

Financial viability of establishing Automatic Milk collection Station Method (AMCUS) for the enhancement of productivity and modernization of Dairy sector: a Case study in Barpeta District Milk Cooperative of Assam

Siddharth Nayan Sharma

Assistant Professor, Department of Commerce

Gauhati University, Guwahati, Assam, India

Abstract-Though India is the largest producer of dairy products but still there is an enormous possibility for augmenting the procurement, processing and production of dairy products for domestic as well as export consumption. In many areas of our country, dairy sector has not been covered with systematically organized optimum milk procurement and processing. Poor quality of the milk collected is also a crucial factor in manufacturing and marketing of different quality dairy products. Hence it is very important for dairy cooperatives to improve the quality of milk and other dairy products by escalating the effectiveness of procurement and testing of milk. Application of up to date technology to increase productivity, reduce cost of production and producing quality products can immensely bring remarkable growth in dairy sector. One of such technological application is the installation of Automatic Milk Collection Stations (AMCUs) which is a computer based milk collection platform that measures the weight and fat contents of the milk procured to ensure the quality standard. In this study researcher mainly examines the financial aspects of such investments to create a standard AMCU in a milk cooperative. Study reveals the viability of such investment based on some select project appraisal variables.

Keywords: Dairy sector, Technological intervention, Automatic Milk Collection Stations, Financial viability, Productivity.

I. INTRODUCTION

India is an agrarian country. In this economy, agriculture and its allied activities have been playing a significant role in terms of livelihood generation. During 2018-19, agriculture and allied sector constituted 14.3% of India's total GVA (Gross Value Addition). Out of different allied activities of agriculture, the animal husbandry sector creates multiple employment opportunities to small as well as marginal farmers who are generally engaged in seasonal farming activities. It has been playing a key role in ensuring the food security of the most vulnerable component of India's population. Indian Livestock sector with its number one position in milk production contributes to the country's economy in a significant manner by way of providing employment opportunities to the seasonally employed farming community. Indian dairy industry is the major contributor to the country's economy surpassing rice in amount. India continued to be the largest milk producing nation with milk Production of 163693670 tonnes

during 2016-17. Several actions have been taken by the Government of India to boost the productivity of dairy sector, which has resulted in escalating the milk productivity significantly. In Assam also, agriculture and allied sector creates employment of more than 50% of the total workforce and support more than 75% population of the state directly or indirectly. Rural population of Assam is almost 85.9% which is higher than national average rural population share of 68.8%. Like in other parts of the country, dairy sector of Assam also has an important share in creating livelihood for a major part of rural population. Therefore it is very important to take measure in some focus areas for the development of dairy sector in Assam. One of such important measure is to create systematic improvement in procurement, processing and distribution of milk aiming at economic upliftment of rural milk produces.

2.1. *Significance of the study*- Every technological up gradation comes up with a cost of investment. Installation of Automatic Milk Collection Stations (AMCUs) is a capital expenditure since it is assumed that such a technological up gradation will create returns for a long period of time. Hence it is very important to understand the cost- benefit aspects of such capital expenditure. In this study researcher mainly examines the financial aspects of such investments to create a standard AMCU in a milk cooperative. Study reveals the viability of such investment based on some select project appraisal variables.

2.2. *Objective of the Study*-

Objective of the study is to examine the financial viability of establishing a standard Automatic Milk Collection Stations in a dairy cooperative.

2.3 *Research Methodology*-

This is a descriptive analytical study based on some secondary financial data. In order to examine the financial viability of investment to develop an AMCS system in a dairy cooperative, researcher has considered Barpeta District Milk Cooperative of Assam as a sample. Financial data are collected from their record keeping books and analyzed based on some select parameters i.e., cost of bank loans, income parameters, expenditure parameters, income-expenditure statement, financial analysis tools like Net Present Value (NPV) , Benefit to Cost Ratio (BCR), and Internal Rate of Return (IRR). Since the investment is of capital in nature, popular methods of capital budgeting like BCR, NPV and IRR are adopted.

2.4. *About Automatic Milk Collection Station Method (AMCUS)*-

Large dairy cooperatives that deal in higher quantities of milk should use modern technology in various processes of milk procurement, their testing and record keeping. Automatic Milk Collection System is an integrated computerized system of milk testing, milk weighing, and electronic medium of storing data. It enables electronic data processing and output. This Automatic Milk Collection system enables web based data management where data can be stored for each milk producer. Computer system prepares transaction details of each farmer and processed the payment details electronically. It can further send the payment details to the bank for direct credit into farmer's bank account. This technology based system enables removal of unnecessary intermediary and executes a faster completion of the whole process. This computer based automatic milk procurement method creates multifold benefits like reduction in the use chemicals, detergent, stationary etc. It also reduces the expenditure related to manpower. This automatic computerized integrated process reduces the wastage of sample milk and creates confidence among the farmers through transparent and efficient milk procurement and payment system.

III. ANALYSIS AND FINDINGS

3.1. Feasibility analysis:

In order to know the feasibility of a capital expenditure decision, the rational estimation of possible cost of investment and their future benefits are very crucial. Cost of investment of installing an Automatic Milk Collection Station may differ with the specifications and requirement of the users. However, in order to conduct the study, based on the available record of the Barpeta Milk Cooperative, researcher has rationally fixed the following parameters related to the techno economic conditions of the investment. A statement of standardized techno economic parameters is shown in Table 1.

Table 1: Statement of Techno-Economic Parameter

SL No.	Particulars	Amount (Rs.)
a.	Cost of Investment, Required Margin Money and Loan amount	
1	Cost of Automatic Milk Collection Unit (Rs.)	125000
2	Amount of Margin Money (Rs.)	31250
3	Amount of Bank Loan (Rs.)	93750
b.	Parameters related to Income	
1	Per Day collection of Milk in liters	400
2	Per Day Milk samples	200
3	Volume of Sample milk saved in quantity (milliliter per sample)	10
4	Sale of milk sample @ 10 ml/sample (liters per month)	60
5	Selling price of sample milk (Rs. per liter)	24
6	Savings in expenses on staff and other employees (Rs. per month)	2500
7	Savings in cost of stationary (Rs. per month)	250
8	Savings in expenses on glassware (Rs. per sample per day)	0.05
9	Savings on detergent, cleaning and other (Rs.)	0.1
c.	Parameters related to expenditure	
1	Expenses on repairs and maintenance (Rs. per month)	1500
d.	Others	
1	Rate of Depreciation (percentage)	15
2	Rate of Interest on bank loan (percentage)	13.5
3	Loan repayment period in Years	7

Source: Author's self compilation from the records of Barpeta District Milk Cooperative, Assam

Finding: It is observed in Table 1 that, the initial cost of investment is Rs 125000 for the establishment of Automatic Milk collection Station Method (AMCUS). Bank loan is 75% of initial investment i.e., Rs. 93750 at an interest of 13.5% with a standard loan repayment period of 7 years. The total bank loan can be repaid in 7 years with no grace time. Therefore the repayment is predetermined at 7 years for the model task. Bank loans for Automatic Milk collection Station Method (AMCUS) is refinanced by NABARD under DEEDS (Dairy Enterprise Development Scheme). Such projects are eligible for back ended capital subsidy of government. Remaining amount of initial investment, 25% of Rs. 125000= Rs. 31250 is margin money required in case of bank loan. Since it is a capital expenditure there is a maintenance expense of Rs 1500 per month. Depreciation is charged at 15% on written down value of the capital expenditure. If income parameters are studied, it is seen that there are savings in case of expenses related to staff and other employees, stationary, glassware, detergent, cleaning etc.

Financing of a capital expenditure decision is based on future income. Hence it is important to calculate the surplus/deficit of each year from 1st year to 7th year. Following table shows the statement of income and expenditure related to the capital expenditure for the installation of Automatic Milk Collection Station.

Table 2: Statement of Income and Expenditure (Rupees in Lakh)

SL No	Particulars	Year-1	Year-2	Year-3	Year-4	Year-5	Year-6	Year-7
i	Per Day collection of Milk in liters	400	400	400	400	400	400	400
ii	Per Day Milk samples	200	200	200	200	200	200	200
iii	Volume of Sample milk saved in quantity (milliliter per sample)	2	2	2	2	2	2	2
A	Particulars of Income							
i	Sale of milk sample	0.18	0.175	0.175	0.175	0.175	0.175	0.175
ii	Savings in expenses on staff and other employees	0.3	0.3	0.3	0.3	0.3	0.3	0.3
iii	Savings in cost of stationary	0.03	0.03	0.03	0.03	0.03	0.03	0.03
iv	Savings in expenses on glassware	0.037	0.037	0.037	0.037	0.037	0.037	0.037
v	Savings on detergent, cleaning and other	0.073	0.073	0.073	0.073	0.073	0.073	0.073
	Total Income (A)	0.615	0.615	0.615	0.615	0.615	0.615	0.615
B	Particulars of Expenses							
i	Expenses on repairs and maintenance	0.18	0.18	0.18	0.18	0.18	0.18	0.18
	Total Expenses (B)	0.18	0.18	0.18	0.18	0.18	0.18	0.18
C	Total Surplus(A-B)	0.435	0.435	0.435	0.435	0.435	0.435	0.435

Source: Author's self compilation from the records of Barpeta District Milk Cooperative, Assam

Finding: Table 2 shows that there are incomes or savings in different aspects because of installation of Automatic Milk collection Station Method. Saving in expenditure like wages salary of employees and other staff is estimated to be Rs. 30000. There will be savings in the cost of manual testing of milk. Due to the application of technology accurate and quick testing of milk will be possible that will reduce the cost of manpower. Since whole testing method will be computerized that brings savings in the cost of various stationary. Savings in stationary expenses is Rs. 3000. In case of manual testing there are requirement of different types of glass pots and glassware to store the milk during the process of testing. But in case of Automatic Milk collection Station Method, there is no such huge requirement of glassware, which in turn brings savings in the cost. This savings in cost of glassware is almost Rs. 3700. Another income is the savings in the cost of detergent, cleaning and other things. It is almost Rs. 7300. On the other hand, there is a repair and maintenances cost of Rs. 18000 for the smooth and efficient functioning of this technological up gradation. Taking both income and expenditure in to consideration, the resultant surplus due to the installation of Automatic Milk Collection Station is amounting to Rs. 43500.

It is already mentioned above that installation of Automatic Milk Collection Station is a capital expenditure and its financial viability has to be examined through capital budgeting methods. In this study there well accepted capital budgeting methods are considered. They are Net Present Value Method, Benefit to Cost Ration and Internal Rate of Return Method to examine the rationality of doing such capital expenditure. A discounting rate of 15% is considered in this case.

Table 3: Statement of Net Present Value, Benefit to Cost Ratio and Internal Rate of Return

Particulars	Year-1	Year-2	Year-3	Year-4	Year-5	Year-6	Year-7
Cost of Investment	1.25						
Recurring Expenses	0.18	0.18	0.18	0.18	0.18	0.18	0.18
Total Cost of the project	1.43	0.18	0.18	0.18	0.18	0.18	0.18
Returns	0.6147	0.6147	0.6147	0.6147	0.6147	0.6147	0.6147
Value of the AMCS after Depreciation	0	0	0	0	0	0	0.125
Total Returns	0.6147	0.6147	0.6147	0.6147	0.6147	0.6147	0.7397
Net Returns	-0.8153	0.435	0.435	0.435	0.435	0.435	0.5597
Discounting Factor at 15%	0.87	0.756	0.658	0.572	0.497	0.432	0.376
Present Value of total cost at 15% Discounting Factor	1.2441	0.13608	0.11844	0.10296	0.08946	0.07776	0.06768
Present Value of total return at 15% Discounting Factor	0.53479	0.46471	0.40447	0.35161	0.30551	0.26555	0.27813
Net Present Value at 15% Discounting Factor	0.76828						
Benefit to Cost Ratio at 15% Discounting Factor	1.41:1						
Internal Rate of Return	49%						

Source: Author's self compilation from the records of Barpeta District Milk Cooperative, Assam

Finding: It is observed that the Present Value (PV) of total cost is reducing over the years because of higher compounding discounting factor at 15%. At the end of year-1, PV of total cost is Rs. 124410 which is highest because in that year cost of initial investment is considered. But in the next year, i.e., in Year-2, PV of total cost is Rs. 13608 which is reduced to Rs 6768 in the 7th year. PV of total return in year-1 is Rs 53479 and it is reduced to Rs. 27813. PV of total return is also decreased because of higher compounding discounting factor at 15%. The calculated Net Present Value (NPV) of the capital expenditure is Rs. 76828. So it can be said that with a significantly positive NPV amount, such a capital expenditure for establishing Automatic Milk Collection Station is

profitable. Going beyond NPV, even calculated Benefit to Cost Ratio and Internal Rate of Return is also reflecting a profitable position. In table 3, it is found that the Benefit to Cost Ratio (BCR) is 1.41 >, and hence capital expenditure is acceptable. In addition to that internal rate of return of 49% is also higher than cost of borrowing rate i.e., 15%. Hence considering all major indicators like NPV, BCR and IRR, it can be concluded that incurring a capital expenditure for the establishment of Automatic Milk Collection Station is financially viable and profitable.

IV. CONCLUSION

Technology is the next big thing in this world economy. A wise and proper use of technology can bring revolutionary changes in any area of an economic activity. In case of a developing economy like Assam with a huge portion of people earning their livelihood from agriculture and allied activities, use of technology is certainly a move towards prosperity. In case of dairy sector, from the preceding financial analysis it is found that, the use of Automatic Milk collection Station Method (AMCUS) in dairy sector is financially and technically viable and sustainable. Use of such method will reduce cost and increase productivity that will create surplus in the hands of farmers and will further motivate the farmers to increase their farm output.

Though technology comes with incremental benefits but it has its own challenges. A technological change like installation of AMCUS may face the challenges like lack of technological awareness among rural people, particularly among the farmers. A system becomes more successful when it can create the participation of its stakeholders. Hence proper awareness and knowledge sharing programs should be conducted among the farmers to communicate them to understand the possible benefits of computerized based process like AMCUS.

In a mission of 'Self Reliant India', strategic changes with the application of technology like AMCUS in a farming activity will definitely bring notable economic progress. Farm mechanization and technology oriented farming activities can help in a massive way in bringing sustainable economic development not only in the dairy sector but in the whole economic scenario of a country like India as well as state like Assam.

REFERENCES

1. Martin Doornbos and Liana Gertsch, "Sustainability, technology and corporate interest: Resource strategies in India's modern dairy sector", *The Journal of Development Studies* Volume 30, Issue 4, pp. 345-356, 1994
2. Creswell, J. H, "Research Designs: Qualitative, Quantitative, and Method Approaches". *SAGA Publications*, pp. 74-86, 2009
3. Das, D. L. Ellen, M. A. B., "Milk and Dairy productions in human nutrition: food and agriculture, organization of the United Nations". *Designs of social research*. Rawat Publications, pp. 134-147, 2013
4. Kumar, A., Staal, J. S., Baltenweck, I., & Lapar, L. L. "Traditional Milk Market in Assam: Potential for Income and employment Generation". 2010.
5. Sirohia, S., Kumara, A. & Staalb, Steven. (2009), "Formal Milk Processing sector in Assam: lessons to be learnt from Institutional Failure", *National Centre for Agricultural Economic and policy research, New Delhi-110012*, 2009
6. Bora Sangita, 'Current status and future scope of Producer's Cooperatives in Livelihood Generation of Assam', *IOSR Journal of Humanities and Social Science (IOSR-JHSS)*, Volume22, Issue6, Ver. 10 , pp85-91, 2017