

India

**The Preparatory Survey Report
for BOP business on
Milk Collection Business by
Revolutionary Cold Chain
Logistics Technology and
Dairy Women Group: "Milk Ladies"
in India**

January 2016

Japan International Cooperation Agency
(JICA)

Innovation Thru Energy Co., LTD
Haruno ESWorks LLC

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Abbreviation

BOP	Bottom of Pyramid
CSR	Corporate Social Responsibility
ESW	Environmental Social Works LLC
FSSAI	Food Safety Standard Authority India
IB	IceBattery
IBS	IceBattery System
ITE	Innovation Thru Energy Co., LTD
SHG	Self Help Group
UK	Uttarkhand
UP	Uttar Pradesh

Executive Summary

1. Outline of the Study

1.1 Background, Objectives and Validity with Development Theme

The founder of Innovation Thru Energy Co.,Ltd. (hereafter referred to as ITE), is Indian-born engineer, who has over 25-year working experience in Japan. He is a great believer in Japanese manufacturing philosophy, and keen to introduce it to India. IceBattery System (hereafter referred to as IBS), developed by ITE, is a portable cooling devices with unique features, such as long lasting refrigeration time without charging, maintenance free simple structure, and safe & easy handling. This brings lots of advantages in utilization particularly in developing countries. ITE has looked for an opportunity to introduce IBS to cold chain logistics in India.

Although India is a one of the countries which is showing strong economic growth, it is still the largest country in population living under poverty. While disparity in economic development between urban and rural areas is becoming larger, empowering women and increasing their cash income is one of the challenges for overall socio-economic development in India. In rural communities, many including the poor breed cows and/or buffalos, which are often taken cared by women. Dairy is currently an important source of cash income for women and her family.

These are background and reasons why ITE conducted this study. The objectives of the study is to develop an inclusive business model aiming women empowerment and improvement of cash income from dairy business by improving cold chain logistics with IBS.

1.2 Study Areas

The study was conducted in Delhi and its adjoining areas, Rampur district and Moradabad district in Uttar Pradesh state (hereafter referred to as UP state), and Kahipur and its adjoining areas in Uttarkhand state (hereafter referred to as UK state). The study team also executed pilot activities at Chatrapur Nyak village in UP state, which is 15 km away from Kashipur.

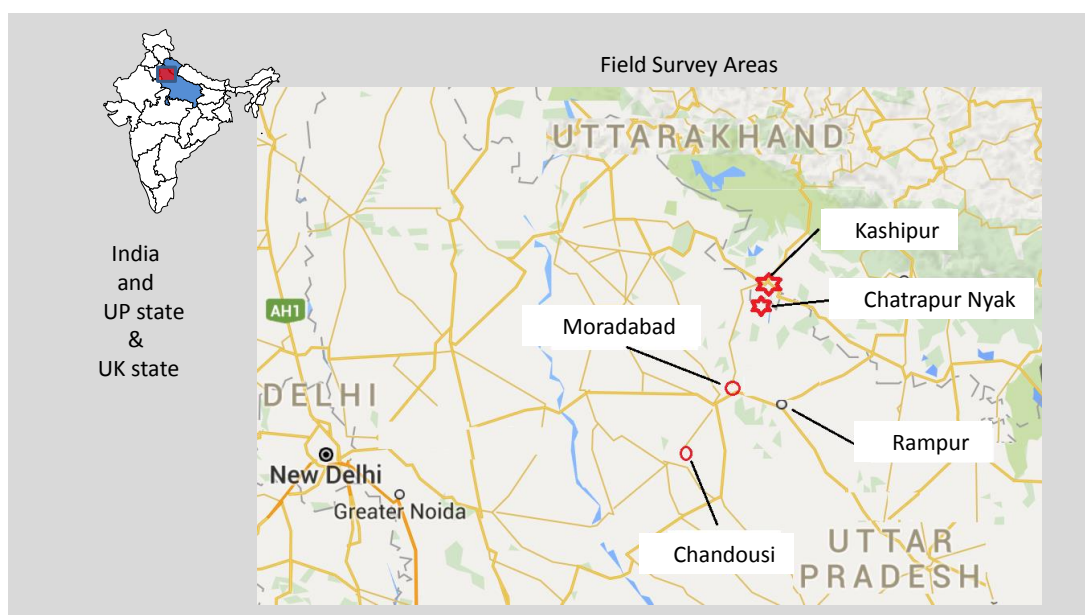


Figure 1 Map of Study Area

1.3 Study Procedure, Items, Methodologies and Schedule

First, the study team gathered information and data by online research and literature review which included the following subjects;

- Socio-economic status and cultural issues in India,
- Agricultural and dairy development policies executed by the government of India,
- Acts and regulations regarding company registration and an investment by foreign companies
- Trend of milk markets both of in terms of production and consumption
- Key players in dairy market including cooperatives and private manufacturers

The study team analyzed them to establish basis for understanding Indian business situation, and identified items to be analyzed and confirmed by a filed survey.

In India, the study team conducted series of field surveys. The team members met milk and dairy business stakeholders at their office and facilities such as;

- Head office of national brand dairy cooperative and their milk processing factory in Delhi.
- Private milk factories and their milk collection points in UK state and UP state.
- Milk collection chilling center (bulk milk cooler) of cooperative in UK state
- Village level milk collection centers in UP state, and UP state
- Milk and dairy products retailers such as large scale super markets, milk shop and tea stand in Delhi and its adjoining areas, UP state, and UK state
- Local sweat manufacture in UK state
- Milk container manufacture in Delhi

At those places, the study team expanded and deepened its knowledge and understanding on milk and dairy sector in India through;

- Interview to get the latest and detail information from key informants.
- Site observation to grasp actual procedure particularly in milk collection, transportation and processing.
- Exchange of opinions regarding the current issues in milk and dairy business including cold chain logistics

Apart from those surveys, the study team visited a district office to get a list of villages to identify candidate villages for baseline survey and pilot activities in UP state. After preliminary visit to several villages, the team selected one village, namely Chatrapur Nyak, in Moradabad district in UP state. The baseline survey was conducted by the Japanese team member and the local staff. The team developed questionnaire and visited panchayat (village council) and individual families in that village. The items collected from panchayat were as follows;

- Population by religion and caste in the village.
- Roles and responsibility of the panchayat and its members.
- Meetings of the panchayat including frequency taken place and its agenda discussed.
- Community activities to which villagers take part in.
- Dssues for development of the village.

The team member visited 60 families individually, and organized group interview to collect the following information;

- Religion, and caste of family.
- Family structure with employment and school attendance status in/outside village.
- Economic activities engaged.
- Household infrastructure such as electricity, gas, water, and toilet.
- Landholding status and household assets.
- Milch animal holding and milk production, consumption, trading detail.
- Needs for training and household assets.
- Access of women to resources.
- Participation to community activities.
- Interest in milk business by women's group.

After the baseline survey at the village, the study team decided to execute milk business pilot activities in the same village. The activities executed are listed below.

- Milk business explanation workshop.
- Sensitization workshop on general hygiene and group activities.
- Women group formulation.
- Provision of trainings to women group in hygienic milking and prevention of adulteration.
- Supporting of women in opening bank account and getting driver's license for scooter.
- Milk collection and payment by bank deposit.
- Visit to companies to identify potential consumers of milk.

Lastly, based on the analysis of information and data, and the review of the results of pilot activities, the study team drafted inclusive business model regarding "direct sales of raw milk to consumers by women dairy group"

Overall study period is 16 months from September 2014. During this period, the Japanese study team members visited India 12 times. The list of the team member and the detail schedule of the field survey are described in the Table 1 and the Table 2 respectively.

Table 1 List of Study Team Member

	Name	Roles
1	Pankaj Garg	Leader / Business plan development 1 / Local partner identification
2	Hiroshi Ogawa	Vice leader/ Community participation1/Rural survey1 / Planning of collaboration with JICA project
3	Hiroshi Hino	Business plan development 2 / Market reseach1
4	Mayura Garg	Legal survey / Market research 2 / Community participation 3
5	Rajeev Garg	Community participation 2 / Rural survey 2 / Logistics 1
6	Ravi Bhandari	Market research 3 / Rural survey 3 / Logistics 2

Table 2 Field Survey Schedule

	Date	Member / Survey Item / Visited Place
1	Oct.26 2014 -Nov.1 2014	G.Pankaj, H.Ogawa / Market research, site visit to Milk factory / Delhi and UP states
2	Dec.12 2014 -Dec.25 2014	H.Ogawa / Hearing survey at Milk cooperatives. Market research. Site visit to Milk factory /UP states and UK state
3	Jan.13 2015- Jan.28 2015	H.Ogawa, G.Pankaj / Rural survey, Site observation at milk factor. Visit to the candidate of local partner/ UP states, UK state and Delhi
4	Mar.6 2015 -Mar.27 2015	H.Ogawa, G.Pankaj / Rural baseline survey. Visit to the candidate of local partner UP state, UK state and Delhi
5	Apr.10 2015 -Apr.19 2015	G.Pankaj / Market research. Site visit to milk factory. Visit to the candidate of local partner
6	May.17 2015 -Jun.6 2015	H.Ogawa, G.Pankaj/ Pilot activities in rural community, Visit to the candidate of local partner/ UP state and Delhi
7	Jun.14 2015 -Jul.4 2015	H.Ogawa / Pilot activities in rural community/ UP state
8	Jul.11 2015 -Jul.31 2015	H.Ogawa / Pilot activities in rural community/ UP state
9	Sep.1 2015 -Sep.18 2015	H.Ogawa / Pilot activities in rural community, market survey/ UP state and UK state
10	Oct.4 2015 -Nov.6 2015	H.Ogawa, G.Pankaj/ Pilot activities in rural community. Market survey, Visit to the candidate of local partner/ UP state, UK state and Delhi
11	Nov.15 2015 -Nov.25 2015	G.Pankaj / Visit to the candidate of local partner/ Delhi and UK state
12	Dec.1 2015 -Dec.15 2015	H.Ogawa / Pilot activities in rural community. Market resarch/ UP state, UK state and Delhi

1.4 Summary of Study Results

The study results are summarized below.

India is the largest country in milk production and consumption. Milk cooperatives have been established in almost all states in India. The most famous cooperative is Gujarat Milk Marketing Cooperative Federation, which is the biggest dairy cooperative in the world, in terms of number of the individual members.

However, the proportion of milk sold through an organized market channel, which is handled by those cooperatives and private milk factories, is only 30 % of the whole milk production in India. For the remaining 70 %, 35 % is for self-consumption by producers, and another 35% is handled by traditional milk transporters called “Milkman”, who operate their business individually without belonging to any organizations.

The study team found that there were lots of stakeholders in milk and dairy sector, who shown strong interest in IBS. Through a series of discussion and exchanging opinions with such stakeholders, the team realized that IBS could contribute towards improvement of cold chain logistics of this sector.

As similar to rice in Japanese market some decades ago, milk is regarded as one of the basic foods for daily consumption by people. Market price is, therefore, controlled by government authority, and is likely to be kept in low. Indian consumer market has not yet matured, and most of people prefer the cheap conventional service or product instead of paying more for better quality and service. Under these circumstances, even if milk is delivered in fresh and better condition which is guaranteed by IBS, milk factory is not able to buy at higher price.

The most notable issue in Indian milk market is an adulteration. Several surveys conducted by the government authorities such as Food Safety Standard Authority India (hereafter referred to as FSSAI) have revealed that quite a large proportion, e.g.70%, of milk in market is not meeting the standards defined by the regulation. Most of adulterated milk are handled by milkmen. On the way from village where they collect milk to their customers, they put adulterants such as water, sugar, urea, starch, detergent and etc. into fresh milk in order to increase volume of trade and/or to make life of milk longer. Now, consumers are beginning to demand for non-adulterated safe milk

During village surveys and pilot activities in the community where most of people still have conservative way of thinking that women should not leave their home. However the team members met several women who have passion to take part in economic activities even outside village. Although most of the women wanted to get more cash income, they didn't think that selling agricultural products such as rice, wheat and sugarcane are a viable option to generate such income. Through lots of discussions with women, the study team understood that milk business would become viable and feasible, if there is change in mindset towards participation of women in society and business, and improvement of hygienic technique in the dairy practice.

Based on the survey results and experiences in pilot activities, the study team finally concluded that a direct sales of raw milk by women's dairy group to consumers who want non-adulterated milk is the most viable inclusive business model. Even in case that sales price is as same as the current market price, it could be economically feasible. Because in that business model, women's group will be able to obtain a profit margin currently taken by milkman. That profit margin will be shared with a new business company which supports women's group in execution of direct sales.

The study team also realized that there were commercial companies in industrial area near the pilot village, who were consuming milk for their staff canteen. At present, by Company Act 2013, companies are obligated to participate in CSR activities including empowerment of women, supporting social business, etc. Therefore, if such companies buy milk from women's group in this business model, they can be regarded to fulfill their CSR obligation.

In the business model, women's group is expected to be registered as Self Help Group (hereafter referred to as SHG), which is a one of the key instruments in Indian government policy on rural development. While the SHGs do milk business by themselves, a newly established consulting company supports them for their business execution. That company will provide SHGs with several services including; a) supporting SHG formation and registration, b) trainings regarding group operation, hygienic milking and etc., c) finding customer and introduction to SHG, d) monitor on activities of SHGs and quality of their milk, e) disclose them to stakeholders as kind of marketing activity, and e) procurement of equipment which is necessary for milk business. In case milk customer needs to publicize CSR report, the consulting company can support its preparation by provision of data and information regarding SHG and its performance.

Once women's group is registered as SHG, it can be financed by a bank or other financial organization. This means that women's group will be able to procure necessary equipment such as IBS and scooter by loan from bank if they can deposit their milk sales as collateral. The consulting company can also expect to recover its service fee stably from women's group if a bank comes into this business transaction.

The costs and sales are estimated, and the profitability of the business model is simulated as described below.

< Simulation for one women's group >

Assuming that

- ✓ One group consists of 10 women.
- ✓ A group can sell 40 litres of raw milk per day, and do 300 days per year
- ✓ Distance for transportation to customer is 30 km per day
- ✓ A group uses one set of IBS consisting of four IB boxes and 24 IB plates
- ✓ A group uses one scooter
- ✓ Direct sales price to consumer is 45 Rs per liter (comparing the sales price at village to milkman is 30 Rs per litre.)

The annual sales for the group becomes

$$40 \text{ litres/day} \times 300 \text{ days} \times 45 \text{ Rs/Litre} = 540,000 \text{ Rs}$$

In that, the annual additional sales comparing to the case that the group sell to milkman is

$$40 \text{ litres/day} \times 300 \text{ days} \times 15 \text{ Rs/Litre} = \underline{180,000 \text{ Rs}}$$

The initial costs and annual operation costs for one group are itemized below

A: Initial Costs

• Scooter	:	59,400 Rs	×	1 units	=	59,400 Rs
• Milk container (10 litre)	:	920 Rs	×	8 units	=	7,360 Rs
• Lactometer	:	800 Rs	×	2 units	=	1,600 Rs
• IB plate	:	1,250 Rs	×	24 units	=	30,000 Rs
• IB box	:	7,500 Rs	×	4 units	=	30,000 Rs
• Training (in total 6 days)	:	10,400 Rs	×	1 set	=	10,400 Rs
		<u>Initial costs total</u>			=	<u>138,760 Rs</u>

B: Annual Operation Costs

• Fuel & maintenance of scooter	:	17,758 Rs	×	1 set	=	17,758 Rs
• Hygienic consumables	:	4,100 Rs	×	1 set	=	4,100 Rs
• Communication & miscellaneous	:	2,500 Rs	×	1 set	=	2,500 Rs
• Allowance for leaders	:	600 Rs	×	36 MM	=	21,600 Rs
• Cost for field instruction	:	400 Rs	×	25 times	=	10,000 Rs
• Overhead cost by company	:	28,800 Rs	×	1 set	=	28,800 Rs
<u>Annual operation costs total</u>						<u>= 84,758 Rs</u>

The annual additional sales (180,000 Rs) exceeds annual operation costs (84,758 Rs), and that sales is less than the initial costs (138,760 Rs). Therefore, the profit in the first year shows minus 43,517 Rs. The accumulated profit becomes 51,724 Rs in the second year, and then it continues to grow later. At the fifth year, the accumulated profit is 337,451 Rs. Thus, the business by one group looks to be profitable in this simulation (refer to Table 3).

Table 3 Sales, Costs and Profits for One Women's Group

	Unit: Rs				
	1st Year	2nd Year	3rd Year	4th Year	5th Year
Initial Costs	138,760				
Operation Costs	84,758	84,758	84,758	84,758	84,758
Total Costs	223,518	84,758	84,758	84,758	84,758
Accumulated Costs	223,518	308,276	393,033	477,791	562,549
Additional Sales	180,000	180,000	180,000	180,000	180,000
Accumulated Additional Sales	180,000	360,000	540,000	720,000	900,000
Profits	-43,518	95,242	95,242	95,242	95,242
Accumulated Profits	-43,518	51,724	146,967	242,209	337,451

< Simulation for a milk business consulting company >

The sales of the consulting company collected from one group consists of two parts;

- 1) Annual overhead charge (fix amount): 28,800 Rs
- 2) Performance-based fee (30 % of the additional sales of milk): 54,000 Rs

Therefore, the annual sales collected from one group becomes 82,800 Rs

Assuming the consulting company can support 12 groups at the same time, the total annual sales of the consulting company becomes,

$$82,800 \text{ Rs/group} \times 12 \text{ groups} = \underline{993,600 \text{ Rs}}$$

On the other hand, the initial costs and annual operation costs for one group are itemized below.

A: Initial Costs

• Laptops, printer, camera,etc	:	108,500 Rs	×	1set	=	108,500 Rs
• Motorbike	:	60,000 Rs	×	2 units	=	120,000 Rs
• Refrigerator	:	25 000 Rs	×	1 unit	=	25,000 Rs
• Milk analyzer	:	40,000 Rs	×	1 unit	=	40,000 Rs
• Milk adulteration test kit	:	3,000 Rs	×	2 sets	=	6,000 Rs
• Office furniture	:	30,000 Rs	×	1 set	=	30,000 Rs
		<u>Initial costs total</u>			=	<u>329,500 Rs</u>

B: Annual Operation Costs

• Salary for permanent staff	:	25,000 Rs	×	24 MM	=	600,000 Rs
• Salary for part-time staff	:	4,000 Rs	×	24 MM	=	96,000 Rs
• Rent of office	:	8,000 Rs	×	12 M	=	96,000 Rs
• Electricity tariff	:	1,000 Rs	×	12 M	=	12,000 Rs
• Communication & miscellaneous	:	4,000 Rs	×	12 M	=	48,000 Rs
		<u>Annual operation costs total</u>			=	<u>852,000 Rs</u>

The annual sales (993,600 Rs) exceeds annual operation costs (852,000 Rs), however that sales is less than the total costs in the first year (1,181,500 Rs). The accumulated profit becomes 95,300 Rs in the third year, and it continues to grow later. At fifth year, the accumulated profit becomes 378,500 Rs. Thus, the business by the consulting company is feasible, even though it doesn't seem to be so profitable. (Refer to Table 4)

Table 4 Sales, Costs and Profits for Consulting Company

	unit: Rs				
	1st Year	2nd Year	3rd Year	4th Year	5th Year
Initial Costs	329,500				
Operation Costs	852,000	852,000	852,000	852,000	852,000
Total Costs	1,181,500	852,000	852,000	852,000	852,000
Accumulated Costs	1,181,500	2,033,500	2,885,500	3,737,500	4,589,500
Additional Sales	993,600	993,600	993,600	993,600	993,600
Accumulated Additional Sales	993,600	1,987,200	2,980,800	3,974,400	4,968,000
Profits	-187,900	141,600	141,600	141,600	141,600
Accumulated Profits	-187,900	-46,300	95,300	236,900	378,500

The study team recognizes that this type of inclusive business has higher risks than common business. The following challenges are identified in order to reduce risk against sustainability of the business.

First, it is necessary to find out the consumers who can procure milk in larger amount with higher price.

If the sales price is lower than the price used in the simulation by only 3 Rs/litre, the accumulated balance for women's group break even only in the third year. Besides, the annual operation costs exceeds annual income for the consulting company.

If the amount of sales of milk per day becomes smaller than that used in the simulation by 5 litres, the accumulated balance for women's group break even only in the fourth year. Besides, the consulting company will be able to recover the initial costs in the 10th years of operation.

In order to avoid such worst case scenarios, the consulting company should try to contact a larger scale company who has CSR obligation, and get higher sales price by emphasizing on CSR premium generated by women empowerment and inclusive social business model.

Secondly, it is necessary to minimize production costs of IBS. That can bring an earlier recovery of the initial costs in this business. The cost reduction may be possible when IBS is made in India instead of in Japan. If the production costs can be reduced to one fourth of the current costs, the business will breakeven within the first year for the women's group. That also contributes to reduction of risk against sustainable operation by the consulting company.

The most critical engineering challenge is to reduce weight of IBS itself. Although milkman can transport 160 litres of milk per trip, in the simulation above, it is assumed that only 40 litres of milk can be transported by women group. This is partly because that, it is difficult for woman driving scooter to transport as same amount of milk as milk "man" does. The more crucial reason is that lots of IB plates are required to reduce temperature of milk and keep it refrigerated. That causes reduction of total volume of milk to be transported per trip. If women can transport 60 litres of milk per trip, profitability and sustainability of this business for both the women's group and the consulting company, are substantially improved.

1.5 Outline of the Business Model

<Title of business>

- Consulting business for a direct sales of raw milk by dairy women's group: Milk Ladies

<Background and Rational>

- In rural communities in India, many families including the poor families breed cow/buffalo. Raw milk sales is the most important source of cash income for women.
- Rural milk market, particularly in area which dairy cooperative is not active, is dominated by traditional milkman. As quite a large proportion of milk is adulterated in the market, now consumers are increasingly concerned about quality and safety of milk.
- Milkman enjoys substantial profit margin between buying price at producer and selling price at consumer.
- According to the Company Acts amended in 2013, Indian companies have legal obligation to spend for CSR activities. It is expected that lots of company will support women empowerment and rural development.

<Outline of business>

- Provision of consulting services for dairy women's group executing direct sales of raw milk.
- The consulting services include;
 - ◇ Supporting SHG establishment and registration
 - ◇ Trainings regarding group operation, hygienic milking and etc.

- ✧ Support in opening bank account and getting driver's license for scooter
- ✧ Finding customers and introduction to SHG,
- ✧ Monitor on activities of SHG and quality of their milk
- ✧ Disclosing monitoring data to stakeholders as part of marketing activity
- ✧ Procurement of equipment which is necessary for milk business.

• The outline of the milk business executed by women's group is;

- ✧ To collect fresh raw milk from its members, and keep it in IBS to prevent it from spoiling
- ✧ To transport it directly to consumers by scooter which woman drives by herself.
- ✧ Target consumer is a company which has CSR obligation and needs milk for its domestic consumption such as for canteen.

<Key features as an empowerment business>

- ✧ development of women's group and SHG
- ✧ provision of training including hygiene knowledge and practices
- ✧ deposit to individual woman's bank account in order for her to access cash by herself
- ✧ provision of an opportunity for woman to go outside village through delivery of milk and meeting with consumers

<Other points of business to be noted>

- ✧ The consulting company doesn't buy nor sell milk by itself, but just concentrates on provision of consulting services for dairy women's group
- ✧ The consulting company support the client company in making CSR report in order to get higher sales price of milk
- ✧ When women's group is registered as SHG, it can be financed by bank
- ✧ Recovery of service fee from women's group can be secured when bank comes to this business transaction

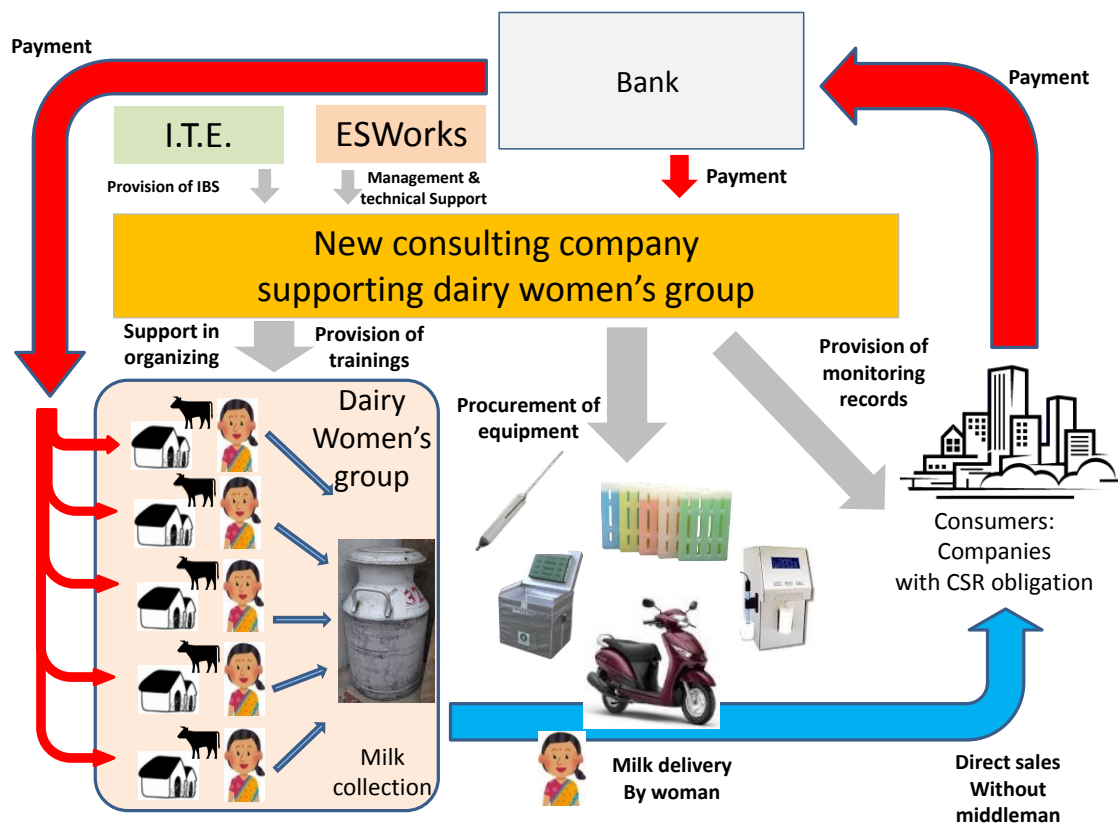


Figure 2 Business Model

1.6 Possibility of Commercialization of the Business Model

At the end of this study period, the team has decided to continue the pilot activities including formal group establishment, actual sales to consumers and involvement of bank to this business model. After execution of those activities, the team is going to make conclusion whether to launch a commercial business based on the business model or not.

1.7 Tasks for Determination of Commercialization and Implementation Schedule

For commercialization, the team have to tackle the following tasks;

- To transform women's group established as pilot into a formal organization such as SHG.
- To establish business transaction circle from collection of milk to payment via bank to every woman, and
- To ensure that transaction cycle runs efficiently.

The implementation schedule of the tasks are summarized below.

- | | |
|----------------------------|---|
| The middle of Jan 2015 | : Milk delivery demonstration to the candidates of customer |
| | : Finalize group members, and preparation to establish SHG |
| The end of Jan 2015 | : Registration of SHG |
| The beginning of Feb. 2015 | : Tentative agreement with the customers |
| | : Organize scooter driving training |
| The middle of Feb.2015 | : Milk delivery to the customer |
| The end of Feb.2015 | : Preparation and making payment |
| The middle of Mar.2015 | : Review and confirmation of customer satisfaction |
| | : Negotiation with a bank regarding payment transaction |

2. Study Photos



Private milk factory under construction



Traditional milk transporter: Milkman



Milk retail shop with vending machine



Milk collection center (Bulk milk cooler)



Needs survey



Rural woman milking



Women's credit group in UK



Business explanation workshop



Yong ladies and scooter



Workshop on hygiene issue



Trainig for hygenic milking



Demonstration of milk adulteration



Monitoring on hygenic milking



Women in bank



Milk collection pilot activity



Milk Lady

carrying

milk in bag