

# **Pro-poor Analysis Of The Dairy Value Chain**

**Strengthening The Dairy Value Chain Project  
CARE Bangladesh**



**Pro-poor Analysis  
of The Dairy Value Chain of Bangladesh**

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**CARE Bangladesh**

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<b>ACRONYMS</b>	
<b>A/I</b>	Artificial Insemination
<b>BDS</b>	Business Development Services
<b>BLRI</b>	Bangladesh Livestock Research Institute
<b>BSP</b>	Big-Scale Producer
<b>DFP</b>	Donor-Funded Project
<b>DLS</b>	Department of Livestock
<b>FF</b>	Field Facilitator
<b>FGD</b>	Focus Group Discussion
<b>FHH</b>	Female Headed Household
<b>HH</b>	Household
<b>IDI</b>	In-Depth Interview
<b>KII</b>	Key Informant Interview
<b>MSP</b>	Medium-Scale Producer
<b>NGO</b>	Non Governmental Organization
<b>PNGO</b>	Partner NGO
<b>SP</b>	Service Provider (private, government or non-commercial, e.g. NGO)
<b>SSP</b>	Small-Scale Producer
<b>VC</b>	Value Chain
<b>VCA</b>	Value Chain Actors



# 1. Introduction to the Value Chain Analysis Study

## 1.1 Background to the Study

The Bill & Melinda Gates Foundation has awarded a \$5.2 million grant to CARE Bangladesh for the “Strengthening the Dairy Value Chain in Bangladesh” project, which will be implemented in 9 districts of North and Northwest of Bangladesh for a period of 4 years (2007-2011). The project aims to increase the income of 35,000 targeted smallholding and landless milk producer households by at least \$20 per month from a current \$18-\$30. The project will also create employment opportunities for extremely poor households especially women through various activities along the value chain. The project design is based on investment from the private sector and development of profit-driven infrastructure, making it sustainable.

The vision of success is that targeted landless and smallholding households in North and Northwest Bangladesh have more sustainable livelihoods through incorporation into a strengthened milk value chain. The specific objectives of the project are to: improve milk production and collection systems in rural and remote areas; improve access to inputs, markets, and services by mobilizing groups of poor farmers, producers, and char dwellers; improve the milk transport network; ensure access to quality services at the producer level; and improve the policy environment.

## 1.2 Objectives of the Study

As part of the Strengthening the Dairy Value Chain Project, Care Bangladesh commissioned a value chain analysis study to identify the root causes of constraints on the chain’s development in Northern and Northeast Bangladesh and also assess potential environmental impacts of the project. The key objectives of the study are to:

1. Explore the nature of production and the terms and conditions of employment along the dairy value chain in Bangladesh
2. Conduct a gender analysis of the value chain while highlighting (the different positions) of men and women across the chain and addressing issues of power reflected in the production and exchange relationships
3. Identify opportunities to improve market outcomes, raise productivity and wages, and foster pro-poor growth in the dairy sector of Bangladesh
4. Focus on institutional arrangements that link producers, processors, marketers and distributors while recognizing that power differentials among actors may influence outcomes along the chain
5. Identify particular bottlenecks/hindrances that limit the growth potential of the sector and address power and inequalities along the value chain
6. Assess potential socio-economic and environmental impact of a dairy value chain development project in the area

### *1.3 Methodology of the Study*

CARE contracted an international lead consultant and a research team leader for a total of 23 days (12 days for the lead consultant and 11 days for the research team leader) who together oversaw and conducted the value chain analysis study. The following paragraph provides an overview of the consultancy and the roles of the lead consultant, Linda Jones and research team leader, Eugene Ryazanov. The field study in Bangladesh was conducted from 23 December, 2007 till 4 January, 2008 by the research team leader and followed up from 5 January till 12 January by the lead consultant.



*Data collection from small scale producers*

The lead consultant prepared a detailed draft Plan (see Annex 1 – Detailed Plan) for the study and research tools (including identification of clusters, team makeup and responsibilities, schedule of activities, sampling frame, interview and focus group discussion guides, questionnaires, surveys, supplier diagnostics). The plan and research tools were revised by the lead consultant based on comments of CARE and the research team leader. The research team

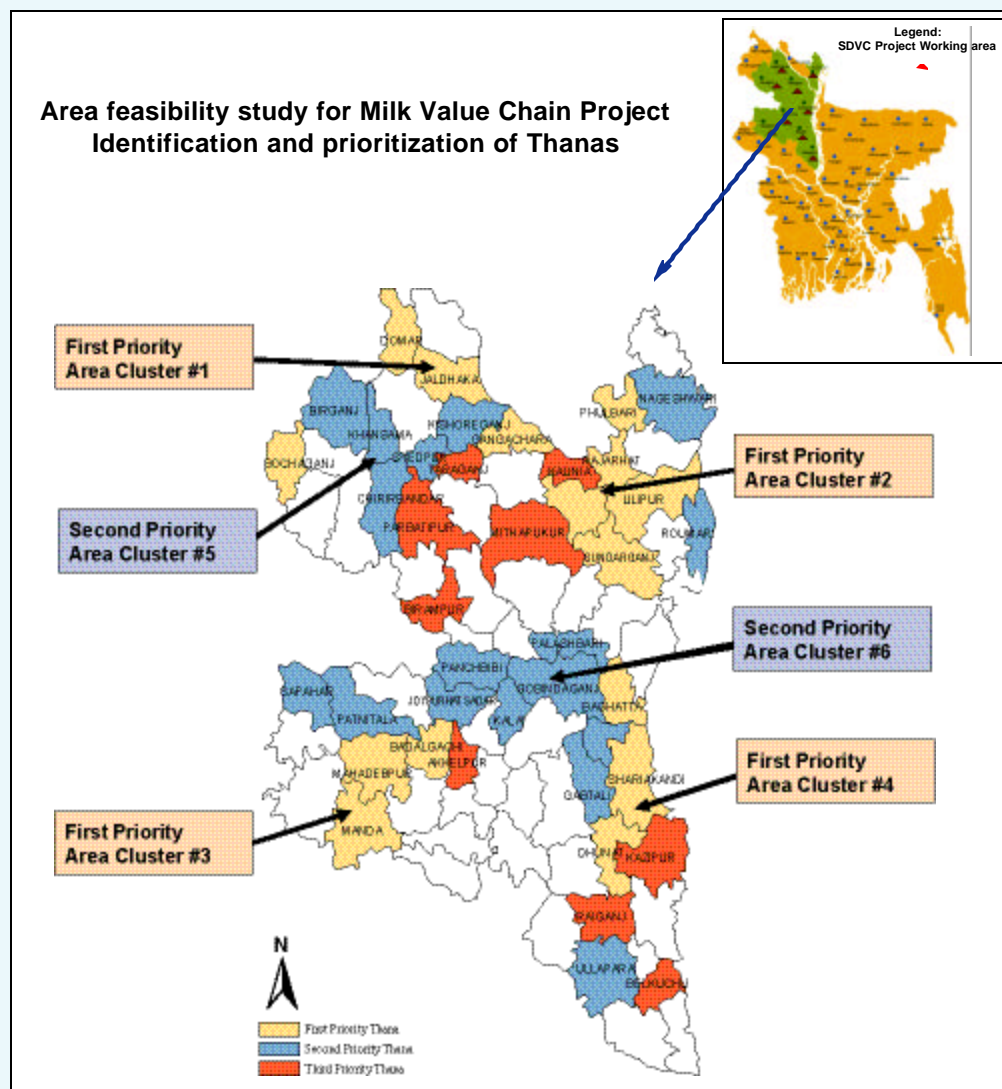
leader conducted training of the CARE team to implement the tools, worked with them on piloting and revising the tools, and was responsible for overseeing the data collection and organization process (including the creation of an excel database for data analysis). The research team leader then drafted parts of this report and provided his conclusions and recommendations to the lead consultant after discussions with the project staff. The research team leader provided consolidated data to the lead consultant, who further analysed the data in discussion with CARE staff, conducted additional research with producers and other key informants, and finalized a draft report and recommendations which were presented to CARE Bangladesh in Dhaka. Based on additional input and discussions, the draft was revised, and submitted to CARE at the end of the mission. Comments from various CARE staff and consultants in January led to further revisions and the creation of this final document.





The following clusters were identified based on information provided in the CARE study *Facilitation Area Feasibility Study*, November 2007.

**Graph 1: Map Identifying Priority Clusters**



At the start of the field research, the research team leader together with project staff finalized the selection of respondents – Small Scale Producers (SSPs), VC Actors (VCAs), and Service Providers (SPs) including veterinarians and paravets. This information is provided in Table 1 below. The detailed work plan for the field research according to the identified clusters is presented in Annex 1.

**Table 1: Selection of Respondents for the VC Analysis Study**

Priority Area	I	I	I	I	II	II	Total
Area Cluster #	1	2	3	4	5	6	6
Number of thanas in the cluster	3	5	3	3	5	7	26
# of the A and B Team	1	2,3	4	5	6,7	8,9	
A Teams							
Number of SSP respondents in the cluster	20	40	20	20	40	40	180
B Teams							
Number of other VC Actor respondents in the cluster	12	24	12	12	24	24	108
Paravets	1	4	2	1	4	2	14
Pharmacists (Animal Drug Sellers)	-	2	1	1	1	1	6
Artificial Insemination Providers	1	1	1	1	2	1	7
Fodder/Feed Providers	2	4	1	1	4	3	15
UMS Block Makers	-	-	1	1	1	2	5
Collectors	2	5	1	2	4	6	20
Diary Processors	1	2	1	1	1	2	8
NGO Staff / Community Mobilizers	1	1	1	1	2	2	8
Transporters	1	1	1	1	2	1	7
Chillers	1	-	-	-	-	1	2
Traders / SM	1	3	1	1	2	2	10
Credit Service Providers	1	1	1	1	1	1	6

The tools used during field research were in-depth interviews (IDIs) with 180 small scale producers, key informant interviews (KIIs) with 39 VCAs, 54 SPs and 14 paravets, and focus group discussions (FGDs) with 9 women producer groups. The research team leader also visited the Rangpur dairy and held discussions with staff. Following on this, and to fill gaps in data and analysis, the lead consultant conducted a lengthy FGD with 20 women in Bogra, unstructured KIIs with a range of women microentrepreneurs, a stakeholder meeting with processor lead firms Milk Vita, BRAC and Rangpur dairy, and information gathering sessions with Agricultural experts, the Bangladesh Livestock Research Institute (BLRI), CARE's gender specialist and other staff.

*For a list of names of those consulted, see Annex 2.*

The following is an overview of the small-scale producers involved in the 180 IDIs:

- 12% of respondents are char dwellers
- 60% of respondents are women. 52% of respondents are married women, 8 are single, 38% of men are married and 1% are single men

- Average age of SSP is 36 years
- 42% have salary as a main source of income; 29% from other agricultural activities, 14% from selling of milk and 15% from small business (9%) and other sources of income (6%)
- 42% of SSP have land of average size 0,48 acres; 80% of land owners are husbands (men) and 18% are women (10% female-headed HH and 8% are wife). Other members of the HH are owners of the land in 3% of cases



## 2. Analysis of Data by Objectives

Section 2 responds to the six objectives outlined in the TOR in subsections 2.1 through 2.6. A Summary of Findings is presented at the start of each subsection, followed by detailed supporting data analyzed from the field research.

### *2.1 Nature of Production and Condition of Employment*

#### *A. Nature of Production along the Dairy Value Chain*

##### Summary of findings

Main Production Challenges	Recommended Solutions
The lack of appropriate and affordable feeds is one of the biggest challenges to producers in all categories.	SSPs trained on and use of fodder with high nutrition content <sup>1</sup> or urea blocks by lead farmers or PNGOs who are trained by CARE. Simple training materials prepared.  Information transfer supported by radio programming, billboards etc. as analyzed and appropriate to the context. Paravets also reinforce information with embedded advisory services. Other combinations of feeds investigated and promoted – acquire info from BLRI.
Knowledge of animal management including hygiene is limited amongst many SSPs. Even the poorest farmers, with little or no cost, can benefit from this information.	SSPs trained on animal management by lead farmers and PNGOs who are trained by CARE. Simple training materials prepared. Information transfer supported by radio programming, billboards etc. as analyzed and appropriate to the context. Paravets also reinforce information with embedded advisory services.



<sup>1</sup> The project will explore other fodder and supplements as alternatives

Main Production Challenges	Recommended Solutions
Knowledge of and access to affordable and appropriate animal healthcare – vaccines, deworming, calf diarrhoea – is a challenge for many SSPs.	<p>Fee-for-service Paravet system established by CARE – review CARE models and select the best one for project replication.</p> <p>Prepare modules for dairy.</p> <p>Recruit paravets from women, men and youth.</p> <p>Work with consultants<sup>2</sup> to advocate government to reduce tariffs on imported medicines, and to increase production of local vaccines.</p>
Improved crossbreeds for increased production – there is considerable confusion about appropriate crossbreeding and their adaptability to the local context.	Appropriate crossbreeds identified. CARE works with BLRI, Milk Vita and others to select and pilot crossbreeds. Crossbreeds to be initially piloted with clusters of larger SSPs who have superior animal management – farmers with longevity of experience and 4-5+ cows.
Access to effective artificial insemination is limited – even when A/I is available, it is often not well managed and ineffective.	A/I services to be available through private sector providers (paravets and other commercial providers). CARE may support development of government A/I services through advocating and facilitation activities. Semen of selected crossbreeds to be made available to A/I providers.
Lack of overall knowledge and access to production information is widespread, and not in formats accessible by SSPs.	SSPs to be exposed to information via a range of media – billboards, radio programs, leaflets as analyzed and appropriate. CARE facilitates the development of such materials with selected stakeholders.
SSPs are not organized into groups to take advantage of potential training and other services.	CARE works with SSPs via its Field Facilitators (FFs) and possibly selected PNGOs to form groups to access training and other services.

<sup>2</sup> CARE has identified a professional consulting team who has experience advocating the government and would be more effective than CARE staff acting on their own. The structure and the responsibilities of this relationship would need to be defined.

## Research Questions

The Plan (Annex 1) proposed the following method and key research questions for Objective 1 A. of the VC study. Answers to the questions are provided in this section.

- **Method**

Assess current situation of milk production by target group using qualitative tools aimed at collecting information from a representative sampling in each district of 1) smallholder and landless owners of dairy cows and 2) support service providers and others in value chain (vets or paravets, input suppliers, traders/collectors/ buyers, transporters, financial services providers, business advisors, quality controller).

### Key Research Questions

- a. **What feeds are used / grazing patterns?**

- Of the 180 SSPs interviewed, the main fodders used for cows are rice straw (30%), grass (29%) and rice bran (26%).
- There appears to be no significant variation between regions or according to type of SSP (women, men, smallholders, landless).
- A range of supplementary feeds are used including molasses, oil cake, boiled arum and wheat bran.
- Only 51% of the HH provides additional fodder as wheat bran (39%) and oil cake (14%) and they do it mainly during milking period (60%) or when fodder is available (15%). Only 12% of the HH provide additional fodder year round.
- Additional feeds are most commonly provided during lactation to promote milk production.





**b. Are better feeds available but not used? Why (not affordable, lack of technology, lack of knowledge)?**

- Agricultural experts suggested that maize straw is an under-utilized resource for cattle feed. Many farmers are now growing maize for human consumption but do not appear to realize that with proper processing that the stalks are an affordable and nutritious source of fodder.
- Napier grass has been introduced in some areas and is highly nutritious for cows. However, it requires land for cultivation and quickly depletes the soil fertility..
- In general, farmers do not have knowledge of Napier grass or access to seeds. This would not be an option for landless farmers. Also, for small farmers it replaces higher value crops and would likely not be attractive.



- If Napier grass is to be promoted more widely, considerations such as displacement of other crops, crop rotation, and soil fertility will have to be considered and farmers trained accordingly.
- Another fodder that might be an option would involve the intercropping of legumes with maize. Again, legumes may displace cash or subsistence crops and would therefore may not be viable.
- Molasses is also an excellent supplement that could be used up to 10% of total intake by cows. In addition, molasses could also be combined with maize stalks to produce silage. However, molasses is not readily available with sugar mills discarding molasses as a waste by-product and not selling it to farmers. Urea molasses blocks are relatively easy to prepare.
- A total of 80% of respondents indicated that they do not use nutrient supplements due to the high cost or the inability to pay for them.
- If other supplements are to be encouraged by the project, cost/benefit analysis should be conducted and the awareness of farmers raised about the potential outcomes.

The BLRI has prepared material on the effective combinations of feed and supplements. BLRI can make this information available to CARE.

**c. Are vet or paravet services available and affordable (what is the cost)? Which services are used by small-scale producers and with what frequency: A/I, technical advice, treatment of sick animals? (Link to poverty profile, gender, age)**

- Paravet services are sometimes available – although the data is contradictory on this score (71% of respondents reported availability, but later 57% reported they don't use services due to lack of availability).
- SSPs stated that the best way to get information about animal care is from friends/ neighbours (48%), paravets (33%) and NGOs (11%).
- No HHs reported receiving information from mass media;
- 91% of respondents reported having used paravet services at some time
- HH access services from local paravets (52%) or a nearby town (25%), while 16% (or 1 in 6 HH) uses the services of a traditional healer.
- The average payment for one visit of a paravet is 70 TK, and this covers a range of services.
- Only 67% of surveyed HH are satisfied with paravet services. The main reasons for their frustrations are unavailability of services (47%), high price (43%), low quality (19%) and long distance (12%).
- Producers who work with processors are more likely to have access to paravets, as are those who are involved in the current CARE paravet program.
- Of the 180 SSPs surveyed, the services most commonly accessed are: sometimes for sickness (31%), vaccinations (26%), de-worming (19%), artificial insemination (A/I) (11%) and all sicknesses (11%).
- In FGDs, women reported that they would utilize more healthcare services if female paravets were available. In particular, women do not feel comfortable seeking A/I services.
- Both smallholder and landless farmers, as well as farmers with variable numbers of cows reported accessing paravet services.

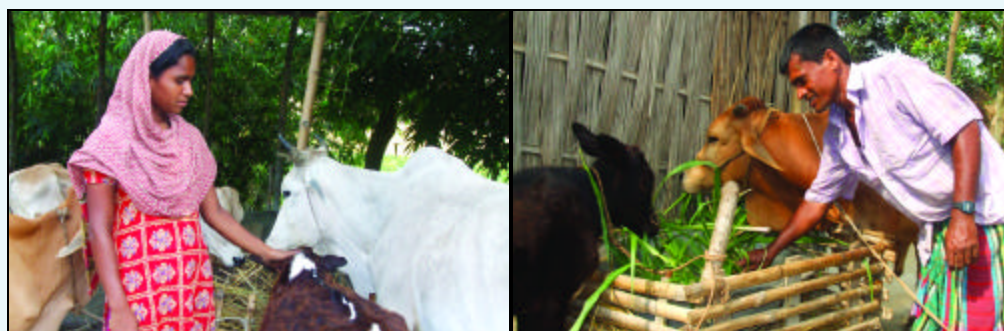




- A/I is used more in some regions than others – it is unknown if this is based on practice or availability of services.
- HHs mainly breed cows locally (92%) and only 8% in A/I Centers.
- 90% of the HHs report burying dead cows – there is some scepticism about this response among project staff who have witnessed them throwing cows in the river.
- Agriculture experts reported that improper disposal of dead animals – with skinning prior to burial – contributes to the spread of anthrax.
- The average size of a cow-shed is 14 x 8 x 8 ft which typically houses 2 to 3 cows. Proper ventilation is essential to cows, and higher sheds with good flow of air would be beneficial particularly to less hardy cross-breeds.

**d. What are the roles of men, women, boys and girls in production? (Feeding, healthcare, breeding, milking, marketing etc.) Are there variations in the roles according to poverty profile, season, time of day, household dynamics, and individual preference?**

- There is some overlap of work between men and women but there are definite distinct patterns.
- Decisions about farm management are taken by the husband (44%) wife (35%) and female head of HH (16%).
- Women tend to have more responsibility for feeding, milking, healthcare and selling to neighbors.
- Men play a greater role in buying animals, breeding and selling to markets.
- There do not appear to be significant differences according to other variables.
- The exception is when husbands are absent or in FHHs, women have to take greater responsibility.
- In some households, women receive more help. The CARE gender advisor indicated that gender sensitization has been proven effective in eliciting support for women from other household members.



**e. What are the main problems faced by households with their cows?**

- The main challenges that HHs face in this work are: unavailability of feed (32%), health care and diseases (27%) and high price of feed (11%).
- It is interesting to note that only 3% of SSPs<sup>3</sup> consider distance to market an issue.
- A key consideration regarding fodder is the cost, particularly since it has risen dramatically over the past year.
- Ag experts stated that critical healthcare issues need to be addressed. There is a prevalence of parasites and calf diarrhea, and the need for vaccination against common diseases (anthrax, foot and mouth disease, rabies, black water etc.)
- See b. and c. above for information on fodder and paravets respectively.
- Secondary problems (after fodder and healthcare) are lack of time (especially noted by women in FGDs), less grazing land, shortage of milk, and financial crises.
- Respondents did not emphasize the need for A/I although cross-breeding or improved breeds were identified as issues by all the Ag experts consulted.
- Local breeds are very hardy and can withstand heat, humidity, parasites and poor nutrition – however, their production of milk is consistently low under these conditions.
- Under improved conditions, local breeds may produce up to 2.5 L (some reports stated 5 L but this seems doubtful).
- Crossbreeds may produce 5++ L but are more susceptible to heat, humidity and disease. Without proper care, they will produce less than local breeds or succumb to illness and death.
- There are some local breeds that might be better producers: Pavna, Chittagong red, Shahjadpur.
- A type of Pavna is available through the BLRI, and they indicated that they would consider a research partnership with CARE whereby germ plasma could be used on a pilot basis. This breed produces 3 L and is a hardy variety.
- In Bogra, we witnessed crossbreeds of local cows with Frisians. These cows are producing 4-5 L per day and seemed healthy. The producers indicated that they had to be careful about hygiene and shade to keep the animals cool and dry.

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<sup>3</sup> It should be noted that on the next page the HH will mention the distance to the market as an issue again but it will be related to sale of milk and in this case they gave answer on general question about HH problems.

**f. What type of relationship exists between different producers group? Like men versus women groups?**

- Only 3% of respondents reported participating in producer groups.
- In FGDs, many women reported membership in credit groups.
- Milk Vita has developed cooperative groups for both male and female producers.
- Men generally have more opportunities to participate in producer groups (according to women in FGDs), and those associated with other processors.
- SSPs that responded (5 or 6) believe that producer groups could benefit members more in terms of pricing, provision of healthcare services.
- In a KII with a female collector in Bogra, evidence was particularly strong about lack of cohesiveness in groups, issues of trust and unfair practices.
- These results indicate that community mobilization may require considerable effort and the demonstration of positive outcomes.



**g. Do they produce surplus milk? If so, can they sell it? What are the issues related to selling milk? (Pricing, access to markets, technology, quality, containers etc.) If they sell milk, do women and children consume less?**

- The average number of cows among those surveyed is 2.3.
- SSPs mainly keep cows for milk production (64%) and fattening (19%) for further resale. 7% of interviewees reported utilizing cows for tillage.
- HHs spend around 18% of time related to dairy cows for selling of milk and the rest time for feeding (22%), healthcare (22%) and milking (19%);
- The average yield per cow per day is 0.75 L
- 89% of respondents said that they know about the quality of milk and it depends on density of milk (50%). Other named other indicators as density and colour.

- Processors stated that lacto-scanners are provided to producer groups so that they can test milk density prior to consolidation for fair pricing to each farmer.
- 64% of SSPs surveyed report raising cows primarily for milk production.
- 94% reported some income from dairy, earning an average of 31 Tk per day total for a price of 18 Tk per L.
- Main marketing channels are selling to other HHs (40%), collectors (31%), who sell milk themselves at the markets and to sweet-makers (9%) and to processing factories. Currently only 2% of HHs sell milk to processing factories, and the marketing channel to the formal market is undeveloped.
- The key challenges in selling of milk are low price (42%), distance to market (22%), lack of transport (14%) and lack of buyers (7%);
- 85% of the respondents who sell milk think that they are in a fair relationship because payment is on time and they have market access, however all are eager to earn more and increase yields.
- 56% of the SSPs stated that there are other market opportunities but they do not use them because of distance (26%)<sup>4</sup>, insufficient manpower (19%) and unstable price (17%).
- 38% of HHs considers the milk price as fair and only 13% of the HHs sells milk the year around.
- 14% indicated that it is a main source of income for the household.
- In 34% of HHs, the husband is responsible for selling milk, in 31% the wife, followed by female heads of HH (13%) and in some cases a son (8%).
- 64% reported selling all the milk that they produce, with approximately 30% not selling all due to household consumption.
- HHs would prefer to sell milk (85%) rather than consume it (15%), with a focus on the management of household expenses.
- When there are less consumption of milk in the HH, the first priority goes to the husband (26%), then boys (23%), followed by the wife (17%) and lastly girls (16%).
- The gender specialist at CARE informed us that there is a widespread belief amongst rural women that it is better to consume less during pregnancy so the baby will be small and the delivery therefore easier.<sup>5</sup>

<sup>4</sup> SSPs mentioned the reason as "long distance" for different questions during the interviews - CARE may chose to investigate this further if it seems relevant to improving project functioning.

<sup>5</sup> The TOR did not request information about HH consumption patterns for purchasers of milk. It would be worthwhile for CARE to conduct this study as it moves forward.

**h. Who are the other business services providers in the value chain<sup>6</sup>? What is missing? What are the main constraints for small-holders producers to access their services?<sup>7</sup>**

- There are limited services for SSPs (see information above and later section on VC bottlenecks for more details).
- SSPs do not access services due to availability, cost of services, awareness and benefit of services.



<sup>6</sup> The research team leader trained the project staff in making drafts of maps of VC in each Upazila. They are available in Annex 4. The drafts will be regularly updated by the project staff in the future.

<sup>7</sup> Additional information is available on leading processors in the section on institutional arrangements.



## ***B. Terms and Conditions of Employment along the Value Chain***

### **Summary of Findings**

<b>Main Employment Challenges</b>	<b>Potential Solutions</b>
Suitable employment needs to be developed throughout value chain as the formal sector grows.	SSPs are made aware of employment opportunities and employers are willing to employ both men and women. CARE FFs to create linkages between potential employees (groups) and employers (VC actors) and promote awareness.
Skills of small scale producers are generally not adequate for employment in the formal sector.	SSPs to train as needed by PNGOs or other partners to be employable. CARE to train partners and provide simple training materials on employment.
Equal opportunities for women employees are often not available, although some areas are more suitable and open to employing women.	Employers are sensitized to employment of women and the value of their contribution. CARE provides awareness rising. CARE promotes women in areas where they have stronger employment opportunities – as loan officers, extension workers and collectors.
Equal opportunities for independent women entrepreneurs need to be developed.	Women to be trained in entrepreneurial and technical skills for selected businesses: sweetmaking, dairy collection and sales, paravets.
There is a lack of overall knowledge and access to employment information.	SSPs to be exposed to information via a range of media – billboards, radio programs, leaflets as analyzed and appropriate to the context. CARE facilitates the development of such materials with selected stakeholders.
SSPs are not organized into groups to take advantage of potential employment training.	CARE works with SSPs via FFs and possible PNGOs/mobilizers to form groups to access training opportunities.

### **Research Questions**

The Plan (Annex 1) proposed the following method and key research questions for Objective 1. B of the VC study. Answers to the questions are provided in this section.

- **Method:**

Assess current employment opportunities for women and men along the dairy value chain using qualitative and quantitative tools aimed at value chain stakeholders and official agencies.

## Key Research Questions

### a. At each level of the value chain, what are the employment opportunities for women and men?

- HH data indicates that an average of 14% HH income is from selling milk. Wage labour is the highest source at 42%; other agricultural activity accounts for 29%.
- To understand dairy value chain employment, 39 VCAs, 54 SPs and 14 paravets were interviewed. The breakdown of respondents by category is outlined in Table 1 above.
- In interviews with key informants, there was a much greater willingness to hire men than women.
- 59% of VCAs and 46% of SPs indicated that they employ men, and 41% and 36% respectively said they would hire more men if the value chain activity increases.
- 13% of VCAs and 17% of SPs indicated that they employ women, and 8% and 11% respectively said they would hire more women if the value chain activity increases.
- Of 39 VCAs and 54 SPs interviewed (total 93), only 17 indicated that they would hire a woman to carry out work currently done by a man if she were qualified for the work.
- In follow-up KIIs in Bogra, women revealed that they have opportunities as collectors, milk sellers, sweetmakers, and would be interested in training as paravets and extortionists.



### *Detailed Employment Analysis by Category*

- 38 men are employed by 11 of the 23 input suppliers mainly for selling; some men perform unskilled labour and financial services. The few women employed carry out cleaning tasks. 13 input suppliers stated that they would provide jobs to more men if business expands.
- 5 of the 7 extension service providers employ 24 men, and 4 have hired 11 women. Women and men work as trainers, community mobilizers, and credit agents. The extension services did not feel they would require many additional employees if value chain activities increase.
- Credit providers employ men (42 total amongst seven organizations) and one institute employs four women. Two of the credit agencies would hire more women and only one plans to hire additional men if the value chain grows.
- Six A/I providers were interviewed and they hire a few men, but no women. Two indicated they would be interested in employing more men if their enterprise expands.
- Transport services and equipment suppliers appeared to have few or no male or female employees. Equipment suppliers showed some interest in hiring men if activities increase.
- One of the four pharmacies (animal drug sellers) interviewed stated that it employs four men, while none hire women. One of the remaining pharmacies stated it would employ more men if needed.<sup>8</sup>
- 16 of the 10 traders interviewed hire men with an average of four employees each across a range of activities. One woman has a job as a cleaner. Nine traders indicated they will hire more men if business grows.
- Five out of 14 collection centres provides work to one man, and none employ women. Seven collections centres said that if value chain activity increases, they will hire more men.
- 121 men are employed by five of the six processors / lead firms interviewed; three indicated they would hire more men if business grows. 19 women work for 4 processors / lead firms, but only 1 is interested in hiring more women.
- 2 of the 3 sweetmakers surveyed indicated that they each hire one man to prepare sweets, and 1 would take on additional staff if demand increases.
- Only 1 of the 3 collectors employs a man, and none are currently willing to hire women.

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<sup>8</sup> Further research on formal and informal animal drug sellers is recommended.



- Opportunities for women as the subsector expands appear to be in extension, credit, collection and paravet services.
- Opportunities for men are more wide-ranging with significant potential to work for input suppliers, traders, collection centres and processors.

**b. For each, are there gender-specific roles/issues? What are they? When women and men do the same job, are they paid the same amount?**

- Within the value chain, women are generally employed for unskilled labour such as cleaning.
- In supporting the value chain, women are more likely to be employed for credit services, community mobilization and training.
- Men's employment ranges across both skilled and unskilled labour with many more employed within the value chain.
- On average, men earn twice as much as women.
- In FGDs, women indicated that they will lose their job if they demand to earn on par with men and they think this isn't fair.



**c. Which of these roles is affected by power dynamics (linkages) rather than the actual content of the work?**

- It would appear that the buying and selling roles, and the support functions related to these, are considered to be men's work.
- The public handling of money, and engagement in this type of work, are not considered appropriate for women.

**d. What is the potential number of jobs for women and men at each level in each value chain / district?**

- A baseline survey will be required to calculate this accurately. Main areas of job growth for women will be in extension, credit and paravet services. Growth for men's employment will be more generalized with strong potential

**e. As the market grows, what is the projected percentage expansion rate for jobs; for women and men?**

- A baseline survey will be required to calculate this accurately. Some, but not all of the employers suggested that number of staff would keep pace with growth in the value chain. 37% of SPs and 41% of VCAs reported that if activity doubles, staff requirements will double.

**f. What issues are there with employment (low pay, safety hazards, child/indentured labour, unreliable, seasonal etc.)?**

- Supporting the value chain only 24% of the jobs for men are year-round and 38% are occasional. Within the value chain, 33% of the work is year-round. As regards women, jobs provided by SPs are 11% all year, and by VCAs, 17%.
- There were no reports of child labour or bonded labour.
- SPs reported paying men an average of 108 Tk per day for a 12.7 hour day. VCAs provided similar data – averaging somewhat higher at 111 Tk per day for 10 hours.
- In general, women are paid much lower – VCAs offer 50 Tk per day for 10 hours labour.
- Women who are entrepreneurs in the value chain (collectors, sweetmakers, and sellers) are able to earn more money. Key informant meetings (follow up research to the fieldwork) found women earning 80-200+Tk per day, and able to save for expenses such as weddings and the purchase of land.

## 2.2 Gender Analysis of the Dairy Value Chain

### Summary of Findings

Main Gender Challenges	Potential Solutions
Women are overburdened as housekeepers, SSPs and day labourers.	Families may need to be sensitized to women's workload and solutions sought within HH. CARE to link to local PNGOs and other projects to provide training and support to women as appropriate and available.
Women do not have decision making authority or respect in the HH.	Through economic empowerment, women's status will improve and they will gain greater control.
Equal opportunities for women employees are limited, and employers are often not open to hiring women.	Employers to be sensitized to employment of women and the value of their contribution. CARE provides awareness raising. CARE promotes women in areas where they have stronger employment opportunities – as loan officers, extension workers and collectors.
Equal opportunities for independent women entrepreneurs cannot be found and leveraged.	Women to be trained in entrepreneurial and technical skills for selected businesses: sweetmaking, dairy collection and sales, paravets.
Women and girls consume less milk as more is sold to the market.	CARE to connect to PNGOs and other projects that promote women's health, as appropriate and desirable. Various media may also be vehicles for awareness raising.
Gender roles and tradition limit women's opportunities.	CARE to connect to PNGOs and other projects that promote the role of women, as appropriate and desirable. Various media may also be vehicles for awareness raising.
Women and their HHs are not organized into groups to take advantage of training and other information.	CARE to work with women and their HHs via FFs and PNGOs/mobilizers that will form groups to access training and other information.

### Research Questions

The Plan (Annex 1) proposed the following method and key research questions for Objective 2 of the VC study. Answers to the questions are provided in this section.

- **Method:**

Assess current employment opportunities for women and men along the dairy value chain using qualitative and quantitative tools aimed at value chain stakeholders and official agencies. Combine with research conducted in 1.B above; add in gender experts as needed/available.

## Key Research Questions

- a. **See 1.A for information on gender variations in production, 1.B for detailed information on women's and men's employment opportunities, and other sections for variations due to gender roles as it relates to specific issues.**
- b. **What is the income distribution in a family? Who earns money? Who controls money? Who makes decisions about family spending? Are different decisions controlled by different members of the household?**
  - Men earn more income than women as day labourers.
  - Men also generate more income based on agricultural output of owned land. Although women often provide labour for this land, the income is considered to be the man's right.
  - In-depth interviews revealed that 52% of the time HH income is controlled by men, and 27% by women. In addition, FHHs account for another 18% of decisions being made by women.
  - FGDs with women presented a variable picture: joint decision making, women controlling their own income, and households where men had complete authority over spending.
  - Follow-up meetings with women in Bogra also revealed that women often have control or share decision making. Women heading households have the most autonomy in decision making.
  - There are some variations with regard to decision making.
- c. **Who owns and who controls the assets of production, including the cows, land, tools? Is there gender disparity and does this varies across groups?**
  - Husbands own the cows in 52% of responding HHs and wives 17%. There were also 17% women-headed HH who own cows.
  - Husbands control the income from milk sales in 52% cases, wife in 27% of cases women-headed HH in 18% of cases.
  - Husbands decide about credit use in 55% of cases and wife in 34% of cases.

**d. Are there different issues around production / employment for women versus men (power dynamics, discrimination, family attitude, personal security, conflict with household work etc.)?**

- Detailed information is provided in 1.A on production issues and in 1.B on employment.
- In general, this information reveals that women have fewer opportunities in terms of control of assets, employment and decision making.
- In FGDs, women stated that they were overburdened with taking care of the home and cattle, and often in day labour as well.
- CARE's gender specialist explained that society expects women to run the home, and when she is working outside the home, adjustments don't naturally follow at home. With sensitization, husbands and other HH members become aware and are more supportive.
- Some cases of spousal abuse were reported in FGDs.



**e. What do women describe as their main challenges as producers / value chain entrepreneurs? How do they see this as different from the challenges faced by men? Do they think there are viable solutions?**

- Detailed information is provided in 1.A on production issues and in 1.B on employment.
- In FGDs, women stated that their main challenges are overwork, lack of authority in the household, lack of respect from husbands, and no control over income.



- In terms of production issues, they feel that their issues are largely similar to men's (feed, paravet services).
- With regard to sales, women indicated they are at a disadvantage because they do not have access to markets.

**f. What new opportunities would women like to have as producers / value chain entrepreneurs? Why these opportunities? How do they think these opportunities would be developed?**

- Women would like to have greater market access.
- They believe that greater market access would ensure fairer prices for milk. Door to door traders generally pay the lowest prices to producers and homebound women have limited sales choices.
- Control over income earned from dairy is considered to be desirable.
- Women did not show strong initiative and interest in new roles. But this element could be further explored and expanded upon as project implementation unfolds.



## ***2.3 Market Opportunities for Small Scale Producers in Dairy Sector***

### **Summary of Findings**

<b>Main Market Challenges</b>	<b>Potential Solutions</b>
SSPs do not produce milk in quantities suitable for strong formal market development.	Improve milk yields as identified under objective 1.A.
SSPs do not produce the quality of milk that will fetch higher prices and be desirable to the formal market.	Improve milk quality as identified under objective 1.A.
SSPs are not organized into groups and cannot take advantage of consolidation of milk that would promote attraction of processors and establishment of chilling plants.	SSPs to be organized into groups to consolidate milk. CARE works through its FFS, lead farmers and local PNGOs/mobilizers to form producer groups. Producer groups are also developed by processors, collectors and other actors in the value chain.
SSPs do not have good knowledge or affordable technology for testing of milk quality and cannot negotiate fair pricing from collectors.	Producer groups may be provided with lactoscanners for basic testing. CARE to work with processors to ensure that SSPs have lactoscanners, test milk, and receive fair price from collectors. Lead farmers may be trained to use lactoscanner.
Appropriate distance for chilling and processing factories is around 30 km in radius and many SSPs are located far from them and urban markets.	Additional chilling plants to be established in conjunction with processors. Alternative transportation such as barges and rickshaws are piloted by CARE.
Potential for informal markets including formalization of sweetmaking not well understood.	Action research to continue as program gets underway regarding alternative markets. In particular, roles of women and youth to be assessed. As production increases, local markets will also likely continue to grow as milk in general is in short supply.
Lack of overall knowledge and access to market information including pricing.	SSPs to be exposed to information via a range of media – billboards, radio programs, leaflets as analyzed and appropriate to the context. CARE facilitate the development of such materials with selected stakeholders.

The following market information will be further elaborated by market assessment once the project is launched. This section focuses mainly on the formal sector, which offers greater income gains to SSPs. However, some informal channels may also prove promising and should be considered if resources allow, and if formal market channels are not developing as planned.

## Research Questions

The Plan (Annex 1) proposed the following method and key research questions for Objective 3 of the VC study. Answers to the questions are provided in this section.

- **Method:**

Assess market opportunities that have growth potential, allow for the integration of small-scale producers, provide a fair return on labour and investment of resources, and include sustainable supports for producers such as embedded services.

### Key Research Questions

**a. What are the growing market opportunities for dairy products in Bangladesh (liquid milk, dried milk, sweetmeats, yoghurt, cheese, other processed products)?**

- All markets appear to be growing quickly – particularly fresh milk as there is a severe shortage.
- Dry milk is imported in large quantities (10 B Tk annually approx \$140 m) but this is not due to preference for dry milk, but a lack of fresh milk.<sup>9</sup>

**b. Compare informal and formal market opportunities.**

- Both markets are large and unmet, but the formal market offers farmers higher profits particularly since the processors cover much of the cost of transportation.
- Currently, Milk Vita pays producers 25 Tk per L<sup>10</sup> whereas traders will pay as low as 14 Tk per L. (See below for information regarding other processors.)
- Formal processors are operating at 10% capacity, and are interested in opening chilling plants throughout the regions where CARE is working.
- Informal markets will continue to grow and absorb excess production as there is a general shortage. In addition, the informal sector will benefit if milk quality is upgraded and health/hygiene standards improved.

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<sup>9</sup> CARE plans to conduct a more detailed market assessment on the informal sector as the project is developed. However, the project will at least initially focus on the formal sector and lead firm processors.

<sup>10</sup> Including transportation costs.



**c. What are the competitive pressures from imports?**

- Imports are not competitive, but are a kind of last resort for consumers.
- Poorer consumers will buy cheaper fresh milk and cannot afford dry milk.
- From team observations and opinions of project staff more affluent consumers buy dry milk only because pasteurized liquid milk is in short supply.

**d. Are some informal market opportunities likely to formalize and provide future growth opportunities (e.g., quality sweetmeats)?**

- The formalization of sweetmaking has already begun.
- Both Milk Vita and Rangpur Dairy report the production of sweets.
- Rangpur dairy is in the process of setting up a line for milk candies and another for canned rashgollahs.
- Informal sweetmakers do not appear to be formalizing in any significant way at this point. The additional market assessment that will be conducted once project implementation begins will drill down on this market as well as other informal buyers and sellers.



**e. Can the proposed value chains and producers be competitive (price, quality, product diversification)?**

- If farmers are able to improve outputs in terms of quantity and to a lesser extent quality, there is huge potential for the formal dairy value chain.
- Due to the huge unmet market demand, the 25 Tk per L that processors are willing to pay, and the willingness of processors to set up collection and transportation systems, the value chains hold great promise.
- As long as milk is available, the processors will be able to diversify products.
- In addition to liquid milk and the sweetmeats already discussed, processors are also producing yoghurt, flavored milk and ice cream.

**f. What changes will need to be made to meet market demand?**

- Interviews with lead firms and assessment of farmer capacity indicate that changes are required in terms of production, enabling farmers to produce enough output to warrant the installation of a chilling plant in their proximity and a collection system.

**g. Is credit/finance an issue for producer and throughout the value chain? What are the specific issues (lack of finance, inappropriate loan products, interest rates, access)? What are the sizes of loans needed at different levels? Who could provide these loans?**

- Credit does not appear to be an issue for SSPs.
- 95% of surveyed HHs know about credit organizations.
- 71% of the HHs need credit and 100% report access to credit.
- 23% of those who would get credit would use the money for starting a new business, 22% for dairy farm (?), 13% for other agricultural business and 10% for HH development.
- Most of the HH have access to saving services (41%), and a few to local money lenders (14%), local NGO loans (13%) and community based cooperatives (11%).
- Only 2% of farmers get money from a processing factory.
- Processors indicated that finance is not an issue and they are able to expand businesses – there largest constraint is supply of milk.



**h. What are the future trends in market demand that will require further change from the value chain?**

- As the demand for milk in Bangladesh continues to grow (and there is already huge unmet demand) there will be further pressure to move to less populated and more marginalized areas for milk collection.
- If CARE can pilot and develop suitable transport from Char areas (such as the proposed barges), there will be market opportunities for marginalized HHs.

**i. Can a dynamic value chain be created that will respond to ongoing change in the market place?**

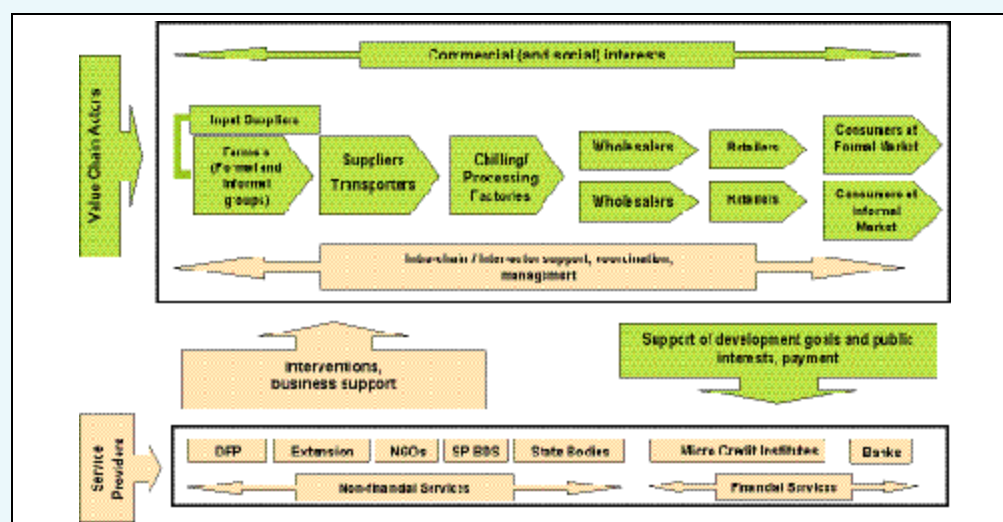
- Creating a dynamic value chain depends upon the flow of product up the value chain and the flow of information down.
- Farmers need to be aware of the market demands so that they can respond to changes.
- If processors remain committed to acquiring milk from SSPs, then it will be in their interest to continue supporting and training milk producing HHs.
- With lead firms committed to growing the market, this dynamism should be possible.
- In a meeting with BRAC, Milk Vita and Rangpur Dairy, they all indicated a double bottom line where they are interested in both profitability and the welfare of the poor producer – this is likely to be the best recipe for continued success if collection and transportation can be streamlined.

### ***A Technical Note on Cooperation of Value Chain Actors:***

It is valuable to distinguish between *Value Chain Actors* (see Glossary) who are directly involved in delivery of milk from production to the final consumer, and *Service Providers* who can influence on efficiency of delivery (graph 2). The value chain is not able to operate in the absence of even one actor, but can function in some manner without supporters. The value chain is an alliance of independent businesses (operators) having a common interest (profit) and utilizing benefits of this cooperation. This form of cooperation, as the alliance, distinguishes a value chain from a commodity chain, which is managed up-stream and down-stream by one business. Ideally, retailers should order dairy products based on demand, and processors and producers should work on reducing the production costs to make their products more competitive and attractive for traders.

Service Providers can be divided in two main groups of providers: 1) Non-financial (mobilization of SSP, extension services, consultancy, training, technology, know-how, information, attraction of investments, etc.) and 2) Financial Services (money). The first group includes donor-funded international and local non-government organisations, non-commercial, state and private extension, and business development services. The group of Financial Services includes micro-credit institutions and commercial banks. It is also useful to distinguish between non-financial and financial services because provision of the latter services requires different types of relationships between operators and supporter such as provision of collateral for obtaining a loan. Thus, an operator in the value chain, having certain financial resources, would be able to buy non-financial services without facing any constraints, but would not be able to obtain credit because of lack of collateral.

**Graph 2: Relationship of Stakeholders in the Value Chain**



## Linking Value Chain Actors

Project partners are all operators directly integrated into the value chain such as SSP, collectors, chilling and dairy processing factories, and traders, as well as supporting organizations such as extension services, input suppliers, local NGOs and service providers.

## Involvement of Service Providers and their Roles

Local PNGOs, government extension services, commercial input suppliers, and providers of BDS are potential partners for project facilitation. The project may choose to support them in pursuing the following objectives:

- Support SSPs in becoming effective contributors to value chains through their mobilization in informal groups; facilitate SSPs linkages to potential buyers (collectors, chilling and processing factories); employ local consultants and marketing experts where entrepreneurship and commercial knowledge is needed.
- Improve market access for SSP informal groups and develop their capacities through the preparation and delivery of training.
- Support sector, sub-sector and value chain analysis as well as research and development efforts.
- Facilitate fair relationships between SSP groups and other VCAs.
- Facilitate Public-Private Partnership with the aim of using public money for public interest.

**Table 2: Potential Roles for Partner Organizations**

Extension Services	Input Suppliers	PNGOs	BDS Providers	Credit Institutes
Farmer mobilization Group development Technical training and consultancy Innovation development Linkages of farmers to processors based on contracts	Supply of certified drugs, semen and seeds for feed productions and fertilizers Provision of technical consultancy to SSPs on proper use of input	Farmer mobilization Group and leadership development of resource farmers Training and capacity building Micro-credit provision Linkages of SSP to collectors, chilling and processing factories	Provision of operational and strategic services on market basis Linkages of dairy processors to potential traders Completion of studies and market analyses for the project	Provision of appropriate credit products for small scale milk producers Consulting with SSPs on obtaining credits for purchase of cows and (cross) breeding Processors are well financed and did not express need for credit. <sup>11</sup>

Further strategic partnerships may be needed: a) to strengthen production and SSP groups' support by linking them with up-stream SSP (farmer) assistance programmes, and b) to connect the supply system to the markets linking the project with downstream trade and private sector promotion initiatives. The project may find it beneficial to cooperate with other important donor initiatives in North and Northwest of Bangladesh.

<sup>11</sup> CARE will need to determine if SPs are unable to meet farmer's needs due to credit limitations. This was not generally expressed as a constraint, but staff should remain aware of this potential constraint.

## ***2.4 Institutional Arrangements for Project Implementation***

The focus of the project will be the upgrading of value chains led by formal processors. The institutional arrangements in this section focus on those relationships and the constraints and opportunities therein.

### **Summary of Findings**

<b>Main Institutional Arrangement Challenges</b>	<b>Potential Solutions</b>
SSPs do not produce in quantities suitable for strong formal market development via processors.	Improve milk yields as identified under objective 1.A.
SSPs do not produce the quality of milk that will fetch higher prices and be desirable to the formal market processors.	Improve milk quality as identified under objective 1.A.
SSPs are not organized into groups and cannot take advantage of consolidation of milk that would promote attraction of processors and establishment of chilling plants.	SSPs to be organized into groups to consolidate milk. CARE works through its FFS, lead farmers, and local PNGOs/mobilizers as well as processors to form producer groups.
Appropriate distance for chilling and processing factories is around 30 km in radius and many SSPs are located far away from them.	Additional chilling plants are established in conjunction with processors. Alternative transportation such as barges and rickshaws are piloted by CARE.
Government does not support the development of the dairy subsector and inhibits growth in a number of areas.	CARE to work with an experienced consulting group to advocate the government re: import tariffs on feeds and medicines, to increase the production of cost-effective vaccines, to expand extension and A/I services, to transfer technical knowledge from BLRI to DLS and extension officers.

### **Research Questions**

The Plan (Annex 1) proposed the following method and key research questions for Objective 4 of the VC study. Answers to the questions are provided in this section.

- **Method:**

Assess institutional arrangements (Milk Vita, PRAN, BRAC, Rangpur Dairy, AKIJ, Danone) and the value chains that link producers to these opportunities.



## Key Research Questions

### a. What are the specific market opportunities – products, size of market, future growth, roles of small producers – with each of the lead firms?

- The Bangladesh dairy market has huge unmet demand with over 90% being served by powdered milk imports, totaling 9,800 m Tk annually (approx \$140 m).
- If consumers are able to buy liquid milk (fresh or pasteurized), it is preferred and more affordable. Powdered milk retails for 450 per Kg which produces 8 L. Pasteurized milk in a pillow pack costs 42 – 44 Tk per L.
- Milk Vita, the leading processor produces 2,450 m Tk per year (approx \$35m), with products including mainly liquid pasteurized milk as well as yoghurt, butter, ghee, sweetmeats and candies.
- BRAC produces mainly pasteurized liquid milk, and some powdered milk.
- Rangpur Dairy is currently set up to produce liquid milk – both plain and flavoured – and is in the process of setting up equipment for milk candies and canned Rashgollahs which it intends to export to the Middle East.
- During a stakeholder meeting with Milk Vita, BRAC and Rangpur Dairy, a strong willingness to collaborate with CARE and serve clients was expressed. This was stated on grounds of both business and social interests. The dairy processors indicated they would invite CARE to future meetings for continued dialogue and interaction.
- The processors indicated that with a minimum of 1000 L in any given area, a chilling plant would be considered. Chilling plants are set up for either 2000 or 10,000 L capacity, and many currently are running well below full potential.
- The role of the rural poor would be mainly as producers of milk, but employment opportunities would also exist for collectors.



**b. How are producers connected to each of the lead firms? Are there any specific barriers due to the gender? Poverty profile of the producers?**

- Each of the three lead firms has a slightly different model of group formation and embedded service delivery. Milk Vita forms cooperatives and states that it is owned by the farmers who ultimately benefit from all profits. The cooperatives are represented by a collector, and receive free technical advice and healthcare including vaccinations, deworming and A/I. Milk Vita provides each group with a lactoscanner to measure density before consolidating so that farmers can be remunerated according to quality.
- BRAC works with farmers' associations and also provides technical services.
- Rangpur is a startup and plans to have a more commercial model, subsidizing services by paying for staff provision of services, and only recovering cost for medications etc. Rangpur Dairy has set up 250 societies with 150 active. Each society has 100 – 300 producers, and sends a collection van around to each society within a 40 km radius of its chilling centers that is producing more than 40 L. Rangpur Dairy plans to have 12 chilling centres operational by June. The chilling centres will also be served up to a 15 km radius by rickshaw vans.
- The processors work with women and men alike, and do not discriminate against the very poor. However, remote producers are not served, and these communities tend to be the poorest.

**c. Who dominates the market most among the lead firms? Why?<sup>12</sup>**

- Milk Vita dominates the market among the lead firms selling 2,450 m Tk annually. The reason for this is that they have been in the market for 20 years and have worked to establish chilling plants and processing facilities.
- BRAC is the second largest with 700 m Tk per year (approx. \$10 m).
- Pran, which did not attend the stakeholder meeting, is third, processing 25,000 to 30,000.
- Rangpur Dairy processes 15,000 L per day, and is rapidly expanding. Rangpur Dairy is owned by PowerTrade Group who has invested in dairy to make profit while having social impact. They are very eager to work with CARE and to establish viable producer groups (societies).

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<sup>12</sup> CARE staffs are currently mapping the location of processor chilling plants, and their reach. Discussions are also underway to determine which processors are willing to expand this reach and increase the number of chilling plants in designated districts.



**d. What are the constraints and opportunities with each lead firm and its value chain in terms of power, costing/pricing, embedded services, equitable return to producers, involvement of the very poor and women?**

- Each of the lead firm processors is struggling with underutilized chilling and processing plants. This is not cost-effective, but they are all invested in the long term.
- Their main concern is low production by farmers in close proximity, and low production compounded by distance for remote areas that are harder to collect from. It is not clear that with current levels of production (0.75 L per cow on average) that either the producers or processors can be profitable.
- Production near existing chilling plants will need to be increased to meet processor demand, and further increases in areas not near existing chilling plants to encourage processors to establish new ones.
- The processors are also covering the cost of many embedded services that are affecting their profitability – some services that might be provided by government, and others for which producers would pay if they were more affluent. This is currently a benefit to producers associated with processors as they have access to subsidized vaccines, healthcare, A/I, transportation.
- The processors pay more to producers than other collectors and local consumers so they are beneficial to producers – they pay 25 Tk per L on average. Producers reported an average of 18 Tk per L in the field research.<sup>13</sup>
- The processors are somewhat unaware of the complications with producer groups – or at least dismiss the complexity of group dynamics, milk adulteration, collector abuse etc. Given Milk Vita's success in Shahjadpur, it may be that many of these difficulties can be overcome.

**e. What are the issues relating to the Business Enabling Environment (BEE) – trade barriers, official and unofficial taxation, business formalization, incentives for private sector, role of importers of dry milk, corruption in the value chain?**

- The government is not involved in the dairy sector in any significant way. There is no national body such as a dairy development board.
- The processors felt that lack of involvement by the government has some benefits, and they are beginning to cooperate to bring about change.
- An import duty has been imposed on powdered milk which makes local milk more competitively priced.

<sup>13</sup> More detailed costing and pricing will determine if farmers make money on the informal sector if the project decides to develop this market. However, it is clear that farmers stand to have much greater income returns by working with the formal processors.

- Import duties are also charged on animal feed (25%) and medicines which raise the cost.
- Some issues around A/I have been reported – although there is only one dairy extension officer per upazila who can provide this service, it appears that there are constraints for private firms to be licensed (note – reported by Jaheed from Ezab – needs further clarification to understand issues).
- The government reduced the production of vaccines in recent years which make the dairy industry more dependent on imports that are more expensive.
- Corruption in the value chain appears to be informal – adulteration of milk with water, collectors who pay producers lower rates, suppliers not providing quality inputs.

### ***A Technical Note on the Basics of Institutional Arrangements***

In addition to working with processors, CARE has the potential to form institutional arrangements with a number of implementing partners. The project intends to build on existing community based groups, such as self help or informal groups, which have gone through some stages of empowerment regarding political awareness, community based action, dairy production, and saving and credit activities. Many members in these groups focus on milk production and animal husbandry as a main source of income and are interested and ready to link to markets. At the same time, the project will build on the social capital established in these groups to reduce poverty, and reach marginal and disadvantaged groups in society, like resource poor farmers, single women and Char dwellers.

One of the key elements to meet this challenge is to work with a range of actors, including NGOs with primarily a social mandate, business actors like chilling and dairy processing companies, and BDS service providers. A feature of value chain development harnesses backward linkages, and supports the downstream actors in a chain through, for example, marketing promotion and stimulating systems to make market information available.

Another element is a strong facilitation of the market broker role between actors in the chain. Trust is often a constraint, and the facilitation role assists in bringing actors together while providing concrete expertise in developing relations between actors. This also relates to Service Providers such as local development NGOs, extension and advisory services, and micro finance institutions. The development of new services which are suitable for the value chain actors, primarily producer and producer groups, and of Service Providers promotes the building of an enabling environment. Last but not least, there is the potential for increased support from collectors, chilling plants and processing factories as an employer of rural poor and as a promoter of social enterprise development.

## 2.5 Bottlenecks Limiting Growth Potential

### Summary of Findings

Main VC Bottleneck Challenges	Potential Solutions
Production: SSPs do not produce in quantities and of a quality suitable for strong formal market development.	Improve milk yields and quality as identified under objective 1.A.
Support Services: SSPs do not have access to suitable and affordable services including paravets, A/I and feeds/breeds.	Service delivery and availability improved as per objective 1.A.
Market Access: SSPs are not organized into groups and cannot take advantage of consolidation of milk that would promote attraction of processors establishment of chilling plants and other economies of scale.	SSPs are organized into groups to consolidate milk. CARE works through its FFs, lead farmers, and local PNGOs/mobilizers to form producer groups. See objectives 3 and 4.
Value Chain Relationships: There is limited trust in the value chain both across producers and between producers and buyers.	Trust to be promoted through the establishment of win-win relationships. CARE staff work to improve linkages between producer groups and collectors/processors as well as amongst producers. Lead farmers to be trained in negotiation and mediation as appropriate.
Enabling Environment: The government is not supportive of a competitive dairy subsector.	Government support is improved in key areas as per objective 4.
Gender: Women face challenges with regard to position in the income, employment opportunities, and over burden of work.	Address issues of gender as in objective 3.

### Research Questions

The Plan (Annex 1) proposed the following method and key research questions for Objective 5 of the VC study. Answers to the questions are provided in this section.

- **Method:**

Assess bottlenecks that limit growth in value chains including power and inequalities through qualitative research.

## Key Research Questions

- a. What are the key bottlenecks that limit growth in each of the identified value chains (e.g., product quality, lack of producer groups, collectors, cold chain, transportation, mistrust, lack of motivation/incentives, finance)?

### Small-scale producers:

- Low-producing breeds.
- Expensive and inadequate feeds.
- Poor animal health and hygiene.
- Very small surplus of milk to market – on average one cow around year produces 0.75 L of milk and approximately 30% of the milk is consumed by the reporting HHs.
- High costs of production and low profits mean farmers are not necessarily interested in expanded dairy production.
- Lack of knowledge about cost effective feed production.
- Insufficient access to support services, and ineffective services that are accessed.
- Lack of information about existing extension services, para/vets (e.g. costs of insemination services, vaccinations), and credit institutions.
- SSPs do not trust others in the value chain, and often do not trust other producers.
- HHs that deals with traders are not able to negotiate for a fair market price.a



### Collectors, chilling and processing factories:

- Huge unsatisfied demand of milk by processors such that plants are often running at 10% of capacity.
- Lack of awareness of possible cooperation with existing development projects, extension services and NGOs.

- Lack of information about actual milk production in the villages, or difficulty in leveraging knowledge to create adequate flow of milk supply.
- High costs of collection due to scattered SSPs, low volumes of milk and need to provide HHs with services
- High cost of delivery to market due to distance and transportation.
- Lack of transparency within contractual relationship between SSP and chilling and processing factories. Existing contracts do not have information about negotiated price of milk and its relevance to quality, transportation expenses and conditions of payment.



#### **Traders (formal and informal markets):**

- High effort to bring milk to markets, e.g. 6 collectors and 1/2 van pullers involved in delivery of 200 – 450 L of milk to a factory, on average 30 – 60 L a person.
- Adulteration of milk by some SSPs.
- Supply of milk irregular.
- Quality of milk irregular.
- Production groups difficult to manage, farmers may not cooperate with each other and often do not trust the trader.
- Demand of the formal market is much higher than the demand of informal market.
- Location and number of chilling plants is not optimal for many traders.
- Risk of milk spoilage is high.
- Inadequate and costly transportation, particularly in reaching remote char areas.

### Extension services, vets and paravets<sup>14</sup>:

- Low availability of existing human resources in extension and paravet services compared to the number of SSPs in these areas.
- Limited knowledge of extension services regarding certain aspects of farm management such as farm profitability: e.g., calculation of milk production costs or production of feed, purchase of feed at minimum price.
- Training and knowledge transfer skills need upgrading – particularly as it applies to conveying technical knowledge to SSPs.
- CARE has a number of paravet programs with mixed success; these are to be analyzed and the best model adapted to the [project funded by the Bill & Melinda Gates Foundation](#).
- Lack of information about cost effective feed composition.
- Confusing information about appropriate breeds, feeds and care techniques.
- Ineffective cold chain for vaccines.
- Farmers often not able or willing to pay for necessary services.



### Suppliers of animal healthcare drugs and A/I services:

- Limited number of services providers.
- Quality of services is low and therefore results not be forthcoming (e.g., repeated efforts for A/I).
- Location and availability to SSPs.
- Input supplies such as appropriate medicines are not always available.
- Ineffective cold chain for A/I

<sup>14</sup> This paragraph refers to services provided by government and NGOs.



### **Suppliers of feed and fodder:**

- Lack of information about existing producers and their needs.
- Inadequate technical knowledge regarding fodder and supplement combinations.
- Tendency to promote business may impair transfer of useful information to farmers re low-cost fodder production techniques.

### **Mobilizers of farmers into farmer groups (NGOs):**

- A challenge to mobilize large numbers of farmers into farmer groups.
- Need for monitoring of benefit to SSPs of participation in groups: access to training, credit, collection, services.
- NGOs require capacity building to participate more fully in mobilization and knowledge transfer.

### **Regulatory activities/ government bodies:**

- No dairy development board, milk marketing board, or government regulations or support of the dairy industry.
- Highly inadequate supply of government extension services (as compared to poultry for example).
- Variability in delivery and quality of services – for example, some SSPs in Bogra appear to have reasonable success with government A/I services (close to centre).
- Reduction in production of vaccines in recent years, and duties on imported vaccines.
- Tariffs up to 25% on imported feeds.
- Regulation or licensing of private A/I providers appears to inhibit participation by a more effective private sector (further investigation needed into Ezab).
- Lack of dissemination of information about available extension services and drug provision to SSPs.
- Useful information from the BLRI on feeds, breeds and animal care does not appear to be transferred to DLS (Department of Livestock) or to government extension services.

**b. What strategies could be devised to overcome each of the bottlenecks?**

- CARE's role as facilitator should focus on knowledge transfer, horizontal and vertical linkages strengthening, group mobilization and empowerment, enabling environment, and special activities related to women and remote producers.
- In order to overcome value chain bottlenecks, CARE will need to partner with various value chain stakeholders and facilitate change. This will be subject to further elaboration as the project unfolds.

**c. Which constraints if overcome will have the greatest benefit for small-scale producers? Listed as solutions here:**

- Knowledge of and access to suitable and affordable feeds.
- Knowledge of and access to appropriate and affordable animal healthcare.
- Knowledge of and access to improved breeds.
- Knowledge of and motivation to practice proper animal care and hygiene.
- Access to profitable and effective markets through a range of market channels.

**d. Which constraints are lead firms willing to invest in overcoming?**

- Lead firms are willing to invest in market access – the development of collection centres<sup>15</sup>, training of collectors, and establishment of transportation systems.
- Lead firms currently also provide technical assistance and subsidized animal healthcare but it is unlikely that this will be sustainable over the longer.

**e. Which constraints can be overcome by program activities?**

- The program activities will facilitate change in the areas of feeding, healthcare, breeds, group formation and empowerment, and enabling environment.

**f. Are there any constraints that cannot be overcome and still benefit small-scale producers?**

- It is unknown if remote HHs can be reached in a way that is economically viable. CARE will have to pilot various approaches and develop cost-effective commercial strategies.

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<sup>15</sup> The research team leader and lead consultant both were told by officials of Rangpur Dairy that if SSPs can consolidate more than 500 L of milk daily, the factory will collect from them and install a chilling plant. Such arrangements need further negotiation, exploration and even formal agreements as appropriate.

The following table presents an analysis of value chain actors and challenges in the dairy value chain. It suggests possible project strategies to deal with constraints and take advantage of opportunities.

**Table 3: Main Challenges and Opportunities in Dairy Value Chain<sup>16</sup>**

Part of the Chain	VC Actor	Value Added, BTK <sup>17</sup>	Explanations	Main Challenges	Main Opportunities	Project responses
Production of Milk	Small Scale Producers	Yearly Production costs <sup>18</sup> – 8'787 BTK Yearly Income 9'948 BTK Yearly Gross Margin 1'161 BTK Production costs per L 18.31 Profit per L 2.42 Costs to collector 20.73	Lactating period around 210 days. During dry season, 90 days * 1,7 <sup>19</sup> L = 153 L; during milking period 120 days * 2.7 L = 327 L. Total: 480 L Income: Dry season 153 L * 184 BTK = 2754 BTK; Milking period (higher fat) 327 L * 754 BTK = 246558 BTK. Total: 9'948 BTK or per one liter 20.73 BTK. Costs: Dry period – rice straw 90 days * 5 kg * 4 BTK = 1 800 BTK, milking period – rice straw 120 days * 5 kg * 4 BTK and concentrate 120 days * 0.5 kg * 22 BTK = 3'720 BTK. Other 5 months like in dry period 3'000 BTK. Vaccination and de-worming – 267 BTK. Total Costs per year – 8'787 BTK. Costs per One liter 18.31 BTK Profit per one liter 2.42 BTK, Profitability 12%	Small production volume by single SSP Small surplus to market Mobilization and training of high number of SSPs Lack of skills and knowledge for production of milk and breeding of cows Natural disasters as typhoon and floods	Mobilization of SSP into groups through FFs and local PNGOs Provision of training and consultancy by local lead farmers, extension services, and paravets. Participate in work with SSP breeding service providers and input suppliers Assist local credit institutions.	Selection of SSP (distance, volume and quality of milk) The project forms groups through its FFS and involves local PNGOs in mobilization of SSP The project works with local lead farmers and possibly extension services and paravets in training and consultancy of SSP The project supports local credit institutes in financing of breeding activities of SSP

<sup>16</sup> All calculations in the table based on annual milk production of one SSP.

<sup>17</sup> Exchange rate taken for calculation is 1USD = 70 BTK

<sup>18</sup> Production costs do not includes other costs and repairing of stable, and other

<sup>19</sup> Actual figure taken from the study

<sup>20</sup> Actual from the study

Part of the Chain	VC Actor	Value Added, BTK'18	Explanations	Main Challenges	Main Opportunities	Project responses
Collectors	Private service providers	Transportation Costs 288 BTK Gross Margin is equal to commissions for collection and it is 312 BTK Costs to chiller 21.98	Transportation costs depends on a distance and varies from 0.35 to 0.80 BTK per liter per km. The costs for 20 km distance are around 0.60 BTK. The total transportation costs for 480 L = 288 BTK Collecting expenses are based on commissions 0.65 BTK per one liter. For 480 L the commissions are 312 BTK Total collecting costs are 600 BTK. Total costs per one liter of milk 1.25 BTK. Profit per one liter 0.65 BTK, Profitability 3% (commissions 312 / total purchase of milk from the SSP 9'948)	Small volume of collected milk Non homogeneous quality Dealing with high numbers of SSP Short time for delivery milk to chilling and processing factories (because of perishability of milk)	Contracts between groups of SSPs and collectors Building of chilling facilities in places with high volume of milk production Development of routes for milk collection Introduction of proper care of cows and milking resulting in homogeneous product	The project facilitates establishment of relationships between SSP groups and collectors (who can be members of those groups) Involvement of chilling and processing factories in payment to collectors for their work Facilitation of establishment of contractual relationships between SSP groups, collectors and chilling/processing factory
Chilling factory	Private company	Chilling and transport costs are 528 BTK Costs to processor 23.08	Chilling costs are 0.60 BTK per one liter. Total costs are 288 BTK. These costs include all processing and labor costs. Delivery to processing factory by lorries. Transport expenses varies from 0.5 to 1.0 BTK per liter and depend on distance. Here for the calculation taken 0.5 BTK/L. Transport costs 240 BTK. Total costs at this processing stage are 528 BTK. Costs per one liter of milk is 1.10 BTK	Unsatisfied demand for milk Inefficient transport expenses (trucks deliver milk to processing factory and come back empty) Unpredictable electricity cuts	Increase of volume supplied to chilling factory	The project supports establishment of transparent and trustful relationship between chilling factory and other VCA The project facilitates of establishment new chilling facilities in other places with high numbers of SSPs

Part of the Chain	VC Actor	Value Added, BTK'18	Explanations	Main Challenges	Main Opportunities	Project responses
Processing Factory and Sales to Final Consumer	Private company	Production and distribution costs 4'026 BTK Taxes and VATE 5'584 Total costs 9'610 Costs to the shop 37.64 Profit per 1 L of milk for processing factory and retailer 18.76 BTK and profitability 33%	Processing costs (including labor, amortization of equipment, etc.), per one liter of milk is 1.10 BTK (incl. 25% additional expenses for flavored milk). Packaging material incl. labor per 1 L is 3 BTK. Transportation costs of final products to shops and supermarkets in Dhaka around 1.0 BTK per 1 liter. Total Production costs are 2'448 BTK and per one liter are 5.10 BTK. Distribution costs in Dhaka around 1.0 BTK per liter. Total production and distribution costs 2'926 BTK or 6.10 BTK per liter. Taxes and VET (~15% of income) - 4'061. Total costs 6'989 or per L 14.56 BTK. Production out 480 L: 60% is UHT milk (3.6% fat) - 288 L or 576 packs (0.5 L) and 40% of flavoured milk (0.7% fat) - 192 L or 960 packs (0.2 L). Income: sales of UNT milk 12'672 BTK (576 packs * 22) and flavoured milk 14'400 BTK (960 packs * 15), in total 27'072 BTK. Income per one L of milk 56.40 BTK. Gross margin: Income - costs of milk-chilling and transport costs - processing and distribution costs-taxes and VET (~ 15% of income) = 26'063 Profit per L 18.18 BTK and profitability 32%	Unsatisfied demand for milk, unloaded processing capacity and high processing costs Low quality of milk Inefficient transport expenses (trucks deliver final products to urban area, e.g. Dhaka and come back empty)	Increase of milk volume supplied to the processing factory Development of routes of milk collection from collecting centers and chilling factories	The project supports establishment of transparent and trustful relationship between processing factory and other VCA The project facilitates of establishment new chilling facilities in other places with high numbers of SSPs Involvement of processing factory in payment to collectors for their work Facilitation of establishment of contractual relationships between SSP groups, collectors and chilling/processing factory Support negotiation of fair price for milk produced by SSP

## 2.6 Potential Socio-Economic and Environmental Impact

### Summary of Findings

Main Environmental Challenges	Potential Solutions
SSPs lack knowledge of appropriate farm management – disposal of carcasses, composting of dung, cleanliness of stable, size and location of stable, disease pathogens and contagion.	SSPs trained on and use sound environmental practices by lead farmers and PNGOs who are trained by CARE. Simple training materials prepared. Other forms of dissemination used such as radio and billboards. Paravets reinforce teachings through embedded advisory services.
Knowledge of animal management with an emphasis on hygiene.	SSPs trained on animal management by lead farmers and local PNGOs who are trained by CARE.  Simple training materials prepared.  Other forms of dissemination used such as radio and billboards. Paravets reinforce teachings through embedded advisory services.
Lack of overall knowledge and access to environmental information.	SSPs to be exposed to information via a range of media – billboards, radio programs, leaflets. CARE facilitates the development of such materials with selected stakeholders.
SSPs are not organized into groups to take advantage of potential training and other services.	CARE to work with SSPs via lead farmers and PNGOs/mobilizers to form groups to access training and other services.

#### Research Questions

The Plan (Annex 1) did not propose specific questions for socio-economic impact as this was adequately covered in other sections of the research. Questions for environmental impact have been partially answered in objective 1.A, but more details are provided here.

- 57% of s HH also raises poultry and 43% have goats – this requires additional attention to hygiene and animal health issues.
- 96% have less land now for grazing of cows than they have had in the past and in average they have to go for grazing for 1.1 km away.
- 91% have clean water for feeding and cleaning of cows.
- 61% of HH keep cows at home when they do not graze them and 23% in bathan and 11% in a separate house
- 49% of HH bury of cows dung, 27% sell it and 21% dry it for fuel.
- The main weather shocks for responding HHs are floods (49%), storms (24%), and the rainy season (23%).
- Ag experts indicated that the main environmental issues related to cows are the disposal of dung and carcasses.
- Dung is best composted for fertilizer or dried for fuel.

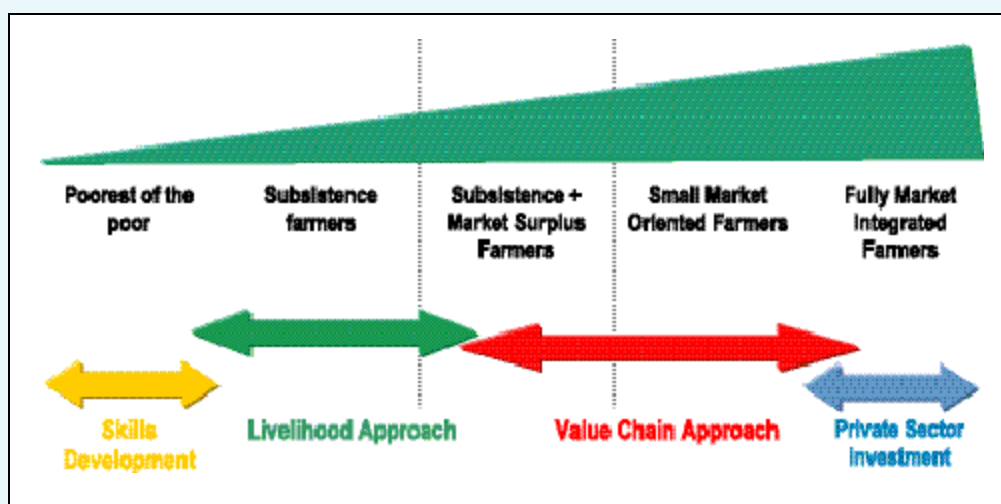


- Carcasses can carry disease, and if buried untreated, cause threat to the groundwater.
- Project staffs have observed the practice of HHs to skin cattle and throw them in the river.

### ***A Technical Note on Economic Targeting of Clients:***

In the light of Strengthening the Dairy Value Chain in Bangladesh Project, the target group can be further divided into the survival poor<sup>21</sup>, the entrepreneurial poor<sup>22</sup> and the employers of the poor<sup>23</sup>. It can be assumed that the second and third category of the rural poor will profit from the project activities first of all. However, the project tries to give chances to farmers with small production resources and who live relatively far away from the potential markets.

**Graph 3: Division of Farmers for Different Development Aims**



### **Program (Project) Interventions**

In the first stage of the project, there will be a greater focus on clients living closer to chilling centres and who have 2-3 cows. Piloting of more complex project components such as crossbreeds will begin with more experienced farmers who own 4-5+ cows. Farmers in more remote areas will be brought into the project as it progresses and as innovative transportation systems have been trialed and proven cost-effective.

<sup>21</sup> Survival poor: those poor whose first priority is to improve their insecure livelihood, both through subsistence and market oriented production

<sup>22</sup> Entrepreneurial poor: those poor who have secured their basic livelihood and engage in market oriented production to further improve it

<sup>23</sup> This can be micro, small and medium-sized dairy farms: those who have entrepreneurial spirit and management experience and oriented at market production

### 3. Program Risks

A clear understanding of risks and a defined risk mitigation strategy are critical elements of any value chain development program. The following table examines key risks that will exist in working towards overcoming value chain bottlenecks. Suggestions for risk mitigation are included.

Key Program Risks	Potential Solutions
Production: SSPs are unable to upgrade quality and quantity of milk production.	Pilot alternate approaches for feeds, breeds, and healthcare in case one or more approaches is not successful.
Support Services: Commercial service providers do not adjust services to meet needs of SSPs	Service delivery and availability improved as per objective 1.A.
Market Access: SSPs are not motivated due to low profitability of milk. Processors do not follow through on commitments to establish chilling plants.	SSPs are organized into groups to consolidate milk. CARE works with its FFs, lead farmers, and local PNGOs/mobilizers to form producer groups. See objectives 3 and 4.
Value Chain Relationships: Distrust amongst VC actors results in intransigent bottlenecks.	Trust is promoted through the establishment of win-win relationships. Lead farmers are trained in negotiation and mediation as appropriate.
Enabling Environment: The government does not improve support of the dairy sector, and other NGOs distort the market.	Government support is improved key areas as per objective 4. Liaise with other NGOs working in the dairy sector and discuss market distortion and sustainable development.
Gender: HHs are not receptive to women's needs and concerns.	Address issues as in objective 3.
Natural Disasters: Program success is compromised by natural disasters, particularly flooding in Char areas.	CARE to conduct a focused study of Char areas to understand the nature of risk and potential risk mitigation strategies.
Displacement: Players in informal market channels are displaced by the development of formal markets.	Baseline survey to include information on informal market actors; M&E to follow up on their situation.
HH Well-being: The price of milk is driven up by formal market demand and HHs cannot afford fresh milk; consumption of producing HHs is reduced in preference to sales.	Collaboration with other projects and PNGOs that are focused on HH health, and particularly maternal well-being as well as that of children, especially girls. Awareness raising as appropriate through a variety of media.

## 4. Response to Overarching Objectives

The specific objectives of the project are to:

- Improve milk collection systems in rural and remote areas
- Improve access to inputs, markets, and services by mobilizing groups of poor farmers, producers, and char dweller
- Improve the milk transport network
- Ensure access to quality services at the producer level
- Improve the policy environment

The findings in each of the above sections provide detailed information on constraints, opportunities and potential solutions that will enable CARE to meet all project objectives.

## 5. Potential Approaches

Key overarching approaches of the first project phase leading to the successful achievement of project objectives can be summarized as follows:

1. Work with a variety of SSPs united into informal groups which have sufficient production resources and decision making authority. In order to develop strong farm management, those with more cows (sign of prosperity) and closer proximity to chilling centres should be targeted at the outset.
2. Utilize lead farmer models to build capacity at the grassroots level in technical areas as well as marketing/sales, and negotiation and mediation of relationships. Lead farmers – both women and men – will be more sophisticated, capable of learning technical information and transferring to producer groups, and able to act on behalf of the group in dealing with market channels.
3. Develop sustainable commercial services as much as possible to ensure ongoing availability beyond the life of the project – paravets, input suppliers, A/I services, collectors.
4. Empower women and women's groups to be active participants in the dairy value chain. At the same time, develop youth as future leaders and service providers (e.g. paravets).
5. Support FFs, lead farmers and PNGO's in working with SSPs to mobilize group formation, develop leadership skills, monitor knowledge acquisition and skills transfer, and provide training modules as assigned by the project.

6. Involve new VC supporters such as input (drug) suppliers, insemination (natural and artificial) services and extension services. Aim to build strong institutional relationships. Be open to new opportunities that present themselves as the project develops.
7. Assist in developing relations between Value Chain Actors and supporters, and provide context appropriate and realistic modes of cooperation. Train lead farmers in negotiation and mediation.
8. Allow for space and resources to develop new dairy products, introduce new feeds and fodder, pilot crossbreeds, and experiment with new approaches and models. This relates especially to stimulating SSP development, extension and microfinance providers, and processors and sweet-makers.
9. Concentrate project activities in the first year on a few market channels where success is realistic – select HHs that are close to chilling plants and have reasonable resources.
10. Form working groups consisting of CARE Bangladesh project staff, representatives of NGOs, extension services, other SPs, decision makers of VC operators for the regular exchange of information, monitoring of planned activities, and increasing ownership of VC management.
11. Arrange for sufficient events for exposure, exchange and learning by key VC actors and supporters.
12. Explore a range of media such as leaflets, radio, TV and billboards to maximize the transfer of knowledge and reinforce information made available through other sources.
13. Investigate and pilot new technologies – transportation, cooling, milk testing – to develop more efficient value chains that are able to reach more marginalized producer groups.

## 6. Glossary of Terms

### **Business environment / investment climate**

Business environment means the broad legal, regulatory and infrastructure conditions under which enterprises operate in a country. These are conditions at the *macro level*. They include macroeconomic and political stability, an effective governance and judicial system in general, as well as the regulations specifically relevant for doing business, such as well-defined property (e.g. land and water) rights, business registration and employment regulations, financial institutions, the transport system, and the efficiency of administrative procedures. There are general conditions of the business environment cutting across many sub sectors, as well as conditions specific for each value chain.

### **Business linkages**

VC operators relate to each other both horizontally (among enterprises at the same stage of the value chain, pursuing the same type of activity) as well as vertically (between suppliers and buyers of product). Vertical business linkages can range from accidental market exchanges to a full coordination of activities regulated by contracts (see *market relationships*). Horizontal business linkages range from informal networks to associations and business membership organizations (BMO).

### **Commodity**

Commodities are bulky (natural-resource based) product, that are internationally traded either as a raw product or after basic industrial processing. The most important agricultural commodities include grains (rice, wheat), green coffee, palm oil, cotton or white sugar. The value chains of commodities mostly are loosely integrated, although trade may be concentrated. In terms of increasing the value-added an interesting strategy is “decommo-dification”, that is the diversification of conventional commodities into high-value variants (e.g. specialty coffee, specialty rice, aromatic cocoa or organic cotton).

### **Contract Farming**

A form of production in which farmer and buyer enter into a contract in advance of the growing season for a specific quantity, quality and date of delivery of an agricultural output at a price or price formula fixed in advance. The contract provides the farmer an assured sale of the crop. Sometimes, the contract includes technical assistance, credit, services, or inputs from the purchaser (see *embedded service arrangement*).

### **Embedded service arrangement**

In an embedded service arrangement operational services are delivered in combination with a basic business transaction (sale of products or loans). The basic idea is to finance the service as part of the business transaction, e.g. linking technical advice to the sale of inputs. Embedded arrangement may include other business partners as the service providers, such as input dealers or processing companies, or professional service providers as third parties.

### **Facilitator / facilitation**

Facilitators are initiators pursuing a public interest in economic development (such as the *pro-poor growth* goal). This includes government programmes for private sector development as well as development projects funded by international donors. Contrary to the *VC actors*, such programmes and projects are funded publicly (by tax money). They remain outsiders to the regular business process and restrict themselves to temporarily facilitating a chain *upgrading* strategy. Typical facilitation tasks include creating awareness, facilitating joint strategy building and action and the coordination of support activities.

### **Interventions (to promote value chains)**

Interventions are temporary actions of external *facilitators* aimed at mobilising and/or joining *value chain actors* and building their capacity thus promoting change in the value chain. The idea is that an external intervention triggers an internal change of the system, in this case the behaviour of VC actors.

### **Leverage point**

An element in a system, where a small intervention or change can yield large effects in the overall system.

### **Macro level**

The macro level refers to the public agencies and institutions constituting the *business enabling environment*. Typically, the macro level of a *value chain* is made up of national, regional and local government, the judicial system and major providers of public utilities (especially roads and water supply). The macro level determines the general cost of doing business cutting across different value chains and *sectors* of the economy.

### **Markets / market relationships**

A market is the interaction of demand and supply (buyers and sellers) of particular types of goods or services. The exchange rules differ depending on the character of the good traded (e.g. *commodities*, perishable products, investment goods or services). There are different forms of market relationships: The basic market transaction is a



once-off purchase of a product displayed by a seller, e.g. in a traditional street market (so called arms-length market relationship in a “wet market”). Sophisticated forms of market relationships include order contracts or regular subcontracting.

### **Margin**

Profit margin or price mark-up: The *gross (profit) margin* is the difference between “sales revenue” and “cost price”, expressed as percentage of the cost price or as discounted percentage of the sales price. The *net (profit) margin* is the same, excluding VAT (Value Added Tax).

### **Micro level**

In a *value chain*, the micro level includes the *VC operators* and the *operational service providers* taken together.

### **Meso level**

In a *value chain*, the meso level includes all chain-specific actors providing regular *support services* or representing the common interest of the *VC actors*. Functions at the meso level include, for example, public research and technology development, agreement on professional standards, promotional services, joint marketing or advocacy. They are taken by *support service providers*.

### **Operational services / operational service providers**

Operational services are those services that either directly perform *value chain functions* on behalf of the *VC operators* or are directly related to them. Operational services therefore are business-to-business (B2B) services. They include value chain specific services as well as generic business services such as, for example, accounting services.

### **Product**

This is a generic category comprising physical, tangible products as well as services sold to costumers. The value chain is defined by a product or group of products, e.g. a tomato value chain or a fresh vegetable value chain.

### **Productivity**

The amount of output per unit of input, e.g. the quantity of a product produced per working hour or per unit of land.

### **Sector / Sub-sector**

The economy can be divided into sectors following different criteria. Here, the term “sector” is defined according to broad product *market* categories. These include, for

example, the “agri-food sector”, “forestry”, the “apparel sector” or the “tourism sector”. Each sector comprises the companies operating in the respective market as well as the specific market rules. Sectors can be further broken down into sub-sectors by differentiating into specific product or service markets, e.g. “horticulture”, “non-timber forest products” or “ecotourism”. Further differentiating these markets leads to the definition of a *value chain*. However, there is no generally accepted classification of sectors, sub-sectors or value chains. In practice, terms often overlap. The term sector (or economic sector) is a higher-order term than sub-sector and aggregates several sub-sectors.

### **Services**

Services are economic goods delivered by a service provider to a client. Services differ from physical products, because service delivery and consumption are closely interconnected. One important distinction is between private services delivered to private clients or to enterprises (business-to-business services), and public benefit services delivered to groups of people in their collective interest. In *value chains*, it is necessary to distinguish between *operational services* and *support services*. Another category is membership services provided to insiders of an organisation, e.g. a cooperative, association or board.

### **Support services / support service providers**

Contrary to the *operational services*, support services do not directly support (or perform) the basic functions in a *value chain*. Instead, they refer to general investment and preparatory activities benefiting all or at least several *Value Chain Actors* simultaneously. Support services therefore provide a collective good shared by the VC actors. Typical examples are the setting of professional standards, provision of sector-specific information, joint export marketing, the generation of generally applicable technical solutions, or political advocating. Support services are often provided by business associations, chambers or specialized public institutes.

### **Supply chain / supply chain management**

The basic concept of a supply chain is similar to the *value chain*. The difference is that the supply chain refers to sequence of (upstream) sourcing and (downstream) marketing functions of individual enterprises, mostly of *lead companies*. Therefore, supply chain management is a business management tool rather than a development concept. It is concerned with logistics rather than market development.

### **Transaction cost**

Apart from the cost of production and marketing at each stage of the value chain, the market relationships between suppliers and buyers engender “transaction cost”. They include the cost of search for business partners, for seeking information and screening

the market, and for negotiating, monitoring and enforcing contracts. High transaction costs often are the result of market inefficiencies, such as low market transparency, lacking grades and standards or deficiencies in the business environment. They can be brought down by organizing markets and by improving value chain coordination.

### **Value added**

Value added is a measure for the value created in the economy. It is equivalent to the total value generated by the *operators* in the chain (chain revenue = final sales price \* volume sold). The value added per unit of product is the difference between the price obtained by a *VC operator* and the price that the operator has paid for the inputs delivered by operators of the preceding stage of the value chain and the intermediate goods bought in from suppliers of inputs and services who are not regarded as part of the value chain. In short: “The worth that is added to a good or service at each stage of its production or distribution” (McCormick/ Schmitz). Part of the additional value created remains in the chain (= value captured), another part is captured by suppliers external to the chain

### **Value chain (VC)**

A value chain is

- a *sequence of related business activities (functions)* from the provision of specific inputs for a particular product to primary production, transformation, marketing, and up to the final sale of the particular product to consumers (the functional view on a value chain).
- the *set of enterprises (operators)* performing these functions i.e. producers, processors, traders and distributors of a particular product. Enterprises are linked by a series of business transactions in which the product is passed on from primary producers to end consumers.

According to the sequence of functions and operators, value chains consist of a series of chain links (or stages).

### **Value chain map / value chain mapping**

The value chain map is a visual representation (chart) of the *micro and meso levels* of the *value chain*. According to the definition of the value chain it consists of a functional map combined with a map of *VC actors*. Mapping can but does not necessarily include the *macro level* of a *value chain*.

### **Value chain promotion**

Promoting a value chains means supporting its development by externally *facilitating* a *value chain upgrading* strategy.

**Value creation / value created**

The additional value added as a consequence of value chain upgrading.

**VC actor**

This term summarizes all individuals, enterprises and public agencies related to a *value chain*, in particular the *VC operators*, providers of *operational services* and the providers of *support services*. In a wider sense, certain government agencies at the *macro level* can also be seen as VC actors if they perform crucial functions in the *business environment* of the value chain in question.

**VC operator**

The enterprises performing the basic functions of a *value chain* are VC operators. Typical operators include farmers, small and medium enterprises, industrial companies, exporters, wholesalers and retailers. They have in common that they become owners of the (raw, semi processed or finished) product at one stage in the VC. Thus, there is a difference between operators and “*operational service providers*”, the latter being subcontracted by the VC operators.

**VC supporter / support service provider**

Service Providers provide *VC support services* and represent the common interests of the *VC actors*. They belong to the *meso level* of the value chain.

**Vertical coordination / vertical integration**

As value chains upgrade the vertical coordination between the different stages of the value chain increases. This means that relationships are being regulated through agreements and written contracts. This coordination function is often taken by a *lead company*. At the extreme, the relationship between suppliers and buyers is “integrated” to the extent that the production and marketing functions of a supplier are entirely controlled by the buying company (also see *value chain governance*)

### 7.1 Annex 1: Work Plan for Field Research

Priority Area/ Cluster	Area Coverage				Survey Team A			Area Coverage			Survey Team B			Respondents
	District	Upazila	Union	Village	No	Date	IDI	District	Upazila	No.	Date	KII		
P1/C1	Rangpur	Gangachara	—	Changmari	A4	26/12	4	Rangpur	Gangachara	B4	28/12	4	Feed supplier, Collector, NGO, Credit service provider	
	Rangpur	Gangachara	Alombidhitor	Boraibari	A4	27/12	4				-		-	
	Nilphamari	Domar	Jorabarihat	Ajizarhat	A4	28/12	4	Nilphamari	Domar	B4	27/12	4	Processor, Transporter, Feed supplier, Traders	
	Nilphamari	Jaldhaka	Khutamara	W. Khutamara	A4	29/12	4	Nilphamari	Jaldhaka	B4	26/12	4	Vet, Chiller, Inseminator, Collector	
	Nilphamari	Jaldhaka	Kaimari	Saimari	A4	30/12	4							
P1/C2	Kurigram	Phulbari	Phulbari	Panimachkuti	A6	26/12	4	Kurigram	Phulbari	B6	28/12	4	Vet, Collector, Pharmacist, Trader	
	Kurigram	Phulbari	Kashipur	Shampur	A6	27/12	4							
	Kurigram	Rajarhat	Biddyananda	Sukhdeb	A6	28/12	4	Kurigram	Rajarhat	B6	26/12	4	Vet, Fodder supplier, Collector, Transporter	
	Kurigram	Ulipur	Pandol	Pandol	A6	29/12	4	Kurigram	Ulipur	B6	27/12	4	Vet, Fodder supplier, Collector, Processor	
	Kurigram	Ulipur	Pandol	Suttarvite	A6	30/12	4							
	Rangpur	Pirgacha	Kolyani	Nobdigonj	A8	26/12	4	Rangpur	Pirgacha	B8	26/12	4	Vet, Pharmacist, Inseminator, Fodder supplier	
	Rangpur	Pirgacha	Saola	Char Sivhdev	A8	27/12	4	Rangpur	Pirgacha	B8	28/12	4	Collector, Dairy processor (RD), Trader, Credit supplier	
	Gaibandha	Sunderganj	Belka	Ksamot Sadar	A8	28/12	4	Gaibandha	Sunderganj	B8	27/12	4	Trader, Fodder supplier, Collector, NGO	
	Gaibandha	Sunderganj	Tarapur	Tarapur	A8	29/12	4							
	Kurigram	Rajarhat	Chakirpasha	Pathok	A8	30/12	4							

Priority Area/ Cluster	Area Coverage				Survey Team A			Area Coverage			Survey Team B			Respondents
	District	Upazila	Union	Village	No	Date	IDI	District	Upazila	No.	Date	KII		
P1/C3	Naogaon	Badalgachi	Badalgachi	Kadibari	A3	26/12	4	Naogaon	Badalgachi	B3	27/12	4	Vet, Inseminator, UMS, NGO	
	Naogaon	Badalgachi	Balubhara	Bouchokal	A3	27/12	4							
	Naogaon	Mahadebpur	Mahadevpur	Dulapara	A3	28/12	4	Naogaon	Mahadebpur	B3	26/12	4	Vet, Pharmacist, Dairy processor, Credit supplier	
	Naogaon	Mahadebpur	Bhimpur	Bhimpur	A3	29/12	4							
	Naogaon	Manda	Proshadpur	Dariapur	A3	30/12	4	Naogaon	Manda	B3	28/12	4	Fodder supplier, Collector, Transporter, Trader	
P1/C4	Bogra	Sonatola	Balua	Balua	A2	26/12	4	Gaibandha	Saghata	B5	26/12	4	Vet, NGO, Collector, Credit service provider	
	Bogra	Sariakandi	Sariakandi	Charbatiachar	A2	26/12	4	Bogra	Sariakandi	B1	27/12	4	Pharmacist, Fodder supplier, Collector, Transporter	
	Bogra	Sariakandi	Hateshyarpur	Jorgacha	A2	27/12	4							
	Bogra	Dhunat	Nimgachi	Nimgachi	A2	28/12	4	Bogra	Dhunat	B1	28/12	4	Inseminator, Collector, Fodder supplier, NGO	
	Bogra	Dhunat	Vandarbari	Baisakhirchar	A2	29/12	4							
P2/C5	Dinajpur	Birganj	Sator	Prannagar	A7	28/12	4	Dinajpur	Birganj	B7	26/12	4	Vet, Fodder supplier, UMS, NGO (NDC)	
	Dinajpur	Birganj	Vognagar	Bijoypur	A7	29/12	4							
	Dinajpur	Chirirbandar	Satnala	Khamar Satnala	A7	26/12	4	Dinajpur	Chirirbandar	B7	27/12	4	Vet, Fodder supplier, Collector, Transporter	
	Dinajpur	Chirirbandar	Saitara	S. Polashbari	A7	27/12	4							
	Dinajpur	Khanshama	Satingar	Angerpara	A7	30/12	4	Dinajpur	Khanshama	B7	28/12	4	Vet, Fodder supplier, Collector, Trader	
	Nilphamari	Kishoreganj	Bahagili	Sonjabari	A9	26/12	4	Nilphamari	Kishoreganj	B9	28/12	4	Vet, Inseminator, Collector, Transporter	
	Nilphamari	Kishoreganj	Bahagili	Chadkhan	A9	27/12	4							
	Nilphamari	Sayedpur	Tamar Pukur	Osurkhai	A9	28/12	4	Nilphamari	Sayedpur	B9	26/12	4	Vet, Pharmacist, Fodder supplier, Collector	
	Nilphamari	Sayedpur	Bangalipur	Lakhonpur	A9	29/12	4	Nilphamari	Sayedpur	B9	27/12	4	Collector, Inseminator, Trader, Credit service provider	
	Dinajpur	Khanshama	Goadihi	W. Hasimpur	A9	30/12	4							



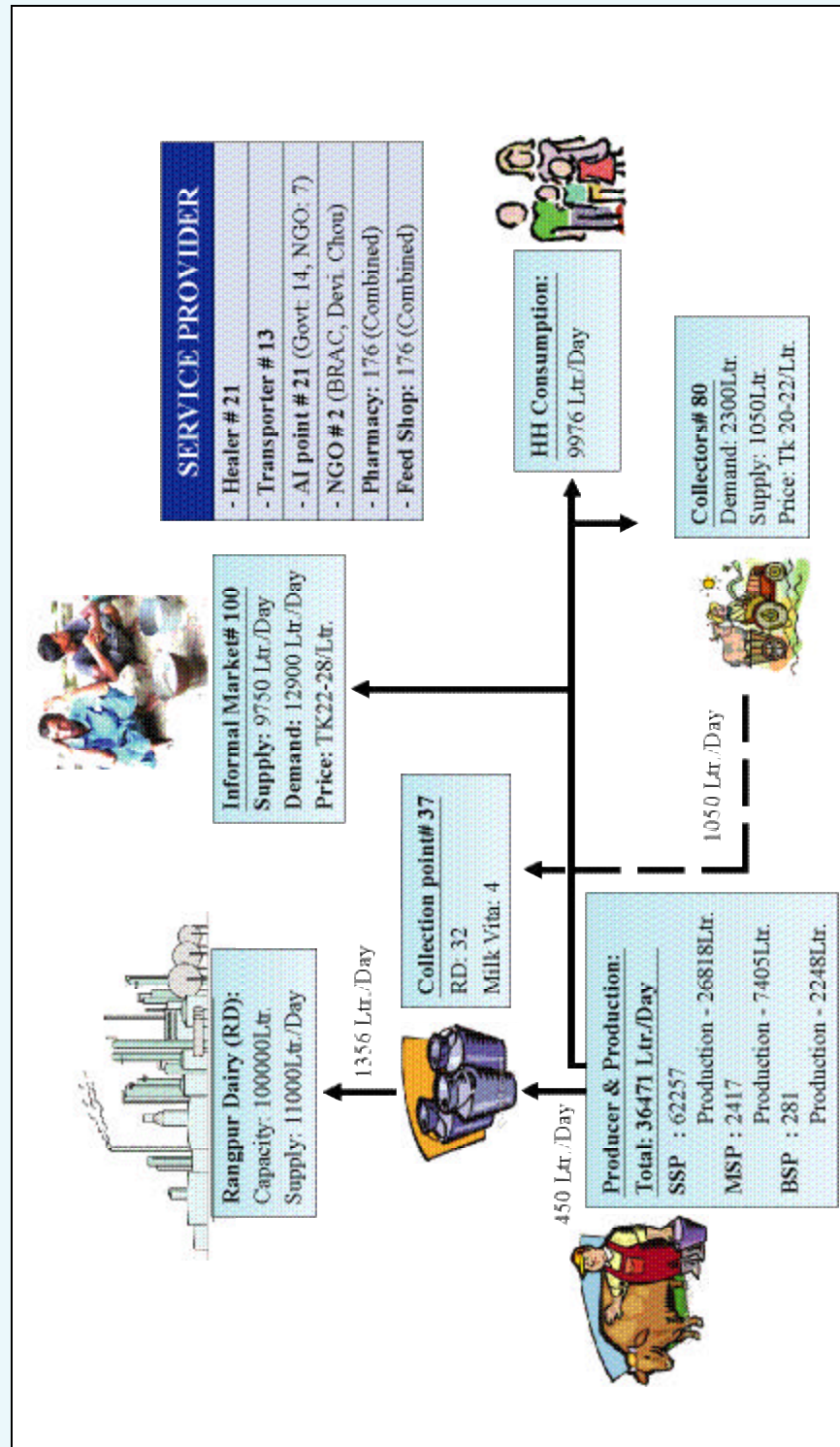
Priority Area/ Cluster	Area Coverage				Survey Team A			Area Coverage			Survey Team B			Respondents
	District	Upazila	Union	Village	No	Date	IDI	District	Upazila	No.	Date	KII		
P2/C6	Gaibandha	Palashbari	Mohodipur	Durgapur	A5	26/12	4	Gaibandha	Palashbari	B5	26/12	4	Vet, Collector, Dairy processor, NGO	
	Gaibandha	Palashbari	Polashbari	W. Goalpara	A5	27/12	4							
	Gaibandha	Gabindaganj	Sapmara	Sapmara	A5	28/12	4	Gaibandha	Gabindaganj	B5	27/12	3	Pharmacist, Collector, Trader	
	Gaibandha	Shagata	Shagata	Sathalia	A5	29/12	4							
	Joypurhat	Panchbibi	Sultanpur	Sultanpur	A1	27/12	4	Joypurhat	Panchbibi	B2	26/12	4	Inseminator, UMS, Collector, Trader	
	Joypurhat	Panchbibi	Balighata	Patabhuga	A1	28/12	4							
	Joypurhat	Joypurhat Sadar	Dhalohara	Bishnupur	A1	26/12	4	Joypurhat	Joypurhat Sadar	B2	27/12	4	Fodder supplier, Collector, NGO, Credit service provider	
	Joypurhat	Kalai	Kalai	Mulgram	A1	29/12	4	Joypurhat	Kalai	B2	28/12	3	Chiller, Vet, Collector	
	Joypurhat	Kalai	Amdai	Rurai	A1	30/12	4	Bogra	Sonatola	B1	28/12	2	Fodder supplier, Transporter	
	Bogra	Gabtali	Naruamala	Bahadurpur	SP	26/12	4	Bogra	Gabtali	SP	26/12	4	Fodder supplier, UMS, Collector, Dairy processor	
Total:							180					108		

## ***7.2 Annex 2: List of Individual Resources***

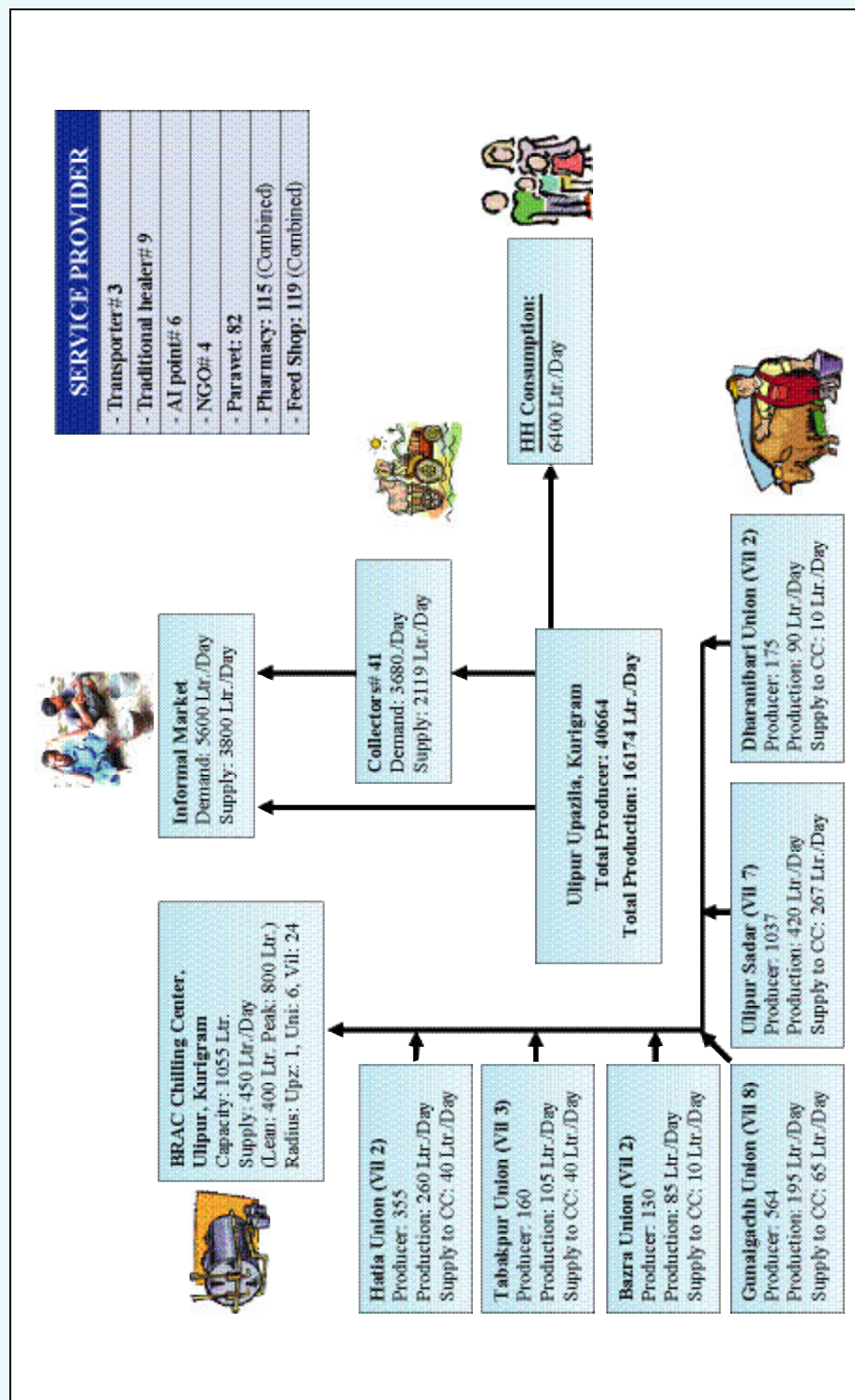
Dr. M.A. Barik, General Manager, Bangladesh Milk producers Co-operative Union Limited  
S.M.Fakhar-Uz-Zaman, Chariman, Rangpur Dairy & power trade Group  
Mohammad Ali, General Manager, Brac dairy & Food product  
Saif Ahmed, Ex Manager, Kazi Feeds Limited  
Dr. Mohammed Habibur Rahman, Poultry specialist, Bangladesh Agricultural University  
Dr.Khan Shahidul Huque, Chief Scientific Officer & Head, Bangladesh livestock research institute  
Dr. Ebadul Haque, Principal Scientific Officer (Training), Bangladesh Livestock research Institute  
Mostafa Nurul Islam, Regional Coordinator, LEAF, Inter Cooperation Bangladesh  
Ms. Stamina Halder, Associate Advisor, SAAKTI, Inter Cooperation Bangladesh  
Md. Ashraful Islam, Project Manager, Rangpur dairy & Food products Ltd.  
Dr. Md. Zahurul Islam, Poultry & Dairy Health Consultant, Veterinary Surgeon  
Dr. Jahangir Hossain, Deputy Manager (Society), Bangladesh Milk producers Co-operative Union, Bogra  
Mr. Asaduzzaman, Deputy Director, Ministry of Cooperative, Government of Bangladesh  
Dr. Kazi Md. Emdadul Haque, Chairman, Bangladesh Poultry Foundation  
Ms. Swapna Ghosh, Sweet Maker, Bogra  
Ms. Parul, Collector, Milkvita Cooperatives, Gabtoli, Bogra  
Ms. Mostom, local milk collector, Gabtoli, Bogra  
Ms. Azufa, House to house milk seller, Bujrupmari, Bogra  
Ms. Monowara Begum, House to house milk seller, Koipara, Bogra  
Ms. Shefali, House to house milk seller, Koipara, Bogra  
Mr. Hafizur Rahman, Executive Director, Development Cooperation, Birampur, Dinajpur  
Anna Minj, Gender Equity and Diversity Coordinator, CARE Bangladesh  
Mahbubul Islam Khan, Governance Coordinator, CARE Bangladesh

### 7.3 Annex 3: Drafts of VC Maps

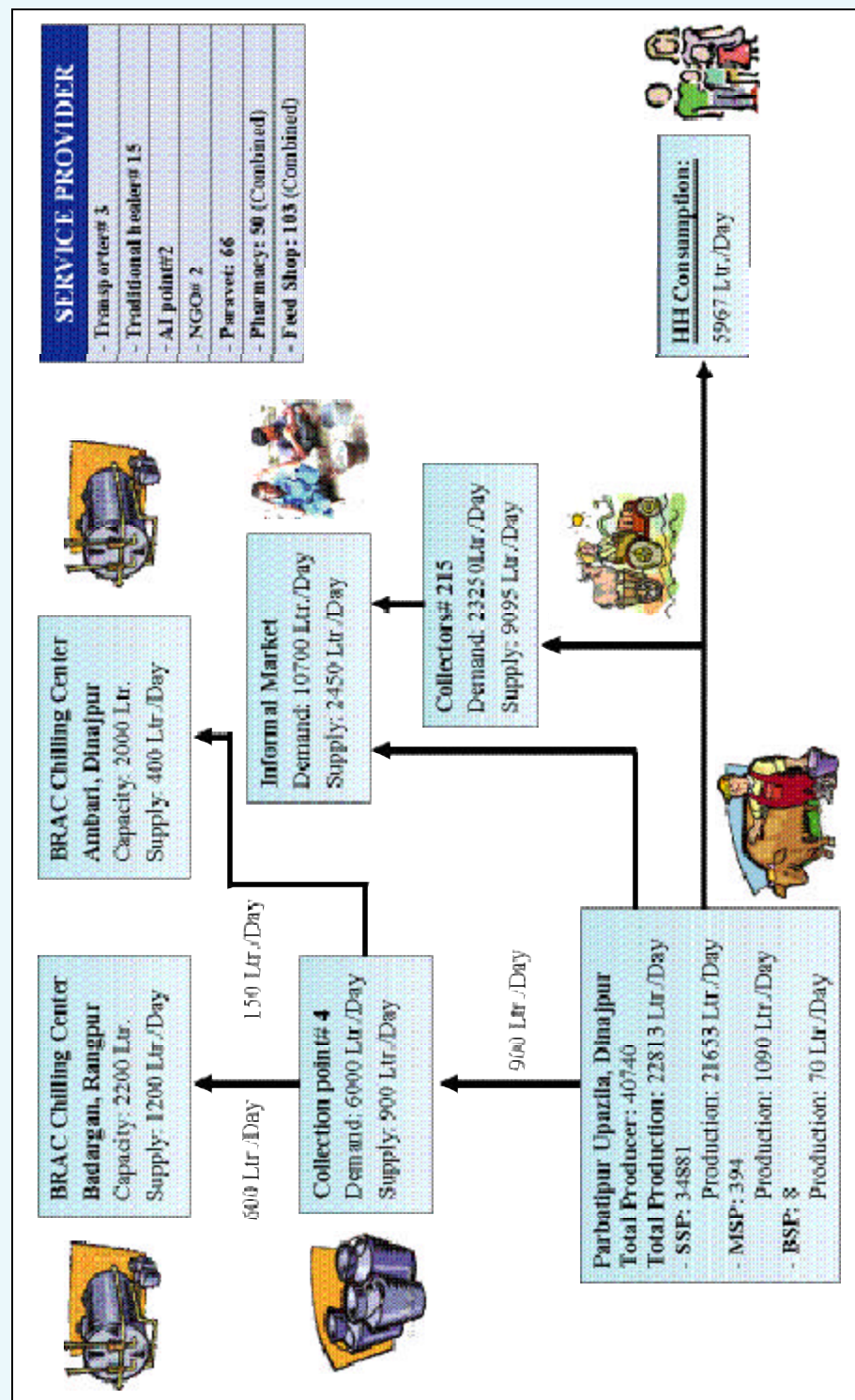
#### Mithapukur Upazila, Rangpur, Targeted: Rangpur Dairy (RD)



## Ulipur Upazila, Kurigram, Targeted: BRAC Chilling Center



**Parbatipur Upazila, Dinajpur, Targeted: BRAC Chilling Center**





## CARE-SDVC Project

Bogra Field Office

### Value Chain Map

Upazila: Badalgachi

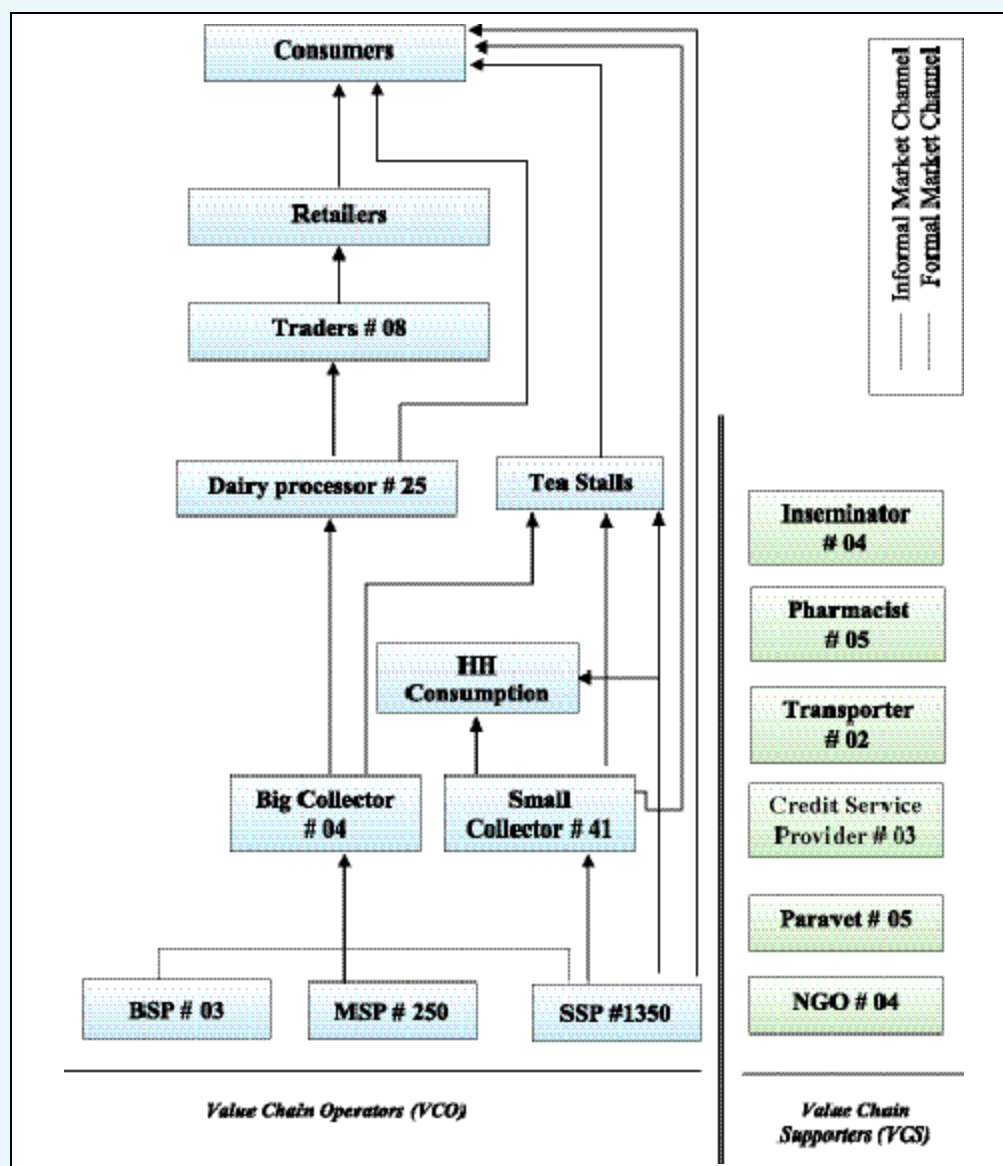
District: Naogaon

Priority: 1

Cluster: 3

Study Team: B3

Team Member: Durga Rani Saha/Mahfuzur Rahman



## CARE-SDVC Project

Bogra Field Office

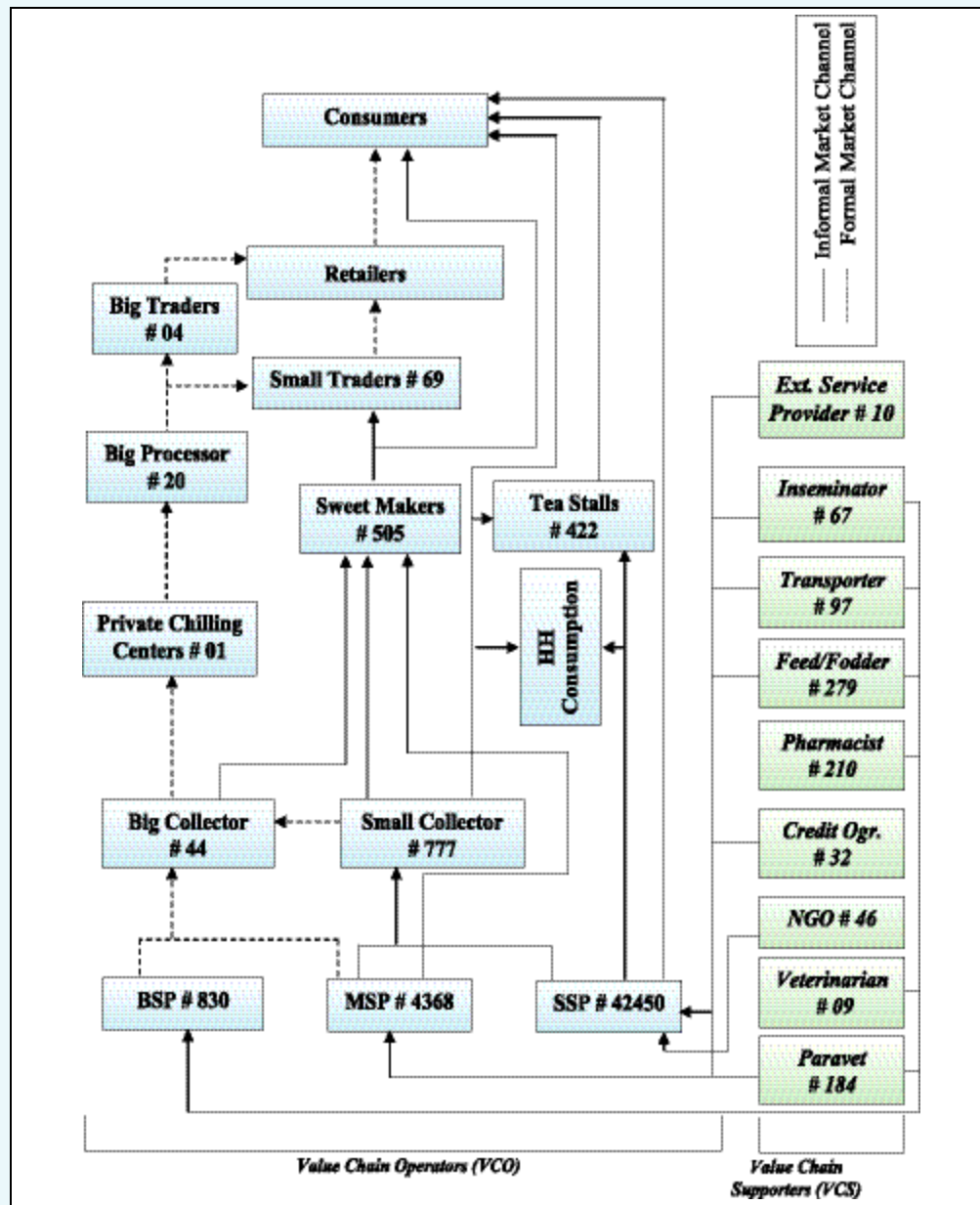
Value Chain Map

**Regional Integrated**

Upazila: 5

District: 3

Region: Bogra





## CARE-SDVC Project

Bogra Field Office

### Value Chain Map

District Integrated

Upazila: Manda, Mohadebpur, Badalgachi

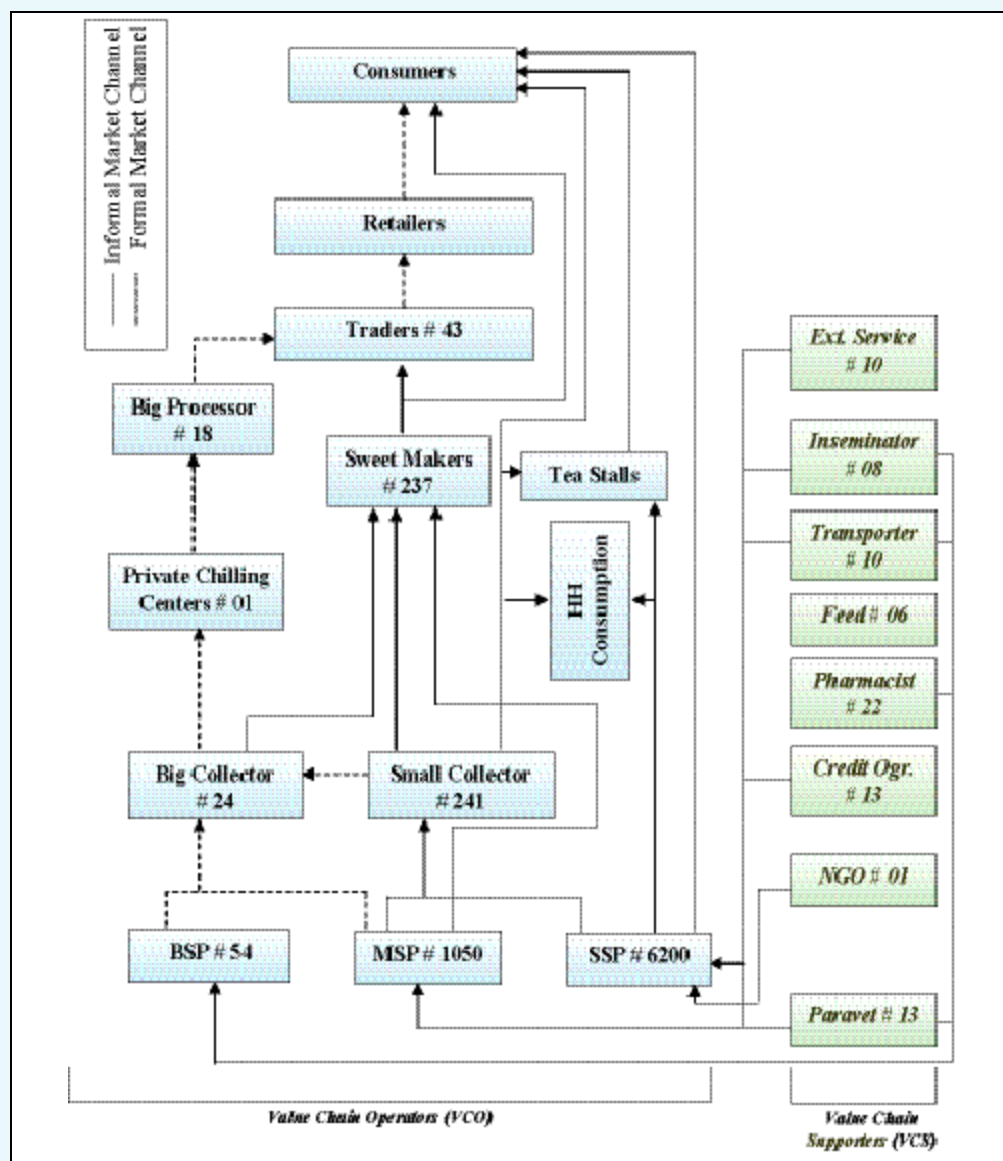
District: Naogaon

Priority: 1

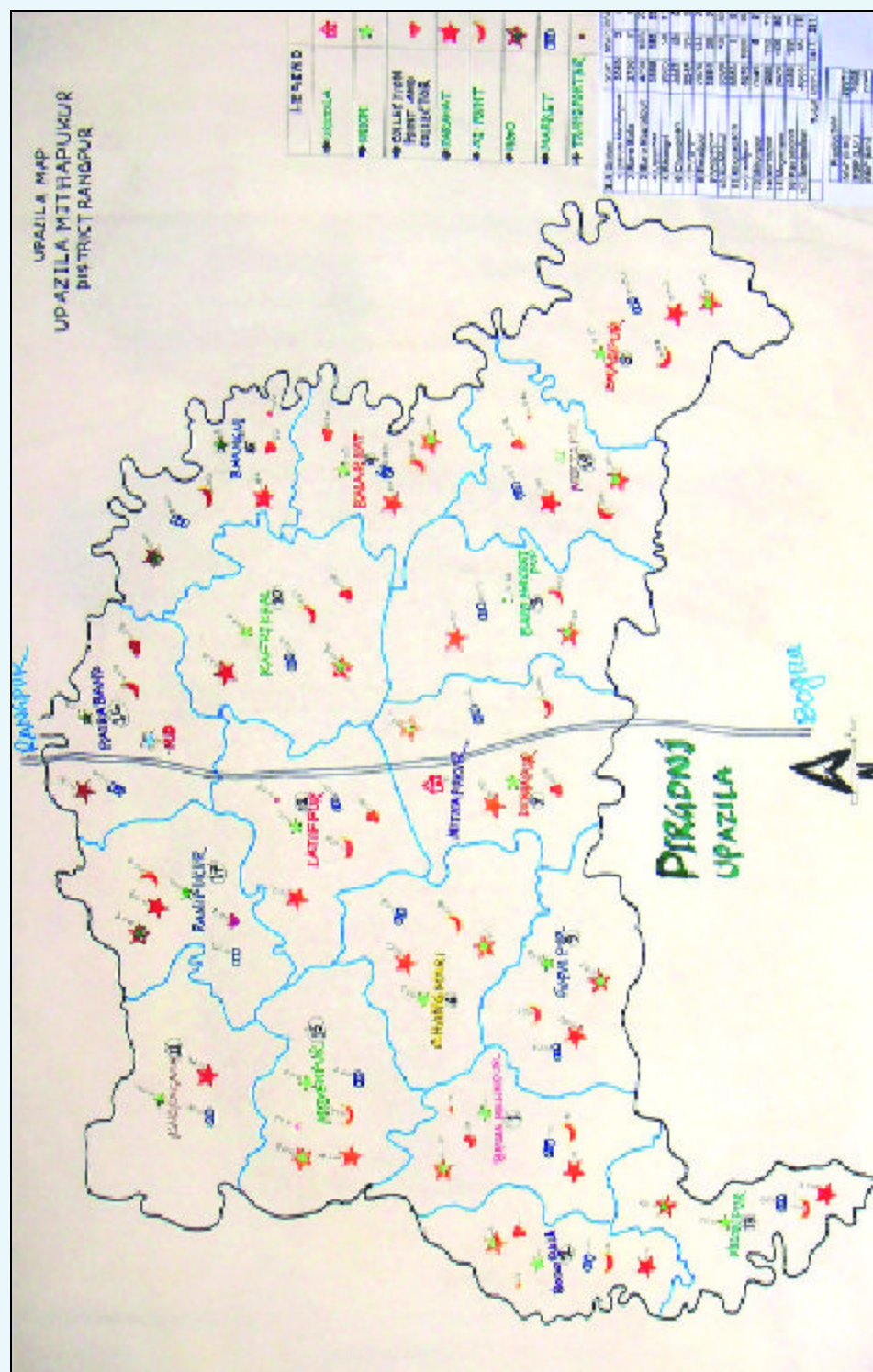
Cluster: 3

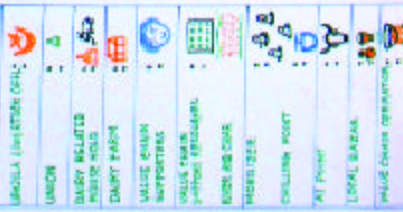
Study Team: B3

Team Member: Durga Rani Saha/Mahfuzur Rahman



## Mithapukur, Rangpur







**SAIDPUR OPAZMA**  
**NILPHAMARI DISTRICT**

**Legend**

- Water
- Water body
- Open Area
- Bar Road
- High Way
- High way
- UP
- Sub Post Office
- Post Office
- Police Station
- Health Center
- Bank
- High School
- UPA
- Market
- Public
- Government
- Land (oil)
- Water
- Temple
- Castle

The map is a hand-drawn representation of Saidpur Upazila in Nilphamari District. It features a network of roads and rivers. The map is divided into several colored regions, likely representing different administrative areas or land use types. The legend at the bottom provides a key for the symbols used on the map, including water, water bodies, open areas, roads, highways, police stations, post offices, health centers, banks, schools, markets, public buildings, government buildings, land (oil), water, temples, and castles. The map is drawn on a grid paper.

#### 7.4 Annex 4: Accumulative Chilling Plant Information

RANGPUR					
Brac Dairy:					
SL#	Name of center	Thana	District	Capacity/ day	Radius Covered
1	Razarhat	Razarhat	Kurigram	1000 Lit.	17 km
2	Ulipur	Ulipur	Kurigram	1000 "	18 "
3	Jaldhaka	Jaldhaka	Nilphamari	1000 "	25 "
4	Dimla	Dimla	Nilphamari	1000 "	18 "
5	Nilphamari	Nilphamari	Nilphamari	2000 "	16 "
6	Badarganj	Badarganj	Rangpur	2000 "	22 "
7	Pirgonj	Pirgonj	Rangpur	1000 "	24 "
8	Sadullapur	Sadullapur	Gaibanda	1000 "	26 "
9	Sagata	Gaibanda	Gaibanda	1000 "	20 "
10	Chiribandor	Chiribandor	Dinajpur	2000 "	27 "
11	Birgonj	Birgonj	Dinajpur	2000 "	20 "
12	Ambari	Chiribandor	Dinajpur	2000 "	17 "
13	Goragat	Goragat	Dinajpur	2000 "	15 "
14	Birampur	Birampur	Dinajpur	2000 "	20 "
15	Razarhat	Razarhat	Kurigram	1000 "	17 "
16	Ulipur	Ulipur	Kurigram	1000 "	18 "
17	Jaldhaka	Jaldhaka	Nilphamari	1000 "	25 "
18	Dimla	Dimla	Nilphamari	1000 "	18 "
Milk Vita:					
19	Rangpur, Rangpur	Taragonj, Badarganj, kaunia, Pargachha, Mithapukur & Syedpur.		20,000 "	40 "
20	Chirirbandar, Dinajpur	Gangachara, kishorganj, Birgnoj & Parbotipur'.		5,000 "	"
21	Domer, Nilphamari	Dimla, Jaldhaka & Dehironj		5,000 "	"

SL#	Name of center	Thana	District	Capacity/ day	Radius Covered
<b>Rangpur Dairy:</b>					
22	Rangpur	Rangpur	Rangpur	10000 Lit.	47 km
23	Bodorgonj	Bodorgonj	Rangpur	2000 "	47 "
24	Mahigonj	Mahigonj	Rangpur	2300 "	47 "
<b>Pran:</b>					
25	Rangpur	Rangpur	Rangpur	10000 "	"
26	Bodorgonj	Bodorgonj	Rangpur	2000 "	"
27	Mahigonj	Mahigonj	Rangpur	2300 "	"
28	Gobindhagonj	Gobindhagonj	Ghaibandha	2000 "	In Planning Stage
29	Syedpur	Syedpur	Nilphamari	2000 "	"
30	Birgonj	Birgonj	Dinajpur	2000 "	"
31	Ulipur	Kurigram	Kurigram	2000 "	"
<b>BOGRA</b>					
<b>Brac Dairy</b>					
32	Panchbibi	Panchbibi	Joypurhat	3000 "	26 "
33	Kalai	Kalai	Joypurhat	2000 "	28 "
34	Shibgonj	Shibgonj	Bogra	1000 "	22 "
35	Kahalu	Kahalu	Bogra	2000 "	27 "
36	Patnitala	Patnitala	Nawgoan	3000 "	34 "
37	Manda	Manda	Nawgoan	2000 "	32 "
<b>Milk Vita</b>					
38	Baghabarighat,	Shahjadpur, Ullapara, Salhia, Faridpur, Bera & Sujanagar	Sirajganj	162,000 "	40 "
39	Lahirirnohanpur,	Bhangura, Chatmohor & Faridpur	Sirajganj	10,000 "	"
40	Manda	Atrai, Mahadebpur	Noagaon	5,000 "	"

SL#	Name of center	Thana	District	Capacity/ day	Radius Covered
<b>Rangpur Dairy:</b>					
41	Baghabari	Shahjadpur	Sirajgong	7000 Lit.	47 km
42	Laharimohonpur	Ullapara	Sirajgong	2300 "	"
43	Protap Bazar	Ullapara	Sirajgong	3000 "	"
<b>Pran:</b>					
44	Baghabari	Shahjadpur	Sirajgong	7000 "	"
45	Laharimohonpur	Ullapara	Sirajgong	2300 "	"
46	Shapaher	Shapaher	Naogaon	1000 "	"
47	Sharishakul	Shahjadpur	Sirajgong	2000 "	In planning Stage
48	Atgharia	Atgharia	Pabna	2000 "	"
49	Joypurhat	Joypurhat	Joypurhat	2000 "	"
50	Shariakandhi	Shariakandhi	Bogra	2000 "	"





