

# *Feasibility Study of Milk Production and Potential Collection/Chilling Centers Establishment*

in Mid-Hill Highway and Hulaki (Postal) Highway  
(RFP No.: NDDDB/C/RFP/2074/75/01)

मध्य-पहाडी लोकमार्ग तथा हुलाकी राजमार्गमा दूध उत्पादन  
र संकलन क्षेत्रको पहिचान सम्वन्धि अध्ययन



## **Government of Nepal**

National Dairy Development Board (NDDDB)  
Hariharbhawan, Pulchowk, Lalitpur, Nepal

Post box: 5901

Tel : 977-1-5525400

<http://www.nddb.gov.np>



## **Consulting Agency**

Right to Access Nepal (RAN)

Lainchaur, Kathmandu, Nepal

Tel: 01-4412240

Email: [rannepalktm@gmail.com](mailto:rannepalktm@gmail.com)

URL: [www.righttoaccessnepal.org.np](http://www.righttoaccessnepal.org.np)

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Yubaraj Devkota, Chairperson  
Right to Access Nepal (RAN)  
Lainchour Kathmandu

## Executive Summary

This report presents the results of feasibility study carried in seven fast growing market centers along the Mid Hill High Way and seven similar market centers along the Postal Road Corridor (*Hulaki Rajmarg*) and recommendations forwarded for the establishment of chilling centers. The study was necessitated to address growing but unmet demand for milk and milk products in these market centers and; more importantly to ensure the milk producers that establishment of collection centers and chilling centers will provide reliable markets for their milk and milk products.

The study was conducted with specific objectives to (i) identify potential pockets for promotion of milk production in targeted market centers; (ii) locate potential and strategic locations in each of the select market centers for establishing milk collection and chilling centers; (iii) conduct technical and financial viability of establishing collection centers; and (iii) recommend future course of actions. The seven market centers selected in Mid Hill High Way include **Sukrabare** (Tehrathum district), **Khurkot** (Sindhuli district), **Baireni/Galchhi** (Dhading district), **Besisahar** (Lamjung district), **Burtibang** (Baglung district), **Rakam Karnali** (Dailekh district) and **Patan** (Baitadi district). Likewise, the seven markets centers selected along the Postal Road Corridor (Hulaki Rajmarg) include **Gaurigunj** (Jhapa district), **Rangeli** (Morang district), **Kalaiya** (Bara district), **Madi** (Chitwan district), **Bardghat** (Nawalparasi district), **Rajapur** (Bardiya district) and **Belauri-Dodhara** (Kanchanpur district).

The qualitative and quantitative data required for the study were generated from secondary and primary sources of information. The desk research/literature review at the center was followed by field visits to all 14 market centers to conduct farm household survey in 1400 sample households involved in milk production, to organize Focus Group Discussions with 173 participants consisting of local stakeholders and to conduct Key Informant Interviews with 61 heads/chiefs of relevant institutions selected from government and non-government sectors.

The feasibility study has revealed that a significant (over 41,000) number of farmers are involved in the production of milk and milk products having adequate number of milking cows and buffalos. A large volume of the milk (over 146,000 liters) and milk products they produce is marketed to fetch cash income; largely to milk producers' cooperatives. It is also found that the potential of milk trade that exists in each of 14 market centers studied is not fully exploited due to a number of factors such as farmers' unwillingness to increase milking cows/buffalos due to risk factor, uncertainty of market to sell increased milk due to the absence of chilling centers and collections centers and lack of easy access to technical assistance and supply of feeds/fodder and other inputs, physical facilities such as water and sheds as well as breeding facilities for the improved cows and buffalos.

Based on assessment of future potentials of milk production, establishment of 23 chilling centers are found technically and financially feasible. Along the Mid Hill High Way the 13 points proposed for establishing chilling centers include Sukrabare, Khurkot, Khaniyakhark, Dhunibesi, Mahadevbesi, Bhorletar, Paundi/Sundarbazar, Baglungbazar, Burtibang, Narayan municipality, Rakam Karnali, Patan and Gajari. Similarly, the 12 points proposed for chilling centers along the Postal Road Corridor include Gaurigunj, Rangeli, Bhodaha, Pipara Simara, Baruwa, Chaupatta, Jyamire, Kandapur Chowk, Shantipur, Belauri, Punarbas and Chandani Dhodhra (Mahakali). It is recommended that a Public Private Participation strategy needs to be adapted for the establishment of chilling centers in the proposed locations. This requires delivery of technical, financial and physical infrastructure supports to both the milk producing farmers and potential private sector investors. The study has revealed that majority of the farmers sell their milk to milk producers' cooperatives serving assured market for them, thus such coops. must be formed where they do not exist. Such cooperatives should be oriented towards facilitating the milk producers to have easy access to technical and financial assistance they require.

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## ACCRONYMS

ADS	Agricultural Development Strategy
CDCAN	Central Dairy Cooperatives Association of Nepal
CLDP	Community Livestock Development Project
DDC	Dairy Development Corporation
DLS	Department of Livestock Services
DLSO	District Livestock Service Office
EC	Executive Committee
ED	Executive Director
FAO	Food and Agriculture Organization
FGD	Focus Group Discussion
GDP	Gross Domestic Product
GoN	Government of Nepal
ILP	Intensive Livestock Production
KII	Key Informant Interview
MCC	Milk Chilling Center
MHHW	Mid Hill Highway
MoAC	Ministry of Agriculture and Cooperatives
MPA	Milk Producers' Association
MPC	Milk Producers' Cooperatives
MPPSS	Milk Products Production and Supply Scheme
MSS	Milk Supply Scheme
NDDB	National Dairy Development Board
NGO	Non Governmental Organization
PRC	Postal Road Corridor
SMP	Skimmed Milk Powder
WHO	World Health Organization

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# Chapter I

## Background, Objectives and Methodology

### 1.1 Background/rationale for the study

Dairy is the most important sub sector of livestock development in Nepal which contributes nearly two third of the livestock Gross Domestic Product (GDP) and around 9% in the total GDP. The dairy production, processing and marketing not only provides employment and income generating opportunities for more than 500,000 households in the country, but also contributes significantly to livelihoods of rural communities and their food and nutrition security. The majorities of the dairy farmers in the country are smallholders keeping either few heads of cattle or buffaloes or mixed herds of cattle and buffaloes. There are around 7,000,000 cattle and 5,000,000 buffalo population in the country at present, of which about 26% of buffaloes and 13% of cattle are at milking stage. The annual milk production stands at around 1.9 million metric ton. Unmet demand for milk and milk products in market centers is growing. Emergence of market centers along the Mid Hill High Way (MHHW) in hilly regions and *Hulaki Rajmarg* (Postal Highway) in *Terai* have led to increased demand. However, there is wide gap between the total amount produced and total potential production. The dairy industries are operating far below their installed capacities mainly due to shortage of fresh milk during lean season. Mismatch between the demand and supply situation created by untapped milk production potentials needs to be resolved by creating environment for increased milk production and more efficient/effective management of milk collection centers as well as chilling centers at appropriate locations along these two highways. It is high time that strategic and potential locations for milk production along these road corridors are identified and collection/ chilling facilities are established to increase the volume of milk marketed through formal channel.

This feasibility study was essentially designed to assess possibility of establishing milk collection centers and thereby establishing chilling centers at appropriate locations in 14 fast growing market centers along the two highways mentioned above. Milk being perishable products need to be marketed in short span of time and collection and chilling facilities need to be in a appropriate locations, so that it becomes convenient for the farmers to bring their milk in the collection/ chilling center within very short period of time without deteriorating the quality of milk.

### 1.2 Objectives and scope of the study

Against the background portrayed above and Terms of Reference extended by National Dairy Development Board (NDDDB), this feasibility study was carried out mainly to accomplish the following four specific objectives:

1. To identify potential pockets for promotion of milk production in select 14 market centers along the Mid-Hill Highway (MHHW) and Postal Road Corridor (PRC)
2. To locate potential and strategic locations in each of the select market centers for establishing milk collection and chilling centers
3. To assess financial and technical feasibilities of establishing milk production pockets and strategic collection/ chilling centers along the select market centers
4. To recommend future course of actions

The results of this study are expected to help the government and non-government/private sectors take necessary measures for developing potential dairy pockets and collection center for meeting increasing demand for milk.

The scope of work planned for this study included:

- Brief review of Nepalese dairy sector focusing on past performance
- Identification of technically feasible milk production areas in select market centers along the two road corridors by focusing on:
  - Existing dairy production scenario of the identified potential locations
  - Growth potential in these locations
  - Need assessment for promoting milk production
- Identification and mapping of potential collection/ chilling center along the two road corridors
- Assessment of the availability of physical facilities and resources (like water, electricity, road access etc) required for the establishment of collection/chilling centres
- Socio- economic set-up and potential market links of the identified potential locations
- Google mapping of proposed milk chilling centers and milk collection centers

### **1.3 Study methodology/approach**

This feasibility study report is based on consultations and interactions made with the relevant stakeholders and both quantitative and qualitative data generated from secondary and primary sources of information as briefly outlined below.

#### 1.3.1 Desk review/secondary sources of information collection

The published reports of Department of Livestock Services (DLS) and District Livestock Service Offices (DLSOs) in the proposed road corridors have been reviewed to delineate existing situation of milk production, trends, demand for milk and milk products, operation of exiting milk collection and chilling centers in the country, demand for milk and constraints to increase supply of milk etc. Notably, potential dairy pockets to be focused in the future are also identified. The information on dairy livestock population and breed (indigenous and exotic/crosses) were compiled as study moved ahead. The information on existing milk collection centers of Dairy Development Corporation (DDC) and various private dairies and cooperatives were collected. The published reports including District Profiles and official records of dairy associations and other related agencies were reviewed to complement/supplement information generated from other sources. Attempt was also made to collect relevant documents during the field survey from concerned municipalities, rural municipalities, DLSOs, and other institutions (Annex 1) for generating background/baseline information.

#### 1.3.2 Google Map Survey

The road corridors (MHHW in the hills and PRC in Terai) have been surveyed through Google map and the potential locations (villages, urban centers from which the road passes or have access to link road or within walking distance) are marked and identified. During the study, all 14 markets centers were brought under Google map survey that revealed GPS coordinates, eye bird view of locations of collection centers and chilling centers, altitude and other geographical profiles.

#### 1.3.3 Rapid appraisal of MHHW and PRC and selection of 14 market centers

The desk review and Google survey provided some basic information about MHHW and PCR. The MHHW with its total length of 1,767 Km. (756 Km. new construction and 1,011 existing roads) passes through 24 districts of Nepal consisting of 10 districts (Panchthar, Tehrathum, Dhankuta, Bhojpur, Khotang, Okhaldhunga, Udaypur, Sindhuli, Kavre and Sindhupalchok) in eastern Nepal and 14 districts (Nuwakot, Dhading, Gorkha, Lamjung, Kaski, Parbat, Baglung, Rukum, Jajarkot, Dailekh, Achham, Doti, Dadeldhura and Baitadi) in western Nepal. Pato Bhanjyang of Nuwakot

district is the central point of this highway. It is expected to extend benefits to seven million people residing in 225 settlements of these 24 districts.

A number of market centers such as enlisted below are emerging along this highway leading to increased demand for milk and milk products.

Region	Market Centers
Eastern	Sukrabare, Chiyobhanjyang, Chongthapur, Oyam, Thapur, Ganeshchowk, Gopetar, Jorsal, Tamor River, Sankranti bazaar, Myanglung, Basantpur, Hille, Leguwaghat, Bhojpur, Diktel, Halesi, Hilepani, Toksalghat (Ghurmi), Phidim
Central	Khurkot, Gurmi, Panchkhal, Bhunepati, Patibhanjyang, Chhahare, Trishuli, Salyantar
Western	Baireni-Galchhi, Burtibang, Besisahar, Arughat, Palungtar, Borletar, Kalika, Hemja, Kushma, Baglung, Nishi
Mid-western	Rakam-Karnali, Patihalne, Lukumgau, Musikot, Chaurjhari, Jagatipr, Bestanda, , Dailekh, Dullu, Jambukandha, Satla, Sajuala
Far western	Patan, Bedkhet, Binayak, Mangalsen, Sanfebagar, Silgadhi, Satbanja, Baitadi, Jhulaghat

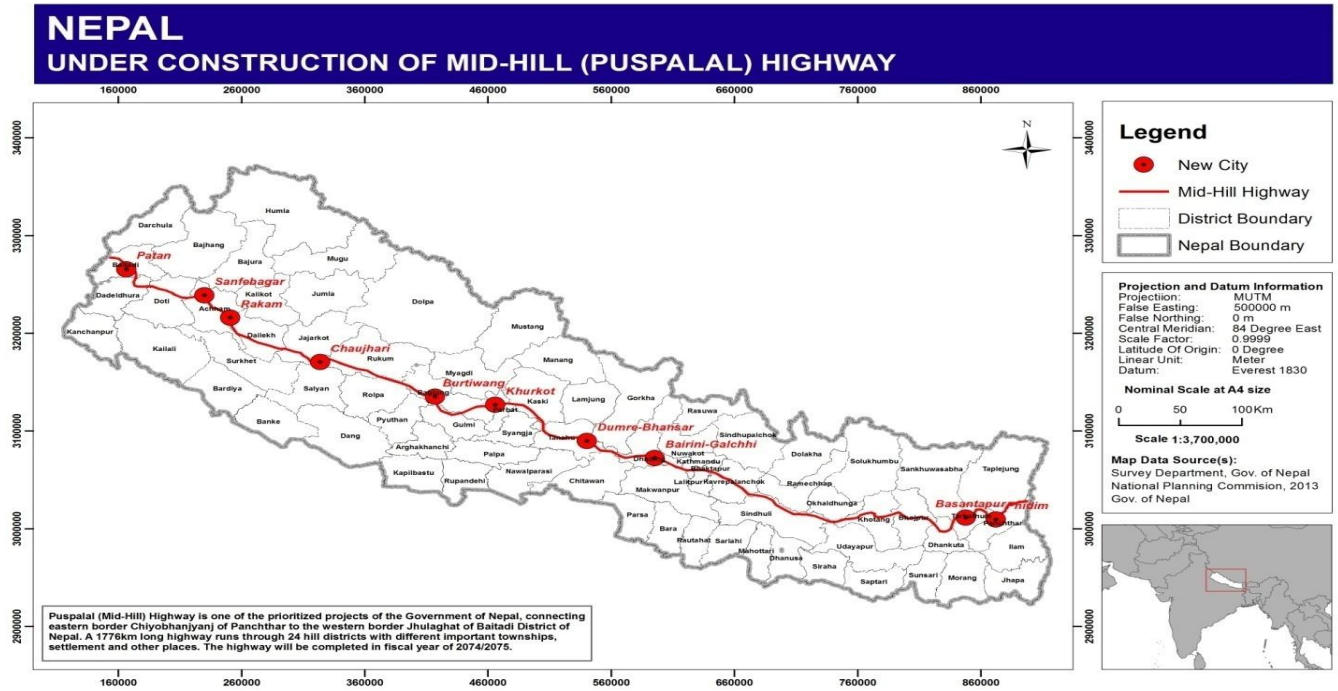
Two teams of experts made a rapid assessment of these market centers and selected seven market centers (Table 1.1) for detailed study out of 10 locations proposed for the development of new cities; (Figure 1). These market centers are Sukrabare, Khurkot, Baireni-Galchhi, Burtibang, Besisahar, Rakam Karnali and Patan.

Table 1.1: Selection of market centers/sites along the MHHW and PRC by district and province

SN	Market centers	District	Province No.
<b>Mid-Hill High Way</b>			
1.	Sukrabare	Tehrathum	1
2.	Khurkot	Sindhuli	2
3.	Baireni-Galchhi	Dhading	3
4.	Burtibang	Baglung	4
5.	Besisahar	Lamjung	5
6.	Rakam Karnali	Dailekh	6
7.	Patan	Baitadi	7
<b>Postal Road Corridor</b>			
1.	Gaurigunj	Jhapa	1
2.	Rangeli	Morang	2
3.	Kalaiya	Bara	2
4.	Madi	Chitwan	3
5.	Bardghat	Nawalparasi	4,5
6.	Rajapur	Bardiya	6
7.	Belauri-Dodhara	Kanchanpur	7

Similarly, the same team of experts has selected seven market centers along the PRC (Table 1.1) out proposed highway cities (Figure 2). The seven selected market centers are Gaurigunj, Rangeli, Kalaiya, Madi, Bardghat, Rajapur and Belfair-Dodhara. They represent seven terai districts; Jhapa in the east and Kanchnapur in the far west and all seven provinces of the country. The PRC with a total length of 1,600 Km. connects Bhadrapur of Jhapa district in far east to Dodhara Chandni of Kanchanpur district in far west. About 75% villages of 20 terai districts are connected with this highway that goes along the Indian border. About half of total population (about 30 million) of Nepal is expected to benefit from this highway. In selecting these market centers it was considered that there are no chilling centers at present in these market centers but they are commercially growing fast with great potential for establishment of chilling centers.

**Figure 1.1**  
**Map showing locations for proposed towns along Mid Hill High Way**



**Figure 1.2**  
**Map showing major cities the Postal Road Corridor passes through in Terai**



#### 1.3.4 Consultation with the relevant stakeholders

Department of Livestock Services, Private Dairy Associations, DDC, CDCAN were consulted to identify potential market centers for field studies.

#### 1.3.5 Discussion at NDDB for finalization of methodology and selection of market centers

Two series of consultative meeting were held at NDDB with the technical group on the methodological approach of current study. The suggestions received from the technical team were incorporated in the final study methodology and field study was implemented based on agreed methodological approach. The tentative list of markets centers to be selected was discussed with the technical team members of NDDB and then finalized with their suggestions.

#### 1.3.6 Data collection tools (primary sources of information)

The primary sources of information used for generating quantitative and qualitative information in 14 market centers along the MHHW and PRC consisted of sample farm household survey, Focus Group Discussions (FGDs) and Key Informant Interviews (KIIs).

**Farm Household Survey:** Altogether 1400 farm households (Table 1.2) were covered. During field visits, firstly list of farm households involved in milk production and or having cattle (cows/buffalos) was prepared in consultation with municipality/rural municipality and other relevant knowledgeable local agencies. Such list was prepared covering a radius of 5 Km. from the center point (major potential pocket adjacent to the main road head) of the market center. From such list, 95-105 farm households were randomly selected for household survey. A structured questionnaire (Annex 2) prepared in Nepali was administered with the heads of the households by the trained enumerators. Information was also collected from some major milk collectors at milk collection centers using a semi-structured questionnaire prepared in Nepali (Annex 3).

Table 1.2: Number of respondents/participants in Farm HH survey, FGDs and KIIs

Highways/ Market Centers	Farm HH Survey	FGD	KII
	Number of Households	Number of Participants	Number of Respondents
<i>Middle Hill High Way</i>	<b>701</b>	<b>81</b>	<b>31</b>
1 Sukrabare	102	14	4
2 Khurkot	105	12	5
3 Baireni-Galchhi	99	14	4
4 Burtibang	101	11	4
5 Besisahar	100	11	5
6 Rakam Karnali	95	9	4
7 Patan	99	10	5
<i>Postal Road Corridor</i>	<b>699</b>	<b>92</b>	<b>30</b>
1. Gaurigunj	99	22	5
2. Rangeli	98	12	3
3. Kalaiya	100	13	3
4. Madi	100	10	5
5. Bardaghat	100	10	4
6. Rajapur	102	10	5
7. Belauri	100	15	5
<b>Total</b>	<b>1,400</b>	<b>173</b>	<b>61</b>

**Focus Group Discussions (FGDs):** The FGDs were organized at all 14 market centers with the participation of all concerned stakeholders. Altogether 173 persons (Table 1.2) participated in the FGDs consisting of minimum of nine in Rakam Karnali market center along the MHHW of Dailekh

district and maximum of 22 along the Gaurigunj along the PRC of Jhapa district. They were represented from concerned municipality/*Gaun Palika* (rural municipality), milk producers associations/Cooperatives, CDCAN, farmers associations/groups, private sector input suppliers and milk collectors. A semi structured checklist prepared in Nepali (Annex 4) was used by the trained field supervisors to facilitate the discussions. The information on existing dairy production scenario, potential areas for dairy production, suitable locations for milk collection centers and milk chilling centers was solicited during FGDs. Scanned copies of the list of participants and results of FGD proceedings are documented in a separate volume of the report for detailed information.

**Key Informant Interviews (KIIs):** Using semi-structured checklist prepared in Nepali (Annex 5) KII was conducted with 61 respondents; 3-5 persons in each market center (Table 1.2). They consisted of chiefs of all concerted agencies/institutions such as Ward Chairpersons of municipalities/rural municipalities, elected head of milk cooperatives, chief of DLSO, chiefs of Ilaka level Livestock Service Centers, heads of private sector stakeholders involved in livestock development in the market centers.

#### 1.3.7 Measures for ensuring quality data collection and its management

Quality of data collection, data entry, output production etc. was ensured basically by adopting measures to minimize non-sampling errors as well as entry and management of computerized data as briefly outlined below.

- Recruitment of qualified and experienced professional personnel as proposed and non-key experts (Field Supervisors, Enumerators, Data Entry Operators)
- Pre-testing of questionnaires/checklists and other survey tools with the farmers, milk collectors and manager of chilling centers in Tika Bhairab, Lalitpur district
- Use of questionnaires/checklist prepared in Nepali
- Use of Field Manual prepared in Nepali (Annex 6)
- Training for the team members including field staff on administration of data collection instruments, data entry formats and protocol, data cleaning, quality assurance and other procedures

Data collected from the field were thoroughly checked before entering into the computer. Latest version of Excel, SPSS was used for data entry and production of tables on survey results. These measures were adopted for ensuring quality of data entry and production of results.

#### **1.4 Limitations**

Problem in generating socio-economic data by market center was difficult to get as the newly formed local bodies (District Coordination Committees, municipalities and rural municipalities) have not yet prepared/updated their district profiles/village profiles. In some market centers, inconsistencies were observed in information generated from KIIs, FGDs and farm household surveys; particularly those related to proposed locations for chilling centers, volume of milk production, milk production pockets. This was resolved by further probing with the local knowledgeable persons. Largely, heads of the households were interviewed during farm household survey. In the absence of household heads, knowledgeable family members were approached for interview.

## Chapter II

### Brief Outline of Existing Situation in Dairy Development

In this chapter an attempt is made to provide some insights into the existing scenario of milk production and past efforts made to the development of dairy sub-sector in Nepal based on literature reviewed in the course of study.

#### **2.1 Mismatch between supply and demand for milk**

In recent years, individual farmer and farmers' cooperatives have emerged with larger commercial herds of cattle/ buffaloes in response to gross deficit of fluid milk which is estimated at about 300,000 to 400,000 liters per day (*Ten Year Dairy Development Plan: 2074/75-2083/84 B.S.*). The same source of information suggests that the population of animals per unit of cultivated land is one of the highest in Nepal among Asian countries. The number of cattle and buffalo at present are estimated to amount to 7,241,743 and 5,167,737 respectively. Total milk production is estimated to have reached to 1,724,823 Mt. (cow milk: 557, 669 Mt. and buffalo milk: 1,167,154 Mt.). However, the productivity is far below the average due to many inherent and external constraints including poor genetic potentials, inappropriate feeding and health care management. There is seasonality of milk production in the country, leading to flush season and lean season. The shortage of fluid milk is more severe during lean season (*March to August*). For addressing the increasing demand of milk and milk products in rapidly growing urban centers, dairy processors both public and private in the country are importing fluid and milk products. The huge amount of money is spent to import SMP (Skimmed Milk Powder) and different dairy products.

With rapid urbanization and increased income of the people and diet diversification, the demand for milk and milk products is increasing at faster rate each year. Even with the constant population growth rate of 1.4% per annum at present, the annual milk production has to be increased at least by 9% per annum from the existing level of 3.4% per annum to meet the WHO recommended 250 gm milk per day per capita requirements by the year 2020 for fulfilling the minimal nutritional requirements.

#### **2.2 Milk production potentials**

The Agricultural Development Strategy (ADS) has revealed that the dairying is one of the most potential and promising sub-sector within agriculture sector which has grown rapidly as an industry. Further, the same document has also revealed that this sub-sector is of high priority area for economic transformation of Nepalese economy having the potential of increasing the productivity from the present level.

Despite huge potential for its development and the increasing demand in the urban centers, only about 17% of the total milk produced in the country goes to formal milk market. Likewise, there are high potentials for collecting fresh milk from most of the districts but at present only the selected dairy pockets in 41 districts are linked to the formal market. There is wide gap between the total amount produced and the total potential production. The dairy industries are operating far below their installed capacities mainly due to shortage of fresh milk during lean season. Out of the total, the government owned Dairy Development Corporation (DDC) has processing capacity of 225,000 liter per day. Furthermore, the private dairies are operating with following capacities which clearly shows that there is predominance of small to medium scale industries.

- 4 processing industries with capacity of over 50,000 liters per day
- 10 processing industries with capacity ranging from 10,000 liter to 50,000 liter per day

- 30 processing industries with capacity ranging from 1,000 to 10,000 liters per day
- 400 processing industries with capacity ranging from less than 1,000 liters per day
- SMP plants with capacity of 20 tons per day

### **2.3 Institutional framework of milk production**

National Dairy Development Board: In 1990, the GoN approved the first “Ten Year Dairy Development Plan (1991-2000)” as a blueprint for dairy development in the country. Based on the recommendation of the Plan, the GoN established NDDB in 1992 under a separate Act. The Board is an apex level autonomous institution of dairy development in Nepal. The major objectives of the Board are to:

- Assist GoN in formulating national level dairy development policies and plans, develop dairy industries,
- Find remedies to problems relating to livestock development and animal health sector for dairy development,
- Maintain coordination among the public and private dairies, carry out dairy development related high level studies and research works, and make arrangements for fodder and pasture resources.

The functions of NDDB include:

- Policy formulation and recommendation on import of goods necessary for production and promotion of milk and milk products as well as animal feeds, and implementation of the approved policies
- Formulation and recommendation of milk pricing policy to the GoN
- Recommendation to GoN on well being of dairy processors and consumers
- Development of cooperative sector dairies
- Registration of dairy industries
- Management and mobilization of national and foreign grant and loan for dairy industries
- Technical assistance for setting-up, improving, promoting and safeguarding dairy industries
- Review, monitoring and evaluation of dairy development programs
- Other necessary activities for dairy industries

NDDB has an Executive Committee (EC) composed of 14 members, which is Chaired by Minister of Agriculture and Cooperatives (MoAC). An Executive Director (ED) whose serving period as specified by the Act is four years heads its Secretariat. The Minister through Cabinet approval appoints the ED. The Secretary of MoAC is the Vice- Chairperson and the ED is the member-secretary. The members include four representatives of farmers, three private dairy entrepreneurs, General Manager of the DDC, Representative of Federation of the Nepalese Chamber of Commerce and Industries (FNCCI), Director General of Department of Livestock Services, and Joint Secretary of the Ministry of Finance.

Department of Livestock Services (DLS) and District Livestock Service Offices (DLSOs): DLS aims to contribute to poverty reduction in the country through livestock development by improving living standard of the people through sustainable livestock development. DLS strives to develop livestock sector by diversification and commercialization as an income generating and prosperous farming. It functions through DLSOs established in all 75 districts (now 77) of the country.

Presently, one of the major activities of DLS related to dairy development is Community Livestock Development Project (CLDP) which is the continuation of Third Livestock Development Project (TLDP); both funded mainly by Asian Development Bank. The overall project objective is to reduce

poverty amongst rural poor through gender and socially inclusive development. Its purpose is to improve the levels of food of 95,000 indirect beneficiaries through increased productivity of the livestock sub-sector in an environmentally sustainable and socially equitable manner. FAO was sole sourced to provide technical assistance for training, guiding process-related activities, technical support, privatizing the delivery of farmer services and inputs, agro processing and marketing. The project functions on market/demand led approach, gender mainstreaming in all components, public/private partnership arrangements, flexible project management, local body capacity improvement and environmental management. The project covers 43 districts and is implemented in three modules: (i) Intensive livestock production (ILP) in 22 districts; (ii) Processing, marketing and commercialization in 21 mainly Terai districts in addition to the emerging areas in the ILP districts; and (iii) Multi-sector approach- based higher altitude pilot project in five districts. The project works with the Non Government Organizations (NGOs) for social mobilization, farmers for productivity enhancement, entrepreneurs for processing and marketing and stakeholders for synergy and avoidance of program duplication. It also promotes private para vets to expand veterinary services and artificial insemination in dairy animals. As of 2008/09, among others, CLDP claimed it has provided direct benefit to 59,000 farm families (71% women, 32% *dalits*, 27% *janajati* and 41% others); 407 dairy entrepreneurs and 46 para vets.

**Dairy Development Corporation (DDC):** It is the pioneer public sector dairy entity. It was created in July 1969 under the Corporation Act of 1964. Its major objectives are to:

- Provide a guaranteed market for milk to the rural farmers with fair price
- Supply pasteurized milk and milk products to urban consumers
- Develop organized milk collection system to meet increasing demand for pasteurized milk and milk products
- Develop an organized marketing system for milk and milk products in urban areas

A Board of Directors appointed by the GoN governs DDC. The General Manager or the Executive Chairperson is also appointed by the Government. Currently, DDC operates six Milk Supply Schemes (MSS) and a Milk Products Production and Supply Scheme (MPPSS). DDC's milk collection network exists in 31 districts.

**Dairy Cooperatives:** The dairy cooperatives became more effective only after December 1981, when DDC initiated the milk producers oriented program by encouraging the farmers to form their own Milk Producers' Associations (MPAs) along the lines of cooperative principles. The MPAs are operated under the by-laws prepared by DDC. The MPAs had no formal legal status and they operated as single purpose primary cooperatives with milk trade and support to milk production as their main activities. There are more than 1,700 such primary Milk Producers' Cooperatives (MPCs), around 36 District Unions and one Central Dairy Cooperatives Association Nepal (CDCAN).

**2.4 Chilling Centers:** There are about 55 milk chilling centers (MCCs) in large capacity in Nepal. But, many small dairy cooperatives have installed numbers of chilling vat sized varies from 300 liter to 1000 liter.

**2.5 Milk processors:** Involvement of private sector in dairy development began in 1998. There are two associations of private sector led dairy industries; Nepal Dairy Association and Dairy Industry Association. About 2,000 milk processors (cottage, small, medium and large) are reported to have been functioning at present with daily milk processing capacity of 50,000 liter (maximum) and 1,000 liter (minimum). Majority of these processors process 1,000 to 5,000 liters of milk per day.

## Chapter III

### Mid Hill High Way

#### Analysis of Study Results and Recommendations

As outlined in Chapter II, seven market centers (Sukrabare, Khurkot, Baireni-Galchhi, Burtibang, Besisahar, Rakam Karnali and Patan) situated along the Mid Hill High Way (MHHW) are covered for the study. They represent seven districts of the country; Tehrathum, Sindhuli, Dhading, Baglung, Lamjung, Dailekh and Baitadi respectively and represent all seven provinces. This chapter presents analysis of information gathered from various secondary and primary sources and then recommends locations for establishing chilling centers in each of seven market centers.

### 3.1 Sukrabare market center

#### A. Introduction

Sukrabare is situated along the MHHW that passes through middle part of **Tehrathum district** covering around 76 Km. The district is situated in the hilly region of Nepal above 322 meter to 3034 meter altitude from the sea level. The triangle shaped district lies between 26°13’-26°58’ North to 87°27’-87°45’ East with 679 km<sup>2</sup> area.

The district has a good network connected with MHHW. It has 32.8 Km blacktopped road and around 435 Km agricultural track road connected with East-West highway. Sukrabare is connected with other market centers of the district such as Maynlung, Basantapur, Sidhuwa, Laliguras, and Mahalaxmi. The road networks also connect Sukrabare to Biratnagar city.

Table 3.1: Number of cows and buffalo and annual milk production in Tehrathum district

SN	Particular	Total Unit	Milking Unit	Annual Milk Production (Metric Ton)	
				2014	2015
1	Cross Cow	2,124	995	1,565	1,586
2	Local Cow	20,126	14,690	1,368	1,379
3	Cross Buffalo	12,310	9,365	1,362	1,358
4	Local Buffalo	6,231	5,780	1,623	1,657
	<b>Total</b>	<b>40,791</b>	<b>30,830</b>	<b>5,918</b>	<b>5,980</b>

Source: District Profile, Terhathum 2016, Office of the District Coordination Committee

According to the latest population census of 2010, Tehrathum has 20,682 households with 101,577 total populations. About 80% of total population is reported to depend on agriculture for their livelihood; among them 15,312 households are involved in keeping cattle and producing milk/milk products. The number of milking cows and buffalo at present is estimated to be 30,830 with estimated annual milk production of 5,980 Mt. (Table 3.1).

#### B. Veterinary services through livestock service centers

The veterinary services in the district are provided through 11 government livestock service centers established in each Ilaka covering all areas (Table 3.2).

#### C. Milk producers' cooperatives

There are 15 milk producers' cooperatives functioning in the vicinity of Sukrabare. Over 530 farmers are associated with these cooperatives that are reported to have potentials to produce as much as 3,075 liters of milk per day (Table 3.3)

Table 3.2: Distribution of livestock service centers and their coverage

SN	Livestock Service Centers	Ilaka No	Area Covered
1.	Sukrabare	6	Harjung, Aandim, Panchakannya, Phakchamara
2.	Sakranti	10	Sakranti, Chuhandada, Khamlalung, Thokalung
3.	Manohara	7	Morahang, Pauthak, Shreejung
4.	Basantapur	4	Basantapur, Phulek, Dagapa
5.	Iba	11	Hwaku, Chhate Dhunga, Iba
6.	Samdu	9	Isibu, Samdu
7.	Simle	8	Simle, Aayakajung, Jaljale
8.	Okhre	5	Okhe, Sudap
9.	Solma	3	Solma, Sangnaam
10.	Jiri Khimti	2	Jiri Khimti, Sabla, Aambung
11.	Manglung	1	Myanglung

Source: District Profile, Terhathum 2016, Office of the District Coordination Committee

Table 3.3: Number of milk producers' cooperatives around Sukrabare market center

Existing Cooperatives	Daily milk production potentials (Liter)	Number of Milk producers (Farmers)
1. Singgdevi Dugd Sahakaari Sanstha	300	50
2. Santeswor Dugd Utpadan Samuh	700	80
3. Machhamai Agro Farm (private)	150	15
4. Srijanshil Krishi Sahakaari Sansthaa	150	40
5. Sidhdha Devi Dudh Utpadak Sahakaari	400	50
6. Lali Gurans Dudh Utpadak Sahakari	200	50
7. Lakshmi Dudh Utpadak Samuh	200	50
8. Sidhikaali Krishi Samuh	250	50
9. Biswashanti Dud Utpadal Sahakaari	250	50
10. Jansewa Bahu-udehsiya Sahakaari	100	30
11. Adarsh Krishi Sahakaari	150	20
12. Kolchaur Dudh Utpadak Sahakaari	50	15
13. Srijanshilutpadak samuh	50	10
14. Mahila Utpadak Samuha	50	10
15. Dedhunga Dudh Utpadak Samuh	75	10
<b>Total</b>	<b>3075</b>	<b>530</b>

Source: FGD, KII and Household Survey, 2074

#### D. Farming households involved in milk production

It is estimated that as many as 1,475 farming households are involved in producing milk in the milk production pockets situated in west region and upper region markets of *chhathar gaunpalika*. The sample household survey revealed that large (36.2%) number of households have land holding over one hectare; just double of national average landholding. However, only about 15% of them were reported to have food sufficient for more than nine months (Annex 7 Tables 3 and 4).

#### E. Major milk collection centers and milk production pockets

The information gathered during KIIs and FGDs suggests that there are as many as 10 major milk production pockets connected with Sukrabare. They are reported to have daily milk production potentials of 3,400 liters from 957 farming households (Table 3.4).

Table 3.4: Major milk production pockets in Sukrabare market center

Collection centers and production pockets	Existing Chilling Center	Milk production (Liter per day)		Number of milk producers (farmers)
		Existing Collection	Potential (Additional)	
<b>Sukrabare collection center</b>			<b>650</b>	<b>220</b>
Birkhe	No	-	150	70
Chhipuwa	Yes	500	200	70
Thakuri tole	No	-	100	40
Angdim	No	-	200	40
<b>Ganesh tar collection center</b>		-	<b>2,750</b>	<b>737</b>
Sudap	Yes	500	600	290
Chaa-thar	Yes	250	1,000	26
Jalkanya	No	-	150	60
Hamarjung	No	-	300	71
Fachomara	No	-	300	100
Okhare	No	-	400	190
<b>Total</b>		<b>1250</b>	<b>3,400</b>	<b>957</b>

Source: FGD, KII and Household Survey, 2074

#### F. Estimated milk production, sale and income earned

In sample household survey, daily milk production of 102 farming households was reported to be 1,033 liters (cow milk: 858.5 liters, buffalo milk: 174.5 liters) suggesting 10 liters of milk per household and 6.7 liters of milk per milking animal. Out of total milk produced, more than 80% is marketed to milk cooperatives within walking distance of less than an hour. The maximum selling prices of cow-milk and buffalo milk are reported to be Rs. 50 and Rs. 60 respectively. On an average each household involved in milk trade is reported to have earned Rs. 4,780 per annum from the sale of milk products; largely ghee/butter (Annex 7 Tables 12, 14, 15, 16, 17, 18).

#### G. Number of cattle

Available information suggests that there are altogether 745 cows (local: 60, cross: 745, jersey: 105) and 170 buffalo (local 50, cross: 120). As per the sample household survey, on an average each household involved in milk production/trade owns 1.75 cows and 0.44 buffalo. The number of milking cows and buffalo significantly outnumber non-milking ones (Annex 7 Tables 5 and 6).

#### H. Suitable areas for collection centers

The participants of FGDs and KIIs have enlisted more than 20 locations in the vicinity of Sukrabare suitable locations. They include Sakhma, Thyaksijam, Kolbung, Chyanglung, Ram Nawami, and Machhegaun, Thakuri gaun, Karki gaun, Limbu gaun, Khadka gaun, Bhandari gaun, Khulal gaun, Paryadil, Mukti dhunga, Chautari chowk, Okhare, Machhindra Fyak Chhipuwa, Angdim, Melbote and Birkhe abre. These points are reachable within maximum of one hour's walk from the milk producing pockets. As much as 5,450 liters of milk is estimated as the milk collection potentials in these collection centers.

#### I. Suitable areas for chilling centers

The local stakeholders including farmers involved in milk production have suggested as many as 15 locations to be considered for chilling center establishment. Daily milk collection potential in these proposed locations ranges from minimum of 300 liters in Panchakanya to maximum of 1,500 liters in Tarbari, Byapatole and Angdim (Table 3.5).

Table 3.5: Suitable areas for chilling centers with their milk collection potentials

Suitable areas for collection Centers	Daily milk collection potential (Liter)
1. Jodisalat Gaunpalika	1,000
2. Phakchamara (Karki gaun)	1,000
3. Tarbari	1500
4. Harmjun	800
5. Fyakkma	600
6. Panchkanya	300
7. Maobre	1,100
8. Chhipuwa	800
9. Chapri chwok	900
10. Chyanglung	600
11. Milijuli	1,000
12. Ganesh tar	1,000
13. Kelchaur	1,000
14. Byapatole	1,500
15. Angdim	1,500
<b>Total</b>	<b>14,600</b>

Source: FGD, KII and Household Survey, 2074

#### J. Problems/constraints and suggested remedies

The stake holders during FDs and KIIs and farmers during farm household surveys expressed various types of problems/constraints they are presently confronted with. They also expressed their opinions on possible solutions. This has been summarized in the following manner:

- High production cost; grants from provincial or federal government should be provided.
- Shortage of fodders and unavailability of feeds in local markets. Private sector Vets should be encouraged to expand their businesses. The milk producers need to be provided with needed supports for growing fodders on their farm; and or they are linked with fodder suppliers.
- Lack of access to veterinary services. Local service providers need to be mobilized.
- Chilling center is far away and mass transport system is not efficient. More chilling centers at suitable locations need to be established.
- Private sector companies are not duly registered that has restricted delivery of their services. Concerned agencies need to facilitate private sector agencies to get them duly registered and provide services in the localities.
- Difficult to get cross cows and buffalos. This is an area where government needs to step in to coordinate with private sector.
- Price variation, low price for milk from the milk collectors. Government announcements of floor price of milk and its strict enforcement is required
- Animal insurance is not in practice; DLSO needs to take steps in promoting insurance

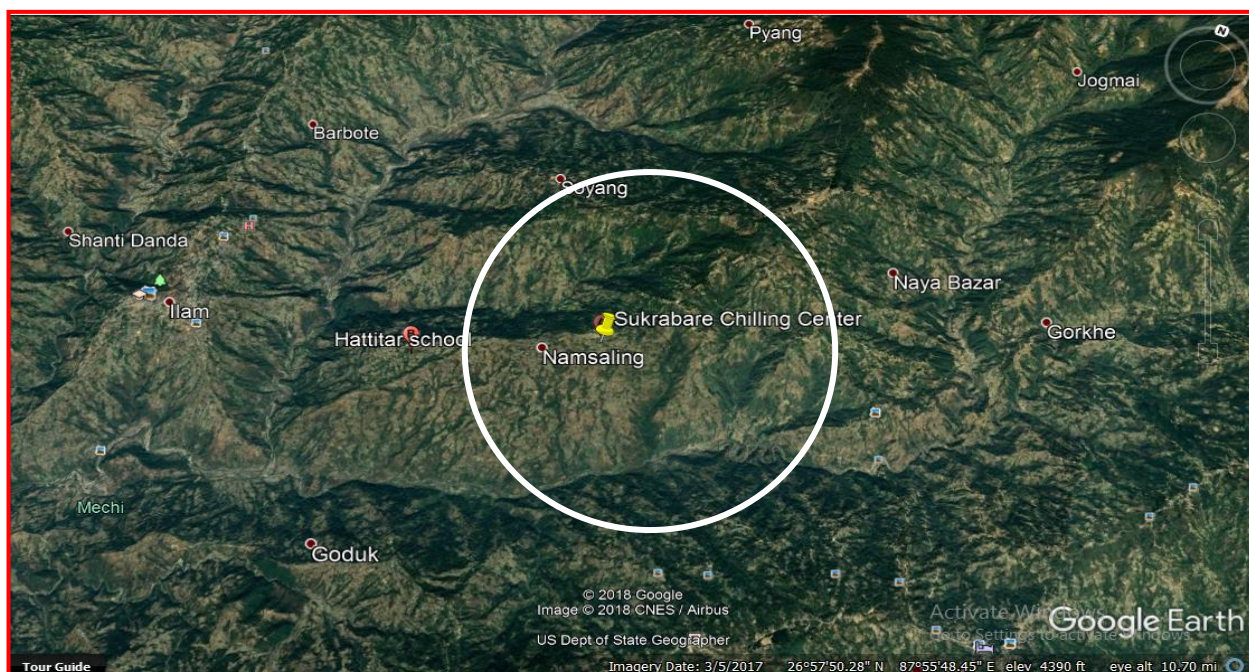
#### K. Proposed chilling center

Out of various locations suggested by the stakeholders for the establishment of chilling centers; Sukrabare market center located at Chhathar rural municipality (*Gaun paliik*), Ward No. 05 is proposed. This is selected on the basis of some consideration such as number of household involved, volume of daily milk collection, number of milk collection centers, centrality and availability of physical facilities such as electricity, water, and good road connectivity, proximity with bigger market centers or district headquarters. Basic information related to the establishment of chilling center at this point is furnished below (Table 3.6).

Table 3.6: Proposed chilling center: Sukrabare

<b>Name</b>	Sukrabare	
<b>Proposed Location</b>	Chhathar Gaaupalik 05, Therhathum	
<b>GPS Code</b>	26°55'26.20"N 87°59'54.88"E	
<b>Number of farmers involved (HHs)</b>	1,300 Hhs	
<b>Present daily milk production (liter)</b>	3,250 (Available for chilling)	
<b>Major areas of milk production for the catchment purpose</b>		
Birkhe, Chhipuwa, Thakuri tole, Angdim, Jalkanye, Aandin, Birkhe, Karkigaun, Nabrarun, etc.		
<b>Expected Future Annual Growth Rate in Milk Production</b>		
Average 15% if external milk promotional activities is provided		
<b>Small Chilling Centers / Collection Center Coverage</b>		
Birkhe, Chhipuwa, Thakuri tole, Angdim		
<b>Nearby Market</b>		
Bhadrapur, Damak, Itahari, Saniarjun, Kankai, Birtamod, Mechinagar, Sivasatasi, etc.		
<b>Distance Market</b>		
Biratnagar, Phidim, etc.		
<b>Technical Feasibility</b>	<b>Size of Chilling Center</b>	1500Ltr: Bulk Milk Cooler; Cost of Milk Cooler:
	<b>Available resources</b>	Road Excess, Vibrant existing cooperatives with reasonable infrastructures of water supply, space, manpower, etc. But three phase electricity not available
<b>Financial feasibility</b>	Cost of Propose Sized Milk Cooler: Rs 450, 000.00 Average cost of milk production: Rs. 48.8/liter; Selling price at farm household: Cow milk Rs.50/liter; buffalo milk R.s 60/liter; Selling price at chilling center: Rs. 65.0/liter Estimated annual turnover at chilling centers: Rs 1,00,00,000.00	
<b>Recommendation:</b> The Unnati Project is running in the area and has distributed 9 sets of chilling Vat from 500 to 1000 liter capacity in nearby surrounding of it. But due to the lack of three phase electricity they are not operating at present, Therefore, it is not feasible for establishing the additional chilling Vat at present. But this is the center among other different potential collection centers and chilling centers. Therefore, further dairy development can be done in this area in future. Moreover, the place is a very potential point to establish the larger size chilling center in very near future when the three phase electricity capacity is installed.		
<b>Nearby Chilling Center: Not available.</b>		

**Figure 3.1**  
**Google mapping of the proposed Chilling Center: Sukrabare**



### 3.2 Khurkot market center

#### A. Introduction

Khurkot is situated in **Sindhuli**; a hilly district of Nepal with 168 meter to 2797 meter altitude from the sea level. The rectangle shaped district lies between 26°55'-27°22'North to 85°15'-86°25'East with 2,513.31 Km<sup>2</sup> area. The district has two municipalities (Kamala and Dudhauri) and seven rural municipalities (Golanjar, Ghyangsekh, Teen Patan, Phikkal, Marin, Sunkoshi and Hariharpur Gadhi). According to district profile of Sindhuli district, the district has 295,741 total populations (48% male and 52% female). The district has a good network connected with BP Highway and Postal Highways. It has 54.5 Km blacktopped road, 121.1 Km graveled road and around 828 Km of agricultural tracked road connected with East-West highway. Around 70 Km of MHHW passes through middle part of Sindhuli district connecting local markets such as Sindhulimadi, Bhiman, Ratamata, Jhangagoli, Dakaha, Dudhauri, Khurkot, Majhuwa, Chhap, and Chakchake. Road network also connects Kathmandu, Kavre, Lalaitpur and Bhaktapur districts in the hills and Dhanusa, Mahottari, and Udayapur districts in terai.

Around 96.02% households are reported to depend in agriculture for their livelihood; among them 40,875 households are involved in cattle rearing and sale of milk and milk products. The cattle population is estimated to be 146,173 followed by 63,065 buffalos. The annual milk production of the district is around 15, 632 Mt. The annual livestock production growth rate is 3.26%.

#### B. Milk producers' cooperatives

There are six milk producers' cooperatives functioning in the vicinity of Khurkot. Over 1,450 farmers are associated with these cooperatives that are reported to have potentials to produce as much as 2,750 liters of milk per day (Table 3.7)

Table 3.7: Number of milk cooperatives around Khurkot market center

Existing Cooperatives	Daily milk production potentials (Liter)/	Number of Milk producers (Farmers)
1. Krishak Uthan Dugdha Utpadak Sahakari	400	250
2. Mahabharat Dugdha Utpadak Sahakar	300	150
3. Tinpata Mahila Dugdha Utpadak Sahakari	250	100
4. Marin Dugdha Utpadak Sahakari Sanstha	300	240
5. Siddiganesha Sahakari Sanstha	500	260
6. Sindhuligadi Dugdha Utpadak Sahakari	1000	450
<b>Total</b>	<b>2,750</b>	<b>1,450</b>

Source: FGD, KII and Household Survey, 2074

#### C. Farming households involved in milk production

It is estimated that as many as 5,500 farming households are involved in producing milk in the milk production pockets such as Khurkot bazar, Khaniyakharka, and Goltar. The sample household survey revealed that large (38.5%) number of households have land holding less than 0.5 hector; lower than national average of landholding. Moreover, about 40.9% of them were reported to have food sufficient for more than nine months (Annex 7, Tables 3 & 4) from their own agricultural production.

#### D. Major milk collection centers and milk production pockets

The information gathered during KIIs and FGDs suggests that there are two main milk collection centers that are linked with large number of milk production pockets within the vicinity of Khurkot. They are reported to have daily milk production potentials of 12,210 liters (Table 3.8).

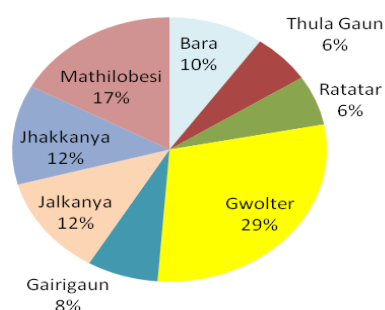
Table 3.8: Major milk production pockets/collection centers in Kurkot market center

Collection centers and production pockets	Avg. Distance (in Km) to Collection /Chilling Center	Access	Existing Chilling Center	Milk production (Liter per day)	
				Existing Collection	Potential (Additional)
<b>Khurkot</b>					
Bara	5	Track Road	No	0	400
Thula Gaun	2	Track Road	No	0	250
Ratatar	1	Track Road	No	0	250
Gwolter	10	Track Road	Yes	400	1200
Gairigaun	3	Track Road	No	0	300
Jalkanya	5	Track Road	No	0	500
Jhakkanya	5	Track Road	No	0	500
Mathilobesi	5	Track Road	Yes	250	700
<b>Total</b>				<b>650</b>	<b>4100</b>
<b>Khaniyakharka</b>					
Jalkanya	5	Track Road	Yes	200	400
Bhadrakali	2	Track Road	Yes	200	200
Kamalamai	1	Track Road	Yes	1200	650
Chisapani	10	Track Road	No	400	500
Naagi	3	Track Road	No	0	300
Marin	5	Track Road	No	0	350
Binayechhap	5	Track Road	No	0	200
Belgari	5	Track Road	No	0	260
Minsthan	5	Track Road	No	0	350
Goltar	5	Track Road	No	0	800
<b>Total</b>				<b>2000</b>	<b>4010</b>

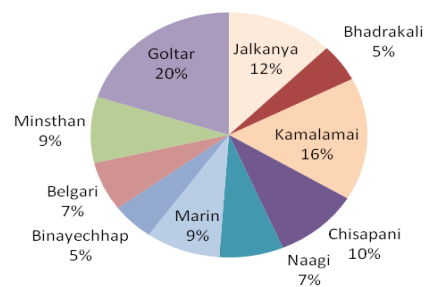
Source: FGD, KII and Household Survey, 2074

**Figure 3.2**  
Weighted contribution of production pockets/collection centers in Kurkot market center

Khurkot Chilling Center Milk Collection Sources



Khaniyakharka Chilling center Collection Milk



### E. Estimated milk production, sale and income earned

In sample household survey, daily milk production of 105 farming households was reported to produce 366.0 liters of milk (cow milk: 140 liters, buffalo milk: 226.5 liters) suggesting 3.5 liters of milk per household and 3.66 liters of milk per milking animal. Out of total respondents, more than 48% have desired to sell their milk to milk cooperatives. The average selling prices of cow-milk and buffalo milk are reported to be Rs. 51.2 and Rs. 52.66 respectively. On an average each household involved in milk trade is reported to have earned Rs. 2,875 per annum from the sale of milk products; largely ghee/butter (Annex 7, Tables 12, 14, 15, 16, 17, 18).

Table 3.9: Proposed chilling center: Khurkot

<b>Name</b>	<b>Khurkot</b>	
<b>Proposed Location</b>	Golanchour 7, Sindhuli	
<b>GPS Code</b>	27°19'43.57"N 85°59'41.04"E	
<b>Number of farmers involved (HHs)</b>	2,250	
<b>Present Daily milk production (liter)</b>	4,100	
<b>Major areas of milk production for the catchment purpose</b>		
Bara, Thula Gaun, Ratatar, Gwolter, Gairigaun, Jalkanya, Jhakkanya, Mathilobesi		
<b>Expected Future Annual Growth Rate in Milk Production</b>		
Average 15% if external milk promotional activities is provided		
<b>Small Chilling Centers / Collection Center Coverage</b>		
Bara, Thula Gaun, Ratatar, Gwolter, Gairigaun, Jalkanya, Jhakkanya, Mathilobesi		
<b>Nearby Market</b>		
Khurkot, Kavre, Janakpur, Sindhuligadi, etc		
<b>Distance Market</b>		
Bhaktpur, Kathmandu, Patan, Bardibas etc.		
<b>Technical Feasibility</b>	<b>Size of Chilling Center</b>	1500Ltr: Bulk Milk Collection:
	<b>Available resources</b>	Road access is viable, Vibrant existing cooperatives with reasonable infrastructures of water supply, electricity, space, manpower, etc.
<b>Financial Feasibility</b>	Cost of Propose Sized Milk Cooler: Rs 450, 000.00 Average cost of milk production: Rs. 48.8/liter; Selling price at farm household: Cow milk Rs.51.2/liter; buffalo milk R.s 52.66 /liter; Selling price at chilling center: Rs. 58/liter Estimated annual turnover at chilling center: Rs. 1,00,00,000.00	
<b>Recommendation:</b> Though the milk collection is done by Krishi Udhan Sahakari in this place. This place is potential for collection of milk from virgin and new areas. But marketing is the most problem for the sector. Therefore, Chilling Vat establishment will increase much amount of milk collection from the region. The place is also a bus stop center for the BP Highway and the collected cooled milk can be directly transported toward the Kathmandu market.		
<b>Nearby chilling center:</b> DDC, but not operating at the movement.		
<b>Nearby Dairy:</b> Koseli Dairy Industry with 1500 liter. daily processing and producing processed milk, ghee, yogurt, ice-cream etc. and marketed toward the Nepalthock, Sindhuli Bazar, Kamalamai Nagarpalika, etc.		

**Figure 3.3**  
**Google mapping of the proposed chilling center: Khurkot**

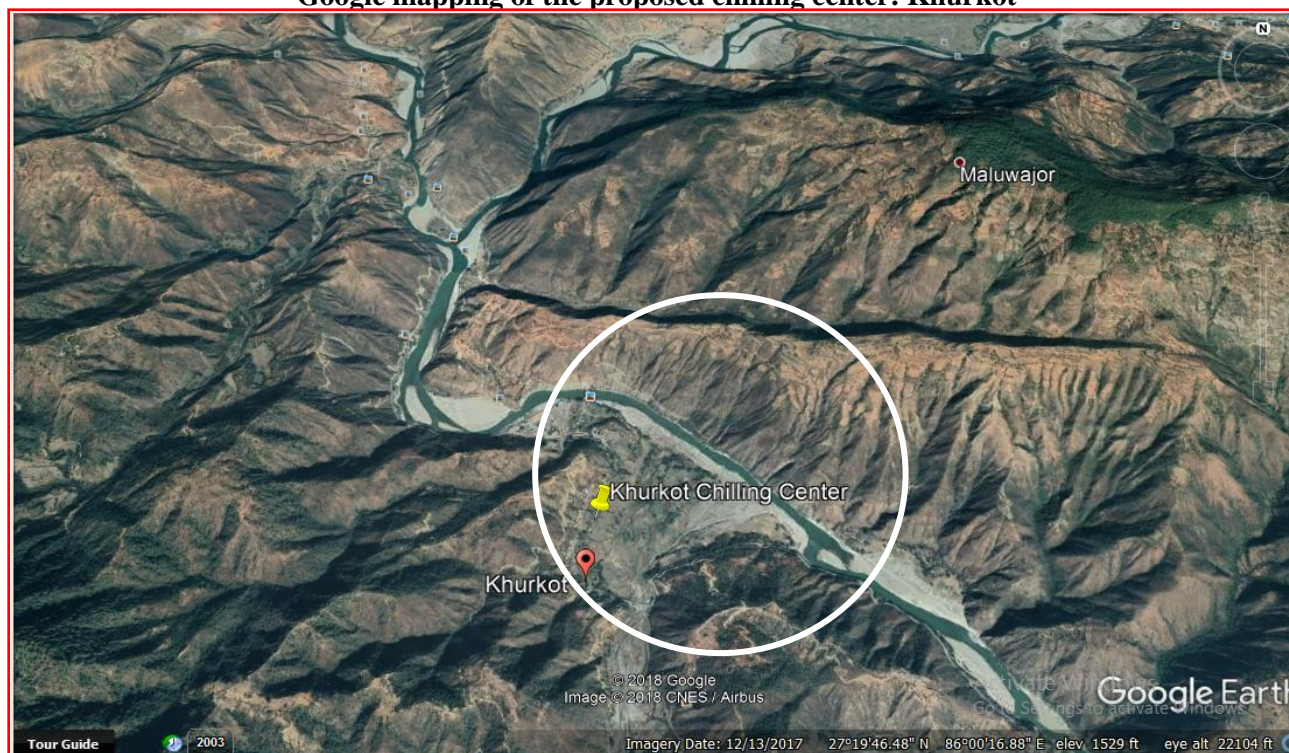
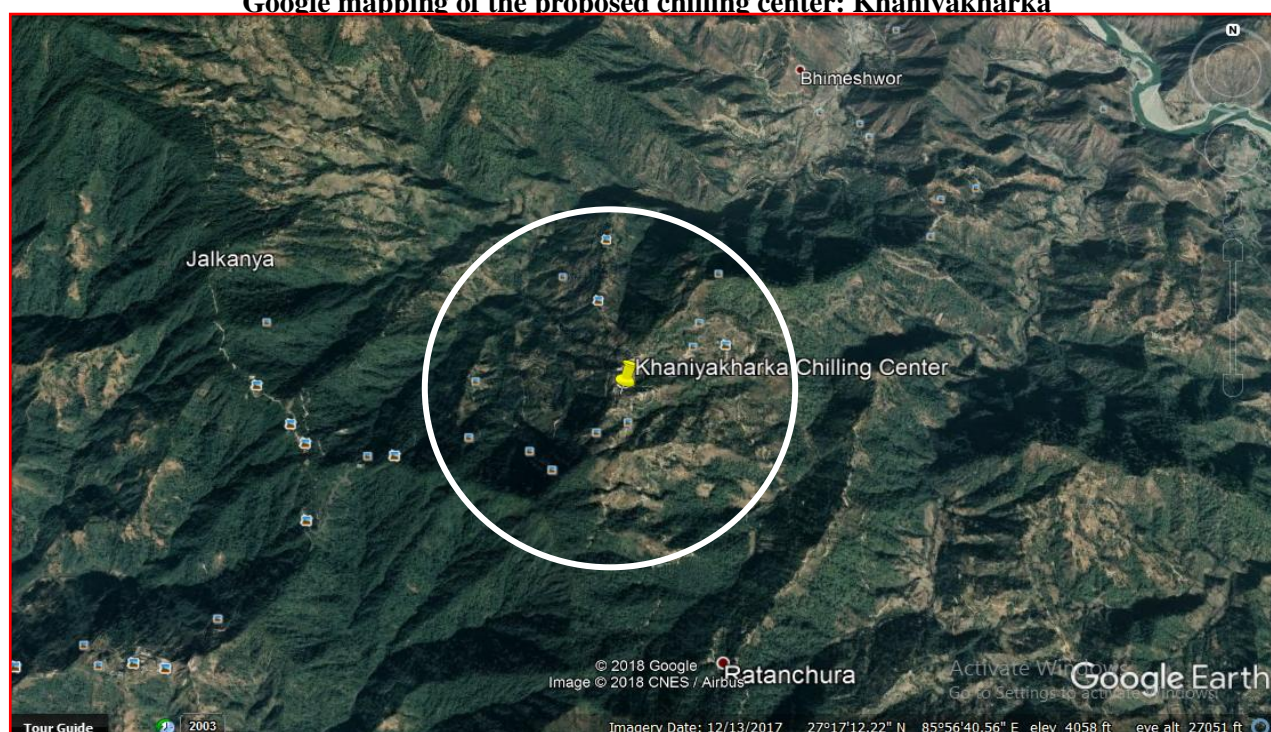


Table 3.10: Proposed chilling center: Khaniyakharka

<b>Name</b>	<b>Khaniyakharka</b>	
<b>Proposed Location</b>	Golanchour 5, Sindhuli	
<b>GPS Code</b>	27°16'59.00"N 85°58'36.81"E	
<b>Number of farmers involved (HHs)</b>	2100	
<b>Present Daily milk production (liter)</b>	4010 (Available for chilling)	
<b>Major areas of milk production for the catchment purpose</b>		
Jalkanya, Bhadrakali, Kamalamai, Chisapani, Naagi, Marin, Binayechhap, Belgari, Minsthan, Goltar, etc.		
<b>Expected Future Annual Growth Rate in Milk Production</b>		
<b>In average 15% if external milk promotional activities is provided</b>		
<b>Small Chilling Centers / Collection Center Coverage</b>		
Jalkanya, Bhadrakali, Kamalamai, Chisapani, Naagi, Marin, Binayechhap, Belgari, Minsthan, Goltar		
<b>Nearby Market</b>		
Khurkot, Kavre, Janakpur, Sindhuligadi, etc		
<b>Distance Market</b>		
<b>Bhaktpur, Kathmandu, Patan, etc.</b>		
<b>Technical Feasibility</b>	<b>Size of Chilling Center</b>	3000Ltr: Bulk Milk Collection
	<b>Available resources</b>	Road access is viable, Vibrant existing cooperatives with reasonable infrastructures of water supply, electricity, space, manpower, etc.
<b>Financial feasibility</b>	Cost of Propose Sized Milk Cooler: Rs 800, 000.00 Average cost of milk production: Rs. 48.8/liter; Selling price at farm household: Cow milk Rs.51.2/liter; buffalo milk R.s 52.66 /liter; Selling price at chilling center: Rs. 58/liter Estimated annual turnover at chilling center: Rs.2,00,00,000.00	
<b>Recommendation:</b> Recently governmental livestock office has distributed the number of chilling VAT of 300 capacities in the small collection center. This place is potential for collection of milk from virgin and new areas. But marketing is a problem for the sector. Therefore, Chilling Vat establishment will increase much amount of milk collection from the region. The place is also bus stop center for the BP Highway and the collected cooled milk can be directly transported toward the Kathmandu Market also.		
<b>Nearby chilling center:</b> Not Available; Nearby Dairy: Koseli Dairy Industry with 1500 liter. daily processing and producing processed milk, ghee, yogurt, ice-cream etc. and marketed toward the Nepalthock, Sindhuli Bazar, etc.		

**Figure 3.4**  
**Google mapping of the proposed chilling center: Khaniyakharka**



#### F. Number of cattle

Available information suggests that there are altogether 86 cows (local: 58, cross:3, jersey:25) and 111 buffalo (local 98, cross:16). As per the sample household survey, on an average each household involved in milk production/trade owns 0.82 cows and 1.06 buffalos. The number of milking cows and buffalos significantly outnumber non-milking ones (Annex 7, Tables 5 and 6).

#### G. Problems and constraints and suggested remedies

The stake holders during FDs and KIIs and farmers during farm household surveys expressed various types of problems/constraints they are presently confronted with. They also expressed their opinions on possible solutions. This has been summarized in the following manner:

- Lack of breed improvement technician: Local Vet service office needs be capacitated
- High production cost. Grants from provincial or federal government should be provided.
- Shortage of fodders and unavailability of feeds in local markets. Private sector Vets should be encouraged to expand their businesses. The milk producers need to be provided needed supports for growing fodders on their farm; and or they are linked with fodder suppliers.
- Chilling center far away and mass transport system is not efficient. More chilling centers at suitable locations need to be established.
- Animal insurance is not in practice; District Livestock Service Office needs to take steps in promoting insurance.

#### H. Proposed chilling centers

Out of various locations suggested by the stakeholders for the establishment of chilling centers, Khurkot in Golanchour 07 and Khaniyakharka, Golanchour 05 are proposed for establishing chilling centers. These points are selected on the basis of some consideration such as number of household involved, volume of daily milk collection, number of milk collection centers, centrality and availability of physical facilities such as electricity, water, and road condition, comparative proximity with bigger market centers or district headquarters. Basic information related to the establishment of chilling center at this point is furnished below (Table 3.9).

### **3.3 Baireni**

#### A. Introduction

Galchhi/Baireni is situated in Dhading district that is expected to cover large milk production catchment areas of Dhading and some parts of adjoining Nuwakot district. Dhading district is situated in the hilly region of Nepal from 300 meter to above 7000 meter altitude from the sea level. The district lies between 28°70'-27°40' North to 80°17'-84°35' East with 1926 km<sup>2</sup> area.

Dhading has a good road network connecting major market centers in the south along East West Highway and Postal Highways and major market centers of Kathmandu, Bhaktapur and Lalitpur districts in the north. It has 146.5 Km blacktopped road, 70 Km graveled road and around 1,290 Km agricultural tracked road. The emerging towns of Dhading that are connected to road network include Dhadingbesi, Benighat, Baseri, Naubise, Galchhi, and Mahadevbesi and Gajuri. Around 36 Km of MHHW passes through eastern part of the district.

There are two municipalities (Dhusnibesi and Nilkantha) and 11 rural municipalities (Khaniyabas, Gajuri, Galchhi, Ganga Jamuna, Jwalamukhi, Thakre, Netrawati, Benighat Rorang, Rubu Valley, Siddalekh and Tripura Subdari) in Dhading district. According to district profile, the district has 336,067 total populations (46.97% male, 53.03% female) and negative (-0.7%) annual population growth. Around 74% population depends in agriculture for their livelihood; among them 40,578 households are involved in production of milk and milk products. In Dhading, the number of cows is

estimated to be 108,451 followed by 84,024 buffalos. Presently, annual milk production in the district is around 16,325 Metric Ton. The annual livestock production growth rate is 3.57%.

Dhading district has three milk processing industries that are connected with 13 livestock service centers. Available information suggests that 13 artificial breeding centers, 23 milk producer cooperatives, 12 modern cow farms, 33 private Vet centers and 11 feed industries are actively involved in the dairy sector of the district. Galchhi/Baireni market center belong to Galchi rural municipality with eight wards that have 27,740 populations residing in area of 129.08 Km<sup>2</sup>.

#### B. Milk producers' cooperatives

There are five milk producers' cooperatives functioning in the vicinity of Baireni. Over 4,120 farmers are associated with these cooperatives that are reported to have potentials to produce as much as 17,600 liters of milk per day (Table 3.11)

Table 3.11: Number of milk cooperatives dairy firms around Baireni market center

<b>Existing Cooperatives</b>	<b>Daily milk production potentials (Liter)/</b>	<b>Number of Milk producers (Farmers)</b>
1. Sanakisan Sahakari	1600	300
2. Lagansil Dugdha Utpadan Sahakari	3100	400
3. Mahadevbesi Dugdha Utpadan Sahakar	3000	400
4. Khalidhunga Dugdha Utpadan Sahakari	6500	1170
5. Nabajoti Sahakari, Dhunibesi	3400	1500
<b>Total</b>	<b>17,600</b>	<b>3,770</b>

Source: FGD, KII and Household Survey, 2074

#### C. Farming households involved in milk production

It is estimated that as many as 8,000 farming households are involved in producing milk in the milk production pockets such as Thakre, Dhunibesi, Mahadebesi, Simle, and Ratmate. The sample household survey revealed that large (78.8%) number of households has land holding less than 0.5 hectare. Moreover, about 52.6% of them were reported to have food sufficient for more than nine months (Annex 7 Tables 3 and 4).

#### D. Major milk collection centers and milk production pockets

The information gathered during KIIs and FGDs suggests that there are as many as four major milk collection centers connected with the milk production pockets. They are reported to have daily milk production potentials of 12,650 liters of milk per day (Table 3.12).

#### E. Estimated milk production, sale and income earned

In sample household survey, daily milk production of 99 farming households was reported to be 976 liters (cow milk: 552 liters, buffalo milk: 444 liters) suggesting 10 liters of milk per household and 8.42 liters of milk per milking animal. Out of total respondents, more than 68% have desired to sell their milk in the private dairy directly rather than selling elsewhere. The average selling prices of cow-milk and buffalo milk are reported to be Rs. 50.32 and Rs. 62.04 respectively. On an average each household involved in milk trade is reported to have earned Rs. 3300 per annum from the sale of milk products; largely ghee/butter (Annex 7 Tables 12, 14, 15, 16, 17, 18).

Table 3.12: Major milk production pockets/collection centers in Baireni market center

Collection centers	Avg. Distance (in Km)	Existing Collection Center	Daily Milk in (liter)		Pockets
			Existing	Additional Potential	
Jamunedada, Thakre	5	Yes	1000	600	Goganpani, Bhumisthan, Debisthan, Simle, Gairegau, Ghalegaun, Ghairenirtigaun, Karkidada, Manakhu Goganpani, Thakre Bhumisthan, Tasarpa, Kebalpur, Baluwaphat, Phedi, Dharke, Galchhi, Dunibesi, Simle, Goganpani, Chhatredurali, Jungekhola, Jibawnpur, Phedi, Kebalpur, Khaniyokola Kalleri, Goganpani, Baireni, Nuwakot, Karkidada, Master, Mahadvphat, Kyureni, etc.
Mahadevbesi	5	Yes	1500	4600	
Dunibesi, Dharke	5	Yes	1000	5250	
Baireni, Galchhi	5	Yes	1200	2200	
<b>Total</b>			<b>4,700</b>	<b>12,650</b>	

Source: FGD, KII and Household Survey, 2014

#### F. Number of cattle

Available information suggests that there are altogether 78 milking cows (local: 8, cross: 29, jersey:84) and 74 buffalo (local 8, cross: 94 including non-milking). As per the sample household survey, on an average each household involved in milk production/trade owns 1.22 cows and 1.03 buffalo. The number of milking cows and buffalo significantly outnumber non-milking ones (Annex 7 Tables 5 and 6).

#### G. Problems and constraints and suggested remedies

The stake holders during FDs and KIIs and farmers during farm household surveys expressed various types of problems/constraints they are presently confronted with. They also expressed their opinions on possible solutions. This has been summarized in the following manner:

- High production cost; grants from provincial or federal government should be provided.
- Price variation, low price for milk from the milk collectors.
- Considering milk production in the region, technical assistance of the stake holders is inadequate. Veterinary service is weak including reproduction service; a good/experienced Veterinary doctor is needed.
- Animal insurance is not in practice; District Livestock Service Office needs to take steps in promoting insurance.
- Subsistence farming system; diversification and modernization of agriculture with focus on dairy development is needed.

#### H. Proposed chilling centers

Out of several locations suggested by local stakeholders two locations are recommended namely; Dhunibesi and Mahadevbesi. These points are selected on the basis of some consideration such as number of household involved, volume of daily milk collection, number of milk collection centers, centrality and availability of physical facilities such as electricity, water, road condition, comparative proximity with bigger market centers or district headquarters. Further details are given below (Tables 3.13 and 3.14).

Table 3.13: Proposed Chilling Center: Dhunibesi

<b>Name</b>	Dunibesi, Dharke	
<b>Proposed Location</b>	Naubise Dharke, 09, Dhading	
<b>GPS Code</b>	27°44'7.37"N 85° 7'57.02"E	
<b>Number of farmers involved (HHs)</b>	1,170 Hhs	
<b>Present Daily milk production (liter)</b>	6,250	
<b>Major areas of milk production for the catchment purpose</b>		
Goganpani, Bhumisthan, Debisthan, Simle, Gairegau, Ghalegaun, Ghartigaun, Karkidada, Manakhu		
<b>Expected Future Annual Growth Rate in Milk Production</b>		
Average 15% if external milk promotional activities is provided		
<b>Small Chilling Centers / Collection Center Coverage</b>		
Goganpani, Bhumisthan, Debisthan, Simle, Gairegau		
<b>Nearby Market</b>		
Gajuri, Kathmandu etc.		
<b>Distance Market</b>		
Lalitpur, Bhaktpur, etc.		
<b>Technical Feasibility</b>	<b>Size of Chilling Center</b>	2000Ltr: Bulk Milk Collection
	<b>Available resources</b>	Road access is viable, Vibrant existing cooperatives with reasonable infrastructures of water supply, electricity, space, manpower, etc.
<b>Financial feasibility</b>	Cost of Propose Sized Milk Cooler: Rs 650, 000.00 Average cost of milk production: Rs. 48.8/liter; Selling price at farm household: Cow milk Rs.50.32/liter; buffalo milk R.s 62.04 /liter; Selling price at chilling center: Rs. 67/liter Estimated annual turnover at chilling center: Rs 1,50,00,000.00	
<b>Recommendation:</b> The market centers have already the numbers of collection centers with small VAT size of up to 500ltr and big sized chilling center of DDC. Therefore it is recommended to upgrade the existing Chilling center/collection center rather than new establishment.		
<b>Nearby Chilling Center:</b> DDC Mahadevbesi with capacity 3000 liter		

**Figure 3.5**  
**Google mapping of the proposed Chilling Center: Dhunibesi**

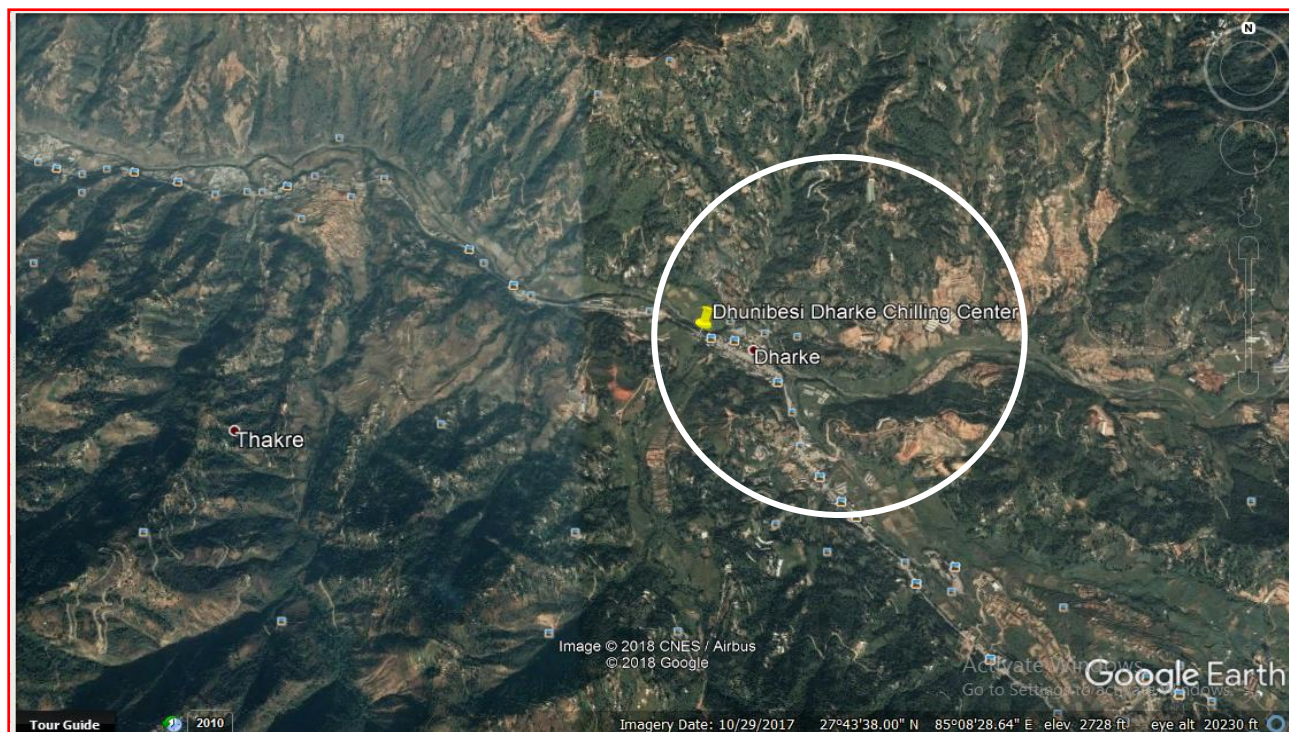
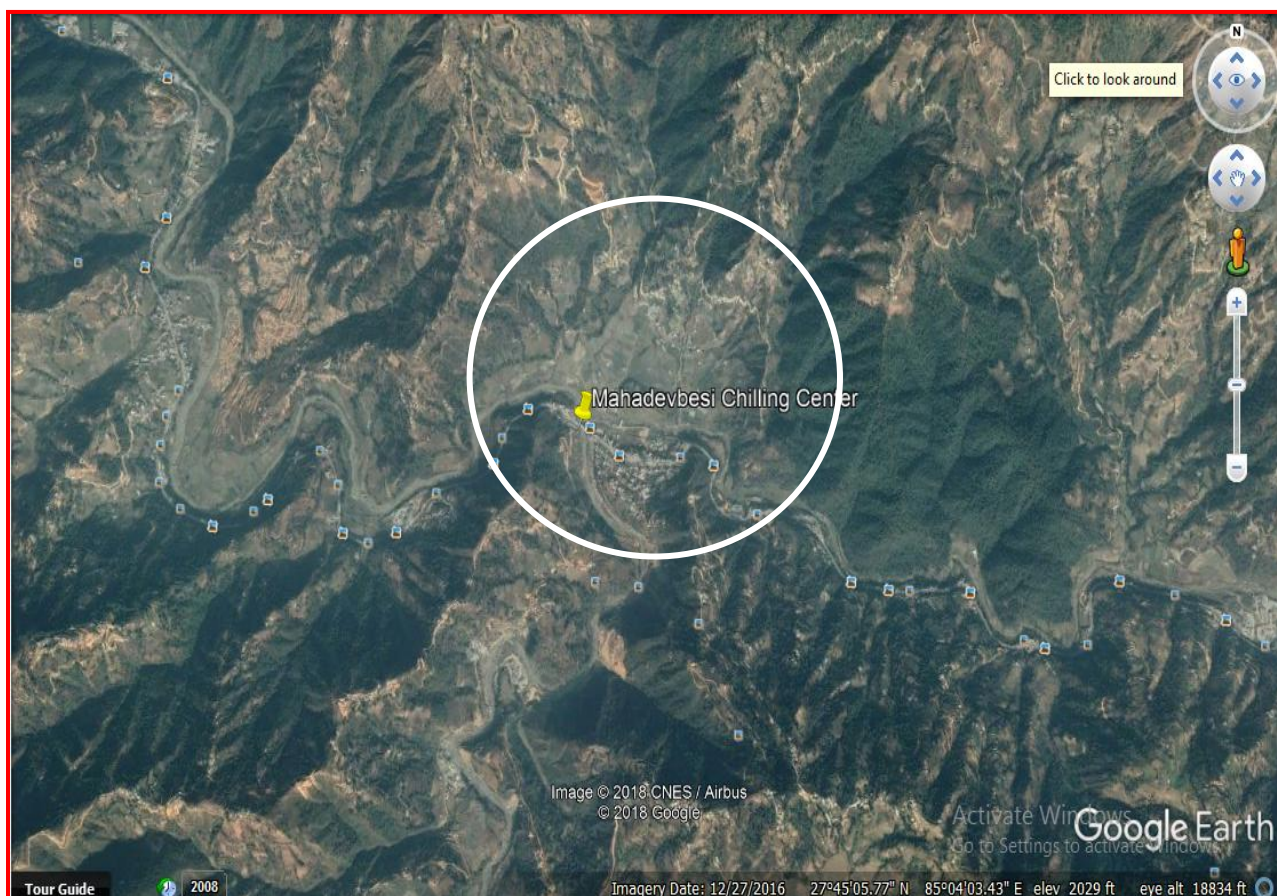


Table 3.14: Proposed chilling center: Mahadevbesi

<b>Name</b>		Mahadevbesi
<b>Proposed Location</b>		Thakre 11, Dhading
<b>GPS Code</b>		27°45'9.56"N 85° 3'51.40"E
<b>Number of farmers involved (HHs)</b>		800
<b>Present Daily milk production (liter)</b>		6100 (Available for chilling)
<b>Major areas of milk production for the catchment purpose</b>		
Goganpani, Thakre Bhumisthan, Tasarpa, Kebalpur, Baluwaphat, Phedi,		
<b>Expected Future Annual Growth Rate in Milk Production</b>		
In average 15% if external milk promotional activities is provided		
<b>Small Chilling Centers / Collection Center Coverage</b>		
Goganpani, Thakre Bhumisthan, Tasarpa, Kebalpur,		
<b>Nearby Market</b>		
Gajuri, Dhadingbesi, Kathmandu		
<b>Distance Market</b>		
Lalitpur, Bhaktpur, etc.		
<b>Technical Feasibility</b>	<b>Size of Chilling Center</b>	1500Ltr: Bulk Milk collection
	<b>Available resources</b>	Track Road access, electricity, space, manpower, etc.
<b>Financial feasibility</b>	Cost of Propose Sized Milk Cooler: Rs 450, 000.00 Average cost of milk production: Rs. 48.8/liter; Selling price at farm household: Cow milk Rs. 50.32/liter; buffalo milk R.s 62.04 /liter; Selling price at chilling center: Rs. 67/liter Estimated annual turn over at chilling center:Rs 1,00,00,000.00	
<b>Recommendation:</b> The market centers have already the numbers of collection centers with small VAT size of up to 500ltr and big sized chilling center of DDC. Therefore it is recommended to upgrade the existing Chilling center/collection center rather than new establishment. <b>Nearby Chilling Center:</b> DDC Mahadevbesi with capacity 3000ltr;		

Figure 3.6  
Google mapping of the proposed chilling center: Mahadevbesi



### 3.4 Besisahar

#### A. Introduction

Besisahar is the headquarters of **Lamjung district**. This district is situated in the hilly region of Nepal from 300 meter to above 5,000 meter altitude from the sea level. It lies between 28°3'-27°30' North to 80°11'-84°38' East with 1,692 Km<sup>2</sup> of area. There are four municipalities (Besisahar, Madhya Nepal, Rainas and Sundrabazar) and four rural municipalities (Kabahola Sothar, Dhudhpokhri, Dordi and Marsyangdi) in the district that are inhabited by about 167,724 populations (45.3% male and 54.7% female). This district has negative annual population growth rate of -0.9%.

The district has a good road network to connect large market centers such as Pokhara, Damauli, Khaireni, Kurintar, Muglin along the Prithivi Highway. It has 389 Km blacktopped road, 95.44 Km graveled road and around 300 Km of agricultural tracked road. The emerging towns of Lamjung district are Besisahar, Bhayelkharka, Jeeta, Sundarbazaar, Bhorletar, and Duradada. Around 15 Km. of MHHW goes through eastern part of Lamjung district.

In Lamjung district, around 71.12% population depends in agriculture for their livelihood; among them 20,514 households are involved in rearing cattle and producing of milk and milk products. The number of cow is estimated to be 38,042 followed by 43,464 buffalos. The annual milk production of the district is around 16,745 Mt. Presently, there is one milk processing industry connected with 12 livestock service centers, 12 milk producer cooperatives, eight modern cow firms, 36 private Vet centers.

#### B. Milk producers' cooperatives

There are two milk producers' cooperatives functioning in the vicinity of Besisahar. Over 2,145 farmers are associated with these cooperatives that are reported to have their members with potentials to produce as much as 7,630 liters of milk per day (Table 3.15)

Table 3.15: Number of milk cooperatives in Besisahar

<b>Existing Cooperatives</b>	<b>Daily milk production potentials (Liter)/ Per day</b>	<b>Number of Milk producers (Farmers)</b>
1. Dudheshor Dhugdha Utpadan Sahakari	230	95
2. Sundarbazaarl Dhugdha Sankalan Kendra	7400	2050
<b>Total</b>	<b>7,630</b>	<b>2,145</b>

Source: FGD, KII and Household Survey, 2074

#### C. Farming households involved in milk production

It is estimated that as many as 8,000 farming households are involved in producing milk in the milk production pockets such as Besisahar, Sundarbazaar, Bhorletar, Dhaminikuwa, Sotipasal, etc. The sample household surveys revealed that large (38%) number of households have land holding less than 0.5 hectare. Moreover, about 55% of them were reported to have food sufficient for more than nine months (Annex 7 Tables 3 and 4).

#### D. Major milk collection centers and milk production pockets

The information gathered during KIIs and FGDs suggests that there are four major milk collection centers that have links with various milk producing pockets. They are reported to have daily milk production potentials of 17,367 liters (Table 3.16).

Table 3.16: Major milk production pockets/collection centers in Besisahar market center

Collection centers	Avg. Distance (in Km) to Chilling Center	Existing Chilling Center	Collection Potential (liter)		Pockets
			Existing	Potential	
Sotipasal/Jitbes	5	Yes	400	445	Lamachour, Takasr, Jita, Tanahu, Rista, Paudelchock, Suryepal, Neta, Jita, Taksar, Ramgha, Bhalayokharka, Bhanu, Kunchha, Bibire Bhanjayn Besisahar, Sundarbazar, Madhyenepal, Rainas, Dhodi
Bhorletar	5	Yes	1200	8700	
Paaundi	5	Yes	1000	7400	
Bhotewodar	5	Ye	500	822	
<b>Total</b>				<b>17,367</b>	

Source: FGD, KII and Household Survey, 2074

#### E. Estimated milk production, sale and income earned

In sample household survey, daily milk production of 100 farming households was reported to be 1,429 liters (cow milk: 1095 liters, buffalo milk: 334 liters) suggesting 14 liters of milk per household and 9.25 liters of milk per milking animal. Out of total respondent, more than 51% have desired to sell their milk in the private dairy directly rather than selling elsewhere. The average selling prices of cow-milk and buffalo milk are reported to be Rs.54.90 and Rs. 57.55 respectively. On an average each household involved in milk trade is reported to have earned Rs. 5,236 per annum from the sale of milk products; largely ghee/butter (Annex 7 Tables 12, 14, 15, 16, 17, 18).

#### F. Number of cattle

Available information suggests that there are altogether 185 milking cows (local: 18, cross: 87, jersey: 162) and 87 buffalo (local 107, cross: 54 including no milking). As per the sample household survey, on an average each household involved in milk production/trade owns 2.67 cows and 1.61 buffalo. The number of milking cows and buffalo significantly outnumber non-milking ones (Annex 7; Tables 5 and 6).

#### G. Problems and constraints and suggested remedies

The stake holders during FDs and KIIs and farmers during farm household surveys expressed various types of problems/constraints they are presently confronted with. They also expressed their opinions on possible solutions. This has been summarized in the following manner:

- High production cost; grants from provincial or federal government should be provided.
- Price variation, low price for milk from the milk collectors.
- Considering milk production in the region, technical assistance of the stake holders is inadequate. Veterinary service is weak including reproduction service; a good/experienced Veterinary doctor is needed.
- Animal insurance is not in practice; District Livestock Service Office needs to take steps in promoting insurance.
- Subsistence farming system; diversification and modernization of agriculture with focus in dairy development is needed.

#### H. Proposed chilling centers

Out of several locations suggested by local stakeholders two locations are recommended namely; Bhorletar and Paundi, Sindarbazaar. These points are selected on the basis of some consideration such as number of household involved, volume of daily milk collection, number of milk collection centers, centrality and availability of physical facilities such as electricity, water, good road connectivity,

comparative proximity with bigger market centers or district headquarters. Further details are given below (Tables 3.17-3.18).

Table 3.17: Potential chilling center: Bhorletar

<b>Name</b>		Bhorletar
<b>Proposed Location</b>		Bhorletar 07, Lamjung
<b>GPS Code</b>		28° 9'9.75"N 84°13'58.90"E
<b>Number of farmers involved (HHs)</b>		2,100 Hhs
<b>Present Daily milk production (liter)</b>		8,700
<b>Major areas of milk production for the catchment purpose</b>		
Neta, Jita, Taksar, Ramgha		
<b>Expected Future Annual Growth Rate in Milk Production</b>		
Average 15% if external milk promotional activities is provided		
<b>Small Chilling Centers / Collection Center Coverage</b>		
Neta, Jita, Taksar, Ramgha		
<b>Nearby Market</b>		
Besisahar, Sundarbazar, Damauli, Khaireni, etc.		
<b>Distance Market</b>		
Pokhara, Mugnin, etc.		
<b>Technical Feasibility</b>	<b>Size of Chilling Center</b>	3000Ltr: Bulk Milk Collection
	<b>Available resources</b>	Road access is viable, Vibrant existing cooperatives with reasonable infrastructures of water supply, electricity, space, manpower, etc.
<b>Financial feasibility</b>	Cost of Propose Sized Milk Cooler: Rs 800, 000.00 Average cost of milk production: Rs. 48.8/liter; Selling price at farm household: Cow milk Rs. 54.90/liter; buffalo milk R.s 57.55/liter; Selling price at chilling center: Rs. 63/liter Estimated annual turnover at chilling center:Rs2,00,00,000.00	
<b>Recommendation:</b> Though milk collection potential is 8700ltrs, the recommended size is only 3000 liter; bulk Milk collection for the chilling of milk. This is because remaining milk is consumed locally or used for household purpose.		

**Figure 3.7**  
**Google mapping of the proposed chilling center: Bhorletar**

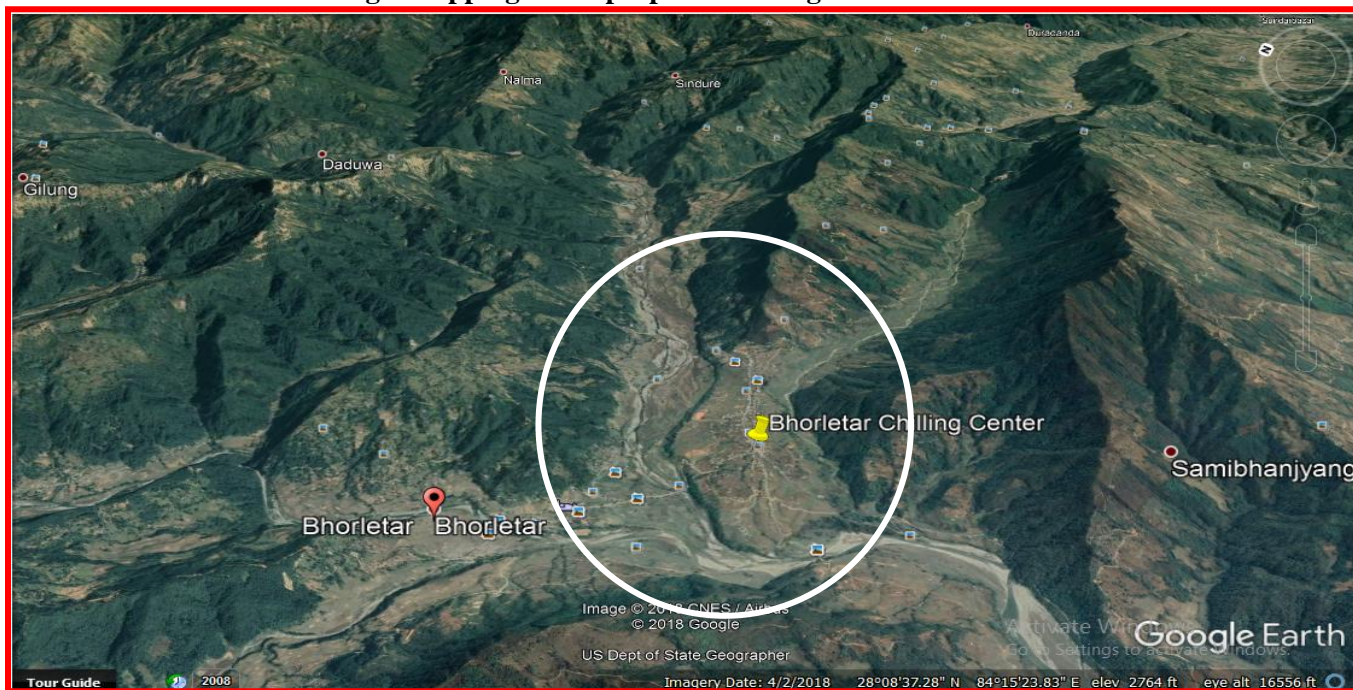
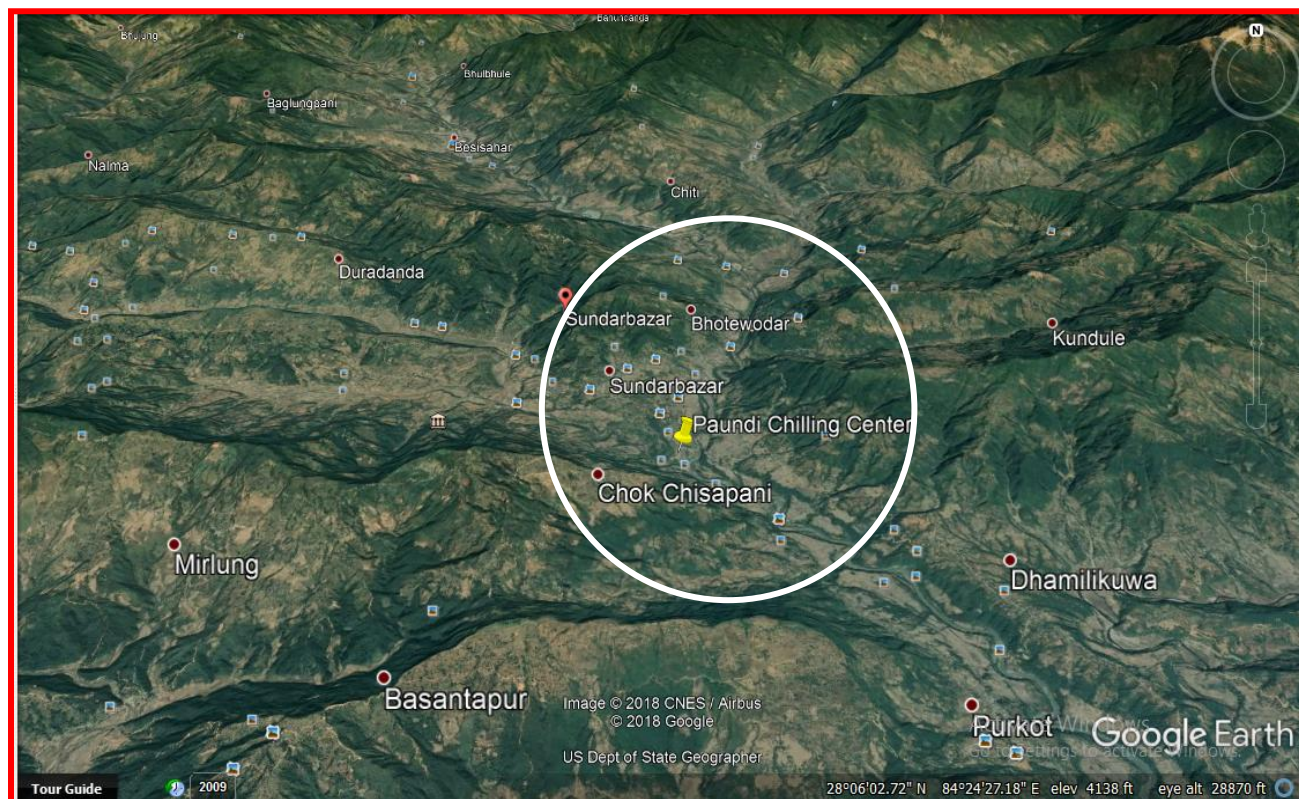


Table 3.18: Proposed Potential chilling center: Paundi/Sundarbazar

<b>Name</b>	Paundi	
<b>Proposed Location</b>	Sundarbazar 07, Lamjung	
<b>GPS Code</b>	28° 6'49.35"N 84°25'49.75"E	
<b>Number of farmers involved (HHs)</b>	2050Hhs	
<b>Present Daily milk production (liter)</b>	7400	
<b>Major areas of milk production for the catchment purpose</b>		
Bhalayokharka, Bhanu, Kunchha, Bibire Bhanjayn		
<b>Expected Future Annual Growth Rate in Milk Production</b>		
In average 15% if external milk promotional activities is provided.		
<b>Small Chilling Centers / Collection Center Coverage</b>		
Bhalayokharka, Bhanu, Kunchha, Bibire Bhanjayn		
<b>Nearby Market</b>		
Besisahar, Sundarbazar, Damauli, Khaireni, etc.		
<b>Distance Market</b>		
Pokhara, Mugnin, etc.		
<b>Technical Feasibility</b>	<b>Size of Chilling Center</b>	1500Ltr: Bulk Milk Collection
	<b>Available resources</b>	Track road access is viable, Reasonable infrastructures of water supply, electricity, space, manpower, etc.
<b>Financial feasibility</b>	Cost of Propose Sized Milk Cooler: Rs 4500, 000.00 Average cost of milk production: Rs. 48.8/liter; Selling price at farm household: Cow milk Rs. 54.90/liter; buffalo milk R.s 57.55/liter; Selling price at chilling center: Rs. 63/liter Estimated annual turn over at chilling center:Rs1,00,00,000.00	
<b>Recommendation:</b> Though milk collection potential is 7400ltrs, the recommended size is only 1500 liter; bulk Milk collection for the chilling of milk. This is because remaining milk is consumed locally or used for household purpose.		

**Figure 3.8**  
Google mapping of the proposed chilling center: Paaudi, Sundarbazaar



### 3.5 Burtibang

#### A. Introduction

Burtibang is one of the major market centers of **Baglung district**. It is situated in the hilly region of Nepal from 600 meter to above 4,500 meter altitude from the sea level. The district lies between 28°15' - 27°37' North to 83°01' - 83°36' East with 1,784 Km<sup>2</sup> of area. According to the district profile of Baglung district, there are four municipalities (Baglung, Galkot, Jaimini and Dhorpatan) and six rural municipalities (Bareng, Kathekhola, Taman Khola, Tara Khola, Nishi Khola and Bad Gad) in the district that has 268,613 total populations (43.9% male, 56.1% female) and negative annual population growth of - 0.1%. The district has a good road network to connect Prithivi Highway through Pokhara Baglung road. It has 15 Km. of blacktopped road, more than around 358 Km. of agricultural tracked road. The emerging towns of Baglung include Rijalchock, Harichour, Hatiya, Burtibang, Bhimguthhe, Baglung Bazaar, Sera, Khara, Bhimginthe that are well connected with roads. Damauli, Beni, Kusma, Waling are other market centers connected with the highway. Around 149 Km. of MHHW goes through the southern part of Baglung district. In Baglung district, around 74.35% population is involved in agriculture; 40,413 households are rearing cattle for producing milk and milk products for home consumption as well as for sale. The number of cows is 49,609 and that of buffalo is 78,246 in the district. The annual milk production of the district is around 16,745 Mt. The annual livestock production growth rate is 2.45%. The district has one milk processing industry/dairy that is connected with 10 livestock service centers.

#### B. Milk producers' cooperatives

There is no milk producers' Cooperative in Burtibang at present

#### C. Farming households involved in milk production

It is estimated that as many as 1473 farming households are involved in producing milk in the milk production pockets such as Burtiwan, Jayamini, Galkot, Khathekhola, Tarakola, Baglung.. The sample household survey revealed that 38.6% of households have land holding less than 0.5 hectare. Moreover, about 10.8% of them were reported to have food sufficient for more than nine months (Annex 7, Tables 3 and 4) from their own production.

#### D. Major milk collection centers and milk production pockets

The information gathered during KIIs and FGDs suggests that there are six major milk collection centers that are connected with a number of milk production pockets. They are reported to have daily milk production potentials of 10,100 liters from 957 farming households (Table 3.19).

Table 3.19: Major milk production pockets/collection centers in Burtibang market center

Collection centers	Avg. Distance (Km) to Chilling Center	Present Collection Potential in (liter/day)		Production pockets
		Existing	Potential	
Burtibang	5	-	1,700	Dhorpatan Municipality, Nisikhola Gaupalika, Badigard, Bhoragaun, Debisthan, Bhimkhidi, Adhikarichour, Galkot, etc.
Bardigard, Nisikhola	5	-	1,700	
Balewa	5	500	1,000	
Kathekhola	5	-	2,500	
Mulpani	5	-	2,000	
Hatiya	5	-	1,200	
<b>Total</b>		<b>500</b>	<b>10,100</b>	

Source: FGD, KII and Household Survey, 2074

#### E. Estimated milk production, sale and income earned

In sample household survey, daily milk production of 102 farming households was reported to be 697 liters (cow milk: 242 liters, buffalo milk: 455 liters) suggesting six liters of milk per household and 4.32 liters of milk per milking animal. Out of total respondents, more than 43% have desired to sell their milk directly to the consumer. The average selling prices of cow-milk and buffalo milk are reported to be Rs.54.6 and Rs. 67.39 respectively. On an average each household involved in milk trade is reported to have earned Rs. 3,870 per annum from the sale of milk products; largely ghee/butter (Annex 7 Tables 12, 14, 15, 16, 17, 18).

#### F. Number of cattle

Available information suggests that there are altogether 43 milking cows (local: 19, cross:10, jersey:25) and 118 buffalos (local 121, cross: 22 including no milking). As per the sample household survey, on an average each household involved in milk production/trade owns 0.53 cows and 1.42 buffalos. The number of milking cows and buffalos significantly outnumber non-milking ones (Annex 7 Tables 5 and 6).

#### G. Problems and constraints and suggested remedies

The stake holders during FDs and KIIs and farmers during farm household surveys expressed various types of problems/constraints they are presently confronted with. They also expressed their opinions on possible solutions. This has been summarized in the following manner:

- High production cost. Grants from provincial or federal government should be provided.
- Shortage of fodders and unavailability of feeds in local markets. Private sector Vets should be encouraged to expand their businesses. The milk producers need to be provided needed supports for growing fodders on their farm; and or they are linked with fodder suppliers.
- Veterinary service is weak including reproduction service; weak: a good/experienced doctor is needed.
- Problem of non fertility in cattle: Artificial breeding should be encouraged.
- Animal insurance is not in practice; District Livestock Service Office needs to take steps in promoting insurance.

#### H. Proposed chilling centers

Baglung bazaar and Burtibang are two locations recommended for chilling centers from the list of locations suggested by local stake holders. These points are selected on the basis of some consideration such as number of household involved, volume of daily milk collection, number of milk collection centers, centrality and availability of physical facilities such as electricity, water, road condition, comparative proximity with bigger market centers or district headquarters. Further details are enlisted below (Tables 3.20-3.21).

Table 3.20: Proposed chilling center: Baglung Bazaar

<b>Name</b>	Baglung Bazaar	
<b>Proposed Location</b>	Baglung Bazaar, Kathekhola, Baglung	
<b>GPS Code</b>	28°16'41.33"N 83°35'59.29"E	
<b>Number of farmers involved (HHs)</b>	860	
<b>Present Daily milk production (liter)</b>	6,000	
<b>Major areas of milk production for the catchment purpose</b>		
Upalachour, Baglung Bazaar, Gaidakot, Nuwara, Khaniyaghat, Odachour, Kundule, etc.		
<b>Expected Future Annual Growth Rate in Milk Production</b>		
In average 15% if external milk promotional activities is provided		
<b>Small Chilling Centers / Collection Center Coverage</b>		
Kathekhola, Mulpani, Hatiya		
<b>Nearby Market</b>		
Baglung Bazar, Burtibang, Beni, Kusma, etc.		
<b>Distance Market</b>		
Pokhara, Palpa, etc.		
<b>Technical Feasibility</b>	<b>Size of Chilling Center</b>	1500Ltr: Bulk Milk collection
	<b>Available resources</b>	Road access is viable, Vibrant existing cooperatives with reasonable infrastructures of water supply, electricity, space, manpower, etc.
<b>Financial feasibility</b>	Cost of Propose Sized Milk Cooler: Rs 4500, 000.00 Average cost of milk production: Rs. 48.8/liter; Selling price at farm household: Cow milk Rs. 54.60/liter; buffalo milk R.s 67.39/liter; Selling price at chilling center: Rs.70/liter Estimated annual turnover at chilling center:Rs1,00,00,000.00	
<b>Recommendation:</b> The market centers have already the numbers of chilling centers. Therefore it is recommended to upgrade the existing Chilling center rather than new establishment.		

**Figure 3.9**  
Google mapping of the proposed chilling: Baglung Bazaar

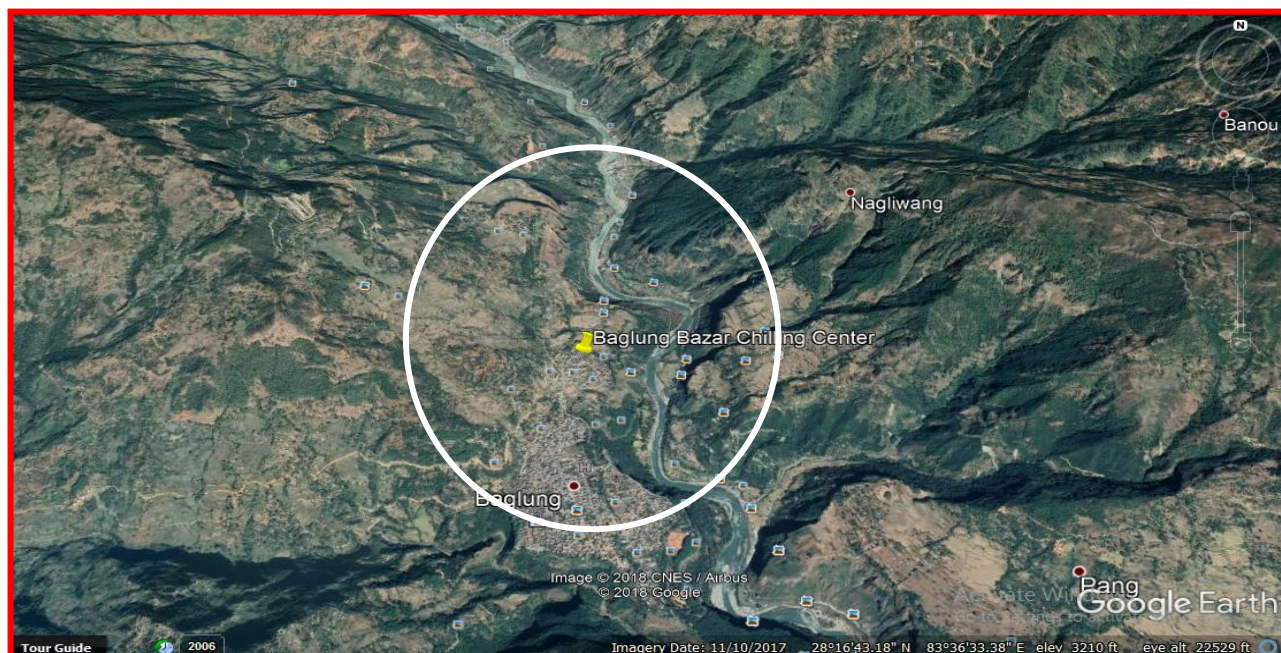
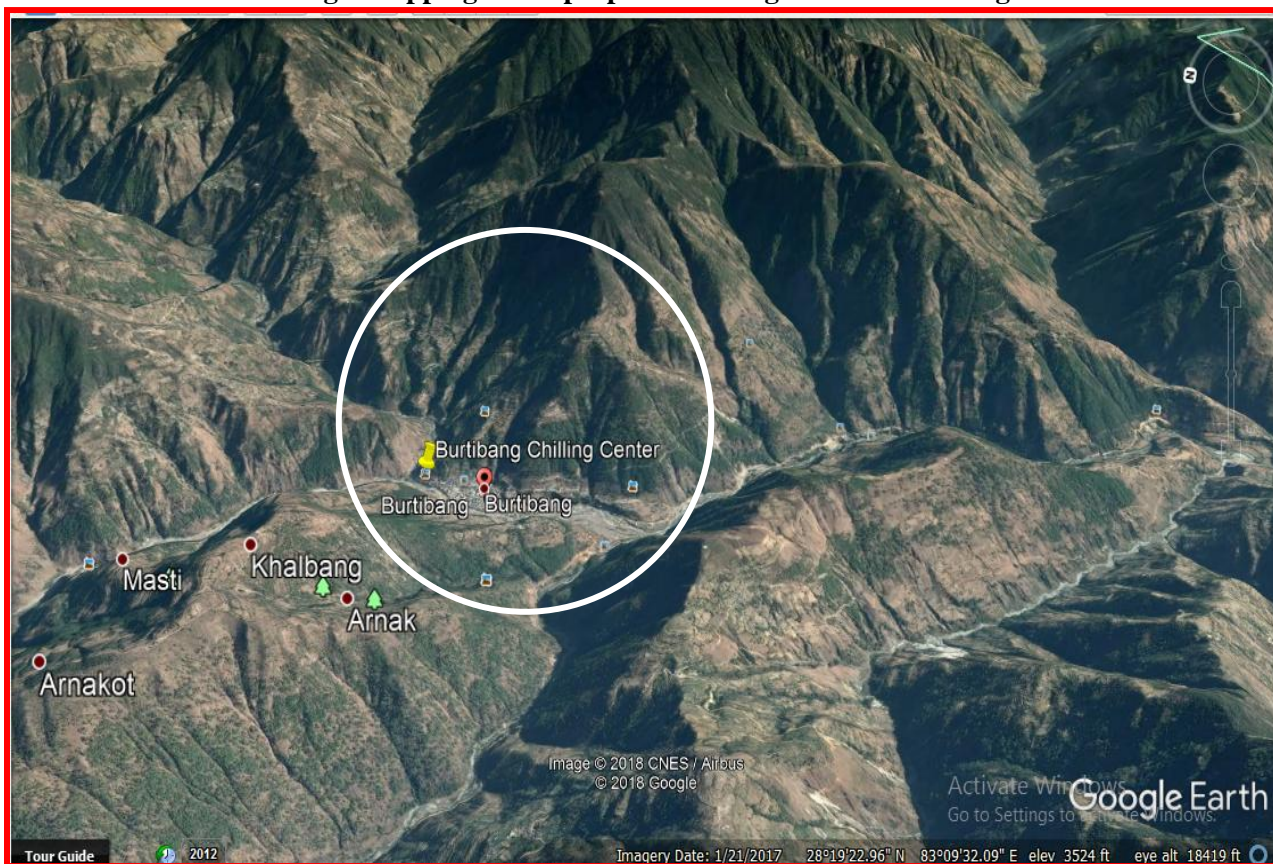


Table 3.21: Proposed chilling center: Burtibang

<b>Name</b>	Burtibang	
<b>Proposed Location</b>	Burtiwan, Dhorpatan Municipality Baglung	
<b>GPS Code</b>	28°20'11.23"N 83° 9'41.08"E	
<b>Number of farmers involved (HHs)</b>	900	
<b>Present Daily milk production (liter)</b>	4000	
<b>Major areas of milk production for the catchment</b>		
Kuthapla, Sera, Masti, Arnak, Khalbang, Bhimgithe, etc.		
<b>Expected Future Annual Growth Rate in Milk Production</b>		
In average 15% if external milk promotional activities is provided		
<b>Small Chilling Centers / Collection Center Coverage</b>		
Burtibang, Bardigard, Nisikhola, Balewa, etc.		
<b>Nearby Market: Baglung Bazar, Burtibang, Beni, Kusma, etc.</b>		
<b>Distance Market</b>		
Pokhara, Palpa, etc.		
<b>Technical Feasibility</b>	<b>Size of Chilling Center</b>	2000Ltr: Bulk Milk Collection
	<b>Available resources</b>	Road access is viable, Vibrant existing cooperatives with reasonable infrastructures of water supply, electricity, space, manpower, etc.
<b>Financial feasibility</b>	Cost of Propose Sized Milk Cooler: Rs 650, 000.00 Average cost of milk production: Rs. 48.8/liter; Selling price at farm household: Cow milk Rs. 54.60/liter; buffalo milk R.s 67.39/liter; Selling price at chilling center: Rs. 70/liter Estimated annual turnover at chilling center:Rs1,50,00,000.00	
<b>Recommendation:</b> Though milk collection potential is 4000ltrs, the recommended size is only 2000 liter Bulk Milk collection for the chilling of milk. This is because remaining milk is consumed locally or used for household purpose.		

**Figure 3.10**  
**Google mapping of the proposed chilling center: Burtibang**



### 3.6 Rakam Karnali market center

#### A. Introduction

Rakam Karnali is situated in **Dailekh**; a hilly district of Nepal that has about 1,485.57 Km<sup>2</sup> of area. . It is situated at 544 meter to 4,168 meters above the sea level. There are four municipalities (Narayan, Dullu, Chamunda Bindrasaini and Aathabis) and seven rural municipalities (Bhagwati Mai, Gurans, Dungeswor, Naumule, Mahabu, Bairavi and Thantikandh) in the district that have 261,770 total populations (48% male, 52% female) with 1.5% annual population growth.

In Dailekh district, around 79% populations is doing agriculture for their livelihood among them 24,389 households are doing cattle rearing and producing milk and milk products. The number of cattle is 36,410 and that of buffalo is 36,410. The annual milk production of the district is around 18,569 Metric Ton. The annual livestock production growth rate is 3.15%.

Rakam Karnali has access to Dailekh district headquarters and other market centers along the Karnali Highway (Surkhet-Jumla). The emerging towns of Dailekh include Dailekh Bazaar, Dullu, Naumule, Chuppra, Dadi Madi, and Dungeshor. Rakam Karnali also is connected with large cities such as Surkhet, Nepalgunj through the district road network.

The district has 12 livestock service centers, one milk producers' cooperative, six feed shops and 27 Agro vet service centers.

#### B. Milk producers' cooperatives

Belpata Milk Cooperative Ltd., Chuprabazaar is the only milk producers' cooperative functioning in the vicinity of Rakam that has 345 active members producing 2,200 liters of milk every day.

Table 3.22: Major milk production pockets/collection centers in Rakam market center

Collection centers	Distance (Km) to Chilling center	Access	Existing Collection center	Collection Potential (liter/per day)	Milk production pockets
Narayan Nagarpalika	5	Track Road	No	2,200	Narayan Nagarpalika, Aathabise Nagarpalika, Bhairabhi
Malachour	5	Track Road	No	800	Gaaupalika, Bhagawatimai
Miulekot	5	Track Road	No	850	Gaaupalika, Kitutol, Naubalaman, Jayanepali, Telichakha
Rakam Karnali	5	Track Road	No	3,400	Mulekot, Pipalkot, Sibauri, Singasatra, Tarku, Kalikot, Ritetal, Amikana, Gairakhet, Badasaini, etc. Sattala, Tilepata, Rakam Karnali, Pipalkot, etc.
<b>Total</b>				<b>7,250</b>	

Source: FGD, KII and Household Survey, 2074

#### C. Farming households involved in milk production

It is estimated that as many as 1473 farming households are involved in producing milk in the milk production pockets such as Narayan Municipality, Bhagawati, Bhairabi, Aathbise. The sample household survey revealed that large (79%) of households have land holding less than 0.5 hectare. Moreover, about 39% of them were reported to have food sufficient for more than nine months (Annex 7, Tables 3 and 4) from their own production.

#### D. Major milk collection centers and milk production pockets

The information gathered during KIIs and FGDs suggests that there are as many as four major milk collection centers connected with large number of milk production pockets. They are reported to have daily milk production potentials of 7,250 liters. (Table 3.22).

#### E. Estimated milk production, sale and income earned

In sample household survey, daily milk production of 95 farming households was reported to be 481.5 liters (cow milk: 23 liters, buffalo milk: 458.5 liters) suggesting 5.0 liters of milk per household and 4.22 liters of milk per milking animal. Out of total respondents, more than 30% have desired to sell their milk directly to the tea shop and local motels. The average selling prices of cow-milk and buffalo milk are reported to be Rs.50.36 and Rs. 59.82 respectively. On an average each household involved in milk trade is reported to have earned Rs. 4,422 per annum from the sale of milk products; largely ghee/butter (Annex 7 Tables 12, 14, 15, 16, 17, 18).

#### F. Number of cattle

Available information suggests that there are altogether 13 milking cows (local: 20, cross: 0, jersey:13) and 102 buffalos (local 100, cross: 2 including non milking). As per the sample household survey, on an average each household involved in milk production/trade owns 0.21 cows and 1.71 buffalos. The number of milking cows and buffalo significantly outnumber non-milking ones (Annex 7, Tables 5 and 6).

#### G. Problems and constraints and suggested remedies

The stake holders during FDs and KIIs and farmers during farm household surveys expressed various types of problems/constraints they are presently confronted with. They also expressed their opinions on possible solutions. This has been summarized in the following manner:

- Lack of breed improvement technician: Local Vet service office needs to be capacitated and mobilized
- High production costs due to increased transportation costs to bring dodders/feeds and transport milk and milk products. Some sort of subsidies from provincial or federal government should be provided.
- Shortage of fodders and unavailability of feeds in local markets. Private sector Vets should be encouraged to expand their businesses. The milk producers need to be provided needed supports for growing fodders on their farm; and or they are linked with fodder suppliers.
- Considering milk production in the region, technical assistance of the stake holders is inadequate. Veterinary service is weak including reproduction service; weak: a good/experienced doctor is needed.
- Problem of non fertility in cattle: Artificial Breeding should be encouraged.
- Animal insurance is not in practice; District Livestock Service Office needs to take steps in promoting insurance.
- Easy access (in terms time, availability and cost) to transport facility is the biggest hurdle to supply milks to reliable collection centers where reasonable price of milk could be fetched

#### H. Proposed chilling centers

Narayan municipality and Aathbise of Rakam Karnali are two locations that are considered to be most suitable and potential for the establishment of chilling centers. These points are selected on the basis of some consideration such as number of household involved, volume of daily milk collection, number of milk collection centers, centrality and availability of physical facilities such as electricity, water, road condition, comparative proximity with bigger market centers or district headquarters. Further details are furnished below (Tables 3.23-3.24).

Table 3.23: Proposed chilling center: Narayan Municipality

<b>Name</b>		Narayan Municipality
<b>Proposed Location</b>		Narayan Municipality 1, Dailekh
<b>GPS Code</b>		28°51'21.29"N 81°43'51.11"E
<b>Number of farmers involved (HHs)</b>		750
<b>Present Daily milk production (liter)</b>		2200 (Available for chilling)
<b>Major areas of milk production for the catchment purpose</b>		
Narayan Nagarpalika, Aathabise Nagarpalika, Bhairabhi Gaaupalika, Bhagawatimai Gaaupalika, etc.		
<b>Expected Future Annual Growth Rate in Milk Production</b>		
<b>In average 15% if external milk promotional activities is provided</b>		
<b>Small Chilling Centers / Collection Center Coverage</b>		
Narayan Municipality		
<b>Nearby Market</b>		
Rakam, Kalikot, Dadimadi, Desdaada etc.		
<b>Distance Market</b>		
Surkhet, Nepalgunj, etc		
<b>Technical Feasibility</b>	<b>Size of Chilling Center</b>	1500Ltr: Bulk Milk Collection
	<b>Available resources</b>	Track Road access is viable, Reasonable infrastructures of water supply, space, manpower, etc.
<b>Financial feasibility</b>	Cost of Propose Sized Milk Cooler: Rs 450, 000.00 Average cost of milk production: Rs. 48.8/liter; Selling price at farm household: Cow milk Rs. 50.36 Rs 450, 000.00/liter; buffalo milk R.s 59.82/liter; Selling price at chilling center: Rs. 63/liter Estimated annual turnover at chilling center:Rs. 1,00,00,000.00	
<b>Recommendation:</b> The track road is not suitable for Chilling Vat establishment due to problem in distance transportation through cooling van. It cannot be operated in all weather. Therefore, the investment of the farmers in the livestock will be drained out leading to lot of social causes. Therefore, it is recommended to establish the chilling center after the all weather road access is made.		

**Figure 3.11**  
Google mapping of the proposed Chilling enter: Narayan Municipality

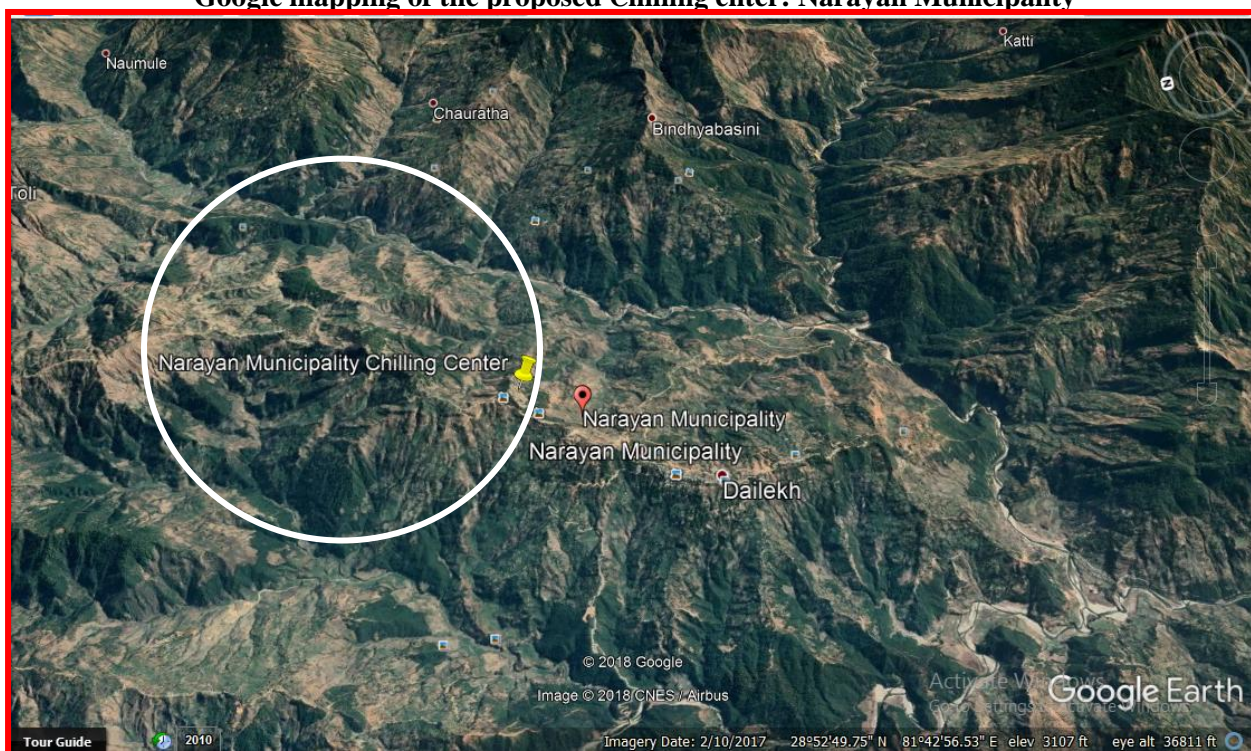
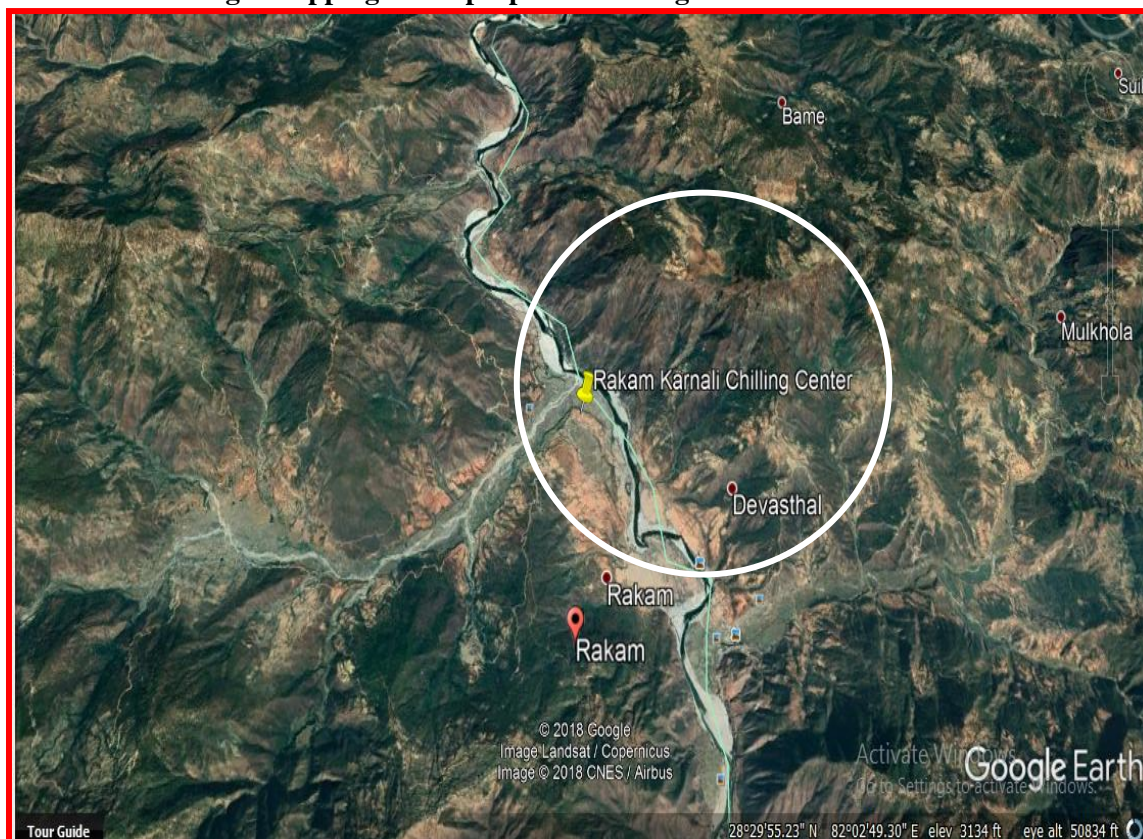


Table 3.24 : Proposed chilling center: Rakam Karnali

<b>Name</b>	Rakam Karnali	
<b>Proposed Location</b>	Aaathbise Municipality 04, Dailekh	
<b>GPS Code</b>	28°32'35.23"N 82° 0'40.92"E	
<b>Number of farmers involved (HHs)</b>	1140	
<b>Present Daily milk production (liter)</b>	3400 (Available for chilling)	
<b>Major areas of milk production for the catchment</b>		
Sattala, Tilepata, Rakam Karnali, Pipalkot, Barne, Mulkhola, Devisthal, etc.		
<b>Expected Future Annual Growth Rate in Milk Production</b>		
In average 15% if external milk promotional activities is provided		
<b>Small Chilling Centers / Collection Center Coverage</b>		
Rakam Karnali		
<b>Nearby Market</b>		
Rakam, Kalikot, Dadimadi, Desdaada etc.		
<b>Distance Market</b>		
Birendranagar, Nepalgunj, Kalikot, etc.		
<b>Technical Feasibility</b>	<b>Size of Chilling Center</b>	1500Ltr: Bulk Milk Collection
	<b>Available resources</b>	All weather road access is connected, Reasonable infrastructures of water supply, space, manpower, etc.
<b>Financial feasibility</b>	Cost of Propose Sized Milk Cooler: Rs 450, 000.00 Average cost of milk production: Rs. 48.8/liter; Selling price at farm household: Cow milk Rs. 50.36 Rs 450,000.00/liter; buffalo milk R.s 59.82/liter; Selling price at chilling center: Rs. 64/liter; Estimated annual turnover at chilling center:Rs1,00,00,000.00	
<b>Recommendation:</b> Due to the lack of three phase electricity it is not feasible for establishing the chilling vat at present. But this is the center of different other potential collection centers and milk production pockets, therefore dairy development can be done in this area in the future.		

**Figure 3.12**  
Google mapping of the proposed Chilling Center: Rakam Karnali



### 3.7 Patan market center

#### A. Introduction

Patan is one of the major market centers of **Baitadi district**. Baitadi district is situated in the hilly region of Nepal from 2,439 meter to 6,936 meter altitude from the sea level with 1,519 Km<sup>2</sup> of areas. There are four municipalities (Dashrath Chand, Patan, Melauli Purchaundi) and six rural municipalities (Surmaiya, Sigas, Shivanath, Pancheshor, Dogada Kedar and Dilasaini) in the district. The district has 250,898 total population (46.79% male and 53.31% female) and with 1.58% annual population growth rate. Like in other districts along the MHHW, around 73.13% population depends in agriculture for their livelihood. About 39,856 households are reported to have been involved in producing milk and milk product; largely for marketing and partly for home consumption. The cattle population is estimated to be 116,672 and followed by 56,183 buffalos. The annual milk production of the district is around 17,227 Mt. The annual livestock production growth rate is 1.23%.

As compared to other district along the MHHW, road network is poor in Baitadi. However, Patan is well connected with MHHW that links it with district headquarters of nine districts under Province 7. The emerging market centers of Baitadi include Sharmali, Mahakali, Pancheshwor, Kulau, Udayadev, Bisalpur, Shivanath, Aamchaur, Melauli, Maharudra, Rodidewal, Giregada, Nagarjun, Guwalek, Salena, Durgasthan, Dehimandu, Gurukhola, Basantapur, Sakar, Kailpal, Khalagagadi Dugad, Thalakada, Sigas, Siddhapur, Gajari, Shilanga, Patan, Bhumeshwor, Gujar, Siddheshwor, Chaukham, Shikharpur, Kotpetera.

#### B. Milk producers' cooperatives

There is no any Milk Cooperative at present. But there is private sector Nagarjun Dairy at Patan.

#### C. Farming households involved in milk production

It is estimated that as many as 3,343 farming households are involved in producing milk in the milk production pockets such as Dhatabazar, Sigas, Patanbazar, Patan Municipality, Iranabazar, Hatasbazar, Gajari, and Chamadekharka. The sample household survey revealed that large (45.4%) number of households has land holding less than 0.5 hectare. Moreover, about 13.1% of them were reported to have food sufficient for more than nine months (Annex 7, Tables 3 and 4) from their own production.

#### D. Major milk collection centers and milk production pockets

The information gathered during KIIs and FGDs suggests that there are two main milk collection centers around Patan; namely Patan in Ward No. 6 that has collects 1,500 liters of milk per day and Gajari at Ward No. 2 that has larger milk collection i.e. 2,000 per day. Santoli, Sukeli, Kholasi, Patangaun, Dudegaira, Sukhaye Gaupalika, Sigaru Gaupalika, Patan Nagarpalika, Gajari Gaupalika, Kotila, Irana, Bajkot are the major milk production pockets. Reaching these collection centers is difficult for the farmers as majority of farmers cover five to eight kilometers of distance. Public transport is mostly not available.

#### E. Estimated milk production, sale and income earned

In sample household survey, daily milk production of 99 farming households was reported to be 707 liters (cow milk: 264 liters, buffalo milk: 443 liters) suggesting 7.0 liters of milk per household and 3.66 liters of milk per milking animal. Out of total respondents, only about 10% have desired to sell their milk directly to the tea shop and local motels. The average selling prices of cow-milk and buffalo milk are reported to be Rs.51.33 and Rs. 56.33 respectively. On an average each household

involved in milk trade is reported to have earned Rs. 4,780 per annum from the sale of milk products; largely ghee/butter (Annex 7, Tables 12, 14, 15, 16, 17, 18).

#### F. Number of cattle

Available information suggests that there are altogether 105 milking cows (local: 189, cross :6, jersey:0) and 88 buffalos (local 162, cross: 2 including none milking). As per the sample household survey, on an average each household involved in milk production/trade owns 1.97 cows and 1.66 buffalo. The number of milking cows and buffalo significantly outnumber non-milking ones (Annex 7, Tables 5 and 6).

#### G. Problems and constraints and suggested remedies

The stake holders during FDs and KIIs and farmers during farm household surveys expressed various types of problems/constraints they are presently confronted with. They also expressed their opinions on possible solutions. This has been summarized in the following manner:

- Lack of breed improvement technician: Local Vet service office needs to be capacitated and mobilized
- High production costs due to increased transportation costs to bring fodders/feeds and transport milk and milk products. Some sort of subsidies from provincial or federal government should be provided.
- Shortage of fodders and unavailability of feeds in local markets. Private sector Vets should be encouraged to expand their businesses. The milk producers need to be provided needed supports for growing fodders on their farm; and or they are linked with fodder suppliers.
- Considering milk production in the region, technical assistance of the stake holders is inadequate. Veterinary service is weak including reproduction service; weak: a good/experienced doctor is needed.
- Problem of non fertility in cattle: artificial breeding facilities need to be made available.
- Animal insurance is not in practice; District Livestock Service Office needs to take steps in promoting insurance.
- Easy access (in terms time, availability and cost) to transport facility is the biggest hurdle to supply milks to reliable collection centers where reasonable price of milk could be fetched

#### H. Proposed chilling centers

Patan and Gajari are two locations that are considered to be most suitable and potential for the establishment of chilling centers. These points are selected on the basis of some consideration such as number of household involved, volume of daily milk collection, number of milk collection centers, centrality and availability of physical facilities such as electricity, water, road condition, comparative proximity with bigger market centers or district headquarters. Further details are furnished below (Tables 3.25-3.26).

Table 3.25: Proposed chilling center: Patan

<b>Name</b>		Patan 06
<b>Proposed Location</b>		Patan 06, Baitadi
<b>GPS Code</b>		29°27'41.42"N80°32'29.90"E
<b>Number of farmers involved (HHs)</b>		560
<b>Present Daily milk production (liter)</b>		1500
<b>Major areas of milk production for the catchment purpose</b>		
Gajari Gaupalika, Kotila , Irana, Bajkot, etc.		
<b>Expected Future Annual Growth Rate in Milk Production</b>		
In average 15% if external milk promotional activities is provided		
<b>Small Chilling Centers / Collection Center Coverage</b>		
Gajari, Kotila, Iran, Bajkot		
<b>Nearby Market</b>		
Data Bazar, Patan Bazar, Hatas Bazar, Dasaratchand, etc.		
<b>Distance Market</b>		
Surkhet, Nepalgunj, etc		
<b>Technical Feasibility</b>	<b>Size of Chilling Center</b>	500Ltr: Bulk Milk Collection
	<b>Available resources</b>	Access of all weather road, Reasonable infrastructures of water supply, electricity, space, etc.
<b>Financial feasibility</b>	Cost of Propose Sized Milk Cooler: Rs 150, 000.00 Average cost of milk production: Rs. 48.8/liter; Selling price at farm household: Cow milk Rs. 50.36 /liter; buffalo milk R.s 59.82/liter; Selling price at chilling center: Rs.64/liter; Estimated annual turnover at chilling center:Rs. 25,00,000.00	
<b>Recommendation:</b> Though milk collection potential is 1500 liters, the recommended size is only 500 liters; bulk milk collection for the chilling of milk. This is because remaining milk is consumed locally or used for household purpose.		

**Figure 3.13**  
Google mapping of the proposed chilling center: Patan

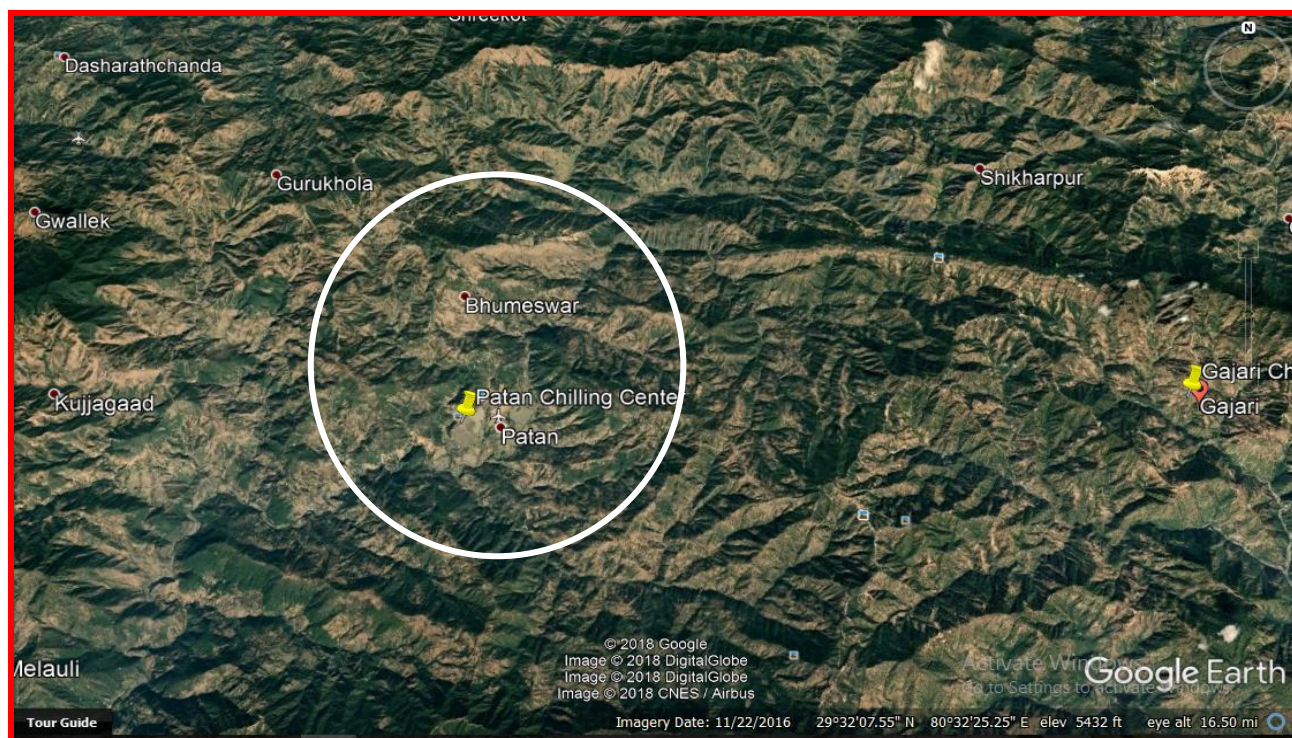
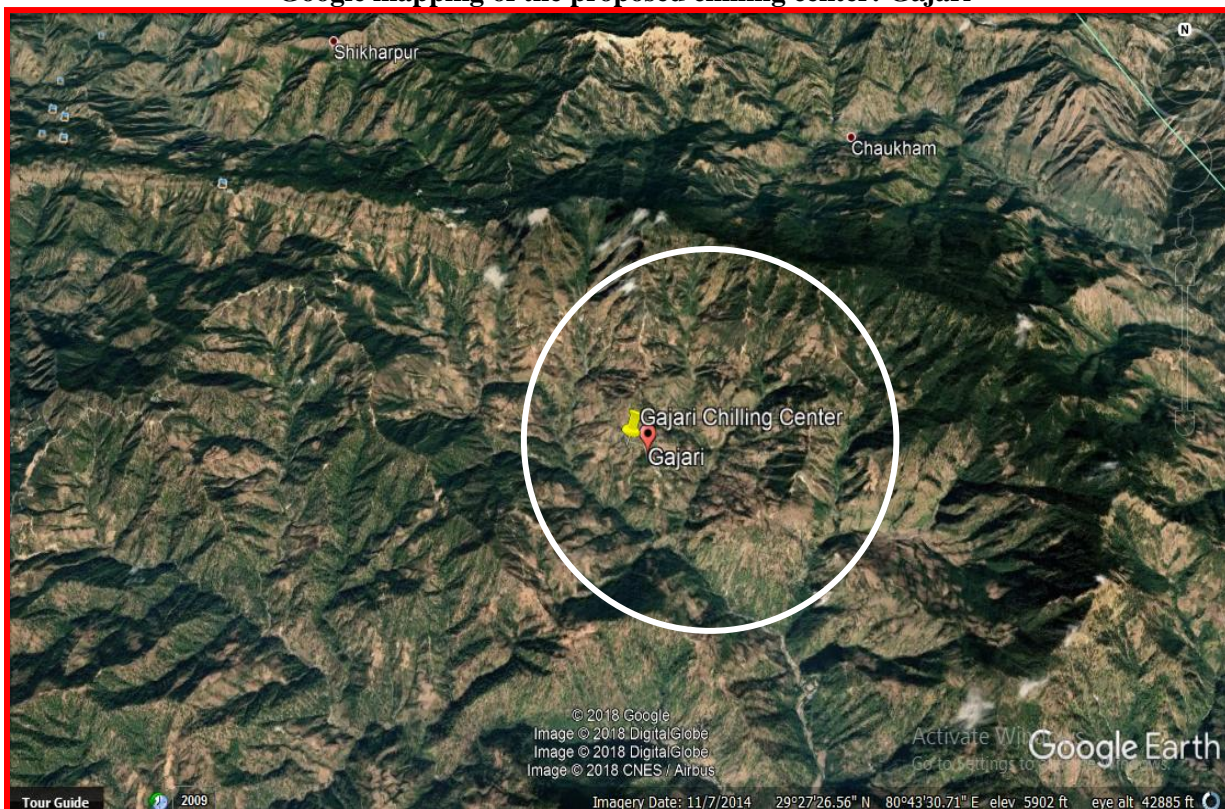


Table 3.26 Proposed chilling center: Gajari

<b>Name</b>	Gajari 2	
<b>Proposed Location</b>	Sigas Gaupalika 02, Baitadi	
<b>GPS Code</b>	29°27'57.49"N 80°42'54.60"E	
<b>Number of farmers involved (HHs)</b>	540	
<b>Present Daily milk production (liter)</b>	2,000	
<b>Major areas of milk production for the catchment</b>		
Sattala, Tilepata, Rakam Karnali, Pipalkot, Barne, Mulkhola, Devisthal, etc.		
<b>Expected Future Annual Growth Rate in Milk Production</b>		
<b>In average 15% if external milk promotional activities is provided</b>		
<b>Small Chilling Centers / Collection Center Coverage</b>		
Gajari		
<b>Nearby Market</b>		
Dadeldura, Baitadi district headquarters		
<b>Distance Market</b>		
<b>Dhangadhi, Mahendra Nagar</b>		
<b>Technical Feasibility</b>	<b>Size of Chilling Center</b>	500Ltr: Bulk Milk Collection
	<b>Available resources</b>	Track Road Access, Reasonable infrastructures of water supply, etc.
<b>Financial feasibility</b>	Cost of Propose Sized Milk Cooler: Rs 200, 000.00 Average cost of milk production: Rs. 48.8/liter; Selling price at farm household: Cow milk Rs. 51.33 /liter; buffalo milk R.s 56.33/liter; Selling price at chilling center: Rs. 60/liter; Estimated annual turnover at chilling center:Rs25,00,000.00	
<b>Recommendation:</b> The Track Road is not feasible for Chilling Vat establishment due to problem in distance transportation through cooling van. It cannot be operated in all weather therefore; the investment of the farmer in the livestock will be drained out leading to a lot of social causes. Therefore it is recommended to establish the Chilling center after the all weather road access is made.		

**Figure 3.14**  
**Google mapping of the proposed chilling center: Gajari**



## Chapter IV

### Postal Road Corridor

#### Analysis of Study Results and Recommendations

As outlined in Chapter II, seven market centers situated along the Postal Road Corridor (*Hulaki Rajmarg*) are covered for the study namely; Gaurigunj in Jhapa district, Rangeli in Morang, Kalaiya in Bara, Madi in Chitwan, Bardghat in Nawalparasi, Rajapur in Bardiya and Belauri-Dodhara in Kanchanpur district. This chapter presents analysis of information gathered from various secondary and primary sources and then recommends locations for establishing chilling centers in each of seven market centers.

#### 4.1 Gaurigunj market center

##### A. Introduction

Gaurigunj is situated in the Jhapa; one of the 20 terai districts. It is situated at an altitude of 58 meter to 500 meter above the sea level. The rectangle shaped district lies between 26°20'-26°50'North to 87°39'-88°2'East with 1606 Km<sup>2</sup> area. There are eight municipalities (Mechinagar, Damak, Kankai, Bhadrapur, Arjundhara, Shivasataxi, Gauradaha and Birtamod) and seven rural municipalities (Kamal, Gaurigunj, Barhadashi, Jhapa, Budda Shanti, Haldibari and Kanchankawal) in the district that have 875,828 total populations (47.42% male , 52.58% female) with 1.66% annual population growth.

Jhapa has an estimated road network of 2068.5 kilometers (Km.), including two strategic roads with total length of 216.6 Km, 269.45 Km of district road core network and 791.72 Km of village roads. Out of that 342.38 Km existing black top surface, 1131.55 Km. is existing gravel road and 594.56 km are earthen road. Around 46 Km. of postal highway passes through various market centers of the district. The major local markets such as Bhadrapur, Damak, Itahari, Sanjarjun, Kankai, Birtamod, Mechinagar, Sivasatasi, are connected with postal highway through link roads spread all over the district.

Around 54% population depends in agriculture for their livelihood in the district. About 91,943 households are involved in cattle rearing and producing milk and milk products. The total number of cattle in the district is 209,741 (Table 4.1). The annual milk production of the district is around 93,569 Mt..

Table 4.1: Number of milking cows and buffalos in Jhapa district

SN	Particular	Milking	Dry	Young	Calf	Total
1	Cross Cow	33,238	6,142	22,056	15,110	
2	Local Cow	47,926	10,330	13800	21,164	93,220
3	Cross buffalo	13,723	2,253	6,336	6,611	28,923
4	Local Buffalo	4,664	2,014	2,108	2,266	11,052
<b>Total</b>		<b>99,551</b>	<b>20,739</b>	<b>44,300</b>	<b>45,151</b>	<b>209,741</b>

Source: District Profile, Jhapa 2016.

The district has 25 milk producers' cooperatives that are linked with six livestock service centers and 11 livestock service sub centers. In recent years, there are 137 private Vet service centers, 45 feed shops, and 22 regular livestock haat bazaars for the regular trading of the livestock in local and regional level. Around 40% of cattle and cow are breeding with artificial breeding facilities.

### B. Milk producers' cooperatives

There are four milk producers' cooperatives functioning in the vicinity of Gaurigunj. As many as 1,975 farmers are associated with these cooperatives that are reported to have potentials to produce as much as 5,950 liters of milk per day (Table 4.2)

Table 4.2: Number of milk producers' cooperatives in the vicinity of Gaurigunj

<b>Existing Cooperatives</b>	<b>Daily milk production potentials (Liter)/ Per day</b>	<b>Number of Milk producers (Farmers)</b>
1. Himali Dugdha Kharid Kendra	300	540
2. Saana Kisan Sahakari Sastha	1,850	475
3. Aathmauwa Sahakari Sastha	1,500	350
4. Pruba Nepal Bahuudhesiya Sahakrai Sastha, Gaurigunj	2,300	610
<b>Total</b>	<b>5,950</b>	<b>1975</b>

Source: FGD, KII and Household Survey, 2074

### C. Farming households involved in milk production

It is estimated that as many as 1,975 farming households are involved in producing milk in the milk production pockets such as Garuigaunj, Khajurgaachi, Kerabari, Mahabara. The sample household survey revealed that large (44.44%) number of households have land holding over one hectare; higher than national average landholding. Moreover, about 97% of them were reported to have food sufficient for more than nine months (Annex 8, Tables 3 and 4).

### D. Major milk collection centers and milk production pockets

The information gathered during KIIs and FGDs suggests that there are as many as five major milk production pockets connected with Gaurigunj. They are reported to have daily milk production potentials of 13,000 liters from 957 farming households (Table 4.3).

Table 4.3: Major milk production pockets/collection centers in Gaurigunj market center

<b>Collection Centers/ and pockets</b>	<b>Distance (Km) to Collection/ Chilling Centers</b>	<b>Access</b>	<b>Existing Collection Centers</b>	<b>Collection Potential (liter/per day)</b>	
				<b>Existing</b>	<b>Potential (Additional)</b>
Gaurigunj	5	Road	Yes	1,500	4,000
Mahabhar	5	Track Road	Yes	1,000	2,000
Korobari	4	Road	Yes	1,500	2,000
Thekitola	4	Road	Yes	1,200	2,000
Khajurgaachhi	4.5	Road	Yes	1,000	3,000
<b>Total</b>				<b>6,200</b>	<b>13,000</b>

Source: FGD, KII and Household Survey, 2074

### E. Estimated milk production, sale and income earned

In sample household survey, daily milk production of 99 farming households was reported to be 1289.0 liters (cow milk: 1156 liters, buffalo milk: 133 liters) suggesting 13 liters of milk per household and 5.65 liters of milk per milking animal. Out of total respondent, more than 87.5% have desired to sell their milk in the chilling center directly rather than selling elsewhere. The average selling prices of cow-milk and buffalo milk are reported to be Rs. 50 and Rs. 50.56 respectively. On an average each household involved in milk trade is reported to have earned Rs. 3,200 per annum from the sale of milk products; largely ghee/butter (Annex 8 Tables 12, 14, 15, 16, 17, 18).

#### F. Number of cattle

Available information suggests that there are altogether 348 cows (local: 66, cross: 149, jersey:133) and 38 buffalos (local 21, cross:17) in the vicinity of Gaurigunj. As per the sample household survey, on an average each household involved in milk production/trade owns 3.52 cows and 0.38 buffalo. The number of milking cows and buffalo significantly outnumber non-milking ones (Annex 8, Tables 5 and 6).

#### G. Problems and constraints and suggested remedies

During FGDs, KIIs and sample household surveys, the stakeholders were asked to express their opinions on problems and constraints being encountered in milk production and its sale to the markets/consumers. They were also requested to suggest ways to resolve those problems/constraints. Their responses are presented below:

- Lack of breed improvement facilities; technicians, local Vet service office needs to be capacitated and mobilized
- High production cost. Grants from provincial or federal government should be provided
- Shortage of fodders and unavailability of feeds in local markets. Private sector Vets should be encouraged to expand their businesses. The milk producers need to be provided needed supports for growing fodders on their farm; and or they are linked with fodder suppliers.
- Private sector companies are not duly registered that has restricted delivery of their services. Concerned agencies need to facilitate private sector agencies to get duly registered and provide services in the localities.
- Price variation, low price for milk from the milk collectors; government needs to announce floor price for milk every year
- Considering milk production in the region, technical assistance of the stake holders is inadequate. Veterinary service is weak including reproduction service; weak: a good/experienced doctor is needed.
- Animal insurance is not in practice; DLSO needs to take steps in promoting insurance.

#### H. Proposed chilling centers

Out of some market centers suggested as suitable locations to establish chilling centers, Gaurigunj and Mahabhara are two milk collection centers proposed for chilling centers. These chilling centers are recommended on the basis of their comparative advantages in terms of potential amount of milk collection, number of households to be involved, number of functional milk collection centers and road networks and connectivity to the larger areas. Information related to each of these proposed chilling centers is furnished below (Tables 4.4-4.5):

Table 4.4: Proposed chilling center: Gaurigunj

<b>Name</b>		Gaurigunj
<b>Proposed Location</b>		Gaurigunj 04, Gaurigunj, Jhapa
<b>GPS Code</b>		26.28409038N, 87.42458477E
<b>Number of farmers involved (HHs)</b>		1656 Hhs
<b>Present daily milk production (liter)</b>		6543
<b>Major areas of milk production for the catchment purpose</b>		
Kamala Gaupalika Sivasatasi, Tullachan, Juropani, Kadamgaachhi, Gauradaha, Khajurgaachhi, Aamgachhi, Birpur, Bagahachudhari, Bhodesimal, Bhawanipur, Teldaagi		
<b>Expected Future Annual Growth Rate in Milk Production</b>		
<b>In average 15% if external milk promotional activities is provided</b>		
<b>Small Chilling Centers / Collection Center Coverage</b>		
Mahabhar, Korobari, Thekitola, Khajurgaachhi		
<b>Nearby Market</b>		
Bhadrapur, Damak, Itahari, Saniarjun, Kankai, Birtamod, Mechinagar, Sivasatasi, etc.		
<b>Distance Market</b>		
<b>Biratnagar</b>		
<b>Technical Feasibility</b>	<b>Size of Chilling Center</b>	3000Ltr: Bulk Milk Collection
	<b>Available resources</b>	Road access is viable, Vibrant existing cooperatives with reasonable infrastructures of water supply, electricity, space, manpower, etc.
<b>Financial feasibility</b>	Cost of Propose Sized Milk Cooler: Rs 800, 000.00 Average cost of milk production: Rs. 48.8/liter; Selling price at farm household: Cow milk Rs. 50.0 /liter; buffalo milk R.s 50.556/liter; Selling price at chilling center: Rs. 56/liter; Estimated annual turnover at chilling center:Rs. 2,00,00,000.00	
<b>Recommendation:</b> Though milk collection potential is 8700ltrs, the recommended size is only 3000 liter Bulk Milk Collection for the chilling of milk. This is because remaining milk is consumed locally or used for household purpose.		
<b>Nearby Chilling Centers:</b> DDC in Biratnagar Milk Supply Scheme; Other numbers of private sectors.		

**Figure 4.1:**  
**Google mapping of the proposed chilling center: Gaurigunj**

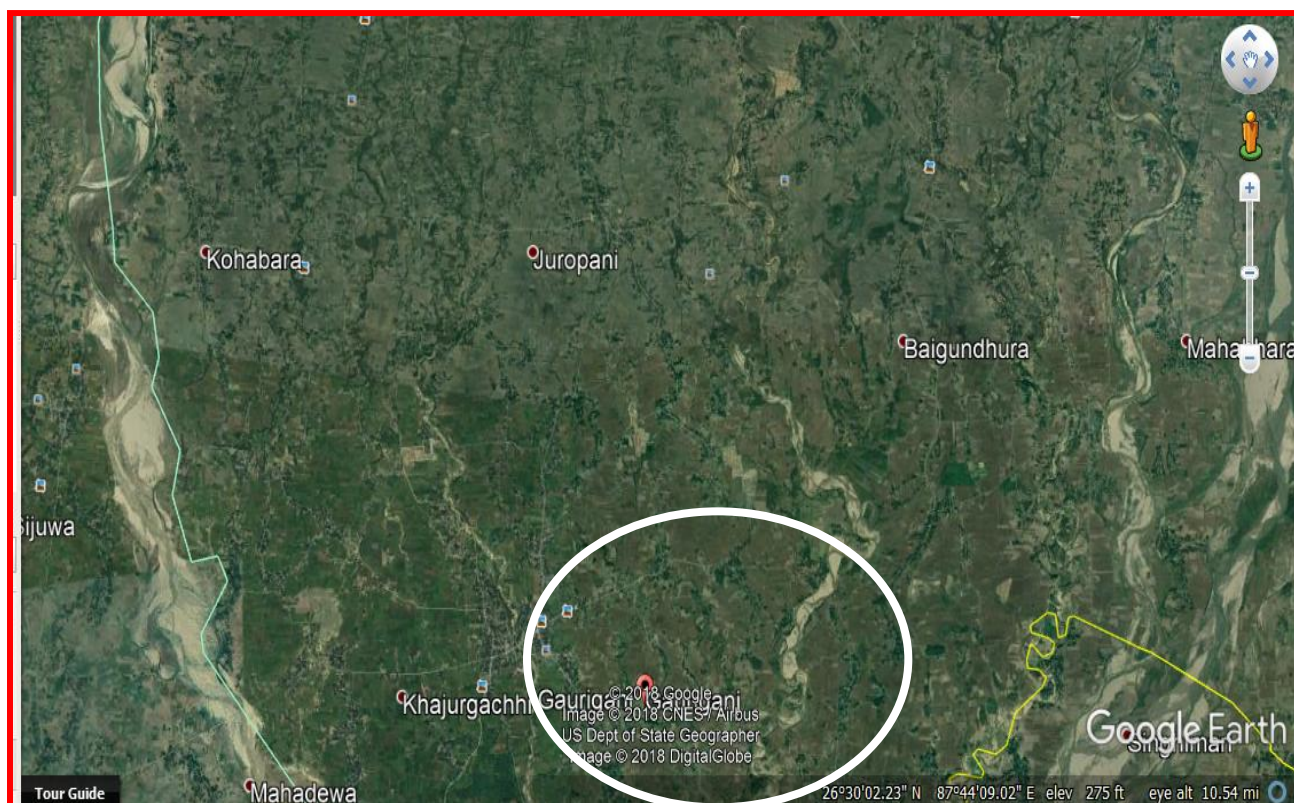
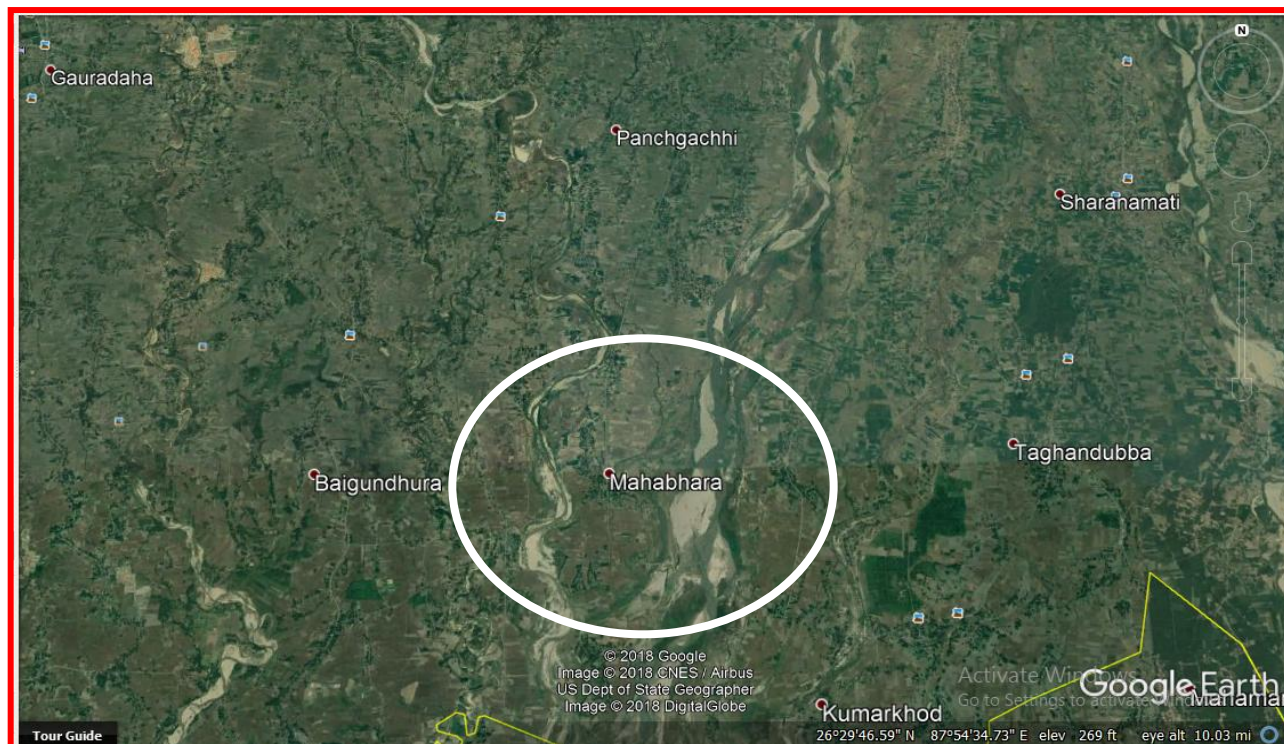


Table 4.5: Proposed chilling center: Mahabhara

<b>Name</b>	Mahabhara	
<b>Proposed Location</b>	Gaurigunj 01, Mahabhara, Jhapa	
<b>GPS Code</b>	26°29'53.74"N 87°48'37.01"E	
<b>Number of farmers involved (HHs)</b>	156 Hhs	
<b>Present Daily milk production (liter)</b>	1060	
<b>Major areas of milk production for the catchment purpose</b>		
Kamala Gaupalika, Sivasatasi, Tullachan, Juropani, Kadamgaachhi, Gauradaha, Khajurgaachhi, Aamgachhi, Birpur, Bagahachudhari, Bhodesimal, Bhawanipur, Teldaagi		
<b>Expected Future Annual Growth Rate in Milk Production</b>		
In average 15% if external milk promotional activities is provided		
<b>Small Chilling Centers / Collection Center Coverage</b>		
Mahabhar, Shyalchandi, Kumarkhod, Panchagaachi, Kamalgaupalik,		
<b>Nearby Market</b>		
Gaurigunj Bazaar		
<b>Distance Market</b>		
Biratnagar, Birtamod		
<b>Technical Feasibility</b>	<b>Size of Chilling Center</b>	500Ltr: Bulk Milk Collection
	<b>Available resources</b>	Track Road access, electricity, space, manpower, etc.
<b>Financial feasibility</b>	Cost of Propose Sized Milk Cooler: Rs 200, 000.00 Average cost of milk production: Rs. 48.8/liter; Selling price at farm household: Cow milk Rs. 50.0 /liter; buffalo milk R.s 50.556/liter; Selling price at chilling center: Rs. 56/liter; Estimated annual turnover at chilling center:Rs. 25,00,000.00	
<b>Recommendation:</b> Though milk collection potential is 1060 liters, the recommended size is only 500 liter Bulk Milk collection for the chilling of milk. This is because remaining milk is consumed locally or used for household purpose. It is also recommended to upgrade some cooperative, collection center or existing chilling centers.		
<b>Nearby Chilling Centers:</b> DDC in Biratnagar Milk Supply Scheme; Other numbers of private sectors.		

**Figure 4.2**  
Google mapping of the proposed chilling center: Mahabara



## 4.2 Rangeli market center

### A. Introduction

Rangeli is one of the fast growing market centers in **Morang district**; one of 20 terai districts situated at an altitude of 60 meter to 1410 meter above the sea level. The rectangle shaped district lies between 26°20'-26°53'North to 87°16'-87°41'East with 1855 Km<sup>2</sup> of total area. The district has one sub-metropolitan city (Biratnagar), eight municipalities (Belbari, Lotang, Pathari-Sanischare, Rangeli, Ratuwamai, Sunbarshi, Urlabari and Sundar Harianch) and eight rural municipalities (Budhiganga, Dhanpathan, Gramthan, Jahada, Kanepokhri, Katahari, Kerabari and Miklajung). District has 991,611 total population (48.35% male, 51.65% female) and with 1.38% annual population growth rate.

The district has a good road network to connect large number of households to East West and Postal highways. It has 1,919 Km blacktopped road, 3,038 Km graveled road and around 300 Km of agricultural tracked road connected with East-West highway. Around 47 Km postal highway possesses through southern part of Morang district. Morang has the highest numbers of industries and factories with multinational brands too. Jute Mills, Arihant and Dhanawat Matches are among the nation's oldest industries. Urlabari, Biratchowk, Belbari, Pathari and Rangeli are the emerging towns of the district.

Around 59.64% population is involved in agriculture for their livelihood. As many as 86,557 households are rearing cattle and producing milk and milk products. The numbers of cows and buffalos are 271,066 and 72,254 respectively. The annual milk production of the district is around 13,450 Mt.. The annual livestock production growth rate is 5.8%.

The district has three milk processing industries connected to fur livestock service center and 13 livestock service sub centers. There are three feed industries, 13 artificial breeding centers, 187 livestock firms.. Fodder cultivation is done in 1,875 hectares of land.

### B. Milk producers' cooperatives

There are four milk producers' cooperatives functioning in the vicinity of Rangeli. Over 1,300 farmers are associated with these cooperatives that are reported to have potentials to produce as much as 4,730 liters of milk per day (Table 4.6).

Table 4.6: Number of milk producers' Cooperatives around Rangeli market center

<b>Existing Cooperatives</b>	<b>Daily milk production potentials (Liter)</b>	<b>Number of Milk producers (Farmers)</b>
1. Ranjani Krisi Multipurpose Cooperative	2530	>600
2. Farsadaagi Collection Center	1200	>300
3. Sakubathan Krishi Sahakari,	1000	>250
4. Nabajoti Nichhep Krishak Samuha	500	>150
<b>Total</b>	<b>4,730</b>	<b>&gt;1,300</b>

Source: FGD, KII and Household Survey, 2074

### C. Farming households involved in milk production

It is estimated that as many as 1,150 farming households are involved in producing milk in the milk production pockets such as Rangeli, Ranjani, Farsadagi, Sakubathan. The sample household survey revealed that large (almost 100%) number of households have land holding less than 0.5 hectare; lower than the national average land holding. Moreover, about 82.7% of them were reported to have food sufficient for more than nine months (Annex 8 Tables 3 and 4).

### D. Major milk collection centers and milk production pockets

The information gathered during KIIs and FGDs suggests that there are four major milk collection centers connected with Rangeli. They are reported to have daily milk production potentials of 2,530 liters (Table 4.7).

Table 4.7: Major milk production pockets/collection centers in Rangeli market center

Collection centers	Avg. Distance (in Km) to Collection Center	Access	Present Collection Potential in (liter)	Milk Production Pockets
Rangeli	5	Road	700	Fasadagi, Aaamatola, Babiya, Takuta, Baundo, Sukuwathan, Karsiya
Ranjani	5	Track Road	780	
Babiyabirta	4	Road	550	
Farsadagi	4	Road	500	
<b>Total</b>			<b>2,530</b>	

Source: FGD, KII and Household Survey, 2074

#### E. Estimated milk production, sale and income earned

In sample household survey, daily milk production of 98 farming households was reported to be 786.0 liters (cow milk: 746 liters, buffalo milk: 40 liters) suggesting eight liters of milk per household and 3.46 liters of milk per milking animal. Out of total respondent, more than 54.6% have desired to sell their milk directly to consumer. The average selling prices of cow-milk and buffalo milk are reported to be Rs. 50.01 and Rs. 50.02 respectively (Annex 8 Tables 12, 14, 15, 16, 17, 18).

#### F. Number of cattle

Available information suggests that there are altogether 209 milking cows (local: 53, cross:3, jersey:168) and 18 milking buffalo (local 20, cross:0). As per the sample household survey, on an average each household involved in milk production/trade owns 2.13 cows and 0.18 buffalo. The number of milking cows and buffalo significantly outnumber non-milking ones (Annex 8 Tables 5 and 6).

#### G. Problems and constraints and suggested remedies

During FGDs, KIIs and sample household surveys, the stakeholders were asked to express their opinions on problems and constraints being encountered in milk production and its sale to the markets/consumers. They were also requested to suggest ways to resolve those problems/constraints. Their responses are presented below:

- Lack of insurance, breeding improvement technician: Local vet service office needs to be capacitated and mobilized
- Shortage of fodders and unavailability of feeds in local markets. Private sector Vets should be encouraged to expand their businesses. The milk producers need to be provided needed supports for growing fodders on their farm; and or they are linked with fodder suppliers.
- Price variation, low price is given for milk from the milk collectors.
- Considering milk production in the region, technical assistance of the stake holders is inadequate.

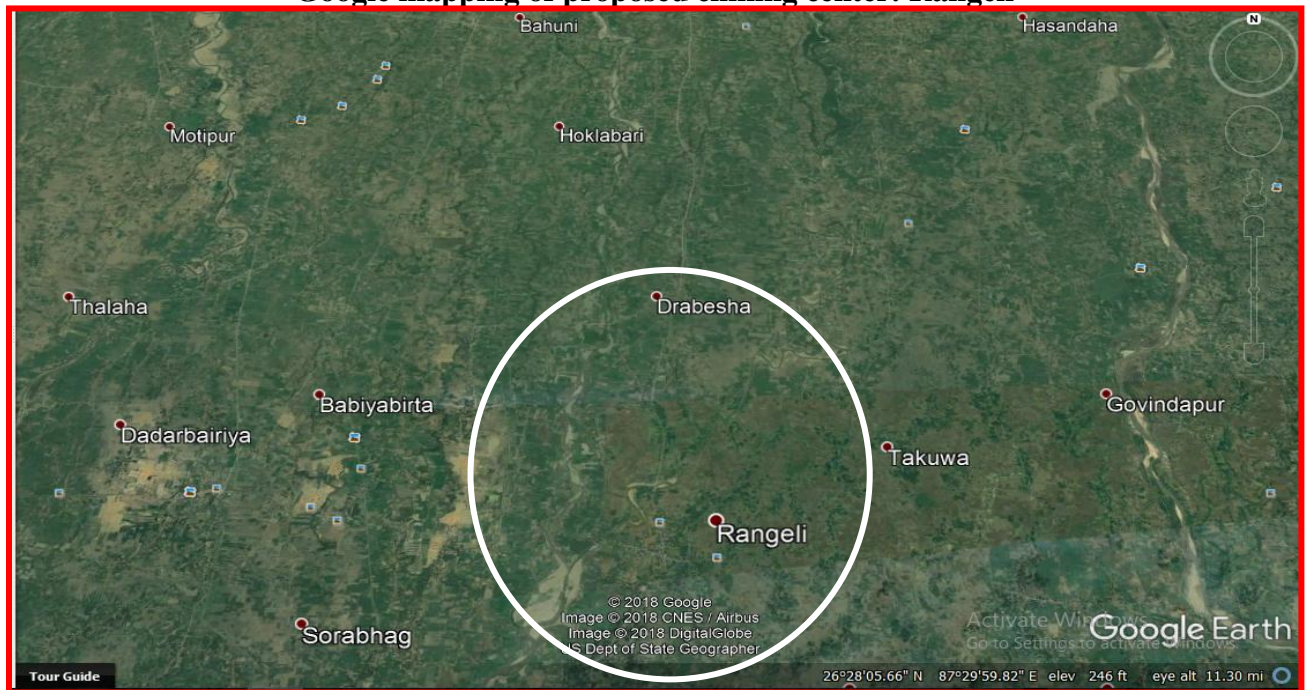
#### H. Proposed chilling centers

Among some suitable locations for establishing chilling centers suggested by the participants of FGD and KIIs, one chilling center at Rangeli is proposed with the following details related to potential amount of milk collection, number of households to be involved, number of functional milk collection centers and road networks and connectivity to the larger areas (Table 4.8).

Table 4.8: Proposed chilling center: Rangeli

<b>Name</b>	Rangeli	
<b>Proposed Location</b>	Biratnagar Metro City 13, Rangeli, Morang	
<b>GPS Code</b>	26° 28' 05.66" N, 87° 29' 59.82"E	
<b>Number of farmers involved (HHs)</b>	1150 Hhs	
<b>Present Daily milk production (liter)</b>	4,730 (Available for chilling)	
<b>Major areas of milk production for the catchment purpose</b>		
Fasadagi, Aamatola, Babiya, Takuta, Baundo, Sukuwathan, Karsiya, Gobindapur, Darbesa, etc.		
<b>Expected Future Annual Growth Rate in Milk Production</b>		
In average 12% if external milk promotional activities is provided		
<b>Small Chilling Centers / Collection Center Coverage</b>		
Rangeli, Ranjani, Babiyabirta, Farsadagi		
<b>Nearby Market</b>		
Biratnagar		
<b>Distance Market</b>		
Bitamod		
<b>Technical Feasibility</b>	<b>Size of Chilling Center</b>	1500Ltr: Bulk Milk Collection;
	<b>Available resources</b>	Road access is viable, Vibrant existing collection centers with reasonable infrastructures of water supply, electricity, space, manpower, etc.
<b>Financial feasibility</b>	Cost of Propose Sized Milk Cooler: Rs 450, 000.00 Average cost of milk production: Rs. 48.8/liter; Selling price at farm household: Cow milk Rs. 50.0 /liter; buffalo milk R.s 50.05/liter; Selling price at chilling center: Rs. ....../liter; Estimated annual turnover at chilling center: Rs. ....	
<b>Recommendation:</b> The market centers have already the numbers of chilling centers. Therefore, it is recommended to upgrade the existing Chilling center/Collection Center rather than new establishment;		
<b>Nearby Chilling Centers:</b> DDC in Garuda, Chandranigahapur, etc. and numbers of other small chilling vat installation.		

**Figure 4.3:**  
**Google mapping of proposed chilling center: Rangeli**



### 4.3 Kalaiya market center

#### A. Introduction

Kalaiya is situated in **Bara district** at the altitude ranging from 152 meter to 915 meter from the sea level. The rectangle shaped district is lies between 26°51’-27°51’North to 84°51’-84°16’East with 2025 Km<sup>2</sup> area. There are six municipalities (Kalaiya, Jitpur, Kolhabi, Nijgadh, Maha Gahadimai and Simraun) and nine rural municipalities (Adarsha Katwal, Karaya Mai, Devtaal, Pachrauta, Parwanipur, Prasauni, Pheta, Baragadhi and Subarna) to house 687,798 total populations (48.9% male, 51.1% female) with 2.75% annual population growth. Bara has good road network of 1,014.4 kilometers, including strategic roads with total length of 183.34 Km, 298.87 Km of district road core network and rest of village roads. Around 45 Km of postal highway goes through the southern part of the district. The road network connects major markets such as Pacharauta, Simrongud, Mahagadimai, Dumarbana, Birgunj, Jitpur, and Simara.

The annual milk production of the district was around 79,327 Mt. in 2073 B.S. that increased from previous year’s milk production of 78,155.07 Mt. With marginal increase from previous year (2072 B.S.), in 20173 B.S., the numbers of cross cows, local cow, cross buffalo and local buffalo were recorded as 101,538, 312,010, 104,418 and 45,771 respectively. The district has 192 active livestock farming groups, 19 artificial breeding centers, 244 modern livestock firms, 18 milk producers’ cooperatives, five livestock service centers, 10 livestock service sub centers, and one livestock service unit. In recent years, there are 67 registered private Vet service centers, 49 feed shops, seven dairy industries, and six regular Livestock Haat Bazaars.

#### B. Milk producers’ cooperatives

There are 15 milk producers’ cooperatives functioning in the vicinity of Kalaiya. Over 2,405 farmers are associated with these cooperatives that are reported to have potentials to produce as much as 10,750 liters of milk per day.

#### C. Farming households involved in milk production

It is estimated that as many as 2,450 farming households are involved in producing milk in the milk production pockets such as Dumarbana and Kalaiya. The sample household survey revealed almost 18% of households have land holding more than one hectare; higher than national average landholding. Moreover, about 55% of them were reported to have food sufficient for more than nine months (Annex 8, Tables 3 and 4).

Table 4.9: Major milk production pockets/collection centers in Kalaiya market center

Collection centers and production pockets	Distance (in Km) to Collection /Chilling Center	Access	Present Milk Collection Potential (Liter)	Pockets
Bhodaha	1	Road	900	Bakuliya, Khesrol, Pipariya, Kohalpur, Dohari, Sakarbina, Yadabtol, Materia, Khumbaha, Dhodaha
Aamatar	2	Road	780	
Mahagadimai	3	Road	1600	
Dumarbana	2	Road	8000	
Dohori	2.5	Road	1600	
<b>Total</b>			<b>12,880</b>	

Source: FGD, KII and Household Survey, 2074

#### D. Major milk collection centers and milk production pockets

The information gathered during KIIs and FGDs suggests that there are as many as five major milk production pockets connected with Kalaiya. They are reported to have daily milk production potentials of 412,880 liters from 1,150 farming households (Table 4.6).

#### E. Estimated milk production, sale and income earned

In sample household survey, daily milk production of 100 farming households was reported to be 927.0 liters (cow milk: 318 liters, buffalo milk: 609 liters) suggesting 9 liters of milk per household and 3.46 liters of milk per milking animal. Out of total respondents, more than 56% have desired to sell their milk to milk cooperative. The average selling prices of cow-milk and buffalo milk are reported to be Rs. 51.34 and Rs. 57.68 respectively. On an average each household involved in milk trade is reported to have earned Rs. 1,200 per annum from the sale of milk products; largely ghee/butter (Annex 8 Tables 12, 14, 15, 16, 17, 18).

#### F. Number of cattle

Available information suggests that there are altogether 53 milking cows (local: 32, cross:19, jersey:40) and 99 milking buffalo (local 98, cross:67 including no milking). As per the sample household survey, on an average each household involved in milk production/trade owns 0.9 cows and one buffalo. The number of milking cows and buffalo significantly outnumber non-milking ones (Annex 8 Tables 5 and 6).

#### G. Problems and constraints and suggested remedies

During FGDs, KIIs and sample household surveys, the stakeholders were asked to express their opinions on problems and constraints being encountered in milk production and its sale to the markets/consumers. They were also requested to suggest ways to resolve those problems/constraints. Their responses are presented below:

- Shortage of fodders and unavailability of feeds in local markets. Private sector Vets should be encouraged to expand their businesses. The milk producers need to be provided needed supports for growing fodders on their farm; and or they are linked with fodder suppliers.
- Private sector companies are not duly registered that has restricted delivery of their services. Concerned agencies need to facilitate private sector agencies to get duly registered and provide services in the localities.
- Price variation, low price for milk from the milk collectors. Determination of floor price in consultation with milk producers' Cooperatives is urgently needed to encourage ensured supply of milk.
- Veterinary service is weak including reproduction service; a good/experienced doctor is needed.
- Animal insurance is most neglected link in dairy development in the hills and *terai*.

#### H. Proposed chilling centers

Based on information generated during field visits, two locations (Bodaha and Pipara Simra) are recommended for the establishment of chilling centers in the future. Each proposed location for chilling center has adequate volume of milk collection and has huge potentials for increasing milk production. Relevant information about each of two proposed locations is furnished below (Tables 4.10-4.11).

Table 4.10: Proposed chilling center: Bhodaha

<b>Name</b>	Bhodaha	
<b>Proposed Location</b>	Kalaiya Sub Metro City 21, Bhodaha, Bara	
<b>GPS Code</b>	27° 8' 12.31" N, 85° 1' 3.65" E	
<b>Number of farmers involved (HHs)</b>	2405 Hhs	
<b>Present Daily milk production (liter)</b>	13,000 (Available for chilling)	
<b>Major areas of milk production for the catchment purpose</b>		
Bakuliya, Khesrol, Pipariya, Kohalpur, Dohari, Sakarbina, Yadabtol, Materia, Khumbaha, Dhodaha, etc.		
<b>Expected Future Annual Growth Rate in Milk Production</b>		
In average 15% if external milk promotional activities is provided		
<b>Small Chilling Centers / Collection Center Coverage</b>		
Mahagadimai, Gitpursimara, Dumarwana, Bhodaha, Dohori, Barampuri, etc		
<b>Nearby Market</b>		
Kalaiya Sub-Metro, Birgunj Metro, Jitpursimara Sub Metro, etc.		
<b>Distance Market</b>		
Hetauda, Chitwan		
<b>Technical Feasibility</b>	<b>Size of Chilling Center</b>	1500Ltr: Bulk Milk Collection
	<b>Available resources</b>	Road access is viable, Vibrant existing cooperatives with reasonable infrastructures of water supply, electricity, space, manpower, etc.
<b>Financial feasibility</b>	Cost of Propose Sized Milk Cooler: Rs 450, 000.00 Average cost of milk production: Rs. 48.8/liter; Selling price at farm household: Cow milk Rs. 51.34 /liter; buffalo milk R.s 57.68/liter; Selling price at chilling center: Rs. 63/liter; Estimated annual turnover at chilling center: Rs 1,00,00,000.00	
<b>Recommendation:</b> The market centers have already the numbers of chilling centers. Therefore it is recommended to upgrade the existing chilling center rather than new establishment. <b>Nearby Chilling Center: DDC: Baurbatharia, Simrongud, Baruhathawa, etc.</b>		

**Figure 4.4**  
**Google mapping of proposed chilling center: Bhodaha**

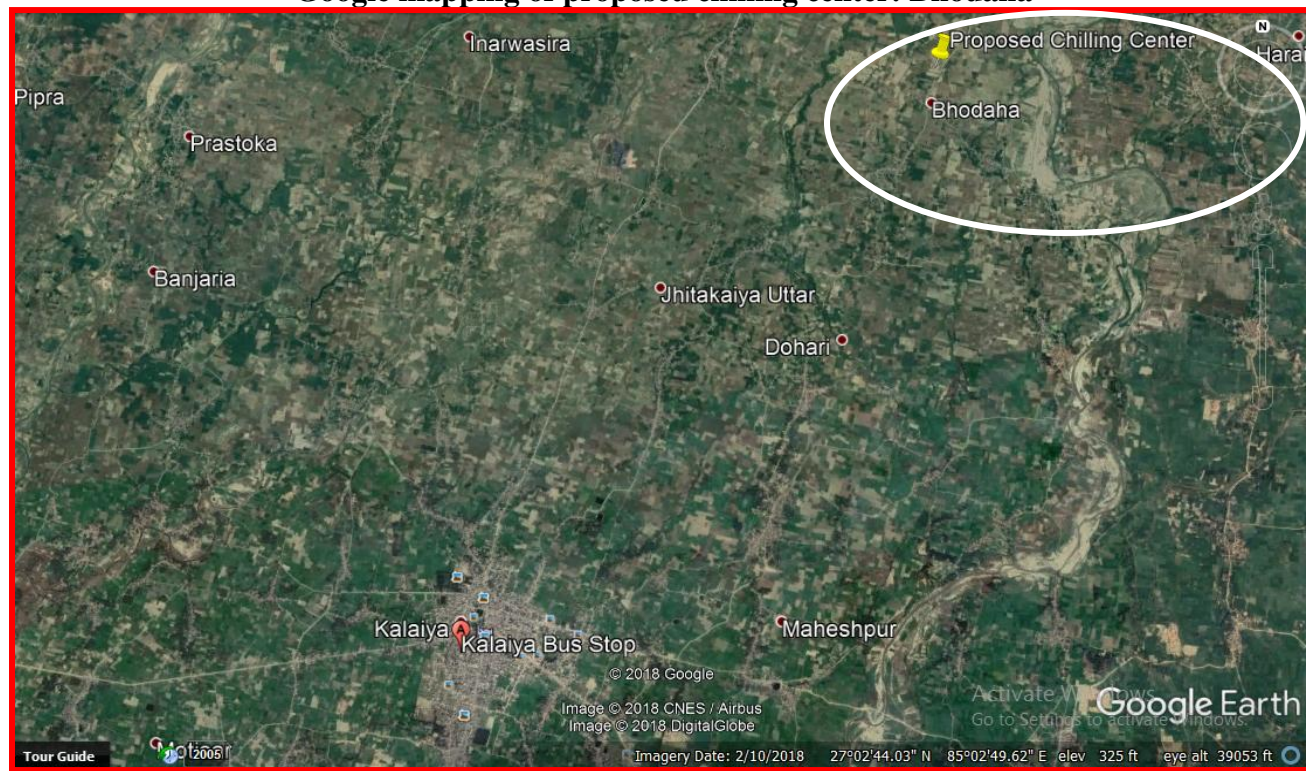
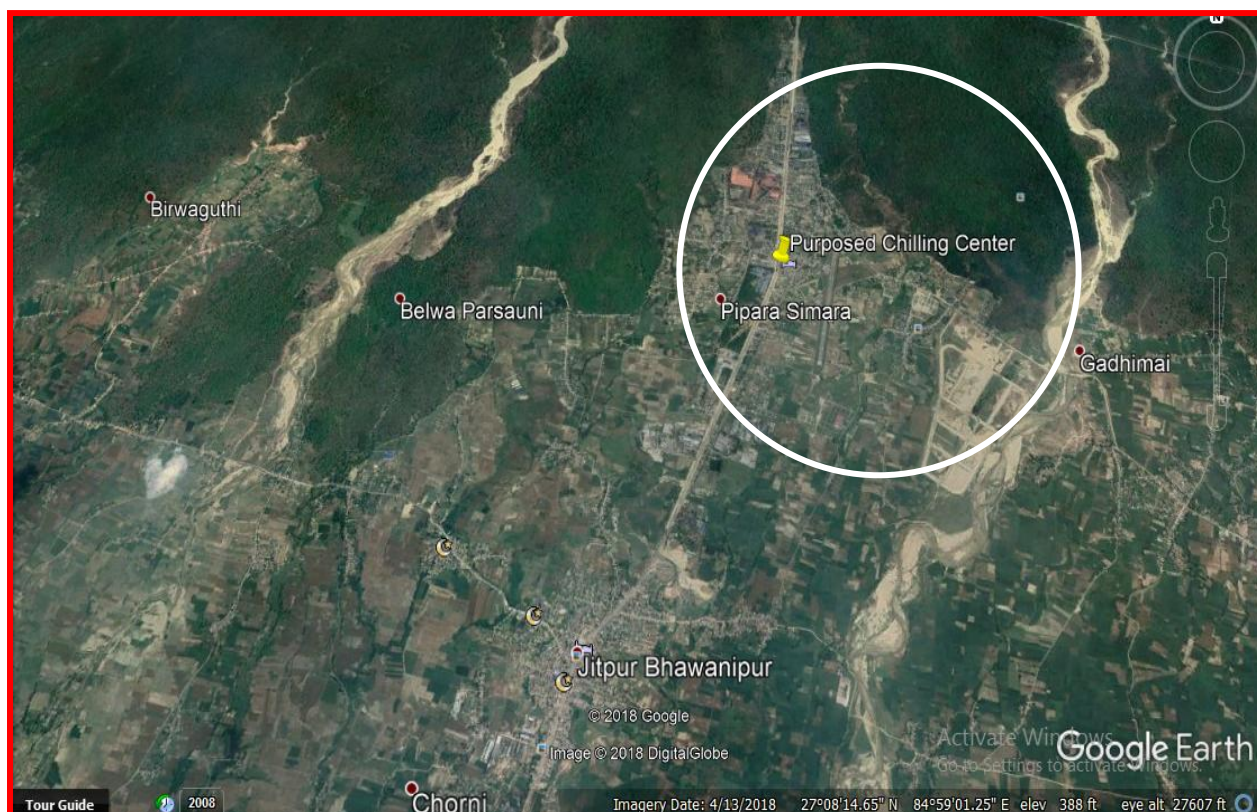


Table 4.11 : Proposed chilling center: Pipara Simara

<b>Name</b>	Pipara Simara	
<b>Proposed Location</b>	Jitpur Simara Sub Metro City, Bara	
<b>GPS Code</b>	27° 9'47.14" N, 84° 58'31.73"E	
<b>Number of farmers involved (HHs)</b>	2250 Hhs	
<b>Present Daily milk production (liter)</b>	10,000 (Available for chilling)	
<b>Major areas of milk production for the catchment purpose</b>		
Bakuliya, Khesrol, Pipariya, Kohalpur, Dohari, Sakarbina, Yadabtol, Materia, Khumbaha, Dhodaha, etc.		
<b>Expected Future Annual Growth Rate in Milk Production</b>		
<b>In average 15% if external milk promotional activities is provided</b>		
<b>Small Chilling Centers / Collection Center Coverage</b>		
Dumarbana, Bhawanipur, Santitol, Dakahare, Maulapur, Badhawa		
<b>Nearby Market</b>		
Kalaiya Sub-Metro, Birgunj Metro,		
<b>Distance Market</b>		
Hetauda, Chitwan		
<b>Technical Feasibility</b>	<b>Size of Chilling Center</b>	1500Ltr: Bulk Milk Collection
	<b>Available resources</b>	Road access is viable, Vibrant existing cooperatives with reasonable infrastructures of water supply, electricity, space, manpower, etc. Road corridor to transfer milk toward the Hetauda, Amlekhgunj, Kathmandu after Kathmandu/Bara Fast Track Operation.
<b>Financial feasibility</b>	Cost of Propose Sized Milk Cooler: Rs 450, 000.00 Average cost of milk production: Rs. 48.8/liter; Selling price at farm household: Cow milk Rs. 51.34 /liter; buffalo milk Rs. 57.68/liter; Selling price at chilling center: Rs.63/liter; Estimated annual turnover at chilling center :Rs1,00,00,000.00	
<b>Recommendation:</b> The market centers have already the numbers of chilling centers. Therefore it is recommended to upgrade the existing Chilling center rather than new establishment.		
<b>Nearby Chilling Center: DDC:</b> Baurbatharia, Simrongud, Baruhathawa, etc.		

Figure 4.5

Google mapping of proposed chilling center: Pipara, Simra



## 4.4 Madi market center

### A. Introduction

Madi is one of the fast growing market centers of Chitwan district that is situated at an altitude of 141 meter to 1947meter from the sea level. The district lies between 27°21’-27°52’North to 83°54’-84°48’East with 2238.39 Km<sup>2</sup> area. The district has six municipalities ( Bharatpur, Kalika, Khairhani, Madi, Ratna Nagar and Rapti) but only one rural municipality (Ichhchhakamana) that have 579,984 total populations (48 % male, 52% female) with 2.06% annual population growth.

Chitwan has an estimated road network of 2,021.41 Km., including 233.25 Km of black topped road, 1,471.93 Km graveled road, and rest of the earthen road. The road network connects all major local markets such as Narayanghat, Bharatpur, Tandi, Kurintar, Mugling, Parsa, Bhandara, Chanauli, Parbatipur, Kholesimal, Meghauri, Sauraha, Patihyani and-west highway to connect other major market centers of the country.

The annual milk production of the district is around 79,327 Mt.. The numbers of cows, and buffalos were recorded as 71,867 and 77, 045 respectively.

The district has 192 active livestock farming groups, 39 artificial breeding centers, 325 modern livestock firms, 133 milk-producers’ cooperatives, 12 livestock service centers. There are 59 registered private Vet service centers, 37 feed shops and nine dairy industries. In addition, three livestock haat bazaars are organized for the regular trading of the livestock.

### B. Milk producers’ cooperatives

There are four milk producers’ cooperatives functioning in the vicinity of Madi. Over 1,600 farmers are associated with these cooperatives that are reported to have potentials to produce as much as 6,655 liters of milk per day (Table 4.12)

Table 4.12: Number of milk producers ‘cooperatives

Existing Cooperatives	Daily milk production potentials (Liter)/	Number of Milk producers (Farmers)
Krishanaagar Milk Producer Cooperative	1,205	>50
Bhairabi Dhugdha Sahakari Cooperative	1,450	>370
Dovan Milk Producer Cooperative	3,000	>700
Kamadhenu Milk Producer Cooperative	1,000	>500
<b>Total</b>	<b>6,655</b>	<b>&gt;1600</b>

Source: FGD, KII and Household Survey, 2074

### C. Farming households involved in milk production

It is estimated that as many as 5500 farming households are involved in producing milk in the milk production pockets such as Madi and Thori. The sample household survey revealed that 36% of households have land holding less than 0.5 hectare; lower than national average landholding. Moreover, about 83% of them were reported to have food sufficient for more than nine months (Annex 8, Tables 3 and 4).

### D. Major milk collection centers and milk production pockets

The information gathered during KIIs and FGDs suggests that there are as many as eight major milk production pockets and milk collection centers connected with Madi. They are reported to have daily milk production potentials of 3,870 liters from 1150 farming households (Table 4.13).

Table 4.13: Major milk production pockets/collection centers in Madi market center

Collection centers	Avg. Distance (in Km)	Access	Present Collection Potential in (liter)	Pockets
Krishnanagar	1	Road	150	Barmapuri, Kalyanpur, Kritanpur, Ineruwa, Khaireni, Sitalpur, Bagauda, Gardi, Laxmuniya, Chainpur, Bhavirabpur, Someshor, Seruwa, etc.
Khairahani	1	Road	450	
Kharakhatta	1	Road	70	
Sitalpur	1	Road	500	
Bhairabpur	1	Road	1000	
Bramapuri	1	Road	500	
Basantapur	1	Road	400	
Debendrapur	1	Road	800	
<b>Total</b>			<b>3870</b>	

Source: FGD, KII and Household Survey, 2074

#### E. Estimated milk production, sale and income earned

In sample household survey, daily milk production of 100 farming households was reported to be 1152.5 liters (cow milk: 581.5 liters, buffalo milk: 571 liters) suggesting 12 liters of milk per household and 6.33 liters of milk per milking animal. Out of total respondents, more than 36.1% have desired to sell their milk directly to cooperative. The average selling prices of cow-milk and buffalo milk are reported to be Rs. 50.37 and Rs. 54.89 respectively (Annex 8 Tables 12, 14, 15, 16, 17, 18).

#### F. Number of cattle

Available information suggests that there are altogether 76 milking cows (local: 21, cross: 37, jersey: 92 including oxen) and 106 milking buffalo (local 113, cross: 85 including he buffalo). As per the sample household survey, on an average each household involved in milk production/trade owns 2.13 cows and 0.18 buffalo. The number of milking cows and buffalo s significantly outnumber non-milking ones (Annex 8 Tables 5 and 6).

#### G. Problems and constraints and suggested remedies

During FGDs, KIIs and sample household surveys, the stakeholders were asked to express their opinions on problems and constraints being encountered in milk production and its sale to the markets/consumers. They were also requested to suggest ways to resolve those problems/constraints. Their responses are presentenced below:

- Due to lack of animal insurance, farmers' seem to be reluctant to expand their dairy business.
- Access to road but lack of vehicle: local carriage business should be promoted.
- Shortage of fodders and unavailability of feeds in local markets. Private sector Vets should be encouraged to expand their businesses. The milk producers need to be provided needed supports for growing fodders on their farm; and or they are linked with fodder suppliers.
- Chilling centers far away and mass transport is costly. More chilling centers at suitable locations need to be established.

#### H. Proposed chilling centers

Among some possible locations for chilling center establishment, Baruwa is found more suitable due to larger volume of milk supply and better transport and other physical facilities. Other related details are provided below (Table 4.14).

Table 4.14 : Proposed chilling center: Baruwa

<b>Name</b>	Baruwa	
<b>Proposed Location</b>	Baurwa Madi-1, Chitwan	
<b>GPS Code</b>	27°27'37.93"N, 84°18'36.15"E	
<b>Number of farmers involved (HHs)</b>	5500 Hhs	
<b>Present Daily milk production (liter)</b>	4000	
<b>Major areas of milk production for the catchment purpose</b>		
Barmapuri, Kalyanpur, Kritanpur, Ineruwa, Khaireni, Sitalpur, Bagauda, Gardi, Laxmuniya, Chainpur, Bhavirabpur, Someshor, Seruwa, etc.		
<b>Expected Future Annual Growth Rate in Milk Production</b>		
<b>In average 10% if external milk promotional activities is provided for next 3 years</b>		
<b>Small Chilling Centers / Collection Center Coverage</b>		
Krishnanagar, Khairahani, Kharakhatta, Sitalpur, Bhairabpur, Bramapuri, Basantapur, Debendrapur		
<b>Nearby Market</b>		
Narayanghat		
<b>Distance Market</b>		
Kathmandu		
<b>Technical Feasibility</b>	<b>Size of Chilling Center</b>	500Ltr: Bulk Milk Collection
	<b>Available resources</b>	Road access is viable, Vibrant existing cooperatives with reasonable infrastructures of water supply, electricity, space, manpower, etc.
<b>Financial feasibility</b>	Cost of Propose Sized Milk Cooler: Rs 200, 000.00 Average cost of milk production: Rs. 48.8/liter; Selling price at farm household: Cow milk Rs. 50.37 /liter; buffalo milk R.s 54.69/liter; Selling price at chilling center: Rs60/liter; Estimated annual turnover at chilling centers Rs 25,00,000.00	
<b>Recommendation:</b> Though milk collection potential is 4000ltrs, the recommended size is only 500 liter Bulk Milk Collection for the chilling of milk. This is because remaining milk is consumed locally or used for household purpose. Nearby Chilling Center: DDC Madi, but farmers are not satisfied by the performance of DDC so it is recommended to upgrade any other Collection center, .		

Figure 4.6

Google mapping of proposed chilling center: Baruwa



## 4.5 Bardaghat market center

### A. Introduction

Bardaghat is most fast developed market center along the postal high way in Nawalparasi district. The district is situated in the altitude ranging from 123 meters to 1,937 meters above the sea level. The rectangle shaped district lies between 28°37'9.84''North to 81°01'12.00''East with 2,162 km<sup>2</sup> area. The district has seven municipalities (Kawasoti, Gaidakot, Devchuli, Bardghat, Madhya Bindu, Ramgram and Sunwal) and eight rural municipalities (Triveni Susta, Palhi Nandaan, Pratappur, Burgai Kali, Bulingtar, Binayi, Saruwal and Hupsekot). The district has 643,508 total populations (48% male and 52% female) with 2.1% annual population growth.

Nawalparasi has an estimated road length of 1,853.49 kilometers, including 338.95 Km of black topped road, 895.22 Km graveled road, and rest earthen road. Major markets centers such as Gaidakot, Nabalpur, Bardaghat, Parasi, Danda, Sunawal, Kawasoti, Devchuli, Narayanghat are well connected with road network.

The annual milk production of the district is around 79,327 Mt. with 96,113 cow population and 83,792 buffalo population. The total number of the farmers is 40,413 involved in milk production in the district.

The Bardghat market center itself belongs to Bardghat municipality that has 16 wards to accommodate 55,382 populations (12,382 households) and is spread over 162.05 Km<sup>2</sup> of urban area.

### B. Milk producers' cooperatives

There are five milk producers' cooperatives functioning in the vicinity of Bardaghat. Over 622 farmers are associated with these cooperatives that are reported to have potentials to produce as much as 2,750 liters of milk per day (Table 4.15).

Table 4.15: Number of milk cooperatives and milk production potentials in Bardghat

<b>Existing Cooperatives</b>	<b>Daily milk production potentials (Liter)</b>	<b>Number of Milk producers (Farmers)</b>
Sitalpur Sahakari Sastha Ltd.	350	155
Sanakisan Krisi Cooperative Ltd.	300	20
Balmiki Multipurpose Cooperative Ltd.	600	42
Janakalyan Dugdha Utpadak Cooperative	500	55
Chandrodaya Multipurpose Cooperative	1,000	350
<b>Total</b>	<b>2,750</b>	<b>622</b>

Source: FGD, KII and Household Survey, 2074

### C. Farming households involved in milk production

It is estimated that over 1650 farming households are involved in producing milk in the milk production pockets such as Nayabasti, Kuthiya, Keulani, Sivapur, etc. The sample household survey revealed that 52% of households have land holding less than 0.5 hectare. Moreover, about 89% of them were reported to have food sufficient for more than nine months (Annex 8, Tables 3 and 4).

### D. Major milk collection centers and milk production pockets

The information gathered during KIIs and FGDs suggests that there are as many as 10 major milk collection centers connected with Bardaghat. They are reported to have daily milk production potentials of 6,200 liters from 1150 farming households (Table 4.16).

Table 4.16: Major milk production pockets/collection centers in Bardghat market center

Collection centers	Access	Present Collection Potential (Liter)	Milk Production Pockets
Koltani	Road	150	Chisapani, Koradi, Pachadhari, Sunayie, Jageda, Sukaha, Jamire, Phultari, Dadajhor, Jusebi, Kumaltar, Suntari, Deurali, Purnaba, Gangabasti, Dharmabasti, Somani, Daunedebi, Pabitrabasti, Gangabasti, Beltari, etc.
Jimkibas	Road	250	
Purnabas	Road	700	
Jimirevar	Road	900	
Chupatabara	Road	500	
Bhatauria	Road	500	
Dhanewa	Road	800	
Budhabasti	Road	800	
Pattapur	Road	1000	
Prithibibasti	Road	600	
<b>Total</b>		<b>6,200</b>	

Source: FGD, KII and Household Survey, 2074

#### E. Estimated milk production, sale and income earned

In sample household survey, daily milk production of 100 farming households was reported to be 2,384 liters (cow milk: 1,934.5 liters, buffalo milk: 450 liters) suggesting 24 liters of milk per household and 7.62 liters of milk per milking animal. Out of total respondents, more than 65.7% have desired to sell their milk directly to milk cooperative. The average selling prices of cow-milk and buffalo milk are reported to be Rs. 50.15 and Rs. 54.24 respectively (Annex 8 Tables 12, 14, 15, 16, 17, 18).

#### F. Number of cattle

Available information suggests that there are altogether 235 milking cows (local: 17, cross: 80, jersey: 257 including oxen) and 69 milking buffalo (local 73, cross:52 including he buffalos). As per the sample household survey, on an average each household involved in milk production/trade owns 213 cows and 0.69 buffalo. The number of milking cows and buffalo significantly outnumber non-milking ones (Annex 8, Tables 5 and 6).

#### G. Disclaimer

In Bardaghat, there is a large milk chilling center privately operated named Chandrodaya Dhudha Sahakari Sastha which has very positive impacts over the local farmers, therefore, upgrading of this chilling center is highly recommended.

Table 4.17: Proposed chilling center: Chaupatta

<b>Name</b>	Chaupatta	
<b>Proposed Location</b>	Bardaghat 14, Parasi	
<b>GPS Code</b>	27°29'58.2845"N, 83°47'8.264"E	
<b>Number of farmers involved (HHs)</b>	1650+	
<b>Present Daily milk production (liter)</b>	13200+	
<b>Major areas of milk production for the catchment purpose</b>		
Deurali, Purnaba, Gangabasti, Dharmabasti, Somani, Daunedebi, Pabitrabasti, Gangabasti, Beltari, etc.		
<b>Expected Future Annual Growth Rate in Milk Production</b>		
In average 10% if external milk promotional activities is provided for next 3 years		
<b>Small Chilling Centers / Collection Center Coverage</b>		
Purnabas; Jimirevar; Chupatabara, Bhatauria; Dhanewa; Budhabasti; Pattapur; Prithibibasti		
<b>Nearby Market</b>		
Narayanghat, Gaidakot, Butawal		
<b>Distance Market</b>		
Kathmandu		
<b>Technical feasibility</b>	<b>Size of Chilling Center</b>	1500Ltr: Bulk Milk Collection
	<b>Available resources</b>	Road access is viable, Vibrant existing cooperatives with reasonable infrastructures of water supply, electricity, space, manpower, etc.
<b>Financial feasibility</b>	Cost of Propose Sized Milk Cooler: Rs 450, 000.00 Average cost of milk production: Rs. 48.8/liter; Selling price at farm household: Cow milk Rs. 50.15 /liter; buffalo milk R.s 54.24/liter; Selling price at chilling center: Rs60/liter; Estimated annual turnover at chilling centers Rs 1,00,00,000.00	
<b>Recommendation:</b> The market centers have already the numbers of chilling centers. Therefore it is recommended to upgrade the existing Chilling center rather than new establishment. Nearby Chilling Center: Private Dairy, Chaupatta.		

**Figure 4.7**  
Google mapping of proposed chilling center: Chaupatta

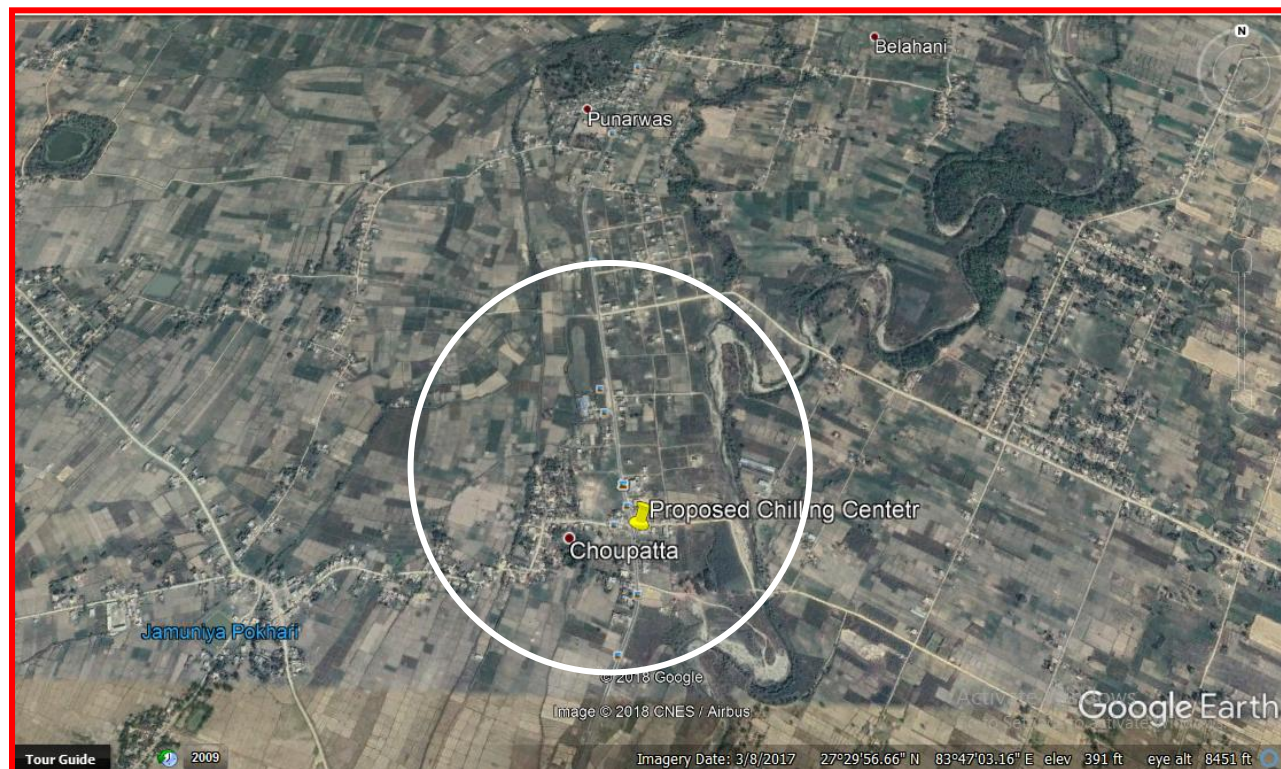
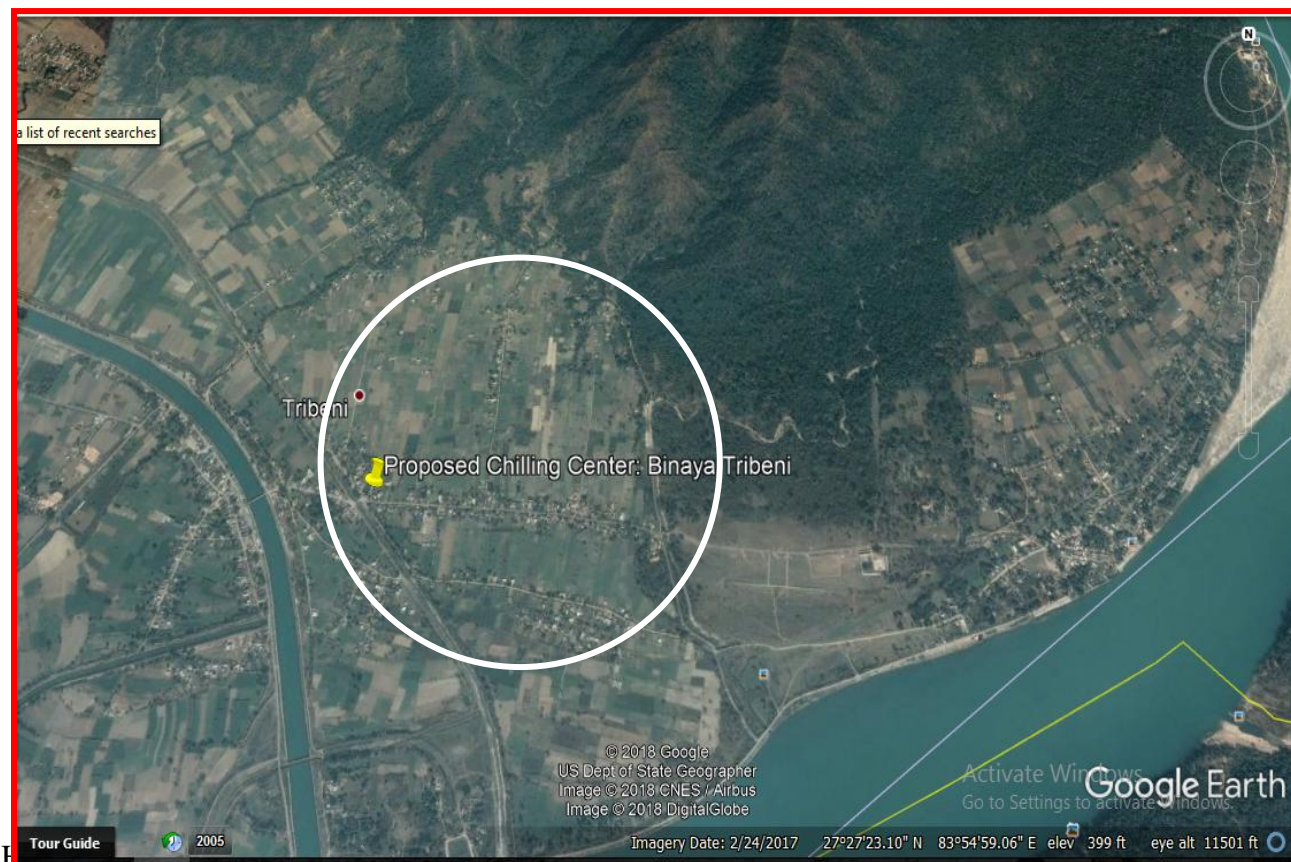


Table 4.18: Proposed chilling center: Jyamire, Binaye Tribeni

<b>Name</b>	Jyamire Tribeni	
<b>Proposed Location</b>	Binaya Tribeni-2, Nawalpur	
<b>GPS Code</b>	27°27'16.15"N, 83°54'23.16"E	
<b>Number of farmers involved (HHs)</b>	1000++ Hhs	
<b>Present Daily milk production (liter)</b>	2000	
<b>Major areas of milk production for the catchment purpose</b>		
Chisapani, Koradi, Pachadhari, Sunayie, Jageda, Sukaha, Jamire, Phultari, Dadajhor, Jusebi, Kumaltar, Suntari, etc.		
<b>Expected Future Annual Growth Rate in Milk Production</b>		
In average 10% if external milk promotional activities is provided for next 3 years		
<b>Small Chilling Centers / Collection Center Coverage</b>		
Koltani; Jimkibas;		
<b>Nearby Market</b>		
Narayanghat, Gaidakot, Butawal, etc.		
<b>Distance Market</b>		
Kathmandu		
<b>Technical Feasibility</b>	<b>Size of Chilling Center</b>	500Ltr: Bulk Milk Collection:
	<b>Available resources</b>	Road access is viable, Infrastructures of water supply, electricity, space, manpower, etc.
<b>Financial feasibility</b>	Cost of Propose Sized Milk Cooler: Rs 200, 000.00 Average cost of milk production: Rs. 48.8/liter; Selling price at farm household: Cow milk Rs. 50.15 /liter; buffalo milk R.s 54.24/liter; Selling price at chilling center: Rs60/liter; Estimated annual turnover at chilling center: Rs25,00,000.00	
<b>Recommendation:</b> Though milk collection potential is 2000ltrs, the recommended size is only 500 liter Bulk Milk Collecion for the chilling of milk. This is because remaining milk is consumed locally or used for household purpose. Nearby Chilling Center: Not Available.		

**Figure 4.8**  
Google mapping of proposed chilling center: Jyamire



During FGDs, KIIs and sample household surveys, the stakeholders were asked to express their opinions on problems and constraints being encountered in milk production and its sale to the markets/consumers. They were also requested to suggest ways to resolve those problems/constraints. Their responses are presented below:

- Access to road is satisfactory but lack of vehicle is serious problem; local carriage business should be promoted.
- Shortage of fodders and unavailability of feeds in local markets. Private sector Vets should be encouraged to expand their businesses. The milk producers need to be provided needed supports for growing fodders on their farm; and or they are linked with fodder suppliers. Milk producers' Cooperatives need to take initiative to resolve this problem.
- Price variation, low price for milk from the milk collectors and increasing cost of milk production. More grants and compensation packages need to be developed. Floor price of milk has to be worked out each year.
- Animal insurance is not in practice; District Livestock Service Office needs to take steps in promoting insurance.
- Seasonal variation of milk and problem in collection during the peak time.

#### I. Proposed chilling centers

From the number of locations suggested by the stakeholders during the field survey, two locations are recommended namely Chaupatta and Jyamire Tribeni. Each proposed location for chilling center has good physical infrastructure facilities, adequate volume of milk collection and has huge potentials for increasing milk production. All relevant details are furnished below (Tables 4.17-4.18).

### **4.6 Rajapur market center**

#### A. Introduction

Rajapur is one of the fast growing market centers of **Bardiya district** that is situated at an altitude of 138 meter to 1279 meter altitude from the sea level. The rectangle shaped district lies between 28°7'-28°39'North to 81°3'-8°41'East with 2025 km<sup>2</sup> area. There are six municipalities (Gulriya, Madhuvan, Rajaur Taratal, Thakur Baba, Bansgadhi and Bar Bardiya) and two rural municipalities (Badhaiya Tal and Geruwa) where 483,4044 total population (48.1% male, 51.9% female) resides presently. Annual population growth of the district is 1.66%. The district is spread over 127.08 Km<sup>2</sup> of area.

In the past, Bardiya district was considered to be worst amongst 20 terai district in terms of road network. However, now the district enjoys road network of 725.36 Kilometers including two strategic roads with total length of 120 Km of East West Highway, 115 Km Postal Highway, 181 Km of district road core network and rest of village roads. Out of that 156 Km existing black topped surface, 158 Km is existing gravel road and rest are earthen road. The road network of the district connects local markets such as Gulariya, Rajapur, Basgadi, Mainapokhar, Pragati, Pashupati Bazaar, Jayanagar, Danphe Bazaar, Shanti Bazaar, Ambasa, and Vuri.

The annual milk production of the district was around 79,327 Mt. in 2073 B.S. The numbers of cross cow, local cow and cross buffalo in the same year were reported to be 101,538, 312,010 and 104,418 respectively. The district has 192 active livestock farming groups, 19 artificial breeding centers, 244 modern livestock firms, 18 milk producers' cooperatives, six livestock service centers and 10 livestock service sub centers. In recent years, there are 67 registered private Vet service centers, 49 feed shops, seven dairy industries, and seven regular livestock *haat bazaars*.

Rajapur itself belongs to Rajapur Taratal municipality that has 10 wards where 59,553 citizens reside covering an area of 127.08 Km<sup>2</sup>.

#### B. Milk producers' cooperatives

There are eight milk producers' cooperatives functioning in the vicinity of Rajapur. Over 1661 farmers are associated with these cooperatives that are reported to have potentials to produce as much as 5,170 liters of milk per day (Table 4.19).

Table 4.19: Number of milk cooperatives around Rajapur market center

<b>Existing Cooperatives</b>	<b>Daily milk production potentials (Liter)</b>	<b>Number of Milk producers (Farmers)</b>
Sanakisan Dhugdha Sahakari Ltd	400	120
Sanakisan Krisi Cooperative Ltd.	820	330
Bhagawati Dugdha Sahakari Sastha	300	56
Kalika Dugdha Utpadak Sahakari Ltd.	450	250
Aadisakti Dugdha Sakari	900	200
Nakaha Dugdha Utpadan Sahakari	400	125
Mahila Sanakisan Dudha Utpadan Sahakari Sastha	900	330
Aadisakti Sahakari Dudha Utpandan Sahakari Sanstha	1000	250
<b>Total</b>	<b>5,170</b>	<b>1661</b>

Source: FGD, KII and Household Survey, 2074

#### C. Farming households involved in milk production

It is estimated that as many as 1661 farming households are involved in producing milk in the milk production pockets such as Sitalpur and Jamuni.. The sample household survey revealed that 43.1% of households have land holding less than 0.5 hectare. Moreover, about 19.6% of them were reported to have food sufficient for more than nine months (Annex 8, Tables 3 and 4) from their own cultivation.

#### D. Major milk collection centers and milk production pockets

The information gathered during KIIs and FGDs suggests that there are as many as 13 major milk collection centers connected with various pockets of milk production. They are reported to have daily milk production potentials of 12,020 liters (Table 4.20)..

#### E. Estimated milk production, sale and income earned

In sample household survey, daily milk production of 102 farming households was reported to be 1,103 liters (cow milk: 926.5 liters, buffalo milk: 176.5 liters) suggesting 11 liters of milk per household and 8.60 liters of milk per milking animal. Out of total respondents, more than 46.1% have desired to sell their milk directly to milk cooperatives or direct chilling centers. The average selling prices of cow-milk and buffalo milk are reported to be Rs. 50.00 and Rs. 50.24 respectively (Annex 8 Tables 12, 14, 15, 16, 17, 18).

#### F. Number of cattle

Available information suggests that there are altogether 135 milking cows (local: 11, cross: 104, jersey: 78 including oxen) and 32 milking buffalo (local 11, cross: 34 including he buffalos). As per the sample household survey, on an average each household involved in milk production/trade owns 1.32 cows and 0.31 buffalo. The number of milking cows and buffalo significantly outnumber non-milking ones (Annex 8, Tables 5 and 6).

Table 4.20: Major milk production pockets/collection around Rajapur market center

Collection centers	Distance (in Km.) to Chilling/Collection centers	Present Collection Potential in (liter)	Milk Production Pockets
1. Gulariya	2.5	2,250	Mohamdpur, Badaiyatal, Achkawa (India), Lokaiye (India), Achkawa (India), Khamariya, Sadapur, Sitapur, Simara, Bhaithakpur, Bastajpur, Phattepur, Puraina, Pahadipur, Dayarampur, Jarepur, Basanta, Shankarpur, Belas, Bhaluphata, Daradhuna, Padariya, Ramgaudi, Yakaisa, Panchabazaar, Sayribazaar
2. Jamuni	3	2,350	
3. Kalika	4	1,750	
4. Sitapur	2	400	
5. Santipur	6	350	
6. Dhaphe	3	300	
7. Phutaha	2	420	
8. Dhobinipur	3	650	
9. Rajpuruwa	1	450	
10. Bhimbapur	1	550	
11. Simara	3	1,550	
12. Tilkhana/ Pachasa	5	500	
13. Sital Bazzar	5	500	
<b>Total</b>		<b>12,020</b>	

Source: FGD, KII and Household Survey, 2074

#### G. Problems and constraints and suggested remedies

During FGDs, KIIs and sample household surveys, the stakeholders were asked to express their opinions on problems and constraints being encountered in milk production and its sale to the markets/consumers. They were also requested to suggest ways to resolve those problems/constraints. Their responses are presented below:

- Access to road but lack of vehicle: local carriage business should be promoted.
- Shortage of fodders and unavailability of feeds in local markets. Chilling center far away and mass transport system is not efficient. More chilling centers at suitable locations need to be established.
- Price variation, low price for milk from the milk collectors. Farmers are not provided with the reasonable prices for their products.
- Veterinary service is weak including reproduction service; a good/experienced doctor is needed.
- Animal insurance is not in practice; District Livestock Service Office needs to take steps in promoting insurance.
- Supply of water unreliable; maintenance of water sources and physical construction

#### H. Proposed chilling centers

Kandapur Chowk in Badhaiya Tal rural municipality and Shantipur in Rajapur municipality are two locations proposed for the establishment of chilling centers amongst the few suggested by the stakeholders during the field surveys. Each proposed location for chilling center has good physical infrastructure facilities, adequate volume of milk collection and has huge potentials for increasing milk production. Details are documented in the table below (Table 4.21).

Table 4.21: Proposed chilling center: Kandapur chowk

<b>Name</b>	Kandapur Chowk	
<b>Proposed Location</b>	Badhaiya Tal rural municipality, Ward No. 08, Bardiya	
<b>GPS Code</b>	28°11'0.24"N 81°23'31.12"E	
<b>Number of farmers involved (HHs)</b>	1000+ Hhs	
<b>Present Daily milk production (liter)</b>	2000+	
<b>Major areas of milk production for the catchment purpose</b>		
Mohamdpur, Badaiyatal, Achkaua (India), Lokaiye (India), Achkawa (India), Khamariya, Munalpur, etc.		
<b>Expected Future Annual Growth Rate in Milk Production</b>		
In average 10% if external milk promotional activities is provided for next 3 years		
<b>Small Chilling Centers / Collection Center Coverage</b>		
Guleria, Jamuni, Kalika		
<b>Nearby Market</b>		
Tikapur, Guleria		
<b>Distance Market</b>		
Nepalgunj		
<b>Technical Feasibility</b>	<b>Size of Chilling Center</b>	500Ltr: Bulk Milk Collection
	<b>Available resources</b>	Road access is viable, Vibrant existing cooperatives with reasonable infrastructures of water supply, electricity, space, manpower, etc.
<b>Financial feasibility</b>	Cost of Propose Sized Milk Cooler: Rs 200, 000.00 Average cost of milk production: Rs. 48.8/liter; Selling price at farm household: Cow milk Rs. 50 /liter; buffalo milk R.s 50.24/liter; Selling price at chilling center: Rs56/liter; Estimated annual turnover at chilling center: Rs25,00,000.00	
<b>Recommendation:</b> The market centers have already the numbers of chilling centers. Therefore it is recommended to upgrade the existing chilling center rather than new establishment; <b>Nearby Chilling Center: DDC, Nepalgunj; Sanoshree Chilling Center DDC, Bardia, etc.</b>		

Figure 4.9

Google mapping of proposed chilling center: Kandapur Chowk

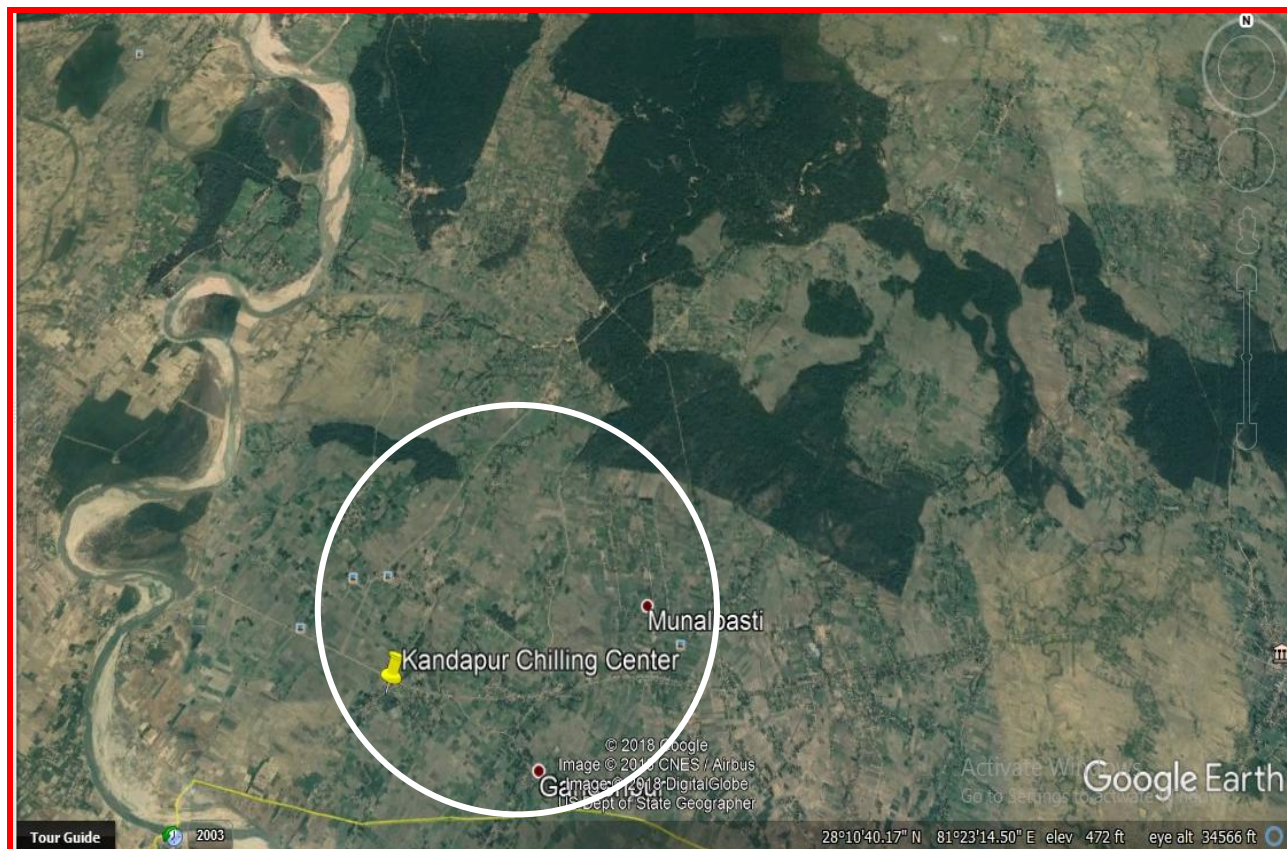
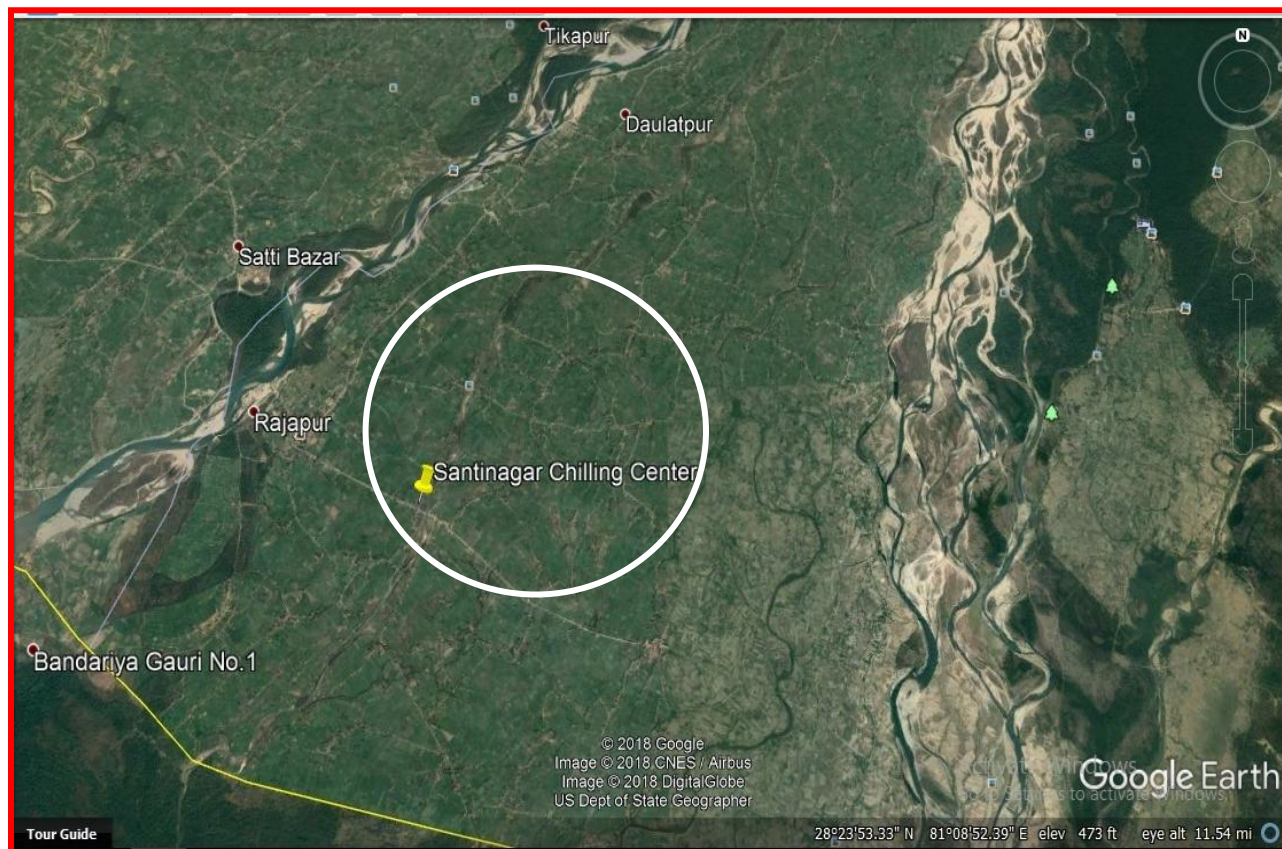


Table 4.22: Proposed chilling center: Shantipur

<b>Name</b>	Shantipur	
<b>Proposed Location</b>	Rajapur municipality, Ward no. 04, Bardiya	
<b>GPS Code</b>	28.4194N, 81.1137E	
<b>Number of farmers involved (HHs)</b>	2000++ Hhs	
<b>Present Daily milk production (liter)</b>	4000 (Available for chilling)	
<b>Major areas of milk production for the catchment purpose</b>		
Dhobinipur, Badhalpur, Santipur, Rajkuruwa Muraiya, Bhimbapur, Basantapur, Belas, etc.		
<b>Expected Future Annual Growth Rate in Milk Production</b>		
In average 10% if external milk promotional activities is provided for next 3 years		
<b>Small Chilling Centers / Collection Center Coverage</b>		
Dhobinipur, Badalpur, Santipur, etc.		
<b>Nearby Market</b>		
Tikapur, Guleria, etc.		
<b>Distance Market</b>		
Nepalgunj		
<b>Technical Feasibility</b>	<b>Size of Chilling Center</b>	1500Ltr: Bulk Milk Collection
	<b>Available resources</b>	Road access is viable, Infrastructures of water supply, electricity, space, manpower, etc.
<b>Financial feasibility</b>	Cost of Propose Sized Milk Cooler: Rs 450, 000.00 Average cost of milk production: Rs. 48.8/liter; Selling price at farm household: Cow milk Rs. 50. /liter; buffalo milk R.s 50.24/liter; Selling price at chilling center: Rs. 56/liter; Estimated annual turnover at chilling center: Rs1,00,00,000.00	
<b>Recommendation:</b> The market centers have already the numbers of chilling centers. Therefore it is recommended to upgrade the existing Chilling center rather than new establishment. <b>Nearby Chilling Center: DDC, Nepalgunj; Sanoshree, Bhurigaun Chilling Center DDC, Bardia, etc.</b>		

**Figure 4.10**  
**Google mapping proposed chilling center: Shantipur**



## 4.7 Belauri-Dodhara market center

### A. Introduction

Belauri is one of the emerging market centers of Kanchanpur district. The district is situated at an altitude ranging from 152 meter to 915 meter from the sea level. The rectangle shaped district lies between 26°51'-27°51'North to 84°51'-84°16'East with 2025 km<sup>2</sup> area. The district has seven municipalities (Bemata, Piranhas, Becket, Suklapkata, Belauri, Mahakali and Krishnapur) and two rural municipalities (Beldandi and Laljhadi). Kanchanpur district has 448,503 total populations (47.9% male, 52.1% female) with 1.77% annual population growth.

Kanchanpur has an estimated road network of 737.09.4 kilometers, including strategic roads with total length of 155.42 Km, 443.15 Km of district road core network and rest of village roads. The local markets such as Beldadi, Belauri, Puranbas, Mahendranagar, Bedkot, Mahakali are well connected with road network. The annual milk production of the district is around 79,327 Mt.. The numbers of cross cow, local cow and cross buffalo in the same year were reported to be 101,293, 310,010 and 103,868 respectively.

The district has 192 active livestock farming groups, 19 artificial breeding centers, 244 modern livestock firms, 18 milk producing cooperatives, five livestock service centers, 10 livestock service sub centers, and one livestock service unit. There are 67 registered private vet service centers, 49 feed shops, 7 dairy industries, and 6 regular livestock *haat bazaars* for regular trading of the livestock in local and regional level. The Belauri market center itself belongs to Belauri municipality that has 10 wards and 53,544 populations covering an area of 123.37 Km<sup>2</sup>.

### B. Milk producers' cooperatives

There are five milk producers' cooperatives functioning in the vicinity of Belauri. Nearly 3,000 farmers are associated with these cooperatives that are reported to have potentials to produce as much as 8,520 liters of milk per day (Table 4.23).

Table 4.23: Number of milk cooperatives around Belauri market center

Existing Cooperatives	Daily milk production potentials (Liter)/	Number of Milk producers (Farmers)
Punarbas Sahakari Sastha Ltd.	6,000	2,000
Sivasakti Dugdha Sahakari Ltd.	820	260
Prithibibtsati Dugdha Sahakari	700	300
Dhanalaxmi Dhugdha Sahakari	1,000	370
Shrijana Sahakari	750	200
<b>Total</b>	<b>8,520</b>	<b>2,930</b>

Source: FGD, KII and Household Survey, 2074

### C. Farming households involved in milk production

Nearly 3,000 farming households are reported to have been involved in producing milk in the milk production pockets such as Punarbas, Belauri and Mahakali. The sample household survey revealed that 49% of households have land holding less than 0.5 hectare. Moreover, about 85% of them were reported to have food sufficient for more than nine months (Annex 8; Tables 3 and 4) from their own cultivation.

### D. Major milk collection centers and milk production pockets

The information gathered during KIIs and FGDs suggests that there are eight major milk collection centers connected with Belauri. They are reported to have daily milk production potentials of 13,850 liters from 3,000 farming households (Table 4.23).

### E. Estimated milk production, sale and income earned

In sample household survey, daily milk production of 100 farming households was reported to be 899 liters (cow milk: 327.5 liters, buffalo milk: 571.5 liters) suggesting 9.0 liters of milk per household and 9.23 liters of milk per milking animal. Out of total respondents, more than 48% have desired to sell their milk directly to milk cooperative. The average selling prices of cow-milk and buffalo milk are reported to be Rs.50.0 and Rs. 50.16 respectively (Annex 8 Tables 12, 14, 16, 17).

#### F. Number of cattle

Available information suggests that there are altogether 58 milking cows (local: 54, cross:7, jersey:77 including he) and 114 milking buffalo (local 136, cross:50 including he). As per the sample household survey, on an average each household involved in milk production/trade owns 0.58 cows and 1.14 buffalo. The number of milking cows and buffalo significantly outnumber non-milking ones (Annex 8; Tables 5 and 6).

Table 4.24: Major milk production pockets/collection centers in Belauri market center

Chilling/Collection centers	Avg. Distance (in Km) to Collection /Chilling Center	Present Collection Potential (liter)	Milk Production Pockets
Belauri (3 locations)	2.5	8,350	Tediya, Sinhapur, Paulaha, Bhagatpur, Beldadi, Laldadi, Jilamila, Khairidada, Kaanpur, Janjar, Kachhuwa, Dekhatbuli, Gokulpur, Phattaiya, Kiriya, Ramnagar
Parasna	4	550	
Motibasti	2	300	
Tribhuwan Basti	6	650	Birupata, Khadakankat, Sitabasti, Rambasti, Puraina, Amrisai, Janakbasti, Sukumbasi Basti, Gagaun, Chagaun, Khagaun, Kagaun, Rajagaau, Lahaghat
Budhabasti	3	500	
Prithibibasti	2	650	
Belaria (2 locations)	1	1,250	
Mahakali (4 locations)	2	1,600	Chadani, Baaba Thatn Dhodara, Garadebitol Chadani, Dambar Chauraha, Dodhar
<b>Total</b>		<b>13,850</b>	

Source: FGD, KII and Household Survey, 2074

#### G. Problems and constraints and suggested remedies

During FGDs, KIIs and sample household surveys, the stakeholders were asked to express their opinions on problems and constraints being encountered in milk production and its sale to the markets/consumers. They were also requested to suggest ways to resolve those problems/constraints. Their responses are presented below:

- Shortage of fodders and unavailability of feeds in local markets. Private sector Vets should be encouraged to expand their businesses. The milk producers need to be provided needed supports for growing fodders on their farm; and or they are linked with fodder suppliers.
- Price variation, low price for milk from the milk collectors.
- Technical assistance of the stake holders is inadequate. Veterinary service is weak including reproduction service. Private sector service providers are not available at service level.
- Animal insurance is not in practice; District Livestock Service Office needs to take steps in promoting insurance.
- Lack of road infrastructure and road connetivity towards rest part of Nepal due to the lack of bridge in Mahakali River.

#### H. Proposed chilling centers

Out of few locations suggested by local stakeholders as potential points for establishing centers, three most suitable and potential locations are recommended. They are Belauri, Punarbas and Chadani Dodhara. Each proposed location for chilling center has good physical infrastructure facilities, adequate volume of milk collection and has huge potentials for increasing milk production. Other details concerning each location are provided below (Tables 4.25-4.27).

Table 4.25: Proposed chilling center: Belauri

<b>Name</b>	Belauri	
<b>Proposed Location</b>	Belauri 04, Kanchanpur	
<b>GPS Code</b>	28°40'53.59"N 80°21'46.05"E	
<b>Number of farmers involved (HHs)</b>	3,000	
<b>Present Daily milk production (liter)</b>	10,000+ (Available for chilling)	
<b>Major areas of milk production for the catchment purpose</b>		
Tediya, Sinhapur, Paulaha, Bhagatpur, Beldadi, Laldadi, Jilamila, Khairidada, Kaanpur, Janjar, Kachhuwa, Dekhatbuli, Gokulpur, Phattaiya, Kiriya, Ramnagar, etc.		
<b>Expected Future Annual Growth Rate in Milk Production</b>		
<b>In average 10% if external milk promotional activities is provided for next 3 years</b>		
<b>Small Chilling Centers / Collection Center Coverage</b>		
Beldadi, Laldadi, Belauri,		
<b>Nearby Market</b>		
Mahendarnagar		
<b>Distance Market</b>		
Nepalgunj, Surkhet		
<b>Technical Feasibility</b>	<b>Size of Chilling Center</b>	3000Ltr: Bulk Milk Collection
	<b>Available resources</b>	Road access is viable, Vibrant existing cooperatives with reasonable infrastructures of water supply, electricity, space, manpower, etc.
<b>Financial feasibility</b>	Cost of Propose Sized Milk Cooler: Rs 800, 000.00 Average cost of milk production: Rs. 48.8/liter; Selling price at farm household: Cow milk Rs. 50/liter; Buffalo milk R.s 50.16/liter; Selling price at chilling center: Rs. 56/liter; Estimated annual turnover at chilling center: Rs 2,00,00,000.00	
<b>Recommendation:</b> The market centers have already the numbers of chilling centers. Therefore it is recommended to upgrade the existing Chilling center rather than new establishment.; Nearby Chilling Centers DDC, Dhangadi; Belauri Chilling Center, Belauri, etc.		

**Figure 4.11**  
Google mapping of proposed chilling center: Belauri

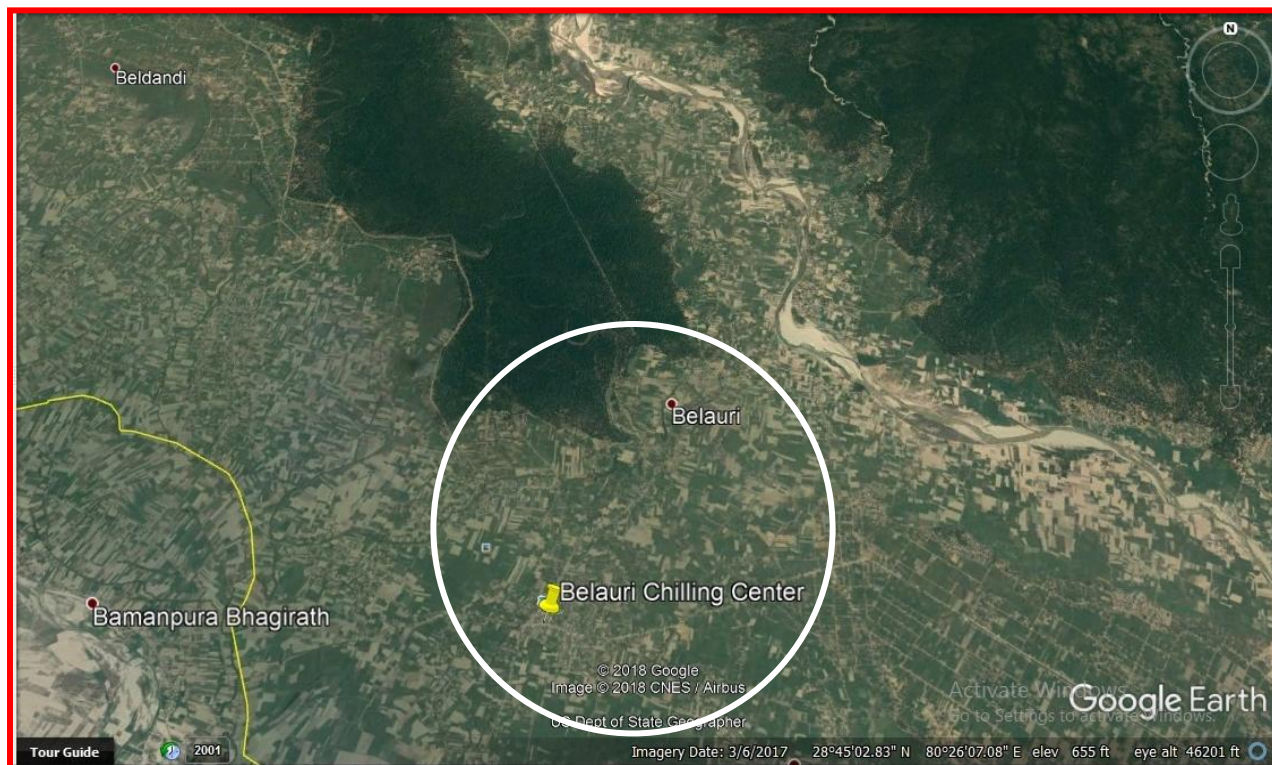


Table 4.26: Proposed chilling center: Punarbas

<b>Name</b>	Punarbas	
<b>Proposed Location</b>	Punarbas 06, Tribhuwan Basti, Kanchanpur	
<b>GPS Code</b>	28°39'5.06"N 80°27'59.17"E	
<b>Number of farmers involved (HHs)</b>	2000++ Hhs	
<b>Present Daily milk production (liter)</b>	4000 (Available for chilling)	
<b>Major areas of milk production for the catchment purpose</b>		
Birupata, Khadakankat, Sitabasti, Rambasti, Puraina, Amrisai, Janakbasti, Sukumbasi Basti, Gagaun, Chagaun, Khagaun, Kagaun, Rajagaau, etc.		
<b>Expected Future Annual Growth Rate in Milk Production</b>		
<b>In average 10% if external milk promotional activities is provided for next 3 years</b>		
<b>Small Chilling Centers / Collection Center Coverage</b>		
Parasna, Motibasti, Tribhuwan Basti, Budhabasti, Prithibibasti		
<b>Nearby Market</b>		
Mahendarnagar		
<b>Distance Market</b>		
Nepalgunj, Surkhet		
<b>Technical Feasibility</b>	<b>Size of Chilling Center</b>	1500Ltr: Bulk Milk Collection Rs 4500, 000.00
	<b>Available resources</b>	Road access is viable, Infrastructures of water supply, electricity, space, manpower, etc.
<b>Financial feasibility</b>	Cost of Propose Sized Milk Cooler: Rs 450, 000.00 Average cost of milk production: Rs. 48.8/liter; Selling price at farm household: Cow milk Rs. 50. 0/liter; buffalo milk R.s 50.16/liter; Selling price at chilling center: Rs55/liter; Estimated annual turnover at chilling center: Rs 1,00,00,000.00	
<b>Recommendation:</b> The market centers have already the numbers of chilling centers. Therefore it is recommended to upgrade the existing Chilling center rather than new establishment. Nearby Chilling Center: DDC, Dhangadi; Belauri Chilling Center, Belauri, etc.; and other private Dairy in Mahendranagar.		

**Figure 4.12**  
**Google mapping of the proposed chilling center: Punarbas**

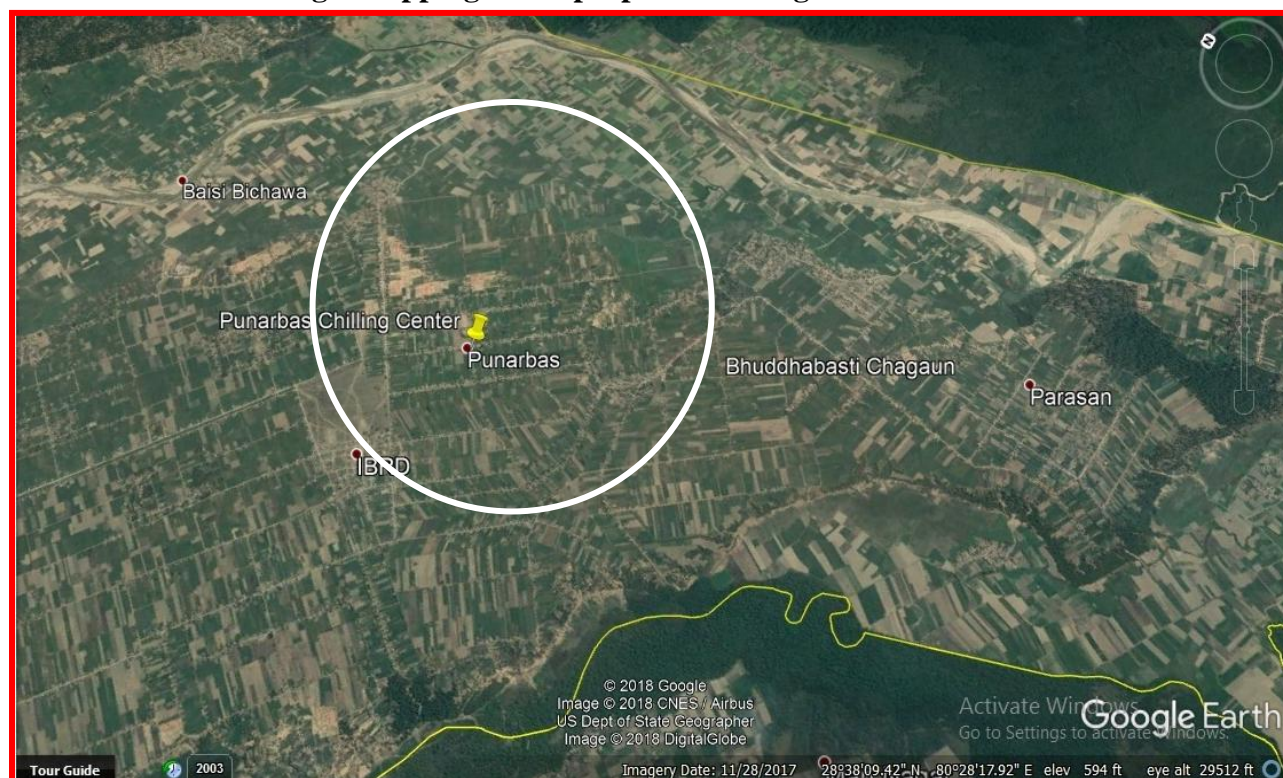


Table 4.27: Potential chilling center: Chadani Dodhara

<b>Name</b>	Mahkali (Chadani Dodhara)	
<b>Proposed Location</b>	Mahakali 06, Kanchanpur	
<b>GPS Code</b>	28°53'29.83"N 80° 5'24.09"E	
<b>Number of farmers involved (HHs)</b>	1000+ Hhs	
<b>Present Daily milk production (liter)</b>	1600	
<b>Major areas of milk production for the catchment purpose</b>		
Lahaghat Chadani, Baaba Thatn Dhodara, Garadebitol Chadani, Dambar Chauraha, Dodhar, etc.		
<b>Expected Future Annual Growth Rate in Milk Production</b>		
In average 10% if external milk promotional activities is provided for next 3 years		
<b>Small Chilling Centers / Collection Center Coverage</b>		
Chadani, Dodhara		
<b>Nearby Market</b>		
Mahendarnagar		
<b>Distance Market</b>		
Nepalgunj, Surkhet		
<b>Technical Feasibility</b>	<b>Size of Chilling Center</b>	500Ltr: Bulk Milk Collection
	<b>Available resources</b>	Road access, Infrastructures of water supply, electricity, space, manpower, etc.
<b>Financial feasibility</b>	Cost of Propose Sized Milk Cooler: Rs 200,000.00 Average cost of milk production: Rs. 48.8/liter; Selling price at farm household: Cow milk Rs. 50.0/liter; buffalo milk R.s 50.16/liter; Selling price at chilling center: Rs55/liter; Estimated annual turnover at chilling center: Rs25,00,000.00	
<b>Recommendation:</b> In Chadani Dodhara, the suspension bridge in Mahakali river is not access for four wheel transportation. Only two wheelers such as motorbikes and Bicycles are carrying the milk. Therefore, Chilling Center can be established after the bridge construction is made in the region.		

Figure 4.13

Google mapping of the proposed chilling center: Chadani Dodhara



## **Chapter V**

### **Summary of Findings and Recommendations**

#### **5.1 Summary of findings**

The results of farm household survey, FGDs and KIIs have adequately revealed that a significant number of farmers in all 14 market centers covered for the study are involved in the production and sale of milk and milk products. It is also found that the huge potentials to meet growing unmet demand for milk and milk products is not yet fully exploited in these fast developing market centers. The farmers, by and large, are enthusiastic to expand their milk production activities provided they are provided the types of supports they need. The stakeholders concerned with dairy development in the locality have also shown their serious concerns to promote milk production. However, they seem to be reluctant to invest in dairy development unless there is assured supply of milk. The farmers, on other hand, feel that they can produce milk to meet growing demand if there is assured markets. In this respect, they would like to see development of collection centers and chilling centers at appropriate locations

Based on assessment of future potentials of milk production, establishment of 23 chilling centers are found technically and financially feasible. This includes at least one chilling center in each of 14 market centers studied. Along the Mid Hill High Way the 13 chilling centers proposed include Sukrabare, Khurkot, Khaniyakhark, Dhunibesi, Mahadevbesi, Bhorletar, Paundi/Sundarbazar, Baglungbazar, Burtibang, Narayan municipality, Rakam Karnali, Patan and Gajari (Table 5.1). Similarly, the 12 chilling centers proposed for Postal Road Corridor include Gaurigunj, Rangeli, Bhodaha, Pipara Simara, Baruwa. Chaupatta, Jyamire, Kandapur Chowk, Shantipur, Belauri, Punarbas and Belauri (Table 5.2).

#### **5.2 Recommendations**

##### **5.2.1 Overall general recommendations**

The proposed chilling centers and collection centers are technically and financially feasible in the markets centers covered for the study. For the establishment and smooth functioning of proposed chilling centers and collection centers, a well designed Public Private Partnership strategy would be required. The public sector involvement through governmental and semi-governmental institutional structures functioning at the center, province, district and municipal and rural municipal levels will have to be involved in providing institutional/legal, coordination and grant subsidy supports to the farmers and potential private sector investors. The private sector with governmental technical and financial (arrangement for loan and grants/subsidy) backstopping will have to act as main investors in establishing and managing chilling centers and collection centers.

The study has revealed that majority of the farmers sell their milk to milk producers' cooperatives. It is also found that; not in all but, in many locations of the market centers covered under the study such Cooperatives are buying milk from the milk producers. Such cooperatives are serving mainly as assured market for the milk producers. It is recommended that Milk Producers' Cooperatives must be formed in all milk collection/chilling centers where they do not exist at present. Such cooperatives should be oriented towards facilitating the milk producers to have easy access to technical and financial assistance they require. Moreover, such cooperatives are the an wonderful model to flow the money from urban to rural and from high class to small and middle class farmers in Nepal. Thus, strengthening

such milk producer cooperatives through trainings and infrastructure supports shall be done regarding good milk management and product diversification.

Depending upon the geographical variation (hill and terai) and level of dairy development, the problems and constraints differ in MHHW and PCR. At the same time, variations in the farmers' involvement in dairy development, existing physical facilities, availability of veterinary services and access to loan and technical supports, the problems and constraints differ in the market centers within the given highways. Market center-wise problems and constraint and suggested remedial measures are spelled out in Chapter III on MHHW and Chapter IV on PCR. They are summarized and synthesized in the following manner:

#### 5.2.2 Recommendations related to chilling centers at Mid Hill High Way (MHHW)

Some common problems and constraints that were mentioned by the milk producing farmers and stakeholders involved in marketing of dairy products in seven market centers brought under study are briefly outlined below:

- No case of animal insurance was reported resulting largely from ignorance on government grant on animal insurance and partly absence of supports from the DLSOs and other public sector agencies. This calls for DLSO, NDDDB, DDC and other agencies involved in dairy development to mobilize milk producers' cooperatives to take initiatives.
- High production cost due to increased costs of transportation, animal feeds, medicines and consultancy service charge of livestock service providers has discouraged expansion of milk trade. In most of the time, farmers have to sell their milk at prices below the production costs. This calls for governments' initiative to fix floor price annually and work out areas where grant subsidy is required.
- Access to road round the year is not available for all farmers. As a result, they are forced to sell their milk and milk products to milk agents (middle men) who come to buy milk and milk products at their door; considerably at prices much lower than market prices. Improvement in road condition and establishments of more collection centers are suggested remedies.
- For majority of farmers, it was difficult to get improved varieties of cows and buffalos. This is an area where government needs to step in to coordinate with private sector.
- Open grazing in public land is not available in all places. Moreover, they to supplement animal foods with animal feeds. This requires improvement in shed at household levels. The farmers who are involved in milk trade at large scale have good arrangements for keeping the cows/buffalos. But for small farmers good shed management is costly which they cannot afford.

#### 5.2.3 Recommendations related to chilling centers at Postal Road Corridor (PCR)

Most of the problems and suggested remedial measures apply to the farmers involved in milk production along the PCR. However, they differ from their counterparts in the hills specifically in some aspects.

- Status of physical faculties such as road network, electricity, water, public transport is comparatively better in terrain. Yet, absence of milk collection centers at appropriate places has forced them to sell their milk and milk products by using vehicular transport; largely run by private sector, that has become costlier every month.
- Access to transport facility becomes difficult during rainy season as many of the link roads are not all weather roads. Functioning of milk collection centers at appropriate point will resolve such issues.
- Like in MHHW, no case of animal insurance was reported. It is believed that farmers, by and large, are ignorant about it. There is a need to make animal insurance mandatory for all.

- For majority of farmers, it was difficult to get improved varieties of cows and buffalos. This is an area where government needs to step in to coordinate with private sector.
- Open grazing in public land is not available in all places. Moreover, they to supplement animal foods with animal feeds. This requires improvement in shed at household levels. The farmers who are involved in milk trade at large scale have good arrangements for keeping the cows/buffalos. But for small farmers good shed management is costly which they cannot afford.
- As compared to MHHW, the progress in the construction of this highway is extremely unsatisfactory. This has severely constrained expansion of dairy development activities due to absence of connectivity with larger cities and market centers.

### 5.3 Assessment of risk factors and associated mitigation measures

Dairy development as sub sector of agriculture is volatile and risk-prone due to certain inherent factors. Firstly, it is concerned with milk which is highly perishable. Lack of timely and proper and timely management of milk results in great loss to farmers that every farmer cannot afford to bear. Notably, milk is essential part of food items of children, weak/sick and old people and is expected to improve their health. Hence, any disruption in its supply and deterioration in its quality have direct bearing upon their health and become an issue of human cry. Secondly, the milk, in turn, is derived from animals i.e. cows and she-buffalos. These animals are prone to disease and increased casualties that have direct bearing upon supply of milk on the part of consumers and financial loss on the part of milk producing farmers. Thirdly, cow is religious commodity for the Hindus who significantly outnumber other religions in Nepal. Any misuse of cows, hence, may lead to political/social unrest in the country. Identification of risk factors associated with dairy development; especially establishment of chilling centers along the MHHW and PCR and mitigation measures are mentioned in such contextual framework.

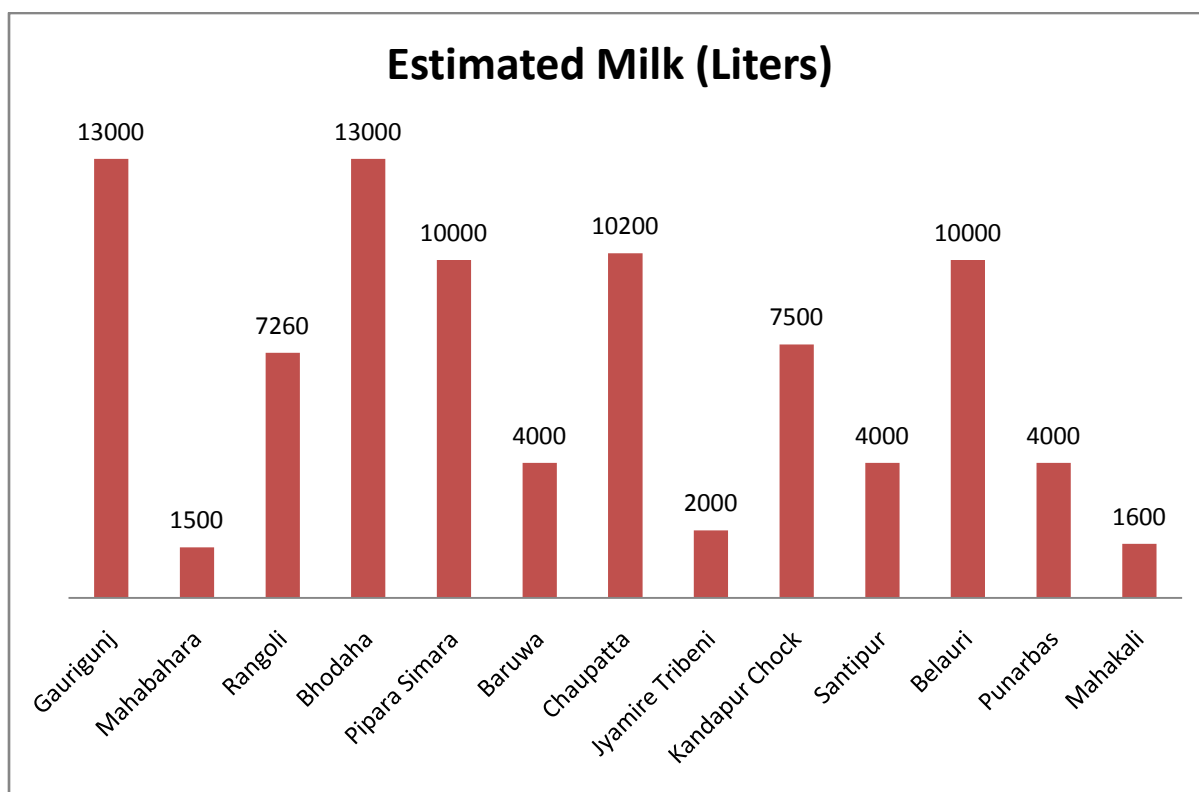
- Risk of getting milk deteriorated if not properly managed will have to be resolved by establishing chilling centers and milk collection centers.
- There is high risk of animal casualties; especially casualties of milking cows and buffalos due to rampant animal disease; natural calamities such as earthquake, land slide, floods that have great toll on animal lives. The hilly region as compared to terai region is more prone to such risks. The farmers are the first category of sufferers. Such risk factors need to be mitigated by making animal insurance mandatory, improving animal health services and proper management of sheds.
- Specially, in HRC the supply of milk, its quality and prices are affected by of supply of milk from Indian border. Due to open border, the farmers producing milk have to compete with their counter parts in India. In most of the cases such competition is unhealthy and favors Indian producers. Some control mechanism to check flow of milk from India; notably checking quality of milk.
- Cases of adulteration; whether true or false, in milk are most often reported in the media leading to total rejection by the consumers to consume and buy milk. Not only are the farmers, all involved in value chains of milk trade badly affected. This can be resolved making the government and concerned stakeholders monitor the quality of milk; and compensate loss to farmers.
- Proper schemes for managing increasing number of non-cows losing fertility period has to be worked out. Chances of misuse of cows (beef production) must be checked.
- The milk producers are badly affected by price variations. Scheme such as milk holidays need to be discouraged.
- Natural calamities and political unrest reflected in district blockade and *Nepal bandh* (general strikes) disrupt vehicular movement affecting negatively supply of milk. Government and

concerned stakeholders need to motivate farmers to have insurance against such unforeseen events.

**Table 5.1: Estimated daily milk collection at proposed chilling centers along PRC**

SN	Proposed Chilling Centers	Estimated Farming Households	Estimated daily milk collection (Liters)	Benefit to the farmers (Per day)		
				Cost of milk production (Rs. 48.8/liter)	Average selling price (Rs.53.0/liter)	Net return (cost-sell)
1	Gaurigunj	1,656	13,000	634,400	689,000	54,600
2	Rangeli	1,150	7,260	354,288	384,780	30,492
3	Bhodaha	2,405	13,000	634,400	689,000	54,600
4	Pipara Simara	2,250	10,000	488,000	530,000	42,000
5	Baruwa	5,500	4,000	195,200	212,000	16,800
6	Chaupatta	1,650	10,200	497,760	540,600	42,840
7	Jyamire Tribeni	1,000	2,000	97,600	106,000	8,400
8	Kandapur Chock	1,000	7,500	366,000	397,500	31,500
9	Santipur	2,000	4,000	195,200	212,000	16,800
10	Belauri	3,000	10,000	488,000	530,000	42,000
11	Punarbhas	2,000	4,000	195,200	212,000	16,800
12	Mahakali (Chandani Dhodhara)	1,000	1,600	78,080	84,800	6,720
<b>Total</b>		<b>24,611</b>	<b>86,560</b>	4,224,128	4,587,680	363,552

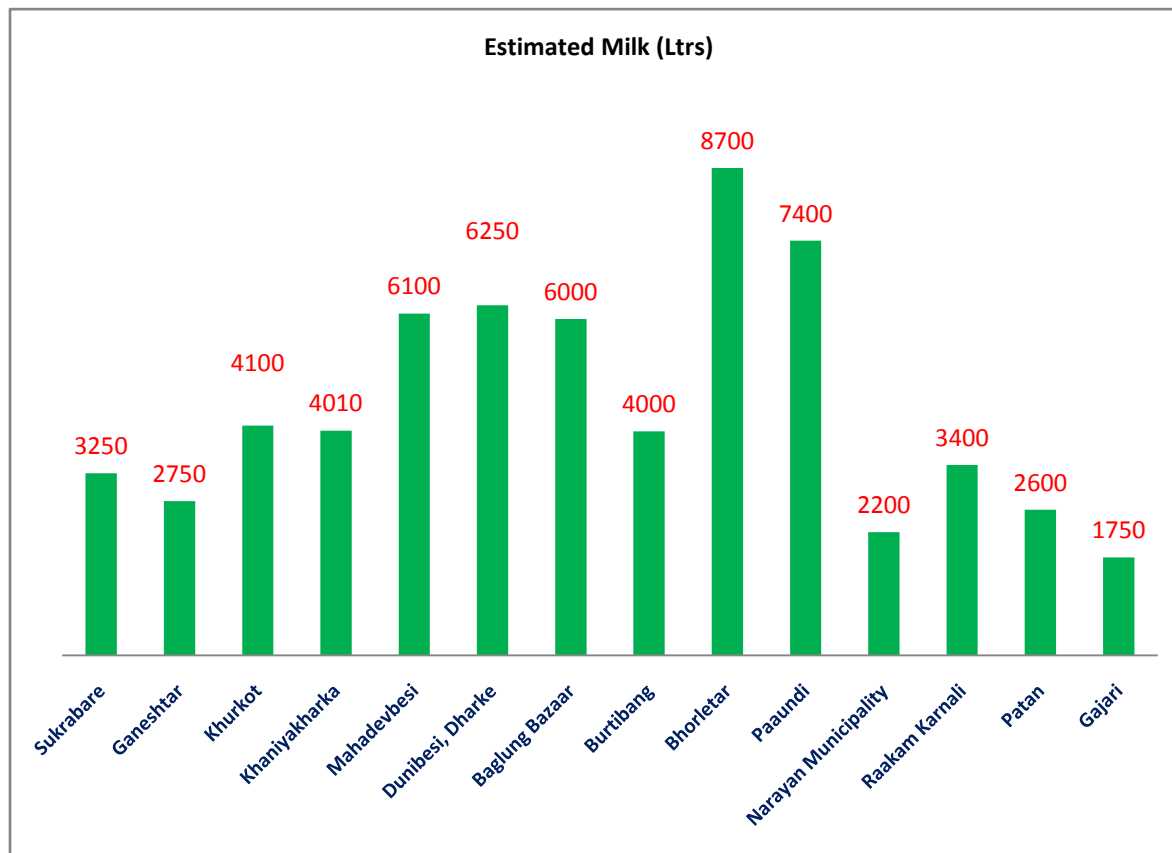
**Figure 5.1**  
**Estimated milk collection at proposed chilling centers along PCR**



**Table 5.2: Estimated daily milk collection at proposed chilling centers along the MHHW**

SN	Proposed chilling centers	Estimated Farming Households	Estimated daily milk collection (Liters)	Benefit to the farmers (Per day)		
				Cost of milk production (Rs. 48.8/liter)	Average selling price (Rs.53.0/liter)	Net return (cost-sell)
1	Sukrabare	1,300	3,250	158,600	175,500	16,900
2	Khurkot	2,250	4,100	200,080	221,400	21,320
3	Khaniyakharka	2,100	4,010	195,688	216,540	20,852
4	Mahadevbesi	1,170	6,100	297,680	329,400	31,720
5	Dunibesi, Dharke	800	6,250	305,000	337,500	32,500
6	Baglung Bazaar	860	6,000	292,800	324,000	31,200
7	Burtibang	900	4,000	195,200	216,000	20,800
8	Bhorletar	2,100	8,700	424,560	469,800	45,240
9	Paaundi	2,050	7,400	361,120	399,600	38,480
10	Narayan Municipality	750	2,200	107,360	118,800	11,440
11	Rakam Karnali	1,140	3,400	165,920	183,600	17,680
12	Patan	560	2,600	126,880	140,400	13,520
13	Gajari	540	1,750	85,400	94,500	9,100
<b>Total</b>		<b>16,520</b>	<b>59,760</b>	<b>2,916,288</b>	<b>3,227,040</b>	<b>310,752</b>

**Figure 5.2  
Estimated milk collection at proposed chilling centers along MHHW**



# PHOTOGRAPHS



Field supervisor Ms. Samjhana Pyakurel at Baglung





Field supervisor Ms. Radhika Shjrestha and Ms. Samjhana Pyakurel at Lamjung



FGD Photographs





FGD Photographs





# **ANNEXES**

## जिल्ला तथा गाउँ स्तरीय कार्यालयबाट लिनु पर्ने जानकारी

### जिल्ला स्तरीय तथ्यांक संकलन

Key Informant Interview (KII) र Focus Group Discussion (FGD) बाट लिने जानकारी बाहेकको थप सामग्री/जानकारीको लागि मात्र

#### १. सम्पर्क गर्नु पर्ने कार्यालयहरू

१.१ जिल्ला पशु बिकास कार्यालय

१.२ जिल्ला दुध सहकारी संघ (Federation of Milk Producers Cooperatives)

#### १.२ संकलन गर्नु पर्ने सामग्री/जानकारी

- बार्षिक प्रतिबेदन (गत २ बर्षको)
- आगामी आर्थिक बर्षको प्रस्तावित योजना र बजेट
- पशु/दुध बिकासको दीर्घकालीन योजना (Long Term Plan); छ भने
- जिल्लामा कार्यरत दुध सहकारी संस्थाको बिबरण

### नगरपालिका/गाउँपालिका स्तरीय तथ्यांक संकलन

Key Informant Interview (KII) र Focus Group Discussion (FGD) बाट लिने जानकारी बाहेकको थप सामग्री/जानकारीको लागि मात्र

१. सम्पर्क गर्नु पर्ने कार्यालय: सर्वेक्षणमा परेका १४ वटा केंद्रहरूसंग आबद्ध नगरपालिका वा गाउँपालिका, पशु सेवा कार्यालय, दूध सहकारी, संकलन केन्द्र आदि ।

#### २ संकलन गर्नु पर्ने सामग्री/जानकारी

- Municipality/village profile
- बार्षिक प्रतिबेदन (गत २ बर्षको)
- आगामी आर्थिक बर्षको प्रस्तावित योजना र बजेट
- पशु/दुध बिकासको दीर्घकालीन योजना (Long Term Plan); छ भने
- नगरपालिका/गाउँपालिका क्षेत्र अन्तर्गत कार्यरत दुध सहकारी संस्थाको बिबरण
- नगरपालिका/गाउँपालिका क्षेत्र अन्तर्गतका व्यवसायीक स्थापनाहरू (होटेल, Industries, commercial livestock farming, shops, market centers, etc.)
- सरकारी/गैर सरकारी कार्यालयहरूको बिबरण/संख्या
- अन्य

#### ३. निम्न अनुसारको बिबरण

३.१ हालको नगरपालिका/गाउँपालिका पहिलेको कुन कुन गाउँपालिका र वडाहरू मिलेर स्थापना गरीएको हो? बिबरण लिने

### ३.२ तालिका अनुसारको बिबरण

वडा नं	बस्तीको नाम	जनसंख्या	घरधुरी	बसोबास गर्ने प्रमुख जनजाती	मोटर बाटोबाट दुरी (Km.)
१.					
२.					
३.					
४.					
५.					
६.					
७.					
८.					
९.					
१०.					
११.					
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१३.					
१४.					
१५.					
१६.					
१७.					
१८.					
१९.					
२०.					

## घरधुरी प्रश्नावली (Farm Household Questionnaire)

नमस्कार ! म यस क्षेत्रमा दूध उत्पादन र संकलन क्षेत्रको पहिचान सम्बन्धि अध्ययनको लागि सर्भेक्षणमा आएको छु । यो अध्ययन राष्ट्रिय दूध विकास बोर्डको सहयोगमा अधिकारका लागि पहुँच नेपालले गर्न लागि रहेको छ । यस अध्ययनबाट यस क्षेत्रमा सरोकारवाला निकायहरुलाई दूध ब्यवसायको रणनीतिक प्रबर्द्धन गर्न सहयोग पुग्दछ । अब म केहि प्रश्नहरु तपाईंहरूसँग सोध्नेछु । यसबाट प्राप्त सुचना अध्ययनको नतिजा हाँसिल गर्न मात्र प्रयोग हुनेछ । तपाईंहरुले दिनुभएको सुचनाको प्रसारण गर्ने छैनौं । तसर्थ, सहि जवाफ दिएर अध्ययनलाई सफल पारिदिनुहोला ।

### १. क्षेत्रगत जानकारी

- १.१ राजमार्ग : (मध्यपहाडी १, हुलाकी २)  
 १.२ बजारकेन्द्र : (चौध वटा केन्द्रबाट एउटा छान्नुहोस्)<sup>१</sup>  
 १.३ जिल्ला : १.४ प्रदेश :  
 १.५ हालको न.पा./गाउँपालिका : वडा नं.  
 १.६ साविक : ना.पा./गा.वि.स. वडा नं.  
 १.७ जि.पि.एस. विन्दु :  
 १.८ सर्भेक्षण कर्ताको नाम: हस्ताक्षर  
 १.९ सर्भेक्षणको मिति: स्थानर  
 समयर

### २. उत्तरदाताको (घरमुली) विवरण

- २.१ नाम : २.२ उमेर : २.३ लिङ्ग  
 २.४ शिक्षा : २.५ जातजाति :

### ३. परिवारको सामाजिक/आर्थिक जानकारी

- ३.१ परिवार संख्या : क) काम गर्न सक्ने ख) काम गर्न नसक्ने  
 ३.२ भूस्वामित्व (कृषि प्रयोजनका लागी भएका सबै) रोपनी/कठ्ठा  
 ३.३ आफ्नै उत्पादनबाट खाद्यान्नको प्रर्याप्तता महिना प्रति वर्ष

### ४. पशु संख्या/विवरण

- ४.१ गाईको संख्या दूध दिने दूध नदिने जम्मा  
 गाईको नस्ल (संख्यामा) लोकल क्रस जर्सी

<sup>१</sup> १. सुक्रवारे (तेह्रथुम), २. खुर्कोट (सिन्धुली), ३. वैरेनी (धादिङ), ४. बुर्तिवाड (बागलुङ), ५. लंजुड (बेसिशाहर), ६. राकम (दैलेख), ७. पाटन (वैतडी), ८. गौरीगञ्ज (भापा), ९. रंगोली (मोरङ), १०. कलैया (वारा), ११. माँडि (चितवन), १२. बर्दघाट (नवलपरासी), १३. राजापुर (बर्दिया) र १४. वेलौरी (कञ्चनपुर)

४.२ भैंसी संख्या	दूध दिने	दूध नदिने	जम्मा
भैंसीको नस्ल (संख्यामा)		लोकल	क्रस
४.३ गाई/भैंसी किन्न कृण लिनु भएको छ ?		छ	छैन
छ भने,		कति रु	व्याजदर
४.४ व्याजमा अनुदान लिनु भएको छ ?		छ	छैन
४.५ कृणको श्रोत : बैंक	समूह	सहकारी	व्यक्तिगत
			अन्य

#### ५. गोठ/दाना/स्याउलाको व्यवस्था

- ५.१ कति गाई भैंसीको क्षमताको गोठ छ ?  
 ५.२ बस्तुभाउलाई आवश्यक घाँस/दाना को व्यवस्थापन कसरी गर्नुहुन्छ ?

#### ६. पारिवारिक/अन्य श्रम संलग्नता

- ६.१ तलब / ज्यालामा बस्तुभाउ हेरचाह गर्ने मान्छे राख्नु भएको छ ? छ  
 यदि छ भने, कति जना प्रयोग गर्नुभएको छ ?  
 प्रति महिना ज्याला कति तिर्नुहुन्छ ?  
 ६.२ तपाईंको परिवारका कति जनासदस्य पशुपालन संलग्न हुनुहुन्छ ?

#### ७. दूध को उत्पादन घरायसी खपत र बजारमा बिक्रि

- ७.१ दिनको कति लिटर दूध उत्पादन गरिरहनु भएको छ ?  
 गाईबाट लि. भैंसीबाट लि.  
 ७.२ जम्मा उत्पादित दूध को कति लिटर घरायसी खपत हुन्छ र कति लिटर बजारमा बिक्रि हुन्छ ?  
 घरायसी लि. बजारमा लि.  
 ७.३ तपाईंको परिवार कति वर्ष देखि दूध उत्पादनमा संलग्न छ ? वर्ष देखि  
 ७.४ दूध कहा बिक्रि गर्नु हुन्छ ?  
 घरबाटै बिक्रि हुन्छ व्यक्तिका घरमा बजारको होटलमा  
 सहकारी डेरीमा निजि डेरीमा  
 ७.५ दूध बिक्रि स्थलसम्म पुऱ्याउन कति समय लाग्छ ?  
 के मा लैजानु हुन्छ ? हिडेर साइकल गाडी अन्य  
 ७.६ दूध को औसत मूल्य प्रति लिटर कति मा बिक्रि गर्नुहुन्छ ?  
 गाईको दूध रु भैंसीको दूध  
 ७.७ तपाईंलाई तल मध्ये कुन ठाउँमा दूध बिक्रि गर्न रुचाउनुहुन्छ ?  
 उपभोक्तालाई सिधै चिया पसलमा दूध सहकारीमा  
 निजि डेरी फार्म चिस्यान केन्द्र अन्य  
 ७.८ दूध बाहेक अन्य दूध जन्य परिकार बिक्रि गरी मासिक कति आमदानी गर्नुहुन्छ ?  
 रु अन्य

#### ८. दूध को मूल्य निर्धारण कसले गर्दछ ?

कृषकले सहकारीले व्यापारीले सरकारले

९. यस क्षेत्रका कृषकहरूलाई पायक पर्ने गरी दूध संकलन र चिस्यान केन्द्र कहाँ बनाउदा उपयुक्त होला ?

केन्द्र संकलन हुने दूध (लि) अन्य कारण

१०. तपाईसंग दूध उत्पादनका लागि आवश्यक पूर्वाधारको अवस्था कस्तो छ ? (✓ चिन्ह लगाउने)

क्र.स.	विवरण	पर्याप्त	ठिकै	कमजोर	अझै राम्रो बनाउन के गर्नुपर्ला ?
१	हरियो घाँस / स्याउला				
२	पराल / छवाली				
३	दाना / चोकर				
४	भेटनरी सेवा				
५	प्रजनन् सेवा				
६	विमा				
७	खानेपानी				
८	बिजुली				
९	गोठ				
१०	जनशक्ति				
११	अन्य.....				

११. तपाईको क्षेत्रमा दूध उत्पादनको समस्याहरु के के छन् ?

.....१२. दूध व्यवसाय विस्तारका लागि तपाईको क्षेत्रमा सरकार र डेरी व्यवसायीहरुको तर्फबाट के कस्ता विकास गर्नु पर्ला ?

.....१३. अहिले यस क्षेत्रमा दूध को माग अनुसार आपूर्ति नपुगेको जस्तो लाग्छ ?

.....१४. दूध को उत्पादन वृद्धि गर्नका लागि तपाईलाई कस्तो खालको अनुदान (सहयोग) आवश्यक छ ?

तालिम गोठ सुधार

घासे वाली

उन्नत गाइ/भैसी

उन्नत प्रजनन् सेवा

विमा

अन्य:

१६. यस क्षेत्रमा दूध संकलन केन्द्र, चिस्यान केन्द्र निर्माणका लागि तपाइको राय सुभाब के छ ?

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## दुध संकलकसंग लिनुपर्ने जानकारी

सर्बेक्षण केन्द्र/क्षेत्रको नाम :

प्रदेश नं/जिल्ला :

नगरपालिका/गाउँपालिकाको नाम :

दुध संकलकको नाम :

यस कार्यमा कति वर्ष देखि लागेको :

यस क्षेत्रमा तपाईं बाहेक अन्य कति जना दुध संकलकहरु हुनुहुन्छ? : .....

### १. कृपया निम्न अनुसारको जानकारी दिनुहोस

बिबरण	गाईको दुध (लिट्र)	भैसीको दुध (लिट्र)	कुन कुन गाउँ/ वडाबाट दुध आउछ?	अधिकतम दुरी (किलोमीटर)	नूनतम दुरी (किलोमीटर)	कति घर परिवारबाट दुध आउछ?
सालाखाला दैनिक खरिद						
दैनिक नूनतम खरिद (लिट्र)			कुन कुन महिनामा र बिक्रीको लागि किन थोरै दुध आउछ? :			
दैनिक अधिकतम खरिद			कुन कुन महिनामा र बिक्रीको लागि किन धेरै दुध आउछ? :			

### २. कृपया निम्न अनुसारको दुध बिक्रि बारे जानकारी दिनुहोस

दुधको बिक्रि मुल्य

दुधको किसिम (गगुणस्तर :चिल्लो भएको/नभएको आदि)	गाईको दुधको बिक्रि मुल्य (रु. प्रति लिटर)		भैसीको दुधको बिक्रि मुल्य (रु. प्रति लिटर)	
	अधिकतम	नूनतम	अधिकतम	नूनतम

## दुध बिक्री गर्ने स्थान

तपाईंले खरिद गरेको दुध कहाँ र के कस्तो यातायात व्यवस्थापनबाट बिक्री गर्नु हुन्छ? दुध खरीद कर्ता तपाईं कहाँ आएर लिएर जानु हुन्छ वा तपाईं लागि दिनु हुन्छ? दुध लगदा के कस्तो साधान प्रयोग हुन्छ र के कति खर्च लाग्छ?

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३. तपाईंले यो व्यवसाय संचालन गर्दा के कति रकम खर्च गर्नु भयो र के कस्तो कामको लागि खर्च गर्नु भयो (जस्तै: सामान खरिद, घरभाडा, यातायातका साधन खरिद आदि); कृपया जानकारी दिनु हुन्छ कि?

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४. यस क्षेत्रमा दुधको मांग र आपूर्तिको के कस्तो अवास्था छ, अर्थात, मांग अनुसारको आपूर्ति हुन सकेको छैन, यदि छैन भने के कति लिटर अपुग छ?, के कति बढी दुध उत्पादन गर्न/बिक्री गर्न सकिन्छ?

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५. अन्तमा, तपाईंको बिचारमा यस क्षेत्रमा दुध चिसान केन्द्र कुन ठाउँ र के कति क्षमताको राखनु पर्ला?

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## लक्षित समुह छलफल (Focus Group Discussion)

नमस्कार ! म यस क्षेत्रमा दूध उत्पादन र संकलन क्षेत्रको पहिचान सम्बन्धि अध्ययनको लागि लक्षित समुह छलफल गर्न गैरहेको छु । यो अध्ययन राष्ट्रिय दूध विकास बोर्डको सहयोगमा अधिकारका लागि पहुँच नेपालले गर्न लागि रहेको छ । यस अध्ययनबाट यस क्षेत्रमा सरोकारवाला निकायहरूलाई दूध ब्यवसायको रणनीतिक प्रबर्द्धन गर्न सहयोग पुग्दछ । अब म केहि प्रश्नहरू तपाईंहरूसँग सोध्नेछु । यसबाट प्राप्त सुचना अध्ययनको नतिजा हाँसिल गर्न मात्र प्रयोग हुनेछ । तपाईंहरूले दिनुभएको सूचनाको गोप्य राख्ने छौं । तसर्थ, सहि जवाफ दिएर अध्ययनलाई सफल बनाईदिनु होला ।

### १. क्षेत्रगत जानकारी

- १.१ राजमार्ग : (मध्यपहाडी १ , हुलाकी २)  
 १.२ बजारकेन्द्र : (चौध बटा केन्द्रबाट एउटा छान्नुहोस्)<sup>१</sup>  
 १.३ जिल्ला : १.४ प्रदेश :  
 १.५ हालको न.पा./गाउँपालिका : वडा नं.  
 १.६ साविक : ना.पा./गा.वि.स. वडा नं.  
 १.७ जि.पि.एस. विन्दु :  
 १.८ सहभागी संख्या : (उपस्थितको हाजिर गराउने)  
 १.८ छलफल गराउनेको नाम: हस्ताक्षर  
 १.९ छलफलको मिति:

### २. अन्य प्रश्नावली

२.१ यस क्षेत्रका दूध उत्पादन, उत्पादक किसान र दूध बिक्रिको अवस्था कस्तो छ ?

- दूध उत्पादनको मुख्य क्षेत्रहरू कुन कुन हुन् ?  
 कति जति कृषकहरूले दूध उत्पादन गर्दछन् ?  
 दैनिक कति जति लिटर दूध उत्पादन हुन्छ ?  
 नजिकको चिस्यान केन्द्र कहाँ छ ?  
 दूध कहाँ कहाँ बिक्रि हुने गरेको छ ?  
 दूध उत्पादनमा मुख्यरूपमा कुन कुन जातजाती संलग्न छन् ?

२.२ दूध विकासमा सरोकारवाला जस्तै पशु सेवा कार्यालय, निजिक्षेत्र, सहकारीहरूको भूमिका कस्तो छ ?

<sup>१</sup> १. महालक्ष्मी नपा (पाचथर), २. खुर्कोट (सिन्धुली), ३. श्रीशुली (नुवाकोट), ४. बुर्तिवाड (बाग्लुङ), ५. बेसिाशहर (लम्जुङ), ६. राकम (दैलेख), ७. पाटन (वैतडी), ८. गौरीगञ्ज (झापा), ९. रंगोली (मोरङ), १०. कलैया (वारा), ११. माँडि (चितवन), १२. बर्दघाट (नवलपरासी), १३. राजापुर (बाँदा) र १४. बेलौरी (कञ्चनपुर)

२.३ यस क्षेत्रमा चिस्यान केन्द्र बनाउन उपयुक्त ठाउँहरु कुन कुन हुन सक्दछ ? र किन ? (यसले स्थानीय दूध उत्पादक कृषकहरु र अन्य सरोकारवालाहरुलाई कस्तो फाइदा पुग्दछ )

क्र.	संभावित क्षेत्रको नाम	किन ?	दैनिक जम्मा हुनसक्ने दूध (लि.)
स.			
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पुनश्च: (क) यस प्रश्नमा कम्तिमा पनि ४ वटा क्षेत्रको पहिचान हुनु पर्ने । (ख) संभावित क्षेत्रको सम्पर्क अनिवार्य लिनुपर्ने ।

संभावित क्षेत्रको सम्पर्क:

क्र.	संभावित क्षेत्रको नाम	सम्पर्क व्यक्ति / अगुवा कृषकको नाम र नम्बर	कैफियत
स.			
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२.४ तपाइले राखनुभएको सुझाव अनुसारका स्थानहरुमा चिस्यान केन्द्र बनाउदा दैनिक कति लिटर जति दूध संकलन हुन सक्दछ ?

क्र.	संभावित क्षेत्रको नाम	संभावित दूध संकलन (लि.)	कैफियत
स.			
१			
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२.५ दूध उत्पादन किसानले भैल्लु परेका मुख्य मुख्य समस्याहरु र समाधानका उपायहरु के के हुन् ?

समस्याहरु

समाधानहरु

२.६ दूध उत्पादन र डेरी विकासका लागि चाहिने बाह्य सहयोगहरु के के हुन् ?

क्र.स. सहयोगहरु

## धन्यवाद

## महत्वपूर्ण सूचनाकर्ताको अन्तर्वार्ता (Key Informant Interview)

नमस्कार ! म यस क्षेत्रमा दूध उत्पादन र संकलन क्षेत्रको पहिचान सम्बन्धि अध्ययनको लागि लक्षित समुह छलफल गर्न गैरहेको छु । यो अध्ययन राष्ट्रिय दूध विकास बोर्डको सहयोगमा अधिकारका लागि पहुँच नेपालले गर्न लागि रहेको छ । यस अध्ययनबाट यस क्षेत्रमा सरोकारवाला निकायहरुलाई दूध ब्यवसायको रणनीतिक प्रबर्द्धन गर्न सहयोग पुग्दछ । अब म केहि प्रश्नहरु तपाईंहरुसँग सोध्नेछु । यसबाट प्राप्त सूचना अध्ययनको नतिजा हाँसिल गर्न मात्र प्रयोग हुनेछ । तपाईंहरुले दिनुभएको सुचनाको गोप्य राख्ने छौं । तसर्थ, सहि जवाफ दिएर अध्ययनलाई सफल पारिदिनुहोला ।

<b>१. क्षेत्रगत जानकारी</b>		
१.१ राजमार्ग :	(मध्यपहाडी १ , हुलाकी २)	
१.२ बजारकेन्द्र :	(चौध वटा केन्द्रबाट एउटा छान्नुहोस्) <sup>३</sup>	
१.३ जिल्ला :	१.४ प्रदेश :	
१.५ हालको न.पा./गाउँपालिका :		वडा नं.
१.६ साविक : ना.पा./गा.वि.स.		वडा नं.
१.७ जि.पि.एस. विन्दु :		
१.८ अन्तर्वार्ता लिनेको नाम:	हस्ताक्षर	
१.९ अन्तर्वार्ताको मिति:		
<b>२. सूचनाकर्ताको विवरण</b>		
२.१ नाम :	२.२ पद :	२.३ लिङ्ग :
२.४ संस्था :	२.५ शिक्षा :	
२.५ यस क्षेत्रका बसोबास गर्नुभएको कति वर्ष भयो ? :		
<b>३. अन्य प्रश्नावली</b>		

३.१ यहाँ विद्यमान दूध उत्पादन पकेट क्षेत्रहरु कुन कुन हुन् ?(जिल्लामा नपर्ने)

क्र.स.	क्षेत्रको नाम / ठेगाना	दैनिक दूध संकलन हुन सक्ने सम्भावित लि.	दूध उत्पादक कृषक संख्या	संकलन केन्द्र छ?
१				
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३.२ यस जिल्ला/क्षेत्रमा पशुपालन सम्बन्धि अनुमानित जानकारी दिनुहोस् ? (जिल्लामा प्रतिवेदन)

क्र.स.	विवरण
१	दूध उत्पादनमा संलग्न घरधुरी संख्या
२	दूध उत्पादनमा संलग्न मुख्य जातजाती

<sup>३</sup> १. महालक्ष्मी नपा (पाचथर), २. खुर्कोट (सिन्धुली), ३. त्रीशुली (नुवाकोट), ४. वुर्तिवाड (वाग्लुङ), ५. वेसिशहर (लम्जुङ), ६. राकम (दैलेख), ७. पाटन (वैतडी), ८. गौरीगञ्ज (झापा), ९. रंगोली (मोरङ), १०. गढिमाई (वारा), ११. माँडि (चितवन), १२. बर्दघाट (नवलपरासी), १३. राजापुर (बर्दिया) र १४. बेलौरी (कञ्चनपुर)

३	दूध उत्पादन (लि.)			
४	गाइको संख्या	लोकल	क्रस	जर्सी
५	भैसीको संख्या	लोकल		क्रस

३.३ त्यस क्षेत्रमा दूध संकलन केन्द्र स्थापना गर्न संभावित ठाउँहरु कुन कुन हुन सक्दछन् ?

क्षेत्र	दैनिक दूध संकलन हुन सक्ने लि.	दूध समेट्न सक्ने पकेट क्षेत्रहरु	चुनौतिहरु के के छन् ?
१.			
२.			
३.			

३.४ माथिका स्थानहरु मध्येमा पनि चिस्यान केन्द्र बनाउनका लागि उपयुक्त स्थान कुन हो ?

ठाउँको नाम	समेट्न सक्ने क्षेत्र र दुरीहरु	संकलन हुन सक्ने दूध (लि.)	आवश्यक साधन श्रोतहरु के के हुन् ?	चुनौतिहरु के के छन् ?
१.				
२.				

३.६ यस क्षेत्रमा दूध उत्पादन सहकारी छ ? यदि छ भने यिनिहरुको जानकारी दिनुहोस् ? (प्रतिवेदन)

क्र.स.	सहकारीको नाम	ठेगाना	सम्पर्क
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३.७ दूध उत्पादनका लागि आवश्यक पुर्वाधारको अवस्था कस्तो छ ? (✓ चिन्ह लगाउने)

क्र.स.	विवरण	पर्याप्त	ठिकै	कमजोर	अझै राम्रो बनाउन के गर्नुपर्ला ?
१	हरियो घाँस / स्याउला				
२	परास / छत्राली				
३	दाना / चोकर				
४	भेटनरी सेवा				
५	प्रजनन सेवा				
६	विमा				
७	खानेपानी				
८	विजुली				
९	गोठ				
१०	जनशक्ति				
११	अन्य.....				

३.८ यस क्षेत्रमा निजि व्यवसायि, स्थानीयहरु दूध चिस्यान केन्द्र बनाउन उत्प्रेरित होलान् ? किन ?

✓ लगाउने कारण

छन्

छैनन्

३.९ यस क्षेत्रमा दूध उत्पादनका समस्याहरु र सिमाहरु के के होलान् ?

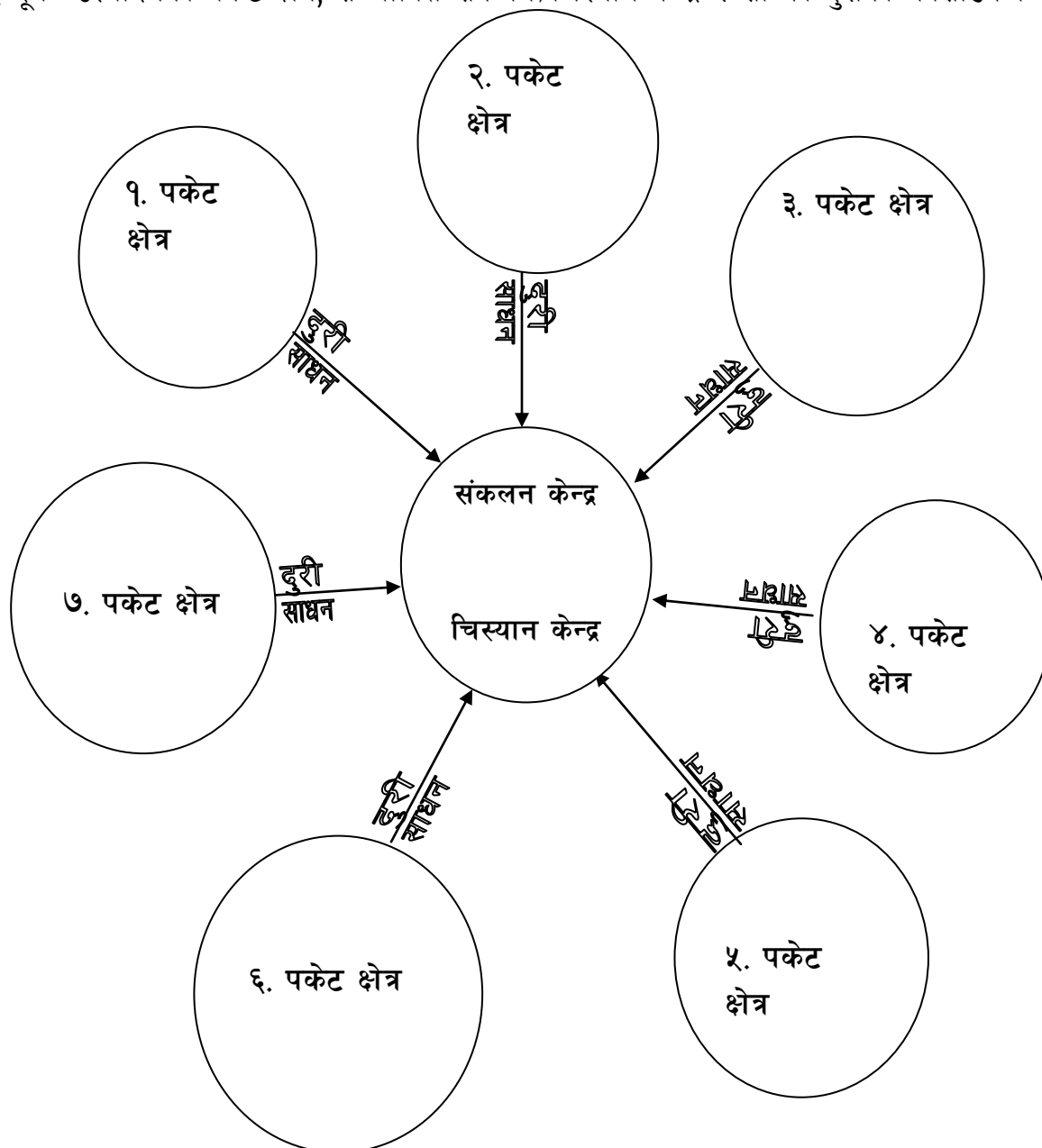
३.१० दूध उत्पादन, संकलन केन्द्र, दूध सहकारी, चिस्यान केन्द्र आदि वनाउनका लागि अनुदानहरुको अवस्था कस्तो छ ?

सरकारी अनुदान

निजी क्षेत्रको अनुदान

अन्य ऋण/व्याज सहयोगको अनुदान

३.११ दूध उत्पादनको पकेट क्षेत्र, सम्भावित संकलन/चिस्यान केन्द्र र सो को दुरीको नक्साडकन



## फिल्ड सर्भेक्षण निर्देशिका

### परिचय

नेपाल सरकार, राष्ट्रिय दूध विकास बोर्डको सहयोगमा अधिकारका लागि पहुँच नेपाल मार्फत मध्य पहाडी लोकमार्ग तथा हुलाकी राजमार्गमा पर्ने विभिन्न १४ वटा स्थानका विभिन्न नयाँ क्षेत्रहरूमा दूध संकलन तथा चिस्यान केन्द्रहरूको सम्भाव्यता अध्ययन गर्न लागिएको हो । सो का सिलसिलामा गर्न लागिएको सर्भेक्षणका आधारभूत मापदण्डहरूलाई पालना गरी सर्भेक्षणको गुणस्तरीयता तथा विश्वसनियतालाई कायम गर्दै स्थलगत सर्भेक्षणकर्ताहरूको कार्य सम्पादनमा सहजीकरण र एकरूपताका लागि यो निर्देशिका तयार पारिएको छ ।

### उद्देश्य

- सर्भेक्षणको आधारभूत मापदण्ड पालना गर्ने ।
- सर्भेक्षणको गुणस्तरीयता र विश्वासनियता कायम गर्ने ।
- स्थलगत सर्भेक्षणकर्ताहरूको कार्यलाई एकरूपता दिने ।
- सर्भेक्षणलाई प्रभावकारी अनुगमन गर्ने ।

### मापदण्डहरू

१. सम्झौता र तालिम: परिचालन गर्ने संस्था (अधिकारका लागि पहुँच नेपाल) र सम्बन्धित सर्भेक्षणकर्ताका विचमा द्विपक्षिय सम्झौता गरिनेछ र सर्भेक्षणकर्ताहरूलाई लक्षित गरि संस्था मार्फत एक दिने सर्भेक्षण तालिम संचालन गरिनेछ । सो तालिममा सम्पूर्ण सर्भेक्षणकर्ताहरूको अनिवार्य सहभागिता हुनुपर्नेछ ।

२. पूर्व तयारी: सर्भेक्षणकर्ताहरू स्थलगत सर्भेक्षणमा जानु पूर्व राष्ट्रिय दूध विकास बोर्ड र अधिकारका लागि पहुँच नेपाल मार्फत स्थलगत समन्वयका लागि पत्र लिनुपर्ने । चेक लिष्ट अनुसारका तयारीहरू पुरा गरी/✓ चिन्ह लगाई परियोजना व्यवस्थापक ९एचयवभअत :वलवनभच० संग रुजु गराउनु पर्नेछ ।

### चेक लिष्ट

क्र.स.	विवरण		तयारी भएको	तयारी नभएको
१	जाने स्थानको निर्धारण	नाम: ठेगाना		
२	सम्पर्क व्यक्ति:	नाम : पद : सम्पर्क :		
		नाम : पद : सम्पर्क :		
		नाम : पद : सम्पर्क :		
३	समन्वय	स्थलगत (फिल्ड) का व्यक्तिहरूसंग फोन सम्पर्क गरी समन्वय गर्ने र सर्भेक्षणको सम्भावित समय तालिका		

		र रुट निर्धारण गर्ने ।		
४	आवश्यकता अनुसारको प्रश्नावलीहरु तयारी	मुख्य सूचना दतासंगको अर्न्तवार्ता प्रश्नावली ६ प्रति लक्षित समुह छलफलको प्रश्नावली २ प्रति फार्म तथा घरधुरी सर्भेक्षण फारम ११० प्रति		
५	सुरक्षण	आवश्यक सम्पूर्ण कागजातहरुको सुरक्षित तवरले लैजाने र ल्याउने व्यवस्थापन गर्ने ।		

फारम भर्नेको नाम  
पद  
हस्ताक्षर  
मिति

रुजु गर्नेको नाम  
पद  
हस्ताक्षर  
मिति

### ३. स्थलगत कार्यहरु

३.१. सम्बन्धित जिल्ला पशुसेवा कार्यालय/पशुसेवा केन्द्र/गाउँपालिकाको कृषि तथा पशु विकास शाखामा अनिवार्य रुपमा समन्वय गरि पत्राचार गर्ने र कार्यालयले पत्र बुझेको छाप सहितको अफिस प्रति फिर्ता ल्याउने ।

३.२. सम्बन्धित क्षेत्रमा लामो समयदेखि पशु तथा दूध विकासको क्षेत्रमा कार्यरत मुख्य सूचनादाताहरूसंग अनुसूचि अनुसारको फारम/प्रश्नावलीमा आधारित भई अर्न्तवार्ता गर्ने ।

३.३. जिल्ला/क्षेत्र (स्थानीय बजार केन्द्र) लक्षित गरी अनुसूचि अनुसारको फारम/प्रश्नावलीमा आधारित भई लक्षित समुह छलफल (न्म) संचालन गर्ने । छलफलमा १० देखि १५ जना सम्म तपसिल अनुसारका दूध सरोकारवालाहरुलाई सहभागि गराउने ।

तपसिल

क. जिल्ला पशु कार्यालय/ गाउँपालिका/ पशु सेवा केन्द्रका प्रतिनिधि ।

ख. वडा/गाउँपालिका स्तरीय पशु सेवा प्राविधिकहरु ।

ग. केन्द्रीय दूध उत्पादक सहकारीका प्रतिनिधिहरु ।

घ. निजि डेरी उत्पादक संघ/निजि डेरीका प्रतिनिधिहरु

ङ. दूध उत्पादक अगुवा कृषकहरु

च. निजि क्षेत्रवाट संचालित भेटेनेरीयनहरु

छ. स्थानीय समाजसेवीहरु र आवश्यकता अनुसार अन्य

३.४. फार्म तथा घरधुरी सर्भेक्षण गर्दा लक्षित समुह छलफलवाट निर्धारण भए बमोजिम मध्य पहाडि लोकमार्ग तथा हुलाकी राजमार्गको ५ कि.मि. पेरीफेरी भित्र रही कम्तिमा पनि एक क्षेत्रवाट १०० जना दूध उत्पादक कृषकहरुको अनुसूचि अनुसारको फारममा सर्भेक्षण गर्नुपर्ने । यसरी सर्भेक्षण गर्दा एक टोलवाट ५ भन्दा बढि तथा एक वडामा २५ भन्दा बढि घरधुरी छनोट गर्न पाइने छैन । साथै, संगै जोडिएका घरहरुलाई लस्कुरै छनोट गर्न पाइने छैन । कम्तिमा ३ वा सो भन्दा बढि जोडिएका घरधुरीहरुवाट एकवटा मात्रै घर छनोट गर्ने । हाल दूध उत्पादन गरीरहेका कृषकहरुवाट मात्रै सर्भेक्षण गर्नुपर्नेछ ।

### ४. जिपिएस विन्दु

स्थलगत सर्भेक्षणको हरेक स्थानहरुको जिपिएस विन्दु अनिवार्यरुपमा पहिचान हुनुपर्नेछ । यसका लागि एन्ड्रोइड मोवाइल सेट मार्फत MAPS.ME एप्लीकेसन डाउनलोड गरी सो एप्स मार्फत जिपिएस विन्दुको पहिचान गरी सबै सर्भेक्षणफारमहरुमा जिपिएस विन्दु उल्लेख गरेको हुनुपर्ने ।

### ५. सहायक तथ्यांक संकलन

जिल्ला, नगरपालिका, गाउँपालिका, स्तरका सबै कार्यालयमा समन्वय गर्दा अनिवार्य सहायक तथ्यांक संकलन गर्नुपर्नेछ । त्यस्ता तथ्याडकहरूमा दूध तथा पशुपालन सम्बन्धि तथ्याडकहरू, जिल्ला प्रोफाइल, गाउँपालिका/न.पा./साविक गाविस प्रोफाइल, प्रकाशनहरू, डेरी सरोकारवालाहरूका प्रतिवेदन तथा प्रकाशनहरू, पशु प्राविधिक लगायत स्थानीय सरोकारवालाहरूको सम्पर्क नम्बरहरू संकलन गर्ने ।

#### ६. अनुगमन

स्थलगत सर्भेक्षणका क्रममा सर्भेक्षणकर्ताहरूले सम्पादन गरेको दैनिक क्रियाकलापहरूको सोहि दिनमा आयोजना व्यवस्थापकलाई जानकारी गराउनुपर्नेछ । स्थलगत रूपमा खटिएका सर्भेक्षणकर्ताहरूको दैनिक अनुगमन टिम लिडर, डेरी टेक्नोलोजिस्ट र आयोजना व्यवस्थाकले गर्नेछन् ।

#### ७. भ्रमण फाटवारी

सर्भेक्षणकर्ताहरूले कार्यालयबाट आफ्नो सामाग्रिहरू बुझिलिई फिल्डमा निस्किएर सम्पूर्ण कार्यसम्पादन गर्दासम्मको भ्रमणको फाटवारी अनुसूचि ५ मा अनुसारको फारम अनिवार्य भरि पेश गर्नुपर्नेछ ।

#### ८. प्रस्तुति

सर्भेक्षण कर्ताहरूले स्पष्ट संचार, सर्भेक्षणको प्रष्ट उदेश्य र आफ्नो परिचय दिने र नरम भएर उत्तरदाताहरूलाई सहज बतावरण बनाई सर्भेक्षण गर्ने ।

## Annex 7: Tables on results of farming households conducted in Middle Hill High way

**Table 1: Percentage distribution of respondents by family size**

Market centers	Total	Sex		Education			
		Male	Female	Illiterate	Literate	Up to 10 class	Above 10 class
1. Sukrabarae	102	77.4	22.6	7.8		81.3	10.7
2. Khurkot	105	48.5	51.5	30.5	5.7	46.7	17.1
3. Baireni	99	53.6	46.4	37.3	2.0	53.6	7.0
4. Burtibang	101	78.3	21.7	29.7	7.9	60.4	1.9
5. Besisahar	100	66.0	34.0	10.0	1.0	77.0	12.0
6. Rakam	95	70.6	29.4	9.4	1.0	84.2	5.2
7. Patan	99	86.9	13.1	1.0		68.7	30.3
Total	701	68.7	31.3	18.2	2.6	67.2	12.2

**Table 2: Percentage distribution of respondents by family size**

Market centers	Total	Categories of family size				
		<i>Upto 2</i>	<i>3-6</i>	<i>6-9</i>	<i>10 and above</i>	
1. Sukrabarae	102		2.9	62.8	30.3	3.9
2. Khurkot	105		2.9	42.9	46.7	7.7
3. Baireni	99		2.0	56.6	35.3	6.0
4. Burtibang	101		0.9	54.5	42.5	1.9
5. Besisahar	100		3.0	54.0	43.0	
6. Rakam	95		2.2	29.4	56.8	11.6
7. Patan	99			28.2	53.6	18.1
Total	701		2.0	47.1	44.0	6.9

**Table 3: Percentage distribution of respondents by land holding (Hectare)**

Market centers	Total	Categories of land holding (hectare)				
		<i>Upto 0.5</i>	<i>0.5-0.75</i>	<i>0.75-1.0</i>	<i>1.0 and above</i>	
1. Sukrabarae	102		23.6	23.6	16.7	36.2
2. Khurkot	105		74.3	17.1	5.7	2.9
3. Baireni	99		78.8	8.0	7.0	6.0
4. Burtibang	101		38.6	36.6	10.8	13.8
5. Besisahar	100		38.0	21.0	22.0	19.0
6. Rakam	95		79.0	11.6	8.4	1.0
7. Patan	99		45.4	15.1	22.2	17.1
Total	701		53.7	19.2	13.3	13.9

**Table 4: Percentage distribution of respondents by food sufficiency**

Market centers	Total	Food sufficient for: (months)				
		<i>Upto 3 months</i>	<i>3-6 months</i>	<i>6-9 months</i>	<i>Above 9 months</i>	
1. Sukrabarae	102		14.8	35.2	35.2	14.8
2. Khurkot	105		18.1	13.3	27.7	40.9
3. Baireni	99		5.0	8.0	34.3	52.6
4. Burtibang	101		4.9	17.8	66.4	10.8
5. Besisahar	100		4.0	6.0	35.0	55.0
6. Rakam	95		4.2	27.4	29.4	39.0
7. Patan	99		4.0	27.2	55.6	13.1
Total	701		8.0	19.3	40.5	32.3

**Table 5: Number of cows by type**

Market centers	Total	Average per household	Milking	Non-milking	Local	Cross	Jersey
1. Sukrabarae	178	1.75	123	55	13	101	64
2. Khurkot	86	0.82	43	43	58	3	25
3. Baireni	121	1.22	78	43	8	29	84
4. Burtibang	54	0.53	43	11	19	10	25
5. Besisahar	267	2.67	185	82	18	87	162
6. Rakam	20	0.21	13	7	20	0	0
7. Patan	195	1.97	105	90	189	6	0
Total	921	1.31	590	331	325	236	360

**Table 6: Number of buffalo by type**

Market centers	Total buffalos	Average per household	Number of		Number of	
			Milking buffalo	Non-milking buffalo	Local buffalo	Cross buffalo
1. Sukrabarae	45	0.44	31	14	13	32
2. Khurkot	111	1.06	59	52	95	16
3. Baireni	102	1.03	74	28	8	94
4. Burtibang	143	1.42	118	25	121	22
5. Besisahar	161	1.61	87	74	107	54
6. Rakam	162	1.71	101	61	160	2
7. Patan	164	1.66	88	76	162	2
Total	888	1.27	558	330	666	222

Status of loan or grant received by the farmers

**Table 7: Percentage distribution of respondents by financial use (loan/grant) to buy cows/buffalo**

Market centers	Total respondents	Number of respondents who have		Number of respondents who have	
		taken loan	not taken loan	received grant	not received grant
1. Sukrabarae	102	38.3	61.7	33.3	66.7
2. Khurkot	105	20.0	80.0	85.7	14.3
3. Baireni	99	19.1	80.9	5.2	94.8
4. Burtibang	101	8.9	91.1		100.0
5. Besisahar	100	9.0	91.0	44.4	55.6
6. Rakam	95	10.6	89.4	20.0	80.0
7. Patan	99	10.1	89.9	30.0	70.0
Total	701	16.6	83.4	35.0	65.0

**Table 8: Percentage distribution of respondents by amount of loan (Rs.) taken**

Market centers	Total Loan Disbursed	Minimum amount of loan	Maximum amount of loan	Average amount of loan per farmer	Average amount of loan per cow/buffalo
1. Sukrabarae	4,415,000	20,000	800,000	113,205	19,798
2. Khurkot	2,156,000	15,000	620,000	102,667	10,944
3. Baireni	1,328,000	3,000	200,000	69,895	5,955
4. Burtibang	1,700,000	50,000	500,000	188,889	8,629
5. Besisahar	7,000,000	100,000	2,000,000	777,778	16,355
6. Rakam	528,400	18,400	100,000	52,840	2,903
7. Patan	890,000	15,000	150,000	89,000	2,479
Total	18,017,400	3,000	2,000,000	153,995	9,960

**Table 9: Percentage distribution of respondents by sources of loan taken**

Market centers	Financial institutions				
	Banks	Savings/Credit Groups	Cooperatives	Personal (relatives/friends/ money lenders)	Others
1. Sukrabarae	28.3	15.3	56.4		28.3
2. Khurkot	14.3	28.5	38.1	19.1	14.3
3. Baireni	21.0		68.4	10.6	21.0
4. Burtibang	11.1	22.2	11.1	55.6	11.1
5. Besisahar	66.7	11.1	22.2		66.7
6. Rakam	30.0	10.0	50.0	10.0	30.0
7. Patan		10.0	90.0		
Total	23.9	14.6	51.2	10.3	23.9

**Table 10: Percentage distribution of respondents by capacity of sheds**

Market centers	Shed sufficient for				Total
	≤2 animals	3-5 animals	6-9 animals	> 9 animals	
1. Sukrabarae	31.3	52.9	10.7	4.9	102
2. Khurkot	21.9	54.3	18.1	5.7	105
3. Baireni	38.3	52.6	6.0	3.0	99
4. Burtibang	30.6	63.4	3.9	1.9	101
5. Besisahar	8.0	65.0	16.0	11.0	100
6. Rakam	34.8	52.6	12.6		95
7. Patan	9.0	47.4	41.4	2.0	99
Total	24.8	55.4	15.6	4.2	701

**Table 11: Percentage distribution of respondents by involvement of family and hired labor**

Market centers	Hired labor				Number of family members involved in livestock development			
	Yes	No	If yes		Total	Total	Minimum Per HH	Maximum Per HH
			Total number	Number per HH				
1. Sukrabarae	.9	99.1	2	2.00		348	0	9
2. Khurkot		100.0				378	1	11
3. Baireni	2.0	98.0	7	3.50		347	1	10
4. Burtibang		100.0				314	1	11
5. Besisahar	4.0	96.0	11	2.75		288	1	6
6. Rakam	1.0	99.0	1	1.00		385	1	11
7. Patan		100.0				440	2	11
Total	1.1	98.9	21	2.63		2500	0	11

**Table 12: Quantity of daily milk production, home consumption and sale (liter)**

Market Centers	Daily milk production (Liter) :			Home consumption (liter)	Sale (Liter)
	Cow milk	Buffalo milk	Total		
1. Sukrabarae	858.5	174.5	1033.0	188.5	844.5
2. Khurkot	140.0	226.5	366.5	114.5	252.0
3. Baireni	532.0	444.0	976.0	203.0	773.0
4. Burtibang	242.0	455.0	697.0	206.5	490.5
5. Besisahar	1095.0	334.0	1429.0	239.0	1190.0
6. Rakam	23.0	458.5	481.5	275.5	206.0
7. Patan	264.0	443.0	707.0	615.0	92.0
Total	3154.5	2535.5	5690.0	1842.0	3848.0

**Table 13: Percentage distribution of respondents by years of involvement in milk production**

Market centers	Years involved in milk production				Total
	Upto 1	2-5	6-9	Above 9	
1. Sukrabarae	8.8	11.7	10.7	68.7	102
2. Khurkot	8.5	14.3	5.7	71.5	105
3. Baireni	4.0	11.1	6.0	78.8	99
4. Burtibang	2.9	15.8	4.9	76.3	101
5. Besisahar	6.0	59.0	11.0	24.0	100
6. Rakam	2.2	11.6	4.2	82.2	95
7. Patan	26.2	3.0	16.1	54.6	99
Total	8.5	18.2	8.5	65.1	701

**Table 14: Percentage distribution of respondents by channels for selling milk**

Market centers	Channels to sell milk				Private dairy
	Home collection	Individual consumers (Households)	Restaurants /hotels in the market	Milk Cooperative(Dairy)	
1. Sukrabarae	0	0	2	79	1
2. Khurkot	1	8	18	48	4
3. Baireni	0	2	9	18	68
4. Burtibang	2	43	5	1	40
5. Besisahar	1	1	1	42	51
6. Rakam	18	6	30	0	0
7. Patan	2	2	10	1	0
Total	24	62	75	189	164

**Table 15: Percentage distribution of respondents by mode of transport and time to sell milk**

Market centers	Time required		Mode of transport			
	Less than an hour	1 hour & more	Walk	Bicycle	Vehicle (Motor bike / 4 wheelers)	Others
1. Sukrabarae	95.1	4.9	100.0			
2. Khurkot	65.8	34.2	92.5	3.8		3.8
3. Baireni	75.8	24.2	99.0			1.0
4. Burtibang	56.9	43.1	100.0			
5. Besisahar	83.3	16.7	91.7	5.3		3.2
6. Rakam	96.3	3.7	58.1			20.0 21.9
7. Patan	100.0		100.0			
Total	78.4	21.6	92.6	1.6		3.6 2.3

**Table 16: Selling price (per liter) of cow-milk and buffalo-milk**

Market centers	Selling price of Cow milk			Selling price of buffalo milk		
	Average (Rs./liter)	Minimum (Rs./liter)	Maximum (Rs./liter)	Average (Rs./liter)	Minimum (Rs./liter)	Maximum (Rs./liter)
1. Sukrabarae	50.00	50	50	50.18	50	60
2. Khurkot	51.20	50	80	52.66	50	80
3. Baireni	50.32	50	60	62.04	50	120
4. Burtibang	54.60	50	80	67.39	50	100
5. Besisahar	54.90	50	75	57.55	50	75
6. Rakam	50.36	50	70	59.82	50	80
7. Patan	51.33	50	70	51.33	50	70
Total	52.04	50	80	58.20	50	120

**Table 17: Percentage distribution of respondents by their preferred place to sell milk**

Market centers	Direct to consumers	Tea shop	Milk Cooperative	Private Dairy	Chilling center	Others
1. Sukrabarae	0.0	3.4	44.8	1.1	50.6	0.0
2. Khurkot	13.6	32.1	40.7	9.9	3.7	0.0
3. Baireni	21.4	20.4	32.0	26.2	0.0	0.0
4. Burtibang	20.5	1.3	34.0	16.7	27.6	0.0
5. Besisahar	0.0	1.0	80.2	15.6	3.1	0.0
6. Rakam	24.6	49.1	3.5	5.3	17.5	0.0
7. Patan	0.0	16.0	28.0	4.0	52.0	0.0
Total	12.5	14.1	39.8	13.0	20.5	0.0

**Table 18: Status of earnings (Rs.) from the sale of milk products**

Market centers	Amount earned from the sale of milk-products	
	Total (Rs.)	Average (Rs.)
1. Sukrabarae	47800	4780
2. Khurkot	69000	2875
3. Baireni	33000	3300
4. Burtibang	193500	3870
5. Besisahar	466000	5236
6. Rakam	809300	4422
7. Patan	47800	4780
Total	69000	2875

**Table 19: Percentage distribution of respondents on who determines the price of milk**

Market centers	Farmers	Cooperatives	Milk traders	Government
1. Sukrabarae	7.8	75.4	5.8	10.7
2. Khurkot	16.1	33.3	27.7	22.9
3. Baireni	4.0	9.0	61.7	25.2
4. Burtibang	51.5	12.8	32.6	2.9
5. Besisahar	2.0	45.0	52.0	1.0
6. Rakam	24.2	2.2	68.4	5.2
7. Patan	16.1	2.0	79.8	2.0
Total	17.4	26.2	46.3	10.2

**Table 20: Suitable locations suggested by respondents for collection centers and chilling centers**

Market centers	Collection centers	Chilling centers
	Milk collection potential (Liter)	Milk collection potential (Liter)
1. Sukrabarae	39345	77250
2. Khurkot	10420	19300
3. Baireni	66511	134800
4. Burtibang	0	
5. Besisahar	0	
6. Rakam	44409	111750
7. Patan	28535	78250
<b>Total</b>	<b>189220</b>	<b>421350</b>

Table 21: Percentage distribution of respondents who said that physical and institutional infrastructures were adequate/sufficient

Market centers	Physical and institutional infrastructures										
	Fodder	Straw/ Paral	Feed/ dana	Veterinary services	Inseminatio n/ Reproducti	Insurance	Drinking water	Electricity	Shed	Human resource	Others
1. Sukrabarae	6.8	4.9	4.9	4.9	5.8	3.9	8.8	18.7	1.9	1.9	0
2. Khurkot	10.5	13.3	2.9	12.3	7.7	1.9	24.7	49.5	6.7	8.5	0
3. Baireni	18.1	10.1	1.0	19.1	35.3	39.3	45.4	97.0	50.6	54.6	0
4. Burtibang	2.9	1.9	.9	0	0	0	1.9	1.9	0	0	0
5. Besisahar	42.0	18.0	7.0	3.0	2.0	3.0	4.0	6.0	4.0	0	0
6. Rakam	20.0	3.2	0	0	0	1.0	2.2	3.2	2.2	2.2	0
7. Patan	19.1		3.0	2.0		1.0		2.0	1.0	1.0	0
Total	17.0	7.5	2.8	5.9	7.3	7.1	12.5	25.7	9.5	9.7	0

Table 22: Percentage distribution of respondents who said that physical and institutional infrastructures were averagely good

Market centers	Physical and institutional infrastructures										
	Fodder	Straw/ Paral	Feed/ dana	Veterinary services	Insemination/ Reproduction services	Insurance	Drinking water	Electricity	Shed	Human resource	Others
1. Sukrabarae	58.8	45.1	49.1	49.1	30.3	51.9	59.8	70.6	62.8	64.8	
2. Khurkot	48.5	56.1	36.1	46.7	34.3	5.7	44.7	42.9	42.9	61.9	
3. Baireni	33.3	25.2	17.1	61.7	43.4	2.0	30.3	1.0	25.2	30.3	
4. Burtibang	24.7	8.9	30.6	64.4	59.5	.9	69.4	70.3	7.9	2.9	
5. Besisahar	47.0	69.0	86.0	96.0	93.0	47.0	69.0	89.0	48.0	38.0	
6. Rakam	41.0	77.8	1.0	12.6	8.4		47.4	8.4	36.8	63.2	
7. Patan	57.6	75.8	26.2	44.4	21.2	16.1	79.8	9.0	79.8	80.9	
Total	44.6	51.0	35.5	53.7	41.6	17.8	57.2	42.0	43.4	48.8	

Table 23: Percentage distribution of respondents who said that physical and institutional infrastructures were weak/poor

Market centers	Physical and institutional infrastructures										
	Fodder	Straw/ Paral	Feed/ dana	Veterinary services	Inseminati on/ Reproducti	Insurance	Drinking water	Electricity	Shed	Human resource	Others
1. Sukrabarae	34.3	50.0	46.1	46.1	63.8	44.2	31.3	10.7	35.2	33.3	
2. Khurkot	40.9	30.5	60.9	40.9	58.1	92.3	30.5	7.7	50.5	29.5	
3. Baireni	48.4	64.7	81.9	19.1	21.2	58.6	24.2	2.0	24.2	15.1	
4. Burtibang	72.3	89.2	68.4	35.6	40.5	99.1	28.7	27.7	92.1	97.1	
5. Besisahar	11.0	13.0	7.0	1.0	5.0	50.0	27.0	5.0	48.0	62.0	
6. Rakam	39.0	19.0	99.0	87.4	91.6	99.0	50.6	88.4	61.0	34.8	
7. Patan	23.2	24.2	70.8	53.6	78.8	82.9	20.2	88.9	19.1	18.1	
Total	38.6	41.6	61.7	40.3	51.1	75.1	30.2	32.3	47.3	41.5	

**Table 24: Main problems expressed by respondents encountered in milk production**

Market centers	Main problems expressed by respondents encountered in milk production						
	Lack of improved grass	No chilling center	No shed	No grant in loan interest	No training facility	No Improved cows/ buffalo	Others
1. Sukrabarae	20.6	11.7	13.8	24.6	11.7	11.7	5.8
2. Khurkot	56.1	10.5	5.7	7.7	3.9	10.5	5.7
3. Baireni	66.7	7.0	1.0	7.0	11.1	1.0	6.0
4. Burtibang	61.4	2.9	4.9	0	15.8	9.9	4.9
5. Besisahar	40.0	5.0	17.0	2.0	15.0	4.0	17.0
6. Rakam	65.2	13.6	8.4	0	1.0	4.2	7.4
7. Patan	82.9	5.0	9.0	2.0	1.0	0	0
Total	55.9	8.0	8.6	6.3	8.6	5.9	6.7

**Table 25: Percentage distribution of respondents on adequacy of supply of milk**

Market centers	Supply of milk is inadequate to meet demand	Supply of milk is adequate to meet demand
1. Sukrabarae	12.8	87.2
2. Khurkot	87.7	12.3
3. Baireni	49.4	50.6
4. Burtibang	94.1	5.9
5. Besisahar	99.0	1.0
6. Rakam	22.2	77.8
7. Patan	95.0	5.0
Total	66.1	33.9

**Table 26: Percentage distribution of respondents on suggestions to increase milk production**

Market centers	Training	Shed improvement	Feeding grass	Cross Cows/buff alo	Inseminati on service	Animal Insurance	Others
1. Sukrabarae	16.5	16.3	16.5	16.7	16.3	16.7	1.0
2. Khurkot	16.6	16.6	16.3	16.8	16.6	16.8	0.2
3. Baireni	16.7	11.5	18.4	25.2	12.8	13.4	2.0
4. Burtibang	16.7	16.7	16.7	16.7	16.7	16.7	0.0
5. Besisahar	16.5	16.7	16.7	16.7	16.5	16.7	0.2
6. Rakam	16.5	16.5	16.7	16.7	16.7	16.7	0.0
7. Patan	16.5	16.3	16.7	16.5	16.7	16.5	0.7
Total	16.6	16.1	16.7	17.4	16.3	16.4	0.5

## Annex 8: Tables on results of farming households conducted in Postal High Way

**Table 1: Percentage distribution of respondents by family size**

Market centers	Total	Sex		Education			
		Male	Female	Illiterate	Literate	Up to 10 class	Above 10 class
Gaurigunj	99	75.8	24.2	3.0		74.7	22.2
Rangeli	98	73.5	26.5	39.8		44.9	15.3
Kalaiya	100	79.0	21.0	43.0	2.0	47.0	8.0
Madi	100	52.0	48.0	22.0	10.0	50.0	18.0
Bardaghat	100	68.0	32.0	16.0	9.0	70.0	5.0
Rajapur	102	77.5	22.5	6.9		81.4	11.8
Belauri	100	59.0	41.0	9.0	1.0	80.0	10.0
Total	699	69.2	30.8	19.9	3.1	64.1	12.9

**Table 2: Percentage distribution of respondents by family size**

Market centers	Total	Categories of family size				
		<i>Upto 2</i>	<i>3-6</i>	<i>6-9</i>	<i>10 and above</i>	
Gaurigunj	99		3.0	59.6	33.3	4.0
Rangeli	98		2.0	50.0	46.9	1.0
Kalaiya	100			32.0	42.0	26.0
Madi	100		4.0	55.0	31.0	10.0
Bardaghat	100		1.0	59.0	36.0	4.0
Rajapur	102		3.9	59.8	32.4	3.9
Belauri	100		1.0	34.0	56.0	9.0
Total	699		2.1	49.9	39.6	8.3

**Table 3: Percentage distribution of respondents by land holding (Hectare)**

Market centers	Total	Categories of land holding (hectare)			
		<i>Upto 0.5</i>	<i>0.5-0.75</i>	<i>0.75-1.0</i>	<i>1.0 and above</i>
Gaurigunj	99	13.1	26.3	16.2	44.4
Rangeli	98	100.0			
Kalaiya	100	49.0	30.0	3.0	18.0
Madi	100	36.0	27.0	7.0	30.0
Bardaghat	100	52.0	39.0	3.0	6.0
Rajapur	102	43.1	32.4	7.8	16.7
Belauri	100	49.0	24.0		27.0
Total	699	48.8	25.6	5.3	20.3

**Table 4: Percentage distribution of respondents by food sufficiency**

Market centers	Total	Food sufficient for: (months)			
		<i>Upto 3 months</i>	<i>3-6 months</i>	<i>6-9 months</i>	<i>Above 9 months</i>
Gaurigunj	99	1.0		2.0	97.0
Rangeli	98	13.3		4.1	82.7
Kalaiya	100	8.0	14.0	24.0	54.0
Madi	100	3.0	2.0	12.0	83.0
Bardaghat	100	1.0	3.0	7.0	89.0
Rajapur	102	14.7	34.3	31.4	19.6
Belauri	100	1.0	4.0	10.0	85.0
Total	699	6.0	8.3	13.0	72.7

**Table 5: Number of cows by type**

Market centers	Total	Average per household	Milking	Non-milking	Local	Cross	Jersey
Gaurigunj	348	3.52	200	148	66	149	133
Rangeli	224	2.29	209	15	53	3	168
Kalaiya	91	.91	53	38	32	19	40
Madi	150	1.50	76	74	21	37	92
Bardaghat	354	3.54	235	119	17	80	257
Rajapur	193	1.89	135	58	11	104	78
Belauri	138	1.38	58	80	54	7	77
Total	1498	2.14	966	532	254	399	845

**Table 6: Number of buffalo by type**

Market centers	Total buffalos	Average per household	Number of		Number of	
			Milking buffalo	Non-milking buffalo	Local buffalo	Cross buffalo
Gaurigunj	38	.38	28	10	21	17
Rangeli	20	.20	18	2	20	0
Kalaiya	165	1.65	99	66	98	67
Madi	198	1.98	106	92	113	85
Bardaghat	125	1.25	69	56	73	52
Rajapur	45	.44	32	13	11	34
Belauri	186	1.86	114	72	136	50
Total	777	1.11	466	311	472	305

**Table 7: Percentage distribution of respondents by financial use (loan/grant) to buy cows/buffalo**

Market centers	Total respondents	Number of respondents who have		Number of respondents who have	
		taken loan	not taken loan	received grant	not received grant
Gaurigunj	99	35.4	64.6	17.1	82.9
Rangeli	98	8.2	91.8	62.5	37.5
Kalaiya	100	21.0	79.0		100.0
Madi	100	20.0	80.0	15.0	85.0
Bardaghat	100	34.0	66.0	8.8	91.2
Rajapur	102	40.2	59.8	31.7	68.3
Belauri	100	20.0	80.0	5.0	95.0
Total	699	25.6	74.4	17.3	82.7

**Table 8: Percentage distribution of respondents by amount of loan (Rs.) taken**

Market centers	Total Loan Disbursed	Minimum amount of loan	Maximum amount of loan	Average amount of loan per farmer	Average amount of loan per cow/buffalo
Gaurigunj	7,095,000	10,000	1,000,000	202,714	18,381
Rangeli	700,000	50,000	300,000	87,500	2,869
Kalaiya	1,600,000	5,000	250,000	76,190	6,250
Madi	4,275,000	20,000	1,500,000	213,750	12,284
Bardaghat	14,046,000	11,000	2,000,000	413,118	29,324
Rajapur	4,925,000	20,000	800,000	120,122	20,693
Belauri	4,580,000	20,000	1,200,000	229,000	14,136
Total	37,221,000	5,000	2,000,000	207,939	16,361

**Table 9: Percentage distribution of respondents by sources of loan taken**

Market centers	Financial institutions				
	Banks	Savings/Credit Groups	Cooperatives	Personal (relatives/friends/ money lenders)	Others
Gaurigunj	8.6	22.9	68.6		
Rangeli	87.5	12.5			
Kalaiya	38.1	14.3	33.3	14.3	
Madi	15.0	20.0	30.0	35.0	
Bardaghat	23.5		70.6	5.9	
Rajapur	31.7	17.1	51.2		
Belauri	35.0	15.0	45.0	5.0	
Total	27.4	14.5	50.8	7.3	

**Table 10: Percentage distribution of respondents by capacity of sheds**

Market centers	Shed sufficient for				
	Up to 2 animals	3-5 animals	6-9 animals	Above 9 animals	Total
Gaurigunj	8.1	40.4	23.2	28.3	99
Rangeli	6.1	63.3	24.5	6.1	98
Kalaiya	29.0	55.0	14.0	2.0	100
Madi	16.0	49.0	21.0	14.0	100
Bardaghat	12.0	51.0	13.0	24.0	100
Rajapur	29.4	53.9	11.8	4.9	102
Belauri	8.0	61.0	18.0	13.0	100
Total	15.6	53.4	17.9	13.2	699

**Table 11: Percentage distribution of respondents by involvement of family and hired labor**

Market centers	Hire labor				Number of family members involved in livestock development			
	Yes	No	If yes		Total	Total	Minimum Per HH	Maximum Per HH
			Total number	Number per HH				
Gaurigunj	6.1	93.9	9	1.50		366	2	10
Rangeli	5.1	94.9	5	1.00		381	1	8
Kalaiya		100.0	3	1.50		369	1	14
Madi	2.0	98.0	15	1.88		336	1	8
Bardaghat	8.0	92.0	2	2.00		323	1	11
Rajapur	1.0	99.0	5	2.50		351	0	9
Belauri	2.0	98.0	39	1.63		403	0	9
Total	3.4	96.6	9	1.50		2529	0	14

**Table 12: Quantity of daily milk production, home consumption and sale (liter)**

Market Centers	Daily milk production (Liter) :			Home consumption (liter)	Sale (Liter)
	Cow milk	Buffalo milk	Total		
Gaurigunj	1156.0	133.0	1289.0	210.5	1078.5
Rangeli	746.0	40.0	786.0	132.0	654.0
Kalaiya	318.0	609.0	927.0	167.0	760.0
Madi	581.5	571.0	1152.5	245.0	907.5
Bardaghat	1934.5	450.0	2384.5	214.0	2170.5
Rajapur	926.5	176.5	1103.0	188.5	914.5
Belauri	327.5	571.5	899.0	186.5	712.5
Total	5990.0	2551.0	8541.0	1343.5	7197.5

**Table 13: Percentage distribution of respondents by years of involvement in milk production**

Market centers	Years involved in milk production				Total
	Upto 1	2-5	6-9	Above 9	
Gaurigunj	23.2	13.1	5.1	58.6	99
Rangeli	1.0	10.2		88.8	98
Kalaiya	8.0	26.0	15.0	51.0	100
Madi	13.0	31.0	6.0	50.0	100
Bardaghat	4.0	29.0	15.0	52.0	100
Rajapur	8.8	11.8	11.8	67.6	102
Belauri	3.0	14.0	9.0	74.0	100
Total	8.7	19.3	8.9	63.1	699

**Table 14: Percentage distribution of respondents by channels for selling milk**

Market centers	Channels to sell milk				Private dairy
	Home collection	Individual consumers (Households)	Restaurants /hotels in the market	Milk Cooperative(Dairy)	
Gaurigunj	9	8	15	56	4
Rangeli	2	1	1	95	0
Kalaiya	16	12	9	42	21
Madi	7	2	10	45	31
Bardaghat	2	0	3	92	2
Rajapur	0	0	2	79	5
Belauri	41	16	4	25	6
Total	77	39	44	434	69

**Table 15: Percentage distribution of respondents by mode of transport and time to sell milk**

Market centers	Time required		Mode of transport			
	Less than an hour	1 hour & more	Walk	Bicycle	Vehicle Motor bike/ 4 wheelers)	Others
Gaurigunj	94.4	5.6	14.6	82.0		3.4
Rangeli	86.5	13.5	55.2	42.7	2.1	
Kalaiya	80.4	19.6	56.7	42.3	1.0	
Madi	96.8	3.2	87.4	9.5	2.1	1.1
Bardaghat	98.0	2.0	35.4	53.5	3.0	8.1
Rajapur	95.2	4.8	96.4	2.4		1.2
Belauri	98.9	1.1	34.4	10.8		54.8
Total	92.8	7.2	53.8	35.1	1.2	9.8

**Table 16: Selling price (per liter) of cow-milk and buffalo-milk**

Market centers	Selling price of Cow milk			Selling price of buffalo milk		
	Average (Rs./liter)	Minimum (Rs./liter)	Maximum (Rs./liter)	Average (Rs./liter)	Minimum (Rs./liter)	Maximum (Rs./liter)
Gaurigunj	50.00	50	50	50.56	50	60
Rangeli	50.10	50	60	50.00	50	50
Kalaiya	51.34	50	65	57.68	50	90
Madi	50.37	50	70	54.89	50	70
Bardaghat	50.15	50	65	54.24	50	75
Rajapur	50.00	50	50	50.24	50	60
Belauri	50.00	50	50	50.16	50	60
Total	50.29	50	70	52.63	50	90

**Table 17: Percentage distribution of respondents by their preferred place to sell milk**

Market centers	Direct to consumers	Tea shop	Milk Cooperative	Private Dairy	Chilling center	Others
Gaurigunj	3.1	3.1	1.0	5.2	87.5	0.0
Rangeli	54.6	12.4	32.0	1.0	0.0	0.0
Kalaiya	20.0	6.0	56.0	10.0	4.0	4.0
Madi	18.6	8.2	35.1	29.9	8.2	0.0
Bardaghat	22.2	8.1	65.7	3.0	1.0	0.0
Rajapur	0.0	3.4	46.1	4.5	46.1	0.0
Belauri	13.8	7.4	47.9	19.1	10.6	1.1
Total	19.2	7.0	40.6	10.4	22.0	0.7

**Table 18: Status of earnings (Rs.) from the sale of milk products**

Market centers	Amount earned from the sale of milk-products	
	Total (Rs.)	Average(Rs.)
Gaurigunj	6400	3200
Rangeli		
Kalaiya	1200	1200
Madi	1500	1500
Bardaghat		
Rajapur	3000	3000
Belauri	98400	3393
Total	110500	3250

**Table 19: Percentage distribution of respondents on who determines the price of milk**

Market centers	Farmers	Cooperatives	Milk traders	Government
Gaurigunj	15.2	62.6	16.2	6.1
Rangeli		13.3	34.7	52.0
Kalaiya	8.0	49.0	42.0	1.0
Madi	4.0	77.0	15.0	4.0
Bardaghat		99.0	1.0	
Rajapur	4.9	76.5	5.9	12.7
Belauri	8.0	16.0	65.0	11.0
Total	5.7	56.4	25.6	12.3

**Table 20: Suitable locations suggested by respondents for collection centers and chilling centers**

Market centers	Collection centers	Chilling centers
	Milk collection potential (Liter)	Milk collection potential (Liter)
Gaurigunj		
Rangeli		
Kalaiya	800	800
Madi		
Bardaghat		
Rajapur	37845	76100
Belauri		
Total	38645	76900

**Table 21: Percentage distribution of respondents who said that physical and institutional infrastructures were adequate/sufficient**

Market centers	Physical and institutional infrastructures										
	Fodder	Straw/ Paral	Feed/ dana	Veterinary services	Inseminatio n/ Reproducti	Insurance	Drinking water	Electricity	Shed	Human resource	Others
Gaurigunj	32.3	79.8	1.0	4.0	4.0	47.5	18.2	22.2	25.3	6.1	
Rangeli	3.1	40.8	41.8	1.0	1.0	9.2	49.0	45.9	8.2	7.1	
Kalaiya	78.0	88.0	79.0	62.0	62.0	17.0	83.0	85.0	51.0	96.0	
Madi	56.0	83.0	90.0	72.0	64.0	10.0	58.0	28.0	71.0	84.0	
Bardaghat	54.0	98.0	94.0	86.0	85.0	67.0	85.0	95.0	76.0	92.0	
Rajapur	5.9	4.9	3.9	3.9	4.9	3.9	8.8	19.6	2.9	2.0	
Belauri	27.0	23.0	2.0			1.0	24.0	44.0	23.0	12.0	
Total	36.6	59.5	44.5	32.8	31.6	22.2	46.5	48.5	36.8	42.8	

**Table 22: Percentage distribution of respondents who said that physical and institutional infrastructures were averagely good**

Market centers	Physical and institutional infrastructures										
	Fodder	Straw/ Paral	Feed/ dana	Veterinary services	Insemination/ Reproduction services	Insurance	Drinking water	Electricity	Shed	Human resource	Others
Gaurigunj	61.6	15.2	75.8	59.6	59.6	16.2	75.8	75.8	26.3	87.9	
Rangeli	86.7	59.2	56.1	87.8	88.8	71.4	50.0	54.1	88.8	84.7	
Kalaiya	19.0	12.0	18.0	19.0	25.0	11.0	14.0	7.0	29.0	2.0	
Madi	35.0	12.0	8.0	22.0	28.0	6.0	18.0	7.0	21.0	12.0	
Bardaghat	43.0	2.0	5.0	14.0	15.0	3.0	15.0	5.0	16.0	7.0	
Rajapur	59.8	49.0	49.0	47.1	31.4	50.0	60.8	69.6	60.8	65.7	
Belauri	64.0	64.0	47.0	34.0	39.0	18.0	65.0	53.0	63.0	82.0	
Total	52.6	30.5	36.9	40.3	40.8	25.0	42.6	38.8	43.5	48.6	

**Table 23: Percentage distribution of respondents who said that physical and institutional infrastructures were weak/poor**

Market centers	Physical and institutional infrastructures										
	Fodder	Straw/ Paral	Feed/ dana	Veterinary services	Inseminati on/ Reproducti	Insurance	Drinking water	Electricity	Shed	Human resource	Others
Gaurigunj	6.1	5.1	23.2	36.4	36.4	36.4	6.1	2.0	48.5	6.1	
Rangeli	10.2		2.0	11.2	10.2	19.4	1.0		3.1	8.2	
Kalaiya	3.0		3.0	19.0	13.0	72.0	3.0	8.0	20.0	2.0	
Madi	9.0	5.0	2.0	6.0	8.0	84.0	24.0	65.0	8.0	4.0	
Bardaghat	3.0		1.0			30.0			8.0	1.0	
Rajapur	34.3	46.1	47.1	49.0	63.7	46.1	30.4	10.8	36.3	32.4	
Belauri	9.0	13.0	51.0	66.0	61.0	81.0	11.0	3.0	14.0	6.0	
Total	10.7	10.0	18.6	26.9	27.6	52.8	10.9	12.7	19.7	8.6	

**Table 24: Main problems expressed by respondents encountered in milk production**

Market centers	Main problems expressed by respondents encountered in milk production						
	Lack of improved grass	No chilling center	No shed	No grant in loan interest	No training facility	No Improved cows/ buffalo	Others
Gaurigunj	3.0	4.0	43.4	7.1	7.1	5.1	30.3
Rangeli	40.8	4.1	36.7		1.0	5.1	12.2
Kalaiya	16.0	24.0	16.0	21.0	6.0	6.0	11.0
Madi	61.0	8.0	16.0	1.0	3.0	6.0	5.0
Bardaghat	58.0	13.0	20.0	4.0	1.0	4.0	
Rajapur	20.6	10.8	12.7	25.5	12.7	11.8	5.9
Belauri	34.0	1.0	30.0	1.0	7.0	12.0	15.0
Total	33.3	9.3	24.9	8.6	5.4	7.2	11.3

**Table 25: Percentage distribution of respondents on adequacy of supply of milk**

Market centers	Supply of milk is inadequate to meet demand	Supply of milk is adequate to meet demand
Gaurigunj	84.8	15.2
Rangeli		100.0
Kalaiya	81.0	19.0
Madi	43.0	57.0
Bardaghat	51.0	49.0
Rajapur	17.6	82.4
Belauri	3.0	97.0
Total	40.1	59.9

**Table 26: Percentage distribution of respondents on suggestions to increase milk production**

Market centers	Training	Shed improvement	Feeding grass	Cross Cows/buffalo	Insemination service	Animal Insurance	Others
Gaurigunj	17.4	16.5	16.5	16.9	18.4	14.4	0.0
Rangeli	16.7	16.7	16.7	16.7	16.7	16.7	0.0
Kalaiya	30.9	24.8	9.7	5.4	5.8	17.6	5.8
Madi	21.6	15.0	20.7	16.7	8.4	14.1	3.5
Bardaghat	36.4	14.2	16.7	5.6	5.6	11.1	10.5
Rajapur	16.5	16.3	16.5	16.7	16.3	16.7	1.0
Belauri	16.8	17.7	16.6	17.7	16.4	14.6	0.2
Total	19.6	17.3	16.2	15.2	14.6	15.5	1.6