk and take the sample for milk quality inspection.	(Same as Milk quality inspection)
DCS	All staff wear a cap, mask, gloves. No water and milk on the floor.	Almost all DCS staff don't wear a cap, mask and gloves. There is no water slope. Milk hose doesn't clean enough.
Transportation to Chilling center or plant	Milk is brought to the chilling center or plant by temperature-controlled tanker from farm.	In some cases, milk buckets are brought to the chilling center or plant by open track under ambient temperature. From BMC/MCC, milk is usually brought to plant in insulated tanker.

Source: Survey team

The comparisons of overall dairy value chain management of milk unions visited by the JICA survey team is summarized in the table below.

Table 2-18: Comparisons of value chain management on food safety among milk unions visited

	Gujarat	Rajasthan	Madhya Pradesh	Uttar Pradesh
Farmers	Cooperatives provide technical assistance to farmers for mastitis prevention, and farmers follow the instruction.	Jaipur MU provide technical training to DCS	Provision of mastitis prevention training to farmers is not confirmed.	(Same as left)
	Clean milk production training is provided to farmers. (coverage was not confirmed)	(Same as left)	(Same as left)	(Same as left)
	Price incentive to farmers for low bacteria count is provided. (Kaira MU)	N/A	Price incentive to farmers for low bacteria count is not provided. (Bhopal MU)	(Same as left) (Lucknow MU)
DCS	BMCs are installed to almost all DCS	About 82% milk come through BMC while 18% come through chilling center in case of Jaipur MU. At two milk pouring pints for milk producer company, Paayas, row milk temperature is required to be controlled by installing BMC.	About 5% milk come in can while the rest come though BMC (Bhopal MU).	All milk come through BMC (Lucknow MU).
	AMCU/DPMCU are installed to all DCS	(Same as left) (Jaipur MU)	About half DCS were covered by milk analyzers. It is planned to cover all within five years.	DPMCU were purchased to cover all 6,835 DCS. However, only 950 is used as of August 2018
DCS to plant	Temperature of receiving milk from tankers to plant is a bit high (10 degree)	N/A	N/A	Quality of milk from tankers to plant is low (MBRT shows discoloration within 30 to 60 minutes in summer at Lucknow MU)
Distributor	Sometimes ice cream melts during distribution.	N/A	It is not less than 4 degree during distribution (one to five cases of sour milk claimed at Bhopal MU).	N/A
Retailers	N/A	N/A	N/A	About 20% of retailers don't have refrigerators

Source: Survey team

(1) Farmers

1) Provision of training

The Government of India has been promoting clean milk production practices. Therefore, all milk unions visited by the JICA study team have experiences in providing training to farmers. However, the coverage may vary. Once dairy animal is affected by mastitis, the production volume and the milk quality are decreased due to increased number of somatic cells in milk. Therefore, preventing, detecting, and curing mastitis is very important for farmers. Milk unions such as Kaira milk union provide training for mastitis control to farmers, and farmers seem well practicing. However, it was observed that, producer members associated with the milk unions in Uttar Pradesh do not have adequate knowledge on clean milk production.

2) Price incentive system

Kaira milk union and other progressive milk unions have already introduced mechanism to measure price incentive based on bacterial count. NDDB has also recommended to the milk unions to introduce the price incentive system based on low bacterial count in milk. In order to improve milk quality, further efforts need to be required.

(2) DCS

1) Chilling facility

In order to control milk quality, installment of chilling facility from farmer to plant is essential. The Government of India has been supported and majority of procurement channel have chilling facilities such as chilling center and BMC at DCS. In near future, all channel should be covered by cold chain from farmer to plant.

2) AMCU/DPMCU

In order to confirm quality to avoid adulteration and establish transparent procurement network for fostering trust between farmers and cooperative, installation of AMCU and DPMCU are important. Milk unions visited by the JICA study team have already covered or have a plan to cover all DCS with milk analyzers.

(3) DCS to plants

As for one example, according to one milk union, the raw milk quality which their plant receives in summer is quite low; the raw milk gets discolored within 30 to 60 minutes after Methylene Blue Reduction Test (MBRT) which is used as a quick method to assess the microbial quality.

In addition, Kaira milk union has already installed price incentive system and DCS visited also takes care of quality control. However, there are some points which they can improve at farm or DCS level.

(4) Plants to consumers (distributor and retailers)

The necessity of improvement of milk quality exists not only from farmers to plants but also from plants to consumers. Especially distributors and retailers need to understand the importance of quality including temperature control. Controlling distribution channel and retail shops also needs to be considered.

2-3-6. Evaluation of food safety and hygiene management capacity

Evaluation of food safety and hygiene management capacity of each plant visited by the JICA study team is summarized in the below table.

Table 2-19: Comparisons of quality control techniques and practices among milk unions visited

	Gujarat	Rajasthan	Madhya Pradesh	Uttar Pradesh
Analyzed items for raw milk and products	Same as Japan except radioactivity	(Same as left)	(Same as left)	(Same as left)
Critical points or figure of each ingredient or contaminants	Critical points or figures are same as Japan	(Same as left)	(Same as left)	(Same as left)
Daily management methods such as bacteria testing, calibration of measuring instruments and accuracy control of inspection value	N/A	New processing plant at Jaipur MU has just started. No detailed data acquired. (Existing plant have HACCP and ISO, and got EIA license)	N/A	N/A
Devices at lab	N/A	New and modern devices are provided.	Since some devices are old, new devices are needed to improve accuracy.	(Same as left)

Source: Survey team

3. POTENTIAL CAPACITY DEVELOPMENT RESOURCES

3-1. Outline of the Cooperatives' Human Resource Management System

The human resource capacity development is deeply related to the human resource management system and the organizational structure of the target entity. Therefore, this section briefly explains: 1) the human resource management system between Federation and Milk Union; and 2) the mechanism of human resource capacity development of Federations, Milk Unions, District Cooperative Societies & milk producers and NDDB's role.

3-1-1. Human resource management system between Federation and Milk Union

Human resource management system between Federation and Milk Union varies from State to State. In most States like Uttar Pradesh, Rajasthan, Madhya Pradesh and Bihar, the Cadre employees of Federation work as the top management of the Milk Unions. They are reshuffled around the Federation and the Milk Unions in the State. Thus, the regular employees of the Milk Unions hired by their belonging Union do not take the top management position. However, in Gujarat, the employees of the Federation and the Milk Unions are recruited separately and stay at their own institutions; therefore, the persons employed within the same MU are promoted to the top management. In general, most States follow the former system with Gujarat being an exception. Each State has its own Cooperative Societies Act and they regulate the different recruitment processes of the employees of Cooperatives. The production line workers of the plant are usually contract based. A contractor is determined every certain period by bidding. The primary responsibility to make the plant line workers be able to work properly at the production line is of the contractor.

3-1-2. Mechanism of human resource capacity development of Federations, Milk Unions, DCSs & milk producers and NDDB's role

In terms of the human resource capacity development, there are mainly two streams. One is the human resource capacity development of the DCSs & milk producers, and the other is that of Milk Unions & Federations.

<u>Capacity Development (CD)-Stream1: Human resource capacity development of DCSs and milk producers</u>

The responsible section for this first stream varies among States as the function of and relationship between the Federation and the Milk Unions in each State are not the same across India. Usually the "Procurement and Inputs" section (name differs from MU to MU) handle the trainings & capacity development activities, in coordination with the respective Federation.

Each State has several regional training centers. The trainings for this stream, for example, trainings for DCS secretary, Management Committee members, AI workers, milk testers, first aid workers, chairman etc.

are mainly organized in these regional training centers or villages on-site. In Uttar Pradesh there used to be 6 training centers but reduced to 3 located in Meerut, Lucknow and Varanasi during the process of the optimization of the operations of Pradeshik Cooperative Dairy Federation (PCDF) as per the State Government cabinet approval. In Madhya Pradesh there are 3 training centers, which are in Bhopal, Ujjain, and Gwalior. In Rajasthan, seven milk unions in Ajmer, Bhilwara, Bikaner, Jaipur, Jodhpur, Kota and Udaipur have functional training centers.

In addition to these training centers in the State, trainings targeting this stream have been carried out by NDDB in its training centres. In NDDB, CD-Stream1 is mainly taken care by Cooperative Services Group (CS). The CS Group analyzes the training needs at DCS & milk producer level and the CS & Cooperative Training (CT) Groups in consultation with other technical groups of NDDB design the capacity development programmes.for the new needs.

CD-Stream 2: Human resource capacity development of Milk Unions and Federations

Comparing to CD-Stream1, CD-Stream 2 has been much weaker. The following section "3-2. Current Situation of Human Resource Capacity Development of the Cooperatives" will explain its reason and issues. The section called "Administration and Personnel" and "Administration and Planning" (or similar name of the section) in Milk Unions and Federation respectively are in charge of Human Resource Development.

CD-Stream 2 is mainly taken care by CT Group of NDDB. For this stream, each technical Group like Quality Assurance, Engineering Services, Product and Process Development, is responsible to identify the capacity development needs at Federation and Milk Union level. The technical and CT Groups coordinate to design the capacity development programmes for the new needs. NDDB also organizes customized training courses upon request.

While developing new training programmes, CT Group of NDDB coordinates overall activities. CT Group designs the training module, allocates time slot for each topic, search and decide who will deliver or teach each topic. The method which CT Group follows to identify a person to deliver or teach a certain topic is as follows. First, CT Group tries to find the suitable experts within the group and if not, it identifies them from technical Groups within NDDB. If not, CT Group will try to find them from the pooled resources outside NDDB. Trainings for CD-Stream1 utilize NDDB's internal resources more than external ones while those for CD-Stream 2, especially targeting business management and marketing utilize the external experts.

NDDB has one main training center in Anand, Gujarat located in the same compound of NDDB, and three Regional Demonstration & Training Centers (RDTCs) located in Erode, Tamil Nadu for the southern region, Jalandhar, in Punjab for the northern region, and Siliguri, West Bengal Sate for the eastern region. The main one in Anand is also considered to cover the western region. Three RDTCs conduct trainings mainly for CD-Stream1 whereas the main training center in Anand conduct trainings for both CD-Stream1 and CD-

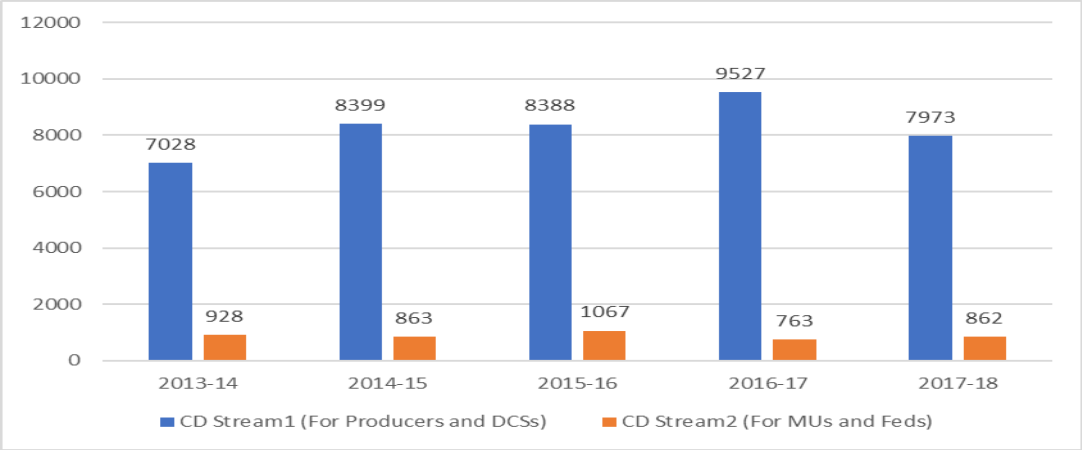
Stream 2. In addition, NDDB has Mansinh Institute of Technology (MIT) in Mehsana, Gujarat State which has the dairy related equipment & machinery and provides hands-on practical trainings for plant managers, operators, and technicians.

NDDB takes efforts to enhance the capacity of various stakeholders of Dairy Cooperatives in India and does not fully charge the participants to pay their tuition fee or expenses needed to develop and deliver the training programmes. Instead, regardless of the expenses needed to develop and deliver the programmes, NDDB sets the tuitions and lodging & boarding charges and they are different depending on category of participants, for example, milk producers & secretaries of DCSs, technicians & supervisors, managers & managing directors, etc.. Basically, the remuneration for the external experts is not calculated separately for the preparation stage of the training programmes, for example, developing training contents and teaching materials, and for delivering stage. In this sense, it could be considered as honorarium rather than remuneration.

3-2. Current Situation of Human Resource Capacity Development of the Cooperatives

3-2-1. Analysis of the past trainings programmes conducted by NDDB

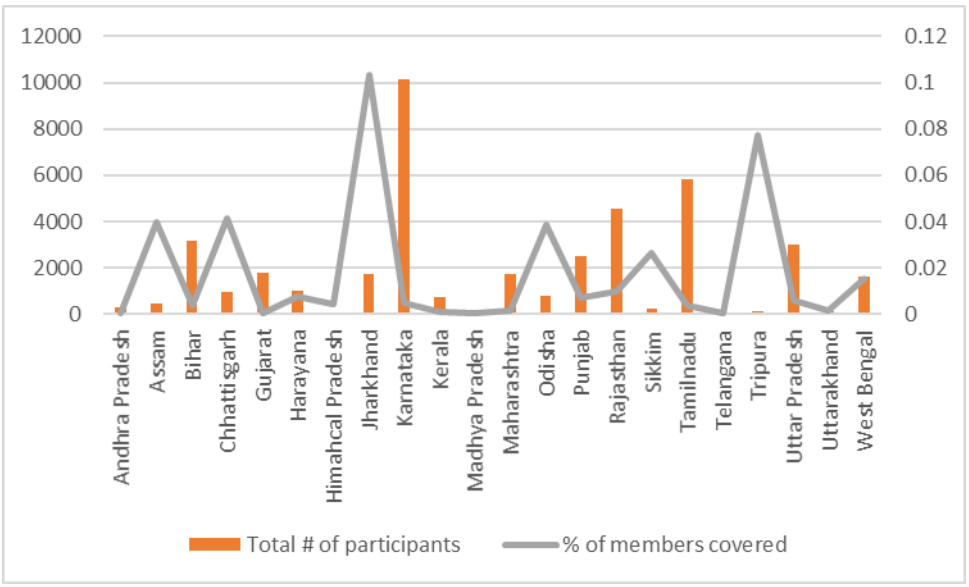
CD Stream 1 has been gradually strengthened since the Operation Flood started and many lessons have been learned. Some of the examples of lessons learned for conducting the CD Stream 1 activities are as follows. Prior to the trainings, it is crucial to make a chairman and elected board members understand the purpose and benefits of the CD activities in order to bring their cooperation towards the CD activities by conducting a sensitization session. The media of instructions need to be appropriate for each different stakeholders, such as chairman, elected board members, milk producers, DCS secretaries, managing directors of milk unions, are varied; therefore, these should be carefully selected accordingly. In addition, how to establish the cascade "train the trainer system" for CD Stream 1 has been institutionalized. Hence, the capacity development mechanism for this stream has developed relatively better as compared to CD Stream 2. The attachment 3-2-1 shows the training programmes conducted under five NDDB training centers from 2013-14 to 2017-18. Figure 3-1 depicts the total number of participants of those programmes during that period under CD Stream1 (for Producers and DCSs) and CD Stream 2 (for MUs / Federations). The total number of participants on year to year basis are quite stable for both Streams, but the total number of participants of CD Stream1 is obviously much larger than that of Stream 2.



Source: Compiled by JICA Survey team based on data provided by NDDB

Figure 3-1: Number of participants of NDDB's training programmes

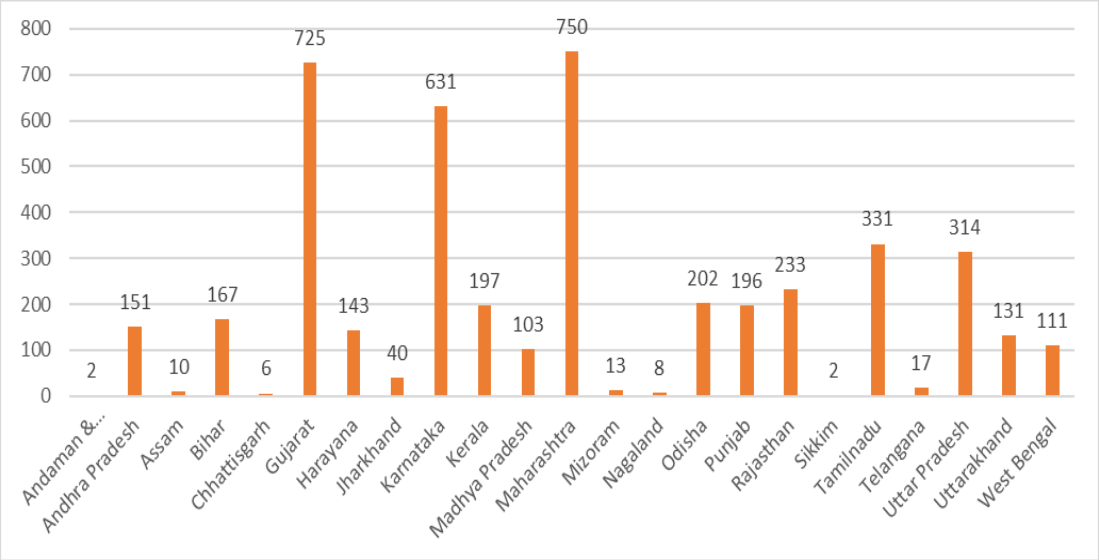
Figure 3-2 depicts the total number of participants in CD Stream1 programmes from 2013-14 to 2017-18 and its state wise ratio to the number of producer members under functional DCS. As each state has different numbers of milk producers, the coverage ratio (the total number of participants divided by the number of producer members under functional DCS) is also shown. Karnataka has sent the highest number of participants to CD Stream1 programmes; however, the coverage ratio is remained low because the total number of producer members under functional DCS in Karnataka is the second largest, the next to Gujarat. Jharkhand hits the highest ratio 0.1%. Nevertheless, it should be noted that CD Stream1 training programmes have been organized by not only NDDB training centers but also by others such as state level training centers.



Source: Compiled by JICA Survey team based on data provided by NDDB

Figure 3-2: State wise Number of participants in NDDB's CD stream 1 programmes (from 2013-14 to 2017-18)

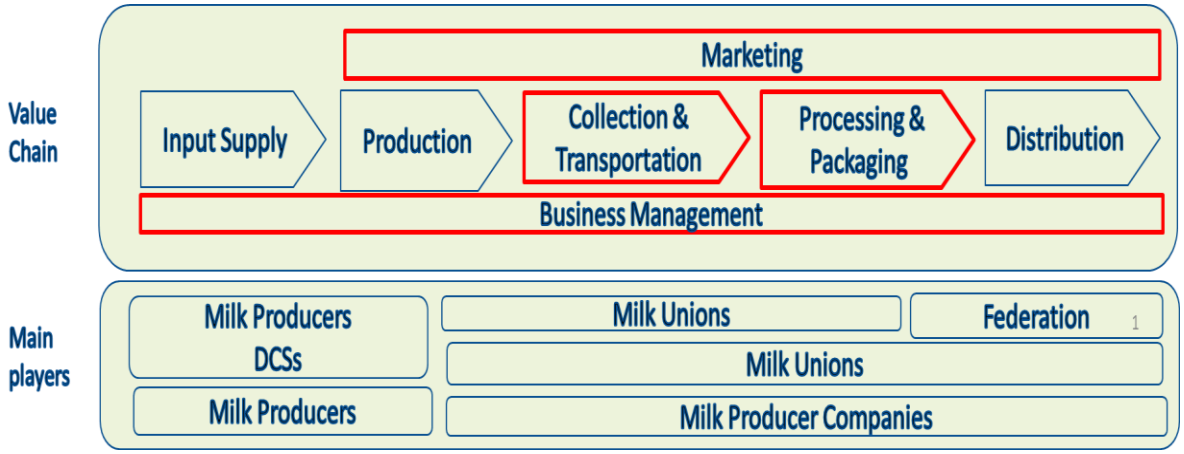
Figure 3-3 depicts the sate wise total number of participants in CD Stream 2 programmes from 2013-14 to 2017-18. Comparing to Figure 3-2, the States that sent proportionally large number of participants to CD Stream 2 rather than Stream1 are Gujarat and Maharashtra. Karnataka sent quite number of participants to both CD Stream 1 and 2. In contrast, the States that sent proportionally large number of participants to CD Strem1 but not to CD Sream 2 is Chhattisgarh. The state that sent participants to CD Stream1 but not anyone to Stream 2 is Tripura and Himachal Pradesh. These three states are far away from NDDB, Anand and MIT where CD Stream 2 programmes are mainly carried out. This may imply that the distance to the training centers would matter.



Source: Compiled by JICA Survey team based on the data provided by NDDB

Figure 3-3: State wise Number of participants in CD Stream 2 programmes (from 2013-14 to 2017-18)

The past five years' training programmes are categorized into the corresponding process of value chain in the dairy sector. Figure 3-4 illustrates the image of a dairy value chain and its corresponding main players in the Cooperative system of India in general and table 3-1 shows the number of training programmes conducted by NDDB from 2013-14 to 2017-18 related to each process of a dairy value chain. The categorization was indicated by NDDB and one training programme is counted multiple times if it covers the multiple processes of the dairy value chain.



Source: JICA Survey team

Figure 3-4: Image of value chain and main players in the Cooperative system in India

Table 3-1: The number of training programmes conducted by NDDB from 2013-14 to 2017-18 for each process of a dairy value chain

	Input supply	Pro duc-tion	Collection & Transportation	Processing & Packaging	Distribution	Marketing	Business Management	Others
For Producers and DCSs	22	22	11	3	0	0	0	2[29]
For MUs / Feds / MPCs	7	7	5	29	3	6	8	
Total	29	29	16	32	3	6	8	2

Source: Compiled by JICA Survey team based on the data provided by NDDB

Table 3-1 elucidates that more variety of trainings have been conducted for the upper-stream (CD Stream 1) processes as compared to the down-stream process of dairy value chain. Trainings that cover an entire value chain like business management and marketing are very few. Table 3-3 indicates that the training programmes targeting the process of distribution, marketing and business management and the year when the trainings have started. It shows that the training programmes targeting distribution, marketing and business management have just recently started. As the two programmes categorized into "Others" in Table 3-1 are also counted as for "Distribution", "Marketing", and "Business Management", Table3-3 excludes these programmes and illustrates only the rest of programmes targeting these three processes of the value chain.

29 "Leadership Development Programme" and "Training on Achievement Motivation"

Table 3-2: The training programmes for distribution, marketing and business management and the year when they started

Title of training modules	Distribution	Marketing	Business Management	Year when the training started
Orientation of Diary Business	1	1	1	2017-18
Marketing Orientation Programme		1		2016-17
Training on Marketing skills		1		2016-17
Training on Marketing of Milk and Milk Products		1		2016-17
Dairy Development through cooperative business model			1	2017-18
Dairy Cooperative Management			1	2017-18
Management Development Training Programme			1	2016-17
Workshop on Governance of Cooperatives			1	2016-17
Board Orientation Program			1	Before 2013-14
Total	1	4	6	

Source: Compiled by JICA Survey team based on the data provided by NDDB

3-2-2. Challenges regarding implementation of human resource capacity development activities

The survey team interviewed the Managing Directors as well as officers in charge of the human resource capacity development of dairy cooperatives, mainly CD-Stream 2. During the visit of the survey team to Federations and Milk Unions in Uttar Pradesh, Madhya Pradesh, and Rajasthan, their work at office were observed. The purpose of interviewing them was to identify the challenges that these institutions have been facing in terms of their human resource capacity development in particular to the factors that would influence on designing the capacity development component of the Project. The survey team also occasionally interviewed the ex-trainees, but it was quite difficult to identify them because most of the institutions have not recorded their employees' past training log. The identified substantial challenges that might affect the design of the Project are as follows:

(1) Mindset of the top management of Federations and Milk Unions toward their human resource development

In most of Federations and Milk Unions where the survey team visited, the human resource development plans have not explicitly developed. Budget for the human resource development activities is not prepared in

a planned manner; therefore, the employees participate in such activities on ad-hoc basis when the fund is available. It seems that the top management of Federations and Milk Unions consider human resource development activities as a cost rather than investment. The head of administration and personnel section of these organizations do not consider that they have a mandate to develop human resource capacity of their organization[30]. The intention of the top management of Federations and Milk Unions to link their business development plan and human resource development plan is rather weak.

However, PAAYAS, one of the MPCs, has adopted a mindset that human resource development is an investment not a cost. Thus, every year after the annual business plan is complied, the human resource development plan is also developed by HR division aligning with the annual business plan and its budget is secured accordingly. Ten to fifteen percent of the total annual budget for human resource development is pooled for the needs that are being raised by each functional division during the year.

(2) Shortage of human resources of Federations and Milk Unions

The shortage of human resources of some Federations and Milk Unions where the survey team visited are very serious. Many employees of Federations and Milk Unions were hired during the Operation Flood and since then have recruited few regular employees. According to the data provided by the Federations and Milk Unions where the survey team visited, approximately 85% of current regular employees of Pradeshik Cooperative Dairy Federation (PCDF) in Uttar Pradesh including those promoted as the top managements of Milk Unions in Uttar Pradesh are going to retire by 2023-24. Paying attention to the Milk Union level, about 50% of current regular employees of Gorakhpur Milk Union in Uttar Pradesh and 65% of those of Jaipur Milk Union, Rajasthan will also be retiring by 2023-24. Currently PCDF is under reformation of its manpower and NDDB has also submitted Manpower Recommendation Report for PCDF to mitigate this issue. The report recommends the followings: i) The PCDF will manage some of the plants of cluster unions that were created by merging several district level milk unions where the rest will be leased out to other institutions. ii) The PCDF shall be responsible for processing and marketing of milk & milk products, cattle feed plants, fodder seed processing unit and training centers, whereas cluster unions shall be responsible for procurement and input operations. iii) The manpower structure has to be in sync with this proposed restructuring.

For the RCDF (Rajasthan Cooperative Dairy Federation Ltd.) according to the published data[31], as of April 2018, the approved number of employees is 619 and the current one is 232, and thus the number of the vacant position is 387. Likewise, for the Milk Unions visited by the survey team, the approved one is 2910 whereas the current one is 1172, and thus the number of the vacant position is 1738. The survey team does

30 One of the other reasons why the top management of Federations and Milk Unions does not or cannot pay much attention to human resource capacity development is that their large proportion of employees are soon retiring. See the next point (2) Shortage of human resources of Federations and Milk Unions of this sub section.

31 Source: RDCF homepage : http://www.sarasmilkfed.rajasthan.gov.in/orgn-stru2.pdf

not have enough data to comment on whether the approved number of employees is appropriate or not. However, from the interviews and observations in Federation and Milk Union in both Rajasthan and Uttar Pradesh, at least the team has recognized that the section head and the above, who are mostly in their late fifties, are handling additional roles due to a lack of human resources.

(3) Facilitation mechanism for enabling training participants to apply what they have learned through the trainings on their working place

The past trainings especially for CD-Stream 2 mainly comprised concept and theory learning in the classroom. Their syllabus lacks practical session[32]. Each Federation and Milk Union has different environment and conditions. After knowing the concept and theory, the training participants are expected to apply what they have learned through the trainings at their own workplace. Nevertheless, the mechanism to facilitate or encourage the participants to behave in that way has not yet been institutionalized. The reasons are complex and have many facets. According to the interviews and observations that the survey team conducted in the field, the following three main reasons for the same: 1) Lack of understanding and support of the management for the participants to apply; 2) Lack of ideas among participants about how to modify what they have learned to fit with their workplace environment and conditions; and 3) Lack of mechanism to motivate participants to apply their learning at their workplace. The interviewees, the persons in charge of human resource section at Federation and Milk Unions in Uttar Pradesh where the majority of employees are over fifty years old, pointed out all these three reasons and those of the milk unions in Rajasthan also mentioned reason three. As a training provider, NDDB is also aware of these challenges as factors to affect the effectiveness of the trainings.

3-3. Resources for Human Resource Capacity Development

3-3-1. Capacity development resources in India

According to the analysis of the last five years' trainings under NDDB and discussion with NDDB officers, there have been quite number of institutions and experts who can be mobilized as trainers for the trainings as per the requirement. The attachment 3-3-1 shows the training resources that were extracted from the past training records provided by NDDB/Milk Unions/Federations and web search by the survey team. In general, resources could be categorized into the following three categories:

Category 1: Professors, researchers, or trainers / instructors from universities, research or educational / training institutions

32 The survey team examined the training programme schedule of past 5 years received from NDDB. It examined the proportion of the method of instructions applied to each programme into three categories: 1) lecture; 2) exposure visit; and 3) active learning including practical, discussion, and case studies etc., and calculated its average ratio by CD-Stream1 and 2. Among 21 programmes for CD-Stream1, the average ratio of three was 61%, 20%, 19% respectively, while among 24 programmes for CD-Stream 2, it was 69%, 18%, 13%.

Category 2: Consultants or employees of private companies

Category 3: Retired ex-employees of NDDB, Federation or Milk Union

Category 1 and 2 can be considered at both personal level and institutional level.

According to the subject matter and the objectives of the training module whether it is theory oriented or practical oriented, these resources should be appropriately selected. In terms of practical oriented trainings Vidya Dairy located inside Anand Agricultural University and Mansinh Institute of Technology of NDDB, Mehsana in Gujarat are the only training centers equipped with dairy plant machineries that can provide practical trainings on dairy plant machineries.

NDDB officers, especially those on front-line duty of capacity development activities particularly for CD-Stream 2, have recognized that providing just trainings to the employees of Federations and Milk Unions are not adequate to increase their work performance at the personal level and ultimately bring about outcomes at organizational level. A mind-set supporting changes with a clear vision is needed for a leader to have. To respond these recognized needs, NDDB in collaboration with IRMA (Institute of Rural Management, Anand) has just established Executive Post Graduate Diploma programme in Management (Rural), (PGDMX(R)) targeting for those who are or will be the top managements of Cooperatives in 2018. It is equivalent to MBA and 15 months full-time residential programme, approved by All India Council for Technical Education (AICTE). The first batch has commenced in January 2019.

In terms of quality of trainers, trainers for the field of Food Safety who are mainly NDDB officers, for example, from Engineering Services, Quality Assurance and MIT of CT Group, have quite strong technical knowledge. Nevertheless, to conduct the new training programmes that the survey team are proposing, they are expected to acquire new technical knowledge and skills through training in Japan. The survey team had identified about 150 items which are important for food safety in the beginning of the study. After the plant visits, the JICA survey team discussed with NDDB/MIT on which items NDDB/MIT have already developed or can develop training programmes by themselves. It was confirmed that NDDB/MIT has already had training contents which cover about 80% of the items. However, some items cannot be covered by Indian resources as summarized in Table 3-1. The items which NDDB/MIT is interested in learning from Japan are summarized in the below table:

Table 3-3: Desirable items learned in Japan

Areas	Item desired by NDDB/MIT to be learned in Japan
Knowledge on food safety	・ International trend of food safety, GFSI, FSSC22000, EHEDG, and 3A ・ CIP and cleaning system, and cleaning results checking system in Japan ・ How to use disinfecting water and ozonized water ・ How to use sodium hypochlorite, hypochlorous acid water, and low-acid water ・ How to use joule heating ・ New online checking devices after packaging

Areas	Item desired by NDDB/MIT to be learned in Japan
	・ Food safety regulation such as raw milk in Japan to compare with situation in India ・ How to measure antibiotics with which devices ・ Relation between temperature and bacteria growth ・ Ne analyzing devices used in Japanese lab
Discussion and field visit	・ Discussion with Japanese dairy processors ・ Discussion and field visit to Japanese farmers
Other than food safety	・ Animal health ・ Breeding ・ Animal nutrition

Source: JICA Survey team

Regarding trainers for the field of Business Management, the number of qualified NDDB officers is still few because the history of the trainings of this field is shorter than that of Food Safety. NDDB has organized the intensive business management and marketing trainings for NDDB officers to enhance their knowledge in this field but it is still in need to mobilize external resources from IRMA or other institutions that are mostly categorized into Category 1 in the attachment 3-3-1.

3-3-2. Areas suitable to utilize Japanese expertise and potential resources for the capacity development for these areas

(1) Business management

- Total Quality Management (TQM)

As for quality control of plant, there are mainly two approaches. One is bottom-up approach, such as 5S, Kaizen, and QC circle where the employees take initiatives rather than the top management, which started from Japanese factories or plants. The other is top-down approach, such as TQM based on the organizational leadership. According to the observations about the Federation and Milk Unions, the survey team found that in Indian dairy cooperative context, it would be appropriate to first start with top-down approach, TQM with policy management (Hoshinkanri), and then gradually move to bottom up approach.

From 1991 until 2011 approximately 250 employees of GCMMF and some Milk Unions of Gujarat State had participated in training programme on TQM, 5S, Kaizen organized in Japan by AOTS (The Association for Overseas Technical Cooperation and Sustainable Partnerships) at their own expenses. In their plants, policy management (Hoshinkanri) based on TQM and day-to-day management based on 5S, Kaizen have been implemented well, and it was observed that motivation of staff for quality work is high, and visualization in the plant and efforts of employees to achieve the target have been in progress. GCMMF and the Milk Unions who have sent their employees to the training programmes have recognized the impact brought in by those employees in their organization. These training programmes have not only helped their employees in enhancing their knowledge and skills but also positively impacted their attitude towards work in the organization. These are shared with NDDB occasionally. The survey team considers that TQM training

programmes in Japan organized by AOTS are useful for Cooperatives that have a certain level of management resources, such as human resources, production system, financial management to lead further improvement in their management and quality control.

- Leadership development for managers of Cooperatives

As stated above, top-management approach rather than bottom-up approach as a starting point would be more suitable for business management and plant management & operation in context of Indian dairy cooperative. In Bihar the survey team observed the Cooperatives that have been operated soundly under a strong leadership of MD who has steered product development suitable for the market and implemented kaizen ideas for plant management & operation. How top management can generate innovative ideas free from the established stereotype ideas and how they can set the goal and direct the organization to align with it are a key to success. In this regard, the VLFM (Visionary leaders for manufacturing) / CSM (Champions for societal manufacturing) training programme that has been proved effective for enhancing the leadership of top management from manufacturing industries was examined. The basic principle of VLFM / CSM is written in the box below. VLFM / CSM programmes have been supported through JICA's technical cooperation project in partnership with Confederation of Indian Industry (CII) since 2007 to the present.

As dairy cooperatives in India have a high public role, it would not be so appropriate to directly introduce the VLFM / CSM programmes originally targeted at the top management of a private company in India. Thus, it was considered to modify VLFM / CSM programmes to make it in line with dairy cooperative environment with a collaboration between NDDB and CII. However, as PGDMX(R) developed with a collaboration between NDDB and IRMA mentioned in 3-3-1 has just started, it is decided that NDDB will figure out the effectiveness of this newly developed program for leaders.

The unchanging elements of VLFM/CSM

<From Effective Managers to Visionary Leaders>

Senior managers are often focused on solving current problems. A visionary leader has the ability to identify the **future invisible challenges** and find solutions for them. In a world that is undergoing drastic changes companies cannot survive only by solving current problems. Apart from strong execution capabilities and the skill to motivate people, a visionary leader must have **a noble mind**, which enhances the viewpoint of the person. A visionary leader also has the **three eyes of control, incremental improvement and breakthrough**.

<From small m to BIG M>

India is undergoing drastic changing, especially in areas related to society, environment and technology. Awareness of such factors is critical for senior managers to effectively lead their companies in periods of drastic change. VLFM/CSM is designed to focus on transforming the mindsets of senior managers from "small m" to "BIG M". VLFM/CSM focuses on mindset change from a production-oriented, i.e. small "m" mentality to developing a holistic view of manufacturing such as R&D, Product Design, Customers and supply chain. In addition, it includes societal and environment related changes as well. This is the BIG M concept.

Source: VLFM/CSM brochure

(2) **Food safety**

- Food safety technologies and system applied by cooperatives

In Japan, cooperatives procure milk from farmers and ship it to processors. For better milk quality, farmers and cooperatives put a lot of effort, by not only complying with law and regulations but also setting up their own standards and regulations. Roles and activities of farmers and cooperatives, practices applied by farmers, quality check system and price incentive system for food safety can be introduced to Indian stakeholders.

- Food safety technologies and system applied by dairy processors

After receiving milk from cooperatives, dairy processors also implement many kinds of measurements for food safety, including quality check system of ingredient and final products, plant design, plant management practices and so on. Those technologies, skills, and practices can be introduced to Indian stakeholders. Meiji Co. Ltd., Morinaga & Co., Ltd., and Megmilk Snow Brand Co., Ltd. are the three biggest dairy processors in Japan. Yotsuba Milk Products Co., Ltd. is owned by cooperatives, and their mission and strategies can be learnt by Indian stakeholders to consider what kind of strategies can be made by dairy cooperative in India to compete with private dairy companies.

- University

There are some university which teach veterinary science in Japan, and Obihiro University of Agriculture and Veterinary Medicine is one of the best universities to study veterinary science for dairy animals and dairy food processing in Japan. The university has experimental farms and dairy processing plant with HACCP and FSSC22000 certificates, and it provides veterinary science courses in English as accepting foreign students including Indians. It also has good experience in implementing JICA training courses.

- Japanese dairy-related machinery manufactures

There are some Japanese dairy-related machinery manufacturers who sell or are interested in selling their products in India. Those manufacturers have advanced technologies related to improving food safety and cost efficiency. Learning and exchanging experiences with those manufacturers may contribute to better understanding of technologies.

(3) Exposure visit in Japan

The exposure visit was implemented as “invitation programme to Japan for dairying through cooperatives” from November 12 to November 21, 2018 in Japan in order to identify potential resources and training contents related to Japanese technologies, knowledge, and experiences which would enhance impact of the JICA project. The outline of the programme is summarized in below table and more detail is attached

as Attachment 3-3-2.

Table 3-4: Outline of the exposure visit in Japan

Date	Institutions visited and contents of lecture and visit	
	AM	PM
Nov. 13 Tuesday	Obihiro city ・ Courtesy visit to vice mayor ・ Overview of Food Valley Tokachi	JA Tokachi (Agricultural Cooperative Federation) Livestock test center ・ Overview of the dairy sector in Japan ・ Activities of JA Tokachi ・ Site visit to milk quality test center
Nov. 14 Wednesday	Obihiro University of Agriculture and Veterinary Medicine ・ Overview of the university ・ Site visits to the university	JA Tokachi Shimizu-town ・ Organization of agriculturaCTooperative ・ Activities of JA Tokachi Shimizu town
Nov. 15 Thursday	Meiji Co. Ltd., ・ Overview of the firm ・ Site visit to the plant ・ Q&A session	HOKUREN Federation of Agricultural Cooperatives ・ Overview of Hukuren ・ Price of milk Overview of feed plant
Nov. 16 Friday	Yotsuba Milk Products Co.,Ltd ・ Overview of the firm	Tsuchiya manufacturing Co,Ltd. ・ Overview of the firm
Nov. 17 Saturday	Orion Machinery Co. Ltd., ・ Overview of the firm ・ Overview of dairy section in Nagano ・ Visit to the plant	Orion Machinery Co. Ltd., (cont.) ・ Visit to exhibition hall ・ Q&A session
Nov. 19 Monday	Retailers visits	Study and communication session with Japanese dairy related companies
Nov. 20 Tuesday,	JICA ・ Courtesy visit ・ Feedback session	Ministry of Agriculture, Forestry and Fisheries ・ Courtesy visit ・ Overview of dairy sector in Japan

Source: JICA Survey team

Because of quarantine restriction such as prevention of foot-and-mouth (FMD), it is difficult for persons coming from FMD contaminated countries, including India to visit farms and livestock related places within about two weeks after arriving in Japan. The participants from India strongly requested to visit farm, dairy processing factories, feed plant, and facilities in the university, but the requests could not be fulfilled all. Based on this restriction, the contents of the Japan training held under the JICA project will be designed.

The feedback on the programme was received from the participants during the feedback session on 20th November 2018 at JICA Headquarter. The comments of the participants received at the session are as follows:

Table 3-5: Feedback from the Exposure Visit Participants

Area	Major comments
Useful areas for the training	・ Improvement of milk productivity (including the knowledge on feed)) ・ Processing plant（automation technology, quality assurance, processing technology, food safety） ・ Cold chain management (including simple testing technique) ・ Transfer of practical technology from Japanese firms such as Meiji, Orion Machineries, and ITE

Area	Major comments
	・ 6 sigma (state of art technique in Japan), packaging, energy saving technology, technology to extend shelf-like, food safety technology
Areas that are not useful	・ Breeding ・ Marketing (there are good resources available in India)
Expected participants of the training	・ Trainers of NDDB/MIT and Cooperative Federations and Unions ・ Professional staffs of Milk Unions (one staff each from operation, marketing, and engineering)
Duration of training	・ Repair technique of equipment such as broiler (5-7 days) ・ ETP Plant, energy saving technique (however, 15 days would not be sufficient to learn those topics)

Source: JICA Survey team

As pointed out, in addition to state of art technique on management and food safety, state of art technique on business management (6 sigma), improvement of milk productivities, processing technologies and practices, and energy efficiency can be focused areas of Japan training under the JICA project.

4. PROJECT FORMULATION PROCESS

4-1. Philosophy and Concepts of the Capacity Development Component

To address the concerning issues needed to be improved described in Chapter 2 and consideration on CD described in Chapter 3, the following principle to design the CD component of the project is set:

✧ Business Management and Food Safety through the value chain:

"Holistic approach to manage the entire flow of the value chain" is the core concept of the proposed capacity development, both in business management area and in food safety area. As the project offers a series of loan in each step of the value chain, from the upper-stream (milk procurement) to the lower-stream (marketing) of the value chain, the capacity development will support the end-borrowers to make the most of those infrastructures by offering holistic approach of business management and food safety that enables to cover the entire value chain.

Business management capacity development will put emphasis on the management of the value chain through the "market-in approach", focusing on the management of the whole value chain highly responsive to the consumer needs and market requirement. In this sense, managing directors and head of departments who formulate and implement the institutional strategies will be the main object of the capacity development.

Food safety capacity development will put emphasis to cover the food safety capacity development to different stakeholders throughout the whole value chain, from milk producers and DCS workers to the plant managers and plant operators and quality assurance technicians.

✧ Practical and Field-Oriented:

Another important concept of the capacity development proposed for this project is to be as much as possible practical and action-oriented. In this sense, most of the proposed capacity development programmes will consist of on-the-job trainings and actual implementation of the learned skills and techniques to the working place. It is also field-oriented because the instructor will visit the plant or to the milk unions.

Business strategy will be formulated and implemented by the participants managers or managing directors. Based on the formulated business strategy, marketing research will be implemented, and the result of its analysis will be utilized for the improvement of existing products or process and/or introduction of new products.

In food safety, although the installation of adequate equipment is crucial for the plant hygiene, workers awareness on hygiene, such as wearing shoes, mask and air shower is important. The control of temperature is also important. The proposed capacity development will introduce on-site review and guidance in the field.

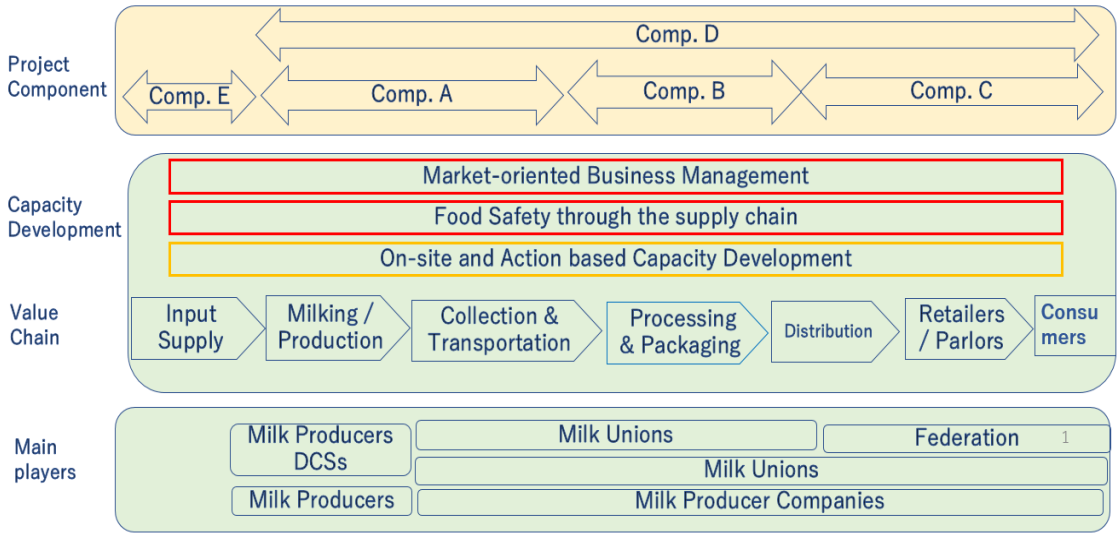
4-1-1. Proposed Capacity Development Mix: DPR and recommendation from JICA study team

The proposed project "Project for the Dairy Development" will be comprised of seven components: A) Strengthening of Milk Procurement Infrastructure, B) Strengthening of processing and manufacturing facilities, C) Support for Marketing Infrastructure, D) Support for ICT Infrastructure, E) Productivity Enhancement, F) Project Monitoring and Studies, and G) Training and Capacity Building (See Table 4-1).

These components of the project cover the entire dairy value chain as shown in Figure 4-1.

Table 4-1: Components of the Dairy Sector Development Project

Component A	Strengthening of Milk Procurement Infrastructure
Component B	Strengthening of processing and manufacturing facilities
Sub-component B1	Milk processing facilities and manufacturing facilities for value added products
Sub- component B2	Feed & feed supplements manufacturing infrastructure
Component C	Support for Marketing Infrastructure
Component D	Support for ICT Infrastructure
Component E	Productivity Enhancement -through nutritional intervention-
Component F	Project Monitoring and Studies
Component G	Training and Capacity Development



Source: JICA Survey Team

Figure 4-1: Project components, Value chain and Capacity Development

(1) Capacity Development for Business Management and Project Components

Most of the dairy cooperatives have focused their efforts in strengthening of their milk procurement

operations on the conventional concept of product-out management. As the milk procurement volume increases, and competition in consumer market increases, the importance to incorporate marketing strategy and brand management as the cooperative's overall management strategy becomes crucial.

JICA Survey Team proposes to provide a set of business management capacity development programs which consists of the following mutually related modules incorporating the concept of market-in based business management. The contents of the proposed modules will be identical for Component A, B, and C.

- Business management and strategic planning
- Marketing Management
- Strategic Management and Total Quality Management (Training in Japan)

(2) Capacity Development for Food Safety and Project Components

As for Component A (Strengthening of milk procurement infrastructure), the upper stream of the dairy value chain is substantial; many kinds of programs were developed and implemented during the NDP I. However, from a food safety point of view, the JICA study team recommended a few training contents and expansion of targets under Component A.

On the other hand, as for Component B (Strengthening of milk processing & manufacturing facilities), although the Mansinh Institute of Training, Mehsana (MIT) already has range of training & capacity development programme related to dairy plant management. Looking at the current situation of dairy plants of milk unions, capacity development needs of their personnel and activities proposed under the project, there is a need to further customize the contents of the capacity development programme. Therefore, additional training contents focusing on food safety including lecture, OJT/practices, on-site consultation, and field visits for plant design and management are proposed under the project. As for QC techniques and practices for Lab staff, there are already substantial number of programmes, and the person in - charge of quality control in the union practices it according to the guidelines. Milk unions having the ISO22000 certification are managed well. Therefore, optional training programme for QC technicians is proposed.

As for Component C (Support for marketing infrastructure), part of downstream of the dairy value chain, the JICA study team found it needs to be improved; temperature handling or controlling is the most important part of improvement. Existing retailer awareness program proposed under the project mainly focuses on marketing aspects, but food safety point of view can be included.

(3) Comparison of training contents between DPR and recommendation from JICA study team

The JICA study team recommends adding new training programmes or modifying some training contents for Component A, B-1 and C in relation to business management and food safety as summarizing below.

Table 4-2: Comparison between Training Courses proposed by NDDB and JICA study team

Component	Training or Program Title proposed by NDDB	Training Programme Selection (→: selected training program)	Recommendation points by JICA team to be incorporated into the NDDB's planning module
A	➢ **Farmers' induction program**	←	
A	**Awareness program on clean milk production**	→ JICA team's recommendation points are written in the right row, which to be incorporated into NDDB's existing module mentioned on the left side.	➢ **Clean milk production and milk quality management at village level (FS-A1-2)** ✧ Training contents are as per the proposal from NDDB. NDDB proposed this awareness program for members in new DCS. ✧ In addition, the JICA study team proposes to cover members in existing DCS if they have not received clean milk production training in past certain years. ✧ The outline (called "schedule" in the term used at NDDB) that NDDB has already had is used and existing DCSs of the PI (Comp A) will also be targeted. ✧ At least 30% of the participants should be female.
A	➢ **Management Committee Members (MCM) Orientation programme for New DCS**	←	
A	➢ **Board of Directors (BOD) orientation program**	←	
A	➢ **Business Appreciation Program for Existing Proc. Staff**	→ This module includes ToT function for FS-A1-2 but does not include Action Plan development, which is going to be reviewed and guided at FS-A1-3	Recommend to insert points to enable PIs' section head, officers, supervisors and staff in charge of milk procurement to: 1) recall the importance of quality control during milk production and milking at farm and procurement from farm to plant; 2) know possible measures for ensuring better milk quality 3) how to train the farmers for better quality milk 4) develop an action plan to improve raw milk quality ➢ **Clean milk production and milk quality management at village level (FS-A1)**
A	➢ **Basic Training for new DCS Secretaries**	←	
A	➢ **Refresher Training of DCS secretaries**	←	
A	➢ **Operation & Maintenance of BMC/AMCU/DPMCU Operators**	←	➢ Importance of temperature control of milk in BMC ➢ How to clean BMC and other facilities (it may need to be discussed with QA group)
A	Strategic Dairy Business Management for MD & Section Heads	→ Replaced by BM-1-1	➢ **Business Management and Strategic Planning (BM-1-1)**

Component	Training or Program Title proposed by NDDB	Training Programme Selection (→: selected training program)	Recommendation points by JICA team to be incorporated into the NDDB's planning module
B	Dairy Plant Management	→ Replaced by FS-B1-1, -2, -3, -4@PI	➢ **Dairy Plant Management and Plant Hygiene and Sanitation (FS-B)**
B	Dairy Plant Hygiene and Sanitation ensuring compliances of FSSAI regulations		
B	Modern Dairy Management practices including TQM, Kaizen, 5S, ISOs	→ Replaced by BM-1-1, FS-B1-1,-2,-3 and BM-JP	➢ **Business Management and Strategic Planning (BM-1-1)** ➢ **Dairy Plant Management and Plant Hygiene and Sanitation (FS-B)** ➢ **Training in Japan for Strategic Planning and TQM (BM-JP)**
C	➢ **Retailers Awareness Programme**	←	Proper handling of milk and dairy products for food safety
C	Marketing Management Training for officers	→ Replaced by BM-2-1, 2-2@PI, 1-3@PI)	➢ **Marketing Management (BM-2)**
C	Marketing Approaches in Milk & Milk Products for marketing team	→ Replaced by BM-2-1, 2-2@PI, and 1-3@PI)	➢ **Marketing Management (BM-2)**
E	➢ **Software Training at POI Level**	←	
E	➢ **Training at DCS Level**	←	
E	➢ **Training to Animal Nutrition Officers**	←	
E	➢ **Training to AN and CRP Supervisors**	←	
E	➢ **Milch animal rearing for dairy farmers**	←	
E	➢ **Fodder Development (Newly added by NDDB)**	←	

Source: Survey Team

In addition to training programmes itself, the JICA study team proposes to conduct sensitization workshop at project commencement stage as targeting to all the eligible PIs to sensitize them about various aspects of business management and food safety practices and motivate them to envisage assistance under the JICA project. The sensitization workshop for two types of decision makers of PIs will be conducted as given below:

Table 4-3: Outline of Sensitization Workshop

Target	Mode
Managing Directors of PIs including milk unions and federation	Conference or workshop type of activities

Chairman and elected board members of milk unions and federation (producer members)	Conference, workshop type of activities or video viewing

4-1-4. Principle of Capacity Development for Business Management

The principle of capacity development for business management is summarized into two points, i) Introduction of market-oriented business strategy, and ii) Practical and field-oriented capacity development.

Principle of capacity development for Business Management:

(1) Introduction of market-oriented business strategy, and

(2) Practical and field-oriented capacity development

(1) Introduction of market-oriented business strategy

Although further analysis is required for each dairy cooperative and its products, major bottleneck of the cooperatives lies on the decline or stagnation in sales caused by a higher competition in the market. Generally, cooperatives give more attention to their milk procurement operations. This system will work if the targeted local dairy consumer's market is less competitive. But in most of the cases, the dairy market is becoming highly competitive in recent years, especially in the urban areas. Thus, introduction of market-oriented business strategy is essential to compete in the market. In some cases, market-oriented business strategy would require a change in mind-set and good coordination between the Board Members, General Managers, Managing Directors and Departmental Heads in every organization.

.

(2) Practical and field-oriented capacity development

Most of the existing courses on business management are based on lectures in the classroom with limited period between 3 days to 5 days. Capacity development for business management and marketing will be highly effective if the courses not only offers lecture-type classes, but also introducing on-the-job and practical methods such as formulating, implementing and monitoring the participant institutions marketing and business strategy. Field-oriented capacity development such as 5S-Kaizen will also be effective, to increase not only productivity but also motivation and discipline in the processing plant.

4-1-5. Target situations

The following list describes the targeted situations of district unions and state federations in the fields of business plan, marketing, and product development:

Capabilities:

- The management of the district unions and state federation become able to do proper scenario planning

and to modify the plans responding to the changes of the business environments.

- The management and the staff of the dairy union and federation have common ideas of their brand and branding.
- Marketing department of the dairy union become able to conduct regular market research in a systematic way.
- Dairy unions and federations become capable of developing new product regularly.
- Financial department become capable of producing and analyzing necessary data for strategic planning.

Operation:

- Data related to key indicators of business management in sales, production, and procurement are systematically collected and analyzed, and the targets of the business plans are regularly monitored.
- Necessary market information for managing the cooperative is regularly collected.
- The new products are developed regularly.
- Capacity utilization rate does not fall below 70% even in the lean period.

Customer:

- Cooperatives maintain or increase the market share of dairy products in the state, which upholds the brand awareness among the consumers.
- Consumers' emotional connections and loyalty to the cooperative brands are maintained or improved through effective brand management.

Financial;

- Market share of the cooperatives does not decrease.
- The share of liquid milk sales to total sales turnover is decreased and that of high value-added products is increased, which increase their capacities to accrue profits.
- Cooperatives make profits sustainably.

4-1-6. Principle of Capacity Development for Food Safety and Quality Control

Many programs are well developed and implemented as mentioned above, however, there are still many problems to be seen in the value chain between DCS and MU, as well as between MU and retailors, not only from the food safety perspective, but also from effective management on physical safety and investment for farmers and workers. Lack of awareness may be the main reason of the problems. Less participants who can attend to trainings due to hard working environment in MUs and shortage of training budget could be another reason. To improve this situation, the JICA study team considers that it is imperative to focus more on action program to get practical and actual improvement on the ground, introducing on-the-job training and post

training review for food safety program rather than concentrating on lecture-type training. It is also essential to improve the food safety through the entire value chain, since problems in just one of the process in the value chain will damage the quality of all final products.

Therefore, the principle of capacity development for food safety and quality control is summarized into two points,

i)	Practical and field-oriented capacity development
ii)	Improvement through entire value chain.

In addition to this, the JICA study team pays attention to two categories. One is the hygienic practice, because many of these plants the JICA study team visited do not have enough hygienic design or satisfactory situation to keep the product safer. Thus, it is important to increase hygienic topics to be focused in the program. And how to raise awareness and keep motivation is another main issue.

(1) Practical and field-oriented capacity development

In order to improve the effectiveness of the training, on-the-job training and implementation of what one have learned from trainings is very important. Each training module of the new food safety programme consists of three or four sessions: lecture, OJT (for some modules), on-site consultation at each site, and post training review or reflection workshop. Some award system may provide PIs to implement what they learned during the training on the ground. Therefore, award for PIs is also proposed by the JICA study team.

It must be very effective to show the progressive plant in terms of food safety management at plant, especially worker's working style, worker's inlet system, QC laboratory and device, inspection of foreign matters after packaging, CIP and processing room situations on the plant newly constructed in India and also in Japan. Based on this principle, the detail capacity development component is being designed.

(2) Improvement through entire value chain

The milk quality assurance and control system of dairy products has many aspects to be improved. Therefore, the measures have to be covered through all the entire value chain, from cow to consumers. In this context, capacity development component is being designed.

4-1-7. Target situations

The following describes the targeted situations of PIs in the fields of food safety management:

a) Basic knowledge

- Top managements and plant manager understand international trend and knowledge of food safety such as principle of food safety, GFSI (Global Food Safety Initiative), FSSC (Food Safety System Certification)22000, and EHEDG (European Hygienic Engineering and Design Group) in addition to domestic laws and regulations. Because awareness of food safety movement is spreading rapidly throughout the globe, so many points are very helpful and should be adopted.
- All the MUs keep applying HACCP properly, and have or keep trying to acquire ISO22000 and NDDB Quality Mark certificates.
- Top managements and employees deeply understand risk and responsibility as a food operator.

b) Plant management

- The key points from factory environment, production facility, operational aspects and QC point of view are applied to the actual production level
- Managers and operators pay their attention always to food safety, including quality control, operational conditions, equipment and devices, maintenance, and record keeping to make sure that food safety at the facilities is surely progressing.

c) Value chain management

- Food safety system is continuously improved with all together among top management, general manager, the lab personnel, operators and engineers at PIs. They pay careful attention and have responsibility on food safety management from famers to consumers. They continue improving their hygiene management.
- All dairy farmers understand proper milking procedure as well as proper knowledge on quality milk production and apply it.
- At DCS level, temperature control and hygienic awareness of raw milk is the key. Raw milk temperature is kept as low as possible ideally below 4 to 6 degree C at BMC and chilling center, not easily goes up to ambulant temperature, and BMC operation and cleaning are satisfactory. At the distributor level, all the transportation facilities have refrigeration or insulated system. At the retailors level, such as shops and parlors, keeping the temperature below 4 to 6 degree C is the most significant point. All of them also should have coolers or refrigerator in their facilities.

4-2. Current Organizational Capacity Related to Fund Management

Organizational capacity of the major stakeholders of the project is as shown below:

4-2-1. NDDB

NDDB is the implementing agency of the project, which will receive the funds from DoAHD and disburse to end borrowers/Participating Institutions (PIs) as per the terms and conditions of the project. Currently, NDDB is implementing a central sector scheme- Dairy Processing & Infrastructure Development Fund (DIDF) Scheme and also managing Long-term and Short-term loans to cooperatives from its own resources. Details given as under:

Table 4-4: Schemes handled by NDDB

Scheme	Infrastructure (long term) loan by NDDB	DIDF
Terms and Conditions	Annual interest rate: 8.25% Repayment: 10 years including 2 years moratorium period	Annual interest rate: 6.5% Repayment: 10 years including 2 years moratorium period
Period of scheme	Regular	2017-18 to 2019-20
Loan size	5-year annual average (2012-13 to 2016-17) Average disbursement: INR 236 crores Average principal repayment: INR 128 crores Average interest paid: INR 58 crores	Total cost: INR 10,881 crores, of which 8,004 crores are covered by loan (20% contribution from end-borrowers).
Project areas	All over India	All over India
Implementing	NDDB	NABARD-> NDDB and NCDC

Source: NDDB

In addition to the above, the working capital loan (short term) is also provided by NDDB with annual average disbursement of INR 135 crores during 2012-13 to 2016-17. For all loan cases, NDDB carefully assesses their proposal, and prepares appraisal reports in coordination with concerned technical groups. In their long-term infrastructure loan, the actual repayment rate against the loan due has been almost 100% in the last five years as shown below.

Table 4-5: Disbursement, and Repayment of Term Loan (long term for infrastructure) by NDDB for Five years

Rs. in crores		2012-13	2013-14	2014-15	2015-16	2016-17	average
Disbursement		168.82	274.25	235.92	278.56	224.28	236.366
Repayment							
Due	principal	82.87	108.89	86.83	197.61	162.75	127.79
	Interest	34.24	48.17	63.45	71.02	73.48	58.072
	Total	117.11	157.06	150.28	268.63	236.23	185.862
Actual	principal	82.81	108.83	86.78	197.56	162.71	127.738
	Interest	34.23	48.17	63.44	71.02	73.48	58.068
	Total	117.04	157	150.22	268.58	236.19	185.806

Rs. in crores		2012-13	2013-14	2014-15	2015-16	2016-17	average
% Repay	principal	99.93%	99.94%	99.94%	99.97%	99.98%	99.96%
	interest	99.97%	100.00%	99.98%	100.00%	100.00%	99.99%
	Total	99.94%	99.96%	99.96%	99.98%	99.98%	99.97%

Source: NDDB

In addition to the above, NDP I is currently being managed by NDDB. A PMU (Project Management Unit) was formed to manage NDP I. The current accumulated disbursement is around INR 1,633 crores (as of March 2019) out of total INR 1,760 crores. Though the funds given to the stakeholders is grant, not loan, the size of fund management is more than what is expected for the JICA project.

In the view of the above, it can be inferred that NDDB has experience on fund management of similar projects, including loan disbursement, appraisal of proposals, & repayment management therefore, they can handle JICA's loan.

4-2-2. State Milk Federation

The roles of the state milk federations are different from milk unions in a state. During field visit, two categories of federations have been observed as follows:

1) A coordinating body among district-level milk unions

In Madhya Pradesh State, the federation coordinates with the milk unions for policy planning, overall strategy development, product branding and monitoring. The federation is not involved in any business transaction such as procuring milk, processing, and selling. In case of externally aided projects and government schemes federations generally act as a link between the milk unions and funding agency and sometimes funds are disbursed through the federation to milk unions. Therefore, federation may play a role in decision making and overall monitoring of the JICA sub projects.

2) A business body to deal with dairy products

The Gujarat Cooperative Milk Marketing Federation (GCMMF) markets surplus milk products available with its member milk unions within and outside the state. The federation also has processing and manufacturing facilities for value added products to handle the surplus milk procured by its member unions. The Bihar State Milk Cooperative Federation Ltd. (COMFED) has similar function as that of Gujarat state. The Bihar milk federation is registered as Multi-state milk cooperative, as they operate in Jharkhand state also. (Jharkhand state was separated from Bihar state in year 2000).

The Rajasthan milk cooperative federation has a hybrid function. The federation basically liaise and coordinate with the unions for production of milk and milk products. However, the federation also has a cattle feed plant and directly manages the cattle feed business. The Uttar Pradesh State federation (Pradeshik Cooperative Dairy Federation, PCDF) currently does not have any processing plant but markets surplus milk

products available with its member milk unions within the state. In near future, if the restructuring plan is implemented, Uttar Pradesh State federation could operate seven new plants.

The category (1) federation receives commission from the unions to cover their expenses. The category (2)'s income is from their business operation and sometime commission from the unions also depending upon their functions.

In the loan component, main targeted federation shall be the latter federation depending upon their business domains under the project. The former federations are involved for a coordinating purpose. In any case, upon proposal submission, their roles and functions should be clearly stated for appropriate appraisal.

Major financial status of federations visited are shown in the table below:

Table 4-6: Financial Status of Five Federations Visited

State	Gujarat	Uttar Pradesh	Bihar	Madhya Pradesh	Rajasthan
Category (stated in the above)	2)	2) partially hybrid with 1). Some milk products are transacted.	2)	1)	2) partially hybrid with 1). Cattle feed is run by federation
BS 2016-17 (Total size of assets and liabilities)	INR 2,674 crores	INR 2,018 crores (Accumulated Loss: INR (-) 67 crores)	INR 643 crores	INR 41 crores (Accumulated profit: INR 2.5 crores)	INR 468 crores (Accumulated profit: INR 71.2 crores)
PL 2016-17	Sales, not including other income: INR 27,043 crores	Turnover: INR 304 crores	Turnover: INR 908 crores	Turnover: no business transaction	Turnover: INR765 crores
		Gross profit (not including other income): INR 7.7 crores	Gross profit (not including other income): INR 66.2 crores	Gross profit (not including other income): INR 9.4 crores	Gross profit (not including indirect income): INR 31.4 crores
	Net profit (after tax): INR 47 crores	Net Loss: INR (-)27.1 crores	Net profit (after tax): INR 23.2 crores	Net profit (after tax): INR 0.7 crores	Net profit (after tax): INR 22.1 crores
ROE (16-17) (= Net profit/ equity)	Equity (capital); INR 451 crores ROE: 10%	Equity (capital); INR 122 crores ROE: -22%	Equity (capital); INR 227.2 crores ROE: 10 %	Equity (capital); INR 27.7 crores ROE: 3%	Equity (capital); INR 195.7 crores ROE: 11%

Remarks: *: Amul adopts a different form of financial statement from other unions, and statements are different even in other unions. Thus, some indicators which include some items may not exactly the same in other unions as they are not included in the same indicators in another unions. Here "equity" tentatively is calculated to include "reserve" if it is shown in BS in the same side.

Source: Survey team based on the information given by each federation

All the federations visited are financially independent in principle, except the Uttar Pradesh federation with the financial assistance from the state government for their operation loss.

The Gujarat federation had the biggest size in terms of BS, while the Madhya Pradesh federation was the smallest in 2016-17 because of their nature of operation (Gujarat has milk processing facility, complete dairy

business, while MP does just coordination). UP also shows the bigger BS size, however it availed huge loans and recorded accumulated net loss, while others did not.

Annual turnover (=sales in the above table) of the Gujarat federation is the highest as compared to the other federations.

Though the UP federation recorded gross operation profit, but incurred net loss due to high administration costs, indicating ineffective management in the federation (the Rajasthan federation spent INR 9.3 crores for administration cost, while the UP spent INR 34.8 crores, even, UP Federation does not have any plants). The Bihar federation, which has processing facilities and involved in marketing activities, showed good financial health in 2016-17, recorded INR 66 crores as gross profit and INR 23 crores as net profit.

In terms of ROE, though it would be difficult to draw clear conclusion purely from the above figures, as cooperatives follow the philosophy of passing on maximum share of sales revenue to its producer members, Gujarat, Bihar, and Rajasthan recorded around 10% ROE as business entities, while UP showed negative figures as they incurred net loss.

As such, depending upon the situation of the states, the operation and management of federations are different. When they apply for the loan under the project, financial statements should be carefully analyzed and financially viable sub project may be approved.

4-2-3. Milk Unions

The district level milk unions are the main body to procure milk from producers via DCS, and process milk to milk products, and sell the products to consumers (or federation), meaning that unions are main business bodies as processing entities in the dairy value chain. Therefore, unions are main targets under the project as end borrowers of the sub-loan. During the survey period, the team visited six different unions in five states. The main features in the financial statements are summarized as below:

Table 4-7: Financial Features of Six Unions Visited

Union	**Kaira Milk Union**	**Lucknow Milk Union**	**Gorakhpur Milk Union**	**Patna Milk Union**	**Bhopal Milk Union**	**Jaipur Milk Unions**
State	**Gujarat**	**Uttar Pradesh**	**Uttar Pradesh**	**Bihar**	**Madhya Pradesh**	**Rajasthan**
BS 2016-17 (Total size of assets and liabilities)	INR 1,760 crores	INR 241 crores (accommodating accumulated loss INR (-) 35 crores)	INR 22.3 crores (accommodating accumulated loss: INR (-)8.2 crores)	INR 301.8 crores	INR 242 crores (accommodating accumulated profit: INR 47.8 crores)	INR793 crores (accommodating accumulated profit: INR 159.7 crores)
PL 2016-17	Net revenue from operation (not including other income): INR 5,700	Turnover: INR 163 crores	Turnover: INR 11.3 crores	Turnover: INR 474.8 crores	Turnover: INR 712 crores	Turnover: INR 1,635 crores

Union	Kaira Milk Union	Lucknow Milk Union	Gorakhpur Milk Union	Patna Milk Union	Bhopal Milk Union	Jaipur Milk Unions
State	**Gujarat**	**Uttar Pradesh**	**Uttar Pradesh**	**Bihar**	**Madhya Pradesh**	**Rajasthan**
	crores Net profit (after tax): INR 21.8 crores	Gross profit (not including indirect income): INR 17 crores Net loss: INR (-) 1.7 crores	Gross profit (not including indirect income): INR 0.3 crores Net loss: INR (-) 2 crores	Gross profit (not including indirect income): INR 34 crores Net profit (after tax): INR 2 crores	Gross profit (not including indirect income): INR 83 crores Net profit (after tax): INR 30 crores	Gross profit (not including indirect income): INR 101.9 crores Net profit (after tax): INR 40.4 crores
Milk procurement volume (TkgPD) in 2016-17	2,000	63	4.7	274	376	1,061
ROE (16-17)	Equity (capital); INR 165 crores ROE: 13%	Equity (capital); INR 174 crores ROE: -1%	Equity (capital); INR 11.9 crores ROE: -17%	Equity (capital); INR 107.3 crores ROE: 2%	Equity (capital); INR 94.7 crores ROE: 32%	Equity (capital); INR 175 crores ROE: 23%
Past trend	net profit for the past 2 years	Incurring net loss since 2012-13	Incurring net loss since 2014-15	net profit for the past 3 years,	net profit for the past 3 years	Net profit for the past 6-7 years
Positioning from the above financial performance	*Amul model, a reference union as a very successful union*	*Considered as a less successful union*	*Considered as a poorly managed union (the operational size is small)*	*Considered as a successful union*	*Considered as a successful union*	*Considered as a more successful union*

Remarks: *: Amul adopts a different form of financial statement from other unions, and statements are different even in other unions. Thus, some indicators which include some items may not exactly the same in other unions as they are not included in the same indicators in another unions.
Here "equity" tentatively is calculated to include "reserve" if it is shown in BS in the same side.

Source: the survey team based on the information given by each union

As shown in the above table, the size of Kaira milk union is much bigger than the rest of the milk unions in terms of BS asset size, followed by Jaipur union in Rajasthan state. Except Gorakhpur union, the sizes (INR 200-300 crores) are similar for the rest (three, Lucknow, Patna, and Bhopal). Two unions visited in UP showed accumulated net loss. Net revenue (almost equal to turnover) in Kaira union showed the biggest sales, followed by Jaipur union. When it comes to annual net profit, Jaipur showed highest, INR 40 crores, followed by Bhopal, and Kaira. Bhopal and Jaipur showed higher ROE as 30-20%, followed by Kaira 13%. Interpretation of the amounts or percent of net profit and ROE can vary because the reasons could be several (e.g. new investment, higher benefits returning back to farmers, or, inefficient operation). However, it is expected that net profits will continue in the coming years. In this sense, except the two unions in UP, all unions visited showed annual net profit for the past several years.

Net profits of all the unions (and the federations) in the visited Priority and Other States for the past three years are shown in Attachment 4-2-1. In Madhya Pradesh state, all five unions have net profit for the past three years. However, in Uttar Pradesh state, most of 18 milk unions recorded net loss for the past three years. In Rajasthan state, out of 21 unions, three to seven unions have shown annual net loss for the past seven - eight years, but most unions recorded net profits. In Bihar, out of eight unions, two to three unions have shown net loss in the recent two years. Details of net profit/loss of milk unions and federations is given the table below:

Table 4-8: Annual Net Profits/Loss of All Milk Unions and Federations for Past Three Years in Four States

Uttar Pradesh		2014-15	2015-16	2016-17
	Total of milk unions (total 18)	(-) 2,435.8	(-) 3,312.5	(-) 4,922.2
	PCDF	(-) 151.6	(-) 1,047.3	(-) 2,708.0
Bihar		2014-15	2015-16	2016-17**
	Total of milk unions (total 8)	19.3	(-) 4.7	23.7
	COMFED	922.8	2,351.9	2,322.8
Madhya Pradesh*		2015-16	2016-17	2017-18
	Total of milk unions (total 5)	7,238.0	9,807.8	3,474.0
	MPCDF, Bhopal	12.8	70.0	127.6
Rajasthan		2014-15	2015-16	2016-17
	Total of milk unions (total 21)	2,575.3	6,063.0	6,642.6
	RCDF	238.2	1,754.6	2,211.0

Remarks: Rs in lakh
*: 2015-16, 2016-17, 2018-19
**: provisional except federation
Net profit is after tax. The above may not be exactly the same as the figures of financial statement separately provided by the visited unions (some slight differences).
Source: Each federation visited.

Madhya Pradesh and Rajasthan have earned profits continuously from the operations of all milk unions, whereas Bihar has shown small positive in two years. In these three states, the federations have also earned net profits. On the other hand, the operations of the federation and all unions in Uttar Pradesh have incurred losses for the above three years. The performance of milk cooperative in the states can be inferred from these data, as Madhya Pradesh and Rajasthan perform better than others; followed by Bihar; and Uttar Pradesh situation is relatively poor among the four states.

Current loan

Bhopal milk union has availed loan from NDDB for upgradation of the dairy plant (disbursement was completed in January 2017). The union is repaying the loan as per the agreed repayment schedule (INR 5.2 crores out of the total repayment amount of INR 12 crores has been repaid as of March 2018). However, in case of the Indore milk union, the union had failed to repay the loan availed under Operation Flood Programme. The state government has settled all the outstanding loan amount under One Time Settlement

Scheme (OTS) of NDDB, and it was decided that the union will repay only the principal amount without interest to the state government when they earn net profit. The union has already repaid the principal amount to state government.

Patna milk union has outstanding loan which was availed from NCDC with 11% interest rate per annum for expansion of its processing plants.

To access the sub-loan and secure repayment, the operations of milk unions are necessary to be sustained in a profitable manner. The financial health of the milk unions who intend to avail loan under JICA project, needs to be critically analyzed during appraisal. Out of the above visited milk unions, Jaipur, Bhopal, and Patna could be potential eligible although, investment plans need to be carefully evaluated.

4-2-4. Milk Producer Company

There are also other players in dairy sectors, Milk Producer Company, which are registered under Company Act, and different from dairy cooperative registered under State Cooperative Society Act by nature especially from a viewpoint of business-oriented operation. However, it is also explained that their philosophy is to keep cooperative characteristic based on principles of mutual assistance so as to give benefit back to dairy farmers. The following table shows major features and differences between producer companies and cooperatives:

Table 4-9: Salient Features of Producer Companies and Cooperatives

Features	Producer Company	Cooperative
Legal framework	Central Act and enabling in nature	State Cooperative Societies Act
Area of operation	All over India	Restricted
Share holders	User members only to hold shares	Non users can also hold shares
Voting rights	One member one vote. PCs having only Producer Institutions as its members shall have Patronage based voting rights	One member one vote for all types of cooperatives.
Active member	PC legislation has active member provision. Removal of inactive member is easier.	No provision for active member
Audit	Regular audit by a Chartered Accountant	Audit by cooperative audit department and often audit is delayed.
Professional management	Explicit provision in the Act for Experts on Board	No provision for experts on board
Govt. Nominees on Board	No provision for Govt. nominees	Provision for Govt. nominees

Source: NDDB Dairy Services

According to NDDB Dairy Services, a wholly owned subsidiary of NDDB, there are 14 Producer Companies already established, and another 6 to be established within this fiscal year (2018-19) in all over India. The list of 14 MPCs, which are facilitated by NDDB Dairy Services are shown as below:

Table 4-10: List of Milk Producer Companies Facilitated by NDDB Dairy Services

No	Name	State	Date of incorporation (established)
Companies considered with stable operation			
1	Paayas	Rajasthan	19/05/2012
2	Maahi	Gujarat	07/06/2012
3	Shreeja	Andhra Pradesh	03/07/2014
4	Baani	Punjab	11/08/2014
5	Saahaj	Uttar Pradesh	17/10/2014
6	Bapudham	Bihar	12/04/2017
Companies recently established			
7	Sakhi	Rajasthan	19/03/2016
8	Asha	Rajasthan	21/03/2016
9	Shwetdhara	Uttar Pradesh	25/04/2016
10	Ruhaanii	Punjab	21/10/2016
11	Indujaa	Maharashtra	11/07/2018
12	Muktaa	Madhya Pradesh	01/08/2017
13	Maalav	Madhya Pradesh	18/08/2017
14	Kaushikee	Bihar	22/09/2017

Source: NDDB Dairy Services

Out of the above 14, the first six producer companies are considered as active in terms of business management (stable activities), and the rest of eight companies have been recently established. Out of the six MPCs, the Paayas Milk Producers Company in Jaipur, Rajasthan state was visited as an example. The financial features are shown in the following table in comparison to Jaipur milk union:

Table 4-11: Financial Features of Paayas Milk Producer Company vis-à-vis Jaipur Milk Union

MPC/Union	Paayas Milk Producer Company**	Jaipur Milk Unions (reference)
State	Rajasthan	
Positioning	Considered as a business-oriented model/institution	Considered as a more successful union
BS 2016-17 (Total size of assets and liabilities)	INR 240 crores	INR793 crores (accommodating accumulated profit: INR 159.7 crores)
PL 2016-17	Revenue from operations not including other income: INR 1,056 crores Net profit (after tax): INR 11 crores	Turnover: INR 1,635 crores Gross profit (not including indirect income): INR 101.9 crores Net profit (after tax): INR 40.4 crores
Milk procurement volume (TkgPD)	650	1,061
ROE	Equity (capital); INR 60 crores ROE: 18%	Equity (capital); INR 175 crores ROE: 23%

Past trend

Established in 2012. Net profit since past four years	2013-14	2017-18
Reg. Membership (Nos.)	37,824	97,816
Milk Procurement (TkgPD)	339	760
Turnover (Rs. in million)	4,440	12,820

Net profit since past 6-7 years

	2013-14	2017-18
Reg. Membership (Nos.)	136,516	162,659
Milk Procurement (TkgPD)	906	1,136
Turnover (Rs. in million)	12,702	17,012

Remarks: * see Section 8-1 for more details., **: Paayas adopts a different form of financial statement from other unions. Here "equity" tentatively is calculated to include "reserve" if it is shown in BS in the same side.

Source: Survey team based on the information given by each MPC/union

Since its establishment, Paayas MPC has grown very rapidly. Currently, about 90% of procured milk is sold to bulk buyer such as Mother Dairy, and the rest 10% is processed in the leased processing plant. As per the discussion with the officers, Paayas MPC is focusing on increasing milk procurement volume. It will consider investing in a processing plant based on its milk procurement in the coming years. Its mindset (capacity first) is quite reasonable unlike an idea of infrastructure first. One of reasons could be that in this milk processing business, milk procurement capacity is quite important. The ability to procure certain volume of milk procurement per year constantly (= to establish solid milk processing business at certain scale with human resources at certain level) increases the success rate of investment for processing infrastructure, in a sense that there would be high probability to maintain the optimum level of utilization rate of invested infrastructure in terms of processing capacity. If capacities are not well developed at a time of investment, risks of low utilization rate of infrastructure would be higher. And, if this investment is given by loan, success of business is a key for repayment.

There are more than 150 Milk Producer Companies (MPCs) all over India, if ones which are not facilitated by NDDB Dairy Services (NDS) are counted. According to NDS, most of them do not follow the core design principles as NDS guides.

In the project, as long as their business plans (gradual growth within their capacities) match with the project framework (time frame, as well as target states), Milk Producer Companies will be potential eligible PIs.

4-3. Similar Schemes and Synergy with the project

The following two major schemes are summarized as below:

4-3-1. NDP I

National Dairy Plan, Phase I is being implemented with the assistance of the Word Bank. Main areas of focus are productivity enhancement and strengthening of village-based milk procurement system. This project was initially planned to end in December 2017, but, extended to November 2019.

NDP I is being implemented in 18 states namely Andhra Pradesh, Bihar, Gujarat, Haryana, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Odisha, Punjab, Rajasthan, Tamil Nadu, Uttar Pradesh, West Bengal, Telangana, Uttarakhand, Jharkhand and Chhattisgarh with the total project outlay of INR 2,242 crore. According to the NDDB, there is a discussion to formulate NDP-II, though not yet to be materialized. Focus of NDP-II would be the same as its first phase, upper stream of the supply chain of milk, and coverage would be expanded in the second phase.

In terms of synergy with the JICA project, the unions which have availed funds under NDP I will be eligible for the JICA's project. All nine (Priority and Other) States have been covered under NDP I. Activities being proposed under JICA project will complement the activities being implemented under NDP I.

4-3-2. DIDF

DIDF, Dairy Processing and Infrastructure Development Fund, is a central sector scheme launched by the Government of India in 2017. This scheme provides funds for strengthening of milk processing infrastructure with the dairy cooperatives, which is similar to the component B proposed under the JICA's project. The project is being implemented across the country. The project is funded as a loan by NABARD (National Bank for Agriculture and Rural Development) which is passed on to NDDB and NCDC for onward lending to the milk unions and federations @ 6.5% per annum.

Actual application process started early in 2018, and as of the end as on 11 Dec 2018, 21 sub projects have been approved in five states namely Gujarat, Karnataka, Punjab, Haryana and Maharashtra. Out of the 21 sub projects, according to the NDDB, the fund requirement per institution ranges from around INR 5 to 600 crores rupees, which is also similar in size to JICA's potential PIs.

The fund requirements for strengthening processing capacity are vast all over India, therefore, the JICA's focus can be on poorer but potentially capable institutions.

Synergy with the JICA's project could be to accept unions/federations which will receive financial assistance from this scheme to apply for other components (A, C, D, and E), so that various parts of value chain can be strengthened through DIDF as well as JICA project. Even, such unions/federations could receive the training programs of business management as well as food safety and hygiene which are effective for plant operations. NDDB has the same opinion on the above.

4-3-3. Rashtriya Gokul Mission

The “Rashtriya Gokul Mission” was launched by the Government of India as a project under National Programme for Bovine Breeding and Dairy Development, with an outlay of Rs 500 crore for three years from 2014-15 to 2016-17. The project focusses on conservation and development of indigenous breeds in a focused and scientific manner. The project is funded as 100% grant-in-aid and the area of operation is throughout the country.

Components of the project are a) establishment of Integrated Indigenous Cattle Centres viz “Gokul Gram”; b) strengthening of bull mother farms to conserve high genetic merit Indigenous Breeds; c) establishment of Field Performance Recording (FPR) in the breeding tract; d) assistance to Institutions/Institutes which are repositories of best germplasm; e) implementation of Pedigree Selection Programme for the Indigenous Breeds with large population; f) Establishment of Breeder’s Societies: Gopalan Sangh; g) distribution of disease free high genetic merit bulls for natural service; h) incentive to farmers maintaining elite animals of indigenous breeds; i) heifer rearing programme; award to Farmers (“Gopal Ratna”) and Breeders’ Societies (“Kamadhenu”); j) organization of Milk Yield Competitions for indigenous breeds; and k) organization of Training Programme for technical and nontechnical personnel working at the Institute/Institutions engaged in indigenous cattle development.

Synergy between this mission and the project is expected in the same manner as NDP I. The Unions which have availed assistance under RGM may also seek assistance under JICA project.

PART II THE PROJECT

5. Objective of the Project

5-1. Name

The title of the project is "Project for the Dairy Development".

5-2. Objective

The objective of the project is to increase sales of milk and dairy products by increasing farmers' access to organized market, upgrading dairy processing facilities and marketing infrastructure and enhancing the capacity of Producers' Owned Institutions, thereby contributing to increase in returns to milk producers in the project area.

6. Scope of the Project

6-1. Target Area

The project will be initially implemented in two states namely Uttar Pradesh and Bihar (Priority States). After review of progress on completion of 18 months, if required, maximum three more states from among Madhya Pradesh, West Bengal, Rajasthan, Andhra Pradesh, Telangana, Uttarakhand and Punjab (Other States), will be identified. Stakeholder consultation with these states shall be undertaken prior to commencement of the Project.

6-2. Component, Cost, and Loan Amount

(1) Project Component and Cost

The project components and project costs are shown in Attachment 6-2-1 and summarized below:

Table 6-1: Project Component and Cost

(1/3) Source of finance of the project of the component from A to G

Particulars	Amount (Rs. Crore)	Amount (Million JPY)
ODA loan	812	13,146
GoI Contri.	627	10,157
State/PI Contri.	128	2,029
Total	1,567	25,382

(2/3) Component wise breakup of finance source (Rs. Crore):

Sr.	Component	Activities	JICA ODA loan portion	GOI budget to NDDB*	PI's contribution**	Total
A	Strengthening Milk Procurement infrastructure	Bulk milk coolers (BMC), milk collection tank, cooling unit, generator, BMC accessories, Automatic Milk Collection Unit (AMCU), Data Processor Milk Collection Unit (DPMCU), Electronic Milk Adulteration Testing Equipment, Renewable Energy (Solar) System, DCS/BMC building, Tankers for milk transportation, computer/laptop/tablet, initial operational cost for management of new DCS	145.8	312.1	50.9***	508.8
B	Strengthening Processing and manufacturing facilities	Civil works, processing and production equipment, services equipment, miscellaneous equipment and erection of plant (Milk processing plant, Value Added Product Plant, Cattle feed & feed supplement plants)	516	108.7	69.4	694.1
C	Support for Marketing infrastructure	Walk-in cold store, Milk parlour, Deep Freezer, Visi Cooler, quality management certification, Insulation for marketing van, initial operational cost for marketing activities	38.2	153.9	0	192
D	Support for ICT Infrastructure	Desk-side and network infrastructure, application software, server and network recurring charges, support charges,	7.1	2.7	0	9.8
E	Productivity Enhancement	Mower, chaff-cutter, micro-training center, silage units, fodder storage godown, Laptop, Tablet, camera	30	41.9	8	79.9
F	Project Monitoring and Studies	Some monitoring and evaluation studies, workshops	29.3	9.5	0	38.9****
G	Training and Capacity Development	Necessary trainings as per the above components, focusing on business management, marketing, and food safety and quality control	45.2	-1.9	0*****	43.3
		Total	811.5	627	128.3	1,566.7

Remarks: Unit of the cost is Rs in crores.
Some total shown may not be the same as calculated with the figures in the table due to decimal numbers.
*: Calculated as the sum of "ODA Loan" and "Grant" of "Financial Outlay" in DPR minus JICA portion of JICA's information for each component.
**: Estimated based on pattern of funding in DPR (see Table 8-6 for more detail).
***: assumed as 90% from NDDB, 10% from PI's contribution for all items to estimate for safety side because there are the other

items of which PI contributions are zero (see Table 8-6 for more detail).
****: Out of this, 10% is used for DoAHD (PCMC)
*****: As per the discussion with the joint secretary of DoAHD on 1st November 2018, this portion becomes zero (PI can receive full grant).
Therefore, the above figures are not the same as those of JICA's information except JICA portion as well as DPR.

(3/3) Component wise breakup from NDDB to PI (Rs. Crore):

Component Name	Loan	Grant	State/PI's Contri.	Total
A. Strengthening Milk Procurement infrastructure	114.5	343.4	50.9	508.8
B. Strengthening Processing and manufacturing facilities	624.7	0.0	69.4	694.1
C. Support for Marketing infrastructure	153.7	38.4	0.0	192.1
D. Support for ICT Infrastructure	7.8	2.0	0.0	9.8
E. Productivity Enhancement	0.0	71.9	8.0	79.9
G. Training and Capacity Development	0.0	43.3	0.0	43.3

Remarks: The above estimation is based on the calculation as shown in Attachment 8-5-1.

Source: Survey team based on JICA and DPR

The above does not include ODA loan for consultant services (Project Management Consultants, PMC). Also, price contingencies covered by ODA loan, tax & levies are not included in the above table. Tax & levies of PMC will have to be borne by GoI. Eligible and Non eligible items are shown in Attachment-6-2-2

(2) Loan Amount

On top of the above amount, there will be consulting services, price escalation, and others added. Total Yen Loan portion becomes JPY 14,978 million, equivalent to Rs. 9,246 in million.

6-3. Terms and Condition of JICA Loan

The terms and condition of JICA loan to the Government of India are as below:

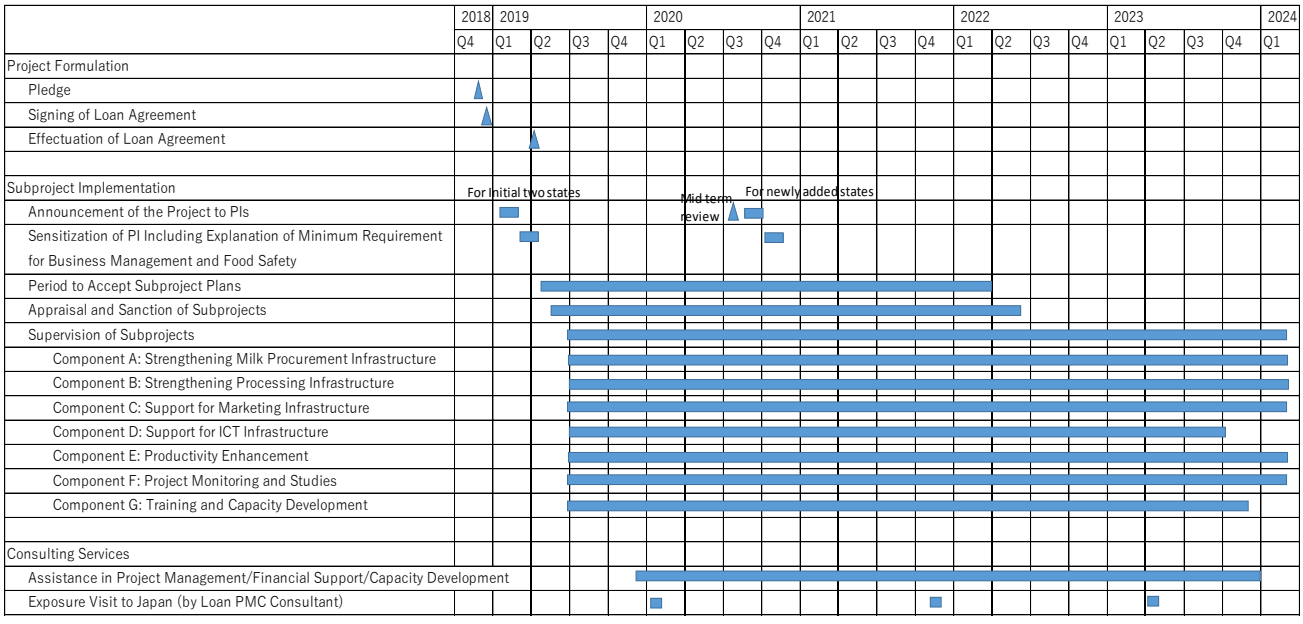
- Option 3 of General Terms (fixed) for lower middle-income countries, (as per the Terms & Conditions of Japanese ODA loans effective from October 1st, 2018),
- Interest rate: 0.85% per annum for main portion of the project while for consulting services interest rate is 0.01% per annum.
- Repayment period: 15 years with five years of grace period on repayment of principal only

Disbursement of ODA loan from JICA to GoI would be up to eight years from the date of effectuation of the Loan Agreement.

6-4. Overall implementation Schedule

Project period is five years (GoI recognizes three years expandable to five years from 2019-20 to 2023-24). Initially the project will be implemented in 53 districts of Uttar Pradesh (31) and Bihar (22) (Priority States). If required, after review of progress on completion of 18 months three more states among Madhya Pradesh, West Bengal, Rajasthan, Andhra Pradesh, Telangana, Uttarakhand and Punjab (Other States) will be selected (see Section 8-1 for more detail). However, the total number of states should not be more than five. Stakeholder consultation with these states shall be undertaken prior to commencement of the Project.

The PIs will be sensitized about the project and preparation of the sub-project plan at the beginning of the project implementation. On submission of the sub-project plan by PI, NDDB will appraise the sub-project plans and put up to Project Sanctioning Committee (PSC) for its approval (please refer chapter 7). After sanction of the sub-project plan by PSC, NDDB will convey the same to the PI. It is expected that sanction of sub-project plans will continue for initial three years (until the first quarter of 2022). Necessary training & capacity development programmes envisaged under the project will be provided at appropriate time during the project implementation. The project implementation schedule is shown in the figure below:



Source: Survey Team modified based on the latest information from NDDB and JICA

Figure 6-1: Project Implementing Schedule

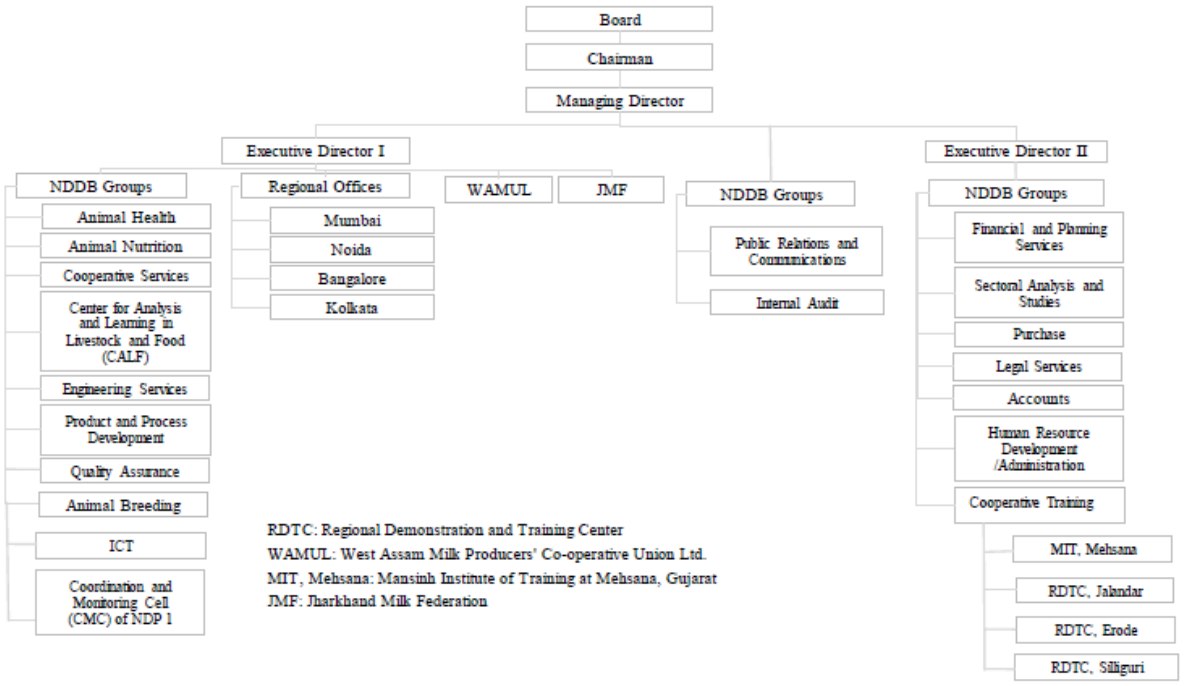
7. Organizational Arrangement of the Project

7-1. Project Management

(1) NDDB

The project will be implemented by National Dairy Development Board (NDDB) through Participating Institutions such as Milk Cooperatives, Multi State Milk Cooperatives, Milk Producer Companies and State Milk Federation. NDDB is an internationally recognized institution in the dairy sector. It has adequate number of technically qualified and experienced professionals working across various disciplines such as Cooperative Services, Engineering Services, Animal Breeding, Animal Health, Animal Nutrition, Financial &Planning Services, Cooperative Training, Sectoral Analysis & Studies, Quality Assurance, Product & Process Development, Information & Communication Technologies, Public Relations & Communications, Accounts, Human Resource Development, Purchase, Legal and Administration. NDDB has four subsidiaries namely Indian Dairy Machinery Corporation (IDMC), Mother Dairy Fruit and Vegetable Pvt. Ltd. (MDFVPL), Indian Immunological Ltd. (IIL) and NDDB Dairy Services (NDS).

The organization chart of NDDB is shown as below:

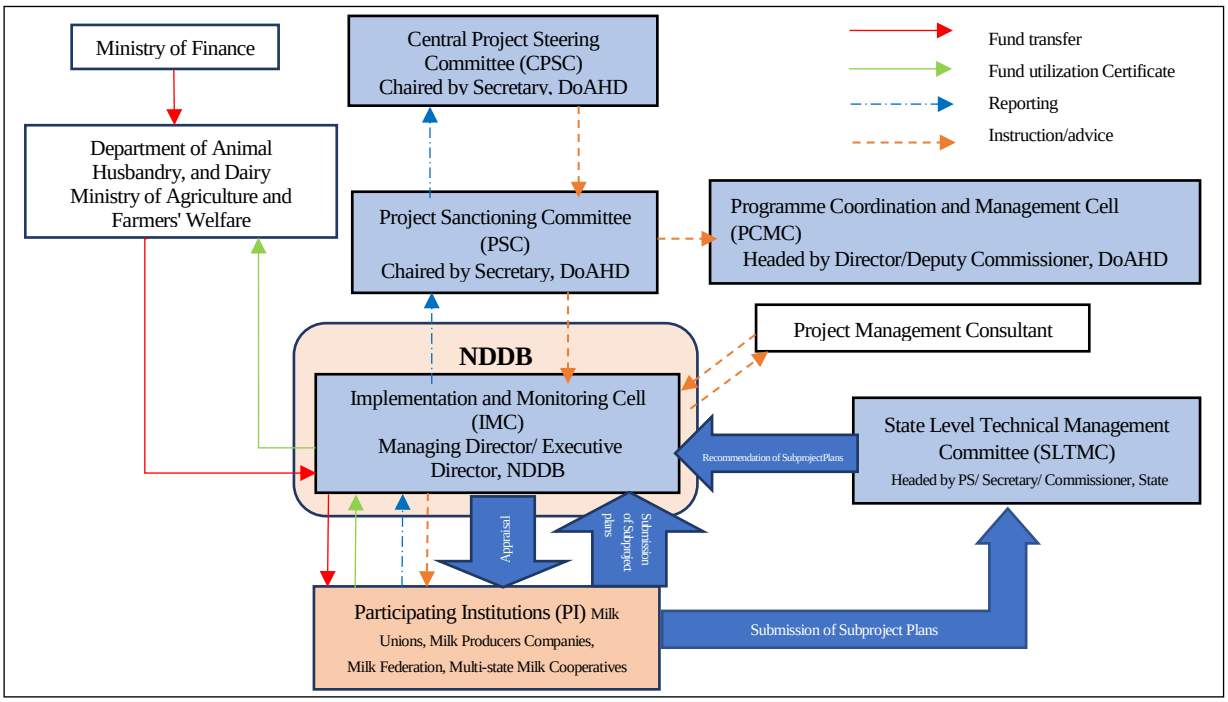


Source: JICA

Figure 7-1: Organization Chart of NDDB

(2) Institutional Arrangement for the Project

The institutional arrangement for the Project is depicted below:



Source: JICA, Modified by the team

Figure 7-2: Project Institutional Arrangement

At apex level, Central Project Steering Committee (CPSC) will be formed, which will provide policy and strategic support to the project. Under the project, a Project Sanctioning Committee (PSC) will be formed, which will be headed by Secretary AHD, GoI and will have the authority to sanction projects recommended by Implementation and Monitoring Cell (IMC), NDDB. An IMC will be established at NDDB, Anand, which will appraise the sub-project plans and screen them based on merit and manage the implementation and monitoring of day-to-day project activities

At DoAHD level, a Programme Coordination Management Cell (PCMC) will be created to provide Secretariat support to CPSC and PSC. PCMC will be responsible for analysis and placement of projects sent by IMC to PSC as well as for providing inputs to CPSC for successful implementation of the project.

At the State level, there will be State Level Technical Management Committee (SLTMC), which will be headed by Principal Secretary/Secretary/commissioner of concerned Department of the State Government for overseeing the land availability for village level institution, BMC, dairy and cattle feed plants, statutory requirements, synergy between various schemes, co-ordination among POIs, policy support, state-level monitoring of the projects etc.

At PI level, a Sub Project Management Committee will be constituted for monitoring and reviewing activities under various components being implemented under the project, which will be headed by Managing Director (MD)/Administrative Head of the PI. Also, Sub Project Implementation Cell (SPIC) will be constituted to effectively implement each component under the project, headed by Sub Project Coordinator (PC) who will

be appointed by MD/Administrative Head of the PI.

Detailed responsibility is shown in Attachment 7-1-1.

7-2. Implementing Organization by Component

The project will be implemented by National Dairy Development Board (NDDB) through Participating Institutions such as Milk Cooperatives, Multi State Milk Cooperatives, Milk Producer Companies and State Milk Federation. Implementing organization for various components is summarized in the table below:

Table 7-1: Component wise Implementing Organization

	Component	Activity and Infrastructure
A	Strengthening of Milk Procurement infrastructure	Procurement by PI Guidance by NDDB for procurement process
B	Strengthening of Processing Infrastructure	Implementation by PIs or with consultancy service contract between NDDB and PI For the latter case, survey and design, construction and instalment: Engineering Group
C	Support for Marketing infrastructure	Implementation by PI
D	Support for ICT Infrastructure	Implementation by PI NDDB will only facilitate the process through vendors
E	Productivity Enhancement	Implementation by PI, Technical guidance by NDDB
G	Capacity Development	Headed by CT group under IMC, with related technical groups

Source: Survey team based on discussion with NDDB

NDDB will provide technical guidance to PIs during implementation of the sub project.

7-3. Operation and Maintenance of Assets Created under the Project

All the assets created under the project will be operated and maintained by the PIs. PIs, in principle, should bear all the recurrent cost for operation of equipment, facilities and plants established under the Project. However, in case of viability gap (e.g. initial operational loss incurred by PIs for modernization /expansion/creation of processing facilities), the state government may decide to provide grant support to the PIs in order to fill the gap. Under the Project, management grant to newly set up village level institutions will be provided for initial two years on tapering basis. The details of institutions responsible for the operation & maintenance of assets created under the project are shown in the table below:

Table 7-2: Project Component Wise Details of Assets and Responsible O&M Institutions

Sr.	Component	Asset	Detailed O&M institution
A	Strengthening Milk Procurement infrastructure	Bulk milk coolers (BMC), milk collection tank, cooling unit, generator, BMC accessories, Automatic Milk Collection Unit (AMCU), Data Processor Milk Collection Unit (DPMCU), Electronic Milk Adulteration Testing Equipment, Renewable Energy (Solar) System, DCS/BMC building	In most cases: DCS to which assets are provided Sometimes: Unions/Federations/Multi State Milk Cooperatives/ Milk Producers Companies if assets are managed by them. .
		Tankers for milk transportation, computer/laptop/tablet	Unions/Federations/ /Multi State Milk Cooperatives /Milk Producers Companies
B	Strengthening Processing and manufacturing facilities	Milk processing plant, Value Added Product Plant, Cattle feed & feed supplement plants	Unions/Federations//Multi State Milk Cooperatives /Milk Producers Companies
C	Support for Marketing infrastructure	Walk-in cold store, Milk parlour, Deep Freezer, Visi Cooler, quality management certification, Insulation for marketing van	Unions/Federations//Multi State Milk Cooperatives / Milk Producers Companies
D	Support for ICT Infrastructure	Desk-side and network infrastructure, application software	Unions/Federations//Multi State Milk Cooperatives / Milk Producers Companies (Some assets like internet dongle will be managed/operated by DCS/MPP)
E	Productivity Enhancement	Mower, chaff-cutter, micro-training center, silage units, fodder storage godowns	In most cases: DCS/progressive farmers to which assets are provided Sometimes: Unions/Federations/Multi State Milk Cooperatives/ Milk Producers Companies if assets are managed by them
		Laptop, Tablet, Camera	Unions/Federations//Multi State Milk Cooperatives / Milk Producers Companies

Source: JICA and DPR

8. Project Operation and Procedure of the Project

8-1. Target PIs

(1) Target Eligible Institutions

Target PIs across all the components are Milk Unions/ Multi-state Milk Cooperatives/ State Dairy Federations/ Milk Producer Companies.

(2) Project Operational Area

Initially the project will be implemented in the 53 districts of Uttar Pradesh (31) and Bihar (22). The project area covers 15 Milk Unions and 1 dairy project (Koshi Dairy Project). If required, after review of progress on completion of 18 months three more states among Madhya Pradesh, West Bengal, Rajasthan, Andhra Pradesh, Telangana, Uttarakhand and Punjab will be selected. However, the total number of states should not be more than five. Stakeholder consultation with these states shall be undertaken prior to commencement of the Project.

Table 8-1: Initial Target PIs (Milk Unions) and Number of Target Districts

States	Milk Unions	Number of Target Districts Covered
Bihar	Barauni	3
	Magadh	5
	VIMUL, Bhagalpur	4
	VPMU, Patna	3
	TIRHUT	3
	KDP, Purnia*	4
Sub total	6	22
Uttar Pradesh	Allahabad	4
	Azamgarh	3
	Basti	3
	Chitrakoot	2
	Varanasi	4
	Faizabad	3
	Gonda	4
	Gorakhpur	4
	Mirzapur	3
	Lucknow	1
Sub total	10	31
Total	16	53

Remarks: *Koshi Dairy Project (KDP), which is managed by COMFED and is not a union.
Source: DPR and NDDB

In addition to the above, it is noted that Milk Producer Companies such as Saahaj MPC and Shwetdhara MPC operate in Uttar Pradesh and Bapudhaam MPC operates in East Champaran, Bihar. They could be eligible if they operate in the above 53 districts initially.

(3) Other considerations

If required, after review of progress of project on completion of 18 months, the target areas could be expanded to PIs in Other States as mentioned earlier, based on remaining project budget considering total approved costs of sub-projects at that time. When the remaining budget is sufficient to expand target PIs, target PIs could be expanded in all possible PIs in Priority States as well as three more states (maximum) selected from among seven remaining Other States. In Priority States, 30 institutions could be potential PIs (federation, unions, and MPC) throughout the whole project period. In Other States, highest numbers of potential institutions are in Rajasthan (23 PIs), followed by West Bengal (15 PIs), and Uttarakhand (13).

In terms of MPC, for those who are increasing their milk procurement volumes, some assistance in component A, or D or E could be demanded considered with MPC's concept of "capacity first" to increase

milk collection volume. Or, those who have certain milk procurement volume could have some fund requirement of Component B (e.g. several to 10 lakh LPD capacity plant).

Possible target PIs are discussed in Attachment 8-1-2.

8-2. Eligibility Criteria to participate under the project

The overall eligible criteria are shown as below:

Table 8-2: Eligibility Criteria

Sr.	Component	Criteria
I. State Eligibility Criteria		
		1) Freedom to PIs to decide procurement and sale price of milk. 2) Freedom to PIs to adopt suitable HR policy related to recruitments and promotions, subject to adhering to the prevailing reservation policy of the government. 3) Agreeing to sign MoU with NDDB to provide necessary productivity enhancement services (such as AI and animal health services) in the project area and if required, support Participating Institution (PI)s for viability gap funding.
II. Eligibility Criteria for PIs		
i. Institutional Governance Criteria for PIs		
		1) PIs should have a duly constituted Governing Body such as Board of Directors/Management Committee as applicable to the legal form of the PI. 2) PIs should have a full time Chief Executive/Managing Director (or equivalent) and adequate number of qualified technical and managerial personnel at key positions. 3) PIs should be willing to amend Bye-laws in line with the model Bye-laws developed and circulated by NDDB. 4) PIs should have fixed/ Undisturbed tenure for senior/ key management personnel including Managing Director/Chief Executive. The PI needs to take consent of NDDB before transferring the Managing Director/Chief Executive. 5) Board of the PI should nominate one expert each in the field of finance, Dairy Technology and marketing as independent directors. 6) PIs should be committed to increase women members in village level institutions,
ii. Financial Criteria for PIs		
	General criteria for all	1) Audit of accounts should be updated and the auditor's observations should not contain any adverse opinion or disclaimer. 2) PIs should not have any over-dues to any financial institution. 3) PI should not be in a default to any bank/financial institution. 4) PI needs to contribute its share in the Project. However, in case PI does not have adequate resources to contribute its share, State Government may offer necessary grant.
	Additional criteria in applying loan	1) PI should have positive net worth. 2) All outstanding dues to producer members should not exceed four payment periods. 3) The financial returns of the project: Project will have uniform rate of Return on Investment (ROI) of 10%(minimum) and Debt Service Coverage Ratio (DSCR) of 1.5 times (minimum) for all sub projects, 4) The loan should be secured through collateral security, which should be minimum 1.5 times of

Sr.	Component	Criteria
		the loan amount in terms of mortgage of immovable assets and hypothecation of movable assets. In case of shortfall, State Government guarantee will be required.
iii. Technical Criteria		
A	Strengthening Milk Procurement infrastructure	1) PI should have its own milk processing facilities or have a forward linkage with an existing milk processing facility. 2) PI should have the land/ premises for setting up DCS building and housing Bulk Milk Coolers free from any encumbrances. 3) Preference will be given to PIs that already have in place IT based reporting and monitoring systems. 4) PI should be capable in organizing producers' institutions, maintaining transparency in the processes of milk collection at village level, milk quality testing, timely payments to milk producers and grievance redressal system in place.
B	Strengthening Processing and manufacturing facilities	1) PI should have required environmental/ statutory clearances for setting up of plants or commitment to attain the same before execution of the project 2) PI should have its own land/ long term lease, free from encumbrances, in case of setting up of new plant or expansion of existing plant. In case of lease, requisite No Objection Certificate from the concerned authority for mortgage to NDDB would have to be obtained.
C	Support for Marketing infrastructure	1) PI should have own milk processing facility and marketing network for sale of liquid milk & milk products.
D	Support for ICT Infrastructure	1) PI should have its own milk processing facilities or have a forward linkage with an existing milk processing facility. 2) PI should have competent manpower to manage ICT Infrastructure and applications.
E	Productivity Enhancement	Sub Component- E1: Calf Rearing Program, and E2: Nutritional Interventions for PE 1) PIs which will identify/recruit technical manpower exclusively for the project will be considered. 2) PIs having sufficient number of indigenous buffalo and cattle population in the area of operation would be preferred for calf rearing component. 3) PIs must have their own plants for manufacturing and supply of cattle feed (pregnancy feed, calf starter & calf growth meal) and mineral mixture or have an assured tie up for sourcing these products. 4) Preference will be given to the PIs which have implemented animal nutrition activities (Ration Balancing Programme (RBP)/Fodder Development) under NDP I successfully. 5) PIs which will create corpus from the beginning for sustainability of the activity, will be given preference. Sub Component – E3: Fodder Development 1. Fodder seed production and distribution/fodder conservation and green fodder enhancement and fodder technology demonstration 1) PIs which will identify/recruit technical manpower exclusively for the project will be considered 2) PIs should have a network of village level farmers organizations such as Village Dairy Cooperative Societies and Milk Producers' Institutions and have an experience in conducting demonstrations for technology transfer at field level. 3) PIs should have capacity to formulate and implement a sound plan for demonstrations. 4) Preference will be given to PIs that have prior experience in this area.

Sr.	Component	Criteria
		2. Crop residue management 1) PIs must have the capacity to formulate and implement a sound plan for crop residue enrichment and densification. 2) Preference will be given to PIs that have prior experience in this area. 3) PIs should have land (free of encumbrances) for setting up the units. 4) Availability of surplus crop residues in the operational area of PI in large quantity from cereal /cash /fodder crops. 5) PIs should have network of village level farmers organizations such as Village Dairy Cooperative Societies and Milk Producers' Institutions for implementation work.

Source: JICA, slightly modified by the team and NDDB

It should be noted that the three indicators, namely the above II, i, 1); E sub component E1&2, 2); and subcomponent E3, 2, are added by the team and NDDB with other minor wording changes. It is further noted that this project includes a concessional loan (2% per annum is lower than 6-8% of regular/private loans). Thus, target PIs are backward but have potential. To achieve the situation where PIs continue to earn annual net profits with fully utilizing invested processing plants, initial selection of potentially capable PIs is quite important.

8-3. General Rule upon Application of Sub Project

General rules upon application of project component are as below:

(1) Selection of components

Eligible PIs can choose among components from A to E separately as per their requirement. Component F: Project Management & Learning is a centralized activity which will be managed by IMC in NDDB.

Component G: Training& Capacity Development has several modules and curriculums. The training programmes are linked with various activities of the components (from A to E). PI cannot apply only for Component G: Training & Capacity Development as a sub project.

(2) Linkage between each components and capacity development program

The PI availing assistance under a component (i.e. Component A to E) will be eligible to avail assistance for following training programmes under Component G, as given below:

Table 8-3: Linkage between Training Program and Component

Components →		A	B		C	D	E	F
			B1	B2				
			Processing Infrastructure					
Module Title in G: Training Program	ID	Milk Procurement Infra-structure	Milk processing facilities and manufacturing facilities for Value Added Products	Feed and Feed Supplements Manufacturing Infrastructure	Marketing Infra-structure	ICT Infra-structure	Producti-vity Enhancement	Project Monitor-ing and Studies
Streamlined core modules/programmes = JICA Proposed programmes								
Business management								
Business management & strategic planning	BM-1-1	1	1	1	1	1	1	
	BM-1-2@PI	1	1	1	1			
	BM-1-3@PI	1	1	1	1			
	BM-1-R	1	1	1	1			
Marketing of Milk and Milk Product	BM-2-1	1	1	1	1	1	1	
	BM-2-2@PI		(**)		1(*)			
Food safety and Hygiene								
Clean milk production and Milk Quality Management at village level	FS-A1-1	1	1	1	1	1	1	
	FS-A1-2@PI	1						
	FS-A1-3@PI	1						
Dairy plant management and plant hygiene and sanitation	FS-B1-1 (#)	1	1	1	1	1	1	
	FS-B1-2 (#)	1	1	1	1	1	1	
	FS-B1-3 (#)	1	1	1	1	1	1	
	FS-B1-4@PI		1					
QC technique and practices for lab technician	FS-B2-1 (##)	1	1	1	1	1	1	
	FS-B2-2		1					
Reflection workshop for Food Safety	FS-R	1	1					
Individual training programme = NDDB planned programmes								
Farmers' induction program		1						
Awareness program on clean milk production		1						
Management Committee Members (MCM) Orientation programme for New DCS		1						
Board orientation program		1						
Business Appreciation Program for Existing Procurement & Input Staff		1						
Basic Training for new DCS Secretaries		1						
Refresher Training of DCS secretaries		1						
Operation & Maintenance of BMC/AMCU		1						
Retailers Awareness Programme					1			
Training on Automatic Milk Collection Software at Union level						1		
Training on Automatic Milk Collection Software at DCS level						1		
Training of Animal Nutrition officer/ Animal Nutrition supervisors							1	
Training of Calf Rearing Supervisors on Calf Rearing Programme (CRP)							1	
Milch animal rearing for dairy farmers							1	
Training on Advances in Fodder Production, Conservation and its management practices							1	
Overseas/ National exposure visits/training								1 (overseas

Components →		A	B		C	D	E	F
			B1	B2				
Module Title in G: Training Program	ID	Milk Procurement Infra-structure	Processing Infrastructure: Milk processing facilities and manufacturing facilities for Value Added Products	Processing Infrastructure: Feed and Feed Supplements Manufacturing Infrastructure	Marketing Infra-structure	ICT Infra-structure	Producti-vity Enhancement	Project Monitor-ing and Studies
								training under PMC)
Training programme on E&S aspects of the project								1
Training of Trainers on environment & social aspects								1

(#) PI to participate in FS-B1-1,-2,-3 should have its own dairy plant, not the one leased out. In some cases, the PI may be processing milk in hired facility where their own manpower manages the plant operation. In that case those PIs may be allowed to take these trainings under the project.

(##) PI to participate in FS-B2-1 should have QC Lab. PI not having QC lab may be having QC personnel posted at outsourced processing facility should be considered for this particular training programs as it has direct implications on food safety and quality aspects in dairy value chain.

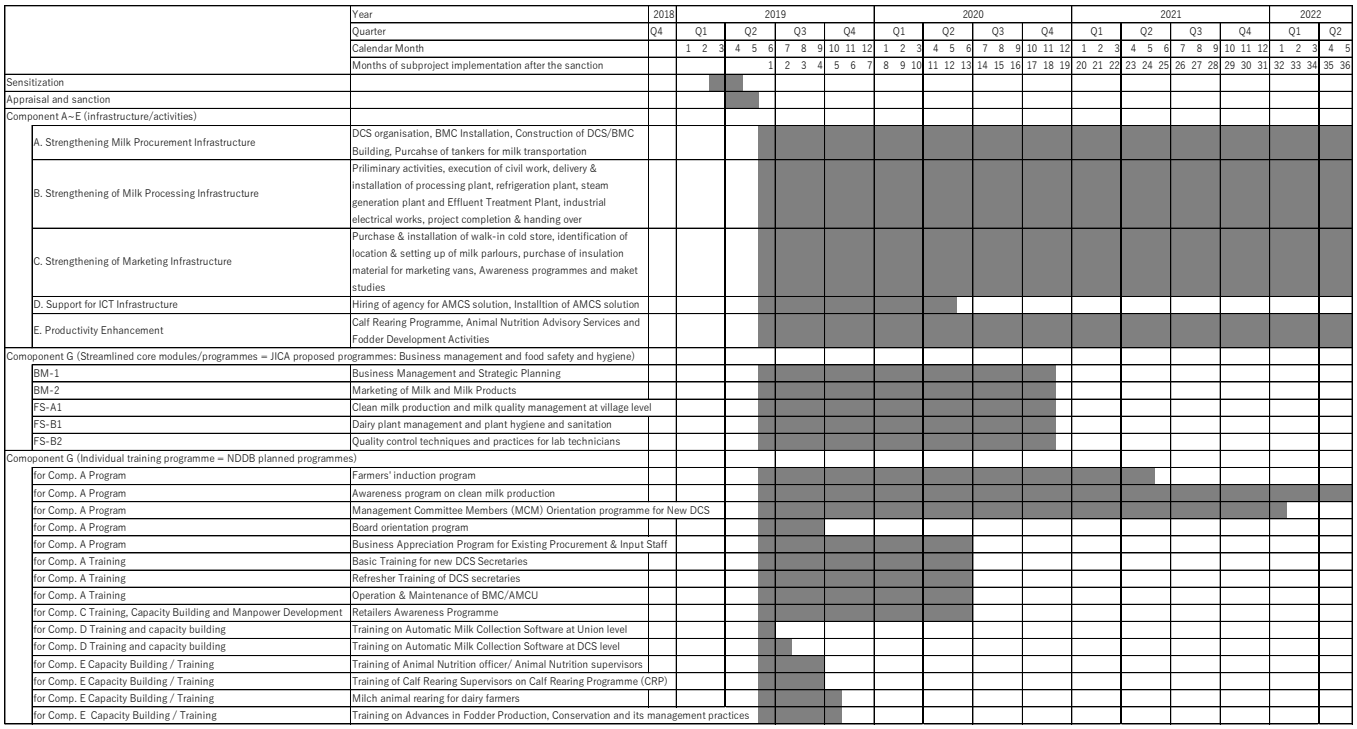
(*) PI that conducts "Market Studies" under Component C will proceed to BM-2-2@PI and use the result of "Market Studies" to reflect it back to its own PI's business strategy.

(**) It is strongly recommended that PI that applies for Component B1 also apply for "Market Studies" under Component C and conduct "Market Studies"; thus proceed to BM2-2@PI.

Source: Survey team

As shown in Table 8-3 above, a programme will be implemented in components which have "1" in the cell in the table above. Generally, trainings of business management and food safety and hygiene are designed in all the components, indicating they are important in the whole value chain from production, procurement, processing, and marketing.

To have a typical image of how the components and the above training programme are related to each other, a model implementation schedule of a sub project which show all the components (from A to E), as well as the training programs of Component G for one PI is shown as below:



Remarks: Component F are not included, because it is a centralized activity, which will be managed by NDDB

Source: Survey team and NDDB

Figure 8-1: A Model Sub project Implementation Schedule for one PI

The implementation period of the sub project to cover all the components is at maximum three years. Considering the overall project schedule of five-year period as well as the time to close sub project plans acceptance (by Q1 in 2022), it is encouraged for potential PIs to apply to the Project within the year of 2021 at least to implement sub projects with enough time. It should be noted that PIs which will be sanctioned at the very end of the acceptance period may not have much time to implement components fully (around two years or less), therefore they may need to consider contents to be assisted by the project as to select contents which can be completed within the remaining project period.

(3) Funding pattern of components

The cost sharing pattern between NDDB and PI is as below:

Table 8-4: Funding Pattern from NDDB to PIs

Sr.	Component		NDDB to PIs		State/PI contribution
	Type of provision		Loan	Grant	
A	Strengthening Milk Procurement infrastructure	SS milk collection accessories, testing equipment, DCS board, furniture etc.	0	90	10
		BMC, AMCU/DPMCU, DCS/BMC building, tankers for milk transportation	50	50	0

Sr.	Component	NDDB to PIs		State/PI contribution
B	Strengthening Processing Infrastructure	90	0	10
C	Support for Marketing infrastructure	80	20	0
D	Support for ICT Infrastructure	80	20	0
E	Productivity Enhancement	0	90	10
G	Capacity Development (Training)	0	100*	0

Remarks:

*: In DPR by DoAHD, funding pattern for Component G is 50% grant and 50% PI's contribution. However, all the cost in this component is proposed to be provided as grant, given the fact that 1) JICA emphasizes the importance of the capacity development component as well as 2) currently less participation in the existing training program is observed due to requirement of some PI's contribution. This was confirmed with the joint secretary of DoAHD in the meeting on 1st November 2018.

Source: DPR, NDDB, and Survey team

Detailed funding pattern based on the concrete items is shown in Attachment 8-3-1.

The size of financial demand/physical target differs largely among cooperatives. Two categories according to sub-project size are set as below:

Category 1: Size of sub project is less than 150 Crores

Category 2: Size of sub project is more than 150 Crores

Considering the total project cost, in order to avoid situation where only a couple of cooperatives receive the majority portion of the fund from the Project, the number of sub-projects which require large investment should be limited. Thus, number of sub project in Category 2 should be initially restricted up to four number, so that more number of cooperatives can have access to the fund. In case fund is still available after extending loans, the number of sub-projects in Category 2 will be reconsidered.

8-4. Procedure of PIs selection and Implementation

8-4-1. Appraisal process:

(1) Announcement of the Project

On approval of the project by Cabinet Committee on Economic Affairs (CCEA), DoAHD will issue Administrative Approval of the project to all concerned stakeholders.

(2) Sensitization

NDDB will organize a stakeholders' consultation cum sensitization workshop for the potential PIs of the two Priority States. The Sensitization workshop will be organized for two days. On first day, various aspects of the project and procedures of preparation of sub project plans will be explained. On the second day,

minimum requirement of business management and food safety & hygiene will be explained. The outline of the session for business management and food safety & hygiene is given at Attachment 8-4-1.

(3) Procedure for submission of sub-project plan

PI intending to avail assistance for any component/sub-component under the Project will have to prepare the sub-project plan and submit it to NDDB as well as SLTMC. It is expected for PIs to prepare sub-project plans as per the model sub-project plan. In case, a PI is not capable to prepare the sub-project plan, on request, Implementation and Monitoring Cell (IMC) (located at NDDB) will assist the PI in preparation of sub-project plans.

(4) Screening the PIs based on the eligibility criteria

IMC (located at NDDB) will examine whether the PI meets the required eligibility criteria of the Project. Sub-project plans of those PIs which have fulfilled all required eligibility criteria will be considered for further processing.

(5) Sub-Project Appraisal Procedures

At the State level, SLTMC will consolidate the funding requirement of each of the Participating Institutions in the state. The consolidated sub-project plans screened by SLTMC will be forwarded to NDDB for appraisal along with commitment letters from State Government for offering guarantee for loan to PIs where adequate security(ies) of PI is not available and for providing grant assistance to meet the viability gap (if required).

The sub-project plans of PIs that meet eligibility criteria will be appraised on technical and financial aspects. Environmental and social assessment according to both government regulation in India and JICA's Guideline for Environmental and Social Consideration (April 2010) shall be conducted at the time of appraisal to ensure that sub-projects should not have any adverse impacts. Based on the screening for the eligibility criteria and technical & financial assessment of the sub project plan, IMC will prepare the appraisal report.

Once the sub-project appraisal is completed, a 'Note for Approval' will be prepared with recommendations and will be submitted to PSC for approval.

PSC will sanction the sub-projects when the aforementioned procedures are completed. PSC meetings will be held periodically or as frequently as required. On approval of PSC, NDDB will request JICA to review sub-project plan with reference to categorization of environmental and social consideration of loan, terms and conditions of loan, viability of the sub-projects, collateral securities and/or guarantee of the loan etc.

It is expected that JICA will give a notice that JICA receives information of approved sub-project plans within 15 days of submission of approved sub-project plans by NDDB. Once JICA gives the notice, NDDB will issue sanction letters to PIs and complete the required documentation process for loan/grant.

(6) Mid-term Evaluation and Adjustment

After 18 months of commencement of the project, a mid-term evaluation will be conducted. IMC (located at NDDB) will report the cumulative sub project sanctioned amounts of all PIs till that date and remaining amount available for the rest of the project period to JICA and CPSC. After due consideration of the physical & financial progress of the project, CPSC shall take decision to expand the project area to all the districts of the Priority States and to other states. In addition to UP and Bihar, maximum three more states from among the seven Other States *(viz. Madhya Pradesh, Rajasthan, West Bengal, Andhra Pradesh, Telangana, Uttarakhand and Punjab)* may be selected. For potential PIs in expanded areas, the process from Step (2): sensitization, will be followed, till the appraised amount for sanctioned PIs reaches the project outlay as stated in Table 6-1.

Three new states will be selected on the basis of 1) fund requirement and 2) scope to expand project activities. Further, CPSC will finalize the states after mid-term review.

(7) Closure of Acceptance of Sub-project Plans

There are two conditions for closure of acceptance of sub-project plans as given below:

- The entire funds allocated to the project are sanctioned to the PIs and there is no fund left to accept new sub-project plans.
- Remaining project periods is not adequate (short) to efficiently implement all components/activities proposed in the sub-project plans.

IMC will closely monitor the above and report to CPSC for decision to close acceptance of new sub-project plans under the project.

(8) **Project External Audit**

The IMC in NDDB will appoint a firm of Chartered Accountants to act as Project External Auditor to carry out audit of the project/sub projects. The PIs sub-project accounts will also be audited by the Project External Auditor annually at the end of the financial year. Necessary communication in this regard will be sent by the IMC in NDDB to the PIs.

8-4-2. Implementation

Once sanction of the sub-project plan is given by PSC and required documentation process is completed with NDDB, the PIs can start implementation of the activities. IMC will report the progress of the project

implementation periodically to CPSC for review. It may be noted that a logo and sign boards with the logo should be installed for all assets created under the Project to show that the asset has been created by receiving assistance under the JICA funded project for the dairy development.

The components are briefly summarized as below:

Component A: Strengthening of Milk Procurement Infrastructure

All the activities proposed under this component would be implemented by the PI and it will be the responsibility of the PI to ensure that the activities are implemented as per the approved sub-project plan.

Activities of the component are as given below:

i. Assistance to village level producers' institution
   a. SS milk collection accessories, testing equipment, DCS board, furniture etc.
   b. DCS building
   c. AMCU (Automatic milk collection unit)
   d. Management grant to village level functionary

ii. Support for BMC
   a. Bulk Milk Coolers
   b. Building for BMC
   c. Tanker for milk transportation 10 KL

Component B: Strengthening of Milk Processing Infrastructure

All the activities proposed under this component would be implemented by the PI and it will be the responsibility of the PI to ensure that the activities are implemented as per the approved sub-project plan.

Activities in this component are as given below:

i. Modernization & creation of new milk processing plants, drying plant and VAP
   a. New plants
   b. Modernization/expansion of existing plants
   c. Manufacturing facility for Value Added Products

ii. Feed & feed supplements manufacturing infrastructure
   a. Cattle Feed Plants
   b. By-pass Protein Plants
   c. Mineral Mixture Plants

Component C: Support for Marketing Infrastructure

All the activities proposed under this component would be implemented by the PI and it will be the responsibility of the PI to ensure that the activities are implemented as per the approved sub-project plan. Activities in this component are as given below:

- Installation of Walk-in-Cold stores
- Insulation for Marketing Van

- Setting up of Milk Parlours with Visi Coolers & Deep Freezers
- Conducting Consumer Awareness Programme
- Marketing Studies
- Market Promotional Activities

Component D: Support for ICT Infrastructure

All the activities proposed under this component would be implemented by the PI and it will be the responsibility of the PI to ensure that the activities are implemented as per the approved sub-project plan.. Under this component Automatic Milk Collection System (AMCS) solutions will be provided to the PIs. AMCS is a software to streamline milk collection operations at village level and provide farmers and other stakeholders with the information on milk procurement transactions on real-time basis. It helps in bringing transparency in milk collection operations of the PI, improve process efficiency and provide real time information to dairy cooperatives. AMCS enables milk bill payment directly to farmers' bank accounts. Farmers will receive instant SMSs for every transaction and will have access to all past transactions with AMCS mobile application. PIs can avail financial assistance for following items under the project:

a) Internet dongle and charges at DCS/MPI Level and Union/PC
b) Software implementation support
c) Annual Maintenance Contract (AMC) for AMCS
d) Server hosting support
e) SMS charges

Component E: Productivity Enhancement

There are three subcomponents as given below:

E1. Calf Rearing Programme (CRP)
E2. Animal Nutrition Advisory Services
E3. Fodder Development

All the activities proposed under this component would be implemented by the PI and it will be the responsibility of the PI to ensure that the activities are implemented as per the approved sub-project plan. The main objective of these subcomponents are; E1: to create awareness amongst milk producers on scientific feeding and management of cow & buffalo calves at various stages of growth, including foetal stage; E2: to inculcate the practice of feeding of various feed and mineral mixture among farmers and generate awareness regarding their importance; and E3: to enhance the fodder availability for the livestock.

Component F: Project Management & Learning

This is a centralized activity which will be managed by IMC in NDDB.

Component G: Training & Capacity Building

Training & capacity development programmes envisaged under the project are explained in Chapter 12, 13, and 14 of this report.

8-5. Procurement, Fund Management and Accounting

8-5-1. Procurement

Procurement of goods and services covered by Japanese ODA Loans should be implemented in accordance with “Guidelines for Procurement under Japanese ODA Loans", dated April 2012. And employment of consultants should be implemented in accordance with "Guidelines for Employment of Consultants under Japanese ODA Loans", dated April 2012, in case NDDB procures goods and services and employ consultant under the project These Guidelines will not be applied in the case of procurement of goods and services and consultant which are, by nature or scope, unlikely to attract foreign firms and, thus, to be domestically procured.

The PIs will follow the procurement (purchase) manual for procurement of goods, services & consultants, which is prepared by NDDB reflecting the JICA’s procurement principle.

Summary of the above is shown in the table below:

Table 8-5: Procurement Method

Entity of procurement	Condition	Method
NDDB	international suppliers and service providers are interested in any procurements of goods and services	Mainly International Competitive Bidding (ICB), ODA Guidelines
NDDB	procurement of goods and services which are, by nature or scope, unlikely to attract foreign firms and, thus, to be domestically procured	Mainly Local Competitive Bidding (LCB) NDDB’s manual
NDDB	Loan Consultant Procurement (PMC)	Mainly ICB, ODA Guidelines
PIs	ODA guidelines are not necessarily required to be applied	NDDB’s manual

Source: Survey team based on JICA and NDDB

8-5-2. Fund management and Accounting

(1) Disbursement procedure by JICA

The following disbursement Procedures are to be followed:

Table 8-6: JICA’s Disbursement Procedure Applied

Payment Procedure	Condition	Explanation
Commitment Procedure	Payments are made in foreign currencies (payment to PMC could be a major one as of now)	After the letter of credit (L/C) is issued by L/C issuing bank in India and Letter of Commitment (L/COM) is issued by JICA, suppliers can receive the fund from JICA passing through only commercial banks (L/C issuing bank and supplier’s bank).
Reimbursement Procedure	Payments are made in local currencies	After NDDB makes payment to suppliers, NDDB will requests JICA through Controller of Aid Accounts & Audit (CAAA) to reimburse the fund. In this case, the funds transferred by JICA to the bank account of GOI will pass through the budget of DoAHD to NDDB.

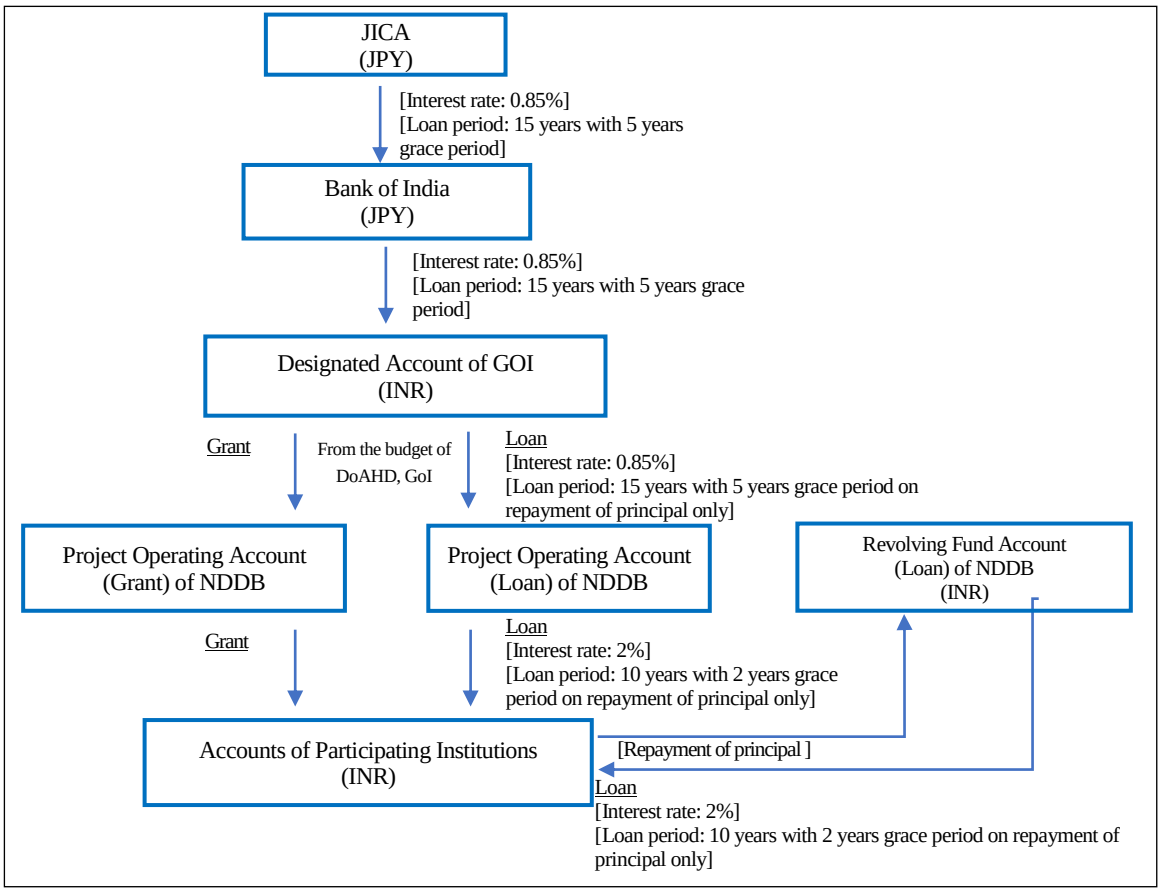
Source: Survey team based on JICA and DPR

The above mentioned procedures, described in the brochures prepared by JICA shall be followed. Any expenditure to be made under the project shall be done after the effectuation of the loan agreement to get reimbursed. Retractive claim is not allowed under the project. In addition, swapping of existing loans, which potential PIs have already committed and owed, with loan of this project will not be allowed.

(2) Overall Fund flow under the Project

Government of India will receive the ODA loan from JICA in the designated account in Yen term. These funds along with share of GoI will pass through the budget of DoAHD to the project operating accounts of NDDB as loan and grant in Rupee term, for onward disbursement to the PIs.

The overall fund flow of the Project is indicated in the diagram below.

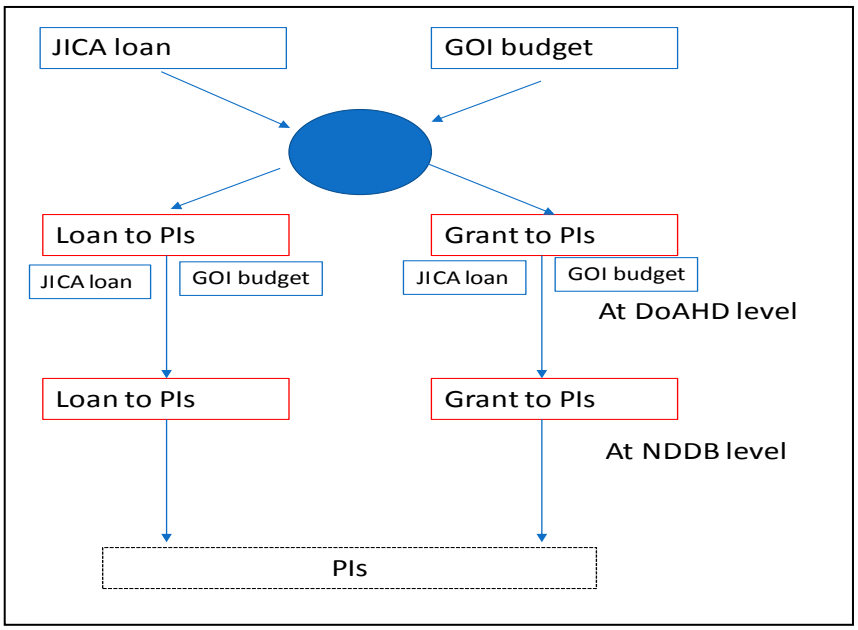


Source: Survey Team based on JICA

Figure 8-2: Overall Fund Flow under the Project

DoAHD and NDDB will prepare the statements as per the format of statement of designated account and project operating account, and revolving fund account and submit the same to JICA. From the sub project implementation point of view, NDDB will submit on-going sub-project summary report to JICA and DoAHD.

The following picture explains the found source. At DoAHD, the JICA loan and GOI budget come together and are sent to NDDB following two patterns of fund flows to PIs, namely loan and grant. Therefore, both loan and grant to PIs include both JICA loan and GOI budget as the fund source. In this sense, monitoring of fund source of JICA Loan and GOI budget is important. Indicative fund allocation is estiamted and shown in Attachment 8-5-1 for reference, and actual allocation will be dcided by NDDB through the course of implementation.



Source: Survey Team

Figure 8-3: Flow of Fund Source

(3) Fund management of NDDB

NDDB will be responsible for disbursement/repayment of the fund extended under the Project.

1. Project Operating Accounts

NDDB will maintain two separate project operating accounts, one for loan and the other for grant, including bank account under the Project. NDDB will disburse loan and grant as per the terms of the project.

2. Revolving Fund Account

NDDB will create Revolving Fund Account in order to extend loans to additional sub project under the same terms and conditions of the Project, by utilizing the fund generated from the gap between repayment period of Japanese ODA Loan and loans to PIs under the Project. Principal repaid from PIs will be managed in the Revolving Fund Account and will be extended from NDDB to other PIs. NDDB will report the status of the Revolving Fund to JICA for three years from the completion of the disbursement of the Japanese ODA Loan. Physical target for such fund should be set based on the actual repayment of the 1st lending from PIs, therefore, physical target for the loan from Revolving Fund should be determined by the mid-term review.

3. Audit of Fund

NDDB shall appoint an external auditor for audit of the project operating accounts created for the project. NDDB shall ensure that audit is done and report the result to JICA every year till the completion of the Project. The audit report shall be submitted to JICA within nine months from the end of the fiscal year. As Revolving Fund is created for subsequent disbursement, NDDB shall continue audit for three years after the completion of the Project.

(4) Fund Flow from NDDB to Participating Institutions

1. Release of funds to finance sub projects

Upon completion of the required documentation by the PIs with NDDB (to be mentioned in the Sanction Letter) and compliance of pre-disbursement terms & conditions, if there are for instances environmental clearance, and collateral arrangement etc., the PIs could avail funds sanctioned under the project. PIs will be required to open a separate Bank Account for transactions related to the implementation of the Sub Project. The name of the account will be "name of the Participating Institution –sub project under the Project for the dairy development (loan/grant) ____" (this will also be specified in the Sanction Letter).

Loan and grant portion of the fund will be disbursed in the form of Reimbursement of expenditure or in the form of Imprest advance.

2. Reimbursement of expenditure

Participating Institutions will implement the sub project from its own resources and submits audited quarterly Fund Utilization Report (FUR) within 15 days of the completion of the quarter. On receipt of the FUR, NDDB will examine the claim and after proper vetting will disburse the funds. FUR shall include statement showing list of contracts/purchase orders awarded on a quarterly basis.

3. Imprest advance

In case of non-availability of adequate funds with the Participating Institutions to implement approved project activities, the Participating Institutions may avail Imprest advance from NDDB which carries the same rate of interest as that applicable to the loan. The amount of Imprest advance is limited to 75% of loan amount and 100% of the grant amount during the reference quarter.

The Participating Institutions will have to utilize the advance amount in the reference quarter itself and any unutilized amount will have to be refunded immediately after completion of the reference quarter. Otherwise it will attract penalty charges of additional interest at 3% per annum. In case utilization is more than 90% it will not attract such penalty.

The advance and subsequent fund disbursements shall be deposited in the separate bank account opened for transactions relating to the sub project. The PIs shall endeavor to utilize the advance and submit audited quarterly FUR within 15 days of the completion of the quarter. The PIs shall utilize the advance for activities approved under the Sub Projects. The interest earned (in the bank account for grant) on imprest advance

released as grant will have to be paid back to NDDB on quarterly basis. In case, it is noticed that funds have been utilized for activities other than approved under the sub projects, the PIs will be required to refund the diverted amount immediately with interest @ 12% p.a. on the diverted amount from the date of release.

4. Management of PIs contribution

In the cases where contribution of PIs is required for any particular item (capital or revenue), the following should be followed:

In case of capital items, the PIs contribution shall also be deposited in the Sub-Project bank account & the entire payment due to the suppliers/ service providers be made from the sub-project bank account. To re-iterate, in both the cases, all payments to suppliers/ contractors, service providers shall be released from the sub-project bank account only. This is to maintain proper audit trail of assets and expenditures incurred under the Sub Project and monitor contribution of the PIs, where required.

Such expenditure should be reported including both the PIs contribution and grant assistance (i.e gross expenditure) and the advance will be adjusted/accounted for by IMC in NDDB as per the approved pattern of funding of the specific activity.

5. Other consideration

For some cases in the components such as Component B, Participating Institutions may make agreement with NDDB for providing consultancy services, under which NDDB works as a Pure Agent and prepare and make agreements with suppliers and contractors on behalf of the Participating Institutions. Under the agreement for this service between Participating Institutions and NDDB, fund is not transferred to Participating Institutions and payment is directly made by NDDB, while the disbursed amount to supplier/contractor is calculated as loan of the Participating Institutions.

8-6. Monitoring and Reporting

(1) Contents of the Project Monitoring Report

IMC (located at NDDB) will be responsible of monitoring activities for the project. Necessary reports to be submitted and their contents could be as given below:

Table 8-7: Reports to be submitted to JICA, prepared by NDDB

Report	Contents	Timing
Quarterly Progress Report (QPR)	The progress report for the Project should be submitted by NDDB to JICA and DoAHD in the form of Project Status Report (PSR).	Quarterly basis, not later than 30 days after the concerned quarter
Project Completion Report (PCR)	As above, and plus the following: - Overall evaluation - Lessons learnt and recommendation	Not later than six months after completion of the project
Others	As per the request of JICA specific reports will be prepared by NDDB.	Upon requirement

Source: JICA and survey team

The format of Project Status Report (PSR) is set by JICA, and the above reports basically follow the format and update information in the format. Quarterly Progress Report, and Project Completion Report shall be submitted to JICA and DoAHD with updated forms of Project Status Report. Field information is expected to be updated through monitoring officers of NDDB in respective states, and PMC.

Especially Monitoring Indicators, which are set by JICA, shall be designed to be monitored from the beginning of sub projects right after the sanction because the information will be used to compare before and after the project implementation.

Table 8-8: Monitoring Indicators for the Project

Category	Indicators	Timing
Mandatory (quantitative)	- Quantity of milk processed in upgraded/new plants (thousand litre/day) - Quantity of liquid milk marketed by PIs (thousand litre/day) - Revenue of participating institutions from milk and dairy products (million Rupee) - Additional producer members of dairy cooperative society - Share of women producer members to total additional members to be enrolled (%)	Baseline and end-line survey Periodically such as quarterly basis (at least once in a year)
Mandatory (qualitative)	- Stabilization of farmers' income - Improvement of level of trust on dairy products in terms of food safety - Nutrition improvement due to increased consumption of milk and dairy products	Baseline and end-line survey
Additional	- Activity wise physical & financial progress of the approved sub-project plans.	Periodically such as quarterly basis

Source: JICA and survey team

The above information could be included in appraisal reports, or baseline surveys, because the baseline and target information of the indicators should be set before implementation. Through the monitoring activities, these can be updated as specified (or some are studied in end-line surveys).

In addition to the above, indicators suggested to be monitored for overall monitoring and evaluation of the project are shown in Attachment 8-6-1.

(2) Preparation of monitoring reports

The PIs in each target state will collect the information related to the monitoring parameters of the sub projects and provide the same to IMC in NDDB. IMC will compile all the information from all the states and prepare the above reports with the assistance of PMC (Project Management Consultant).

9. Assistance available for PIs

9-1. Pattern of Assistance

PI can avail assistance (loan/grant) under the components A, B, C, D and E. Assistance under Component G: Training & Capacity Building can only be availed if a PI has applied for any or all of the components among A to E. Pattern of assistance for various components are given in Table 8-4.

9-2. Eligibility Criteria

PI has to fulfill institutional/governance, financial and technical criteria as mentioned in Table 8-2 to avail assistance under the project.

9-3. Organizations eligible to avail assistance PIs to be financed

Eligible organizations are Milk Unions, Multi-State Milk Cooperative, State Milk Federations and Milk Producer Companies.

10. Major Terms and Conditions of Loan & Grant to PIs

10-1. Terms and conditions

Major terms and conditions of the loan and grant are as below:

- Loan under the project will be available to PI mainly for Component B: Strengthening of Milk Processing Infrastructure. Component A (milk procurement infrastructure), Component C (marketing infrastructure), and Component D (ICT infrastructure) (refer to Table 8-4).
- Terms and Condition of the loan to participating institution (PI):
  - Interest rate: Up to 2% per annum (to be finalized soon)
  - Repayment: 10 years repayment period including two years moratorium period on the repayment of principal amount.
- Grant under the project will be available to PI for Component A (milk procurement infrastructure), Component C (marketing infrastructure), Component D (ICT infrastructure), and Component E (Productivity Enhancement) (refer to Table 8-4).
- Terms and conditions of the grant provided under the project:
  - Grant should be used only for intended purpose as specified in the sub-project plan.
  - PI will have to maintain the asset created from the grant assistance for 10 years (minimum) after the project completion.
  - PI will have to take consent of NDDB before disposing any assets created from grant received under the project.

10-2. Collateral security requirement

According to the financial eligibility criteria of the project, the loan should be secured through collateral security, which should be minimum 1.5 times of the loan amount in terms of mortgage of immovable assets and hypothecation of movable assets. Collateral can be generally existing land, building, machinery, and equipment. In addition, new plants, machinery, building and equipment which will be installed under the sub projects will also be taken as collateral security. What types of collateral security are to be taken will be decided during the appraisal process considering the conditions of the PI.

10-3. Suspension, termination, and default

During appraisal of the sub project, NDDB assess the capacity of PI to repay the loan and limit loan amount within repayment capacity of PIs. However, NDDB may suspend/terminate the right of PIs to avail/withdraw from the loan/grant proceeds or otherwise cause the immediate cancellation of the unavailed fund upon default or violation of the loan agreement executed between PI and NDDB.

11. Operating Procedures for PI

11-1. Application Procedure

(1) Application Procedure

Process of the application procedure for sub projects is shown in Section 8-4.

(2) Important points to be considered

PI will prepare the sub-project plan as per the model SPP. Out of all the eligibility criteria mentioned in Section 9-2, the most important indicators to assess eligibility to provide loan to PI is are in the third criteria i.e. ROI to be 10% and DSCR to be 1.5 times the loan amount. Definition of ROI and DSCR are shown as below:

- ROI = [Projected (Net Profit after depreciation and taxes + interest payment)] / Total Investment
- DSCR = [Sum of projected (Profit after tax + Depreciation + Interest) over the repayment period] / Total repayment (i.e. Principal + Interest)

Profit is to be calculated capturing results of all business operation of a PI. And, investment does not include grant portion. To come up with the sub project ROI, annual ROI is calculated for 10 years of repayment period, and average of them is taken. For this, cumulative investment per year including existing net assets is used as denominator per each year. It should be noted that 10% sensitivity in respect of both sales and procurement will be considered for the two indicators in appraisal process.

To estimate net profit after tax for ten years of repayment period is very critical for sustainability, which must be based on practical and sound business plans, not just estimating the past business trend. Therefore, it is necessary that PI should provide the necessary information on the following items in the sub-project plans:

- Capacity utilization rates of BMC, chilling centers, and plants (last 5 years)
- Annual milk procurement quantity (Last 5 years, in Lakh Kg per Day)
- Annual Sales Turnover (Last 5 years, in Rs. Lakh)
- Total price paid to members (as purchase of raw milk, bonus, price difference, and other benefits)
- Annual operating profit (Last 5 years, in Rs. Lakh)
- Net profit (Last 5 years, in Rs. Lakh)
- Administration cost as percentage of total cost
- Annual sales turnover (in Rs. Lakh) for each product (Last 3 years' trend).
- Market share of liquid milk of the institution in their jurisdiction including loose milk (Last 3 years' trend)
- Main competitors in the market. Market share of the main competitors.
- Value of sales made outside the state (revenue and quantity)
- If there are major institutional buyers, values of sales to these buyers (last 3 years) (quantity)
- Value of sales made through their own parlours or shops
- Strategies based on 4P (product, price, place and promotion), 3C (company, competitor, and consumer), SWOT (strengths, weakness, opportunities, and threats) and Cross SWOT analysis.
- Business Plan (with solid reason and explanation for each targeted indicator with future prediction)

The above aspects will be considered during appraisal of the sub-project plan along with assessment of sub-project viability by NDDB. There are cases that initially requested loan amount can be sanctioned, or may be reduced depending on the capacity of PIs to be assessed by NDDB. Final important figures related to sub-project operation will be presented in the form of Project Operating Statement as an example shown in Attachment 11-1-1.

(3) Appraisal of the sub-project plan

NDDB will appraise the sub-project plan submitted by the PI and put up to PSC for its approval and sanction.

(4) Loan/grant agreement

After NDDB conveys its sanction to the sub-project plan, the PIs will execute loan/ grant agreement with NDDB. Necessary conditions will be stated in this agreement.

11-2. Disbursement and Repayment

(1) Disbursement of loan/ grant

Once sanction is given, necessary documentation will be completed. After that, the implementation of sub project and disbursement from NDDB will begin. As mentioned in Section 8-5, there are two

disbursement methods: Reimbursement and Imprest Advance. PIs will receive the fund by either method and submit FUR to NDDB.

(2) Repayment of loan

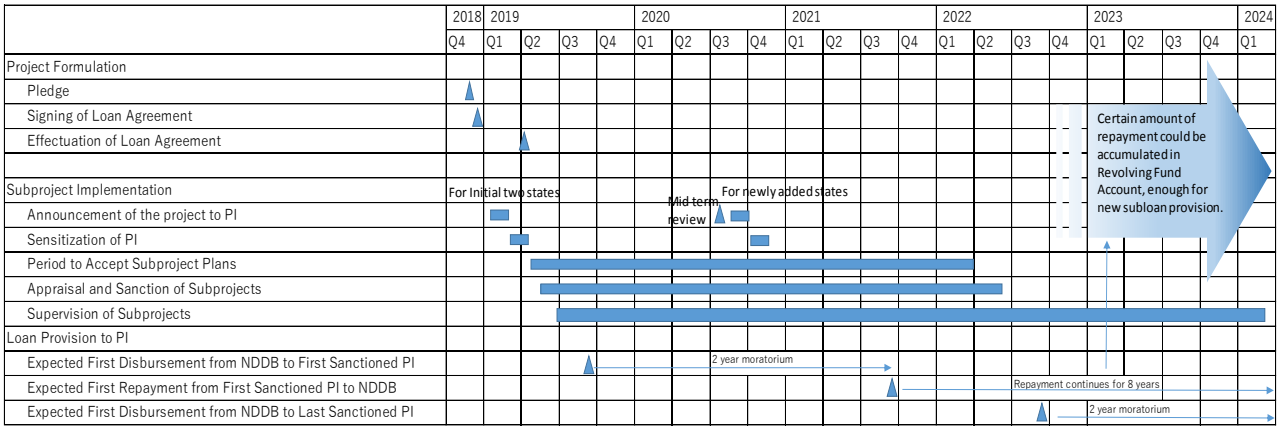
Ten-year repayment period starts from the time of the first disbursement. After two-year moratorium period, repayment of principal commences while the interest payment will begin form the next month of release of first instalment. Repayment of principal and interest is to be made on monthly basis.

11-3. Timeframe

Disbursement of loan and grant proceeds will be within 3 years after sanction of the sub project plan. PIs will have to prepare the sub project plans accordingly.

Based on the overall project implementing schedule, the first disbursement of loan to the first sanctioned PI is assumed to be made in the fourth quarter in 2019 as the earliest case. In this case, the first PI will start repayment in the fourth quarter of 2021. Therefore, within the five-year project period, it can be observed that at least several PIs which are sanctioned at the earliest stage of the project will repay the principal for two years. At least, it is suggested that the Revolving Fund account can receive some repayment money within the project period.

And, it is assumed that the last PI to be sanctioned could start receiving disbursement from NDDB in the third quarter in 2022. If so, all repayments from all PIs under this Project would be completed by the third quarter of 2032. The following figure shows indicative time frame of disbursement and repayment of loan to PI.



Source: Survey Team based on JICA's Information

Figure 11-1: Indicative Timeframe of Disbursement and Repayment of Loan to PI

According to the above indicative timeframe, it can be assumed that loan from the Revolving Fund Account starts disbursement sometime in 2023 and onwards. This means, that at least initial stage of loan

provision using Revolving Fund can be within the Project period. Physical target of the Revolving Fund will be decided by the mid-term review.

11-4. Procurement, Fund Management, and Accounting

(1) Procurement

Procurement of goods, works & services (including consultancy & non-consultancy services) using JICA's loan by PI should follow the procurement (purchase) manual prepared by NDDB for the Project. The PIs should also submit the statement showing list of contracts/ purchase orders awarded on a quarterly basis to NDDB along with FUR.

(2) Fund management and accounting

As shown in Section 8-5, PIs should open a separate Bank Account for transactions relating to the implementation of the Sub Project. PIs should keep separate accounting records to distinguish 1) receipt and expenditures of loan received from NDDB, 2) receipt and expenditures of grant received from NDDB, 3) expenditures of PI contribution and 4) interest accrued from the receipts (if any). When repayment starts, PIs should keep records of monthly repayment of principal and interest payment properly until all due is settled.

(3) Audit

PIs shall appoint a firm of Chartered Accountants for audit of the FUR and supporting books of accounts/ records of all the transactions under the Sub Project. If the PIs have appointed a firm of Chartered Accountant as Internal Auditor, the audit of quarterly FUR under the Sub Project can be carried out by them.

The Board of Directors/Sub-Project Management Committee shall also review the audit observations and give necessary directions for compliance. Any adverse audit comments/ observations need to be complied immediately. A quarterly statement of observations pending compliance for more than six months shall be sent to IMC in NDDB.

The Statutory Audit and finalization of annual accounts of the PIs should be completed and submitted to the IMC in NDDB within six months of the close of the financial year.

11-5. Monitoring and Reporting

PIs will be responsible for the following:

- Provide monthly, quarterly and annual reports to IMC in a specified format or through online software developed by NDDB.
- Submit quarterly Fund Utilization Report (FUR) to IMC.
- Support the IMC in baseline and end term project survey and studies.
- Monitor the physical and financial progress of the sub projects and document success stories.

12. Overview and Contents of Capacity Development

12-1. Philosophy and Concepts in the Project

12-1-1. Overall principle

The Capacity Development (CD) component will introduce the following concepts to PIs and facilitate PIs to be able to drive their business based on them.

1) market-oriented and quality conscious business strategy
2) comprehension of their business and hygiene from an entire value chain point of view
3) alignment with business strategy and human resource development plan

Most of the bottleneck of the POIs lies on the decline or stagnation in sales caused by a higher competition in the market.

Generally, POIs give more attention to their milk procurement operations. Therefore, the capacity development measures have also been focused more on milk production and procurement rather than processing and marketing. In recent years the dairy market in the country has become highly competitive and the demand for safe & quality food is increasing, especially in the urban areas. Thus, it is critical for POIs to have a market-oriented and quality conscious business strategy. In addition, PIs should also be able to determine their future strategies by comprehending their business from an entire value chain point of view. Accordingly, the human resource development should be planned and carried out with an aim to achieve the market-oriented and quality conscious business strategy.

12-1-2. Principle towards methodology of the CD component

CD component does not mean just carrying out trainings like one-time event but rather providing a support to trainees' and ultimately PIs' changing PROCESS. Trainings, one of the forms of CD component, target to support trainees' changing "process", would help them in applying their learnings at their workplace.

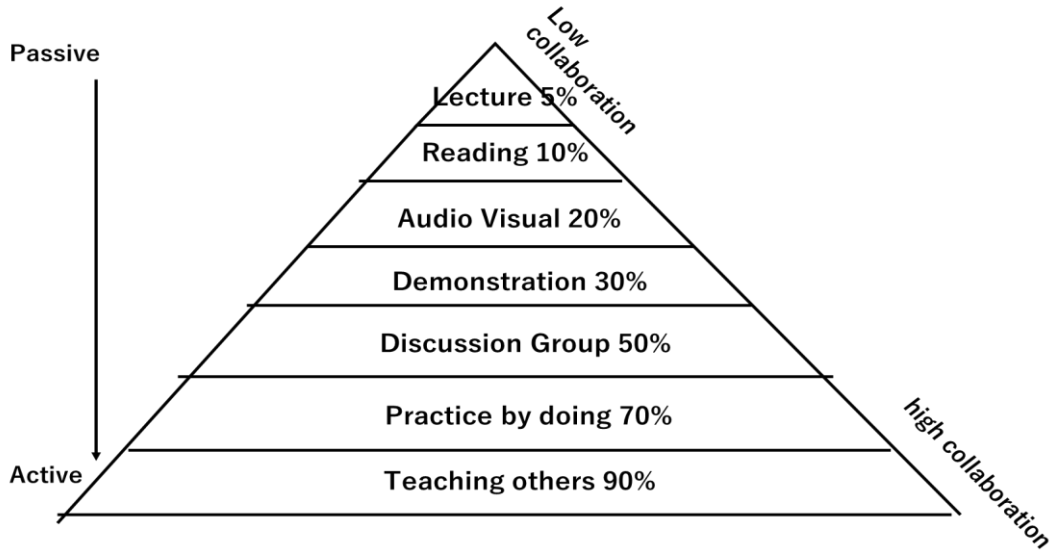
Having this aim in mind, "practical" and "field oriented" approach is applied while designing the training programmes. Therefore, the proposed trainings will:

1) be practical, on-site, and action plan based;
2) be monitored and followed up periodically; in review meeting planned by PI and documenting the proceedings.
3) facilitate cross-learning and sharing; and
4) include reward and recognition mechanism.

It is essential that facilitation mechanism will enable trainees to apply what they have learned through the trainings at their workplace. Thus, trainings will include not only lecture to provide knowledge but also provide the trainees with the opportunity to practice & develop the action plan to be implemented in their organization. Their implementation process of the action plan will be monitored and followed up periodically

through on-site review & guidance and would involve not only participants of the trainings but also other employees of the PI including the top management. Trainings will also promote the cross learning among the participants of various PIs. Cross learning may contribute to finding some hints to overcome challenges that they face from other PIs' experiences, evaluation and revitalization of their own PIs. The reward and recognition mechanisms may also be introduced to motivate trainees to implement their learnings from trainings at their workplace.

Keeping in view of the learners' learning retention rate shown in Figure 12-1, at the detail design stage of the trainings, training method of instruction, in other words, delivery method, should be carefully selected. Methods that would bring out participants' active participation as well as their collaboration, such as discussion, practice by doing, teaching others, are encouraged to be applied while delivering trainings.



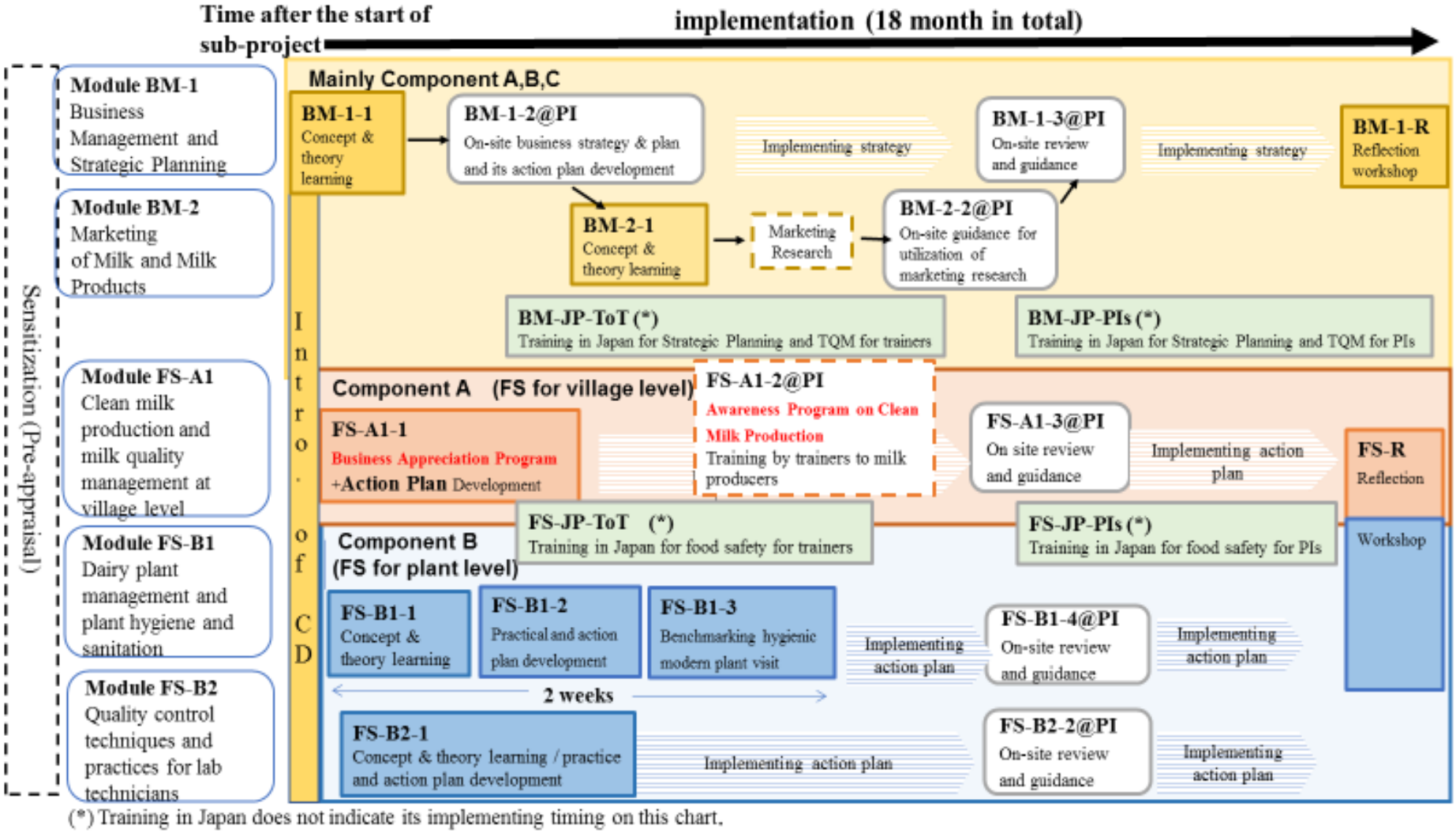
Source: National Training Laboratories Institute for Applied Behavioral Science

Figure 12-1: Learning retention rate

12-2. Curriculum and Content Outlines of Capacity Development (CD)

12-2-1. CD activities in India

After examining the overlap between JICA team proposed curriculum and content outlines of training programmes, and those of NDDB originally planned, the following training programmes are identified to be carried out under the Component G: Training & Capacity Building as a CD component of the Project. The curriculum indicating the overview and flow of JICA team proposed CD programmes are shown in Figure 12-2.



(*) Training in Japan does not indicate its implementing timing on this chart.

Figure 12-2: Overview and flow of JICA team proposed CD modules / programmes

Regarding JICA proposed programmes, the word "module" indicates one package of trainings consisting of several sequential "programmes". The one module basically follows the following flow. After concept and theory learning programme is provided at a training center, action plan development and its review and guidance programme are held at PI site where NDDB and/or external resource persons will visit and provide advice to develop and implement the action plan. At the end of the module, the reflection workshop will be held together with other PIs. On-site review and guidance programme, and reflection workshop is supposed to provide follow-up functions of trainings. NDDB planned training does not have a concept of "module" and each exists as an individual "programme".

Most of the POIs have focused their efforts on strengthening of their milk procurement operations based on the conventional concept of product-out management. As the milk procurement volume increases, and competition in consumer market increases, the importance to incorporate marketing strategy and brand management as the cooperative's overall management strategy becomes crucial. Corresponding to the changes of business environment surrounding the POIs, business management CD modules incorporating the concept of market-in based business management will be provided under the project as given below:

- Module BM-1(Business Management and Strategic Planning)
  The goal of this module is to enable PIs to develop/implement/revise their own business strategy & plan aiming to transform PI's business processes into more market- and quality-oriented.
- Module BM-2 (Marketing of Milk and Milk Products)
  The overall goal of BM-2 coupled with BM-1 is to promote supply of milk and milk products in the competitive market and increase the revenue of PI, and ultimately that of milk producers.

During NDPI implementation, NDDB has developed and implemented various training & capacity development programmes. However, from food safety point of view, observing the current situation of dairy plants of POIs there is a need to provide customized CD modules according to each PI's situations. Therefore, the following proposed modules have the Action Plan development to improve PI's situation from a food safety point of view and on-site review & guidance to provide PIs with necessary technical guidance/advice/recommendation to implement their developed action plan at their own PIs.

- Module FS-A1 (Clean Milk Production and Milk Quality Management at Village Level)
  The goal of this module is to enable PIs to improve quality control practices on the procurement of raw milk during the process of milk production & milking at village level and transportation from DCS/ MPI to dairy plant.
- Module FS-B1 (Dairy Plant Management and Plant Hygiene and Sanitation)
  The goal of this module is to improve PI's dairy plant operation and management particularly from a hygiene and sanitation point of view.

- Module FS-B2 (Quality control techniques and practices for lab technicians)
  The goal of this module is to enable the PIs to improve milk quality control & assurance through the lab related affairs.

The summary of JICA team proposed modules / programmes are presented in Table 12-1 and those of NDDB are in Table 12-2. Attachment 12-2-1 describes more detailed content outlines of JICA team proposed modules / programmes and Attachment 12-2-2 explains points needed to be considered at the detail design and implementation stage of them. The content outlines of NDDBs are also shown in Attachment 12-2-3.

Table 12-1: Summary of JICA team proposed modules / programmes

Module ID & Title	Programme ID	Programme Title	Programme Objectives	Main Target participants	Potential resources to develop and deliver the programmes
BM-1 Business Management and Strategic Planning	-1	Concept & theory learning	This session has two functions. One is to brief the top management of PIs about the capacity development (CD) modules that the employees of PIs are going to participate in and get their supports for the subsequent CD activities. The other is to let the participants comprehend the key concept of the strategic management and marketing, which are the contents of the first session of the Business Management Strategic Planning module (BM-1).	・ Managing Directors/Administrative Heads of PI ・ Section Heads of PI ・ In each training programme participants should be nominated who will be responsible for this project implementation. Similarly, farmers should also be from the villages of project area.	・ NDDB's internal resources from Cooperative Training (CT), Financial and Planning Services (FPS), Quality Assurance (QA) and Cooperative Service (CS), etc. ・ External resources in the field of: ・ Strategic Management; Marketing; Quality Control and TQM, if required.
	-2@PI	On-site business strategy & plan and its action plan development	To guide the participants to develop: 1) the business strategy & plan of their own PI; and 2) the action plans to implement the developed business strategy & plan.	・ Chairman / Vice-chairman of the Board of Members ・ Managing Directors/Administrative Heads of PI ・ Section Heads of PI ・ Other key decision makers	
	-3@PI	On-site review and guidance	To: 1) review the progress and achievement of the business strategy & plan, and action plans, and provide necessary technical guidance/advice/recommendation; and 2) guide the participants to identify the issues and points for further improvement and find out how to tackle them.		・ NDDB's internal resources from CT, FPS, QA and CS, etc. ・ External resources in the field of Strategic Management, if required.
	-R	Reflection workshop	To 1) guide the participants to reflect lessons learned through the implementation of the business strategy & plan and its action plans, learn from other PIs' experiences; and 2) also recognize PIs that have achieved significant improvement.	・ Managing Directors/Administrative Heads of PI ・ Section Heads of PI	
BM-2 Marketing of Milk and Milk	-1	Concept & theory learning	To 1) enable PIs to design the marketing research and outsource it to the marketing consultants; and 2) reflect its results into the action plans in accordance with the road map and marketing strategy of PIs.	・ Manager(s) of Marketing Department ・ Manager(s) of Marketing Department of the Federation	・ NDDB's internal resources from CT, etc. ・ External resources in the field of Marketing, if required.

Module ID & Title	Programme ID	Programme Title	Programme Objectives	Main Target participants	Potential resources to develop and deliver the programmes
Products	-2@PI	On-site guidance for utilization of marketing research	To 1) let the marketing officers of the PI comprehend how to interpret and utilize the results of the marketing research conducted by the consultants outsourced by the PI into the action plans, in accordance with their own PI's road map and marketing strategy.	・Any other staffs of marketing department including administrative staffs, field supervisors, and field staffs.	・NDDB's internal resources from CT, etc. ・External resources in the field of Marketing, if required. ・Marketing consultant who conducted the marketing studies outsourced by the PI under component C.
FS-A1 Clean milk production (CMP) and milk quality management at village level	-1	Business Appreciation Program + Action Plan development	This is based on the existing training "Business Appreciation Program" and Action Plan development is mainly added. To 1) enable the participants being able to train the milk producers at village level and 2) guide them to develop the action plans of their own PI to improve clean milk production and milk quality management at village level.	・Section head (Procurement and Inputs) ・Working level officers especially for milk procurement ・Supervisors and staff for milk procurement ・Preference will be given to female employees	・NDDB's internal resources from CT and CS, etc. ・External resources, if required.
	-2@village	Training by trainers to milk producers	Use the existing "Awareness Program on Clean Milk Production" See Table 12-2 Summary of NDDB planned programmes.	・Milk producers ・Workers at DCS	・Working level officers of PIs in charge of milk procurement ・Supervisors and staff for milk procurement
	-3@PI	On-site review and guidance	To guide the participants to identify the points needed to improve the training mechanism to train milk producers and workers of DCS on clean milk production and milk quality management	・Section head (Procurement and Inputs) ・Working level officers especially for milk procurement ・Supervisors and staff for milk procurement ・Preference will be given to female employees	・NDDB's technical officers ・External resources, if required.
FS-B1	-1	Concept & theory learning	To let the participants comprehend the key concept of food safety and thereby be aware of the benchmark standards for plant	・Plant Manager ・Section Head (QA,	・NDDB's internal resources from CT (MIT: Mansinh

Module ID & Title	Programme ID	Programme Title	Programme Objectives	Main Target participants	Potential resources to develop and deliver the programmes
Dairy plant management and plant hygiene and sanitation			environments, production facilities, operational aspects and quality control to carry out the necessary improvements at the production level of their own PIs.	Production, etc) ・ Working level officers / technicians / plant operators (control room operator, QA officer, etc)	Institute of Training), QA, Engineering, etc. ・ External resources in the field concerning plant hygiene and sanitation, if required.
	-2	Practical and action plan development	To: 1) familiarize the participants on maintaining and utilizing the actual milk processing machines at the dairy plant; and 2) guide the participants to develop the action plans to improve the current situation of their own PI's plant mainly from a hygiene and sanitation point of view.		
	-3	Benchmarking hygienic modern plant visit	To let the participants comprehend the quality benchmarks for the operation of dairy plants through the observation of the benchmarking hygienic modern plant and recognize the future improvement points for the plant of their own PI.		
	-4@PI	On-site review and guidance	To: 1) review the progress of the implementation of the action plans and provide necessary technical guidance/advice/recommendation; and 2) guide the participants to apply knowledge and skills acquired through the previous session FS-B-1,2, and 3 to improve the current situations of their own PI.		
FS-B2 Quality control techniques and practices for lab technicians	-1	Basic concept & theory learning / practice and action plan development	To enable the participants to enhance their knowledge and skills on milk quality control & assurance and develop the action plan to improve it of their own PI.	・ QA section head ・ Working level officers / staff especially for lab	・ NDDB's internal resources from CT and QA, etc. ・ External resources in the field concerning milk quality control and assurance, if required.
	-2@PI	On-site review and guidance	To: 1) review the progress of the implementation of the action plans and provide necessary technical guidance/advice/recommendation; and 2) guide the participants to improve their technique, practice, procedures and other activities to improve accuracy and as a result to assure the quality of the products of their own PI.		
FS-R	-R	Reflection workshop for Food Safety	To 1) guide the participants to reflect lessons learned through the implementation of the action plans and learn from other PIs' experiences; and 2) also recognize PIs that have achieved significant improvement.		・ NDDB's internal resources from CT, QA, Engineering, CS, etc. ・ External resources in the field concerning Food Safety, if required.

Table 12-2: Summary of NDDB training programmes

Component of the Project	**Program Title**	**Learning Objectives** **Participants will be able to:**	**Main Target participants**	**Main resources to develop and deliver the programmes**	Content Outline ID
A	Farmers' induction program	· Appreciate the need for fair and transparent milk procurement operations, trained DCS staff and proactive management committee members. · Value member involvement and participation of women members at the DCS level for efficient operations. · Describe proper breeding, feeding, health care and management of animals to enhance milk production. · Adopt clean milk production practices at farm and DCS level.	· Milk Producer members of dairy cooperatives/ Producer Companies	· NDDB's internal resources · PI, if desires, can outsource agency or use its own training facility for the training	1
A	Awareness program on clean milk production	· Practice clean milk production techniques in their milk production and handling activities. · Pour good quality milk to producer institutions.	· Milk Producer members of dairy cooperatives/ Producer Companies	· Milk union trainers / officers	2
A	Management Committee Members (MCM) Orientation programme for New DCS	· Understand Financial and Accounting system of DCS · Understand DCS management system · Prepare Business Plan · Have a clear understanding of their roles and responsibilities · Have an awareness on provisions of Cooperative Bye-Laws	· Elected Management Committee members of DCS	· Milk union trainers / officers	3
A	Board orientation program	· Develop a clear understanding of roles & responsibilities of a Board of Director; role clarity between Policy make and executive · Identify strengths and weakness of their milk union business · Demonstrate systemic approach in solving problems and taking decisions based on policy formulation · Show more concern & meaningful participation during the discussions in board meetings for the growth of milk union.	· Elected Board of Directors of Milk Unions / Producer Companies	· NDDB's internal resources · PI, if desires, can outsource agency or use its own training facility for the training	4
A	Business Appreciation Program for Existing Procurement & Input Staff	· Work as effective and efficient facilitators · Achieve the desired key targets related to milk procurement and institutional development and facilitate member participation · Exhibit a high professional commitment and initiative for development of cooperative milk business	· Milk Union Producer Company Personnel involved in Milk Procurement and institutional Building	· ditto	5

Component of the Project	Program Title	Learning Objectives Participants will be able to:	Main Target participants	Main resources to develop and deliver the programmes	Content Outline ID
			activities		
A	Basic Training for new DCS Secretaries	・ Carry out day to day business of the DCS in an efficient and effective manner to ensure functioning of the society as viable business unit ・ Understand the factors for DCS profitability ・ Ensure member participation in milk pooling and utilizing inputs activity ・ Address member grievances	・ Secretaries of newly organized DCS/MPI	・ ditto ・	6
A	Refresher Training of DCS secretaries	・ Carry out day to day function of the society in an efficient and effective manner to ensure functioning of the society as viable business unit	・ DCS/MPI Secretaries of older DCSs/MPIs (those who have already undergone DCS Secretary Basic Training)	・ ditto	7
A	Operation & Maintenance of BMC/AMCU	・ Efficiently utilize the assets BMC, AMCU, DG Sets etc. ・ Smoothly operate the Bulk Milk Cooler and AMCU.	・ BMC operators/ Chilling Centre In charge	・ ditto	8
C	Retailers Awareness Programme	・ Understanding retailer's area of operation and reach ・ Understanding the demography of the surrounding locality and demographic based services required ・ Estimating milk and milk products demand of the surrounding locality ・ Understanding competitor's activity and volume, retailer's share in milk and milk products business in his /her area of operation.	・ Retailers associated with Dairy Milk Union /State Milk Federation/ Producer Company	・ Marketing Officers and Executives of Milk Unions / State Milk Federations / Producer Companies	9
D	Training on Automatic Milk Collection Software at Union level	・ Operate the AMCS efficiently ・ Train the Village level functionaries on the software ・ Generate report, analyze and use it for decision making	・ Milk Union/ Producer Company officials engaged in milk procurement activities and Management Information System	・ External faculty	10
D	Training on Automatic Milk Collection Software at DCS level	・ Operate the AMCS efficiently ・ Generate data and provide relevant information to the milk union ・ Provide information to Management Committee Members for business decision	・ DCS/MPI secretary	・ Milk Union / Producer Company official along the External faculty	11

Component of the Project	**Program Title**	**Learning Objectives** **Participants will be able to:**	**Main Target participants**	**Main resources to develop and deliver the programmes**	Content Outline ID
E	Training of Animal Nutrition officer/ Animal Nutrition supervisors	・ To orient the participants on Animal Nutrition - to acquire knowledge of scientific animal feeding & management at different stages for improving productivity and reproduction efficiency.	・ Animal Nutrition Officers and Supervisors	・ NDDB's internal resources ・	12
E	Training of Calf Rearing Supervisors on Calf Rearing Programme (CRP)	・ To orient the participants on implementation of CRP and to acquire basic knowledge of feeding and management of dairy animals and calves.	・ Calf Rearing Programme Supervisors	・ ditto	13
E	Milch animal rearing for dairy farmers	・ Adequate operational knowledge and understanding to for scientific animal management ・ Required skills through hands on training and perform the required operations within the specified standards ・ Ability to make operational decisions pertaining to the dairy farming. ・	・ Progressive Milk Producers	・ NDDB's internal resources ・ External faculty from Agriculture University, Financial Institutions	14
E	Training on Advances in Fodder Production, Conservation and its management practices	・ Providing advance knowledge and practical training on green fodder cultivation and conservation in villages. ・ Implementation of DCS based low cost commercial silage making and extension activities. ・ Introduction machinery and crop residue management ・ Skill development of trainee in extension activities and carry out village level development programmes ・ Data collection from farmers and handling and reporting ・ Procurement and maintenance of farm machineries	・ Fodder development officer and his / her supporting field officers/staff	・ NDDB's internal resources ・ External faculty from Agriculture University	15

12-2-2. CD activities in Japan

Under this, the trainings are planned to be conducted in Japan, three times each for Business Management (BM) and Food Safety (FS) area respectively. Linkage between BM trainings in Japan and JICA proposed BM programmes and linkage between FS trainings in Japan and JICA proposed FS programmes are shown in Figure 12-3 and Figure 12-4 respectively.

The first batch of trainings in Japan, such as BM-JP-ToT for Business Management and FS-JP-ToT for Food Safety has the objective to train the trainers. Those who are or will be trainers mainly for BM-1 and/or BM-2 will join BM-JP-ToT, and those for FS-A1, FS-B1 and/or FS-B2 will join FS-JP-ToT respectively. After finishing the trainings in Japan, the participants should update the contents of CD programmes by utilizing knowledge, skills, and even attitudes that they have learned in Japan and actually deliver CD programmes for PIs.

The second and third batch of trainings in Japan are mainly for those PIs that have shown high performance and / or have improved their operational procedures well as the results of the CD processes throughout BM and /or FS modules. Monitoring indicators suggested in the following section 14-3 **Monitoring and Reporting** (2) PI, could be referred as some examples of criteria to select the PIs that send the participants to trainings in Japan. In addition, the final programme of series of CD programmes, such as a reflection workshop (BM-1-R or FS-R), could also be an opportunity to recognize each PI's achievement during the entire 18 month CD processes, which might be utilized as one of the references to select PIs to send trainees in Japan. In this regard, trainings in Japan might work as some incentives for participants from PIs to implement their learnings from trainings at their own workplace. It is recommended to have multiple number of participants from one PI attend the trainings in Japan in order to get as close as possible to the critical mass number of employees to actually facilitate the changes for the improvement by applying learnings in Japan rather than to scatter the participants to many PIs and only one employee from one PI attend.

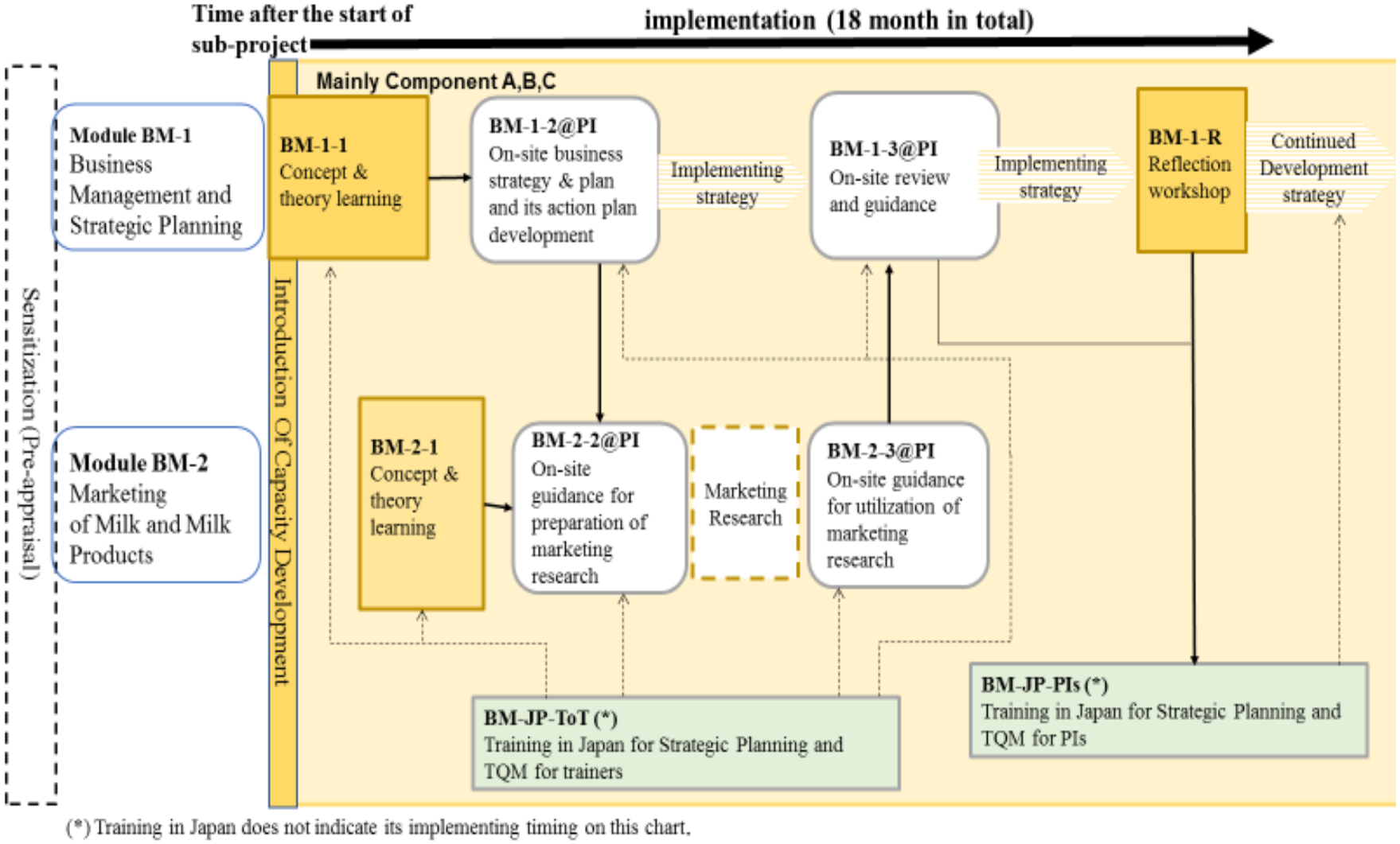
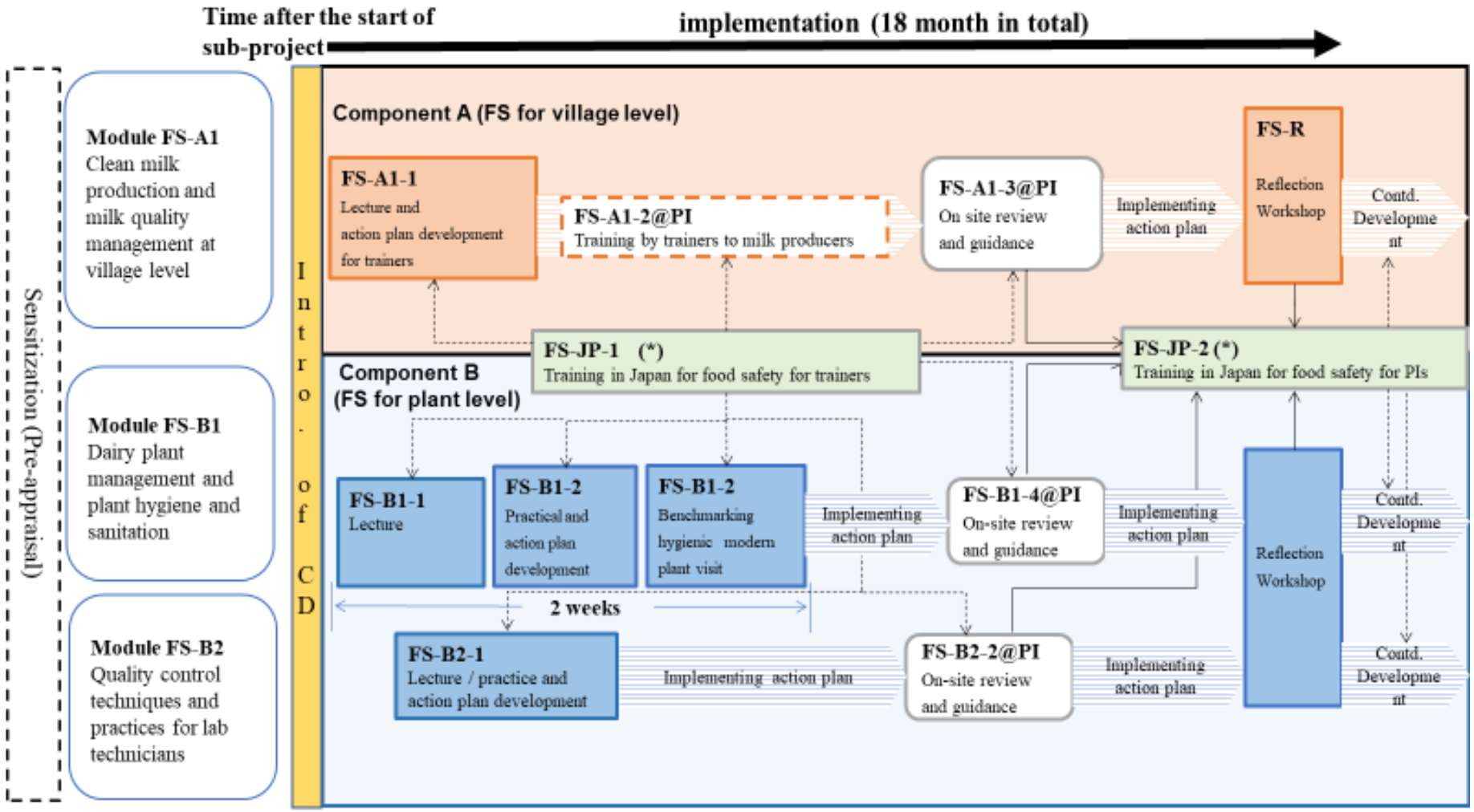


Figure 12-3: Linkage between BM training in Japan and JICA proposed BM programmes



(*) Training in Japan does not indicate its implementing timing on this chart.

Figure 12-4: Linkage between FS training in Japan and JICA proposed FS programmes

The summary of trainings in Japan are presented in Table 12-3 and the attachment 12-2-4 describes more detailed content outlines of them. Due to quarantine restrictions for foot-and-mouth disease prevention in Japan, visitors from a foot-and-mouth disease contaminated country are required to keep away from livestock and livestock related facilities for certain period, for example at least two weeks, after their arrival in Japan. Thus, training in Japan for Food Safety is planned to last about two and a half weeks and visiting dairy farms is placed in the last part after the participants spend two weeks for other training activities. Visiting dairy farms could be optional depending on the participants' job role as well as their availability to leave the workplace.

Table 12-3: Summary of trainings in Japan

Module ID and Title	**Programme ID**	**Programme title**	**Objectives**	**Main Target participants**
BM-JP Training in Japan for strategic planning and TQM	-ToT	For trainers	To let NDDB trainers who will be trainers of capacity development training modules such as BM-1 and/or BM-2: 1) comprehend a variety of concepts and practices useful to transform dairy cooperative institutions' business processes through the introduction of the strategic management based on the demand- and quality-oriented value chain management and Total Quality Management; 2) reflect what can be applicable to the training modules to be provided at NDDB and their working environment in India.	・ Trainers from NDDB who will be trainers of BM-1 and/or BM-2 ・ In all category participants should be nominated who will be responsible for project implementation
	-PIs	For PIs and trainers	To let the participants: 1) comprehend a variety of concepts and practices useful to transform dairy cooperative institutions' business processes through the introduction of the strategic management based on the demand-oriented and quality-oriented value chain management and Total Quality Management; 2) reflect what can be applicable to (the training modules to be provided at NDDB and) their working environment in India.	・ Managing Director ・ Key persons in the PI responsible for implementation of project
FS-JP Training in Japan for Food Safety	-ToT	For trainers	To let NDDB trainers who will be trainers of capacity development training modules such as FS-A1, FS-B1 and/or FS-B2: 1) comprehend the advanced food safety related technology and actual practices in Japan; 2) reflect what can be applicable to the training modules to be provided at NDDB and their working environment in India.	・ Trainers from NDDB who will be trainers of FS-A1, FS-B1 and/or FS-B2
	-PIs	For PIs and trainers	To let the participants: 1) comprehend the food safety related technology and actual practices in Japan; 2) reflect what can be applicable to (the training modules to be provided at NDDB and) their working environment in India.	・ Plant Manager ・ Section Head (QA, Production, etc) ・ Working level officers / technicians /

Module ID and Title	Programme ID	Programme title	Objectives	Main Target participants
				plant operators (control room operator, QA officer, etc) ・ Persons responsible for project implementation

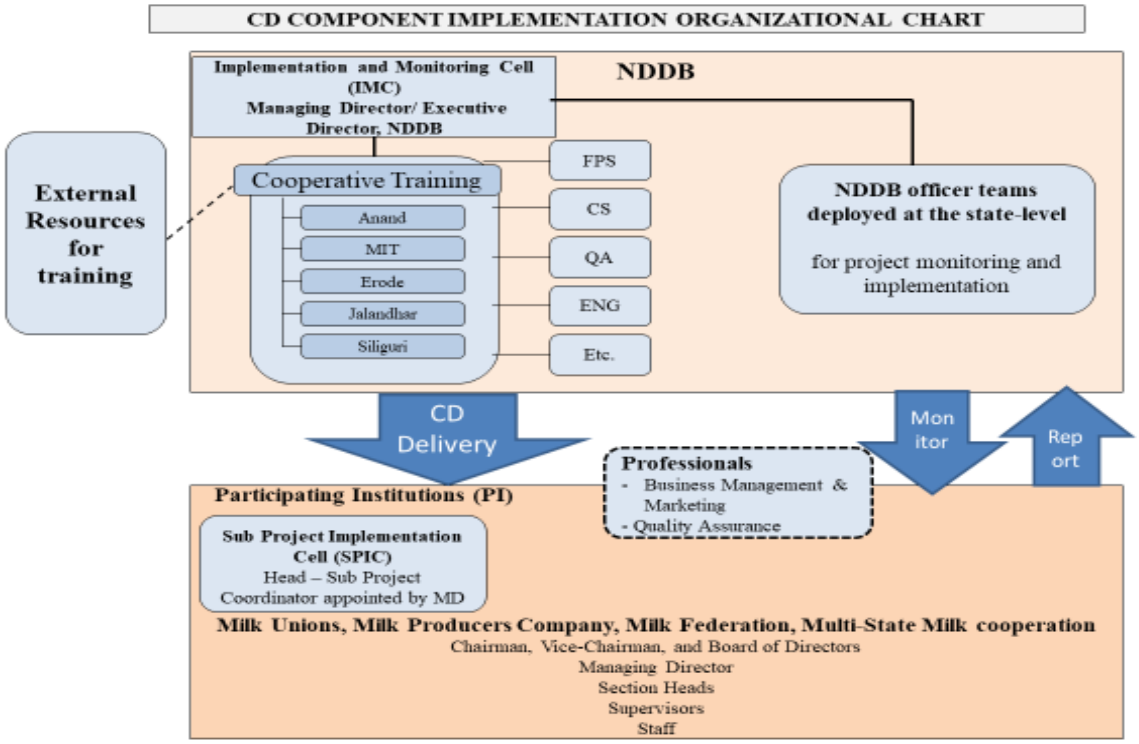
Source: Survey team

13. Organizational Arrangement of Capacity Development

13-1. Implementing Organization

Figure 13-1 depicts the organizational arrangement to develop and implement CD programmes written in 12-2 above although Component G also follows the overall framework of the Project. To develop and deliver CD programmes, CT of NDDB has played as a coordinator. CT plans the overall contents and schedule of the programmes, and for topic-wise, it mobilizes NDDB internal resources from technical department, for example, FPS, CS, QA, Engineering, as well as external ones upon necessity to develop and deliver them.

As mentioned in section 12-1-2 Component G comprises practical and field-oriented approach and aims at providing a support to trainees' and ultimately improving PIs' changing process. As a result, the Action Plan development and its review and guidance at each PI will be conducted to improve PI's situation by utilizing what the trainees learned through the CD programmes. JICA team proposes to assign two professionals under the project who will facilitate the implementation of the Action Plan and other CD activities at PI for two years. More details are elaborated in Attachment 13-1-1.



Source: Survey team

Figure 13-1: CD Component Implementation Organizational Chart

13-2. Resource persons who develop and deliver CD Programmes for Component G

Potential resource persons who will develop and deliver proposed CD programmes (instructors / trainers) are indicated in Table 12-1. For a newly developed programme, basically the resource persons who have developed the contents of a certain topic will also deliver it. In principle, honorariums for external resources has set to include both developing contents and teaching materials as well as their deliver according to the NDDB practice.

13-3. Starting preparation for the programs

Before the start of the program, following preparation mentioned below is necessary and it takes time. Therefore, smooth and effective discussion, decision and execution are crucial.

(1) Discussion with MIT at MIT

At FS-B1-2, JICA team propose new lecture as additional content which is a study, presentation and discussion from hygienic point of view, for example using BMC, pump, valve and homogenizer. The purpose of this program is not only for participants to understand the inside machine mechanism but to increase hygienic awareness of structure through discussion checking actual disassembled machine in front of them. To implement this content, it is desirable to discuss the issue between MIT lectures and Japanese expertise beforehand.

(2) At FS-B1-3, participants will see modern and hygienic plant(s) to understand the quality benchmark. Therefore, suitable benchmark plant needs to be selected carefully. JICA team already suggested candidate plant but it is not decided yet. Because benchmark plant will be helpful to further strengthen NDDB ability to design the plant, it is essential to select it among NDDB construction plants. Big plant and foreign capital plant are not suitable for this purpose. However, any plant selected as a model need to be improved beforehand hygienically, especially factory entrance system because it is very important, effective and outstanding. To modify these facilities, it must be speedy to select benchmark plant and decide improvement design, and implement work need to be done before participants visit, since it may take three or four months to do this work. JICA team are willing to join these discussions.

(3) Factory entrance system

Plant construction, production and improvement continue regardless of CD. Just before CD, all the texts and documents for Food Safety actual improvement will be prepared. However, we do not need to wait until CD start and become effective. Here JICA team suggests improvement plan for factory entrance system. Typical example in Japan is shown on Figure 2-18. NDDB can use this idea to discuss, decide and execute actual modification from now.

(4) At FS-B1-3, MIT lectures have to guide the participants at benchmark plant(s) leading discussion among them. To do this effectively, discussion with Japanese expertise beforehand will be useful. Besides hygienic system, participants need to learn how to process and facilities works and daily operations are carried out to utilize these knowledge for future improvement. MIT already have the same opinion with JICA team on this matter.

(5) For FS-A1-1, the purpose of the training from food safety and hygiene point of view, the trainers of PIs become enable to provide clean milk production training to their farmers. If the training contents focus on business appreciation program, NDDB has to confirm whether trainers of PIs have enough knowledge and capacity to provide clean milk production to farmers. If not, additional training or modified training contents focusing on clean milk production needs to be provided to those PIs. In addition, training contents which enable persons in charge at DCS to conduct proper clean and sanitation procedure of BMC as well as proper utilization of AMCU/DPMCU should be covered.

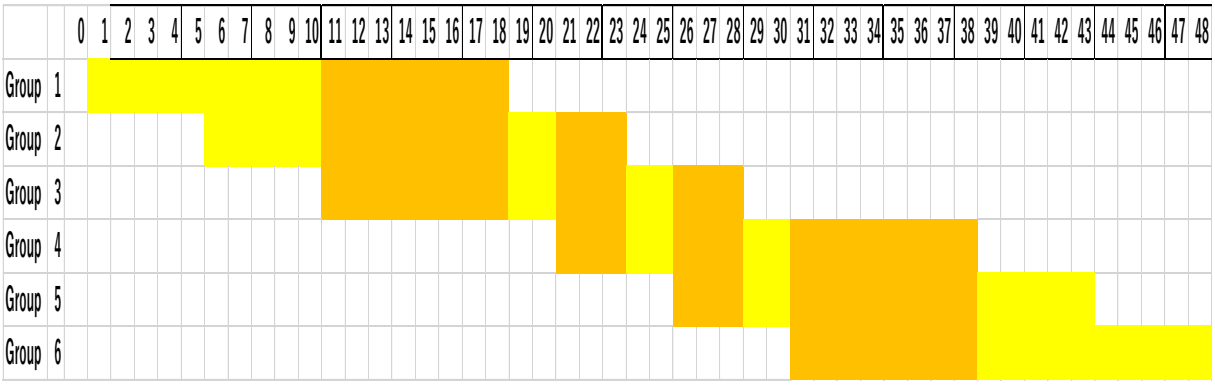
14. Implementation Schedule and Operating Procedure of Capacity Development

14-1. Implementation Schedule

Implementation of Component G, especially for the CD of business management as well as food safety areas can be designed as below:

- Total 30 PIs in the project are assumed to participate.

- The CD programme will start when the number of PIs that will participate in the programme reaches the appropriate number to carry out the programme from teaching/learning effectiveness and cost efficiency point of view. The content outline sheet in Attachment 12-2-1 suggests the approximate number of PIs suitable to carry out the programme.
- One group will consist approximately of 5 PIs and total 6 groups for Component G in the Project are assumed.
- Grouping of PIs into one group basically follows "first come first served" basis as the sub-project approval timing differs from one PI to another,
- One group requires 1.5 years to complete the CD trainings. Therefore, all trainings will be completed in 48th month after the commencement of the first sub project in the Project as shown in the figure below:



Remarks: vertical axis shows number of batches, and horizontal axis indicates months after commencement of the first sub project.

Source: Survey team

Figure 14-1: Overall Training Schedule for Business Management and Food Safety

As the colors become darker in the figure, number of parallel groups which receive trainings increases, meaning NDDB will be busy delivering the trainings. Maximum number of overlapped group is three, having 15 PIs. The interval between the group is suggested around 5 months by considering affordable number of CD programmes to be conducted in parallel from the training provider perspective. Attachment 14-1-1 demonstrates the schedule simulations of developing and delivering all JICA team proposed CD programmes for 6 groups. Group 4 is planned to start after the results of mid-term review are confirmed. The CD programmes that the PI should participate in are determined by the sub-project components approved for PI (See Table 8-5: Linkage between Training Program and Component). Attachment 14-1-2 demonstrates the schedule simulations of one PI participating in all the JICA team proposed CD programmes.

14-2. Operating Procedures

There are two types of trainings among JICA team proposed CD programmes under Component G. One is to be carried out off-site where the participants of PI will come to the NDDB training centers and the other is to be carried out at PI's location. The latter type is recognized by programme ID with @PI as a suffix. As the participants have their working duty at PI, it is difficult for PI to allow many of them at one time to leave their work place and participate in trainings conducted at training centers far away from PI. Therefore, the off-site type of trainings of the same programme for one group will be offered basically multiple times in order to give PI a chance to send more employees to the programme in rotation.

As for the programmes to be carried out at PI's location, the number of times and its timing of on-site programmes need to be examined by considering each PI's characteristics and needs for the effectiveness of on-site review and guidance for **Action Plan.** NDDB officer team at the state-level for the project monitoring and execution and professionals assigned at PI with PI's request basis might play as an agent to understand PI's needs regarding Action Plan implementation. The number of instructors & trainers and their specialized fields who will go on-site would be decided based on the components approved for the PI under the project.

14-3. Monitoring and Reporting

To monitor the progress of CD Component, the following indicators are suggested to be monitored which would be collected by IMC (located at NDDB). On-site review and guidance @PI program and reflection workshop could be a good opportunity to monitor the qualitative indicators for PI.

(1) NDDB (Training provider side)

- Quantitative
  - Total number of participants / CD programme with female / male distinction
  - Total number of PIs / CD programme
  - Number of times on-site review and guidance conducted @PI program / PI
- Qualitative
  - How the contents and method of instructions of CD Programmes have been upgraded after trainers participated in trainings in Japan.

(2) PI (Training participant side)

- Quantitative
  - Percentage of employees of PI who participated in CD Programmes
  - Number of times that the Action Plan have been revised according to the workplace situation
- Qualitative
  - How the Action Plan has been implemented

- Any changes in the operational procedures of PI contributing to driving its business into market-oriented and quality censorious direction.

15. Some Observations of Survey Team

15-1. Initial Assessment of Project component

The following table shows the component wise initial assessment by the team on JICA's coverage when the first work in India was on-going in the early August in 2018:

Table 15-1: Component wise Initial Assessment and Technical Observation on Each Component by the Team

Sr.	Component	Loan	Grant				Technical Observation by the Team from the viewpoint of whether the components should be covered by JICA Loan or not in the project
	Purpose	Facility/equipment	Facility/equipment		Capacity development		
	Source of fund	JICA (loan to PIs)	JICA (on grant to PIs)	GOI	JICA (on grant to PIs)	GOI	
A	Strengthening Milk Procurement infrastructure	-	O or -	O	O or -	O	Most of the other programs cover this component. To make sure of quality milk supply to invested plants, some BMC could be important, and there are still many needs to assist this area, though the component may not be the priority in the project. From food safety and hygiene points of view, capacity development is necessary.
B	Strengthening Processing Infrastructure						This is the main component in the project, and relatively weak area in terms of support provided in the past. Business planning for operating these infrastructures is indispensable. As well as plant operation and hygiene areas are also important in capacity development.
B.1.	- Milk processing facilities and manufacturing facilities for Value Added Products	O	-	O	O	O	
B.2.	- Feed & feed supplements manufacturing infrastructure	O	-	-	O	O	
C	Support for Marketing infrastructure	-	O or -	O	O	O	Marketing is very important. Some infrastructure in this area is also necessary. Capacity development in this component is a must to be covered by JICA loan.

D	Support for ICT Infrastructure	-	O or -	-O	-	O	Systems proposed in DPR focus on the system from producers to unions. Instead of that, the team finds some necessities to install ERP in highly capable PIs to improve business decision making.
E	Productivity Enhancement	-	-	O (in a form of programs)	-	O	Lots of support have been given in the past to this area including NDP-I. Still there are needs to address this area, but the project could give less focus on this component.
F	Project Management and Learning	-	-	O (in a form of services)	O	O	This is also an important component. This can be assisted either through grant.

Remarks: The shaded cells indicate theoretical possibilities for JICA to assist the components/fund pattern/purpose before MD was signed. "O" means the Survey Team preliminarily assessed that cells which have "O" are relevant for JICA to assist the components/fund pattern/purpose.

Source: DPR and the Survey Team

Although to strengthen the entire dairy value chain of POIs is essential and other components are included in the project, as shown in the above, to give priority to component B is somehow relevant. Training can give more focus on hygiene and business management, which seem relatively weak, than milk production part. Component C, marketing area, can be emphasized more, especially capacity development and training.

15-2. Assumed Fund Requirements

(1) Possible loan size

Possible loan size per PI is estimated and showed in the following table.

Table 15-2: Possible Loan Size per PI

Target	All potential PIs in 9 Priority and Other States*
Average	INR 61 crores
min	INR 0 cores
max	INR 519 crores
median	INR 5 crores

*: Include federations, milk unions and milk producer companies (113 PIs).

Source: Survey team based on the fund requirement obtained from JICA

Based on the requirement of potential PIs, which was studies in 2015-2016 by NDDB, average fund requirement size becomes INR 61 crores per PI. There are huge variances for the fund requirement by PI, ranging from 0 to INR 519 crores with medium INR 5 crores.

With the data, assumed number of participating institutions are around 20 PIs (17.7 = INR 1,083 crores of total /INR 61 crores). Considered with the median if INR 5 crores, more number of PIs could be anticipated.

(2) Indicative Fund Requirement

Using the anticipated fund requirement obtained from JICA, which was based on the consultation held in 2015-2016 with POIs, the indicative fund requirement for the project can be estimated as below.

Table 15-3: Indicative Fund Requirement for the Project (Component A and B)

Unit: Crores of Rs.

	Before mid-term review	After mid-term review			Total during the project		
		1) Top three states of fund requirement	2) Possible three states (example)	3) Bottom three states of fund requirement	1) Max requirement	2) Possible case	3) Min requirement
Priority State							
Bihar	144	93	93	93	237	237	237
Uttar Pradesh	10	805	805	805	815	815	815
Other state							
Andhra Pradesh	0	1,065	1,065	-	1,065	1,065	0
Madhya Pradesh	0	-	1,045	-	0	1,045	0
Punjab	0	1,356	-	-	1,356	0	0
Rajasthan	0	1,587	1,587	-	1,587	1,587	0
Telangana	0	-	-	594	0	0	594
Uttarakhand	0	-	-	60	0	0	60
West Bengal	0	-	-	137	0	0	137
Total	154	4,906	4,594	1,689	5,060	4,748	1,843
Component A+B (JICA portion)	662	662	662	662	662	662	662
%	23%	741%	694%	255%	765%	717%	278%
Component A+B (JICA + GOI portion)	1,083	1,083	1,083	1,083	1,083	1,083	1,083
%	14%	453%	424%	156%	467%	439%	170%

Remarks: the data include federation, union and MPC, although MPC plan is not exactly the same as the scenario described above.
Source: the Survey team

The above data include fund requirement of federations, unions, and milk producer companies initially estimated by NDDB. In this analysis, before the mid-term review, the fund requirement of 16 unions in Priority State, which have been already identified, was extracted. After the mid-term review after 18 months

from the commencement of the project, three cases were assumed for possible expansion of the target states, and to know anticipated fund requirement for the entire project. Namely, the cases are fund requirement of 1) top three states with the biggest total fund requirement (=max case), 2) technically possible three states for future expansion (current proposal), which are Andhra Pradesh, Madhya Pradesh, and Rajasthan, and 3) bottom three states with the lowest fund requirement (=min case). During this second phase, the fund requirement of Priority State was estimated totaling fund requirement of the rest of the unions other than 16 unions.

The component A and B fund requirement (the above partially includes the component A as BMC) can be estimated as INR 154 crores before the mid-term review, which corresponds to 23% of the JICA portion, 14% of JICA plus GOI portion, indicating that there are high probabilities to expand the target states to three more states. There are three cases assumed for the fund requirement from Other States after the mid-term review, as 1) top three states, 2) possible three states currently proposed (Andhra Pradesh, Madhya Pradesh, and Rajasthan), and 3) bottom three states, total fund requirements for Case 1), 2) and 3) are estimated as INR 5,060, 4,748, and 1,843 crores respectively. These correspond to 1) 765%, 467%, 2) 717%, 436%, and 3) 278% and 170% of JICA portion, and the sum of JICA and GOI portion of Component A and B, respectively. This indicates that at least some extra fund requirement can be secured even if the minimum case is considered.

15-3. Examination of Fund Requirement of Component G

The survey team and NDDB discussed and identified the training programmes considering overlap between programmes proposed by NDDB and the survey team. The overlapping check list is shown in Table 4-2. The attachment 15-3-1 shows the estimated fund required to implement JICA proposed programmes by applying the unit cost provided by NDDB. Table 15-4 shows cost estimation to implement: 1) JICA proposed programmes; 2) NDDB originally planned programmes – overlapping programmes with JICA proposed; and 3) professional assignment at PIs to take a lead in steering the process of improvement envisaged under JICA project. According to the examination procedures mentioned above, the estimated fund requirement of component G to implement these three are found within the budget allocated in Component G, such as around 43.3 crores.

Table 15-4: Cost estimation to implement CD activities under Component G

Component G			INR	JPY Equivalent
		NDDB originally planned training programmes	259,100,000	419,742,000
		JICA proposed programmes	122,868,350	199,046,727
		(NDDB originally planned programmes) - (Overlapping programmes with JICA Proposed programmes)	232,900,000	377,298,000
TOTAL	Training programmes (*)		355,768,350	576,344,727
		Professional assignment (**) (2 professionals at 30 PIs for a period of 2 years)	75,600,000	122,472,000
TOTAL	Training programmes + Professional Assignment		431,368,350	698,816,727

(*) JICA proposed programmes + (NDDB Planned - Overlapping programmes with JICA Proposed)
(**) The first year's salary of one professional is INR 600,000 and the second year is INR 660,000 by 10% increase.
Source: Compiled by survey team.

15-4. Overseas Training

As described in 12-2-1 "CD activities in India" and 12-2-2 "CD activities in Japan", oversea training is closely linked to CD activities under Component G. The contents of training programmes, especially the programmes proposed by the survey team, to be carried out for PIs are planned to be continuously updated by utilizing what the trainers have learned through oversea trainings. It also aims to motivate the PIs for the continuous improvement for the future that would be triggered by the CD activities in India under Component G. In this regard, to bring about synergy effect of oversea trainings and training programmes for PIs under Component G, overseas training is recommended to be done in Japan.

If organizing and implementing oversea training in Japan is a part of TOR of Project Management Consultant (PMC), it is essential for PMC to have capability to do so in Japan with a strong network to mobilize appropriate resource persons or institutions in Japan. PMC could outsource the oversea training to an organization that has an expertise to provide trainings in Japan for oversea trainees, for instance, AOTS mentioned in 3-3-2. The scope of outsourcing could be: 1) the entire processes, for example, a detail design of the contents based on the outline developed by the survey team, finding the appropriate resource persons/institutions to develop and deliver the training contents and let them deliver, and all the logistic matters to implement trainings in Japan.; or 2) some processes only, for example, just for the logistic to implement trainings in Japan. To conduct the oversea training for trainers, such as BM-JP-ToT and FS-JP-ToT, at right timing is also crucial. It will be valuable to arrange the environment enabling trainers to incorporate their learnings in Japan into the CD activities for PIs as well as participate in oversea trainings by coordinating the timing with their busy training delivering schedule in India. The provisional cost estimation for the case of outsourcing the entire processes as one package is shown in attachment 15-4-1.

If organizing and implementing oversea training in Japan is a part of Component F, JICA's procurement guidelines need to be followed. This might be intricate and time consuming. Attachment 15-4-1 indicates that outsourcing oversea training in Japan as one package is still within the budget of Overseas/National

exposure visits/training under Component F; however, it will exceed the budget when transportation and miscellaneous cost for participants is included.

Oversea trainings are important investment for the future. Key officers of the leading organizations like NDDB as well as progressive PIs in the dairy sector in India who will participate in the oversea training are expected to be drivers for the continuous improvement even after the project finishes and bring new ideas & innovations for the sector through learning from other countries' cases.

15-5. Proposed TOR of PMC by the Survey Team

NDDB has capacity to implement the project effectively. However, as NDDB is implementing the JICA project for the first time, there is need of Project Management Consultant (PMC) to assist the IMC in implementation of the project activities. With this in view, the survey team has proposed the following scope for PMC TOR when the first work in India was on-going in the early August in 2018:

- Assistance especially in initial screening and appraisal process of sub-project plans from viewpoint of reviewing and training on realistic business planning;
- Some trainings in the capacity development component (including NDDB's planning capacity on future training programs, and monitoring after the completion of training);
- Overseas training (exposure visit in Japan);
- Assistance in fund management especially following specific yen loan procedures, reallocation of fund among components, and changes of target areas;
- Assistance in monitoring including Project Status Report preparation and setting & updates of O&E indicators, or any other requirements by JICA; and
- Overall coordination of the above as the project management with the NDDB and JICA.

Considering the above TORs, possible experts who can be part of PMC are listed as below:

a) Team leader/project management, responsible for overall project management and consultant team including arrangement and implementation of overseas training.

b) Training program development expert, responsible for supporting the capacity development program, as well as consultation on NDDB's planning capacity on future needs of capacity development

c) Business management expert, mainly responsible for supporting initial assessment and appraisal process done by NDDB, and implementation of the capacity development component

d) Food safety and hygiene expert, responsible for supporting implementation of the capacity development component

e) Disbursement management and monitoring expert, responsible for supporting fund management from the viewpoint of yen loan procedures, and preparation of related monitoring report required by

JICA

f) Specialist as required, responsible for specific areas who maybe specialized in marketing, branding, plant and hygiene (engineering), or dairy production.

ATTACHMENT

Attachment3-2-1 #1

Business management related past trainings for DCS s and milk producers by NDDB

	2013-14					2014-15					2015-16					2016-17					2017-18				
Course Title	**A**	**M**	**J**	**E**	**S**	**A**	**M**	**J**	**E**	**S**	**A**	**M**	**J**	**E**	**S**	**A**	**M**	**J**	**E**	**S**	**A**	**M**	**J**	**E**	**S**
Farmers Induction Prog	*		*		*	*		*	*		*		*	*		*		*	*	*	*		*		*
Farmers Orientation Prog	*		*	*		*		*	*		*		*	*		*		*	*	*	*		*	*	*
Customised FOP	*					*													*		*				
Artificial Insemination: Basic			*	*	*			*	*	*			*	*				*	*	*			*	*	*
Artificial Insemination: Refresher			*	*	*				*	*				*				*	*	*			*	*	*
Customised AI Refresher			*					*										*							
DCS Secretary					*			*		*				*					*	*					*
DCS Secretary Refresher			*					*	*	*			*	*					*	*	*				*
Management Committee Members of DCS								*	*				*	*					*						
Training of new field supervisors on producer relationship mgmt.											*					*									
New Field Supervisor Training on Milk Business & Producer Relationship Management	*					*					*					*					*				
P & I Supervisors Programme																			*						
Milk Procurement & Technical Inputs					*				*																*
Orientation on INAPH software				*																					
Fodder Seed Production				*					*	*														*	
Dairy Animal Management				*	*				*	*			*					*					*	*	*
Ration balancing Programme																			*						
Training of trainers (Veterinanrians)																			*						
Progressive Farmers Orientation Programme																					*				
Training on Micro Training Centre																*									
Lady extension Officers training											*					*					*				
Refresher training on Bovine breeding																			*						
Exposure visit of Farmers and Paravets																					*				

A: The main center in Anand
M: Mansinh Institute of Technology
J: Jalandhar in Punjab for the North
E: Erode, Tamil Nadu for the South
S: Siliguri, West Bengal for the East

Attachment3-2-1 #2

Business management related past trainings for Federations and Milk Unions by NDDB

	2013-14					2014-15					2015-16					2016-17					2017-18				
Course Title	**A**	**M**	**J**	**E**	**S**	**A**	**M**	**J**	**E**	**S**	**A**	**M**	**J**	**E**	**S**	**A**	**M**	**J**	**E**	**S**	**A**	**M**	**J**	**E**	**S**
Board Orientation Prog	*					*					*					*					*				
Customised Board Prog	*																								
Orientation of Dairy Business																					*				
Dairy Development through cooperative business model																					*				
Dairy Cooperative Management																					*				
Management Development Training Programme																			*						
Marketing Orientation Programme																			*						
Training on Marketing of Milk and Milk Products																*					*				
Training on Marketing skills																			*						
Business Appreciation Programme(BAP)	*					*			*		*					*					*				
Lady extension Officers training on BAP						*																			
Leadership Development Programme																					*				
Training of Achievement Motivation											*										*				
Workshop on Governance of Cooperatives																			*						
Milk Procurement and Input Operations in Dairy Cooperatives																					*				
Dairy for non-dairy Personnel																					*				
Training of Trainers on Milk Business & Producer Relationship Management	*					*					*					*					*				

A: The main center in Anand
M: Mansinh Institute of Technology
J: Jalandhar in Punjab for the North
E: Erode, Tamil Nadu for the South
S: Siliguri, West Bengal for the East

Attachment3-2-1 #3

Food safety related past trainings for DCS s and Milk producers by NDDB

	2013-14					2014-15					2015-16					2016-17					2017-18				
Course Title	**A**	**M**	**J**	**E**	**S**	**A**	**M**	**J**	**E**	**S**	**A**	**M**	**J**	**E**	**S**	**A**	**M**	**J**	**E**	**S**	**A**	**M**	**J**	**E**	**S**
Clean Milk Production				*				*	*					*										*	
Procurement Producer relationship and QA for facilitators																			*						
Clean Milk Production, Operation & Maintenance of AMCU & BMCU		*					*					*					*		*			*			
Training of Trainers-O & M of AMCU & BMCU		*																				*			

A: The main center in Anand

M: Mansinh Institute of Technology

J: Jalandhar in Punjab for the North

E: Erode, Tamil Nadu for the South

S: Siliguri, West Bengal for the East

Attachment3-2-1 #4

Food safety related past trainings for Federations and Milk Unions by NDDB

	2013-14					2014-15					2015-16					2016-17					2017-18				
Course Title	A	M	J	E	S	A	M	J	E	S	A	M	J	E	S	A	M	J	E	S	A	M	J	E	S
Clean Milk Production & Dairy Plant Management		*		*								*										*			
Plant Operations and Quality Aspects																						*			
Hygiene & Sanitation		*					*										*					*			
Minimizing/Economizing Milk Solid Losses		*										*					*					*			
O & M of dairy Equip. and Management Sys.		*																							
O & M of Dairy Plant Equipment							*					*													
Dairy Plant Management												*													
Dairy Plant Management - Refresher																						*			
Electrical distribution, Safety and Maintenance in Dairy Industry																	*								
Efficient Steam Generation and & Distribution																	*								
Effective Milk Processing and Packaging												*					*					*			
Energy Conservation & Management							*					*					*								
Alternate Energy Resources ulitization in Dairy Industry & CFP																	*								
ETP(Effluent treatment processes) and Waste Management in dairy Industry																	*								
CMP, Quality & Food Safety System							*					*					*								
Basics of Dairy Technology												*										*			
FSSAI Training																						*			
Total Quality Management												*													
Efficient Operation of Refrigeration Plant												*					*					*			
Total Productive Maintenance												*					*								
Electrical Systems & Automation												*													
Quality & Food Safety for Dairy Plant												*					*					*			
Quality & Plant Management							*		*																
Instrumentation and Automation in Dairy Industry																	*					*			
Customized Program for Ice Cream manufacturing & Packaging - Hassan Milk Union																						*			
Customized Training programme for Vidya Dairy																	*					*			

Subject field	Category	Name	Location (State)
BM	1	Gandhigram rural institute	Tamil Nadu
BM	1	Hallmark Business School	Tamil Nadu
BM	1	Indian Institue of Management	In 13 States
BM	1	Indian Institute of Materials Management	In 5 States
BM	1	Institute of Rural Management Anand	Gujrat
BM		National Council for Coopertive Training	New Delhi
	1	Institue of Co-operative Management	In 14 States
	1	Regional institute of Co-operative Management	In 5 States
BM	1	National Institute of Design	Gujarat and Karnataka
BM	1	Rajasthan Institute of co-operative education and management	Rajasthan
BM	1	Xavier School of Management	Jharkhand
BM	2	XAXIS India	Maharashtra
BM	1	XLRI - Xavier School of Management	Jharkhand
FS	1	Builders Engineering College	Tamil Nadu
FS	1	Indian Institute of Health Management Research	Rajasthan
FS	1	International Food Policy Research Institute (IFPRI)	New Delhi
FS	1	Mansinhbhai Institute of Dairy & Food Technology	Gujrat
FS	1	National Dairy Research Institute	Hariyana
	1	Southern Regional Station	Bengaluru
	1	Eastern Regional Station	Kalyani
FS	1	Veterinary and Animal Sciences University	in many States
FS	1	Vidya Dairy	Gujarat
FS	2	Apex Laboratories Pvt. Ltd.	Tamil Nadu
FS	2	GEA Process Engineering (India) Ltd.	Gujrat
FS	2	HACCP Training Yushmakam consultancy	Kerala and Karnataka
FS	2	Kerala Livestock Development Board Ltd.	Kerala
FS	1&2	Quality Hub India (Online training providers)	
BM&FS	1	Anand Agriculture University	Gujrat
BM&FS	1	Annai Industrial Training Institute	Tamil Nadu
BM&FS	1	Confederation of Indian Industry	In all States and Union territories
	1	Institute of Quality	Karnataka
BM&FS	1	Govind Ballabh Pant University of Agriculture and Technology	Uttarakhand
BM&FS	1	MICA (formerly known as Mudra Institute of Communications, Ahmedabad)	Gujrat
BM&FS	1	Sardarkrushinagar Dntiwada Agricultural University	Gujrat
BM&FS	1	Sardar Patel Renewable Energy Research Institute	Gujrat
BM&FS	1	Sardar Patel University	Gujrat
BM&FS	1	The Maharaja Sayajirao University of Baroda	Gujarat
BM&FS	2	Basa Dairy consultancy Services Pvt. Ltd.	Maharashtra
BM&FS	2	Suruchi Consultants	Uttar Pracesh

BM: Business Management

FS: Food Safety

Category1: Universities, Research institute, or educational / training institutions

Category2: Private companies

Attachment 3-3-2
Invitation Programme to Japan for Dairying though Cooperatives

(1) Overview of the invitation programme

1) Name

Invitation Programme to Japan for Dairying though Cooperatives

2) Purpose of the programme

To identify potential training contents related to Japanese technologies, knowledge, and experiences which would enhance impact of the "Dairying through Cooperatives" Project (yen loan project)

3) Time and duration of the invitation programme

Arrives on 12th of November, 2018 an leaves on 21st of November 2018 (10 days stay in Japan)

4) Participants

11 people from the following organization were participated.

Organization	Number of participants
Directorate of Dairy Development, Department of Animal Husbandry, Dairy, and Fisheries	2
National Dairy Development Board	2
Dairy Cooperative Federation of Bihar	1
Dairy Cooperative Union of Barauni, Bihar	1
Dairy Cooperative Union of Patna, Bihar	1
Dairy Cooperative Federation of Uttar Pradesh	1
Dairy Cooperative Union of Gontha, Uttar Pradesh	1
Dairy Cooperative Union of Faizabad, Uttar Pradesh	1
Ministry of Finance	1

5) Contents of the programme

Various lectures and site-visits of livestock related organizations in Obihiro, Nagano, and Tokyo have been done during the stay between 12th of November and 21st of November. Table 1 depicts the overview of the schedule of the programme.

Table 1: Overview of the schedule of the Invitation Programme

Day	Place	Major activities
Monday, 12th November to Friday, 16th November	Obhiro	Orientation Lectures on dairy activities in Obihiro, Tokachi areas and

		site visits by Agri. Corp, university and private dairy firms
Saturday, 17th November	Nagano	Lecture on dairy activities in Nagano and site visits by Orion Machinery Co., Ltd.
Monday 19th November to Tuesday, 20th November	Tokyo	Courtesy visits to Ministry of Agriculture, Forestry and Fisheries and JICA Discussion with dairy processing companies Feedback session

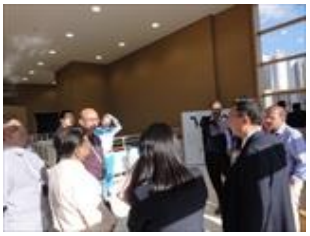
(2) Observations on the implementation of the invitation programme

1) Contents of the Invitation Programme

Contents of the lectures and site-visits which have conducted in the programme are shown in Table 2. One member of the Study Team accompanied the participants for all the activities of the programme, except for the courtesy visit to JICA. Also, 4 members of the Study Team joined Study and communication session with Japanese dairy firms on November 19th, and 3 of them joined the courtesy visit to Ministry of Agriculture, Forestry and Fisheries and feedback session on November 20th. These members have collected the feedback and comments of the participants on this programme when they accompanied the participants.

Table 2: Contents of lectures and site-visits

Day and time	Implementing agency of lecture and site-visits/ contents	Places/Pictures
Tuesday 13th Nov Morning	Obihiro city ・ Courtesy visit to vice mayor ・ Overview of Food Valley Tokachi	Place：City hall of Obihiro (Hokkaido)  
Afternoon	JA Tokachi (Agricultural Cooperative Federation) Livestock test center ・ Overview of the dairy sector in Japan ・ Activities of JA Tokachi ・ Site visit to milk quality test center	Place: Livestock test center of JA Tokachi (Hokkaido)  

		 
Wednesday 14th Nov Morning	Obihiro University of Agriculture and Veterinary Medicine ・ Overview of the university ・ Site visits to the university	Place: Obihiro University of Agriculture and Veterinary Medicine (Hokkaido)  
Afternoon	JA Tokachi Shimizu-town ・ Organization of agricultural cooperative ・ Activities of JA Tokachi Shimizu town	Place: JICA Obihiro (Hokkaido) 
Thursday, 15th Nov Morning	Meiji Co. Ltd., ・ Overview of the firm ・ Site visit to the plant ・ Q&A session	Place: Meiji Naruhodo factory Tokachi (Hokkaido)    
Afternoon	HOKUREN Federation of Agricultural Cooperatives ・ Overview of Hukuren ・ Price of milk ・ Overview of feed plant	Place: JICA Obihiro (Hokkaido) 

		
Friday 16th Nov Morning	Yotsuba Milk Products Co.,Ltd ・ Overview of the firm	Place: JICA Obihiro (Hokkaido)  
Afternoon	Tsuchiya manufacturing co,ltd. ・ Overview of the firm	Place: JICA Obihiro (Hokkaido)
Saturday 17th Nov	Orion Machinery Co.Ltd., ・ Overview of the firm ・ Overview of dairy section in Nagano ・ Visit to the plant ・ Visit to exhibition hall ・ Q&A session	Place: Orion Machinery Co.Ltd., (Nagano)    
Monday 19th Nov Afternoon	Study and communication session with Japanese dairy firms	Place: New Otani Hotel (Tokyo)  

		   
Tuesday, 20th Nov Morning	JICA ・ Courtesy visit ・ Feedback session	Place：JICA Headquarter (Tokyo)
Afternoon	Ministry of Agriculture, Forestry and Fisheries ・ Courtesy visit ・ Overview of dairy sector in Japan	Place: Ministry of Agriculture, Forestry and Fisheries (Tokyo) 

(3) Evaluation on the progremme by the participants

The evaluation on the program was collected by the questionnaire to each session and comments from the participants at the feedback session which was held at the end of the programme.

1) Questionnaire

The following 3 questions were asked to all the participants to evaluate each session of the programme.

i) Do you think the contents of this session is useful for India's dairy sector development in general?
ii) Do you think the contents of this session is useful to improve your organization (or dairy cooperatives in general if you are not from cooperatives)?
iii) Do you think the contents of this session should be included into "the exposure visit in Japan" which is planned to be implemented during the coming JICA project "Dairying through cooperatives"?

The participants answered these questions by choosing from Absolutely No, No, Neutral, Yes, Absolutely Yes. Figure 1 shows the evaluation for each session by assigning these answers into the points from 1 to 5 and averaging these points.

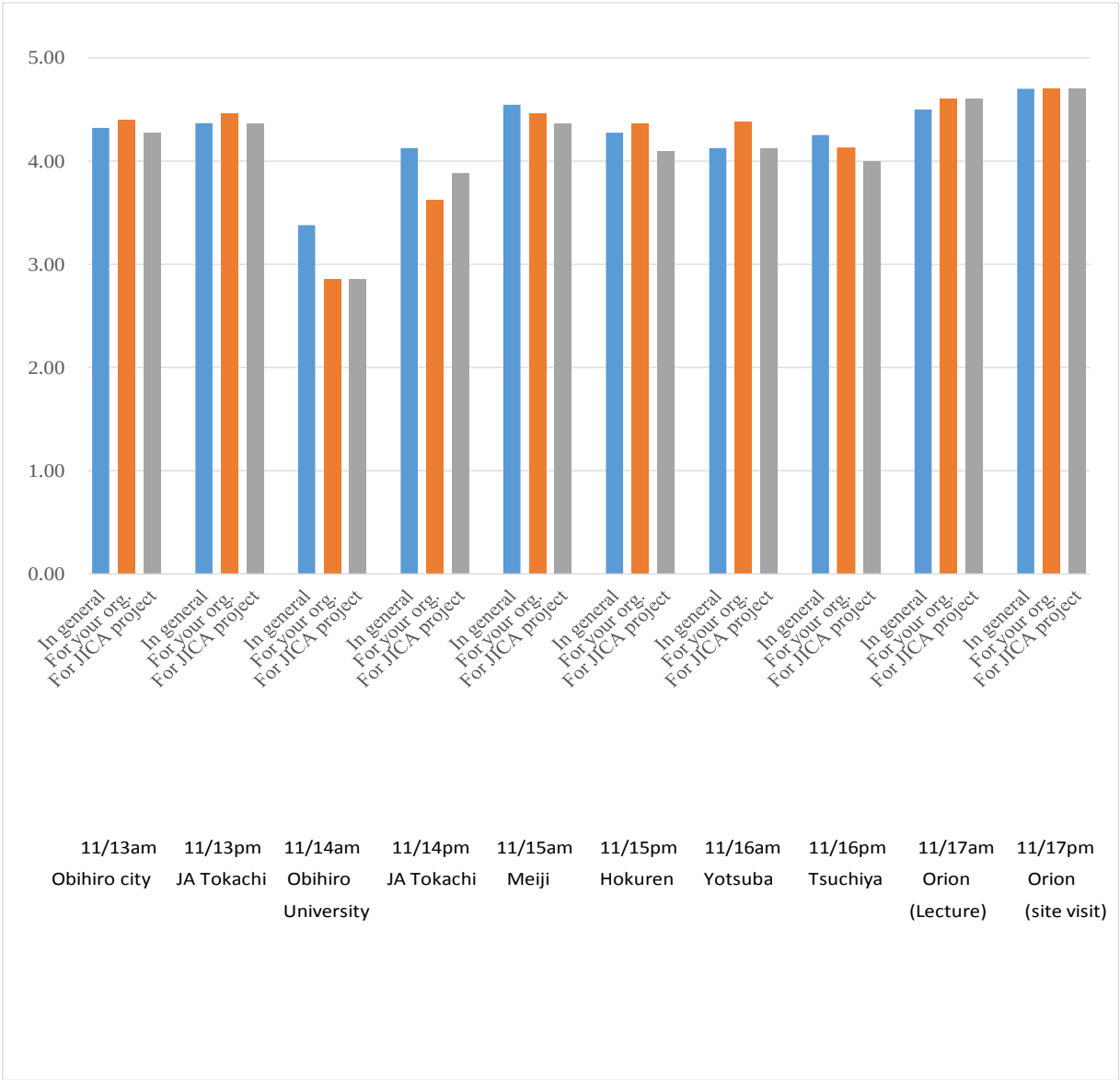


Figure 1: Evaluations for each session of the programme

Figure 1 shows that participants evaluated most of the sessions to be useful. One can see that the participants especially highly evaluate the session that accompanies site-visits such as the visit to plant of Meiji and the session of Orion Machineries. The sessions by Orion Machineries were divided into lecture in the morning and visit to plant and exhibition hall in the afternoon; the afternoon session received the highest evaluation (average 4.7). The participants seem to evaluate that session especially

as they obtained practical knowledge such as the functions and qualities of the machinery of the firm and the overview of the dairy sector in Japan by the introduction of the machinery of the firm, as well as the overview of the firm.

On the other hand, the evaluations on the session of Obihiro University of Agriculture and Veterinary Medicine which claimed the difficulty to provide customize lecture.

2) Feedback session

The feedback on the programme was received from the participants at the feedback session on November 20th at JICA Headquarter. The comments of the participants received at the session are as follows.

<Useful areas for the training of the loan project>

- Improvement of milk productivity (including the knowledge on feed)）
- Processing plant（automation technology, quality assurance, processing technology, food safety）
- Cold chain management (including simple testing technique)
- Transfer of practical technology from Japanese firms such as Meij, Orion Machineries, and ITE
- 6 sigma (state of art technique in Japan), packaging, energy saving technology, technology to extend shelf-like, food safety technology

<Areas that are not useful>

- Breeding
- Marketing (there are good resources to learn it in India)

<Expected participants of the training>

- Trainers of NDDB/MIT and cooperative federations and unions
- Professional staffs of dairy unions (1 staff each from operation, marketing, and engineering)

＜Duration of training＞

- Repair technique of equipment such as broiler (5-7 days)
- ETP Plant, energy saving technique (however, 15 days would not be sufficient to learn

3) Points for improvements

- As the duration of the stay in Japan of this programme was only 15 days, the programme started in Obihiro. Yet if the training lasts long enough time, it would be better to start it by having lecture on the overview of dairy sector in japan and related laws by the staffs of Ministry of Agriculture, Forestry and Fisheries or professionals.

Attachment 4-2-1 Net profit for the past three years of all unions in 4 states visited

Rs. in lakh

Priority States				
Uttara Pradesh		2014-15	2015-16	2016-17
	FIROZABAD CLUSTER	-88.6	-93.0	-564.0
	ALICARH CLUSTER	-143.4	-31.7	-236.3
	JHANSI CLUSTER	-3.5	-23.7	-15.5
	KARVI CLUSTER	-39.0	-22.0	-38.1
	LUCKNOW CLUSTER	-423.1	-353.8	-168.1
	BAREILLY CLUSTER	-128.3	-147.9	-230.7
	MEERUT CLOISTER	7.5	-298.9	14.7
	MUZAFFAR NAGAR CLUSTER	-68.2	-36.5	-246.4
	MORADABAD CLUSTER	-392.9	-399.2	-1,319.8
	VARANASI CLUSTER	-208.5	-797.5	-498.7
	MIRZAPUR CLUSTER	-0.1	-0.3	-0.4
	GORAKHPUR CLUSTER	-22.9	-19.0	-205.8
	BASTI CLUSTER	-24.5	-99.2	-0.2
	AZAMGARH CLUSTER	-44.3	-39.6	-30.1
	ALLAHABAD CLUSYER	-306.4	-543.9	-634.4
	KANPUR CLUSTER	-500.2	-372.0	-687.7
	FAIZABAD CLUSTER	44.3	-42.6	0.1
	GONDA CLUSTER	-93.9	8.3	-60.7
	Total of milk unions	-2,435.8	-3,312.5	-4,922.2
	PCDF	-151.6	-1,047.3	-2,708.0
Bihar		2014-15	2015-16	2016-17***
	Vaishal Patliputra Milk Union, Patna	1.8	1.0	2.0
	Shahabad Milk Union, Ara	1.6	-2.4	-6.4
	Mithila Milk Union, Samastipur	1.4	-11.5	8.3
	Deshratna Dr. Rajendra Prasad MilkUnion, Barauni	9.2	8.5	12.3
	Tirhut Milk Union, Muzaffarpur	4.0	4.5	8.4
	Vikramshila Milk Union, Bhagalpur	1.3	-5.2	-2.3
	Magadh Milk Union, Gaya	**	0.4	2.0
	Kosi Milk Union, Supaul	**	-0.0	-0.6
	Total of milk unions	19.3	-4.7	23.7
	COMFED	922.8	2,351.9	2,322.8
Other States (two visited)				
Madhya Pradesh*		2015-16	2016-17	2017-18
	Bhopal Dugdha Samgh	2,849.9	3,017.6	1,131.7
	Indore Dugdha Samgh	1,733.2	2,732.3	1,444.0
	Gwalior Dugdha Samgh	395.9	2,732.3	167.7
	Jabalpur Dugdha Samgh	1,129.5	906.2	626.0
	Ujjain Dugdha Samgh	1,129.5	419.6	104.7
	Total of milk unions	7,238.0	9,807.8	3,474.0
	MPCDF, Bhopal	12.8	70.0	127.6
Rajastan		2014-15	2015-16	2016-17
	AJMER	167.3	135.1	188.7
	ALWAR	167.4	1,188.3	197.8
	BANSWARA	3.2	-164.5	31.0
	BARMER	17.0	12.8	27.7

	BHARATPUR	-60.9	56.8	21.9
	BHILWARA	40.7	689.8	805.0
	BIKANER	108.0	101.8	-219.4
	CHITTORGARH	9.0	26.5	15.7
	CHURU	-73.7	-62.5	1.6
	SRI GANGANAGAR	51.5	206.2	209.4
	JAIPUR	2,092.5	3,591.5	4,045.0
	JALORE-SIROHI	39.1	-114.3	62.5
	JHALAWAR	0.5	-85.2	-23.3
	JODHPUR	15.2	29.8	28.3
	KOTA	46.5	58.2	138.6
	NAGOUR	1.4	10.5	10.2
	PALI	4.8	-348.0	382.5
	SIKAR	-86.9	445.7	218.0
	SWAIMADHOPUR	-165.6	-121.2	-81.2
	TONK	112.2	290.3	157.6
	UDAIPUR	86.2	115.4	424.9
	Total of milk unions	2,575.3	6,063.0	6,642.6
	RCDF	238.2	1,754.6	2,211.0

Remarks:

*: 2015-16, 2016-17, 2018-19

**: not yet start operation

***: provisional except federation

Net profit is after tax. The above may not exactly match with the figures of financial statement separately provided by the visited unions

Source: Eash federation visited.

Attachment 6-2-1. Cost Breakdown for Component

USD 1 = 111 JPY
USD 1 = 68.7 INR
INR 1 = 1.62 JPY

From MD

Component A: Strengthening Milk Procurement Infrastructure

	JPY			INR		
	JICA Portion*	GOI Portion	Total	JICA Portion*	GOI Portion	Total
	2,361,597,120	590,399,280	2,951,996,400	1,457,776,000	364,444,000	1,822,220,000
% of each component out of A~G	18%					
% of each component out of A~E only	20%					
Indicative capacity development allocation	144,745,108	36,186,277	180,931,386	89,348,832	22,337,208	111,686,040

Component B: Strengthening Processing Infrastructure

	JPY			INR		
	JICA Portion	GOI Portion	Total	JICA Portion	GOI Portion	Total
	8,358,552,000	2,089,638,000	10,448,190,000	5,159,600,000	1,289,900,000	6,449,500,000
% of each component out of A~G	64%					
% of each component out of A~E only	70%					
Indicative capacity development allocation	512,305,636	128,076,409	640,382,046	316,238,047	79,059,512	395,297,559

Component C: Support for Marketing Infrastructure

	JPY			INR		
	JICA Portion*	GOI Portion	Total	JICA Portion*	GOI Portion	Total
	618,088,320	154,522,080	772,610,400	381,536,000	95,384,000	476,920,000
% of each component out of A~G	5%					
% of each component out of A~E only	5%					
Indiactive capacity development allocation	37,883,371	9,470,843	47,354,214	23,384,797	5,846,199	29,230,996

Component D: Support for ICT Infrastructure

	JPY			INR		
	JICA Portion*	GOI Portion	Total	JICA Portion*	GOI Portion	Total
	115,344,000	28,836,000	144,180,000	71,200,000	17,800,000	89,000,000
% of each component out of A~G	1%					
% of each component out of A~E only	1%					
Indiactive capacity development allocation	7,069,572	1,767,393	8,836,964	4,363,933	1,090,983	5,454,916

Component E: Prductivity Enhancement

	JPY			INR		
	JICA Portion*	GOI Portion	Total	JICA Portion*	GOI Portion	Total
	485,287,200	121,321,800	606,609,000	299,560,000	74,890,000	374,450,000
% of each component out of A~G	4%					
% of each component out of A~E only	4%					
Indiactive capacity development allocation	29,743,832	7,435,958	37,179,790	18,360,390	4,590,098	22,950,488

Component F: Project Monitoring and Studies

	JPY			INR		
	JICA Portion*	GOI Portion	Total	JICA Portion*	GOI Portion	Total
	475,372,800	118,843,200	594,216,000	293,440,000	73,360,000	366,800,000
% of each component out of A~G	4%					

Component G: Training and Capacity Development

	JPY			INR		
	JICA Portion*	GOI Portion	Total	JICA Portion*	GOI Portion	Total
	731,747,520	182,936,880	914,684,400	451,696,000	112,924,000	564,620,000
% of each component out of A~G	6%					

Source: prepared by the survey team

Reference: the latest DoAHD's DPR

Component A: Strengthening Milk Procurement Infrastructure

	INR			
	JICA ODA Loan	Grant**	State/PI's Contribution	Total
	1,877,600,000	2,701,400,000	91,500,000	4,670,500,000
			2%	<- out ot total

Component B: Strengthening Processing Infrastructure

	INR			
	JICA ODA Loan	Grant**	State/PI's Contribution	Total
	6,246,700,000		694,100,000	6,940,800,000
			10%	<- out ot total

Component C: Support for Marketing Infrastructure

	INR			
	JICA ODA Loan	Grant**	State/PI's Contribution	Total
	1,426,400,000	494,000,000		1,920,400,000
			0%	<- out ot total

Component D: Support for ICT Infrastructure

	INR			
	JICA ODA Loan	Grant**	State/PI's Contribution	Total
	78,500,000	19,600,000		98,100,000
			0%	<- out ot total

Component E: Prductivity Enhancement

	INR			
	JICA ODA Loan	Grant**	State/PI's Contribution	Total
		718,700,000	79,900,000	798,600,000
			10%	<- out ot total

Component F: Project Monitoring and Studies

	INR			
	JICA ODA Loan	Grant**	State/PI's Contribution	Total
		388,800,000		388,800,000
			0%	<- out ot total

Component G: Training and Capacity Development

	INR			
	JICA ODA Loan	Grant**	State/PI's Contribution	Total
		432,900,000	432,800,000	865,700,000
			50%	<- out ot total

Actual Anticipated Allocation of Cost from both MD and DPR between GOJ and GOI

Component A: Strengthening Milk Procurement Infrastructure

	JPY			INR		
	JICA ODA Loan	GOI Budget to NDDB	Total	JICA ODA Loan	GOI Budget to NDDB	Total
	2,361,597,120	5,056,382,880	7,417,980,000	1,457,776,000	3,121,224,000	4,579,000,000
				32%	<- out ot total budget of GOI	
						90

Component B: Strengthening Processing Infrastructure

	JPY			INR		
	JICA ODA Loan	GOI Budget to NDDB	Total	JICA ODA Loan	GOI Budget to NDDB	Total
	8,358,552,000	1,761,102,000	10,119,654,000	5,159,600,000	1,087,100,000	6,246,700,000
				83%	<- out ot total budget of GOI	
						90

Component C: Support for Marketing Infrastructure

	JPY			INR		
	JICA ODA Loan	GOI Budget to NDDB	Total	JICA ODA Loan	GOI Budget to NDDB	Total
	618,088,320	2,492,959,680	3,111,048,000	381,536,000	1,538,864,000	1,920,400,000
				20%	<- out ot total budget of GOI	
						100

Component D: Support for ICT Infrastructure

	JPY			INR		
	JICA ODA Loan	GOI Budget to NDDB	Total	JICA ODA Loan	GOI Budget to NDDB	Total
	115,344,000	43,578,000	158,922,000	71,200,000	26,900,000	98,100,000
				73%	<- out ot total budget of GOI	
						100

Component E: Prductivity Enhancement

	JPY			INR		
	JICA ODA Loan	GOI Budget to NDDB	Total	JICA ODA Loan	GOI Budget to NDDB	Total
	485,287,200	679,006,800	1,164,294,000	299,560,000	419,140,000	718,700,000
				42%	<- out ot total budget of GOI	
						90

Component F: Project Monitoring and Studies

	JPY			INR		
	JICA ODA Loan	GOI Budget to NDDB	Total	JICA ODA Loan	GOI Budget to NDDB	Total
	475,372,800	154,483,200	629,856,000	293,440,000	95,360,000	388,800,000
				75%	<- out ot total budget of GOI	

Component G: Training and Capacity Development

	JPY			INR		
	JICA ODA Loan	GOI Budget to NDDB	Total	JICA ODA Loan	GOI Budget to NDDB	Total
	731,747,520	-30,449,520	701,298,000	451,696,000	-18,796,000	432,900,000
				104%	<- out ot total budget of GOI	

Attachment 6-2-2: Eligible/Non-Eligible Items for Sub-projects

No.	Component	Eligible Items	Non-eligible Items
A	Strengthening of Milk Procurement Infrastructure	Bulk milk coolers (BMC), milk collection tank, cooling unit, generator, Automatic Milk Collection Unit (AMCU), BMC accessories, Electronic Milk Adulteration Testing Equipment, Renewable, Energy (Solar) System, Computer/laptop/tablet, initial operational cost for management of new DCS, civil works , miscellaneous equipment and erection of DCS/BMC building	Land
B	Strengthening of Processing Infrastructure	Civil works, processing and production equipment, services equipment, miscellaneous equipment and erection of plant	Residential complex
C	Strengthening of Marketing Infrastructure	Walk-in cold store, Milk parlour, Deep Freezer, Visi Cooler, insulation for marketing vans	
D	Support for ICT infrastructure	Desk-side and network infrastructure, application implementation, application software, server and network recurring charges, support charges,	Construction of rooms/building for housing server
E	Productivity Enhancement	Cattle feed, mineral mixture, transition feed, early lactation feed, fodder seeds, mower, chaff-cutter, micro-training center, silage units	

Note: The list is indicative and not exhaustive.

Attachment 7-1-1: Detailed Responsibility of Institutions

1. Overall Framework for Project Management

1.1. NDDB and Central Level Institutional Arrangement

The project will be implemented by National Dairy Development Board (NDDB). The institutional arrangement has been designed with a view to ensure effective coordination, monitoring and comply with environment and social requirement of the project. An Implementation and Monitoring Cell (IMC) will be established at NDDB, Anand, which will be headed by Managing Director/ Executive Director. IMC will manage the implementation and monitoring of day- to-day project activities with the support of various Technical Groups of NDDB and NDDB Dairy Services. There will be a Project Sanctioning Committee (PSC), headed by Secretary (Animal Husbandry, Dairying and Fisheries), GoI , which will sanction the sub-projects recommended by the Implementation and Monitoring Cell (IMC) for its approval. At the apex level, there will be Central Project Steering Committee (CPSC), headed by Secretary (Animal Husbandry, Dairying and Fisheries), GoI, which will provide policy and strategic support to the project. Programme Coordination and Management Cell (PCMC) will be set up in DADF which supports coordination among stakeholders and provides secretariat support to CPSC and PSC.

1.2. State and District Level Institutional Arrangement

At the State level, there will be State Level Technical Management Committee (SLTMC), which will be headed by Principal Secretary/Secretary/commissioner of concerned Department of the State Government for overseeing the land availability for village level institution, BMC, dairy and cattle feed plants, statutory requirements, synergy between various schemes, co-ordination among POIs, policy support, state-level monitoring of the projects etc. All PIs shall be the member of the committee.

2. Central Project Steering Committee (CPSC):

2.1. Roles and Responsibilities of CPSC

CPSC will be responsible for approval of Annual Action Plans, sanction release of funds to NDDB as well as re-appropriation of funds across project components, general oversee and review of implementation of the project. The CPSC would also have powers to modify

physical and financial targets of the project based on review, approved inclusion and changes in eligibility criteria for POIs and other guidelines including project area, component structure and composition of CPSC. The CPSC will be fully empowered to make any changes and delegate powers that may be necessary for smooth implementation of the project.

CPSC would meet twice a year, or as frequently as may be required, and provide policy and strategic support to the project.

2.2. Members of CPSC

- Secretary (ADF), DADF, GoI - *Chairman of the Committee*
- Chairman, NDDB *or his nominee*
- Additional Secretary & Financial Advisor, DADF, GoI
- Joint Secretary (Dairy Development), DADF, Government of India
- Managing Director/ Executive Director, NDDB
- A Representative from JICA as an observer
- Group Head (Financial and Planning Services), NDDB
- Deputy Commissioner (DD) / Assistant Commissioner (DD), DADF, GoI – *Member Convener*

3. Project Sanctioning Committee (PSC):

3.1. Roles and Responsibilities of PSC

PSC will be headed by Secretary ADF, GoI and will have the authority to sanction projects recommended by IMC,NDDB.

PSC will be responsible for consideration of proposals received from POIs. Proposals received from POIs and recommended by the IMC, NDDB after screening & appraisal will be placed before the PSC for approval and sanction of funds. The PSC will meet quarterly or as frequently as necessary to ensure that proposals received from PIs are considered without unreasonable delay. PSC will have power for re-appropriation of funds within the components of the project and change norms/unit cost of component/items of the project.

PSC will also have power to re-appropriate the funds within the approved sub projects of same PI and decide the loan security mechanism for sub- projects.

3.2. Members of PSC

- Secretary (ADF), DADF, GoI - *Chairman of the Committee*
- Chairman, NDDB or his nominee not below the rank of Executive Director (ED)
- Joint Secretary (Dairy Development), DADF
- Executive Director / Group Head (FPS), NDDB
- A representative from the concerned State Government and the State Dairy Federation would be an invitee while discussing the proposals pertaining to that particular state.
- Deputy Commissioner (DD)/ Assistant Commissioner (DD) – *Member Convener*

4. Programme Coordination and Management Cell (PCMC)

4.1. Roles and responsibilities of PCMC

A Programme Coordination Management Cell (PCMC) shall be created to provide Secretariat support to CPSC and PSC. PCMC will be responsible for analysis and placement of projects sent by IMC of NDDB to PSC as well as for providing inputs to CPSC foe successful implementation of the project as per the objectives. PCMC shall be headed by Joint Secretary (CDD) and supported by Deputy Commissioner (DD) and Assistant Commissioner (DD) and shall have adequate technical and financial experts supported from the Project Learning and Management Component

4.2. Member of PCMC

- Joint Secretary (C&DD)
- Deputy Commissioner (DD)/ Asst. Commissioner (DD)

5. Implementation and Monitoring Cell (IMC)

5.1. Roles and responsibilities of IMC

6.6.1 An Implementation and Monitoring Cell (IMC) located at NDDB, Anand, will appraise the project proposals and screen them based on merit and manage the implementation and monitoring of day-to-day project activities. IMC will forward the appraised projects to PSC for consideration. IMC will be supported by various Technical Groups within NDDB during implementation of the project. IMC will be headed by Managing Director/ Executive Director, NDDB. .

6.6.2 On approval of PSC, IMC will also have authority to re-appropriate the funds within the approved sub-components of the approved proposal and decide the loan security arrangements for sub- projects subject to concurrence of PSC,DADF. IMC shall identify necessary changes required in the programme for effective implementation and prepare policy proposals for decision of CPSC. It will also prepare annual action plan and technical interventions required for smooth implementation of the programme for consideration of CPSC.

5.2. other Members of IMC

- Group Head (FPS), NDDB
- 13 Officers in FPS Group

6 State Level Technical Management Committee (SLTMC)

6.1. Roles and Responsibilities of SLTMC

State Government will constitute a SLTMC headed by Principal Secretary (PS) /Secretary/Commissioner of concerned Department of the State Government for examining and forwarding of the projects submitted by the Participating Institutions.

SLTMC will consolidate the funding requirement of each of the Participating Institutions in the state. The consolidated proposals

screened by SLTMC will be forwarded to NDDB for appraisal and screening along with commitment letter from State Government for offering guarantee for loan to PIs where adequate security(ies) of PI is not available and for providing grant assistance to meet

the viability gap (if required).SLTMC will also review the progress of the individual sub projects and facilitate the smooth implementation of the sub projects in the state.

6.2. Members of SLTMC

- Principal Secretary/Secretary/Commissioner of DADF of the State Government – *Chairman of the Committee*
- Representatives from Animal Husbandry/Dairy Development Department of the State Government.
- Representatives from Animal Husbandry, Dairying and Fisheries of DADF, Government of India.
- Representative from Department of Finance of the State Government
- Managing Director, State Dairy Federation
- District Magistrate of Project Districts
- A representative from NDDB – *Member convener*
- CEO,State Livestock Board
- All PIs

7. Implementation Arrangement at PI Level

7.1 Sub Project Management Committee (SPMC)

- At the PI level, a Sub Project Management Committee will be constituted for monitoring and reviewing activities under various components being implemented under the project, which will be headed by Managing Director (MD) / Administrative Headof the Participating Institution.
- The members of the Committee will be:
  i. Managing Director/ Chief Executive Officer / General Manager of the PI (Chairperson)
  ii. Section/Department Heads (Purchase, Finance & Accounts, HR & Admin, Procurement & Inputs, Plant & Engineering, Marketing & Sales, IT/MIS.)
  iii. Sub-Project Coordinators (all components proposed under the project)
  iv. Grievance Redressal Officer (GRO)
  v. NDDB representative
  vi. MIS Officer – who shall be the member convener

- The Committee, if desires, may also call special invitees to attend the meeting. The Committee will meet at least once a quarter to review the progress of sub project activities.
- The roles & responsibilities of the Committee will be:
    - To review the progress of the sub project (component wise) and provide quarterly reports (as may be required) to Implementation & Monitoring Cell (IMC) in NDDB in specified formats.
    - To prepare long term strategies, action plans, take policy decisions related to sub project implementation, including approval of budget, expenditure, reimbursement and release of advances, entering into contracts with agencies and other organizations, etc.
    - Post sanction, timely execution of project agreements and ensure regular utilisation & repayment of loan as per the terms and conditions prescribed in the loan agreements.
    - Resolve issue and bottlenecks during sub project implementation.
    - Regularly review the status of grievance redressals under the sub projects and provide guidance/directions, if required.
    - Provide required support to auditors appointed under the project.
    - Ensure timely submission of required data, information and reports to IMC (located at NDDB).

7.2 Sub Project Implementation Cell (SPIC)

- To effectively implement each component under the project, a Sub Project Implementation Cell will be constituted at PI level for each component.
- The Cell will be headed by Sub Project Coordinator (PC) who will be appointed by MD /CE/GM of the PI and the members of the Cell will be:
    i. Sub Project Coordinator (one PC each for respective component) – head of the cell
    ii. Officers & Supervisor (Milk procurement supervisor/ Marketing supervisor/AN officer, FDO, AN supervisor, CRP Supervisor – as applicable to the sub project)
    iii. Purchase Officer
    iv. Finance & Accounts Officer
    v. IT/MIS Officer
- The Cell will be responsible for implementation and monitoring of the activities of the particular component on day-to-day basis and will be accountable for achievement of the targets set under the sub project.
- The Cell would meet every month and will manage implementation of the sub project under the supervision, direction and control of the Sub Project Management Committee.
- The roles & responsibilities of the Committee will be:

- Define sub-project Key Performance Indicators (KPI) in line with Project Operation Manual and set monthly targets under each KPI.
- Arrange required resources to implement the project.
- Monitor the physical and financial progress of the Sub project .
- Document success stories.
- Periodically report the progress of sub project activities to the Sub Project Management Committee.
- Provide required suggestions/ recommendations to Sub Project Management Committee to take necessary policy decisions for smooth implementation of the sub-project.
- Resolve and respond to all grievances received under the sub project.
- Maintain record and accounts of all transactions.
- Identification/recruitment of requisite manpower & arrange their training

7.3 Implementation in the field

- The PI will identify one senior officer as Sub-Project Coordinator from the existing manpower for overall project coordination and monitoring. Supervisors/Field staff will report to Sub-Project Coordinator. Sub-Project Coordinator will liaison with NDDB for technical and other supports.

Attachment 8-1-1 Initial Target PIs (Milk Unions) and Target Districts

Sr No	STATE	Milk Union	DISTRICT	Milk Production (TKgPD) 2015-16	Investment for dairy development	Milk Production per Village KgPD	Milk retention in villages	DCS Organised	Marketable surplus	Milk Procurement (TKgPD) 2016-17	Milk Procurement as share of Milk Production	Milk procurement By CO-operative (TKgPD) 2016-17	BMC installed Capacity By CO-operative (TLPD)	Processing plant intalled By CO-operative Capacity (TLPD)	Drying plant installed By CO-operative capacity (MTPD)	Cattle feed plants installed capacity (MTPD)
1.	Bihar	Barauni	Begusarai	873	10.22	1258	340.57	1001	532.69	99.71	11.40%	424	279	440	13	
2.			Khagaria	588	0	2401	229.45	639	358.88	43.33	7.40%					
3.			Lakhisarai	241	0	666	94.01	250	147.05	11.02	4.60%					
4.		Magadh Dairy	Gaya	1166	0.48	435	454.92	552	711.54	20.2	1.70%	35	96	100		
5.		Project ,Gaya	Arwal	168	0	561	65.46	247	102.38	7.4	4.40%					
6.			Aurangabad	681	0	391	265.56	326	415.37	19.6	2.90%					
7.			Jehanabad	244	0	451	95.1	321	148.74	8.6	3.50%					
8.			Nawada	517	0	541	201.65	268	315.41	4.6	0.90%					
9.		VIMUL,Bhagalpur	Banka	581	0	341	226.55	320	354.34	10.89	1.90%	61	173	70		
10.			Bhagalpur	793	5	821	309.44	577	483.99	69.16	8.70%					
11.			Jamui	665	0	502	259.3	232	405.58	8.85	1.30%					
12.			Munger	373	0.14	699	145.6	226	227.73	12.55	3.40%					
13.		VPMU ,Patna	Nalanda	642	0	640	250.33	660	391.54	0	0.00%	269	252	375	10	150
14.			Sheikhpura	128	0	492	50.04	93	78.27	0	0.00%					
15.			Vaishali	663	0	466	258.39	745	404.16	0	0.00%					
16.		TIRHUT	Muzaffarpur	790	8.19	459	307.92	734	481.62	100.44	12.70%	205	158	310	10	60
17.			Sheohar	90	0	473	35.22	129	55.08	14.29	15.80%					
18.			Sitamarhi	397	0	491	154.64	251	241.87	28.42	7.20%					
19.		KDP,Purnia	Araria	450	0	628	175.32	161	274.22	1.72	0.40%	16	72	25		
20.			Katihar	517	0	396	201.58	191	315.3	15.66	3.00%					
21.			Kishanganj	370	0	506	144.45	34	225.93	0.83	0.20%					
22.			Purnia	489		439	190.71	228	522	9	1.80%					

23.	UP	Allahabad	Allahabad	1454	9.75	518	566.93	178	886.74	4.16	0.30%					
24.			Kaushambi	435	0	596	169.51	0	265.14	0	0.00%					
37.			Fatehpur	919	1.27	680	358.41	27	560.58	1.97	0.20%	9	24	60		
38.			Pratapgarh	806	0	369	314.33	34	491.64	0.92	0.10%					
25.		Azamgarh	Azamgarh	1474	0	388	574.72	69	898.92	0.79	0.10%	5				
26.			Ballia	778	0.8	422	303.55	169	474.78	6.08	0.80%					
27.			Mau	630	0	420	245.68	13	384.26	0.52	0.10%					
28.		Basti	Basti	785	0	248	306.14	172	478.84	3.72	0.50%	3				
29.			Sant Kabir Nagar	426	0	269	166.16	0	259.9	0	0.00%					
30.			Siddharthnagar	928	0	397	361.96	24	566.14	0.35	0.00%					
31.		Chitrakoot	Banda	772	0	1175	301.09	30	470.94	0.52	0.10%					
32.			Chitrakoot	557	0	991	217.21	23	339.75	0.05	0.00%	1				
33.		Varanasi	Chandauli	585	0	411	228.25	0	357	0	0.00%					
34.			Varanasi	557	4.65	443	217.14	343	339.63	12.41	2.20%	13	21	100	5	100
35.			Ghazipur	1232	0.26	450	480.44	39	751.45	1.41	0.10%					
36.			Jaunpur	1534	0.24	467	598.35	40	935.89	1.61	0.10%	7				
39.		Faizabad	Faizabad	704	1.83	570	274.51	248	429.36	7.74	1.10%	20				
40.			Ambedkar Nagar	656	1.19	398	255.73	315	399.99	16.12	2.50%					
41.			Sultanpur	1228	0.81	492	479.06	229	749.3	12.2	1.00%					
42.		Gonda	Gonda	1117	1.33	617	435.75	323	681.56	13.56	1.20%	20				
43.			Balrampur	447	0	448	174.28	55	272.59	1.11	0.20%					
44.			Bahraich	931	0	685	363.19	62	568.07	2.7	0.30%					
45.			Shrawasti	306	0	601	119.25	27	186.51	2.16	0.70%					
46.		Gorakhpur	Gorakhpur	1091	0	372	425.6	123	665.68	3.19	0.30%	5				
47.			Mahrajganj	759	0	626	295.92	11	462.86	0.1	0.00%					
48.			Deoria	761	0	377	296.69	49	464.06	1.23	0.20%					
49.			Kushinagar	891	0	564	347.59	16	543.66	0.38	0.00%					
50.		Mirzapur	Mirzapur	769	0.23	441	299.95	84	469.15	3.65	0.50%	3				
51.			Sant Ravidas Nagar (Bhadohi)	292	0	269	113.87	0	178.11	0	0.00%					
52.			Sonbhadra	710	0	510	276.76	0	432.88	0	0.00%					
53.		Lucknow	Rae Bareli	1062	28.07	613	414.03	79	647.58	4.05	0.40%	0	16	20		
				37021.21	74.455	29882.5	14438.27	10967	22806.6	588.97	1.60%					

Source: DPR by DADF

Attachment 8-1-2: Possible Target PIs beyond 18 months

No.	State	Name of Institution
Priority State		
1	Bihar	COMFED
2	Bihar	DR Milk Union(DRMU), Barauni
3	Bihar	Koshi Milk Union, Purnia
4	Bihar	Magadh Milk Union, Gaya
5	Bihar	Mithila Milk Union(MMU), Samastipur
6	Bihar	Shahabad Milk Union(SMU), Ara
7	Bihar	Tirhut Milk Union(TIMUL), Muzaffarpur
8	Bihar	Vaishal Patliputra Milk Union(VPMU), Patna
9	Bihar	Vikramshila Milk Union(VIMUL), Bhagulpur
10	Uttar Pradesh	Aligarh
11	Uttar Pradesh	Allahabad
12	Uttar Pradesh	Azamgarh
13	Uttar Pradesh	Bareilly
14	Uttar Pradesh	Basti
15	Uttar Pradesh	Chitrakoot
16	Uttar Pradesh	Faizabad
17	Uttar Pradesh	Firozabad
18	Uttar Pradesh	Gonda
19	Uttar Pradesh	Gorakhpur
20	Uttar Pradesh	Jhansi
21	Uttar Pradesh	Kanpur
22	Uttar Pradesh	Lucknow
23	Uttar Pradesh	Meerut
24	Uttar Pradesh	Mirzapur
25	Uttar Pradesh	Moradabad
26	Uttar Pradesh	Muz'Nagar
27	Uttar Pradesh	Varanasi
Other States		
28	Andhra Pradesh	APDDCF
29	Andhra Pradesh	Krishna
30	Andhra Pradesh	Kurnool
31	Andhra Pradesh	Nellore MU
32	Andhra Pradesh	Prakasham
33	Andhra Pradesh	Sangam PC (Guntur)
34	Andhra Pradesh	Sri Vijaya Visakha PC
35	Madhya Pradesh	Bhopal
36	Madhya Pradesh	Gwalior
37	Madhya Pradesh	Indore
38	Madhya Pradesh	Jabalpur
39	Madhya Pradesh	Ujjain
40	Punjab	Amritsar
41	Punjab	Bhatinda
42	Punjab	Faridkot
43	Punjab	Ferozpur
44	Punjab	Gurd.pur
45	Punjab	Hosh.pur
46	Punjab	Jalandar
47	Punjab	Ludhiana
48	Punjab	MilkFed
49	Punjab	Patiala
50	Punjab	Ropar
51	Punjab	Sangrur

No.	State	Name of Institution
52	Rajasthan	Ajmer
53	Rajasthan	Alwar
54	Rajasthan	Banswara
55	Rajasthan	Barmer
56	Rajasthan	Bharatpur
57	Rajasthan	Bhilwara
58	Rajasthan	Bikaner
59	Rajasthan	Chittorgarh
60	Rajasthan	Churu
61	Rajasthan	Ganganagar
62	Rajasthan	Jaipur
63	Rajasthan	Jalore
64	Rajasthan	Jhalawar
65	Rajasthan	Jodhpur
66	Rajasthan	Kota
67	Rajasthan	Nagaur
68	Rajasthan	Pali
69	Rajasthan	RCDF
70	Rajasthan	Sawai Madhopur
71	Rajasthan	Sikar
72	Rajasthan	Tonk
73	Rajasthan	Udaipur
74	Telangana	Karimnagar PC
75	Telangana	Mulukanoor
76	Telangana	Nalgonda Rangareddy Milk Union
77	Telangana	TDDCF
78	Uttarakhand	Almora
79	Uttarakhand	Bageshwar
80	Uttarakhand	Chamoli
81	Uttarakhand	Champawat
82	Uttarakhand	Dehradun
83	Uttarakhand	Haridwar
84	Uttarakhand	Nainital
85	Uttarakhand	New Tehri
86	Uttarakhand	Pauri Garhwal
87	Uttarakhand	Pithoragarh
88	Uttarakhand	Srinagar
89	Uttarakhand	Udham Singh Nagar
90	Uttarakhand	Uttarkashi
91	West Bengal	Bardhaman
92	West Bengal	Bhagirathi
93	West Bengal	Damodar
94	West Bengal	HIMUL, Darjeeling
95	West Bengal	Howrah
96	West Bengal	Ichhamati
97	West Bengal	Kangsabati
98	West Bengal	Kishan
99	West Bengal	Kulick
100	West Bengal	Manbhum
101	West Bengal	Mayurakshi
102	West Bengal	Midnapore
103	West Bengal	Sunderban
104	West Bengal	Tamaralipata

Source: the minuites of discussion

Colored cell indicates initial target institutions.

Attachment 8-3-1 Detailed Funding Pattern

Component		Activity	Interest Bearing Loan (%)	Grant	State Government /PI's contribution (%)
A	Strengthening of Milk Procurement Infrastructure	**Assistance to Village Level Producers' Institution**			
		Building for Village Level Producers' Institution	50%	50%	--
		SS milk collection Accessories, testing equipment, DCS board, furniture etc.	--	90%	10%
		AMCU – Capital Cost& Operating Cost	50%	50%	----
		Management grant to Village level functionary	--	100% for 1st year only, 50% for 2nd year	50% in 2nd year
		(Tapering over 2 years - 100%, 50%)	--		
		Support for BMCs			
		Building for Bulk Cooler	50%	50%	---
		Bulk Milk Coolers(2KL)	50%	50%	---
		Tankers for milk transportation 10KL	50%	50%	---
B	Strengthening of Milk Processing Infrastructure	**Milk Processing Facilities and Manufacturing Facilities for Value Added Products**			
		- New Processing Infrastructure (TLPD)			
		1 LLPD Plant Liquid milk Plant	90%	---	10%
		3 LLPD Plant Liquid milk Plant	90%	---	10%
		- Modernisation / Expansion of existing plant			
		40 to 100 TLPD	90%	---	10%
		60 to 200 TLPD	90%	---	10%
		100 to 200 TLPD	90%	---	10%
		- Infrastructure for Value added Products			
		Drying Capacity (……MTPD)	90%	---	10%

Component		Activity	Interest Bearing Loan (%)	Grant	State Government /PI's contribution (%)
		Ice Cream Plant (TLPD)	90%	---	10%
		Aseptic Flavoured Milk (TLPD)	90%	---	10%
		Indigenous Sweets(MTPD)	90%	---	10%
		Dahi, Yoghurt or Fermented Milk (TLPD)	90%	---	10%
		Cheese or Paneer	90%	---	10%
		Feed and Feed Supplements Manufacturing Infrastructure			
		Cattle Feed Plants (MTPD)	90%	---	10%
		By-pass Protein Plants (MTPD)	90%	---	10%
		Mineral Mixture plants (MTPD)	90%	---	10%
C	Support for Marketing Infrastructure	**Cold Chain Infrastructure:**			
		Walk-in-Cold Store - 50 KL Capacity	80%	20%	--
		Walk-in-Cold Store - 25 KL Capacity	80%	20%	--
		Walk-in-Cold Store - 10 KL Capacity	80%	20%	--
		Insulation for Marketing Vans 5KL Capacity	80%	20%	--
		Milk Parlours with Visi Cooler and Deep Freezer	80%	20%	--
		Consumer awareness Programme	80%	20%	--
		Market Studies	80%	20%	--
		Market Promotion Cost on Tapering (Rs. Lakh)			
		(Tapering over 3 years - 100%, 75%, 50%)	--	100% for 1st year only, 75% for 2nd year and 50% for 3rd year	25% in 2nd year and 50% in 3rd year

Component		Activity	Interest Bearing Loan (%)	Grant	State Government /PI's contribution (%)
D	Support for Marketing Infrastructure	Installation of AMCS Solution	80%	20%	---
E	Productivity Enhancement through Nutritional Intervention	**Calf Rearing Programme**			
		Animal Identification, Data Management	---	90%	10%
		Feed quantity			
		Deworming and Vaccination			
		Animal Nutrition Advisory Services			
		Animal Identification, Data Management	---	90%	10%
		Feeding Cost			
		Fodder Development Activities			
		Green Fodder Production Enhancement			
		Fodder seed Support to farmers for TL/ Certified / Hybrid fodder seeds	---	90%	10%
		Plantation support to farmers			
		Demonstration of crop residue management Technologies			
		Demonstration of crop residue management through Mower	---	90%	10%
		Demonstration of Fodder Conservation Technologies			
		Chaff Cutter	---	90%	10%
		Fodder storage godown dry & green dual purpose			
		Low cost silage making at DCS Level			
		Demonstration and Propagation of modern fodder production & conservation technologies			

Component		Activity	Interest Bearing Loan (%)	Grant	State Government /PI's contribution (%)
		Establishment of Micro - training centre one per district	---	90%	10%
		Commercial fodder production through Participating Institution			
		Extension Activities	---	90%	10%
		Capacity Building / Training			
		Project Monitoring Support			

Source: NDDB

Attachment 8-4-1 Outline of the Sensitization Module

Business Management

ID number	Sensitization
Title	Business Management and Strategic Planning
Objectives	- Provision of methodology and standards which will be applied when presenting the business strategy and business plan for the loan application. - Provision of basic format of the business strategy and business plan, where logical justification and methodology (PEST, 3C, SWOT Analysis) is included. - Provision of key indicators which will be important to implement the strategy.
Duration	0.5 day
Number of participants	2 to 3 participants from each PI (for MD)
Brief description of the module contents	1. Introduction to Strategic Management based on Marketing a) Concept of PEST Analysis b) Concept of 3C Analysis c) Concept of SWOT Analysis d) Concept of Cross SWOT Analysis e) How to formulate institutional strategy based on the above analysis 2. Introduction to Management Accounting a) Differences between Finance Accounting and Management Accounting b) Importance of Management Accounting for Strategic Planning c) Main financial indicators - Total performance, profitability, efficiency, safety and growth indicators - Other indicators generally important for all milk unions d) How to use the Key Indicators to implement the Institutional Strategy. 3. Main information that should be submitted for the application a) SWOT Analysis b) Institutional Strategy c) Business Plan d) Logical Explanation behind the Business Plan e) Main key performance indicators (actual and plan)
Method of instruction	Conference or workshop type of activity
Prerequisite, if any	
Post training review and follow up method	

Remarks: PEST (Political, Economical, Social, and Technology), 3C: Company, Competitor, and Customer/Client, SWOT: Strength, Weakness, Opportunity, and Threats

Food Safety and Hygiene

ID number	FS-0a Sensitization for Managing Director
Title	Sensitization for Managing Director (Conference or workshop type of activity)
Objectives	The purpose of this course is to introduce the participants to the importance food safety throughout the value chain. Understanding the current situation at the Federation and MU level is crucial in generating awareness and developing a sense of responsibility towards its improvement. This session aims to enable the top management of PIs understand the importance of food safety, introduce the key concept of the food safety which are crucial for PIs in their management and operations, and to deepen their understanding to carry out following training.
Target participants	Managing Director or other decision makers
Number of participants	2 to 3 participants from each PI
Duration	0.5 day (separate session, in parallel with FS-0b)
Brief description of the module contents	・Social responsibility as a food operator ・Importance of food safety ・International trend for food safety, GFSI, FSSC22000, EHEDG, and 3A ・Recap of FSSAI ・Quality control system in Japan ・Price incentive system and its cost effectiveness (proposed by NDDB)
Method of instruction	Conference or workshop type of activity
Training site	NDDB, Anand, Gujarat
Prerequisite, if any	
Post training review and follow up method	

ID number	FS-0b Sensitization for chairman and elected board members
Title	Sensitization for chairman and elected board members (Video or another appropriate approach)
Objectives	The purpose of this course is to introduce the participants to the importance food safety throughout the value chain. Understanding the current situation at the Federation and MU level is crucial in generating awareness and developing a sense of responsibility towards its improvement. This session aims to enable decision makers of PIs understand importance of food safety, to introduce the key concept of the food safety which are crucial for PIs in their management and operations, and to deepen their understanding to carry out following training.
Target participants	✧ Chairman ✧ Board of Directors
Number of participants	4 to 5 participants from each PI
Duration(*)	0.5 day (separate session, in parallel with FS-0a)
Brief description of the module contents	・Social responsibilities as a food operator ・Importance of food safety ・International trend for food safety, GFSI, FSSC22000, EHEDG, and 3A ・Recap of FSSAI ・Quality control systems in Japan ・Price incentive system and its cost effectiveness (proposed by NDDB)
Method of instruction(*)	Video or another appropriate approach (which needs to be consulted with NDDB)
Training site	NDDB, Anand, Gujarat
Prerequisite, if any	
Post training review and follow up method(*)	

Attachment 8-5-1: Indicative Allocation of Fund Source

Fund source INR in Crores

Comp.	JICA ODA Loan	GOI Budget to NDDB	Total
A	145.8	312.1	457.9
B	516.0	108.7	624.7
C	38.2	153.9	192.1
D	7.1	2.7	9.8
E	30.0	41.9	71.9
F	29.3	9.5	38.8
G	45.2	-1.9	43.3
Total	811.6	626.9	1438.5

Funding pattern %

	Component	Component	DADF -> NDDB -> PI		
Component		Type of provision	Loan	Grant	PI
A	Strengthening Milk Procurement infrastructure	Milk collection accessories, Milk testing equipment, DCS establishment	0	90	10
		BMC, AMCU/DPMCU	50	50	0
B	Strengthening Processing Infrastructure		90	0	10
C	Support for Marketing infrastructure		80	20	0
D	Support for ICT Infrastructure		80	20	0
E	Productivity Enhancement		0	90	10
F	-Retain at NDDB-		-	(100 from DoAHD to NDDB)	-
G	Capacity Development (Training)		0	100	-

Possible fund estimation by funding pattern/source and by component (outlay) INR in Crores

	Composition*	Loan			Grant			Total
Comp	%	JICA	GOI	sub total	JICA	GOI	sub total	
A	50	0.0	0.0	0.0	72.9	156.1	229.0	229.0
	50	36.5	78.0	114.5	36.5	78.0	114.5	229.0
B		516.0	108.7	624.7	0.0	0.0	0.0	624.7
C		30.6	123.1	153.7	7.6	30.8	38.4	192.1
D		5.7	2.2	7.8	1.4	0.5	2.0	9.8
E		0.0	0.0	0.0	30.0	41.9	71.9	71.9
F		0.0	0.0	0.0	29.3	9.5	38.8	38.8
G		0.0	0.0	0.0	45.2	-1.9	43.3	43.3
Total		588.7	312.0	900.7	222.9	314.9	537.8	1438.5

Remarks: * Since there are two percentages in Component A, tentatively half by each is assumed for this estimation.
Source: Estimated by Survey Team

Attachment 8-6-1: Indicators Suggested To Be Monitored For Overall Monitoring And Evaluation

Suggested/highlighted Indicators to Quarterly Progress Report

Report	Contents
Quarterly Progress Report (QPR)	Main contents of PSR to be emphasized in the progress report are extracted as below: - Implementation schedule with plan and actual with reason if any changes; - Project cost information with sanctioned budget for subprojects, actual counterpart fund allocation, and actual disbursement of loan. Fund management information would include: ➢ Disbursement information to subprojects as per progress ➢ Information of due maintenance of the accounts related to the project ➢ Result of annual external audit of the designated account ➢ Results of annual external audit of the project related bank accounts managed by NDDB, ➢ Result of annual external audit of supporting documents of the Statement of Expenditure for the project at the level of NDDB ➢ Repayment status of subprojects from PIs - Subproject progress with photo (selection, sanction, list of subprojects with detailed information, implementation with environmental and social consideration measures if necessary, and operation); and - Information of Monitoring Indicators to see operation as well as effect/impacts.

Source: The survey team

Additional Monitoring Indicators for the Project

Category	Indicators	Timing
Others (or as a basis to report the mandatory indicators)	- General information of PIs - Number of DCS - Number of functional DCS - Number of DCS with BMC/AMCU - Number of DCS members (male and female) - Number of PI employees (age and gender composition, permanent, contract-basis employees). - Annual milk procurement (average annual Lakh Kg/day) - Plant processing capacity (Lakh Litre per Day) - Capacity utilization rates of BMC, chilling centers, and plants - Annual milk processing volume (Lakh Litre per Day) (in both total plants and upgraded/new plant) - Annual quantity of cattle feed manufactured (MTPD) - Annual sales quantity for each product including liquid milk and other products (cattle feed) - Annual sales turnover (in Rs. Lakh) with breakdown of product-wise turnover including liquid milk and other products (cattle feed) - Total values paid to members (as purchase of raw milk, bonus, price difference, and other benefits) - Annual operational cost (in Rs. Lakh) - Net profit (in Rs. Lakh) - Administration cost as percentage of total cost - Value of sales made outside the state (revenue and quantity) - Value of sales made through their own parlours or shops (revenue and quantity) - Number of negative claims from customers regarding product quality	Once a year (plus at the timing of baseline and end-line survey)
	In addition, physical and financial progress by each project component by PIs such as: - Total project cost, number/kinds of equipment provided, number of activities/training, activities/training participants (male and female), detailed monitoring items are referred to each manuals and formats of model subproject plans	At least quarterly

Source: The survey team

Attachment 11-1-1: An Example of Projected Operating Statement of PI

A. Projected Material Balancing Statement

Particulars	Unit	Fat %	SNF %	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28
Procurement														
Cow milk (Own Procurement)	TKgPD	4.40%	8.57%	415	433	480	530	585	598	598	598	598	598	598
Milk (from other Unions)	TKgPD	4.20%	8.50%	78	76	70	67	65	62	62	62	62	62	62
Total	**TKgPD**			**493**	**508**	**550**	**597**	**650**	**660**	**660**	**660**	**660**	**660**	**660**
Total Fat Procured in Milk	**MT**			**7863**	**8107**	**8782**	**9539**	**10392**	**10554**	**10554**	**10554**	**10554**	**10554**	**10554**
Total SNF Procured in Milk	**MT**			**15406**	**15878**	**17186**	**18657**	**20316**	**20629**	**20629**	**20629**	**20629**	**20629**	**20629**
Disposal of Milk in Sachets														
Toned milk	TLPD	3.10%	8.50%	90	92	98	117	124	124	124	124	124	124	124
Homoginised Cow milk	TLPD	3.60%	8.50%	202	207	220	235	261	272	272	272	272	272	272
Subham Milk	TLPD	4.60%	8.50%	5	6	6	7	7	7	7	7	7	7	7
Samrudhi Milk (FCM)	TLPD	6.10%	9.00%	5	6	6	7	7	7	7	7	7	7	7
Homoginised Cow milk in Flexi-pack	TLPD	3.60%	8.50%	40	45	60	64	75	75	75	75	75	75	75
Fat Disposed-Milk	**MT**			**4540**	**4706**	**5160**	**5689**	**6290**	**6439**	**6439**	**6439**	**6439**	**6439**	**6439**
SNF Disposed-Milk	**MT**			**10963**	**11355**	**12442**	**13754**	**15192**	**15544**	**15544**	**15544**	**15544**	**15544**	**15544**
DISPOSAL (MILK PRODUCTS)														
Butter Milk	TLPD	1.0%	2.8%	5	5	6	7	8	10	10	10	10	10	10
Sweet Lassi	TLPD	2.5%	6.8%	4	4	4	5	5	6	6	6	6	6	6

Particulars	Unit	Fat %	SNF %	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28
Mango Lassi	TLPD	2.5%	6.0%	2	2	2	2	3	3	3	3	3	3	3
Flavoured Milk	TLPD	1.5%	9.0%	1	1	1	2	2	2	2	2	2	2	2
Cream (Bulk)	TkgPD	35.0%	0.0%	1	1	1	1	1	2	2	2	2	2	2
Curd	TKgPD	3.1%	9.0%	52	59	67	76	85	95	95	95	95	95	95
Peda	TKgPD	18.0%	36.0%	0	0	0	0	0	0	0	0	0	0	0
Paneer	TKgPD	26.0%	53.0%	1	1	2	2	2	3	3	3	3	3	3
Sweet Pak	TKgPD	49.0%	0.0%	0	0	0	0	0	0	0	0	0	0	0
Khoa	TKgPD	22.0%	45.0%	0	0	0	0	0	0	0	0	0	0	0
Cashew Burfi	TKgPD	11.0%	5.0%	0	0	0	0	0	0	0	0	0	0	0
Burfi	TKgPD	36.0%	7.5%	0	0	0	0	0	0	0	0	0	0	0
Fat Disposed-Products	**MT**			**977**	**1104**	**1250**	**1415**	**1582**	**1771**	**1771**	**1771**	**1771**	**1771**	**1771**
SNF Disposed-Products	**MT**			**2194**	**2490**	**2828**	**3212**	**3628**	**4098**	**4098**	**4098**	**4098**	**4098**	**4098**
Processing Loss														
Fat Loss on Liquid Milk Procured	MT	0.25%		20	20	22	24	26	26	26	26	26	26	26
SNF Loss Liquid Milk Procured	MT		0.25%	39	40	43	47	51	52	52	52	52	52	52
Surplus/Deficit														
Fat Surplus	MT			**2327**	**2276**	**2351**	**2412**	**2494**	**2318**	**2318**	**2318**	**2318**	**2318**	**2318**
SNF Surplus	MT			**2211**	**1993**	**1874**	**1645**	**1445**	**935**	**935**	**935**	**935**	**935**	**935**
Conversion (Butter)	MT	83.0%	0.0%	**2734**	**2674**	**2761**	**2833**	**2930**	**2723**	**2723**	**2723**	**2723**	**2723**	**2723**
Conversion (SMP)	MT	0.0%	96.5%	**2176**	**1962**	**1845**	**1619**	**1422**	**921**	**921**	**921**	**921**	**921**	**921**
Production of Ghee	MT	99.0%	0.0%	**2292**	**2242**	**2315**	**2375**	**2456**	**2283**	**2283**	**2283**	**2283**	**2283**	**2283**
Local sale of Ghee	MT			**1146**	**1121**	**1157**	**1188**	**1228**	**1142**	**1142**	**1142**	**1142**	**1142**	**1142**
Ghee Sale (Depo)	MT			**1146**	**1121**	**1157**	**1188**	**1228**	**1142**	**1142**	**1142**	**1142**	**1142**	**1142**

Particulars	Unit	Fat %	SNF %	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28
Purchase of WB	MT	83.0%		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Purchase of SMP	MT		96.5%	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Opening Stock Ghee	MT			0	0	0	0	0	0	0	0	0	0	0
Ghee Production	MT			2292	2242	2315	2375	2456	2283	2283	2283	2283	2283	2283
Ghee Sales	MT			2292	2242	2315	2375	2456	2283	2283	2283	2283	2283	2283
Closing Stock of Ghee	MT			0	0	0	0	0	0	0	0	0	0	0
Opening Stock of SMP	MT			1256	3433	5395	7240	8859	10281	11202	12123	13043	13964	14885
SMP Purchased	MT			0	0	0	0	0	0	0	0	0	0	0
SMP Production	MT			2176	1962	1845	1619	1422	921	921	921	921	921	921
Sale of SMP	MT													
Use of SMP	MT			0	0	0	0	0	0	0	0	0	0	0
Closing Stock of SMP	MT			3433	5395	7240	8859	10281	11202	12123	13043	13964	14885	15805

B. Projected Operating Statement

Particulars	Unit Value		Actual	Projected (Rs Lakh)										
	Unit	Rs/ Unit	2016-17	2017-18	2018-19	2019-20	2020-21	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27
Sales														
Sale of Liquid Milk														
Toned milk	Ltr	33.51	9,580	11,009	11,253	11,929	14,352	15,216	15,216	15,216	15,216	15,216	15,216	15,216
Homogenised Cow milk	Ltr	36.39	27,739	26,821	27,491	29,160	31,209	34,662	36,123	36,123	36,123	36,123	36,123	36,123
Subham Milk	Ltr	40.22	642	778	825	874	995	1,055	1,055	1,055	1,055	1,055	1,055	1,055
Samrudhi Milk (FCM)	Ltr	42.13	747	815	864	916	1,047	1,110	1,110	1,110	1,110	1,110	1,110	1,110

Particulars	Unit Value		Actual	Projected (Rs Lakh)										
	Unit	Rs/ Unit	2016-17	2017-18	2018-19	2019-20	2020-21	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27
Homoginised Cow milk in Flexi-pack	Ltr	36.36	0	5,335	5,940	7,963	8,504	9,980	9,980	9,980	9,980	9,980	9,980	9,980
Raw Chilled Milk			1											
Total Sales of Liquid Milk			**38,708**	**44,758**	**46,373**	**50,841**	**56,107**	**62,023**	**63,484**	**63,484**	**63,484**	**63,484**	**63,484**	**63,484**
Sale of Milk Products														
Butter Milk	Ltr	21.60	319	357	411	472	543	642	758	758	758	758	758	758
Sweet Lassi	Ltr	37.12	667	512	559	609	664	718	778	778	778	778	778	778
Mango Lassi	Ltr	41.24		227	261	300	345	388	437	437	437	437	437	437
Flavoured Milk	Ltr	68.76	267	290	319	350	385	422	462	462	462	462	462	462
Cream (Bulk)	Ltr	118.77	407	453	498	548	603	628	654	654	654	654	654	654
Curd	Kg	39.50	6,762	7,562	8,545	9,655	10,911	12,252	13,759	13,759	13,759	13,759	13,759	13,759
Peda	Kg	243.07	181	198	218	240	264	289	317	317	317	317	317	317
Paneer	Kg	219.17	725	875	1,049	1,259	1,511	1,787	2,113	2,113	2,113	2,113	2,113	2,113
Sweet Pak	Kg	283.57	171	187	205	226	249	261	274	274	274	274	274	274
Khoa	Kg	219.51	32	38	46	55	66	82	101	101	101	101	101	101
Cashew Burfi	Kg	510.59	65	89	107	129	155	187	227	227	227	227	227	227
Burfi	Kg	186.28	97	105	115	127	139	158	178	178	178	178	178	178
Local sale of Ghee	Kg	314.31	3,546	3,602	3,523	3,638	3,733	3,860	3,588	3,588	3,588	3,588	3,588	3,588
Ghee Sale (Depo)	Kg	267.49		3,065	2,999	3,096	3,177	3,285	3,054	3,054	3,054	3,054	3,054	3,054
Sale of SMP	Kg	200.00	6	0	0	0	0	0	0	0	0	0	0	0
Sale of other Milk Products (Trading)			601	601	601	601	601	601	601	601	601	601	601	601
Less: VAT & Excise duty			55											
Total Milk product sales			**13,792**	**18,160**	**19,456**	**21,306**	**23,345**	**25,561**	**27,301**	**27,301**	**27,301**	**27,301**	**27,301**	**27,301**
TOTAL SALES			**52,500**	**62,919**	**65,829**	**72,147**	**79,452**	**87,583**	**90,784**	**90,784**	**90,784**	**90,784**	**90,784**	**90,784**
Revenue per Kg Throughput			**32**	**37**	**37**	**39**	**40**							

Particulars	Unit Value		Actual	Projected (Rs Lakh)										
	Unit	Rs/ Unit	2016-17	2017-18	2018-19	2019-20	2020-21	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27
Raw-material Cost														
Opening stock (Milk/Milk Products)			328	411	411	411	411	411	411	411	411	411	411	411
Purchase of Milk from DCS	Kg	28.09	36,266	42,542	44,358	49,214	54,340	59,979	61,312	61,312	61,312	61,312	61,312	61,312
Purchase of Milk from Other Union	Kg	27.27	4,857	7,787	7,522	6,967	6,669	6,470	6,171	6,171	6,171	6,171	6,171	6,171
Price difference payment to societies	Kg	0.00		0	0	0	0	0	0	0	0	0	0	0
Purchase of SMP	Kg	200.00	175	0	0	0	0	0	0	0	0	0	0	0
Purchase of Butter	Kg	240.00		0	0	0	0	0	0	0	0	0	0	0
Purchase of other Milk Products (Trading)			573	573	573	573	573	573	573	573	573	573	573	573
Closing (Milk/Milk Products)			411	411	411	411	411	411	411	411	411	411	411	411
Total Cost of Milk			**41,787**	**50,902**	**52,453**	**56,754**	**61,582**	**67,022**	**68,056**	**68,056**	**68,056**	**68,056**	**68,056**	**68,056**
Cost of Raw Material per Kg Throughput			**25.85**	**29.90**	**29.14**	**30.60**	**30.68**							
Gross Margin			**10,713**	**12,017**	**13,376**	**15,393**	**17,871**	**20,562**	**22,728**	**22,728**	**22,728**	**22,728**	**22,728**	**22,728**
Gross Margin Per Kg Throughput			**7**	**7**	**7**	**8**	**9**							
Variable Costs														
Procurement Transport (DCS)	Kg	0.74	972	1,126	1,174	1,303	1,439	1,588	1,623	1,623	1,623	1,623	1,623	1,623
Procurement Transport (Inter Union)	Kg	0.46	143	132	127	118	113	109	104	104	104	104	104	104
Processing & Manufacturing Expenses	Kg	1.73	2,796	2,944	3,113	3,208	3,472	3,769	4,103	4,166	4,166	4,166	4,166	4,166

Particulars	Unit Value		Actual	Projected (Rs Lakh)										
	Unit	Rs/ Unit	2016-17	2017-18	2018-19	2019-20	2020-21	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27
Packing Cost														
Toned milk	Ltr	0.79	414	260	265	281	338	359	359	359	359	359	359	359
Homoginised Cow milk	Ltr	0.79		582	597	633	678	753	784	784	784	784	784	784
Subham Milk	Ltr	1.02		20	21	22	25	27	27	27	27	27	27	27
Samrudhi Milk (FCM)	Ltr	1.02		20	21	22	25	27	27	27	27	27	27	27
Homoginised Cow milk in Flexi-pack	Ltr	4.00		587	653	876	936	1,098	1,098	1,098	1,098	1,098	1,098	1,098
Butter Milk	Ltr	1.50		25	29	33	38	45	53	53	53	53	53	53
Sweet Lassi	Kg	1.50		21	23	25	27	29	31	31	31	31	31	31
Mango Lassi	Kg	1.75		10	11	13	15	16	19	19	19	19	19	19
Flavoured Milk	Kg	25.70		108	119	131	144	158	173	173	173	173	173	173
Cream (Bulk)	Kg	0.00		0	0	0	0	0	0	0	0	0	0	0
Curd	Kg	1.23		235	266	301	340	381	428	428	428	428	428	428
Peda	Kg	8.38		7	8	8	9	10	11	11	11	11	11	11
Paneer	Kg	3.72		15	18	21	26	30	36	36	36	36	36	36
Sweet Pak	Kg	25.24		17	18	20	22	23	24	24	24	24	24	24
Khoa	Kg	3.42		1	1	1	1	1	2	2	2	2	2	2
Cashew Burfi	Kg	29.07		5	6	7	9	11	13	13	13	13	13	13
Burfi	Kg	14.75		8	9	10	11	12	14	14	14	14	14	14
Local sale of Ghee	Kg	9.40		108	105	109	112	115	107	107	107	107	107	107
Ghee Sale (Depo)	Kg	9.40		108	105	109	112	115	107	107	107	107	107	107
Distribution Expenses (Poly Pack)	Ltr	0.68	825	754	773	820	912	996	1,024	1,024	1,024	1,024	1,024	1,024
Distribution Expenses (Flexi Pack)	Ltr	0.60		88	98	131	140	165	165	165	165	165	165	165
Total of variable costs			**5,150**	**7,179**	**7,561**	**8,202**	**8,942**	**9,838**	**10,332**	**10,395**	**10,395**	**10,395**	**10,395**	**10,395**

Particulars	Unit Value		Actual	Projected (Rs Lakh)										
	Unit	Rs/ Unit	2016-17	2017-18	2018-19	2019-20	2020-21	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27
			3	4	4	4	4							
Contribution			**5,562**	**4,838**	**5,815**	**7,191**	**8,929**	**10,723**	**12,396**	**12,333**	**12,333**	**12,333**	**12,333**	**12,333**
			3	3	3	4	4							
Fixed Costs														
Salaries & Benefits to Employees		7%	1,802	1,928	2,063	2,208	2,362	2,362	2,362	2,362	2,362	2,362	2,362	2,362
Additional Salary for the Flexi pack plant		7%		113	121	130	139	139	139	139	139	139	139	139
Additional Salary for the new Plant		7%			411	440	470	470	470	470	470	470	470	470
Administrative Expenses		7%	379	405	433	464	496	496	496	496	496	496	496	496
Marketing Cost		7%	199	213	228	244	261	261	261	261	261	261	261	261
Technical Inputs cost		7%	437	468	500	535	573	573	573	573	573	573	573	573
Total Fixed Cost			**2,817**	**3,127**	**3,757**	**4,020**	**4,302**	**4,302**	**4,302**	**4,302**	**4,302**	**4,302**	**4,302**	**4,302**
Provision for Development Fund	Rs/Kg	1.25	1,519	1,774	1,798	1,889	1,983	2,184	2,420	2,681	2,732	2,732	2,732	2,732
Other Income		0%	705	705	705	705	705	705	705	705	705	705	705	705
Total Other Income			**705**	**705**	**705**	**705**	**705**	**705**	**705**	**705**	**705**	**705**	**705**	**705**
Profit Before Depreciation, Interest & Taxes (PBDIT)			**1,932**	**641**	**965**	**1,987**	**3,349**	**4,943**	**6,380**	**6,056**	**6,004**	**6,004**	**6,004**	**6,004**
Interest on existing Term Loan - NDDB			15	7	4	1	0	0	0	0	0	0	0	0
Interest on existing Term Loan - UVW Bank Financial Institution				135	109	81	53	25	0	0	0	0	0	0
Interest on New Term Loan - NDDB				47	173	251	220	188	154	122	89	56	23	0

Particulars	Unit Value		Actual	Projected (Rs Lakh)										
	Unit	Rs/ Unit	2016-17	2017-18	2018-19	2019-20	2020-21	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27
Int on other Loan (W.C. & Others)			5	5	5	5	5	5	5	5	5	5	5	5
Total Interest			**20**	**194**	**291**	**337**	**278**	**217**	**159**	**127**	**94**	**61**	**28**	**6**
Depreciation														
Existing assets	12%		369	326	289	256	226	200	177	157	139	123	109	96
Flexi-pack Plant			183	254	229	206	185	167	150	135	122	109	98	89
New Plant					0	1,529	1,320	1,139	984	851	736	638	552	479
Total Depreciation			**552**	**580**	**518**	**1,991**	**1,731**	**1,506**	**1,312**	**1,143**	**997**	**870**	**760**	**664**
Total Interest & Depreciation			**572**	**775**	**808**	**2,328**	**2,009**	**1,724**	**1,471**	**1,270**	**1,091**	**931**	**788**	**669**
Net Profit before tax			**1,360**	**-133**	**156**	**-341**	**1,340**	**3,220**	**4,908**	**4,786**	**4,913**	**5,073**	**5,216**	**5,335**
Net Profit + Development Fund (on which tax is payable)			**2,879**	**1,641**	**1,954**	**1,548**	**3,323**	**5,403**	**7,328**	**7,467**	**7,646**	**7,805**	**7,948**	**8,067**
Income Tax @ 30.9%		30.9%	864	507	604	478	1,027	1,670	2,264	2,307	2,363	2,412	2,456	2,493
Net Profit after Tax			**496**	**-640**	**-447**	**-820**	**314**	**1,550**	**2,644**	**2,479**	**2,551**	**2,661**	**2,760**	**2,842**
Accumulated Profit/loss (Op. balance)			426	496	48	-771	-458	1,092	3,736	6,215	8,766	11,427	14,187	17,029
Less Transferred during year			426	496	48	-771	-458	1,092	3,736	6,215	8,766	11,427	14,187	17,029
Accumulated Profit/loss (Cl. balance)			496	-640	-447	-820	314	1,550	2,644	2,479	2,551	2,661	2,760	2,842
Calculation of ROI & DSCR														
PAT +Interest			516	-446	-157	-482	591	1,767	2,803	2,606	2,645	2,722	2,788	2,848
Net Block			1,961	4,686	4,686	4,686	16,196	16,196	16,196	16,196	16,196	16,196	16,196	16,196
New Assets Created			2,725			11,510								

Particulars	Unit Value		Actual	Projected (Rs Lakh)										
	Unit	Rs/ Unit	2016-17	2017-18	2018-19	2019-20	2020-21	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27
Cumulative Investment			4,686	4,686	4,686	16,196	16,196	16,196	16,196	16,196	16,196	16,196	16,196	16,196
ROI		**11.40%**	**11%**	**-10%**	**-3%**	**-3%**	**4%**	**11%**	**17%**	**16%**	**16%**	**17%**	**17%**	**18%**
Profit After Tax (PAT) + Interest + Deprn			1,068	134	361	1,508	2,322	3,274	4,115	3,749	3,642	3,592	3,548	3,511
Total Repayment			112	515	611	2,138	2,198	2,131	1,793	1,760	1,727	1,695	1,662	137
DSCR		**1.87**	10	0	1	1	1	2	2	2	2	2	2	26
Raw Material Cost as % of Sales			80%	81%	80%	79%	78%	77%	75%	75%	75%	75%	75%	75%
Variable Cost as % of Sales			10%	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%
Fixed Cost as % of Sales			5%	5%	6%	6%	5%	5%	5%	5%	5%	5%	5%	5%
Net Profit as % of Sales			0.94%	-1.02%	-0.68%	-1.14%	0.39%	1.77%	2.91%	2.73%	2.81%	2.93%	3.04%	3.13%

Figures are indicative.

Attachment 12-2-1: Outline of JICA team proposed programmes (01/16)

ID number	BM-1-1
Module Title	Business Management and Strategic Planning
Programme Title	Concept & theory learning
Objectives	This programme has two objectives. One is to brief the top management of PIs about the capacity development (CD) modules that the employees of PIs are going to participate in and get their supports for the subsequent CD activities. The other is to let the Managing Directors and Section Heads of PIs comprehend the concept of the strategic management based on the demand-oriented and quality-oriented value chain management As the concept is consisted of a wide range of knowledge regarding marketing strategy, brand management, total quality management, and operational strategy to reflect the consumer's demand to processing and procurement process, an overview lecture will be offered.
Target participants	If PI is MILK UNION: ✧ Managing Director ✧ Head of Finance ✧ Head of Marketing ✧ Head of Procurement and Input ✧ Head of Plant Operation ✧ Head of Quality Assurance ✧ Federation's Head of Marketing, if required ✧ Other key decision makers to formulate the strategy If PI is FEDERATION: ✧ Managing Director ✧ Head of Finance ✧ Head of Marketing ✧ Head of Procurement and Input ✧ Head of Plant Operation ✧ Other key decision makers to formulate the strategy If PI is PRODUCER COMPANY: ✧ Managing Director ✧ Head of Finance ✧ Head of Marketing ✧ Head of Procurement and Input ✧ Head of Plant Operation ✧ Head of Quality Assurance ✧ Other key decision makers to formulate the strategy
# of participants from one PI	3 to 5 participants from one PI 3 batches per PI
# of participants and PIs per programme batch (class	20 to 25 participants / batch 5PIs

size)	
Duration	4 days
Brief description of the module contents	Part1 Capacity Development Introduction and Start-Up 1. Capacity Development as a part of the Sub-loan project ・ Philosophy and concept of the Capacity Development (CD) ・ The reason and necessity of CD in "Business Management" and "Food Safety" areas for PIs ・ The importance and characteristics of field-oriented and implementation-oriented approach for the CD 2. Overall picture and structure of the CD training modules ・ Linkage between the sub-loan project and CD training modules ・ Brief explanation of each CD training modules Part2 Introduction about "Food Safety" ・Social responsibility as a food operator ・Importance of quality control ・Importance of food safety ・Recap of FSSAI ・International trend for food safety, GFSI, FSSC22000, EHEDG, and 3A ・Big benefit of food safety for MU ・Stable operation and less loss of production ・Price incentive system and its cost effectiveness (proposed by NDDB) Part3 Introduction and Details about "Business Management" (Lecture): STRATEGIC MANAGEMENT 1. Concept of Strategic Management a) Mindset change from product-out strategy to market-in strategy b) Importance of demand-driven supply chain management c) Effective operational management to match demand and supply d) Importance of objective analysis of the actual situation to formulate strategy e) Importance of formulation of realistic action plan for each concerning department to implement the strategy f) How to manage and measure the achievement to improve gradually g) Importance of the visualization of improvement for all employees 2. How to implement Strategic Management a) Concept of PEST Analysis b) Concept of 3C Analysis c) Concept of SWOT Analysis d) Concept of Cross SWOT Analysis e) How to formulate institutional strategy based on the above analysis f) 4P (Product, Price, Place and Promotion) g) Segmentation, Targeting and Positioning h) How to manage the value chain: long-term, mid-term and day-to-day adjustment of production based on customers' needs and milk

	procurement. (Lecture): MARKETING 1. Dairy Sector in India- An analytical overview 2. The production system- Incorporating market orientation 3. Building on advantages of cooperative system 4. Supply chain management in dairy Sector 5. Understanding competitions – Unorganized and organized sector 6. Product portfolio management 7. Consumer behavior – Reference to dairy products 8. Skills on distribution, sales and marketing 9. Brand Management in Dairy Products 10. Importance of logistics for success of milk marketing 11. Effective marketing strategy: Segmentation, Targeting, Positioning 12. How to reflect customers' needs to dairy processing and procurement 13. Distribution Channel Management 14. Success story in marketing (Lecture): Quality-driven strategic management 1. Introduction of the concept of TQM (Total Quality Management) a) Relationship between Strategic Business Plan, Hoshin-Kanri and Daily Management: - Daily management: Activities and issues of the business plan which is already implementing. (maintenance and improvement) - Hoshin-Kanri (Policy Management): New activities and issues to implement to achieve the business plan. (Kaizen and Innovation) b) Hoshin-Kanri (Policy management): - Deployment: The objectives of the business plan will be deployed to specific actions in respective departments. Identification of linkages between objectives and means to achieve, and to deploy the actions to each department. - Integration: Progress and level of achievement of the activities implemented by each department should be integrated to the upper level based on the linkages between means and objectives. - PDCA: Plan, Do, Check, Act (Improvement/Kaizen) c) Daily management: - Determination of the measurement to evaluate the performance of the process. - Preparation of the graph with the central line and control limits ca - SDCA: Standardize, Do, Check, Act (Improvement/Kaizen) - QC circle: Workplace culture development Quality control for the front-line workers
Method of instruction	Lecture
Training site	NDDB training centers or any other appropriate places

Prerequisite, if any	None

Attachment 12-2-1: Outline of JICA team proposed programmes (02/16)

ID number	BM-1-2@PI
Module Title	Business Management and Strategic Planning
Programme Title	On-site business strategy & plan and its action plan development
Objectives	To guide the participants to develop: 1) the business strategy & plan of their own PI; and 2) the action plans to implement the developed business strategy & plan.
Target participants	If PI is MILK UNION: ✧ Managing Director ✧ Head of Finance ✧ Head of Marketing ✧ Head of Procurement and Input ✧ Head of Plant Operation ✧ Head of Quality Assurance ✧ Chairman / Vice-chairman of the Board of Members ✧ Federation's Head of Marketing, if required. ✧ Other key decision makers to formulate the strategy If PI is FEDERATION: ✧ Managing Director ✧ Head of Finance ✧ Head of Marketing ✧ Head of Procurement and Input ✧ Head of Plant Operation ✧ Other key decision makers to formulate the strategy If PI is PRODUCER COMPANY: ✧ Managing Director ✧ Head of Finance ✧ Head of Marketing ✧ Head of Procurement and Input ✧ Head of Plant Operation ✧ Head of Quality Assurance ✧ Other key decision makers to formulate the strategy
# of participants	Around 30 participants depending on each PI
Duration	Up to 2 days
Brief description of the module contents	It is preferable that MD and the Section Heads participated in programme 1 could transfer the basic concepts to key persons in the organization before this programme. After a brief recap of the concept of strategic management, the participants will formulate the institutional strategy with the guidance of MD and the heads of departments, starting from an analysis of actual situation of the institution and the local dairy market using the methodologies learned in BM-1-1. The participants, especially the MD and the Section Head, will review the

	formulated strategy to break it down to a series of specific action plans logically formulated to achieve the objective of the strategy. The action plans should be described with information regarding responsible department or person to implement, time schedule, and indicators to measure the achievement. Day 1: Formulation of the Strategy a) PEST Analysis b) 3C Analysis c) SWOT Analysis d) Cross SWOT Analysis e) Formulation of the Business Strategy f) Formulation of Business Plan based on Strategy Day 2: Formulation of Strategy through TQM approach 1. Formulation of Hoshin Kanri (Policy Deployment) 2. Formulation of Daily management 3. How to set the Key Indicators to implement the Institutional Strategy. 4. Setting up the Key Indicators to measure the progress of the Institutional Strategy and the Action Plan
Method of instruction	On-the-job implementation
Training site	Any appropriate places near PI
Prerequisite, if any	After the programme BM-1-1, the participants of the BM-1-1 should disseminate what they have learned at the programme to appropriate stakeholders of their own PI to formulate its Strategy and Business Plan. Then, the PI should formulate the Strategy and Business Plan and submit them to NDDB before the implementation of BM-1-2@PI.

Attachment 12-2-1: Outline of JICA team proposed programmes (03/16)

ID number	BM-1-3@PI
Module Title	Business Management and Strategic Planning
Programme Title	On-site review and guidance
Objectives	To: 1) review the progress and achievement of the business strategy & plan, and action plans, and provide necessary technical guidance/advice/recommendation; and 2) guide the participants to identify the issues and points for further improvement and find out how to tackle them.
Target participants	If PI is MILK UNION: ✧ Managing Director ✧ Head of Finance ✧ Head of Marketing ✧ Head of Procurement and Input ✧ Head of Plant Operation ✧ Chairman / Vice-chairman of the Board of Members ✧ Federation's Head of Marketing, if required ✧ Other key decision makers to formulate the strategy If PI is FEDERATION: ✧ Managing Director ✧ Head of Finance ✧ Head of Marketing ✧ Head of Procurement and Input ✧ Head of Plant Operation ✧ Other key decision makers to formulate the strategy If PI is PRODUCER COMPANY: ✧ Managing Director ✧ Head of Finance ✧ Head of Marketing ✧ Head of Procurement and Input ✧ Head of Plant Operation ✧ Other key decision makers to formulate the strategy
Number of participants	Around 30 participants depending on each PI
Duration	1-2 days / each, 1-2 times per PI during the period between BM1-2@PI and BM1-R
Brief description of the module contents	Day 1: Presentation of the progress and achievement: - Review of PI's Strategy, business plan and action plans - Result of the implementation of each action plans: a) Progress of each action plan b) Progress of the Performance Indicator c) How the action plan would contribute to the strategy - Overall progress regarding each strategy - GUIDANCE, Feedback and review from the instructor Day2: Lecture - Concept of PDCA - How to implement PDCA - How to coordinate the strategy with different departments

	- Concept of Balanced Score Card - Feedback and review of the implementation of Strategic Management incorporating the marketing, brand management and KPI in all department
Method of instruction	On-the-job training
Training site	Any appropriate places near PI
Prerequisite, if any	The instructor would preferable be a person who have attended the Programme 1 and Programme 2 for the same PIs.
Remarks	NDDB will monitor and follow up the implementation process of the PI's business strategies and business plan in quarterly basis as a part of the sub-project monitoring process.

Attachment 12-2-1: Outline of JICA team proposed programmes (04/16)

ID number	BM-1-R
Module Title	Business Management and Strategic Planning
Programme Title	Reflection workshop
Objectives	To 1) guide the participants to reflect lessons learned through the implementation of the market-oriented and quality-oriented business strategy & plan and its action plans, learn from other PIs' experiences; and 2) also recognize PIs that have achieved significant improvement. The interaction among PIs will enable the participants to learn from other PIs and also increase motivation for further continuous improvement.
Target participants	If PI is MILK UNION: ✧ Managing Director ✧ Head of Finance ✧ Head of Marketing ✧ Head of Procurement and Input ✧ Head of Plant Operation ✧ Head of Quality Assurance ✧ Federation's Head of Marketing, if required ✧ Other key decision makers to formulate the strategy If PI is FEDERATION: ✧ Managing Director ✧ Head of Finance ✧ Head of Marketing ✧ Head of Procurement and Input ✧ Head of Plant Operation ✧ Other key decision makers to formulate the strategy If PI is PRODUCER COMPANY: ✧ Managing Director ✧ Head of Finance ✧ Head of Marketing ✧ Head of Procurement and Input ✧ Head of Plant Operation ✧ Head of Quality Assurance ✧ Other key decision makers to formulate the strategy
# of participants from one PI	8-10 participants from one PI
# of participants and PIs per programme batch (class size)	50 - 70 participants / 1 programme batch 7 PIs
Duration	1 day
Brief description of	✧ Presentation: Each PI will present the following experiences focusing on the findings and lessons learned during the following process. ✓ Formulation of business strategy, business plan and action plans.

the module contents	✓ Implementation of each action plans to achieve the goal set in the strategy. ✓ Implementation of marketing research and incorporation of its result to the strategy and action plan. ✓ Coordination among different departments to achieve the common strategy. ✓ Changes in empowerment and motivation of employees experienced during certain activities. ✓ Effective way of communication top-down, bottom-up, among colleagues, and between different departments. ✧ Question and Answer / Discussion: The facilitator of the workshop will carefully lead the participants to discuss freely but oriented to extract the best practices, good know-hows, and hints of success. ✧ Feedbacks from the Strategic Management Experts who have kept overseeing the participating institution's activities during the 18 months. ✧ The organizer of the workshop will summarize and present the most important lessons obtained during the workshop.
Method of instruction	Presentation and Discussions
Training site	NDDB, Anand, Gujarat or any other suitable location
Prerequisite, if any	Each PI will prepare a presentation material summarizing the important achievement, experiences and lessons learned during the 18-months business management capacity development processes before this workshop.

Attachment 12-2-1: Outline of JICA team proposed programmes (05/16)

ID number	BM-2-1
Module Title	Marketing of Milk and Milk Products
Programme Title	Concept & theory learning
Objectives	The overall goal of BM-2 coupled with BM-1 is to promote supply milk and dairy products competitive in the market and increase the revenue of PI, and ultimately that of milk producers. The purpose of Marketing of Milk and Milk Products (BM-2) is to: 1) enable PIs to design the marketing research and outsource it to the marketing consultants; and 2) reflect its results into the action plans in accordance with the road map and marketing strategy of PIs. The objective of this programme is to equip marketing officers of the PI to: ✓ Understand the changes in dairy sector in the recent years, especially in the demands of milk and milk products in the country. ✓ Understand consumption pattern of processed milk and processed & packaged dairy products in urban areas. ✓ Optimize the marketing strategy to produce products preferred by consumers in the right place, with suitable price and strategic promotion activities (4Ps). ✓ Enhance marketing skills of the milk union professionals to compete in market, by acquiring basic skills such as 3C analysis and Segmentation, Targeting and Positioning. ✓ Understand how to outsource and make the most of the marketing research to implement the milk union's marketing strategy.
Target participants	FOR MILK UNIONS: ✧ Manager(s) of Marketing Department ✧ Manager(s) of Marketing Department of the Federation ✧ Any other staffs of marketing department including administrative staffs, field supervisors, and field staffs. FOR FEDERATIONS: ✧ Manager(s) of Marketing Department ✧ Any other staffs of marketing department including administrative staffs Head of Marketing FOR PRODUCER COMPANIES: ✧ Manager(s) of Marketing Department ✧ Any other staffs of marketing department including administrative staffs, field supervisors, and field staffs.
# of participants from one PI	2 to 5 participants from each PI, 3 batches per PI
# of participants and PIs per programme batch (class size)	20 to 25 participants / batch 5 PIs

Duration	5 days
Brief description of the module contents	Day 1: 1. Dairy Sector in India- An analytical overview 2. The production system- Incorporating market orientation 3. Building on advantages of cooperative system Day 2: 4. Understanding competitions – Unorganised and organized sector 5. Consumer behavior – Reference to dairy products 6. Brand Management in Dairy Products 7. Case studies and group discussion on brand management Day 3: 8. Product portfolio management 9. Case studies of product portfolio management 10. Effective marketing strategy: Segmentation, Targeting, Positioning 11. Case studies of Segmentation, Targeting and Positioning 12. How to outsource the marketing research in accordance to the institutional marketing strategy, and how to incorporate the result to the strategy. Day 4 13. Customers Relationship Management 14. How to reflect customers' needs to dairy processing and procurement 15. Supply chain management in dairy Sector – customer focused supply chain 16. Distribution Channel Management – importance of logistics 17. Skills on sales and promotion Day 5: 18. Success stories in marketing 19. Summary of learned topics
Method of instruction	Lectures, Group discussion, Case studies Individual and group exercises Videos Field visits
Training site	NDDB training centers or any other appropriate locations
Prerequisite, if any	

Attachment 12-2-1: Outline of JICA team proposed programmes (06/16)

ID number	BM-2-2@PI
Module Title	Marketing of Milk and Milk Products
Programme Title	On-site guidance for utilization of marketing research
Objectives	A market research will be implemented by the consultants outsourced by the PI under the sub-project as a part of the Component C of the project. The objective of this programme is to 1) let the marketing officers of the PI comprehend how to interpret and utilize the results of the marketing research conducted by the consultants outsourced by the PI into the action plans, in accordance with their own PI's road map and marketing strategy.
Target participants	FOR MILK UNIONS: ✧ Manager(s) of Marketing Department ✧ Manager(s) of Marketing Department of the Federation ✧ Any other staffs of marketing department including administrative staffs, field supervisors, and field staffs. FOR FEDERATIONS: ✧ Manager(s) of Marketing Department ✧ Any other staffs of marketing department including administrative staffs Head of Marketing FOR PRODUCER COMPANIES: ✧ Manager(s) of Marketing Department ✧ Any other staffs of marketing department including administrative staffs, field supervisors, and field staffs.
Number of participants	Around 3 to 7 participants for each PI (No restriction on number of participants)
Duration	1 days
Brief description of the module contents	Once the marketing research is accomplished, it is important to have a programme where the consultants present and explain the detailed results of the marketing research to the "Target participants" of the PI mentioned above to discuss about its implication to the strategy, road map and action to be taken by the PI. Presentation of the result of the marketing research by the marketing consultant 1. Overall results of the marketing research 2. Verification of the hypothesis 3. Suggestion regarding the action plans to be taken Analysis of the result & Formulation of Action Plans 4. Interpretation and proposition of sales/business strategy (Lecture) 5. Analysis of the result of the marketing research (On-the-job) 6. Identification of the main decision-making topics (On-the-job) 7. Formulation of sales / business strategy (On-the-job) 8. Formulation of action plans to achieve the proposition (On-the-job)
Method of instruction	Lecture and Case Studies

Training site	Any appropriate places near PI
Prerequisite, if any	The participants are expected to have participated in BM-2-1 before this programme.
Post training review and follow up method	➢ Results of the marketing research and the action plan formulated during this programme will be shared to the participants of BM-1-2 and BM-1-3 (mainly to the Managing Director and Heads of the departments), to incorporate the results of the research to institutional business strategy.

Attachment 12-2-1: Outline of JICA team proposed programmes (07/16)

ID number	FS-A1-1
Module Title	Clean milk production and milk quality management at village level
Programme Title	Business appreciation program + **Action Plan** development
Objectives	・ This programme will enable PIs' section head, officers, supervisors and staff in charge of milk procurement to: 1) recall the importance of quality control during milk production and milking at farm and procurement from farm to plant; 2) know possible measurement for better milk quality 3) how to train the milk producers for better quality milk 4) develop an action plan to improve raw milk quality
Target participants	・ Section head (Procurement and Inputs) ・ Working level officers especially for milk procurement ・ Supervisors and staff for milk procurement ・ Preference will be given to female employees ・
# of participants from one PI	・ 4-6 participants from each PI depending on the number of supervisors of the PI ・ 3 batches for each PI
# of participants and PIs per programme batch (class size)	・ 20-25 participants /batch (maximum? 25 participants) ・ 5PIs
Duration	5 days
Brief description of the module contents	The contents of this programme are based on the existing module entitled "Business Appreciation Program for Procurement Staff" and Action Plan development and other crucial points from food safety and hygiene perspective to improve clean milk production and milk quality management at village level are added. Examples of contents to be covered shown below. ・Importance of controlling milk quality ・Clean milk production and milk quality management at farm level ・Animal health for clean milk production (mastitis) and nutrition for quality milk ・Brief of FSSAI ・Proper procedure of milking method ・Raw milk quality, importance of clean milk production and milk quality management - Milk cooling, H & S ・Effect of milking practice and feeding management on milk quality ・Milk, its composition and quality aspects ・Relation between temperature and milk quality, bacteria growing ・Effective milk collection route for better quality of milk ・5S, Kaizen, TQM

	・Milk synthesis & antibiotic residuals in milk ・Adulterants, its detection & prevention ・Team building & Leadership ・BMCU: Types, Construction, Specification ・BMCU: Installation, O & M, Refri. Cycle ・Relevance of CIP & COP, and pasteurization ・O & M of DG Set ・BMCU: Workshop practice ・Milk synthesis & antibiotic residuals in milk ・How to train the farmers for better milking and treatment ・BMCU: Dos and Don'ts ・EMT & Milk analyzer: Operation, Maintenance & Cleaning ・O & M of AMCU & DPMCU and report generation ・Other quality control system in Japan ・Price incentive system and its cost effectiveness (proposed by NDDB) ・Introduction of cases of award system for clean milk production in India ・Open Discussion, Feedback ・**Action Plan** development ・Small test, Valedictory
Method of instruction	Lecture, workshop
Training site	NDDB training centers, e.g. MIT
Prerequisite, if any	

Attachment 12-2-1: Outline of JICA team proposed programmes (08/16)

ID number	FS-A1-2@PI
Module Title	Clean milk production and milk quality management at village level
Programme Title	Training by trainers to milk producers
Objectives	・PIs' milk procurement officers and supervisors provide trainings to milk producers in order for milk producers to produce clean milk.
Target participants	・Milk Producers ・Workers at DCS
Number of participants	・40-50 per batch (same as "CMP Programme (Awareness Programme on clean milk production for producers)") ・At least 30% of the participants should be female
Duration	1 Day (including field visit and interaction)
Brief description of the module contents	・The contents of this session are based on the the existing module entitled "Awareness program on clean milk production" ➢ Training contents is as per proposal from NDDB. NDDB proposed members in new DCS. ➢ In addition, the JICA study team proposes to cover members in **existing DCS** if they have not received clean milk production training in past certain years. ➢ The outline (called "schedule" in the term used at NDDB) that NDDB has already had is used and existing DCSs of the PI (Comp A) will also be targeted, ➢ At least 30% of the participants should be female Based on "CMP Programme (Awareness Programme on clean milk production for producers)", the below contents may be included. < Contents of CMP Programme (Awareness Programme on clean milk production for producers)> ・What is dairy cooperative society, how it will benefit them, what are the role & responsibility of members (30 minutes) ・Understanding the constituents of milk & their conversion into milk pricing (10 min) ・Need & of clean milk production (5 min) ・Steps involved in clean milk production (20 min) ・Bacteria growth in milk,microbiological quality, use of SS vessels & future perspectives (10 min) ・Hygienic practices & animal health specifically discussion on Mastitis & ticks (5 min) ・Relationship between quality & income (5 min) ・Hygienic milking procedure at the producer level (10 min) ・Steps to be followed at DCS level to maintain quality of milk intact (10 min) ・Cleanliness of cowshed (5 min) ・Tea & snacks (15 min) ・Showcasing movie on CMP if available (10 min) ・CMP booklets & posters to be given to participants

Method of instruction	Lecture, workshop and study visit
Training site	at villages
Prerequisite, if any	

Attachment 12-2-1: Outline of JICA team proposed programmes (09/16)

ID number	FS-A1-3@PI
Module Title	Clean milk production and milk quality management at village level
Programme Title	On-site review and guidance
Objectives	The purpose of this review and guidance is to review the progress of the action plan developed during the programme FS-A1-1, and provide the participants with guidance and advice in order for them to improve the current milk procurement situation of milk producers and DCS.
Target participants	・ Section head (Procurement and Inputs) ・ Working level officers, supervisors, and staff for milk procurement who are trainers for clean milk production at village level
Number of participants	Around 15 participants depending on each PI
Duration	1-2days/each, 1-2 times per PI
Brief description of the module contents	NDDB technical officers visit the PI and review the implementation of the Action Plan developed during FS-A1-1(Business appreciation program + **Action Plan** development), and provide necessary technical guidance/advice/recommendation ・Mainly to improve existing their milk procurement procedures and other activities for clean milk production
Method of instruction	On site review and guidance by one technical officer from NDDB t
Training site	At each PI's location
Prerequisite, if any	The participants must have completed the programme FS-A1-1

Attachment 12-2-1: Outline of JICA team proposed programmes (10/16)

ID number	FS-B1-1
Title	Dairy plant management and plant hygiene and sanitation (Basic concept & theory learning)
Objectives	The first session of Module FS-B1 will introduce the participants to the key concepts of food safety. The purpose of this session is to impart awareness in understanding food safety and hygiene, milk processing and plant operation and management, international trends in regulations such as, FSSC(Food Safety System Certification)22000, GFSI (Global Food Safety Initiative) and FSSAI, to adopt and implement these practices for improvements in every field of PIs. After completion of this module, participants will be aware of the benchmark standards for plant environments, production facilities, operational aspects and quality control, in order to carry out the necessary improvements at the production level of the plant.
Target participants	・ Plant manager ・ Section head (QA, production, etc), ・ Working level officers / technicians / plant operators (control room operator, QA officer, etc)
# of participants from one PI	4-5 participants from each PI, 3 batches for each PI
# of participants and PIs per programme batch (class size)	20-25 participants / batch 5PIs
Duration	5 days
Brief description of the module contents	Day 1: Present Dairy Scenario ・ Social responsibility as a food operator ・ Milk constituents & its physicochemical properties ・ Statutory and regulatory environment in India ・ Hygienic control of at facilities such as building, zoning, product flow line and worker's entrance system, including air shower. Day 2: Milk Processing and Plant management ・ Importance of Hygiene and Sanitation and its implementation ・ Mechanism of cleaning chemicals and CIP systems ・ Key points of cleaning including monitor and evaluation ・ Different methods and approved chemicals used for cleaning & sanitization ・ Correct system of operational conditions of milk processing, such as milk temperature control and Pasteurization ・ Hygienic design, equipment and instrument from structure and performance point of view

	Day 3: Plant visit Dairy plant visit to Banas or Amul Fed.(they have FSSC22000) Day 4:TQM and QC ・ Biofilm and Methods for checking cleaning effectiveness ・ GMP & GLP in Dairy plant ・ TQM: Implementation of Kaizen, 5'S ・ Quality & Food Safety Management System ・ Quality control techniques and practices Day 5: Wrap up/Feed Back ・ Effective Pest Control ・ International trend for food safety, GFSI, FSSC22000, EHEDG, and 3A ・ FSSC-22000 Clauses, Documentation, Implementation, Auditing & Certification ・ Open Discussion, Feedback ・ Small Test ・ Valedictory
Method of instruction	Lecture and plant visit
Training site	NDDB Training Centers
Prerequisite, if any	None

Attachment 12-2-1: Outline of JICA team proposed programmes (11/16)

ID number	FS-B1-2
Module Title	Dairy plant management and plant hygiene and sanitation
Programme Title	Practical and action plan development
Objectives	After completion of the Basic lecture programme of FS-B1-1, this practical programme will familiarize the participants on maintaining and utilizing actual machines. This workshop will aim to deliver a practical approach to the utilizing and maintaining the milk processing machines involved in the functioning of Dairy plant, from disassembly and maintenance, and to developing action plans for implementation.
Target participants	・ Plant Manager ・ Section Head (QA, Production, etc), ・ Working Level officers / technicians / plant operators (control room operator, QA officer, etc) (who completed proceeding Lecture (Programme FS-B1-1))
# of participants from one PI	・ 4-5 participants from one PI per batch, Total 3 batches per PI
# of participants and PIs per programme batch (class size)	・ 12-15 participants / batch ・ 3PIs
Duration	2-3days
Brief description of the module contents	・Using BMC, Milk Packaging Machine, Pump, Homogenizer, Separator, Pasteurizer, etc. Disassemble to understand inside mechanism (Currently many of these trainings are being done) ・Maintenance procedure for each equipment ・Study, presentation and discussion from hygienic point of view, for example using BMC, pump or valve ・Record keeping ・**Action Plan** development, this is the key of this programme.
Method of instruction	Practical Workshop
Training site	MIT, Vidya Dairy or somewhere that have actual machine
Prerequisite, if any	Completion of Basic Lecture for food safety (FS-B1-1) All participants of basic lecture
Remarks	The following 3 programmes 1), 2), and 3), will be implemented within two weeks. 1) Lecture (5days) 2) Practical training and action plan making (2-3 days) (this programme) 3) Benchmarking hygienic Plant visit in India

Attachment 12-2-1: Outline of JICA team proposed programmes (12/16)

ID number	FS-B1-3
Module Title	Dairy plant management and plant hygiene and sanitation
Programme Title	Benchmarking hygienic modern plant visit
Objectives	This visit will let participants see new or the latest plants to understand the quality benchmarks for the operation of dairy plants. Participants will understand how facilities works and operations are carried out at these plants and utilize this knowledge for future improvements.
Target participants	・ Plant Manager ・ Section Head (QA, production, etc), ・ Working Level officers / technicians / plant operators (control room operator, QA officer, etc)
# of participants from one PI	4-5 participants from one PI per batch, Total 3 batches for each PI that completed proceeding Programme FS-B1-1 and FS-B1-2ProgrammeProgramme
# of participants and PIs per programme batch (class size)	・ 12-15 participants / batch ・ 3PIs
Duration	1-2 days
Brief description of the module contents	・Exposure visit to benchmarking hygienic modern plant inside India ・Discussion what they have learned through the plan visit and for FS-B1-1,1-2, and 1-3 trainings
Method of instruction	Observation and reflective discussion, with guidance of MIT and NDDB trainer
Training site	Benchmarking hygienic modern plant. JICA survey team concerns the current hygienic situations of the visited site and suggests. the site(s) to be selected as a benchmark needs to be improved beforehand if necessary.
Prerequisite, if any	All participants who completed the programme FS-B1-1, FS-B1-2
Remarks	The following three programmes, 1), 2), and 3), will be implemented within two weeks. 1) Basic Lecture (5days) 2) Practical training and action plan making (2-3 days) 3) Hygienic modern plant visit in India (this programme)

Attachment 12-2-1: Outline of JICA team proposed programmes (13/16)

ID number	FS-B1-4@PI
Module Title	Dairy plant management and plant hygiene and sanitation
Programme Title	On-site review and guidance
Objectives	This programme is designed to be delivered after completion of the Lecture (Programme FS-B1-1) Practical and action plan development (Programme FS-B1-2) and benchmarking hygienic plant visit (Programme FS-B1-3). The purpose of this review and guidance is to: 1) review progress of their action plan developed during Programme FS-B1-2 2) facilitate the participants to apply knowledge and skills acquired through Programme FS-B1-1, FS-B1-2 and FS-B1-3 at their own PI with an objective to improve the current situation of PI.
Target participants	・Plant manager ・Section Head (QA, production, etc), ・Working level officers / technicians / plant operators (control room operator, QA officer, etc) who completed the Lecture (FS-B1-1), Practical and action plan development (FS-B1-2), and Benchmarking hygienic plant visit (FS-B1-3)
Number of participants	Around 20 participants depending on each PI
Duration	2-3days/each, 1-2 times per PI
Brief description of the module contents	・Faculty members / advisors visit PI and review the implementation of PI's **Action Plan** developed during FS-B1-2, and provide necessary technical guidance/advice/recommendation. ・Mainly to improve existing plant by utilizing knowledge and skills acquired through Lecture (FS-B1-1), Practical and action plan development (FS-B1-2), and Benchmarking hygienic plant visit (FS-B1-3) ・Cost performance for improvement existing plan will be evaluated.
Method of instruction	On site review and guidance by one person from technical officers from NDDB
Training site	Each PI's on-site
Prerequisite, if any	Completion of Lecture (FS-B1-1), Practical and action plan development (FS-B1-2) and Benchmarking hygienic plant visit (FS-B1-3).

Attachment 12-2-1: Outline of JICA team proposed programmes (14/16)

ID number	FS-B2-1
Module Title	Quality control techniques and practices for lab technicians
Programme Title	Basic concept & theory learninge/practice and action plan development
Objectives	・ This programme will enable each PIs' lab technicians to: 1) enhance the importance of quality control and increase their ability during the process of milk production; 2) know possible and accurate measurement for better milk quality; 3) develop an action plan to improve milk quality control and assurance
Target participants	・ QA section head ・ Working level officers / staff especially for lab
# of participants from one PI	3-5 participants from one PI per batch, Total 2 batches for each PI
# of participants and PIs per programme batch (class size)	15-20 participants / batch 4 PIs
Duration	5 days
Brief description of the module contents	Day 1 ・ Registration, Expectation and Program briefing ・ Milk constituents and its physicochemical properties ・ Quality assurance at all levels of dairy business (including TQM and consumer satisfaction) ・ Introduction to attributes of Quality Management Systems (QMS) and role of lab technicians ・ Sampling for Chemical and microbiological tests of milk & milk products. ・ Sampling and Chemical analysis of milk ・ Sampling and Chemical analysis of milk products Day 2 ・ Visit to CALF laboratory ・ Sampling & Microbiological analysis of milk and milk products ・ Good Laboratory Practices ・ Practical on Milk and Milk Product Testing Day 3 ・ Analysis of water and effluent ・ Analysis of packaging materials for dairy ・ Milk constituents tested at Raw Milk Reception Dock (RMRD) & Adulteration in Milk and its detection techniques - Theory and practical programme

	Day 4 ・ Calibration of milk testing equipment with hands on practice ・ Residues of pesticides and Vet drugs & other Common contaminants in milk Day 5 ・ FSS Act 2006, FSSAI Rules & Regulations ・ Somatic cells & Microbiological contaminants including aflatoxin in milk. ・ NABL accreditation for Lab ・ Action Plan development
Method of instruction	Lecture, workshop, and CALF visit
Training site	NDDB CT/QA (or MIT)
Prerequisite, if any	

Attachment 12-2-1: Outline of JICA team proposed programmes (15/16)

ID number	FS-B2-2@PI
Module Title	Quality control techniques and practices for lab technician
Programme Title	On-site review and guidance
Objectives	This on-site review and guidance will provide support to the lab technicians to realize and implement the action plan developed by themselves during FS-B2-1 and to improve the current situation within the PIs and their Labs.
Target participants	・QA Section Head ・Working Level Officers / staff especially for lab Participants must have completed Programme FS-B2-1
Number of participants	Around 10 participants depending on each PI
Duration	1-2 days / each, 1-2 times per PI (during 18months)
Brief description of the module contents	NDDB officers visit the PI and review the implementation of the Action Plan developed during the proceeding activities, and provide necessary technical guidance/advice/recommendation, mainly to improve their technique, practice, procedure and other activities to improve accuracy and as a result to assure the quality of the products.
Method of instruction	On site review and guidance by one or two technical officers from NDDB
Training site	Each PI's location
Prerequisite, if any	Completion of FS-B2-1

Attachment 12-2-1: Outline of JICA team proposed programmes (16/16)

ID number	FS-R
Programme Title	Reflection Workshop for Food Safety
Objectives	The objective of this reflection workshop is to 1) guide the participants to reflect lessons learned through the implementation of the action plans and learn from other PIs' experiences; and 2) also recognize PIs that have achieved significant improvement. Each PI makes a presentation on the actual improvement and results that they went for as reflection of Food Safety training modules and deepen mutual understanding among PIs. The interaction among PIs will enable the participants to learn from other PIs and also increase motivation for further continuous improvement. Managing Director also may attend to understand the final results. Programme.
Target participants	・Managing Director ・Plant Manager ・Section Head (Procurement and Inputs, QA, and production, etc), ・Working Level Officers who have participated in either FS-A1, FS-B1, or FS-B2. and the implementation of the action plan of their own PI
# of participants from one PI	8-10 participants from one PI
# of participants and PIs per programme batch (class size)	50-70 participants / 1 programme batch 7 PIs
Duration	1days
Brief description of the module contents	Presentation from each PI, Q&A, and Discussion Comment on results from lectures Sharing successful stories PI contributed significantly may be recognized.
Method of instruction	Presentation and Discussion
Training site	NDDB, Anand, Gujarat or any other suitable location
Prerequisite, if any	Each PI will prepare a presentation material summarizing the important achievement, experiences and lessons learned during the 18-months food safety capacity development processes before this workshop.

Attachment 12-2-2: Considerations for the detail design and implementation stage of JICA team proposed programmes

The followings would be necessary to start preparing the JICA team proposed CD programmes and it will take time. Therefore, prompt discussion and decision making among concerning stakeholders in NDDB and its execution would be crucial.

(1) For FS-A1-1, the purpose of the training from food safety and hygiene point of view, the trainers of PIs become enable to provide clean milk production training to their farmers. If the training contents focus on business appreciation program, NDDB need to confirm whether trainers of PIs have enough knowledge and capacity to teach "clean milk production" programme to farmers. If not, additional training or modified training contents focusing on clean milk production needs to be provided to those PIs. In addition, training contents which enable persons in charge at DCS to conduct proper clean and sanitation procedure of BMC as well as proper utilization of AMCU/DPMCU need to be covered.

(2) At FS-B1-2, JICA team proposes new lecture as additional content which is a study, presentation and discussion from hygienic point of view, for example using BMC, pump, valve and homogenizer. The purpose of this program is not only for participants to understand the inside machine mechanism but to increase hygienic awareness of structure through discussion and checking actual disassembled machine in front of them. To implement this content, it is desirable to discuss the issue between MIT lectures and hygiene expert of international level beforehand.

(3) At FS-B1-3, participants will see modern and hygienic plant(s) to understand the quality benchmark. Therefore, suitable benchmark plant needs to be selected carefully. JICA team already suggested candidate plant but it is not decided yet. Because benchmark plant will be helpful to further strengthen NDDB ability to design the plant, it is essential to select it among NDDB construction plants. Big plant and foreign capital plant are not suitable for this purpose. However, any plant selected as a model need to be improved beforehand hygienically, especially factory entrance system because it is very important. To modify these facilities, it is urgent to select benchmark plant, decide design for the improvement, and implement work done before participants visit, since it may take three or four months to do this work.

(4) At FS-B1-3, MIT lectures have to guide the participants at benchmark plant(s) leading discussion among them. To do this effectively, discussion with the hygiene expert of international level beforehand would be useful. Besides hygienic system, participants need to learn how facilities work and process and how daily operations are carried out to utilize these knowledges for future improvement.

Attachment 12-2-3: Outline of individual training programmes (1/14)

ID number	Comp A - 1
Programme Title	Farmers Induction programme
Objectives	• Importance of member involvement and participation of women members at the DCS level for efficient operations. • To acquire knowledge in modern dairy farm management practices • Describe proper animal breeding, feeding, health care and management of animals to enhance milk production.
Target participants	Milk producers/MCM/DCS chairpersons
# of participants from one PI	About 1400 participants from one PI
# of participants and PIs per programme batch (class size)	About 30 participants per / batch 16 PIs and about 46 batches per PI
Duration	2 days
Brief description of the module contents	Brief about Anand Pattern of dairy cooperatives and role of NDDB. Animal health and preventive measures special focus on Ethno-Veterinary Practices. Animal Nutrition and Ration Balancing programme. Fodder Production and Conservation practices. Quality assurance and Clean milk production. Role of women in dairy cooperatives. Values and principles of cooperation. Visit to Village Dairy Cooperatives to understand the functioning of VDCS, demonstration of AI and to interact with milk producer. Visit to Amul dairy and museum. Visit to Fodder demonstration unit and Visit to Cattle Feed Plant.
Method of instruction	Lecture, Field visits and interaction
Training site	NDDB training centers or any other appropriate places
Prerequisite, if any	None

Attachment 12-2-3: Outline of individual training programmes (02/14)

ID number: COMP A - 2

Title of Programme	**:**	**Awareness Programme on clean milk production for producers**
Venue	**:**	
Date	**:**	
Duration	**:**	**01 day**
Programme Coordinator	**:**	
Prog.no	**:**	
Programme objectives	Observe, understand and practice clean milk production techniques in their milk production and handling activities	
	Adopt clean milk production practices at farm and DCS level.	
	Pour good quality milk at DCS	
Focus Area	Improve raw milk quality	
	Awareness about improved animal management practices.	
Batch Size	40 - 50	
Target Participants	Members of Dairy Co-operative Society	
Suggested Review Period of training effectiveness	2-3 months post Programme	
Faculty profile	Officers with good communication skills, having experience, subject knowledge, preferably fluent in local language.	

Tentative programme schedule

No.	Description of course content
1	Dairy cooperative society and its benefits, role & responsibility of members
2	Understanding the constituents of milk & their conversion into milk pricing
3	Significance of clean milk production
4	Steps involved in clean milk production
5	Bacteria growth in milk, microbiological quality, use of SS vessels & future perspectives
6	Hygienic practices & animal health specifically discussion on Mastitis & ticks
7	Relationship between quality & income
8	Hygienic milking procedure at the producer level
9	Steps to be followed at DCS level to maintain quality of milk intact
10	Cleanliness of cowshed

Attachment 12-2-3: Outline of individual training programmes (3/14)

ID number	Comp A - 3
programme Title	Management Committee Members (MCM) Orientation Programme
Objectives	To understand their roles and responsibilities as MCMs To know the vision, mission and strategy of dairy cooperatives there as to make the business viable.
Target participants	Management Committee Members of Dairy Cooperative Society
# of participants from one PI	About 3100 participants from one PI
# of participants and PIs per programme batch (class size)	30 participants / batch 16 PIs and 102 batches per PI
Duration	3 days
Brief description of the module contents	Brief about Anand Pattern of dairy cooperatives and role of NDDB. Roles and responsibilities of MCMs Roles and responsibilities of members and secretary Byelaws & functions of DCS and source of profit for DCS Composition of milk and factors affecting the composition Clean milk production, ways to increase MBRT time and importance of decease prevention Communication and interpersonal Skills for MCMs Significance of MCM meeting and procedure to be followed Importance of conducting annual general body meeting Role of women in dairy cooperatives Participation of weaker section in dairy cooperatives Setting up long term and short term goals for DCS Visits to dairy Cooperative societies Interaction with MCMs Visit to milk unions to understand the milk processing and product making
Method of instruction	Lecture, Field visits and interaction
Training site	NDDB training centers or any other appropriate places
Prerequisite, if any	None

Attachment 12-2-3: Outline of individual training programmes (4/14)

ID number	Comp A - 4
programme Title	Board Orientation Programme
Objectives	Identify the challenges being faced by the union and formulate strategies to run their business profitably. Understand the roles and responsibilities of directors as policy makers in order to achieve the long term objectives of the union. Recognize the importance of values, good governance and professional management in an economic enterprise.
Target participants	Elected union board members including the CEO/GM/MD
# of participants from one PI	About 10 participants from one PI
# of participants and PIs per programme batch (class size)	10 participants / batch 16 PIs and 01 batch per PI
Duration	3 days
Brief description of the module contents	Brief about Anand Pattern of dairy cooperatives and role of NDDB. Roles and responsibilities of union board members Byelaws & functions of milk union Reflection on strategic thrust areas through members participation National and international milk scenario Importance of Ration Balancing Programme (RBP); Infertility Management & Calf Rearing Ethno veterinary practices to prevent diseases and to reduce anti-biotic residual in milk Fodder and crop residue in milk Attaining quality mark and understanding the regulations of FSSAI Physical and financial analysis of the milk union Business ethics & essential of cooperative governance Visits to dairy Cooperative societies and interaction with MCMs Visit to AMUL Plant III and Museum and interaction with AMUL board members Visit to Fodder demonstration union Visit to cattle feed plant Visit to IDMC Unit VI
Method of instruction	Lecture, Field visits and interaction
Training site	NDDB training centers or any other appropriate places
Prerequisite, if any	None

Attachment 12-2-3: Outline of individual training programmes (5/14)

ID number	Comp A - 5
programme Title	Business Appreciation Program for Existing Procurement and Input (P&I) staff
Objectives	• Achieve the desired key targets related to milk procurement and institutional development and facilitate member participation • Exhibit a high professional commitment and initiate for development of cooperative milk business
Target participants	Milk procurement personnel. (supervisors/extension officers/officials handling P&I activity in the union)
# of participants from one PI	About 03 participants from one PI
# of participants and PIs per programme batch (class size)	20 participants / batch 16 PIs and 03 batches
Duration	5 days
Brief description of the module contents	Brief about Anand Pattern of dairy cooperatives and role of NDDB. Challenges faced by dairy coops & strategies to overcome them, Communication & Extension in field work. Grievance Redressal and role of field supervisor in milk procurement activities. Importance of animal breeding for augmenting milk production- recent developments with emphasis on INAPH. Understanding key operational costs and its implication on producer milk price. Achievement Motivation. Role of women in dairy cooperatives and ways to promote their participation Reflection on strategic thrust areas through members participation National and international milk scenario Importance of Ration Balancing Programme (RBP); Infertility Management & Calf Rearing Ethno veterinary practices to prevent diseases and to reduce anti-biotic residual in milk Fodder and crop residue in milk Attaining quality mark and understanding the regulations of FSSAI Quality Assurance and Clean milk production Visits to dairy Cooperative societies and interaction with MCMs Visit to AMUL Plant III and Museum and interaction with AMUL board members

	Visit to Fodder demonstration union Visit to cattle feed plant Visit to IDMC Unit VI
Method of instruction	Lecture, Field visits and interaction
Training site	NDDB training centers or any other appropriate places
Prerequisite, if any	None

Attachment 12-2-3: Outline of individual training programmes (6/14)

ID number	Comp A - 6
programme Title	Basic Training for new DCS Secretaries
Objectives	• Understand the role & responsibility of DCS secretary in perspective of increasing milk procurement & development of societies • Understand & adopt clean milk collection practices and personal hygiene Describe the present scenario and developments in cooperative dairying and appreciate the need for cooperatives to be competitive.
Target participants	New DCS Secretaries
# of participants from one PI	About 280 participants from one PI
# of participants and PIs per programme batch (class size)	20 participants / batch 16 PIs and about 13 batch per PI
Duration	21 days
Brief description of the module contents	Brief about Anand Pattern of dairy cooperatives and role of NDDB. Roles and responsibilities of secretary Roles and responsibilities of MCM & Chair persons Milk & its constituents and factors affecting the composition of milk and methods to improve it. Quality assurance, clean milk production at producer and DCS level. Testing of milk, standardisation of MTE. Common adulterants used in milk and their detection. Cooperative values and principals. Cooperative societies act rule and salient features of bye-laws of DCS Conducting MCM, AGM, Special AGM, preparing agenda items, proceedings and minutes writing Records, accounts ledger & register maintained in DCS Cash book, day book writing and posting of ledger Practical's on Cashbook, ledger posting, day book writing, R&D statement, trading account, GST, P&L account and balance sheet preparation, Auditing of DCS, Net profit distribution Importance of animal breeding for augmenting milk production- recent

	developments with emphasis on INAPH. Reproductive management of dairy cows including artificial insemination and factors affecting conception rate. Function of DCS and problems in milk procurement Sources of profit in DCS and factors affecting the viability of DCS Methods of milk pricing Achievement Motivation. Role of women in dairy cooperatives and ways to promote their participation National and international milk scenario Importance of Ration Balancing Programme (RBP); Infertility Management & Calf Rearing Ethno veterinary practices to prevent diseases and to reduce anti-biotic residual in milk Fodder production and conservation practices Visits to dairy Cooperative societies and interaction with DCS secretaries Visit to AMUL Plant III and Museum and interaction with AMUL board members Visit to Fodder demonstration union Visit to cattle feed plant Visit to IDMC Unit VI
Method of instruction	Lectures, Field visits, practicals, hands on experience and interaction
Training site	NDDB training centers or any other appropriate places
Prerequisite, if any	None

Attachment 12-2-3: Outline of individual training programmes (7/14)

ID number	Comp A - 8
programme Title	Operation and Maintenance of BMC and AMCU
Objectives	To impart knowledge of operation & maintenance of AMCU and BMCU To understand the trouble shooting methods in BMC & AMCU operations To enable participants to understand importance of clean milk production & its implementation.
Target participants	BMCU operators
# of participants from one PI	About 03 participants from one PI
# of participants and PIs per programme batch (class size)	20 participants / batch 16 PIs and about 3 batches
Duration	05 days
Brief description of the module contents	Milk & its constituents and Quality aspects Clean milk production at producer and DCS level. Testing of milk, standardisation of AMCU. Calibration of EMT EMT & AMCU: O&M precautions Common adulterants used in milk and their detection. Components of BMC & their importance BMCU types, construction and specifications BMCU installation, O&M and refrigeration cycle Relevance of CMP, CIP, COP & Hygiene & Sanitation of BMCU O&M of diesel generator set Relevance of ETP for DCS Relevance of pest control for DCS BMC trouble shooting, Dos and Don'ts Practical's: Operation & Maintenance of BMC EMT & AMCU operations and report generations AMCU software Visit to Dairy Cooperative Society Interaction with BMCU in-charges Visit to Milk union
Method of instruction	Lectures, Field visits, practical's, hands on experience and interaction
Training site	NDDB training centers or any other appropriate places
Prerequisite, if any	None

Attachment 12-2-3: Outline of individual training programmes (8/14)

ID number	Comp C - 9		
Module Title	Retailer Awareness Programme		
Programme title	Programme title 1	Programme title 2	Programme title 3
	Training of Retailers in demand estimation, demographic profiling and service identification	Retailer's Knowledge sharing in demand estimation demographic profiling, identification of services and limitation in their implementation.	Sensitizing Retailers regarding importance of consumers and relationship building
Objectives	To help retailers in estimating demand in his/her area of operation. Understanding the demography and their present business position in their locality.	Knowledge sharing by retailers in calculating demand and its practical use. Understanding if the retailers are aware of the demographic profile of his/her locality and demographic based services required.	Retailer's usage of the basic marketing tools in their daily business activities. Grasped the demographic profile of their locality and the various services being provided by competition according to demographic needs. Difficulties being faced in using the basic marketing tools and their solution
Target participants	Retailers associated with dairy milk union/milk federation		
# of participants from one PI	About 200 participants from one PI		
# of participants and PIs per programme batch (class size)	30 participants / batch 16 PIs and about 7 batch per PI		
Duration	3 hrs	3 hrs	3 hrs

Brief description of the module contents	Conducting simple survey of their local area/free milk sampling, Estimating potential /demand of milk and milk products of the surrounding locality, Identification of potential residential areas for demand generation of surrounding locality, Demographic based services required, Understanding competitors activities and services provided by them in the locality. Elaborating mathematically, the mutual growth model based on the above Analyzing and understanding of local demography,	Knowledge and experience sharing about the progress made by retailers. Understanding as to how abled and experienced the retailers have become in using the marketing tools taught to them. Retailers understanding of the importance of consumers and the services sought by them. Local competition and services being provided by them. General awareness about the locality from where they are operating. Difficulties faced, solution and discussing mathematically, the mutual growth model achieved.	Important facts of customer service, Responsibilities of a retailer, Communicating with a customer, Understanding what customer want, Common customer queries and how to deal with it. . Elaborating mathematically, the mutual growth model achieved.
Method of instruction	Lectures		
Training site	PI or any other appropriate places		
Prerequisite, if any	None		

Attachment 12–2–3: Outline NDDB planned programmes (9/14)

Particular	Details
ID number	Comp D - 10
Programme Title	Training on Automatic Milk Collection Software at Union level
Programme Objectives	• Operate the AMCS efficiently • Train the Village level functionaries on the software • Generate report, analyze and use it for decision making
Target Participants	Participating Institution (PI) officials engaged in milk procurement activities and Management Information System
# of participants from one PI	About 20 participants from one PI
# of participants and PIs per programme batch (class size)	20 participants / batch 15 PIs and about 15 batches
Duration	3 days
Brief description of course content	Understanding of the software structure, Milk billing, DCS organisation, Accounting, Core Operations of Milk Business and Inventory Management, Report Generation & Analysis and Decision Making using the data
Method of instruction	Lectures and practical's
Training site	PIs or any other appropriate places
Prerequisite, if any	None

Attachment 12–2–3: Outline NDDB planned programmes (10/14)

Particular	Details
ID number	Comp D - 11
Programme Title	Training on Automatic Milk Collection Software at DCS level
Programme Objectives	• Operate the AMCS efficiently • Generate data and provide relevant information to the milk union • Provide information to Management Committee Members for business decision
Target Participants	Participating Institution (PI) officials engaged in milk procurement activities and Management Information System
# of participants from one PI	About 125 participants from one PI
# of participants and PIs per programme batch (class size)	15 PIs and about 4 batches per PI (spread over 4 months)
Duration	3 days
Brief description of course content	Understanding of the software structure, milk billing, DCS organisation, Accounting, Core Operations of Milk Business, Inventory Management, Report Generation
Method of instruction	Lectures and practical's
Training site	PIs or any other appropriate places
Prerequisite, if any	None

Attachment 12–2–3: Outline NDDB planned programmes (11/14)

Particular	Details
ID number	Comp E - 12
Programme Title	Training of Animal Nutrition Officer (ANO) and Animal Nutrition Supervisor (ANS) on Animal Nutrition
Programme Objectives	To orient the participants on Animal Nutrition - to acquire knowledge of scientific animal feeding & management at different stages for improving productivity and reproduction efficiency.
Target Participants	ANOs and ANSs
# of participants from one PI	About 9 participants from one PI
# of participants and PIs per programme batch (Class Size)	20 participants/ batch 16 PIs and about 2-3 batches per PI
Duration	05 days.
Brief description of course content	Basic aspects of Animal Nutrition; Chemical composition of feeds and fodder; Nutrients requirement for different categories of animals; Significance of area specific mineral mixture, bypass protein and bypass fat supplements. Crop residues management; Importance of green fodder for dairy animals. Quality control and safety aspects in cattle feed production. Introduction on CRP/RBP; Brief on INAPH software and its deployment; Demonstration of CRP/RBP software through laptops/net books; Roles & responsibilities of manpower. Practice on software. Field visits and demonstration of AN activities.
Method of instruction	Lectures, Demonstrations and Practical's
Training site	NDDB centres or any other appropriate places
Prerequisite, if any	None

Attachment 12–2–3: Outline NDDB planned programmes (12/14)

Particular	Details
ID number	Comp E - 13
Programme Title	Training of Calf Rearing Programme Supervisors on Calf Rearing Programme (CRP).
Programme objectives	To orient the participants on implementation of CRP and to acquire basic knowledge of feeding and management of dairy animals and calves.
Target participants	CRP Supervisors.
# of participants from one PI	About 03 participants per PI
# of participants and PIs per programme	20 participants / batch 16 PIs and about 2 batches per PI
Duration	02 days
Brief description of course content	Class room session: Importance of calf rearing in relation to inducting new animal induction, including its economics. Basic aspects of feeding and management of animals; Significance of feeding at advanced stage of pregnancy and calf management; Significance of area specific mineral mixture, bypass protein and fat supplements for enhancing productivity; Importance of feeding green fodder to animals. Brief introduction on CRP; Demonstration of CRP software; Roles & responsibilities of CRPSs. Practice on CRP software. Field demonstrations: Demonstration of ear tagging, measurement of body weight, feeds and fodder etc.; demonstration of CRP at farmers' doorstep; Demonstration of data capturing; Discussions on the difficulties faced during CRP implementation in field and likely the solution.
Method of instruction	Class room sessions & field demonstrations.
Training Site	NDDB training centres or any other appropriate places
Prerequisite, if any	None

Attachment 12–2–3: Outline NDDB planned programmes (13/14)

Particular	Details
ID number	Comp E - 14
Programme Title	Training on Milch animal rearing for dairy farmers
Programme objectives	To orient the participants on improved animal husbandry practices.
Target participants	Dairy farmers.
# of participants from one PI	About 40 participants from one PI
# of participants and PIs per programme batch (class size)	25 participants/batch 16 PIs and about 2-3 batches per PI
Duration	15 Days
Brief description of course content	Class room session: Importance of dairying, dairying as a livelihood, Basic aspects of feeding and management of animals; Significance of feeding at advanced stage of pregnancy and calf management; Significance of area specific mineral mixture, bypass protein and fat supplements for enhancing productivity; Importance of feeding green fodder to animals. Role of AI, Clean milk production, Ethno-veterinary medicines, animal housing, use of information technology Nurturing Entrepreneurial traits, Preparing business plan, economics of dairy unit, significance in record keeping, risk management. Field visits/demonstrations: milk union/DCS/cattle feed plant/dairy farm
Method of instruction	Lectures & field demonstrations.
Training site	NDDB or any other appropriate places
Prerequisite, if any	None

Attachment 12–2–3: Outline NDDB planned programmes (14/14)

Particular	Details
ID number	Comp E - 15
Programme Title	Training on Advances in Fodder Production, Conservation and its management practices
Programme objectives	Providing advance knowledge and practical training on green fodder cultivation and conservation in villages.Implementation of DCS based low cost commercial silage making and extension activities.Introduction machinery and crop residue management Skill development of trainee in extension activities and carry out village level development programmes Data collection from farmers and handling and reporting Procurement and maintenance of farm machineries
Target participants	Fodder development officer and his supporting field officers/staff
# of participants from one PI	About 18 participants from one PI
# of participants from one PIs per programme batch (Class room size)	25 participants / batch 16 PIs and about 12 batches
Duration	05 days
Brief description of course content	Agronomy of forage crop cultivation. Fertiliser Management in Fodder production. Integrated Weed and Pest management in Forage production Resource conservation technology in forage production DCS commercial silage production Grassland and pasture management (Gochar Land Development) Planning for year round green fodder availability. Silage. Farm machineries handling and maintenance. Use of machinery and crop residue management. Organic farming Field visit on Practical forage production & conservation and storage at village level Management of extension activities at MTC and village level. Procurement of inputs, IT and reporting.
Method of instruction	Lectures and Demonstrations
Training site	NDDB training centres or any other appropriate places
Prerequisite, if any	None

Attachment 12-2-4: Outline of trainings in Japan (01/04)

ID number	BM-JP-ToT
Module Title	Training in Japan for Strategic Planning and TQM
Programme Title	For trainers
Objectives	To let NDDB trainers who will be trainers of capacity development training modules such as BM-1 and/or BM-2: 1)comprehend a variety of concepts and practices useful to transform dairy cooperative institutions' business processes through the introduction of the strategic management based on the demand- and quality-oriented value chain management and Total Quality Management(*); and 2) reflect what can be applicable to the training modules to be provided at NDDB and their working environment in India. (*)Total Quality Management is a management approach centered on quality, based on the participation of all its members and aiming at long term success through customer satisfaction and benefits to all members of the organization and society.
Target participants	➢ FOR TRAINERS of NDDB, who will conduct BM-1 and/or BM-2 training modules to federations, milk unions and producer companies ➢
Number of participants	20-24 participants
Duration	10 days (14 days including travelling days)
Brief description of the module contents	Day 1: - Orientation - Leadership and business management - How to measure productivity and performance to create competitive advantage. - How to bring down cost per unit and encourage innovation - How to inculcate performance culture in employees ➢ Policy support ➢ Monetary and non-monetary reward system ➢ Penalty clauses ➢ How to bring in attitude and behavioral changes in individuals ➢ Successful model and how it was brought in ➢ Case studies and discussions - Core concept of TQM (1) and concept of Quality Assurance - Core concept of TAM (2) and implementation of Quality Assurance - Group discussion Day 2: - Concept of TQM: Kaizen - Concept of TQM: Management - Group discussion Day 3 - TQM Vehicles: QC circle - Plant visit: QC circle implemented plant Day 4: - TQM Vehicles: Daily Management - TQM Vehicles: Hoshin-Kanri (Policy deployment) - Concept of TQM: Quality - Concept of TQM: overview of TQM

	Day5 - TQM Vehicles: Daily Management - TQM Vehicles: Hoshin-Kanri (Policy deployment) - Concept of TQM: Quality - Concept of TQM: overview of TQM Day 6: - Plant Visit 1: Good practice of Quality Assurance Day 7: - Plant Visit 2: Good practice of TQM implementation - Plant Visit 3: Good practice of TQM implementation Day 8: - How to implement TQM - Preparation of Final Report Day 9: - Plant Visit4: Good practice of TQM implementation Day 10: - Presentation of Final Report - Wrap-up programme (To reflect what participants learned from this module and consider what can be applicable to the training modules to be provided at NDDB and their working environment in India.) -
Method of instruction	Lecture, Plant visits and on the job training
Training site	Japan
Prerequisite, if any	- Trainers of BM-1 or BM-2 who will train and coach the PIs - English fluency
Post training review and follow up method	➢ After the training, the trainers will introduce the concept learned in Japan to BM-1 and/or BM-2and conduct BM-1 and/or BM-2 as instructors to the PIs.

Attachment 12-2–4: Outline of trainings in Japan (02/04)

ID number	BM-JP-PIs
Module Title	Training in Japan for Strategic Planning and TQM
Program Title	For PIs and trainers
Objectives	To let the participants: 1) comprehend a variety of concepts and practices useful to transform dairy cooperative institutions' business processes through the introduction of the strategic management based on the demand-oriented and quality-oriented value chain management and Total Quality Management(*); and 2) reflect what can be applicable to (the training modules to be provided at NDDB and) their working environment in India. (*) Total Quality Management is a management approach centered on quality, based on the participation of all its members and aiming at long term success through customer satisfaction and benefits to all members of the organization and society.
Target participants	➢ FOR FEDERATION / MILK UNION / PRODUCER COMPANY - Managing Director - Other key persons in the institution ➢ The participants will be selected from the PIs who had a good performance during BM-1 and BM-2.
Number of participants	2-3 participants / PI * multiple PIs (*) = 20-24 participants (*) PIs that show high performance as the results of the process from BM-1-1 to BM-1-3 will be selected.
Duration	➢ 10 days (14 days including travelling days) / Programme
Brief description of the module contents	Day 1: - Orientation - Leadership and business management - How to measure productivity and performance to create competitive advantage. - How to bring down cost per unit and encourage innovation - How to inculcate performance culture in employees ➢ Policy support ➢ Monetary and non-monetary reward system ➢ Penalty clauses ➢ How to bring in attitude and behavioral changes in individuals ➢ Successful model and how it was brought in ➢ Case studies and discussions - Core concept of TQM (1) and concept of Quality Assurance - Core concept of TAM (2) and implementation of Quality Assurance - Group discussion Day 2: - Concept of TQM: Kaizen - Concept of TQM: Management - Group discussion Day 3 - TQM Vehicles: QC circle - Plant visit: QC circle implemented plant

	Day 4: - TQM Vehicles: Dayly Management - TQM Vehicles: Hoshin-Kanri (Policy deployment) - Concept of TQM: Quality - Concept of TQM: overview of TQM Day5 - TQM Vehicles: Dayly Management - TQM Vehicles: Hoshin-Kanri (Policy deployment) - Concept of TQM: Quality - Concept of TQM: overview of TQM Day 6: - Plant Visit 1: Good practice of Quality Assurance Day 7: - Plant Visit 2: Good practice of TQM implementation - Plant Visit 3: Good practice of TQM implementation Day 8: - How to implement TQM - Preparation of Final Report Day 9: - Plant Visit4: Good practice of TQM implementation Day 10: - Presentation of Final Report - Wrap-up programmeprogramme (To reflect what participants learned from this module and consider what can be applicable to the training modules to be provided at NDDB and their working environment in India.) -
Method of instruction	Lecture, Plant visits and on the job training
Training site	Japan
Prerequisite, if any	- Trainers of TQM who will train and coach the federation, milk union and producer companies to introduce TQM. - More than 1 years' experience of practical experiences or faculty/instructor experiences in quality control and quality management. - Undergraduate degree or similar degree. - Good physical and mental condition - English fluency - PIs that received assistance at least 1 Component from Comp A, B, or C - PIs that completed Module BM-1and BM-2 - Employees of the above PIs who have a degree or diploma in MBA, BBA, Diary Technology, Engineering, or Veterinary Science and at least 3 years working experience in dairy sector. - Or trainers, if required. - English fluency

Attachment 12-2-4: Outline of trainings in Japan (03/04)

ID number	FS-JP-ToT
Module Title	Training in Japan for food safety
Programme Title	For trainers
Objectives	・The objective of this module is to let NDDB trainers to: 1) observe food safety related actual practices in dairy sector in Japan and understand how they work; 2) understand global trend, dairy plant hygienic design, management and its operation, and role of dairy cooperatives and quality control in Japan; 3) consider what can be applied to the training modules to be provided at NDDB and their working environment in India; and 4) At advanced lecture, it is helpful for implementation to deeply understand its principle theoretically and practically, and to ensure the safety of these issues in a variety of method. Then introduce these technologies currently being used now in Japan, if possible, on site in dairy plant.
Target participants	・ Trainers from NDDB who will be trainers of capacity development training of FS-A1, FS-B1 and/or FS-B2
Number of participants	Approximately 15 - 20 participants
Duration	2.5 weeks
Brief description of the module contents	Contents of FS-JP-ToT and FS- JP-PIs are different at lectures and those for FS-JP-ToT focuses on advanced contents.<Tokyo> 1) Program orientation and Ministry of Agriculture Lecture on dairy sector in Japan (0.5 day) 2) Lecture on Japanese dairy situation and global trend (0.5 day) ・Start-up programme, the purpose of this programme ・Lecture on global trend of Hygiene and Food Safety and how Japan make hygiene and food safety realize. 3) Advanced Lecture on hygienic design, operation and management (2 days, day1) ・New plant engineering, equipment and process ・How to run the plant, such as production schedule and CIP ・Dairy plant hygienic standard, such as environment, zooning, product flow, worker's flow ・Law of raw milk and accessible materials for food contact ・Principle of the technology of cleaning technology

	・Flow characteristics, key point for cleaning, explanation of using some numerical formulas, (this may be slightly difficult) ・Key cleaning measures of the product that is hard to clean ・ ・This is a lecture course but needs to be suitable for practical issues on dairy plant. (Saturday and Sunday: 2days) (retailer visit) <Tokyo cont…> 4) Advanced Lecture on hygienic design, operation and management (2 days, day2) Heat transfer theory ・Principle of the technology of heat pasteurization and/or sterilization in detail ・Many kinds of various sterilizers, Non-heating sterilization ・Introduction of the technology that is helpful but not used in India at this moment such as Low Acid Water and Microbubble, Cavitation for the new cleaning technology, Joule heating for the new sterilization technology ・Steam direct heating (Infusion and Injection method) ・Measures to TAB (Thermophilic acidophilic bacteria) ・Filtration, MF, UF, NF, RO ・Texture Control of Dairy Product ・Computational Fluid Dynamics (Tank Agitation, Injection, etc.) ・This is a lecture course but needs to be suitable for practical issues on dairy plant. 5) Plant visit (if possible 3 days) ・Introduction ・Worker's preparation to enter, inlet and outlet system, and actual working style ・How to manage the factory, supervise production (plant operation for 1day) ・Quality check items, methods and equipment (quality check for 1day) ・Maintenance and its schedule, tools of plant equipment without disturbing production schedule (maintenance for 1day) ・How to inspect packed products such as contamination of foreign matter and heavy metal, and check of printing expiration date ・Effluent ・How to deal with behavior change

	<Tokyo or Nagano > 6) Visit another milk company or dairy related companies (e..g Orion Machineries) (1 day) (Saturday and Sunday: 2days) <Hokkaido> 7) Role of dairy cooperatives and quality control visiting to Hokkaido (2days) ・3 level of dairy cooperative in Japan: Visit dairy cooperatives and grasp role of dairy cooperative in Japan ・Yotsuba dairy: dairy companies owned by cooperatives 8) Milk testing laboratory at Tokachi Federation of Agricultural Cooperatives (1day) ・How to prevent quality accident and/or trouble ・QC system (including price incentive system) and new measuring devices, checking items and frequency, including for antibiotics detection system 9) Animal Health, Breeding at National Livestock Breeding Center at Tokachi 1day) ・Outline of organization ・Brief of animal health and breeding improvement 10) Field visit and wrap up (1day) ・Cattle feed plant ・Dairy farm ・To reflect what participants learned from this module and consider what can be applicable to the training modules to be provided at NDDB and their working environment in India. (Saturday: leave from Japan)
Method of instruction	Training and on-site visit
Training site	Japan
Prerequisite, if any	Trainers of NDDB
Post training review and follow up method	➢ After the training, trainers will conduct FS-A1, FS-B1, and / or FS-B2 modules according to their expertise.

Remarks	**Necessary considerations for contagion of animal related disease when the participants are planned to visit dairy farms in Japan.** Foot-and-mouth disease (FMD) is a highly contagious and highly transmitted disease. If it is brought into Japan where FMD is free country recognized by the World Organization for Animal Health, OIE, it would bring tremendous negative impact to livestock and dairy industry in Japan. Thus, it would be highly appreciated if the participants give thoughtful attention and take necessary measurements including the following actions and others to be requested by the farms where the participants will visit in order to avoid contagion of FMD and other animal related disease. i) Before coming to Japan, do not visit any places where livestock exist such as livestock farm, veterinary hospital and livestock related research center for at least 2 weeks, preferably 4 weeks or more. ii) Do not bringing any livestock products without official permission to Japan. It is strictly prohibited in Japan. iii) Please prepare new shoes when you visit Japan. iv) Bring new clothes or clothes used laundry or cleaning service before traveling. When washing, washing with oxygen bleach is recommended. v) Simple disinfect of your bags, glasses, belts etc before you come to Japan is recommended. vi) After arriving Japan, do not approach unnecessarily to livestock and livestock-related facilities unless there is a special arrangement or permission. Please be aware of the fact that even if all of these are carried out, it is not possible to completely prevent the introduction of FMD and other animal related disease.

Attachment 12-2-4: Outline of trainings in Japan (04/04)

ID number	FS-JP-PIs
Module Title	Training in Japan for Food Safety
Modula Title	For PIs and trainers
Objectives	・The objective of this module is to let PIs and NDDB trainers to: 1) observe food safety related actual practices in dairy sector in Japan and understand how they work; 2) understand global trend, dairy plant operation and management, and role of dairy cooperatives and quality control in Japan; 3) consider what can be applied to the training modules to be provided at NDDB and their working environment in India; and 4) At basic lecture, it is helpful for implementation to deeply understand its principle theoretically and practically, and to ensure the safety of these issues in a variety of method. Then introduce these technologies currently being used now in Japan, if possible, on site in dairy plant.
Target participants	・ PI staff/officers such as ・ Plant Manager ・ Section Head (procurement and inputs, QA, production, etc), ・ Working Level Officers /technician / plant operators (QA, production, etc), ・ If required, Trainers from NDDB (e.g. QC, CT, CS, Engineering Group, and MIT) who will be trainers of capacity development training of FS-A1, FS-B1, and/or FS-B2 but did not join FS-JP-ToT.
Number of participants	Approximately 15 - 20 participants
Brief description of the module contents	Contents of FS-JPToT and FS-JP-PIs are different and some lectures of FS-JP-PIs focuses on basic contents.<Tokyo> 1) Program orientation and Ministry of Agriculture Lecture on dairy sector in Japan (0.5 day) 2) Lecture on Japanese dairy situation and global trend (0.5 day) ・Start-up programme, the purpose of this programme ・Lecture on global trend of Hygiene and Food Safety and how Japan make hygiene and food safety realize. 3) Basic Lecture on hygienic operation and management (2 days, day1) ・New plant equipment and process ・How to run the plant, such as production schedule and CIP ・Dairy plant hygienic standard, such as environment, zooning, product flow, worker's flow

	・Law of raw milk and accessible materials for food contact ・Basic principle of the technology of cleaning technology ・Outline of flow characteristics, key point for cleaning ・Outline of cleaning measures of the product that is hard to clean ・ ・This is a lecture course but needs to be suitable for practical issues on dairy plant. (Saturday and Sunday: 2days) (retailer visit) <Tokyo cont…> 4) Basic Lecture on hygienic operation and management (2 days, day2) ・ Basic principle of the technology of heat pasteurization and/or sterilization ・Introduction of various sterilizers, Non-heating sterilization ・Introduction of the technology that is helpful but not used in India at this moment such as Low Acid Water and Microbubble, Cavitation for the new cleaning technology, Joule heating for the new sterilization technology ・Steam direct heating (Infusion and Injection method) ・Measures to TAB (Thermophilic acidophilic bacteria) ・Filtration, MF, UF, NF, RO ・Texture Control of Dairy Product ・This is a lecture course but needs to be suitable for practical issues on dairy plant. 5) Plant visit (if possible 3 days) ・Introduction ・Worker's preparation to enter, inlet and outlet system, and actual working style ・How to manage the factory, supervise production (plant operation for 1day) ・Quality check items, methods and equipment (quality check for 1day) ・Maintenance and its schedule, tools of plant equipment without disturbing production schedule (maintenance for 1day) ・How to inspect packed products such as contamination of foreign matter and heavy metal, and check of printing expiration date ・Effluent ・How to deal with behavior change <Tokyo or Nagano > 6) Visit another milk company or dairy related companies (e..g Orion

	Machineries) (1 day) (Saturday and Sunday: 2days) <Hokkaido> 7) Role of dairy cooperatives and quality control visiting to Hokkaido (2days) ・3 level of dairy cooperative in Japan: Visit dairy cooperatives and grasp role of dairy cooperative in Japan ・Yotsuba dairy: dairy companies owned by cooperatives 8) Milk testing laboratory at Tokachi Federation of Agricultural Cooperatives (1day) ・How to prevent quality accident and/or trouble ・QC system (including price incentive system) and new measuring devices, checking items and frequency, including for antibiotics detection system 9) Animal Health, Breeding at National Livestock Breeding Center at Tokachi 1day) ・Outline of organization ・Brief of animal health and breeding improvement 10) Field visit and wrap up (1day) ・Cattle feed plant ・Dairy farm ・To reflect what participants learned from this module and consider what can be applicable to the training modules to be provided at NDDB and their working environment in India. ・(Saturday: leave from Japan)
Method of instruction	Training and on-site visit
Training site	Japan
Prerequisite, if any	・ PIs that will avail Comp B1 or B2 or A ・ Completion of Module FS-B1 (or Module FS-A1, Module FS-B2) ・ or Trainers of NDDB, if required ・ Person having a degree or diploma in Dairy technology, engineering, Agriculture, Veterinary Science and at least 3 years working experience in dairy sector

Remarks	**Necessary considerations for contagion of animal related disease when the participants are planned to visit dairy farms in Japan.** Foot-and-mouth disease (FMD) is a highly contagious and highly transmitted disease. If it is brought into Japan where FMD is free country recognized by the World Organization for Animal Health, OIE, it would bring tremendous negative impact to livestock and dairy industry in Japan. Thus, it would be highly appreciated if the participants give thoughtful attention and take necessary measurements including the following actions and others to be requested by the farms where the participants will visit in order to avoid contagion of FMD and other animal related disease. i) Before coming to Japan, do not visit any places where livestock exist such as livestock farm, veterinary hospital and livestock related research center for at least 2 weeks, preferably 4 weeks or more. ii) Do not bringing any livestock products without official permission to Japan. It is strictly prohibited in Japan. iii) Please prepare new shoes when you visit Japan. iv) Bring new clothes or clothes used laundry or cleaning service before traveling. When washing, washing with oxygen bleach is recommended. v) Simple disinfect of your bags, glasses, belts etc before you come to Japan is recommended. vi) After arriving Japan, do not approach unnecessarily to livestock and livestock-related facilities unless there is a special arrangement or permission. Please be aware of the fact that even if all of these are carried out, it is not possible to completely prevent the introduction of FMD and other animal related disease.

Attachment 13-1-1:

Proposal of Assignment of Professionals for PIs under JICA project

Introduction:

To implement the business management capacity development for the JICA Project's participating institutions (PIs), the following principles are proposed: (1) Introduction of market-oriented business strategy, and (2) Practical and field-oriented capacity development. It is important for PIs to actually "implement" their own business and marketing strategy developed through the capacity development modules consisting of not only lectures, but also practical and field-oriented support. It is also important to assure that the dairy cooperatives are infused with fresh inputs and ideas.

In a bid to catalyse and rewrite the 'change' story and trigger actions that would lead to positive outcomes, it is proposed to assign capable professionals under JICA project to take a lead in steering the processes of Business Management & Strategic planning, Market Research and Quality Management (5S, Kaizen, TQM) at each milk unions (PIs). Professionals assigned to this scheme will take forward the objectives envisaged under JICA project with new ideas and innovations at Participating Institution level for a duration of two years.

Objective:

To support the implementation of action plans of the PIs in the field of marketing and strategic planning, and quality management, by assigning two professionals of respective expertise to work in each participating institution during approx. 2 years of the capacity development period.

Proposed Plan:

- Assignment of 2 professionals: Two professionals in the fields of Marketing and Strategic Management, and Quality Assurance for each PIs over a period of 2 years, upon their request.
- Milk unions availing at component B and C under the project may avail for the assignment of the Professional in the respective milk unions.
- The assignment of 2 professionals will be optional, depending on needs and demands of each PIs. The PIs could also apply for one or two professionals upon their request, although the expertise of the professionals will be limited to these two areas.

- The assignment of 2 professionals are designed mostly for district dairy cooperatives, but other PIs such as Milk Producer Companies and Federations could also apply to professional induction upon their request.

Implementation Strategy:

To make this scheme more attractive for talented professionals, different strategies of implementation can be thought of. It may consist of:

- 2 professionals are to be inducted per PI covered under JICA project, who will look after functional domains (Marketing and Strategic planning, and Quality Management) of milk unions. Functional domains will be decided as per need and future plan of milk unions.
- Professionals will be reporting to MD of posted milk union throughout the tenure.

Salient features of the Scheme:

Eligibility Criteria

The eligibility criteria for selection as a Professional shall be the following:

Essential criteria:

- At the minimum a graduate/post graduate from a recognized university/institute, in the area of business management, marketing or quality assurance, or a post-graduate from a recognized University/ Institute (in case of a graduate holding degree of a course duration of three years or less). Those with degree from universities outside India that are recognised by Association of Indian Universities can also apply. Only those candidates who have completed all requirements and received degree are eligible to apply.
- At least 2 year's working experiences in the respective field.
- At least 60% marks in the aggregate at the graduate or Post-graduate level, whichever is qualifying. While entering details of marks in the online application form, candidates having scores as grade points should convert them to corresponding percentages by referring to the conversion table provided by their college/ university.

Desirable criteria:

- Knowledge of local language and customs.
- Work experience as a researcher, consultant or adviser.
- Excellence in extra-curricular activities like art, culture, sports etc. at High School/College level.

Tenure of the professionals

Professionals will be recruited for 2 years by the project. The contract could be extendable by the contract with the milk union, based on their performance.

Orientation training:

The selected professionals are provided with 30 days Orientation training at NDDB and other educational institutions as required, which includes theoretic, field exposures and hand on practices at identified milk unions. Post the orientation; these professionals are then placed at selected milk unions with the assigned task. They will be monitored and guided by NDDB and milk unions.

Role of professionals:

- The main roles of the professionals will be as follows:

Field of the Assigned Professional	Main Roles of the Professional
Marketing and Strategic Planning	• Participate to BM-1-1 and BM-1-2@PI. • Support the formulation of business strategy and action plans with PI's officials. • Support effective way of communication top-down, bottom-up, among colleagues, and between different departments. • Support the implementation of each action plans. • Support the Plan-do-check cycle of the strategy and action plans (BM-1-3). • Support the formulation of marketing strategy and action plans with PI's officials. • Support the formulation of marketing research during BM-2-2 and afterwards. • Support the process to formulate and implement action plans by making the most of the result of the marketing research. • Support changes in empowerment and motivation of employees through marketing related activities. • Support the Plan-do-check cycle of the strategy and action plans. • Submit monthly progress report on PI's Business Management and Strategic Planning to NDDB
Quality Management	• Attend the lecture on "Quality-driven strategic management" with PI officials. • Support PI to set quality-driven strategic management through Hoshin-kanri or Policy Management.

	• Support PI to introduce 5S and Kaizen in the production site and working place. • Support PI to create QC circles and promote the workplace culture development. • Support changes in empowerment and motivation of employees through QC circles, 5S and Kaizen activities. • Support coordination among different departments to achieve the common strategy • Support effective way of communication top-down, bottom-up, among colleagues, and between different departments. • Submit monthly progress report on PI's Business Management and Strategic Planning to NDDB.

Measurable Output:

- Number of sustainable and implementable solutions provided during the tenure with milk union.
- Quantifiable increase in the specific areas of assignment such as marketing, procurement, quality.
- Implementation of 5S, Kaizen and TQM (Total Quality Management) practices at milk union.

Sustainability of the Programme

- After successful completion of their two years tenure, some unions may absorb the professionals.
- Milk unions benefit by introducing professionals in the area of business management, marketing or quality assurance after experiencing activities during the project implementation.

Attachment 14-1-1: Detailed schedule of all JICA team proposed CD programmes

				2018	2019												2020												2021												2022												2023					
				Q4	Q1			Q2			Q3			Q4			Q1			Q2			Q3			Q4			Q1			Q2			Q3			Q4			Q1			Q2			Q3			Q4			Q1			Q2		
			Month		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6
			Months of subproject implementation after the sanction						1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49
Comoponent G																																																										
Program ID		Duration(days)	Gr and batch																																																							
BM-1	-1	4	Group1 batch1																																																						
			Group1 batch2																																																						
			Group1 batch3																																																						
			Group2 batch1																																																						
			Group2 batch2																																																						
			Group2 batch3																																																						
			Group3 batch1																																																						
			Group3 batch2																																																						
			Group3 batch3																																																						
			Group4 batch1																																																						
			Group4 batch2																																																						
			Group4 batch3																																																						
			Group5 batch1																																																						
			Group5 batch2																																																						
			Group5 batch3																																																						
			Group6 batch1																																																						
			Group6 batch2																																																						
			Group6 batch3																																																						
BM-1	-2@PI	2	Group1																																																						
			Group2																																																						
			Group3																																																						
			Group4																																																						
			Group5																																																						
			Group6																																																						
BM-2	-1	5	Group1 batch1																																																					
			Group1 batch2																																																						
			Group1 batch3																																																						
			Group2 batch1																																																						
			Group2 batch2																																																						
			Group2 batch3																																																						
			Group3 batch1																																																						
			Group3 batch2																																																						
			Group3 batch3																																																						
			Group4 batch1																																																						
			Group4 batch2																																																						
			Group4 batch3																																																						
			Group5 batch1																																																						
			Group5 batch2																																																						
			Group5 batch3																																																						
			Group6 batch1																																																						
			Group6 batch2																																																						
			Group6 batch3																																																						
Marketing Research			Group1																																																						
			Group2																																																						
			Group3																																																						
			Group4																																																						
			Group5																																																						
			Group6																																																						
BM-2	-2@PI	1	Group1																																																					
			Group2																																																						
			Group3																																																						
			Group4																																																						
			Group5																																																						
			Group6																																																						
BM1	-3@PI (PI with marketing research)	2	Group1																																																					
			Group2																																																						
			Group3																																																						
			Group4																																																						
			Group5																																																						
			Group6																																																						

				2018	2019												2020												2021												2022												2023						
				Q4	Q1			Q2			Q3			Q4			Q1			Q2			Q3			Q4			Q1			Q2			Q3			Q4			Q1			Q2			Q3			Q4			Q1			Q2		
			Month		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6
			Months of subproject implementation after the sanction						1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49
BM1	-3@PI (PI without marketing research)	2	Group1																																																							
			Group2																																																					
			Group3																																																					
			Group4																																																					
			Group5																																																					
			Group6																																																					
BM	-R	1	Group1																																																					
			Group2																																																					
			Group3																																																					
			Group4																																																					
			Group5																																																					
			Group6																																																					
FS-A1	-1	5	Group1 batch1																																																				
			Group1 batch2																																																					
			Group1 batch3																																																				
			Group2 batch1																																																				
			Group2 batch2																																																				
			Group2 batch3																																																				
			Group3 batch1																																																				
			Group3 batch2																																																				
			Group3 batch3																																																				
			Group4 batch1																																																				
			Group4 batch2																																																				
			Group4 batch3																																																				
			Group5 batch1																																																				
			Group5 batch2																																																				
			Group5 batch3																																																				
			Group6 batch1																																																				
			Group6 batch2																																																				
			Group6 batch3																																																				
FS-A1	-2@PI	5	Group1																																																					
			Group2																																																					
			Group3																																																					
			Group4																																																					
			Group5																																																					
			Group6																																																					
FS-A1	-3@PI	2	Group1																																																				
			Group2																																																					
			Group3																																																					
			Group4																																																					
			Group5																																																					
			Group6																																																					
FS-B1	-1	5	Group1 batch1																																																				
			Group1 batch2																																																					
			Group1 batch3																																																					
			Group2 batch1																																																					
			Group2 batch2																																																					
			Group2 batch3																																																					
			Group3 batch1																																																					
			Group3 batch2																																																					
			Group3 batch3																																																					
			Group4 batch1																																																					
			Group4 batch2																																																					
			Group4 batch3																																																					
			Group5 batch1																																																					
			Group5 batch2																																																					
			Group5 batch3																																																					
			Group6 batch1																																																					
			Group6 batch2																																																					
			Group6 batch3																																																					

				2018	2019												2020												2021												2022												2023					
				Q4	Q1			Q2			Q3			Q4			Q1			Q2			Q3			Q4			Q1			Q2			Q3			Q4			Q1			Q2			Q3			Q4			Q1			Q2		
			Month		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6
			Months of subproject implementation after the sanction							1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49
FS-B1	-2&-3	5	Group1 batch1							■																																																
			Group1 batch2								■																																															
			Group1 batch3									■																																														
			Group1 batch4										■																																													
			Group1 batch5											■																																												
			Group2 batch1												■																																											
			Group2 batch2													■																																										
			Group2 batch3														■																																									
			Group2 batch4															■																																								
			Group2 batch5																■																																							
			Group3 batch1																	■																																						
			Group3 batch2																		■																																					
			Group3 batch3																			■																																				
			Group3 batch4																				■																																			
			Group3 batch5																					■																																		
			Group4 batch1																											■																												
			Group4 batch2																												■																											
			Group4 batch3																													■																										
			Group4 batch4																														■																									
			Group4 batch5																															■																								
			Group5 batch1																																■																							
			Group5 batch2																																	■																						
			Group5 batch3																																		■																					
			Group5 batch4																																			■																				
			Group5 batch5																																				■																			
			Group6 batch1																																					■																		
			Group6 batch2																																						■																	
			Group6 batch3																																							■																
			Group6 batch4																																								■															
			Group6 batch5																																									■														
FS-B2	-1	5	Group1 batch1								■																																															
			Group1 batch2										■																																													
			Group1 batch1													■																																										
			Group1 batch2															■																																								
			Group1 batch1																		■																																					
			Group1 batch2																				■																																			
			Group1 batch1																												■																											
			Group1 batch2																														■																									
			Group1 batch1																																	■																						
			Group1 batch2																																			■																				
			Group1 batch1																																						■																	
			Group1 batch2																																								■															
FS-B1	-4@PI	3	Group1																	●					●																																	
			Group2																					●					●																												
			Group3																									●					●																							
			Group4																																																								
			Group5																																																								
			Group6																																																								
FS-B2	-2@PI	2	Group1																	●					●																																	
			Group2																					●					●																												
			Group3																									●					●																							
			Group4																																				●					●														
			Group5																																									●					●								
			Group6																																														●					●			
FS	-R	1	Group1																								■																															
			Group2																													■																										
			Group3																																		■																					
			Group4																																												■											
			Group5																																																■						
			Group6																																																					■	
BM-JP	-ToT	2weeks																	■																																							
BM-JP	-PI																														■																				■				
FS-JP	-ToT	2.5weeks																	■																																							
FS-JP	-PI																														■																				■				

Orange cell indicates that the programmes are carried out at PI or any other appropriate places

Attachment 14-1-2: Schedule of JICA team proposedCD programmes for one PI participating in all JICA team proposed CD programmes

				2019												2020												2021												2022		
				Q1			Q2			Q3			Q4			Q1			Q2			Q3			Q4			Q1			Q2			Q3			Q4			Q1		
Month				1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
Months of subproject implementation after the sanction									1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
Sensitization			Implementation																																							
Appraisal and sanction																																										
Comoponent G (Business Management and Food Safety)																																										
BM-1		-1	1st batch																																							
			2nd batch																																							
			3rd batch																																							
		-2@PI																																								
BM-2		-1	1st batch																																							
			2nd batch																																							
			3rd batch																																							
Marketing Research																																										
BM-2		-2@PI																																								
BM1		-3@PI (PI with marketing research)																																								
BM1		-3@PI (PI without marketing research)																																								
BM		-R																																								
FS-A1		-1	1st batch																																							
			2nd batch																																							
			3rd batch																																							
		-2@PI																																								
		-3@PI																																								
FS-B1		-1	1st batch																																							
			2nd batch																																							
			3rd batch																																							
		-2&-3	1st batch																																							
			2nd batch																																							
			3rd batch																																							
		-4@PI																																								
FS-B2		-1	1st batch																																							
			2nd batch																																							
		-2@PI																																								
FS		-R																																								

Orange cell indicates that the programmes are carried out at PI or any other appropriate places

Attachment 15-3-1: Estimated fund required to implement JICA proposed training programmes (1/2)

For Trainings conducted Off-Site (at NDDB or similar training centers)

Module Title	ID	Programme Title	Duration per Session (Days) (days)	No. of PIs covered	Participants per PI per Session	Batches per PI	No. of Participants per Session batch (Class Size)	Total participants per PI	No. of PIs per Session	Total No. of Session batches	Mandays	Training days	NDDB	External Resource	Participants Training cost off-site (NDDB)					External Instructors Training cost off-site (NDDB)			Total Cost INR
													Instructor 1	Instructor 2	Lodging	Boarding	Training Kit	Local travel	Transport	Honorarium	Lodging	Transport	
BM1-Business Management & Strategic Planning	BM-1-1	Lecture	4	30	5	3	25	15	5	18	1800	72		3	514,800	900,000	1,800,000	693,000	3,600,000	2,160,000	432,000	1,080,000	11,179,800
	BM-1-R	Reflection workshop	1	30	10	1	70	10	7	5	300	5		1	85,800	150,000	300,000	115,500	2,400,000	50,000	10,000	100,000	3,211,300
BM2-Marketing Management	BM-2-1	Lecture	5	30	5	3	25	15	5	18	2250	90		3	643,500	1,125,000	2,250,000	866,250	3,600,000	2,700,000	540,000	1,080,000	12,804,750
FS A1-Clean Milk Production and Milk Quality Management at Village level	FS-A1-1	Business Appreciation Program and Action Plan development	5	30	6	3	25	18	5	18	2700	90		0	772,200	1,350,000	2,700,000	1,039,500	4,320,000	0	0	0	10,181,700
FS B1-Dairy Plant Management, Plant hygiene and Sanitation	FS-B1-1	Basic Lecture	5	30	5	3	25	15	5	18	2250	90		2	643,500	1,125,000	2,250,000	866,250	3,600,000	1,800,000	360,000	720,000	11,364,750
	FS-B1-2	Dairy plant management and plant hygiene-practical	3	30	5	3	15	15	3	30	1350	90		1	386,100	675,000	1,350,000	519,750	3,600,000	900,000	180,000	600,000	8,210,850
	FS-B1-3	Plant visit	2	30	5	3	15	15	3	30	900	60		1	257,400	450,000	900,000	720,000	3,600,000	600,000	120,000	600,000	7,247,400
FS-R Reflection Workshop	FS-R	Reflection workshop	1	30	10	1	70	10	7	5	300	5		1	85,800	150,000	300,000	115,500	2,400,000	50,000	10,000	100,000	3,211,300
FS B2-QC technique and practices for lab technician	FS-B2-1	Lecture/Practical and Action Plan Development	5	30	5	2	20	10	4	15	1500	75		1	429,000	750,000	1,500,000	577,500	2,400,000	750,000	150,000	300,000	6,856,500
Grand Total			**31**	**270**	**56**	**22**	**290**	**123**	**44**	**157**	**13350**	**577**	**0**	**13**	**3,818,100**	**6,675,000**	**13,350,000**	**5,513,250**	**29,520,000**	**9,010,000**	**1,802,000**	**4,580,000**	**74,268,350**

As the PIs to be awarded for the sub-project have not been determined, the numbers in this table are tentatively set for the purpose of examining the fund requirment. For example, a total participants per PI may vary according to the size, in other words, the total number of employees, of the PI awarded for the sub-project.

Foot Note

No. of PIs per session= Total number of participants per session/ Participants (from each PI)
To determine the no. of PI that can be accomodated per session

No. of Sessions = No. of PIs x Batches x No. of PIs per batch
To determine the number of sessions to be conducted to cover the total trainings for the Pis

Mandays = Duration x PIs x No. of Batches x No. of Participants

To determine the total participants mandays for conducting the training

Training days= No. of Sessions x Duration (Days)
No. of days the trainers will be conducting trainings

Off-site (Trainings conducted at the NDDB)
Lodging, boarding and Local Travel for trainings conducted at NDDB as per the Fees prescribed by CT team, NDDB
As the number of Internal instructors for the NDDB doesnot affect the costing in this sheet, therefore it is kept blank for now

Unit Cost for trainings Off-site		
Lodging charges	286	Participants
Boarding Charges	500	
Training kit	1,000	
Local travel	385	
Local travel for FS-B1-3 (Plant Visit)	800	
Participants transport (round-trip)	8,000	
Transport (round-trip)	20,000	Instructors
Honorarium (per day) instructor 2 external resources	10,000	
Lodging instructor 2 external resources	2,000	

Equivalent	USD	1081053.2
	JPY	120314727

Attachment 15-3-1: Estimated fund required to implement JICA proposed training programmes (2/2)

For Trainings conducted On-Site (at PI or nearby venue)

Module	ID	Programme Title	Duration per Session (Days) (days)	No. of PIs covered	Total participants per PI	No. of Visits at PI	Total No. of Sessions	Mandays	Training days	NDDB	External Resource	Training cost on-site (PI)				Total Cost INR
												Participants	Instructors			
										Instructor 1	Instructor 2	Cost (*)	Honorarium	Lodging	Transport	
BM1-Business Management & Strategic Planning	BM-1-2@PI	On-Site Business Strategy and Action plan development (On-site)	2	30	30	1	30	1800	60	2	3	3,600,000	1,800,000	2,100,000	3,000,000	10,500,000
	BM-1-3@PI	On-site review and guidance (On-site)	2	30	30	2	60	3600	120	1	1	7,200,000	1,200,000	1,680,000	2,400,000	12,480,000
BM2-Marketing Management	BM-2-2@PI	On-site guidance for ultilization of marketing research (On-site)	1	30	7	1	30	210	30	1	1	420,000	300,000	420,000	1,200,000	2,340,000
FS A1-Clean Milk Production and Milk Quality Management at Village level	FS-A1-2@PI	Training by trainers to milk producers (On-site) <<Cost Estimation included in NDDB Proposed Programmes>>		30			0	0	0				0	0	0	
	FS-A1-3@PI	On site review and guidance (On-site)	2	30	15	2	60	1800	120	1	1	3,600,000	1,200,000	1,680,000	2,400,000	8,880,000
FS B1-Dairy Plant Management, Plant hygiene and Sanitation	FS-B1-4@PI	On site review and guidance (On-site)	3	20	20	2	40	2400	120	1	1	4,800,000	1,200,000	1,680,000	1,600,000	9,280,000
FS B2-QC technique and practices for lab technician	FS-B2-2@PI	On-site review and guidance (On-site)	2	20	10	2	40	800	80	1	1	1,600,000	800,000	1,120,000	1,600,000	5,120,000
Grand Total			**12**	**190**	**112**	**10**	**260**	**10610**	**530**	**7**	**8**	**21,220,000**	**6,500,000**	**8,680,000**	**12,200,000**	**48,600,000**

As the PIs to be awarded for the sub-project have not been determined, the numbers in this table are tentatively set for the purpose of examining the fund requirment. For example, a total participants per PI and the number of instructors may vary according to the size, in other words, the total number of employees, of the PI awarded for the sub-project. The level and quality of external resources may also vary according to the capacity of the PI awarded for the sub-project.

Foot Note

No. of Sessions = No. of PIs x No. of Visits

To determine the number of sessions to be conducted to cover the total requirement of trainings for the PIs

Mandays = Duration x PIs x No. of Batches x No. of Participants

To determine the total participants mandays required for conducting the training

Training days= No. of Sessions x Duration (Days)

No. of days the trainers will be conducting trainings

On-site (Trainings conducted at PI location)

Honorarium for external instructors calculated based on the training costing details provided by the CT Team for external trainings

Transport for Instructors calculated based on the approximate cost to travel the distance of the furthest PI from NDDB

For external resources: **General** refers to external instructors from institutions like IRMA etc.

Cost (*) Cost for participants for venue, training materials and snacks at PI location

Unit Cost for trainings On-site		
Fees per student/day	2,000	
Transport for Instructor (round-trip)	20,000	
Honorarium (per day) External instructor 2	10,000	**on-site**
Lodging instructor 1 (NDDB)	7,000	
Lodging External instructor 2	7,000	

Equivalent		
	USD	**707,424**
	JPY	**78,732,000**

Attachment 15-4-1: Provisional cost estimation for trainings in Japan

Trainings in Japan : Outsourced as one package

	Unit Cost in JPY	INR Equivalent	No. of Times	INR Equivalent	JPY
BM training (24 participants, 13nights 14days)	9,700,000	5,987,654	3	17,962,963	29,100,000
FS training (20 participants, 19nights 20days)	13,200,000	8,148,148	3	24,444,444	39,600,000
Total				42,407,407	68,700,000

Transportation and miscellaneous for participants

	Unit cost in INR	No. of nights	No. of Participants	No. of Times	INR	JPY Equivalent
International Flight round-trip DEL-TYO per participant	60,000		44	3	7,920,000	
Domestic flight cost round-trip per participant	20,000		44	3	2,640,000	
DA $50 for BM(13nights) 24 participants	3,435	13	24	3	3,215,160	5,208,559
DA $50 for FS(19 nights) 20 participants	3,435	19	20	3	3,915,900	6,343,758
Total					17,691,060	28,659,517

USD 50 = INR 3435

	INR	JPY
Trainings in Japan + Transportation and miscellaneous for participants	60,098,467	97,359,517