

Impact of COVID-19 on the Recession of Large-scale Dairy Farms of Cox's Bazar Sadar Upazilla



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Impact of COVID-19 on the Recession of Large-scale Dairy Farms of Cox's Bazar Sadar Upazilla



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List of Acronyms

Abbreviation and symbol	Elaboration
BDT	Bangladeshi Taka
COVID-19	Corona Virus Disease 2019
CVASU	Chattogram Veterinary and Animal Sciences University
DLS	Department of Livestock Service
Dr	Doctor
DVM	Doctor of veterinary Medicine
Etc.	Et cetera
et al.	et alia (and others)
GDP	Gross Domestic Product
Govt.	Government
SARS	Severe Acute Respiratory Syndrome
Tk	Taka
ULO	Upazila Livestock Officer
UVH	Upazila_Veterinary_Hospital
SSC	Senior School Certificate
HSC	Higher Secondary Certificate
SAQTVH	S. A.Quadery Teaching Veterinary Hospital
TTPHRC Centre	Teaching and Training Pet Hospital and Research Centre
ACDI/VOCA International/Volunteers in Overseas	Agricultural Cooperative Development Cooperative Assistance
RV & F	Remount Veterinary & Farm

Abstract

The effect of COVID19 has been very harsh on approximately every sector of our country. Around 0.3 million of dairy farms have experienced the ill fate accompanied with the situation. This survey was conducted to estimate the economic loss of the farmers of Cox'sBazar Sadar Upazilla during the lockdown and analyze the probable causes for the loss. 14 farms within the stated area were selected randomly having more than 10 dairy cattle for the survey amongst 86 registered farms within the area. The data of five years were recorded including the COVID period.

The average milk production per day was 1280 in the farms, in 2022 the amount has been decreased to 951 liter per day (table 3). The farmstock has been also decreased from 433 (in 2018) to 95 (in 2022) (table 4). The study shows the changes in the recurrent cost for concentrate feed, roughage source, medication and labor which might or might not be affected by pandemic situation. The average cost for concentrate source was 205035.282 BDT in the year of 2018, but the cost increased to 222089.74 taka in the year 2020 and the cost is 323766.9 taka at present. Changes in the medication cost was 25.75 % increase in the year 2020 while it decreased 10.38% in 2021. Labor cost increased above 18% in the year of 2020 due to unavailability of manpower.

This study also presents the causes behind poor marketing of local farms and causes behind unsold milk, the need of versatile dairy products generation and properly trained personnel in farms for that.

Keywords: COVID-19, Dairy farms, large-scale, economy

Chapter 1: Introduction

1.1 Background of the study

Outbreak of a disease globally, referred as a pandemic, has had impact on every aspect of the existence of the mankind every time. Earth dwellers have gone through many of such pandemics which affected their life by killing millions, crushing their socio-economic policy, and damaging mental health of people. From 2019 the socio-economic scenario of people's life, around the world have been affected by novel Corona Virus Disease 2019 or COVID – 19 which is caused by Severe Acute Respiratory Syndrome Corona Virus – 2 or SARS-CoV-2. There was a less pernicious outbreak of SARS in 2003 (1). The first infection was reported in Wuhan city, People's Republic of China on November 17, 2019, and in no time spread across the world like wildfire. World Health Organization declared COVID-19 international public health emergency on March 11, 2020 (2). Over 10 million people around the globe had been infected with COVID-19 and more than 5,00,000 died by 1st July 2020 (2).

As well as health sector COVID-19 has affected every other sector deeply. The Agriculture Economy has had a wide impact due to COVID crisis. Economic condition of many countries came to a standstill or worse, dropped due to the lock down imposed on countries. About 37.75% of workforces of Bangladesh are involved in Agriculture and the GDP from agriculture was 12.65% of total GDP of Bangladesh during 2020 (World Bank 2021; O'Neil, 2021). In Bangladesh, cows are the main source of milk. About 90% of the produced milk in the country comes from cows, 8% from goat, and the remaining 2% from buffalo (DLS2013). 0.3 million dairy plants, 65-30 thousand poultry farms in Bangladesh were overturned due to COVID crisis (3).

Dairy farmers in America estimate that farmers nationwide were dumping nearly four million gallons of milk each day (1). In Nepal, dairy product of worth NPR 2 billion had been damaged and dairy product in stock of worth NPR 5 billion seems on the verge of deterioration (2). In Bangladesh, 350,000 dairy farmers were struggling to make ends meet because of the country's lockdown following the coronavirus outbreak, which had severely

disrupted their businesses. The shutdown has left them staring at huge financial losses with around 27,000 tons of milk going unsold each day, which the farmers can't afford to throw away. In some areas, the price of milk is cheaper than water while farmers are also finding it hard to procure cattle feed. (3)

In addition to decreasing the revenue of dairy producers, COVID-19's effects have also resulted in losses for dairy cooperatives. Each farmer experienced the impact to a different degree. A thorough scientific study is needed at the elementary level to address the difficulty in determining the impact of the COVID-19 pandemic. Therefore, the goal of the current study was to evaluate how the COVID-19 pandemic will affect dairy farmers' bottom lines. This survey sought to understand the difficulties the large-scale dairy farms of Cox's Bazar Sadar Upazilla faced. It also aimed to suggest potential solutions for boosting dairy farming and the dairy sector's resilience to such pandemics and other market shocks.

1.2 Justification of the study:

Dairy sector plays a presiding role in nation's economy by generating nutrition, employment, and income. Milk and meat from livestock sector particularly keeping the protein demand of the growing population in check. Because dairy farming has been recognized as one of the activities targeted at reducing poverty and unemployment, it is well known to improve the sustainable livelihood of farmers even in drought-prone areas.

The study includes only large-scale farms, having more than 10 dairy cattle, as sample. As most of the large-scale dairy farms market milk on a wholesale basis, unavailability of market can affect the economy of the farms more abruptly than the small-scale ones. All the procedures that link agricultural production to the final consumer have been impacted by COVID-19. Additionally, it appears to affect the food value chain and the food production system. Agriculture produces are mostly perishable in nature, so farmer is compelled to store their unsold produce for longer period which leads to reduction in food quality as well as increase in cost of production. The supply of milk and dairy product has been hit hardest by COVID-19. Dairy farmers are compelled to dump milk and milk product after remarkable decrease in supply of milk (7)

Cox's Bazar district on coastal region of Bangladesh. Being one of the major tourist areas not only for Bangladesh but for the whole world, lockdown effected the economy of the city greatly. Just like all other tourist spots tourism in Cox's Bazar was shut down for months increasing unsold milk as the supply chain was broke due to strict lock down.

This study aims to review the financial loss of the large-scale dairy farmers of the particular area of Cox's Bazar Sadar Upazilla.

1.3 Objectives of the study

1. To evaluate the economic impact of COVID-19 on large scale farms within Cox's bazar Sadar Upazilla.
2. To evaluate the effect of transportation and communication on wholesale and retail market of milk and Dairy products in Cox's bazar Sadar upazilla

Chapter 2: Materials and Methods

2.1 Study area:

The study was conducted to evaluate the impact of COVID-19 on the economic condition of large-scale dairy farms. For the study, the selected area was Cox's Bazar Sadar Upazilla, most prominent urban municipality of Cox's Bazar District in Bangladesh. Cox's Bazar Sadar Upazilla holds a population of 459082 (both urban and rural) within the area of 228.23 square kilometers (8)

Justification for selection of the area:

- a) Most of the hotels, restaurants, bakery, and sweet meat shops are located at Cox's Bazar Sadar and the Large-scale farms of this area are their provider for dairy needs. So, there is a direct effect of lockdown due to COVID-19 on the farms.
- b) Communication is easier within Sadar Upazilla than other upazillas.
- c) During lockdown transportation outside the upazilla was hampered

2.2 Sampling procedure

2.2.1 Target Population

There are 86 registered dairy farms within Cox's Bazar sadar upazilla, but only 14 of them can be categorized as large scale with more than 10 dairy cow population in farm for the study.

2.2.2 Study population

Fourteen large scale dairy farms, possessing more than ten dairy cattle in their farm, within Cox's Bazar Sadar Upazilla were randomly chosen for the study.

2.3 Survey Schedule program

The survey was scheduled based on the objectives of the study. A preformed questionnaire was used as data collection tools. The following data has been recorded through the survey:

1. Framer's information and location of the farm in union level
2. Livestock information of the farm

3. Milk production data of the farm for five years
4. Management of the farm including – feeding, labor, medication cost etc. before, during and after COVID19 period
5. Sales information of the farm before, during and after COVID19 period
6. Problems affecting sales of farm during COVID19

2.4 Study period

Data was collected from 17th February to 28th April, the whole period of UVH placement of Internship program, with the help of a preformed questionnaire.

2.5 Data collection

The personal information regarding the farm owners or farmers were collected by direct interviewing or questioning the farm owners or farmers. The other information regarding cattle population, production, management cost, milk market price, COVID effect on farms' economy were collected either from farm record or by direct interviewing of the farm owner or manager. The collected record covered five years data of the farm starting from 2018 to 2022.

2.6 Photo gallery



Figure 1 Information Collection



Figure 2 RCG Agro Dairy Farm

2.7 Data analysis

A questionnaire was designed to bring out / enlighten the direct and indirect effects of COVID 19 situation on the sale of large-scale farms within Cox's Bazar Sadar subdistrict. The collected data then was organized and coded to enter in MS Excel for further analysis.

Chapter 3: Result and Discussion

3.1 Result

3.1.1 Status of the farm owners

21.42% of the farm owners were female, in number 3 out of total 14 farms and 78.57% of the farm owners were male, in number 11 out of 14 farms. (Table 1)

Table 1 status of the farm owners' occupation with percentage

Profession	Farmer	Govt. Authority	Businessman	Restaurant owner	Housewife
Percentage	28.57%	21.42%	35.71%	7.14%	7.14%
Number	4	3	5	1	1

Table 1 shows the professional variation of the farm owners indicating their social position.

3.1.2 Status of the farm

The selected 14 farms have an average of 16.71-liter milk production from a single cow. The average of highest production from a single cow is 11.5 liter and average of the lowest yield from a single cow is 5.21 liter.

Table 2 present status of the farms shown with percentage

Categories	Variables	Number of farms	Percentage
Location of the farms	Pourosova	5	35.71%
	Patali Machua Khali	3	21.42%
	Jhilawnjha	3	21.42%
	Pokkhali	1	7.14%
	Islamabad	1	7.14%
	Khurushkul	1	7.14%
Breeds and species	Holstein Frisian	13	92.86 %

	Jersey	4	28.57%
	Local	2	14.28%
	Buffalo	3	21.43%
Cattle number in lactation	Less than 10	6	42.86%
	Within 10 – 15	5	35.71%
	Within 20-25	3	21.43%
Milking Time	Once in a day	3	21.43%
	Twice in a day	11	78.57%
Breeding Method	Only Artificial Insemination	4	28.57%
	Both AI and Natural insemination	10	71.43%
Distribution area of milk	Sweetmeat shop	11	78.57%
	Tea stall	9	64.29%
	Restaurants and café	4	28.57%
	Grocery shop after packaging	6	42.86%
	Individual retail customer	13	92.86%

3.1.3 Overall economic scenario of the selected farms

Table 3 Changes in production and price of milk from 2018 to 2022

Year	2018	2019	2020	2021	2022
Total amount of production (per day)	1280	1119	998	964	951

Average amount in all the farms (per day)	91.42857	79.9285714	71.2857143	68.8571429	67.92857143
Average changes in production per day(in litre)	-	11.5	8.64285714	2.42857143	0.928571429
Average changes in production day (percentage)	-	12.578125 %	10.8132261 %	3.40681363%	1.348547718 %
Average wholesale price(taka)	48.21428571	49.64285714	46.78571429	52.14285714	62.5
Changes in price (in taka)	-	1.428571429 increased	0	2.5 increased	10.35714286 increased
Changes in price (in percentage)	-	2.962962963 % Increased	0	5.035971223 % increased	19.8630137 % increased
Average retail price	62.14286	60.35714	65.71429	72.85714	84.64286
Changes in price (in taka)	-	0.357143 increased	4.642857 Increased	7.142857 increased	11.78571 increased

Changes in price (in percentage)	-	0.574713 % Increased	7.602339 % Increased	10.86957 % Increased	16.17647 % Increased
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Table 4 Overview on the changes of the number of farmstock

Year	2018	2019	2020	2021	2022
Total farmstock in all the farms	433	434	372	333	295
Changes in the total number of farmstock (in number)	-	1 increased	Decreased 62	Decreased 39	Decreased 38
Changes in the total number of farmstock (in percentage)	-	0.230414747 % increased	14.28571429 % Decreased	10.48387097 % decreased	11.41141141 % decreased

3.1.4 Overview of the effect of Covid 19 on the recurrent cost of the farm

Table 5 present availability of feed source

categories	Variables	number	percentage
Concentrate type	Husk or bhushi	11	78.57%
	Soybean meal	5	35.71%
	Maize, corn, wheat bran and pulse	3	21.43
Fodder plot	Own	11	78.57%
	Rented	3	21.43%
Straw source	Local market	6	42.86%

	Own production	8	57.14%
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Table 6: Changes in the recurrent cost before and after covid

Year	2018	2019	2020	2021	2022
Average cost of concentrate feed per year (In taka)	205035.282	207260.5319	222089.74	256117.3	323766.9
Changes in the cost (In taka)	-	2225.249861 Taka increased	14829.209 Taka increased	34027.61 Taka increased	67649.51 Taka increased
Changes in the cost in percentage	-	1.085300949 % Increased	7.154864 % Increased	15.32156 % Increased	26.41348 % Increased
Average medication cost per year (In taka)	260714.3	166428.6	209285.7	187571.4	181142.86
Changes in cost (in taka)	-	94285.71 taka decreased	42857.14 taka increased	21714.29 taka decreased	6428.5714 taka decreased
Changes in cost (in percentage)	-	36.16438 % Decreased	25.75107 % Increased	10.37543 % Decreased	3.4272658 % Decreased
Average Labor cost per year	229285.7143	246428.5714	292857.1429	342142.8571	462142.8571

Changes in cost (in taka)	-	17142.85714 Taka increased	46428.57143 Taka increased	49285.71429 Taka increased	120000 Taka increased
Changes in cost (in percentage)	-	7.476635514 % Increased	18.84057971 % Increased	16.82926829 % Increased	35.07306889 % Increased

Unsold milk

Due to strict lockdown farmers were unable to sell portion of their products. The percentage were considered regarding the total production of milk.

Table 7 Overview of the amount of unsold milk in percentage

Overview of the amount of unsold milk in percentage

Period category	Unsold milk (percentage of total production)	Number of farms	Percentage
Before COVID19	None	0	0
During CoVID19 (Lockdown)	Less than 10%	4	28.57%
	10-15 %	6	42.86%
	25%	1	7.14%
	45%	2	14.28%
	50%	1	7.14%
After COVID19 Lockdown till now	None	0	0

Table 8 Overview on loss of milk

Average milk production in total 14 farms during COVID (Lockdown) per day	Average unsold milk in a farm (percentage of production) per day	Average loss of milk in the farm per day
71.285 L	18%	13.93 L

Table 9 Overview on stated causes behind remaining of unsold milk

Causes stated for the unsold milk by the farm owners	Number of farms stating the reason	Percentage
Closed shop and restaurants	14	100%
Lack of Customer	7	50%
Limitation of transport area	5	35.71%
Unfair Pricing	9	64.29%

Table 10 Overview on percentage of using the unsold milk to produce other dairy products by the farmers

Dairy products made from unsold milk	Number of farms	Percentage
None	9	64.29%
Sweet Yogurt	1	7.14%
Sour Yogurt	4	28.57%

Table 11 rate of damage in the selected farms

Rate of damage	Number	Percentage
Highly damaged	3	21.42%
Moderately damaged	9	64.29%
Less damaged	2	14.28%
Not damaged	0	0

Table 12 Farmers opinion toward Suggestions to ensure financial security amongst the farmers

Questions	Yes	No
Do you have other livestock farm except dairy?	8	6
Did you receive any Govt. Help during Pandemic?	0	14
Do you know the procedures to make any dairy product?	3	11
Did you try to produce any dairy product to reduce the loss?	5	9
Do you wish to be trained to produce and commercialize dairy products?	14	0

3.2 Discussion

This section first reports our assessment of the COVID-19 pandemic's impacts on the dairy farms of Cox's Bazar Sadar then discusses how the pandemic has affected economy of the dairy farms.

Just like every agriculture sector of our country dairy sector of Cox's Bazar Sadar Upazilla had to suffer the in fortune came with the sudden halt of the growth of the economy caused by COVID. There were 86 registered dairy farms within the Sadar Upazilla. 14 of them were randomly selected on the criteria of having at least 10 dairy cattle.

Most of the selected farms were depended on the wholesale market for selling their product. Except 3 farms all the farms produce cattle milk only (table 2). Mostly found cross breeds are Hf, Jersey. As a result of the pandemic situation there was even 50% of unsold milk in 7.14% of the farms during the lockdown situation and less than 10% unsold milk remained in 28.57% of the farms (table 7). 64.29% of the farmers stated unfair pricing, 35.71% of the farmers stated limitation of transport area, 50% of the farmer stated lack of customer and hundred percent of them stated closed shop and restaurants as the reason for remaining of unsold milk in the farm (table 9). Farmers hinted the reason behind reduced customer could be bad financial condition of the previous customer, prejudices against SARS-CoV-2. 35.71% of the farmer produced yogurt to emulsify the loss of unsold milk by using them and remaining 64.29% of the farmer distributed or discarded them amongst the neighbors (table 10).

Cox's Bazar Sadar dairy farming is assisting every family in managing their daily routine. Cows play an important role in dairy farming, with over 290 cows in milk condition (in the selected farms); buffaloes also play an important role in improving dairy farms and farmer's livelihoods. Holstein Frisian (HF), Jersey Cross Breeds are important in the cow herd. In some farms buffalos are used too. Crossbred buffaloes are typically used for milking (5). The farmstock changes can be seen before and after the COVID period in table 4. The livestock number inceasrs on average 0.23% in 2019 while start decreasing n the rate of

14.28% in 2020, 10.48% in 2021 and 11.41% in 2022 (Table 4). Farmers hinted the cause of this gradual decline in the number of farmstock has resulted from the huge loss during the pandemic situation.



Figure 3 Overview of the farm economy

In figure 3 the medication cost decreases in 2019 about 36% but again increases 25.75% from the cost of previous year.

Dairy farming can be affected harshly with the change of price of cattle feed. Most of the farms uses Corn husk (78.57%), soybean meal (35.71%) as the main concentrate feed and 21.43 % of the farms use mixture of corn, maize, wheat bran and pulse as concentrate feed

(Table 5). There was increase in the price of concentrate feed, but the farmers did nit state it as a cause of decrease in farmstock. 78.57% of the farms have their own fodder plot and 21.43% of the farms have rented fodder plot (table 5). So fodder were available throughout the year , though there were difficulties in the availability of straw as the local market for straw is in Chakariya , out of the upazila.

The per year average cost of concentrate feed in all the farm increased 1.085% in 2019, 7.154864% in 2020, 15.32156% in 2021 and 26.41348 in 2022 (Table 6). Changes in the cost of medication was related to changes in the number of farmstock, availability of medicine and veterinarian. Also, the vaccination campaigns were not held at that time, some farms got affected with infectious diseases like FMD resulting in selling of more cattle.

Total amount of produced milk in all the farms were 1280 liter in 2018 and it decreased to 951 liter in 2022. It has a direct relation with the decreases number of farmstock in the farm (table 3). Average wholesale price increased up to 5.036 % in the year of 2021 and the retail price increased 10.87% in the year 2021 (table 3).



Figure 4 Overview of changes in production and milk pricing

Milk production is expected to fall due to a lack of various inputs, particularly feed, fodder, and labor. The availability of concentrated feed had dropped by 40-50 percent, and at the same time its prices had risen by the same proportion. This has influenced the productivity of the livestock. Milk productivity depends 40 to 45 percent is on availability of concentrated feed

Chapter 4 Limitations

There were some limitations to the study that caused less rich study. Identified limitations to the study is given below -

- Lack of large-scale farm within the target area
- Lack of milk register for every year in all the farm
- Lack of cooperative farmers
- Most of the farms are run by care takers who are changed after a certain time
- The study period was short
- Lack of proper funding for the study

Chapter 5: Conclusion

The study was held in Cox's Bazar Sadar Upazila, a coastal region of Bangladesh. The pandemic situation was difficult for farmers to run their farms during this pandemic, which had resulted in massive losses for both farmers and the national economy. This study has helped to understand how important it is to support farmers in continuing the production cycle, growing market demand, and using alternative supply chains to compensate for and address the threats faced by farmers during the lockdown period. This will help to understand the potential barriers during a pandemic period, and new policies can be developed as needed to prevent future economic losses. Both Non-Govt. and Govt. should take step to produce more trained personnel for dairy farming to prevent such loss of resources. To meet up the protein demand we need more and dairy farms, but such history of economic loss may discourage the existing farmers and the aspiring ones to join the dairy industry. They can concentrate on multipurpose cash support to meet the farmers' loss.

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Questionnaires

1. Identification of farmers

Name		Upazila & District	
Village		Cell no.	
Union		Occupation	

2. Fodder land information

Own land for farming		Leased in for farming		Grazing field/ Pasture	
Rented in		Leased out		Cultivation Land	

3. Farmstock information

		2018	2019	2020	2021	2022
Livestock						
Dairy cows						
Local breeds						
Cross Breeds	HF					
	Jersey					
	Sindhi					
	Sahiwal					
Buffalo						
Dry cows						
Pregnant cows						
Heifer(s)						
Bull/ox						
Calf						

4. Milk production and selling information

	2018	2019	2020	2021	2020
Milk yield					
Wholesale price of milk					
Retail price of milk					
Unsold milk					

5. Husbandry practices

Types of feed		Conc source		Straw source	
Roughages	Concentrates	Local market	Outside upazila	market	Own cultivation
Silage:	Maize:				
Straw:	Rice husk:				
Napier:	Corn husk/				
Para:	Bhushi:				
German:	Wheat bran:				
Maize Grass:	Mustard cake:				
Road-side Grass:	Til oil cake:				
Kaun Grass:	Protein Concentrate:				
	Gram's husk:				
	Soyabean Meal:				

Rearing system	a) Free range	b) Intensive	c) Semi-intensive	
Breeding	AI/ Bull			

6. Recurrent costs of the farm

	2018	2019	2020	2021	2020
Conc. Feed cost					
Medication cost					
Labor cost					

7. What is the cause of unsold Milk?

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Biography

Bristy Dhar Nandita, daughter of Binoy Krishna Dhar and Shika Rani Dhar, is from Cox'sbazar sadar, Cox's Bazar. She had passed SSC exam with GPA 5.00 in the year 2014 and HSC exam with GPA 5.00 in the year 2016. She got admitted in CVASU in the year 2017 and has been doing her graduation there. Now she is in her One-year Internship program before getting the professional certificate. She has completed her placement in CVASU Laboratories, SAQTVH, TTPHRC, UVH, NGO- ACDI/VOCA, Chattogram Military farm, RV & F Depo, Regional Duck farm in Kurigram.

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