

Analysis of Dairy Value Chain: The Case Study of Guma Gewog

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Abstract:- Milk Processing Unit in Khuruthang gain popularity and became profitable enterprise in just small period of time. The proper functioning of the farmers' group is the reason for the why the milk processing unit is successful at Khuruthang. The success is not based on one person but with the collection of all the people involved the path of dairy value chain: Input supplier, milk producer, milk collector, milk processor into different products, wholesaler and retailer sale outlet and consumers. The great leadership of the local leaders at the farmers' groups to the transporters hard work, which reaches the end to the Khuruthang to the processing Units' loyal workers. Though there were many challenges at the establishment of the farmers' groups, the combined efforts of all the stakeholders have made it work at the end. For the objective 1, high value mapping was done and for objective 2, SWOT (Strength, Weakness, Opportunities and Threat) analysis was done.

Keywords:- Guma, Milk Processing Unit, SWOT, Value Chain Mapping,

I. INTRODUCTION

Milk Processing Unit of Punakha was officially launched on 1st December 2017 with three gewogs, namely: Guma Kabesa and Dzomi. There are 90 active members from four gewogs providing resources for the milk processing unit. The milk they collected per day is approximately near 300 liters. The first aim or goal of the milk processing unit initially was to sell fresh milk. Now they sell other products as well.

For the yogurt production 0.180 million was granted by Cottage and small industry through rural Industries Development scheme. Value chain mapping is important part of value chain analysis. It depicts the chain or flow of raw materials and inputs from source to production, processing, marketing and final consumer. It also demonstrate the costs, value costs, value addition at the each stage, challenges and influence of various stakeholder in value chain (Reddy, 2013). Value chain of commodities is important to for any economic development of country. It is also helpful understand interpersonal between producers processors, transporters and traders (UNDP, 2016). As per FAO (2000), dairy value chain is the chain through which milk and its product flow from farm to consumer. It is successful when the cooperatives groups have common goals (Sherpa, 2010).

According to Annual Guma gewog Livestock Census, 2020, most reared livestock are cattle (highest breed cattle-jersey, jersey-cross and nublang-thrabum) and poultry (improved layer).

Milk Processing Unit is salient element of food processing, where all kind of machinery used to process, store, pasteurize,

- 1.To determine value chain mapping that shows the chain actors and their function and inter relationships.
- 2.Identify the Strengths, Weaknesses, Opportunities and Threats of the existing value chain.

A. Problem statement

Pungzong Gonor Gakid Detshen Milk processing Unit was package and milk products for supply to consumers (Process Engineers and Associates, 2019). Important place for collecting processing and marketing dairy product. Even though Guma Gewog is the leading milk producer in Punakha dzongkhag. Still it falls short of dairy products and need to buy from Tsirang. The complete understanding of the existing milk processing unit functioning and gaps are not known. Additional, what part of dairy processing unit is doing well, lacking part is not address, pointing risk and what the possible ways of making it more successful is essential.

II. RESEARCH DESIGN AND METHODOLOGY

A. Study area

Study was conducted in Guma gewog under Punakha dzongkhag. The catchment area of Punakha milk processing unit are Guma, Dzomi, Toedwang and Kabesa. Out of four gewogs, Guma is the highest milk producer.

In Punakha dzongkhag there are five milk cooperatives groups (2 groups in Kabesa, 1 in Guma, 1 in Dzomi and 1 in Toedwang). Whereas, Guma gewog is the highest milk producer among four gewogs. Guma gewog is one of the 11 gewogs under Punakha dzongkhag. It stretches over an area of 37 sq.km with an altitude ranging from 1,200-2,200 meters above sea level. It has 950 acres of wetland, 1500 acres of dry land and 54km of irrigational channel in total. There are five chiwogs in Guma gewog namely Guma-Wolokha, Dochu-Ritsha, Changyul-Thara, Lhakhu Phaduna and Phulingsum. Out of all the gewogs, Guma gewog is nearest to the dzongkhag head quarter that is 2 km away from it.

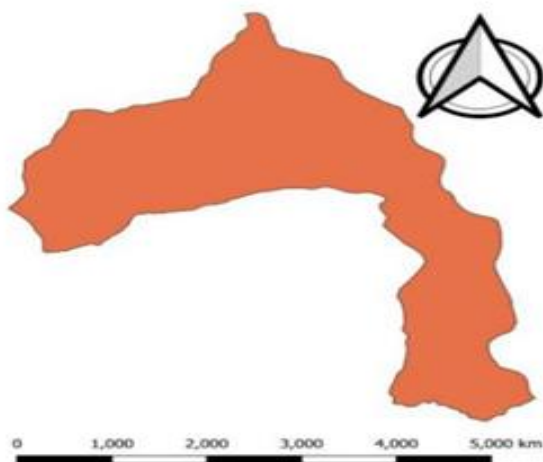


Fig 1: Study site (Guma gewog)

B. Sample size and sampling

The study sites and respondents were selected on the based purposive sampling for unbiased representation. Therefore, respondents are taken from each chain such as producer (farmer), processor, wholesale outlet and retail shop.

➤ *Respondents in the input supplier*

Guma gewog livestock In-charge who practices veterinary medication and socio-economic development project for dairy farmers in gewog was interviewed.

➤ *Respondent in farmers*

III. RESULTS AND DISCUSSION

A. Value chain mapping that shows the chain actors and their functions & inter relationships.

➤ *Input supplier*

Punakha Dzongkhag veterinary hospital for providing essential materials for cattle at subsidized price such as calf or adult cattle, cement, corrugated galvanized iron (CGI) and other medical assistance. 40% of cattle’s price is provided by government and cattle feed such as maize and oat seed are also provided. Gewog veterinary officials assist farmers availing loan with low interest from department of Cottage and Small Industries (CSI). They also help in getting land on lease. Dzongkhag livestock has procured all the equipment necessary for milk processing unit and handed over to farmer’s group. Medical assistance is provided to the local people as per the need.

For yogurt production, rural industries development scheme CSI granted 0.180 million. The people participating are trained for three days and well taught

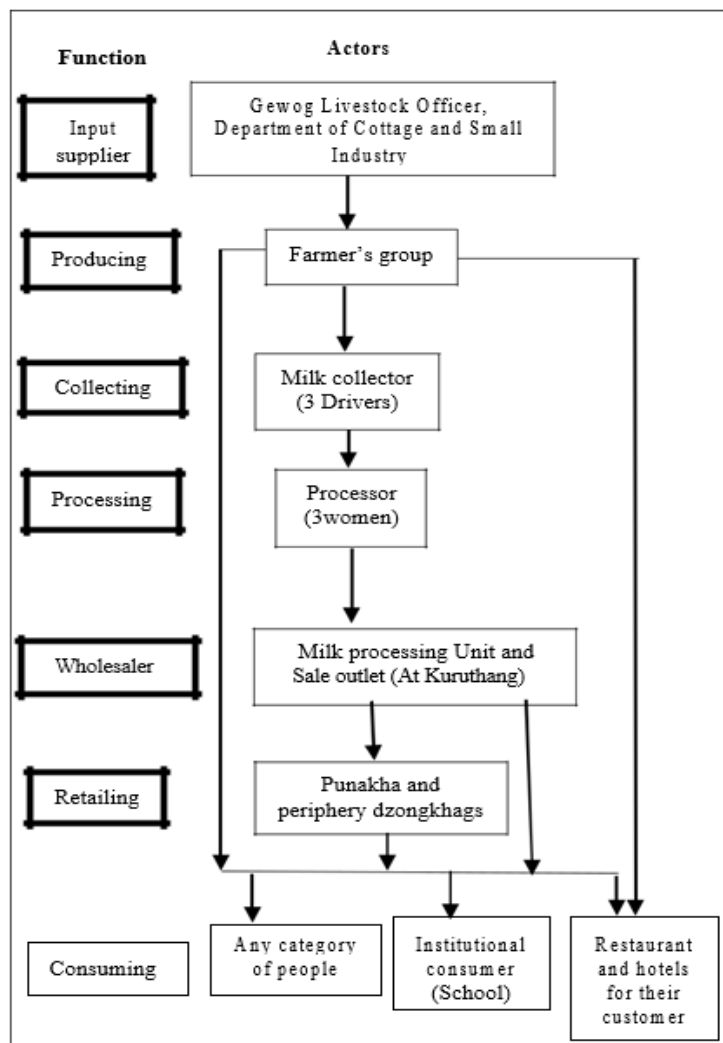


Fig 2: Milk chain map of Guma Gewog

Using Yamane formula, sample size is calculated from 129 active milk producers from Guma gewog and were interviewed with open type question:

$$n = \frac{N}{1+N(e)^2} \quad (1)$$

Table I:- Sample size for interview from milk producer.

Sl.no	Chiwog	Household	Sample size
1	Guma-Wolakha	22	21
2	Changyul-Thara	59	51
3	Phulingsum	6	6
4	Docho-rigtsa	11	11
5	Lhakhu	31	29
	Total	129	118

Note: Sample size calculated from milk producers.

Respondents from milk bulking, processing and marketing activities processor. Under this category, three drivers and three women from processing unit were interviewed.

C. Data collection

The data were collected in February 2021 by personal interview using open based questionnaire and on observation. For the objective 1, high value mapping was done and for objective 2, SWOT analysis was done.

➤ *Farmer’s group*

population of milch decreases from Dochula, phulingsum, Changyul and Wolakha. In the gewog there are 129 jersey cross, 7 jatsham, 6 Yankum, 1 Doethram and 27 Thrabum.

The establishment did not go easy. They were not supported by the Gewog officials in the beginning and no one wanted to invest in the idea. They were not supported by the Gewog officials in the beginning and no one wanted to invest in the idea. However, after discussing the particular issue in Bhutanese Local TV channel (Bhutan Broadcasting Service), where the person behind the idea of MPU shared the challenges of lack of support he faced, the people changed their views and started helping him.

Out of five chiwogs, Changyul produces highest milk (60,600 liters). Then, milk production decreases with Dochu-Ritsa (31,449 liters), Guma- Wolakha (27,582 liters) and Phulingsum produces as lowest (14,127 liters).

➤ *Milk bulking*

Milk is collected every morning from five chiwogs and transported to the milk processing unit in Kuruthang. There are 90 active members from four Gewogs providing resources for the milk processing unit. Daily milk collection from Guma Gewog is 3,000 liters in maximum and 1,500 liters in minimum. During pandemic milk supply was decreased drastically to 20 liters.

Whereas, three drivers are employed to collect milk. Whereby farmers hire vehicle for milk collection. They are responsible for controlling milk quality, record for daily deposit of milk, measuring and receiving from registered member of Gewog. The transportation was initially started by a lady driver who incurred many losses on her side but looked at the brighter side and worked hard.

The sales mostly rely on the transporters as they are the one who check quality of the milk when buying from the farmers’ groups. It is the responsibility of the transporters to check the quality of the milk. The resource contributors are paid on 5th day of every month.

Total milk produced by farmers of Guma Gewog is 158,335 liters. Whereas, 316,670 liters of milk is used for household consumption and 30,744 liters is sold to local people by themselves. At the end only 101,929 liters of milk is collected by milk collecting van for further processing and produce other products.

There is a record system to keep the count of the milk transporters so as to avoid confusion unit. The record keeping book that is with the farmers and transporters are tallied at the production unit. The MPU does not have any official positions given to them as such. They do have roles to fulfil at the center and they do that earnestly.

Milch Population in Gewog

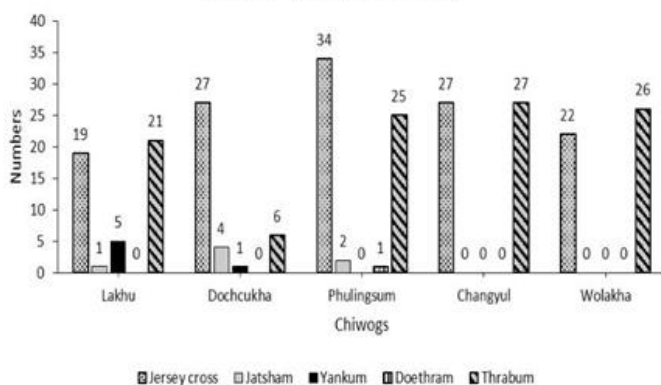


Fig 3: Different breed of cattle in 5 chiwogs of Guma gewog

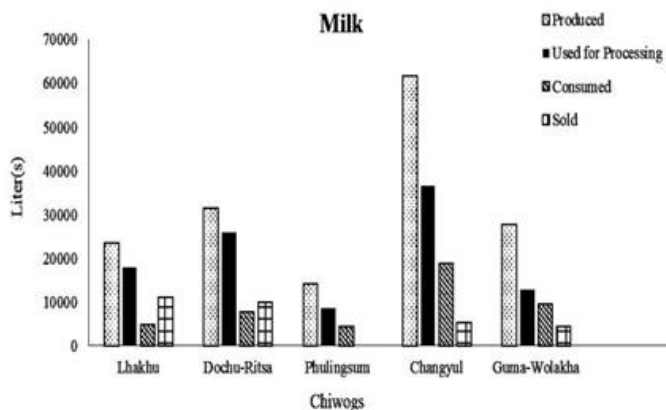


Fig 4: Milk produced, used for processing, consumption and sold (in liters) in 5 chiwogs

The farmer’s group were formed with few goals like to provide employment opportunity for youths, to become self-sufficient by working, to serve the government in some way and to help the poor section of the people.

From this short study it was known that there only 129 active farmers who are rearing different breeds of cattle and produce milk to be processed in milk processing unit (MPU) (Regional Livestock Department Center, 2019). On the cooperative decision, the functioning of MPU is given to particular person on the contract for the period of one year. Daily milk collection record is kept by farmers and MPU. As per the Livestock In-charge of Guma gewog, Lakhlu is the highest milch rarer among five chiwogs. Subsequently, total

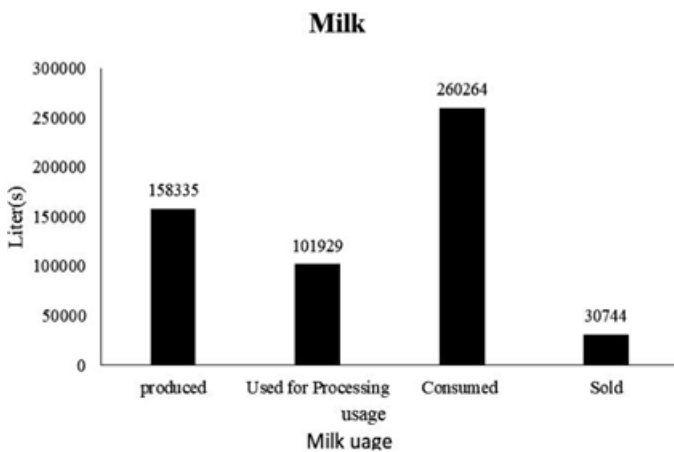


Fig 5: Comparison of milk in quality

➤ Processing and marketing

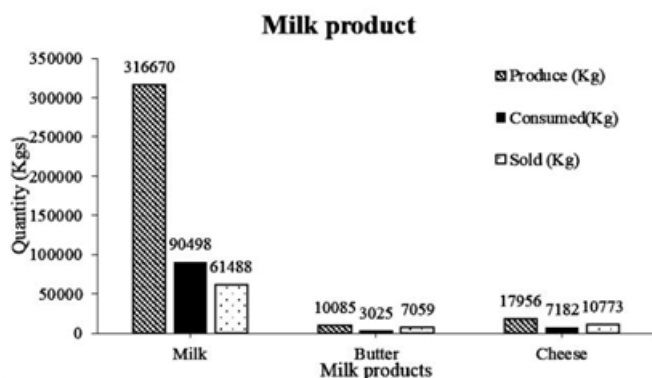


Fig 6: Various milk products

Milk processing unit in Kuruthang is known as Pungzong Gonor Gakid Detshen. MPU is given for contract by the farmer’s group for the period of one year and after that interest person can apply for contract or renew it again. As it is mentioned earlier, 158,335 liters of milk from farmers are collected and delivered in Kuruthang MPU for producing other dairy products in the 2020. There are 7 people employed in processing unit.

During COVID-19 pandemic, the milk collected from Gewog was not sufficient for supplying dairy products. During such those period MPU bought butter and cheese from Darachhu (Tsirang) to fulfill insufficiency.

Before milk is processed, it is tested using lactometer and digital milk tester. Processing unit has equipment such as cream separator, butter churner and refrigerator.

MPU initially was to sell fresh milk. Now they sell other products as well. The products they produce includes curd, milk, butter, cheese and yogurt, among which yogurt is the most profitable to them. Fresh milk and curd are sold in Kuruthang itself. However yogurt is sold to far places such as Thimphu, Gasa and Phobjikha.

➤ Wholesale and Retail

Dairy product outlet is attached with MPU in Kuruthang. Various retails shop avail the whole sale outlet and sell in their locality. As per the worker in MPU, their product is sold in almost all the periphery dzongkhags such as Punakh, Wangdue phodrang, Thimphu, Gasa, Tsirang and Dagana.

Table II Price of dairy products in dairy outlet (wholesale) and retail price

Products	Unit	Wholesale Price (Nu.)	Retail price (Nu.)
Milk	Liter	45	80
Cheese	Ball no.	50	70
Butter	Kg	450	500
Yogurt	Cup	25	40

Note. Comparison of price of milk and its product in sale outlet (wholesale) with retailer. Nu.is the money of Bhutan

Some of the products are directly supplied from MPU to mess of educational institution such as schools and college nearby.

B. Strength, Weakness, Opportunity and Threat of the existing value chains.

➤ Strength

- *Gewog Livestock Officer*
 - ✓ 0.043 Million has been allocated to development of feed and fodder for outsourced cattle in third consecutive year of 12th five year plan.
 - ✓ Demand of milk and other dairy products in society is high because of the eating habit of Bhutanese.
 - ✓ Usage of pasture land for cattle has been maintained and provide support by official.
 - ✓ They do a yearly review of the business where they invite representative from each group and transporters.
 - ✓ The financial institution are willing to support the dairy value chain program.
- *Milk Cooperative group*
 - ✓ Since most of the household head are women, hence they are active in dairy management (starting from rearing and caring and processing in MPU).
 - ✓ Farmer get Nu. 40 for one liters of milk and Nu.5 for transportation. In total, farmer’s account will be credited with Nu.45.
 - ✓ There are certain rules to follow for the proper working of the groups. The leaders of the groups are elected through voting system every two years and Mr. Dophu (MPU idea generator) works hard to make sure the groups keep working.

- *Milk bulking*
 - ✓ If milk collector own vehicle, then they will receive Nu.5 per liter of milk collection.
 - ✓ Milk collectors keep records of milk generation.
- *Processing and marketing*
 - ✓ Only fresh milk are collected for further processing.
 - ✓ Presence of no adulteration.
 - ✓ Before processing quality of milk is checked.
- *Weakness*
- *Input supplier*
 - ✓ Inadequate budget for enhancing the other activities which indirectly affect milk production.
- Milk cooperative group
 - ✓ Difficult to leave old ways of dairy farming and adopt new technology.
 - ✓ Farmers leave dairy farming if they see more profit in other business.
 - ✓ Most farmers are illiterate, makes then difficult to understand new technology.
 - ✓ Farmers are rearing highly produced milking cows.
 - ✓ The farmers' groups are paid on 5th day of every a month. There used to be a group payment system but that did not work well and they suffered a loss of Nu. 60 to Nu.70, 000.
 - ✓ Cattle cannot be raised in large numbers as it is hard to look after due to their topography. Most of the cattle fall down and injure themselves as the herder is not able to look after the large numbers of cattle.
 - ✓ Farmers sells only morning milk, this effects in production (in terms of quantity)
- Milking bulking, processing and marketing
 - ✓ Quality of milk send for processing is comparatively less than consumption.
 - ✓ No laboratory and milk quality measurement facility.
 - ✓ Butter and cheese are sold most during winter seasons as they stay fresh.
 - ✓ Since, it is small unit, there are not many complicated machineries used.
- *Opportunities*
- *Input supplier*
 - ✓ Livestock personal can target educated youths, so they have smooth adaptation in new technology.
 - ✓ After COVID-19, Bhutan have started to support more numbers of entrepreneurs regarding all resources such as breed of cows, money and materials.
- Milk cooperative group
 - ✓ Farmers having limited amount of land can start dairy business and earn money.
 - ✓ Farmers can started to sell milk produced in evening if it is produced in excess.
- Milk bulking, processing and marketing
 - ✓ Livestock department and other stakeholders are trying to increase the capacity of MPU.
 - ✓ MPU are also planning to process huge amount of milk at a time.
 - ✓ There is opportunity to expand the types of dairy products other than milk, butter, cheese and yogurt.
- ✓ MPU can think of value addition and diversifying flavors of milk products.
- Consumer
 - ✓ Increasing customer demands for dairy products making it profitable and sustainable business.
- *Threat*
- Input supplier
 - ✓ High cost of maize and oat seed as feed for the cows.
 - ✓ Frequent outbreak of diseases within cattle affects dairy farmers.
- Milk cooperative group
 - ✓ Illiterate people handling the medicine would be risky.
 - c.Milk bulking, processing and marketing
 - ✓ Lack of proper packaging and ways of conserving of dairy products for longer duration could risk the health of people.

IV. CONCLUSION

Today, the formation of this milk collection group has benefited the community and the farmers to a great extent. The farmers are supplied with cattle and raw materials necessary to build cattle shed. Through selling of milk, they are able to pay off their loan and able to bring development in the community.

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