Model scheme on Automatic Milk Collection Stations

A. Introduction:

India is endowed with the largest livestock population in the world. It accounts for about 57.3 per cent of the world's buffalo population and 14.7 per cent of the cattle population. Indian dairy industry is the major contributor to the country's economy surpassing rice in amount. The value of output of milk is Rs. 3,05,484 crore in 2011-12. The total milk production in the country is 127.9 million tonnes per annum at the end of the Eleventh Plan (2011-12) and the demand is expected to be 180 million tonnes by 2020. In 1970 under the aegis of NDDB, "Operation Flood" programme was launched to modernize the dairy sector and flood the 4 metro cities with milk from dairy cooperatives. By the end of 1996-97, 74,383 village milk producers cooperatives were organised in 264 districts with an average rural milk procurement of 12.26 million liters per day. Another step was taken in 1989, to augment rural income by launching Technology Mission on Dairy Development (TMDD), which aims at applying modern technology to improve productivity, reduce costs of operation and thus ensure greater availability of milk and dairy products.

With the liberalization of the Indian economy in 1991, the dairy sector was also delicensed. On June 9, 1992 GOI issued a Milk and Milk Products Order (MMPO), which was later modified in the year 2002, according to which the dairy units needs to obtain permissions with respect to sanitary and hygienic aspects only. With the introduction of Food Safety and Standards (licensing and Registration of Food Business) Regulations, 2011 with effect from 05 August 2011 all the food processing units including the Dairy processing units comes under the purview of the act. Even though India is the highest milk producing country, productivity per animal is very poor. The organized dairy sector (both cooperatives and private) is presently handling only 24-28 percent of total milk production in the country. Thus leaving a wide scope for enhancing the procurement, processing of milk and manufacture of milk products for domestic consumption as well as exports. The quality of milk collected is also poor which is acting as the main deterring factor in preparation/marketing of different value added products. Even today many parts of the country are not covered with organized milk procurement and at times the milk is procured only once a day.

Having made significant strides in production and processing, it is the time to upgrade the quality of milk by increasing the efficiency of procurement as well as the testing of milk for

quality. In India the milk pricing is based on the fat percentage and to some extent Solid Not Fat (SNF) in milk. The determination of fat is based on the butyrometer method which is one of the oldest technology adopted by the Milk Collection Centres/Milk Cooperative Societies. Since 1980's many of the societies have been using Milk o testers for testing the fat percentage in milk as this is a rapid method compared to former one. Of late Milk Collection Centres/Cooperative Societies are installing Automatic Milk Collection Stations (AMCUs) (PC based milk collection stations, smart automatic milk collection stations and automatic milk collection stations) which measure the weight of milk, fat contents and gives a print out of payment slip to farmers in each shift. The systems also facilitates storing 10 days/monthly/yearly data and printing of cumulative summary of shift as and when needed. The state of art equipment is able to perform 120 to 150 operations in an hour. The milk analyser replaced the milk o testers.

B. Objectives:

financial assistance is extended for purchase of various equipments in the Automatic Milk Collection Stations with the following objectives.

1. To increase the efficiency and accuracy of fat testing in milk. To test for other constituents of milk like SNF%, Water % etc,.
2. To reduce the staff of the society/collection centre through automation and economise the operations by avoiding manual registers.
3. To gain confidence of milk producers through transparent systems and thereby increasing the milk procurement.

C. Potential areas: Many of the milk processing plants in cooperative as well as private sector introduced the Automatic Milk Collection Stations in their procurement network. These stations can be financed in most of the societies/milk collection centres where daily milk procurement is more than 350 litres.

D. Beneficiaries: These units can be established by the Milk Cooperative Societies of the Cooperative Milk Union or Milk Collection Centre of private dairies. Alternatively individuals also can be encouraged to set up these stations in tie up with organized dairies.

E. Project Details:

1. **Components:** Automatic Milk Collection Station is a specially designed integrated unit which is a combination of several units i.e. automatic Milk Weighing System, Electronic Milk Testing, Personal Computer with printer and battery for data processing and providing the output. The procurement centres handling higher quantities of milk can go for modern systems wherein automatic milk analyser can be used in place of milk testing equipment, (provides Fat%, SNF%, water % etc). These higher procuring agencies can also go for web based data management where in the farmer wise data from the AMCU will be sent to server and the payment details will be sent to the bank directly by the milk processing plant. The AMCUs can be made to use dairy to bank concept where farmer's bill amount is directly deposited in its bank account and even without going in bank, he/ she can withdraw money as per requirement directly from Milk collection center. Some of the model AMCUs are shown in the figure below.

Figure 1. Various Components of AMCUs

2. **Capacity:** The capacity of Automatic Milk Collection Stations is to analyse 120 to 150 samples per hour. Based on the equipments used, parameters will be varying.

3. **Specifications:** The machinery used should be as per BIS specifications and the broad parameters measured are as under:

a) Fat measurements : 0 - 13% b) Measuring capacity : 120 to 150 operations per hour. c) Power supply : AC 220 to 240 watts 5O HZ.

In case of milk analysers, in addition to fat content, SNF content from 3 to 15 % and water content as well as other parameters also will be measured. .

4. **Equipment suppliers**: The equipment are being supplied by various agencies which are as follows: IDMC, Ananad, Gujarat, DSK Milkotronics, Pune, Maharashtra, Kamadhenu, Ahmedabad, Gujarat DODIA Himmatnagar, Gujarat PROMPT Baroda, Gujarat, OPTEL Anand, Gujarat, CAPITAL Electronics Anand, Gujarat, REIL Jaipur, Rajashtan. The list is only indicative and suitable systems can be purchased from any of the reputed agencies.

5. **Functioning:** Each milk pouring farmer will be given with a unique number /card by the Collection Centre in consultation with Milk Processing unit . When the farmer comes for pouring milk his number or card will be used for identity. After feeding the number, the sample will be collected for analysis. Simultaneously his milk will be poured into the container where it is weighed automatically and based on the fat content and quantum of milk poured the rate will be calculated and payment slip is printed. If a milk analyser is used other parameters of milk also will be analysed and based on these parameters and quantity of milk the rate will be calculated and displayed. Som manufacturers had come up with mobile Milk Collection Units which can be fitted on the vehicle and milk can be procured from different locations.

F. Advantages of AMCUs:

1. Saving in quantity of sample milk
2. Saving of chemicals and detergents
3. Saving of expenditure on glassware
4. Saving in stationery and time
5. Saving in expenditure on staff.
6. Gaining confidence of milk producers through transparent system and increased milk procurement.

G. Technical Collaboration:

Since the unit is an integrated unit, no technical collaboration is envisaged for the project, however the Milk Unions/Private Dairy Plants would be providing guidance to the societies/collection centres in purchase and installation of Automatic Milk Collection Stations and also training of manpower in operations and maintenance. In case of individual AMCUs necessary arrangements should be made with the suppliers for after sales service.

H. Capital Cost:

The capital cost varies with the specifications and also the manufacturers. However, based on the information furnished by the manufacturers and also as observed in the field , an average unit cost of Rs.1.25 lakh including the cost of battery has been considered.

I. Economics of the project

It is assumed that AMCU will come up in the existing building of the collection centre and hence civil costs were not considered for the AMCUs. Based on the various techno economic parameters furnished in Annexure I, the economics of the project has been worked out and presented in Annexure II. The items of income include saving in expenditure on staff, stationery, chemicals and detergents and glassware and also income from saving of sample milk, while the items of expenditure are consumables, repairs and maintenance of the Automatic Milk Collection Stations.

J. Financial Analysis:

The cash flow analysis covering the Benefit Cost Ratio (BCR) Net Present Worth (NPW) and Internal Rate of Return (IRR) has been worked out for the project and presented in Annexure III. For the model under consideration, the BCR is 1.41:1 NPW is Rs. 76800 and IRR is 49%. The entire bank loan can be repayable in seven years without any grace period. Hence repayment has been fixed at 7 years for the model project. (Annexure IV)

K. Financial assistance:

Automatic Milk Collection Stations would be considered for refinance support by National Bank. Therefore all participating banks may consider financing this activity subject to their technical feasibility, financial viability and bankability.

L. Lending Terms:

1.Margin Money: The Milk Cooperative society or Milk collection centre should normally meet 25% of the project cost out of their own resources.

2.Interest rate: Interest rate will be as determined by the financing bank. However for working out the economics interest rate is considered at 13.5% pa..

Security: As stipulated by the RBI.

Insurance: The financing bank may ensure that the milk society/Collection centre takes adequate insurance cover for the asset.

Repayment period: Depends upon the gross surplus generated, it may be upto 7 years without any grace period.

M. Special terms and conditions:

The special terms and conditions of the project are given in Annexure V**.**

Annexure - I

Unit Cost and Technoeconomic parameters

S.No.	Particulars	Amount in Rs.
A.	**Unit Cost, Bank loan & Margin Money**	
i)	Cost of Automatic Milk Collection Unit (Rs.)	125000
ii)	Margin Money (Rs.)	31250
iii)	Bank loan (Rs.)	93750
B.	**Income Parameters**	
i)	Volume of milk procured (lts/day)	400
ii)	No. of milk samples / day	200
iii)	Quantity of Sample Milk Saved (ml per sample)	10
iv)	Sale of sample milk @ 10ml/sample (lts/month)	60
v)	Sale price of sample milk (Rs./litre)	24
vi)	Savings in expenditure on staff (Rs./month)	2500
vii)	Saving in stationery (Rs. / month)	250
viii)	Saving in expenditure on glassware (@ Rs./sample/day)	0.05
ix)	Saving on chemicals & detergents	. 0.1
C.	**Expenditure parameters**	
i)	Repairs & Maintenance (Rs./month)	1500

D.	**Others**	
i)	Depreciation on AMCU (%)	15
ii)	Interest rate (%)	13.5
iii)	Repayment period (years)	7

ANNEXURE - II

Income and Expenditure - Automatic Milk Collection Stations

(Rs. in Lakhs)

Sr.	Particulars	Years						
		I	II	III	IV	V	VI	VII
1	Volume of Milk Procurement (litres/day)	400	400	400	400	400	400	400
2	No. of Milk Samples per day	200	200	200	200	200	200	200
3	Quantity of Sample Milk Saved (litres/day)	2	2	2	2	2	2	2
A	INCOME							
i)	Sale of Sample Milk	0.1752	0.1752	0.1752	0.1752	0.1752	0.1752	0.1752
ii)	Savings in Expenditure on Staff	0.3	0.3	0.3	0.3	0.3	0.3	0.3
iii)	Savings in stationary	0.03	0.03	0.03	0.03	0.03	0.03	0.03
iv)	Savings in Expenditure on Glassware	0.0365	0.0365	0.0365	0.0365	0.0365	0.0365	0.0365
v)	Savings on Chemicals and detergents	0.073	0.073	0.073	0.073	0.073	0.073	0.073
	Total Income (A)	0.6147	0.6147	0.6147	0.6147	0.6147	0.6147	0.6147
B	EXPENDITURE							
i)	Repairs and Maintenance	0.18	0.18	0.18	0.18	0.18	0.18	0.18

	Total Expenditure (B)	0.18	0.18	0.18	0.18	0.18	0.18	0.18
C	GROSS SURPLUS (A-B)	0.4347	0.4347	0.4347	0.4347	0.4347	0.4347	0.4347

ANNEXURE - III

Financial Analysis - BCR, NPW and IRR

(Rs. in Lakhs)

Sr.No	Particulars	Years						
		I	II	III	IV	V	VI	VII
1	Capital Cost	1.25						
2	Recurring Cost	0.18	0.18	0.18	0.18	0.18	0.18	0.18
3	Total Cost	1.43	0.18	0.18	0.18	0.18	0.18	0.18
4	Benefits	0.6147	0.6147	0.6147	0.6147	0.6147	0.6147	0.6147
5	Depreciated Value of AMCS	0	0	0	0	0	0	0.125
6	Total Benefits	0.6147	0.6147	0.6147	0.6147	0.6147	0.6147	0.7397
7	Net Benefits	-0.8153	0.4347	0.4347	0.4347	0.4347	0.4347	0.5597
8	DF @ 15%	0.87	0.756	0.658	0.572	0.497	0.432	0.376
9	PWC @ 15% DF	1.2441	0.13608	0.11844	0.10296	0.08946	0.07776	0.06768
10	PWB @ 15% DF	0.534789	0.464713	0.404473	0.351608	0.305506	0.26555	0.2781272
11	**NPW @ 15% DF**	**0.76828**						
12	**BCR @ 15% DF**	**1.41:1**						
13	**IRR**	**49%**						

ANNEXURE - IV

Repayment Schedule - automatic Milk Collection Stations

(Rs. in Lakhs)

Year	Bank Loan Oustanding		Gross Surplus	Payment of Interest @ 13.5% p.a.	Repayment of Principal	Total Outgo	Net available to the society collection center	DSCR
	At the beginning of the year	At the end of the year						

I	0.9375	0.8175	0.4347	0.126563	0.12	0.246	0.188	1.763
II	0.8175	0.6975	0.4347	0.110363	0.12	0.214	0.141	1.66
III	0.6975	0.5775	0.4347	0.094163	0.12	0.208	0.147	1.708
IV	0.5775	0.4275	0.4347	0.077963	0.15	0.191	0.164	1.86
V	0.4275	0.2775	0.4347	0.057713	0.15	0.205	0.15	1.733
VI	0.2775	0.1275	0.4347	0.037463	0.15	0.184	0.171	1.93
VII	0.1275	0	0.4347	0.017213	0.1275	0.173	0.182	2.053

Average DSCR is 1.81

ANNEXURE V

Special terms and conditions

The bank should ensure that:-

1. The Milk Union/Dairy will identify the milk societies/collection centres whose milk collection is above 400 litres per day for financing Automatic Milk Collection Stations.
2. The Union/Dairy will guide the society/collection centre for the purchase and installation of Automatic Milk Collection unit.
3. The Milk Union/Dairy will train the secretary/worker of the Milk Cooperative Society/Collection Centre in the operation and maintenance of the Automatic Milk Collection Unit
4. The Union/Dairy will arrange to supply the required stationery and diluents to the milk cooperative society/collection centre.
5. The Milk Society/Collection Centre will enter into an annual service contract with the supplying firm from second year onwards.
6. The milk society/collection centre will insure the Automatic Milk Collection Station with the insurance companies, provided the insurance coverage is available.
7. The Union/Dairy will provide tie up arrangement for the repayment of bank loan.