Identifying Forward Market Scopes through Value Chain Analysis

A study on Dairy and Maize sub-sectors

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TABLE OF CONTENTS

OVERVIEW **5**
Study Background 5
Study Objectives 6
Study Methods 6
Limitations 8

FINDINGS ON DAIRY MILK VALUE CHAIN **9**
The Industry 9
Product Feasibility 10
Value Added Dairy Products-What are available in the market? 10
Observing Consumer Behavior 11
What and how do they consume? 11
What do they expect- scope for value addition? 12
Market Viability 13
Who markets? 13
Present Market Size and Trends 14
Evaluating Supply against Demand 16
The Supply Chain and Value Added Activities 17
Playing with the Prices 18
Power Practice in Milk Value Chain 19
Gendered Market Analysis 19
Position of men and women across dairy value chain 19
Activity Map 20
Knowledge Map 20
Women Leadership Status 21
Constraints 21
Way Forward 21
Enterprise Plan for Potential Dairy Cottage Industry 22
Ghee & Sour Yogurt 23
Chhana (Unripen Cheese) 25
Sweet Yogurt 26
Financial Plan for Sweet Yogurt: 27
Sweetmeat 28
Lassi 29
Making the development sustainable 30
Marketing Plan at a Glance 31
Schools as a Potential Market 33

FINDINGS ON MAIZE VALUE CHAIN **35**
The Industry 35
Consumption & Usage 36
Market Viability 36

Supply versus Demand 36
Who markets – actors in Maize value chain 37
Market and its trends 38
Prices 40
Value Addition and Profit Margin 40
Power Practice in Maize Value Chain 41
Potential Market for Value Added Maize Product 42
Gendered Market Analysis 42
Position of men and women across maize value chain 42
Activity Map 44
Knowledge Map 45
Women Leadership in Maize Value Chain 45
Forward Market Constraints 45
Forward Market Opportunities 46
Enterprise Plan for Potential Value Added Maize Cottage Industry 47
Popcorn 48
Roasted Corn 50
Maize Mixed Flour 51
Marketing Plan at a Glance 55
Financial Plan for Proposed Products at a Glance 56

THE END **57**
Conclusion for Dairy Forward Market Scopes 57
Conclusion for Maize Forward Market Scopes 57

ANNEX 1: LIST OF PARTICIPANTS **58**

OVERVIEW

Study Background

The Oxfam GB, Bangladesh Programme has been implementing the 'Resilience through Economic Empowerment, Climate Adaptation, Leadership and Learning (REECALL)' project in the disaster prone Northern Char, North-eastern Haor, and Southern Coastal communities. REECALL promotes increasing community resilience against climate change and natural disasters to prevent and combats risks associated with them, through economic empowerment and securing sustainable livelihoods for women and men. REECALL has been in the forefront of economic development for many years in the chars of Rangpur, Gaibandha, Kurigram, Nilphamari, Jamalpur and Kishorganj districts.

Most of the char farmers included in REECALL development framework are economically marginalized, and live beneath poverty line. Some of the other farmers – notably very few in numbers- are well off, and have hold of have access to a good deal of land and property. The nature of income generating activities in char lands compared to mainland is different in the context of social choice and availability of alternatives. Rearing livestock in the char lands is traditionally one of the major productive activities. Other agricultural practices are cultivation of chili, jute, maize, rice, potato, ground nuts, wheat and pulse etc. Among different IGAs, REECALL supports mostly livestock (dairy) producers, chilli and maize farmers. The programme supports in producer group formation, capacity building of the producers through skill development training and linking them with local markets.

Based on the initial success at farm level development, Oxfam is now looking to scale its marketing and commercialization activities for selected value chains. To this end in order to explore opportunities of linking up different homogeneous producer groups (involved with different value chains) with high end market actors, Oxfam planned to conduct 'Forward Market Assessment' in selected geography for selected products.

In addition to that, an analysis is required to understand the different gender dimension associated with selected value chains to ensure women's economic empowerment. By analyzing gathered information of the assessment, Oxfam intends to develop an 'Enterprise Development' pilot project with *core focus on forward marketing* with the objective to contribute in improving sustainable income opportunities of the producers.

Study Objectives

The assessment has met the following objectives:

Identification of the constraints and opportunities i.e. forward market scope, market size and market requirement for linkage etc.

Conducted gender analysis of the value chain while highlighting the different positions of men and women across the chain and addressed issues of power reflected in the production and marketing.

It has developed a set of recommendation/way forward to improve market outcomes to foster pro-poor growth of selected value chains etc.

Simultaneously, the gender analysis is used to identify opportunities, stakeholders, and interventions to promote women's economic leadership.

Study Methods

The forward market assessment followed a participatory approach where the consultant, Oxfam and partner NGOs worked in close collaboration, sharing thoughts and views and shaped the framework. The whole assessment framework was based on Market Development Principles and in that note heavily focused on market based analysis and market based solutions in relation to forward market development.

Reconnaissance meeting: Meeting with Oxfam programme team to get everybody in the same page. The first meeting acted as building block and created a platform for further sharing of data, information, thoughts and insights.

Desk review: Relevant documents/reports were reviewed for a good understanding of (a) programme beneficiaries, current economic activities within the Dairy milk and Maize value chain and future outcomes from present tasks; and (b) value chain information i.e. producer group statistics, production mapping, market actor mapping, constraints & opportunities, external factors affecting Dairy milk and Maize value chains, policy, role of private sector actors etc. Journals, Website, other publication, project papers, and research report were reviewed to have a better understanding and practical issues around the value chains selected for forward market development.

Focus Group Discussion (FGD): Discussion with Dairy milk producers and Maize farmers was done on production & market dynamics including product varieties & prices, constraints, opportunities, interactions with the markets, roles of actors and way of intervening for better forward market system.

FGD with women group (producers/farmers): In this part an activity mapping (household, production and marketing activity) and knowledge mapping (production and marketing) was done to understand women's' role across the selected value chains and identify way to develop women inclusive market.

Individual interview with forward market actors: Interview was conducted with market actors i.e. forias, traders, wholesalers, commercial buyers to discuss more on the market demand, demand characteristics, product flow & pricing, buyer expectations etc.

End market analysis: To understand end market's expectation, consumers were interviewed. Key areas of consumer research were done to determine purchase and consumption pattern, features expectation, price and suggestion on product diversification etc.

Key Informant Interview: Local DAE, DLS & DAM officials were interviewed to get broader picture of the area context particularly production dynamics of Milk and Maize, variety and rules & guidelines for Dairy Milk & Maize value chains to comply with govt. policy.

Sampling frame at a glance

Methods	*Nilphamari*	*Rangpur*	*Jamalpur*	*Total Sample (No. of respondents)*
FGD	03 (42)	03 (52)	02 (34)	08 (128)
Individual Interview (forward market actors)	19	11	06	36
End market interview	25	02	00	27
KII	03	02	01	06
Total	**50**	**18**	**09**	**77 (197)**

Limitations

Despite its successful completion, the accuracy of information collected is tainted by possibilities and instances of erroneous data streaming from a lack of cross-verification or data-validation, owing to time limitations.

Secondly, due to inconsistencies or lack of the respondents' written records or logs, in many cases, respondents tended to provide arbitrary answers particularly to historical questions (like previous years' income, price of maize over seasons, production volumes) or generalized questions (such as, which activities of maize cultivation are done by whom). In order to mitigate these inconsistencies, some series of clarifying questions were initiated to cross check vague responses, and some answers recorded may at times reflect generalizations or subjective judgment of the interviewers.

Finally, over the duration of the group interview sessions, the attendance of the participants withered due to obligations on their farms, or other duties of their daily lives and livelihoods, and some ended up leaving the sessions or opting out over its course. As such, parts of the data gathered for this study may not be directly relevant to all respondents.

However, to counter these inconsistencies as much as possible, the data has been cross-checked and validated via telephone interviews with respondents that dropped out.

FINDINGS ON DAIRY MILK VALUE CHAIN

The Industry

The past decade was one of phenomenal growth for the agro industry of Bangladesh. The growth of the dairy sector has neither been substantial nor has it been consistent. In fact per capita consumption of milk which was showing an uprising in the 90's has gone down in the last decade.

Dairy industry is one of the best suited sectors for the generation of employment and thus ameliorating poverty in rural areas of Bangladesh providing jobs to the whole family, i.e. men, women & children alike. Bangladesh government has identified livestock as one of the key player of Poverty Reduction Strategy Paper (PRSP). Small scale commercial dairy production and related backward and forward linkage activities in marketing, input supply, etc. have the potential for significant employment generation and poverty alleviation. The problem is to identify, develop and test appropriate institutional arrangements for linking production, marketing and processing activities to improve smallholder access to urban markets at competitive cost. Improving smallholder competitiveness will require appropriate technology and services (e.g. breed and breeding services, feed and health inputs) specifically targeting smallholder needs for improving productivity.

Dairying is an important economic activity in Bangladesh that provides supplementary income, employment and nutrition to about 3.6 million households. Unlike fisheries, dairying is labor intensive. A farm with two lactating cows generates 4,080 hours of labor opportunities every year.

Even though per capita milk consumption is low in Bangladesh, domestic production is still insufficient to meet existing demand. In the formal market, 87% milk is imported. The sector's growth rate remains far behind that of the neighboring countries (2.05% against 4.1% in India and 4.9% in Pakistan). Informal sectors handle the largest share of the milk (78%) produced in Bangladesh and market traditional products.

Product Feasibility

Value Added Dairy Products- What are available in the market?

Small and individual household's farms stands as a producer at very down level of production of milk and few other dairy products. Being a simple farmer with common poverty strains they are incapable of extra investment or value addition of any kind. And even with the raw milk, the biggest restrain is its short period of time from being stale if not preserved appropriately which brings to necessity of better and reliable storing facilities.

Raw milk: Now that the small-scale producers produce raw milk and sell out the raw milk to the local collectors, collection points, chilling center and local markets. Traditionally, these producers have an average two cattle and are reared following domestic techniques. As, raw milk is a very much perishable items, it is sold immediately after the milking (within 2-3 hours).

Packaged milk: Yes, of course the local dairy milk producers lack technical skills and financial capacity to turn raw milk into packaged milk; packaged liquid milk is very much available and marketed by large industrial processors i.e. PRAN, MILK VITA, AARONG, RD and FRESH. However, a very few local processors is trying to promote locally packaged liquid milk in limited scale (within the city periphery of Rangpur).

Sweetmeats: One very common and popular value added dairy product is sweetmeat. The countryside local sweet shops collect raw milk from farm level producers or collectors, process them into different sweet items and sell them to their small sweet retail shops. Very common forms of sweetmeats are Sponj misty, Rashogolla, Chamcham, Shondash, Rosh Malai, Kalojam and numerous.

Yogurt: An increasingly popular dairy item is yogurt; taste and health benefits (yogurt aids digestion) are key reason for propelling its popularity. Locally made yogurt is very much available and marketed by local sweet shops.

Now that AARONG Dairy (a BRAC Social Enterprise) has introduced **Packet Flavored Yogurt** in the urban and some semi-urban markets which has gained popularity among the kids and youngsters. They introduced two different flavors- chocolate and strawberry. This has been a key innovation in value addition in dairy products and proposes greater marketing options at markets especially in Rangpur and Jamalpur, since markets in Rangpur and Jamalpur are relatively developed with more conscious and educated customers than the markets in Nilphamari district.

Butter (Ghee): Butter is a fairly traditional dairy product, a fancy item that medium and better-off households purchase. Price of branded butter is typically much higher than that is locally processed and marketed. However, it was seen that only the premium customers purchase butter which makes the market a niche one. It gives an immense opportunity for some local processors to commercialize butter and promote as local brand.

The production of butter demands a large amount of milk fat, usually making dairy cows the choice animal. However, goat milk and sheep milk have greater percentages of fat, so these animals can be used if small quantities of butter are to be produced.

Chana: One critical input for making sweetmeats is chana, demand for chana is therefore very high in the surveyed region. Scope to establish entrepreneurship for chana making and marketing exists given the technology and required capital to launch a small scale enterprise.

Ice cream: Probably the best lucrative dairy item after sweetmeats is ice cream. There are local vendors and some local small-scale ice cream manufacturer who extensively market ice cream in different forms and packages. Not only among the children, but also ice cream is very popular to people of all ages. Especially in hot summer season, sale of ice cream goes higher.

Observing Consumer Behavior

What and how do they consume?

Raw milk: When the national per capita need is 250 ml per day, per capita availability is very poor – only 33.95 ml. The uptake is worst in the surveyed regions – 28 ml in Rangpur, 17 ml in Nilphamari and 23 ml in Jamalpur. Poor economic condition of the households living in chars and semi-urban areas does not allow them to increase milk purchase and consumption. Even the marginal and poor milk producers keep a very minimum milk for family consumption (particularly for their children; amount is calculated around 500 ml) and the rest they sell for livelihood.

The study observed that raw milk consumption is relatively higher among the city dwellers, especially in Rangpur and Jamalpur. This is perhaps due to higher level of education and access to information.

One important group of consumers of raw milk is the tea-taker from different tea stalls. Though in this market segment, raw milk is very much substituted by commercially marketed condensed milk, still demand for raw milk tea is in a considerable level in the cities and country side of Rangpur, Nilphamari and Jamalpur.

Sweetmeats and yogurt: Sweetmeats are very much popular and much sold value added dairy products in the surveyed region. Though, consumption of sweetmeats is occasional and intuitive, daily volume of consumptions is very much appreciable. The demand and consumption pattern of sweetmeats is illustrated by daily sales of a sweetmeat shop. An average size sweet shop in Rangpur city sells around kg sweetmeats to 40-60 customers. Shops those have bigger business size sell 80-120 kg sweets per day to 70-80 customers. This revealed how attractive the market for sweetmeats is.

Sales of sweets increase at the time of different religious festivals like Eid (Muslim festival) and Puja (Hindu festival). Estimated consumption increases by three times during these commemorations than regular time. Prices of milk and milk products also get higher at that time.

Chana: The direct consumer of chana is not the individual household customer but the local dairy product processors who process chana for making sweetmeats. Thus, both the use and demand for chana is very high in this market.

Ice cream: It is obvious that children and teenage people are the prime consumers of ice cream, though it is also popular among the people of all ages. When the city dwellers demand for branded ice cream; ice creams sold by ferrywala (local ice cream vendors) are also demandable. The study found that a kid aged between 8-17 years consume at least one ice cream a week. Consumption gets doubled as summer heats up.

What do they expect- scope for value addition?

Followed by the nature of consumption pattern of value added products, the study identified the nature of expectation of different group of consumers – from the kids to the elderly, from lower income group to the up-cut premium buyers.

There is an increased interest among the ***milk producers*** to sell packaged milk through small-scale commercial milk trading enterprise – however, required capital and technical capacity to collect, process, package and sell milk to markets are still underdeveloped.

Urban consumers are relatively health conscious and care for daily nutrition Demand for fresh milk among this group of consumers is thus relatively higher. At the same time, urban consumers want to have home delivery of farm fresh milk and ready to pay better price for fresh milk.

There is an increased demand for exclusive dairy items like lassi, sweet curds and flavored milk shake. Particularly Rangpur has developed a group of premium customers as extensive urbanization, development and industrial progress took place. The trending fast food shops are intriguing demand for such exclusive items.

When it comes to the ***kids and youngers***, ice cream has been the most demandable value added dairy product. They also very fond of seets and yogurts.

While talking with the ***community leaders, NGO personnel*** and other key informants, many have mentioned to introduce milk and milk added items (like biscuit, cakes etc.) in school feeding programs. Developing small scale processing enterprises and promoting contract trading have bigger scopes in this regard.

The study observed a continuous demand trend for milk from ***sweetmeat industry***. Though there are a number of sweetshops operating in the surveyed region, there are few commercially large sweet shops keeping better quality. Given the technology and investment required, there is scope to establish a dedicated sweetmeat retails exclusively by the producer groups, directly linked with farm fresh milk procurement.

Market Viability

Who markets?

Dairy milk value chain is comprised of a number of market actors with their distinctive market roles and functions. A short vivid description os given below.

Milk/Dairy Producers (Household Producers): Dairy producers rear cattle, produce milk and sell to any milk trader, collection point and or chilling center. However, none of them are commercial farmers and do not have large cow farms. Rather they own and average 2 to 3 cows.

Milk Collectors: Milk collectors are not engaged into milk production but collect milk from dairy milk producers. They sell the collected milk to nearby collection points, markets or chilling centers. Importantly, these collectors collect milk from farm gate and do business in cash.

Collection Points: A collection point is any place, premise or establishment where one person or a group of persons engaged in milk collection from dairy farmers or other milk traders. Farmers and local milk collectors come to the point to sell their milk. Milks are then supplied to chilling centers or some local dairy product processors.

Chilling Centers: Study found chilling centers in Dimla, Kaunia and Bakshiganj.

BRAC, PRAN and Rangpur Dairy have chilling centers in these areas. The centers are primary collection points for large scale industrial processors. A chilling center collects milk from collectors as well as from farmers. It pays price of milk on the basis of fat percentage.

Dairy Product Producers/ Local Processor: Local processors are small scale dairy product producers who buy milk from the collectors based on their production capacity. 80 percent processors purchase milk in a contract basis from specific and regular supplier. In this contract system, the milk collectors or milkmen sell milk to processors as liter but many times the suppliers are paid on the basis of chana production. That means processor pay the price of chana which has been produced from given milk. Processors in char lands are found to purchase milk with a 2-3 days interval because of low demand of dairy products among the dwellers of chars and adjacent mainland areas.

Industrial Processors: Industrial processors are large scale commercial dairy product manufacturers and marketers mainly produce and sell pasteurized milk, low fat milk, chocolate milk, butter, ghee, mango milk drink, UHT milk packet, ice creams, yogurt, and milk chocolates. Renowned industrial processors are Milk Vita, Pran Dairy, BRAC Dairy and Rangpur Dairy.

Present Market Size and Trends

Individual collectors are the bridge between production and marketing system. In study area, they collect milk form door-to-door and carry it within can or container from char to mainland. Farmers sell their milk to the local collectors, and these local collectors sell it to different types of consumers in regional market such as individual consumers at market, contact households, tea stalls, hotels or restaurants, sweet shops and chilling centers.

Below are milk production and market comparisons in the surveyed areas.

Area	*Yearly Production (in MT)*	*No. of markets*	*No. of haats*	*No. of chilling centers*	*No. of sweet shops*
Dimla	6,700	09	07	01	15
Kawnia	5,780	07	03	07	03
Bakshiganj	12,500	21	12	00	24

In Dimla, under the REECALL programme, Oxfam's PNGO Polli Sree has 18 producer groups producing 1,095 liters per day. The upazilla has only one chilling center from BRAC which collects 670 liter milk per day against its capacity of 2,000 liters.

When markets in Kawnia is characterized by high presence of chilling centers from BRAC, Pran and Rangpur Dairy; despite having not a single chilling center, Bakshiganj has two times higher production than any other surveyed regions. This is perhaps due to the presence of large number of milk producers in Bakshiganj. There is a private Food processing and Agro Industries Ltd found collecting milk from producers and other collectors. This company produces pasteurized milk, flavored milk (mango and chocolate), different types of sweetmeats, labang (matha), borhany (a traditional rich drink) etc. It was also found that small producers formed a cooperative which is called '*Gata' to* where they aggeregate milk and from where they supply milk to forward market. Gonochetona, the PNGO of Oxfam in Jamalpur has started training up small scale producers to produce milk product and connecting them with forward market milk value chain actors.

Other than production of raw milk, the study calculated production of sweetmeats and some other popular dairy items in the surveyed upazillas.

Area	*Yearly Production of Sweetmeats (in KG)*	*Yearly Production of Yougurt (in KG)*	*Yearly Production of Chana (in KG)*	*No. of sweet shops*
Dimla	160,000	32,000	31,250	15
Kawnia	70,000	14,000	14,000	03
Bakshiganj	80,000	16,000	16,000	24

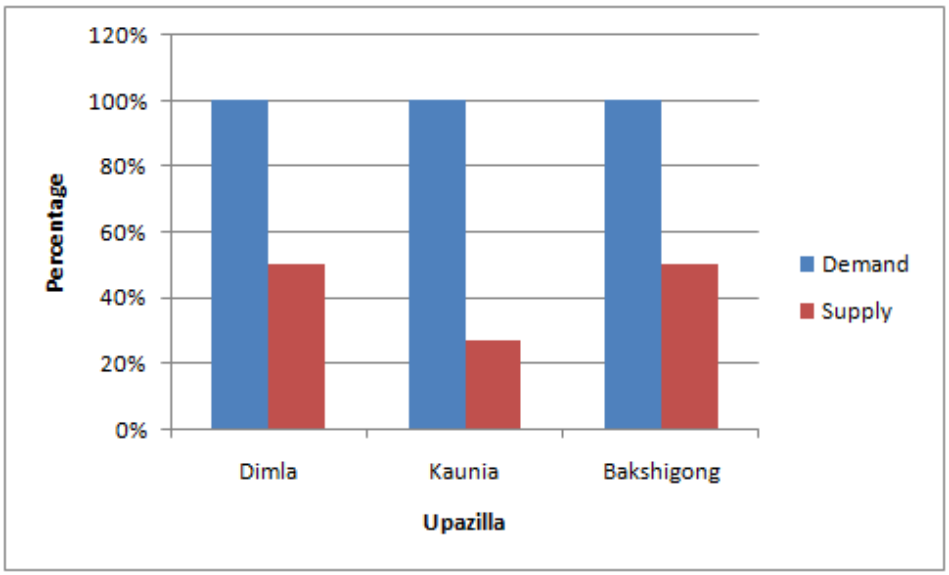
The study also recorded operations of the chilling centers, their mil storing capacity and present supply situation.

Area	*Chilling Center*	*Optimum capacity (Daily in Lt.)*	*Daily collection (in Lt.)*	*Capacity utilization (in %)*
Dimla	BRAC	2,000	670	33.50
Kawnia	PRAN	2,200	1,800	81.82
Kawnia	RD	2,000	1,200	60.00
Bakshiganj	Bakshiganj Food Preservation & Agro Industries Limited	1,000	450	45.00

The study revealed that every commercial chilling center is running under-utilized. There are scopes to increase capacity utilization by an average of 50% for the chilling centers. This perhaps provides the fact that the areas are under-supplying raw milk to the large industrial processors.

Evaluating Supply against Demand

The study has observed a large gap between demand & supply situation. Despite being key milk production hubs in Bangladesh, each upazilla is able to meet an average only 42.33% of the local demand.



According to the information provided by ULO, Dimla, Nilphamari, milk supply from market is not fulfilling the demand. Yearly milk production in Dimla is recorded 6,700 MT against its demand of 13,400 MT which means only 50% milk is being produced against its total demand.

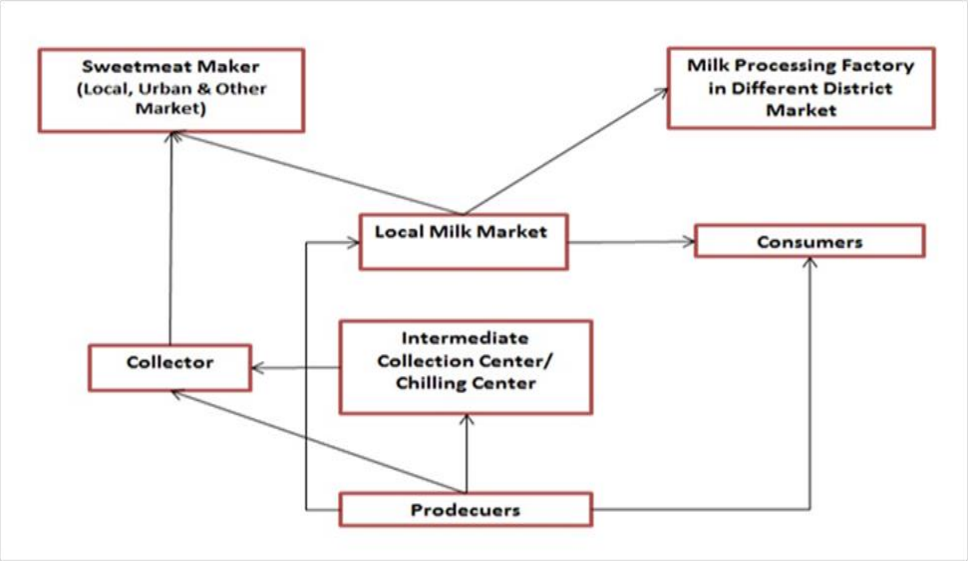
In Kawnia, Rangpur, according to DLO office record it is found that the upazilla has a year round demand for milk around 21,268 MT against which the area can produce and supply only 5,780 MT, means the supply meets only 27% of its annual demand.

In Bakshiganj, Jamalpur, according to the information provided by the Upazilla Livestock Office, the area has a year round production of 12,500 MT which meets only 50% of its yearly demand. The local producers only contribute only 5,000 MT of the total supply and rest quantity is collected from the surrounding collectors.

The present growth of the sweetmeat markets in the region is calculated about 2.21% which is increasing since last two years. This perhaps shows an indication of significant growth of value added dairy market which currently can meet 67% of the local demand.

The Supply Chain and Value Added Activities

Any step in the production process that improves the product for the customer and results in a higher net worth is called value addition. It is apparent that farmers or milk producers in the surveyed areas produce milk and directly sell to collectors, local markets, chilling centers and consumers without adding any value to their produces.



Collectors collect milk from producers and supply to nearby chilling centers and sweetmeat shops. In very few cases, it is found that the collectors do add value to the raw milk, processing the milk into chana and supply s to different district towns. For example, from Dimla, chana has been supplying to Sylhet and Habiganj, from Kawnia to Rangpur and Bogra, and from Bakshiganj to Tangail, Jamalpur and Mymensingh. Now the question is when the local demand for raw milk and chana has not been fulfilled, what motivates the collectors to supply in the outer districts? The answer to this is obvious – it is the higher price and guarantied sales that motivate the collectors to process and sell chana to other regions which has relatively higher demand for processed chana and which pays comparatively better prices.

More than 90% of the times, it is the sweetmeat maker who adds value to the milk and sells value added dairy items. Scopes in the forward market for value addition prevail only with sweet making and trying something different – making ice cream or flavored milk.

How strong the market linkages are?

The assessment measured the strength of backward market linkage with the milk producers about 50% when forward market linkage is performing real poor, only about 20%.

Playing with the Prices

Pricing of raw milk in different channels are given bellow:

Channels in Value Chain	*Prices (in BDT per liter)*		
	Dimla	*Kawnia*	*Bakshiganj*
Milk producer	25-30	35-40	40-45
Local market	35	45	50
Chilling center	35-40	40-50	50-55

Evidently prices of the same per unit raw milk differ from one place to another place due to advancement of the area. Bakshiganj is more developed than Kawnia when Dimla is the least developed as a city. And this process of development and urbanization influence the commodity price.

Margin of prices & profits for raw milk

The value addition at every level of the chain depends on related prices and costs of inputs and services, which vary widely across areas and times. In general, the study found that production cost per liter milk is approximately BDT 25. At this rate, producers win a profit margin of BDT 10 per liter. The collector has the least profit margin, he actually adds value for his collection fee and transportation cost. Thus, he enjoys a profit margin of only BDT 5 per unit. Collection centers perhaps enjoy the best profit portion of BDT 12 per unit which is 44.44% of the total profit margin generated by all the actors in raw milk value chain. Below is a comparison of price margin for different actors for raw milk.

Actors	*Producer*	*Collector*	*CC*	*Processor*
Producer	25	35	40	52
Collector	--	35	40	52
CC	--	--	40	52
Processor	--	--	--	52
Profit margin	10	5	12	--
Margin (%)	37.03	18.52	44.44	--
Profit ratio	40.00	14.28	30.00	--

***Prices are in BDT per unit*

Price mechanism of CC

Chilling centers pay prices based on the fat content in milk. It starts from BDT 37 per liter and end up to BDT 52 for milk which has highest fat content. Typically, fat percentage remains lower (from 3-4.5%) in the morning and increases (4-4.9%) in the afternoon. CCs maintain a lower limit of fat percentage (3.5%) below which milk is rejected. In addition to the milk price, CC pays BDT 3/liter as commission which includes BDT 1.00 for transport, BDT 1.00 for unit management and BDT 1.00 as bonus.

Power Practice in Milk Value Chain

There are two actors that stand out as key controllers of price and demand supply situation in the forward market of milk value chain. Firstly the 'Chilling Centers' and secondly the 'Large scale Chana Producers'.

Chilling Centers: They hold the position as large buyer of the entire local production. They ensure the quality of the milk based on the fat percentage using the technology (digital machine) and thus control product price. Since the milk producers and other small scale collectors do not have access to this kind of technology or technical equipment, they cannot ensure fat content from farm level.

Large Scale Chana Producer: Chana is a very demanding by-product of milk, used as a sole input for many other milk products. Considering the fact that Chana has higher price and demand for many other processors and actors in the market, the study has found that there are some large scale collectors who collect large quantity of milk in order to produce Chana only. 1Kg of Chana can be produced from 6 liter milk. In local market, 6 liter milk costs Tk. 180 (Tk. 30 per liter) and 1 Kg of Chana can be sold at BDT 280 generating BDT 100 per profit for the Chana producer. This profit motive pushes the large scale chana producers collecting milk from local market/from producers at low price and sell them in the regional city markets at higher price and make maximum profit out of it. Since most of the household milk producers are poor farmer and lack processing and storing facility, they tend to sell out from their end without considering the possibility of gaining higher prices. Thus, large scale chana producers have relatively strong domination in the market place.

Gendered Market Analysis

Position of men and women across dairy value chain

Women living in chars manage their household chores and rear their cattle at the same time. They start from managing their small scale farm and ends till the milk is sent to market. Very few are involved in selling milk into market. Almost every task related to manage a dairy farm is done by a woman all alone. They start their household chores as the sun rises. Simultaneously they manage their cattle. They bring cattle out from the cow shed. Next 12 hours, they work hard to manage household chores and cattle without any rest. Sometimes they take help of their children.

The study found that 90% of the women in char areas are involved in cow management. They perform feeding, bathing, milking, breeding and disease management. They also take their cows in grazing lands. It is the woman who manages feeds and fodder collection. Thus, a woman is engaged for 5-6 hours for cow rearing activities.

Activity Map

Activities	Job Distribution		Labor (in hours)	Comment
	Female	*Male*		
Purchasing Inputs	20%	80%	2-3	
Collect fodder, Mix the fodder, Bring drinking water for cow, Wash the dish of cow, Take the cow for grazing in the field. Wash the cowshed. Wash the cow. Feeding. Make a bed of straw for cow to rest.	90%	10%	3-5	
Collect the milk from cow	90%	10%	10-20 min.	
Find out the diseases of cow. Call the doctor for vaccine	90%	10%		As required
Deworming	70 %	30%		As required
Find out the heat of the cow	90%	10%		When required
Take the cow to ox for natural insemination	20%	80%		
Call the doctor for artificial insemination	90%	10%		
Provide smoke to get rid of mosquito	90%	10%		
Process the milk if remain unsold	90%	10%		
Make dairy products (sweets and yogurt) if there is any order from local sweet shops	90%	10%		Rare
Linkage with market for sell out the products (milk or milk products)	90%	10%		

Knowledge Map

It is evident from the study that most women are involved in cattle rearing activities have several knowledge gaps within the milk production process. Women in dairy farming lack knowledge on balance diet of feed, fodder production and breed management. Inadequate knowledge about heat detection and improper timing of insemination were also observed. Lack of knowledge on hygienic milking, vaccination, deworming were also identified among the women involved in the dairy farming. On the other hand, female dairy farmers have weak or no linkage with forward market and or limited private sector engagement. They are not familiar with value added scopes.

Women Leadership Status

Traditionally most of the activities involve with cow rearing and farm based function to produce milk and different milk products are considered as women's work. In the present scenario of the study areas are not much different from that. Around 80% to 90% of the on firm activities relate to production of milk and milk products are being done by women. Women are involved in/with forward market actors as well but comparatively less then as much as they are in on-firm level. In the overall picture of dairy sector under the study area it has been found that it is the women who play verity of significant role. It is also being observed that their role and function can be formalized and their skills can be improved. Training or workshop relates to their involvement and their role (on-firm or in the market) will ensure the progress of the entire value chain and also can provide the betterment of their livelihood as well. A community base approach can be fruitful to encourage the women to be a small entrepreneur. Whereas training them according to their function will turn them in to skillful actors in the value chain. Supports for small business, transportation system and markets that is women friendly and training to increase their knowledge to produce different verity of milk product can give the community women a robust stand the in the value chain. In the present practice the society is somewhat reluctant to engage the women beyond on-firm activities in the value chain.

Constraints

Key constraints in forward market of dairy value chain are:

- Weak linkage between farmers and processors result in low profit of milk at farmers' level
- Lack of knowledge of farmers about production technique of value added product resulting low income
- Insufficient storage/chilling facility at farmers level leads force to sell at lower price result in less profit

Way Forward

Probable action plans recommended to develop forward market for dairy and value added dairy products are:

- Strengthen linkage between farmer and processors
- Improve knowledge of farmers on production technique of value added products
- Promoting alternative use of milk

Enterprise Plan for Potential Dairy Cottage Industry

Packaged Milk

Packaged milk can be an effective way to add value and increase income for the farmers. It can be done by organizing small holder dairy farmers through CBO. From the CBO, milk collectors are to be selected and trained to sell collected milk through packaging. A collection point can be made to collect 500 Liter Milk collection every day. If the milk is to be retained at the household for over 2 hours then cooling is essential as the milk quality can deteriorate very quickly at normal environmental temperature.

Financial Plan of Packaged Milk:

Venture Cost Estimation

Venture cost	**Tk.**
Deep Freeze	30,000
Sealer machine /yr. #3 @3000	9,000
Milk cane Aluminum #3 @6000	18,000
Measuring machine #2 @3000	6000
Tube well	20,000
Electric Fan	5000
Fat measuring machine	50,000
Total Cost	**1,38,000**

Estimated Sales Revenue Projection per day

Revenue (Per Day)	500 Liter	400 Liter	300 Liter
Selling Price per packet Tk. 50	25000	20000	15000
Total Revenue	**25000**	**20000**	**15000**

Estimated Profit and Loss Account per day

	500 lit	400 lit	300 lit
Revenue per day	**25,000**	**20000**	**15,000**
Less: cost per day			
Cost @ 40	20000	16000	12000
Cost for electricity	100	100	100
Cost for packet and printing @.25	125	100	75
Cost labor	1000	1000	1000
House rent/day 100	100	100	100
Transport cost	500	500	500
Other cost (vet, tax etc.) 1 per lit.	500	400	300
Total cost	**22325**	**18,200**	**14,075**
Net profit per day	**2625**	**1800**	**925**
Monthly Income	**78750**	**54000**	**27,750**

Target Customer and Price: Packaged milk can be sold to the local and regional market. It can be sold directly to the customers and also to the retailers in the local and the regional market if proper branding can be done. The price for packaged milk can be TK 50 per liter.

Promotional Plan: Several action plans can be taken for promotion and placement of packaged milk such as:

- Brand Name selection
- Logo Designing-
- Packaging Designing-
- Contractual arrangement with retail grocery shops for supplying of packaged fresh milk.
- The package size would be 500 mili liters as it is of high demanded.
- School and household base promotion (family meeting with leaflets)
- Channel Promotion (leaflet, sales incentives, etc.)

An initial capital of Tk. 1,50,000/= can be provided to a CBO. CBO members can collect the money themselves and start business of selling milk through packaging instead of selling it raw individually. They will get more profit through this process. Also by making linkage with regional market they can increase their present income.

Ghee & Sour Yogurt

Ghee is clarified butter made from milk. Cream is separated from milk by cream separation machine or by indigenous method and boiled to produce ghee. After making ghee, fat free milk remains. From this milk Sour Yogurt is produced by stirring milk thoroughly and inoculated with 3% starter culture and kept undisturbed until complete coagulation (5-6 hours).
Ghee and yogurt can be a potential value added products for market intervention. With less effort the raw milk can be turned to ghee and yogurt and sold at a value added price which can yield more profit for the farmers and also the milk processors.

Financial plan of Ghee and Sour Yogurt:
From 40 Liter Milk, 1.5 Kg Ghee and 30 kg sour yogurt is produced. The cream can be separated by hand churning machine and the cream is used to make Ghee and the fatless milk is then used to make sour yogurt. A hand churning machine costs Tk 60,000 for manual and up to Tk 100,000 for digital machine.

Venture cost Estimation

Venture Cost	**Tk**
Hand Churning Machine (Milk Cream Separation)	60000

Estimated Sales Revenue Projection per day

Revenue (Per Day)	
Sales- Sour Curd (30 Kg x Tk 100)	3000
Sales- Ghee (1.5 kg xTk 800 per Day)	1200
Total Revenue	**4200**

The price of per kg of ghee and yogurt is Tk 800 and Tk 100 respectively in the local and regional market. Estimated revenue of Tk 4200 can be generated per day from selling Ghee and sour yogurt.

Estimated Profit and Loss Account per day

Revenue (Per Day)	
Sales- Sour Curd (30 Kg x Tk 100)	3000
Sales- Ghee (1.5 kg xTk 800 per Day)	1200
Total Revenue	**4200**
Less: Cost Per Day	
Milk (40 Litre x Tk 38)	1520
Fire wood (80 Kg x Tk 4)	320
Labor Cost	600
Packaging cost (Tk 10 per Kg)	300
Wastage Cost	200
Total Cost	**2940**
Net Profit	**1260**

Raw milk costs Tk 38 (Average) at the local market. Other than raw milk other cost factors for ghee and sour yogurt production are fire wood, labor cost and packaging cost. A wastage cost is considered because these products are degradable. After incurring the costs an estimated net profit of Tk 1260 can be earned from daily operation.

Value Addition from ghee and sour yogurt is 42.9%.

Target Customer and Price: Ghee can be sold to the household customers and also to industry processors. The price of 1kg of ghee is Tk. 530 in the local market.

On the other hand yogurt made from the fat free milk remains can be sold to household customers, local consumers and also to the regional market. The targeted customers can be household consumers and people of all demographic groups as it can be consumed by people of all ages. The price of 1kg sour yogurt is Tk. 100 which is affordable for the customers and also can bring profit for the processors.

Promotional Plan: Ghee can be sold by packaging and selling directly to customers or selling through local retailers. Branding and packaging can be used to promote the product. If proper quality and nutritional value can be insured it can have a potential market for the product. At farmers level as they are not producing bulk quantities therefore branding cost can be a burden for them therefore they can sell it to processors or to the local customers. With proper distribution of the product and proper positioning it can generate high income.

For sour yogurt, it can also be marketed in the same manner. Packaging and branding the product and ensuring the quality can help to establish a strong customer base. The product has high demand in local, regional and national market. With proper linkage with the companies and retailers this product can generate high income.

Chhana (Unripen Cheese)

Chana is fresh unripe curd cheese made from milk. Chana is prepared by adding food acid, such as lemon juice, vinegar, citric acid or yogurt to hot milk to separate the curds from the whey. The curds are drained in muslin or cheesecloth and the excess water is pressed out. The resulting chana is dipped in chilled water for 2–3 hours to improve its texture and appearance. Chana can be used to make sweetmeats such as rasogolla, sandesh. Also it can be favored with sugar to make it as a sweet product. It can be a potential milk product which can generate more profit with minimum value addition and effort.

Financial Plan of Chhana:
From 40 Liter Milk, 8 Kg chana can be produced. For Chana production the venture cost required is negligible because it can be made by mixing citric acid with milk. It does not need any machine added materials.

Sales Revenue Projection Per day

Revenue (Per Day)	
Sales (220xTk 8 per Day)	1880
Total Revenue	**1880**

The price of 1 kg Chana is Tk 220. Daily estimated revenue of Tk 1880 can be generated from selling 8 kg Chana which is produced from 40 kg milk.

Profit and Loss Account

Revenue (Per Day)	
Sales (220xTk 8 per Day)	1880
Total Revenue	**1880**
Less: Cost Per Day	
Milk (40 Litre x Tk 38)	1520
Total Cost	**1520**
Net Profit	**360**

A net profit of Tk 360 can be earned from selling Chana. It does not require any installation cost so the profit can be earned easily and also the demand for Chana is high as it is used in production of sweetmeat. Value Addition from Chana production is 23.7%.

Target Customers and Price: Chana is used to make sweetmeats as rasogolla, chamcham, sandesh. So it can be sold to local and regional and national sweet producers. Also by flavoring the Chana it can be sold to the local customers directly. School children and local customers can be the target customers. From 40kg milk, 8 kg Chana can be made if the milk has adequate fat percentage (3.5% and above). The more the fat percentage in milk the more Chana can be produced. Each kg of Chana can be sold at Tk 220 to Tk 250.

Promotional Plan: Chana has high nutritional value. School children and local customers can be potential customers. Informing the local school children and local customers about the nutritional value with the help of workshops and seminars can be an effective tool to promote such product. Also having linkage with the local sweet shops through farmers association can generate a high sale of the product.

Sweet Yogurt

Yogurt is custard like semi solid, acidified dairy product made by fermenting partially evaporated with a special culture containing lactic acid producing bacteria. To make sweet yogurt, whole milk is weighed and heated to boiling temperature until reduced by 20% of the volume of milk. Sugar is added to the milk at the rate of 10% at the boiling time of milk. Milk is stirred thoroughly and inoculated with 3% starter culture poured into several plastic cups. Then the cups are kept undisturbed until complete coagulation (5-6 hours). Sweet yogurt is a popular product in the local, regional and national market. High quality sweet yogurt can be marketed and can generate high income for the producers.

Financial Plan for Sweet Yogurt:

Sweet yogurt is a potential milk product which is demanded all over the country. From 40 Liter milk 320 cups of sweet yogurts can be produced. For installment several items such as saucepan, showcase, utensil, tube well and house rent are required. The venture cost is given below:

Venture cost Estimation

Venture Cost	**Tk**
saucepan (Three)	6000
Showcase	20000
Utensil cost	5000
Tube well	15000
Total	**46000**

Sales Revenue Projection Per day

Revenue (Per Day)	**TK**
Sales- Sweet Curd (320 Cups x Tk 15 per cup)	4800
Total Revenue	**4800**

The price of Sweet Yogurt is Tk 15 per cup. From selling 320 cups, revenue of Tk 4800 can be earned.

Profit and Loss Account

Revenue (Per Day)	
Sales- Sweet Curd (320 Cups x Tk 15 per cup)	4800
Total Revenue	**4800**
Less: Cost Per Day	
Milk (40 Litre x Tk 38)	1520
Fire wood (40 Kg x Tk 4)	160
Sugar (4Kg x Tk38)	152
Curd Culture	20
Labor Cost	200
Cup Cost- (320 Cups at Tk 3)	960
Wastage Cost per cup (Tk 1)	320
House Rent per day	100
Total Cost	**3432**
Net Profit	**1368**

Other than the installation cost, daily cost factors for production are sugar, labor cost, cost of plastic cups and fire wood cost. After considering the net profit of Tk 1368 can be earned daily. Value Addition from Sweet yogurt production is 39.68%.

Target Customers and Price: Sweet yogurt has a vast customer base. People of all age likes sweet yogurt. It has high nutritional value and it is consumed as dessert at local, regional and national level. It can be sold at public squares or at sweet shops. From 40 liter milk, 320 cups of sweet yogurt can be produced. ThePrice of 1 cup of sweet yogurt is Tk. 15.

Promotional Plan: This product can be sold to local and regional sweet shops. Also it can be directly sold to the customers by setting up different outlets in public places such as cinema halls, schools and public squares. This product is popular in the market so promotion is not a major factor to be considered but placement is important. If an effective channel can be maintained between the local firm level processor and the sweet shops or retailers then this product can be marketed more efficiently and more income can be generated.

Sweetmeat

Sweetmeat is a potential existing product in the market. If it can be produced at the farmers level either individually or as an association then with minimum effort and value addition a good amount of income can be generated which is higher than that of selling raw milk. Sponge sweet, Rasogolla, Sandesh, Kalogam are the popular sweets that are produced in this local market. Lacchi.

Financial Plan for Sweetmeat:
Sponge sweet, Sondesh, Rosogollah are trending sweet product in the local market. To set up a sweet shop the cost required are given below:

Venture cost Estimation

Venture Cost	**Tk**
Iron Made Bowl	6000
saucepan (Three)	6000
Showcase	20000
Utensil cost	5000
Tube well	15000
Total Venture cost	**52000**

Lassi

Lassi can be marketed mainly during summer. It can be ventured with the use of small movable van at public places. To set up such small business the installation cost required are:

Venture Cost	**Tk**
Van	30000
Blender	5000
Utensil	**3000**
Total Cost	**38000**

Sales Revenue Projection (Per Day)

Revenue (Per Day)	
Sales- Lassi (60 Litre x Tk80)	4800
Total Revenue	**4800**

From 30 Liter Milk, 60 Liter Lassi can be produced. Price of each liter lassi is Tk 80. Estimated sales can amount to Tk 4800 daily.

Profit and Loss Account

Revenue (Per Day)	
Sales- Lassi (60 Litre x 80Tk)	4800
Total Revenue	**4800**
Less: Cost Per Day	
Milk (Tk 38*40 kg)	1520
Labor Cost	600
Bottle cost (Packaging)	300
Sugar (500gm)	19
Micelleneous cost (Lemon & salt)	30
Ice	100
Total Cost	**2569**
Net Profit	**2231**

After considering the cost factors daily profit of Tk 2231 can be earned from this business. Value addition from Lassi Production is 86.8%.

Target Customers and Price: The target customers for sweetmeats are people of all ages and category. Especially it is demanded during festivals and occasions. For the smaller level producers end the main customers are the retailers and sweet shops. At retailers level the end customers are the targeted customers. Each sweet item have different price based on the specification. The price of 1kg sponge sweet, rasgolla, sondesh and kalojam are Tk200, Tk160, and Tk160 respectively.

Promotional Plan: As these are existing products in the market so placement is more important factor than promotion. Local and regional customers are already acquainted with the products so if it can be placed in the desired locations in the form of small outlets or small shops then it can attract more customers. Quality should be maintained to develop high customer relationship. For the producers' level, keeping a strong supply channel with the retailers can generate more product flow and generate more income.

Making the development sustainable

A small farmers association can be made to teach about the procedures of making these products and it can be marketed by the association and profit sharing can be done. This way the farmers can be benefited.

Major hindrance for these type of products is that it is degradable, and if it is not stored properly, the value can be lost, also if it is not distributed within a certain period than it can lose its value. So proper storage and chilling facilities is a major issue in marketing such products also transportation facilities should be strongly monitored.

A linkage development between the producers and the retailers and sweet shops can be developed to ensure the product flow from the producers to the customers.

Basic requirements to initiate dairy based cottage industries in the locality are:

- ✓ Technical skills for making value added milk based products.
- ✓ Necessary investment for purchasing equipment and operating capitals.
- ✓ Practice quality control to ensure product consistency and food safety.
- ✓ Proper business management skills
- ✓ Promotion and networking for marketing of value added products.

Marketing Plan at a Glance

Potential product	Target Customers	Pricing	Promotional plan	Placement	Competitive product
Packaged Milk	Household customers, local and regional retailers and grocery shops.	Tk 50 per Liter	Brand Name selection- Logo Designing- Packaging Designing-	Contractual arrangement with retail grocery shops for supplying of packaged fresh milk. The package size would be 500 mili liters as it is of high demanded. School and household base promotion (family meeting with leaflets) Channel Promotion (leaflet, sales incentives, etc.)	Soft Drinks, energy drinks.
Ghee and Sour Yogurt	Local sweet shops, consumers of all age. Household customers.	Ghee-Tk530/Kg Sour Yogurt-Tk100/Kg	Branding and packaging, communicating with the retailers. Direct selling to the customers through direct marketing.	Small sweet shops. Creating a supplier chain to ensure the product flow to the end customers.	
Chana	School Children, local and regional consumers. For farm level producers, local sweet shops can be target customers.	Tk 220-Tk250 per Kg	As it is an existing product it does not need much promotion. If there is a plan to produce at an industry level production then branding and packaging can be done. At farmer level, creating a supply chain can be useful.	This product can be sold to sweet shops as it is used in preparation of other sweet products. Also sweetened and flavored it can be sold to customers with the help of small outlets or shops.	
Sweet Yogurt	Target customers can be	Tk 15 per cup	It can be promoted by branding and	Opening small outlets or sweet shops in public squares or in	

Potential product	Target Customers	Pricing	Promotional plan	Placement	Competitive product
	people of all ages. Especially it has a demand for special events and occasions.		setting out outlets in local and regional branding. Ensuring high quality can also ensure a good customer base	front of schools. Selling to retailers and bigger sweet shops at local and regional market.	
Sweetmeat	Target customers are people of all age group. Sweetmeat has demand in local and regional market.	The price of 1kg sponge sweet, rasgolla and sondesh are Tk200, Tk160 and Tk160 respectively.	At enterprise level, promotion through branding and advertisement can be done. At small scale farm level, creating a linkage with the sweet shops can be an effective way for promotion. Also ensuring high quality can attract more customers	Opening small outlets or sweet shops in public squares or in front of schools. Selling to retailers and bigger sweet shops at local and regional market.	
Lacchi	Lacchi is highly demanded during summer. It is popular among all types of people. It can be sold at public places during the summer season	Tk 80 per Bottle/glass	It can be sold with small outlet; van, small shops. It can be bottled and branded and promoted in the local and regional market	Opening small outlets such as moving van or small shops at public places such as cinema halls, schools, public squares	Soft drinks, energy drinks.

Schools as a Potential Market

There are on an average 30 kindergarten schools in every upazilla of char areas. Every kindergarten has 150-200 students. There are also some primary schools, and high schools. Schools can be a big market for milk produced products. Study found that 50% students of kindergartens bring Tiffin at present. They usually bring rice, noodles from home. Sometimes they purchase foods like chutney, ice-cream, nuts, jhalmuri and other things from in front of school. These types of purchased foods are not hygienic and not good for health. No alternative options are available at present. So they are bound to having this. Milk and milk based products can be a better option for students as Tiffin.

Items can be promoted in school as Tiffin are as follows:

- Flavored Milk
- Lacchi
- Yogurt
- Sandesh

According to the teachers and guardians 70% students will take milk and milk based items as Tiffin if anyone can offer such kind of products. But it requires awareness to motivate.

To market this products business enterprise should collaborate with schools. If schools authority is satisfy about the quality of the product then it will be easier to make it attractive to the students and guardians. So firstly quality should be ensured to make it acceptable to the teachers. Teachers should be informed about the hygienic factors of milk.

Workshop can be arranged to aware the guardians, teachers and students about the nutritious value of milk and milk based products. Guardians should be given more emphasis as audience because they are decision maker what children will eat. But it should be attractive to the students otherwise they will not accept it.

Mini-vans can be introduced in front of school to sell these types of milk based products to the students. For lacci, yogurt and sandesh mini-van must have frizzing capacity. During our study teachers suggest to start it as pilot basis.

Venture cost Estimation

Venture cost	**Tk.**
Specialized cooling Van	30000
Total Cost	**30000**

Sales Revenue Projection Per day

Revenue (per day)	**Tk.**
Lacchi 60 glass @15	900
Yogurt 30 cup @15	450
Flavored milk 30 glass @15	450
Sondesh 30 piece @10	300
Total Revenue	**2100**

Profit and Loss Account

Total Revenue		**2100**
Less: Costs		
Cost for Lacchi		
Milk 10.5 Lit @40	420	
Suger 1.5 Kg@40	60	
Labor	50	
Plastic glass	60	
	590	
Cost for Yogurt		
Milk 3.75 Lit @40	150	
Labor cost	40	
Plastic cup	60	
others	30	
	280	
Cost for Flavored milk		
Milk 6 Lit @40	240	
Flavor addition	30	
Labor cost	15	
Plastic glass	30	
	315	
Cost for sondesh		
Milk 3.75 Lit @40	150	
Suger 1 Kg@40	40	
Labor cost	15	
others	10	
	215	
Total cost		**1400**
Net Profit per day		700

FINDINGS ON MAIZE VALUE CHAIN

The Industry

The growth of the maize subsector in Bangladesh experienced a downturn in last decade, despite its significant yield rate (around 60 Maunds per acre). This was due to the sudden dive in the poultry industry plagued by avian influenza (AI) endemic; this resulted in a drastic fall in the demand for poultry feeds since late 2000s, and in turn severely impacting the maize sector livelihoods. Today, maize farming in Bangladesh is still being widely adopted but is subject to embedded inefficiencies. If afforded the adequate attention, local production could meet up 84% of the country's national demand. This report identifies the maize sector and its forward market (value addition) as one with great potentials for expansion.

The growth of the maize sector is a fairly recent phenomenon in Bangladeshi agriculture. Maize farming has been gradually gaining momentum over the past few decades. In the 2007-08 fiscal year (FY), the sector reached its peak, with a national demand for maize seed at 6876 MT (as compared to 538 MT in the 2001-02 FY). During that year, maize cultivation accounted for 0.38 million hectares of land (see Table 6). However, reflecting the major crash in the poultry industry in the following year resultant of the avian flu epidemic, the, demand for maize also shrunk significantly. This, in turn, drastically decreased the demand for seed by farmers. This catastrophe negated the new found growth of the maize subsector, and dragged it back to chronic underperformance, to the effect that in the 2010-11 FY, the national demand was even lower than 2006 levels.

Consumption & Usage

Household Consumptions

A minimum portion (1%) of the maize production in the study area is directly consumed by the households. It is consumed commonly by boiling the cob or baking it in coal, some households also cooks it like rice. Besides that some low income households grinds the maize and makes Roti out of it. Popcorn is not popular in the local market but has popularity in the urban areas.

Feed for Livestock and Fishery

Almost 90% of maize produced in the target area goes to feed processors for poultry, cattle, and fish. Poultry industry is a major sector which demands the fodder; as a result the demand for maize for fodder production has increased the production of maize. The demand for fodder is increasing as a result the demand for maize soaring continually.

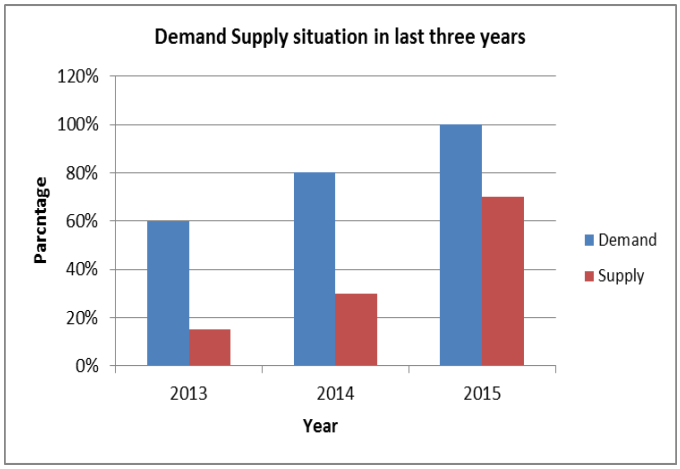
Food ingredient (supplement of wheat)

Use of maize as supplement is increasing. Maize is used in wheat flour mix (around 15%-25%) in local markets; the incentive for this mixing is done to keep to cost low (as maize is cheaper to wheat). Chanachur, bread, biscuit and other bakery item producers also mix powdered maize with flour for their products.

Market Viability

Supply versus Demand

To analyze the demand supply situation of maize demand of 2015 was taken as basis of previous and current data. Study estimated the current demand is 100%. Current supply is 70% of total demand. In 2014 demand was 80% and supply was 30%. In 2013 was demand was 60% supply was 15%. So it is found that demand is increasing as well as supply. Supply increased as a result of different supportive activities of NGOs. As supply increased different parties demanded for locally produced maize. So currently there is a lack of supply compared to demand. There is 30% excess demand in local market.



Who markets – actors in Maize value chain

Farmers

For last few years farmers are more tend to produce maize then the other crops as the demand for raw maize has increased evidently and farmers it appears to be more profitable than the other crops. Farmers do not have the storing facilities at their end that can ensure the quality for long time as moisture level is a major factors that determine the quality of the maize. So they try to sell out from their end as soon as they can. The minimum time while they are keeping it at their end, they try to keep the grain as dry and clean as possible in a natural ways like drying under the sun or using nets or large plastic sheets to keep it clean.

In the most case scenario the traders (small traders or Foria) or collectors come to farmers end to collect the products but in some cases farmers take their products to the nearest market and sell their products in available market price.

Small Traders & Forias

Foria are traditional small-scale floating traders who act as profiteering middlemen between the small farmers and the trade markets. They buy directly from the growers and sell to other traders or to local markets. They collect various crop and farm products directly from the farmers by approaching them door-to-door in their communities. They buy from the farmers for the lowest negotiated prices possible and smaller farmers with limited market networks comply having no other viable buyers for their products.

Small traders are, to some extent, similar to forias, except that they do not accumulate their purchases via door-to-door processes. These traders station themselves at local market places (with or without permanent business outlets established) and buy different products including maize from forias or even directly from farmers who come to the markets to sell their produce.

Contractor

Contractors follow a different approach to farmers; they get into contract (often neither written nor formal) with farmers and bind them to cultivate products and then sell the produce solely to them after harvesting. In this regard, contractors provide farmers with some basic and essential supports like seed, fund, technological knowledge and some other forms of support. Contractors then sell their products to mainly large-scale processors or feed millers or sometimes even to the wholesalers. Contractors generally extend their operations over a wide business territory, with businesses in multiple market places, and sometimes in multiple districts. Monopolizing on their extensive business areas, they exist in particular positions in the chain.

Processing Companies (Livestock Feed Mills)
Industrial Processors are amongst the largest types of business actors. They process agro-products into different intermediate and/or final goods. Even if some industrial processors exist as medium scale operations, they still are the ultimate actors in the core value of maize.

Processing companies (Food Ingredients)
A small portion of maize is used for making food ingredients and household consumption. Some local and other food processors are using maize mixed flour in making bakery items such chanachur, biscuits etc. Also local people are using maize flour for their household consumption.

Market and its trends

The study found that presently, maximum portion, up to 90% of local production of targeted area are going in to feed mills (Poultry, Fish and Cattle feeds). Maize cultivation has remarkably increased in last few years (4/5 years).Farmers are finding it much more profitable comparing with paddy or other alternative. After reaping and grinding, farmers try to sell their products to local traders or collectors. In most of the cases the traders/collector comes to farmers' end to collect the products (grain) as there is a constant and increasing demand at the market mostly for Feed Mills. And as the farmers do not have any storing facilities at their end, they try to sell out their products before it loses its quality. And the remaining portion is being used in other industries or self-consumption with needful value-addition i.e. Pop Corn, Flour, Chips, Bakery products etc.

Flour
In Dimla, there are 6 flour mills. Per day production of flour mill is 30 mounds (approximate). Total production of 6 flour mills per day 180 mounds. Most of the cases the flour mills operate 240 days in a year. It means total production of 6 flour mills at Dimla is 43200 mounds/per year.

On an average 20% (15 -25%) maize flour is mixed with wheat made flour. So, 8,640 mounds maize flour is used in flour (which is sold as wheat flour in the market).

In Nilphamary district the total production of flour is approximately are 288,000 mounds/year. If all the flour mill use maize with wheat then totals use of maize flour in this district is 57,600 mounds/year.

According to FAO, Institute of Nutrition and Food Science, Bangladesh an adult person requires 40 gm. of flour every day for his/her nutritional intake. This estimates yearly demand of flour at Dimla around 77,000 mounds and in Nilphamari 53,5595 mounds.

In Kawnia, there are 5 flour mills using 42,000 mounds of maize flour with wheat made flour. In Rangpur district the total production of flour is approximately is 378,000mound/year. Among the total production, 75600 mounds/year are maize flour.

The total demand of flour at Kawnia is around 66,430 mounds and in Rangpur, it is 841,276 mounds in a year.

In Bakshiganj, there are 4 flour mills using 33,600 mounds of maize flour with wheat made flour. In Jamalpur district the total production of flour is approximately are 319,200 mound/year. Among the total production, 63,840 mounds/year are maize flour.

The total demand of flour at Bakshiganj is around 63927 mounds and in Jamalpur it is 669,460 mounds in a year.

Bakery Items

In Dimla there are 2 Bakeries who produces bread, biscuits and other items**.** Total requirement of flour in these 2 bakeries are 1200 mound in a year.12 percentage of maize four is used to make these items.

In Nilphamari district the total number of bakery is 40.The daily requirement of flour is 120 mounds. Yearly requirement flour is 24000 mounds. If they use 12% maize flour, the total yearly requirement of maize flour in Nilphamari is district is 2880 mounds.\

Kawnia, no bakery exists. Bakery items are imported from neighboring areas. In Rangpur there are 40 numbers of bakeries. Per day requirement of flour for those 40 bakeries are 160 mounds. For a year this figure is about 32,000 mounds. If the bakeries use 12% maize flour to produce bakery items, then the total demand of maize flour in Rangpur district is 3840 mounds.

In Bakshiganj, there are 6 Bakery. Those 6 bakeries require 12 mounds of flour every day. It means in a year the total requirement is 2400 mounds. And the requirement of Maize flour is 288 mounds in a year.

In Jamalpur number of Bakery is 32.The daily requirement of flour is 64 mounds. The yearly requirement is 12800 mounds of flour. And the requirement of maize flour is 1536 mounds.

Prices

The pricing of Raw Maize in different channels are given in the chart below:

Channels in value chain	*Cost price per mound (in BDT)*	*Sales price per mound (in BDT)*
Farmer	300	550
Trader	550	600
Contractor	600	650
Processor	650	Depends on product

It is noticed that there is no fixed pricing policy for maize sector from government level as there is a policy practiced regarding price for paddy or some other crops. As a result the large processing farms those who are at the top of the chain are having the complete control which is causing atypical instability and fluctuation of price, harming the other actor in the chain specially the farmers.

Value Addition and Profit Margin

The value addition at every level of the chain depends on related prices and costs of inputs and services, which vary widely across areas and times. At the farmer level, they have an average cost of production at BDT 9000 per bigha per season. Our study also found that the average yield rate for these areas would be 30mound per bigha, with an average price at BDT 550 per mound. Converting them to kilogram, we project that farmers in *Chars* add the value at around BDT 6.25 which is 62.50% of the total value addition. The remaining 37.25% of the value addition is attributed to different traders going up to the processors.

Level in value chain	*Cost per kg (BDT)*	*Sales price per kg (BDT)*	*Value addition (BDT)*	*% to total value addition*
Farmer	7.5	13.75	6.25	71.44%
Trader	13.75	15	1.25	14.28%
Contractor	15	16.25	1.25	14.28%
Processor	16.25	Depends on product		

Total value addition= Tk. 8.75

Profit Ratio

At farmer level cost per kg is Tk. 7.50

Actors	*Farmers selling price to actors (in BDT)*	*Profit ratio of farmer*
Trader	13.75	83.33%
Contractor	15	100%
Processor	16.25	116.66%

Large scale Collectors/ Traders: They exist in the local market considered as the large scale collectors or traders (local known as Mahajan) playing a role as a hub or a selling point for all the other small scale collectors (Foria) and some time for the farmers too. They ensure the quality of the product based on the moisture level (12 % - 14%), cleanliness and the size of the grain. Quantity and price both depend on these factors. For the lowest percentage of moisture they pay higher price and collect the maximum quantity. But the farmers do not have the access of expensive technology to ensure and be confident about the moisture level of their produce. And in the most case scenario they are incapable to afford or avail the drying facilities like chatal or other dependable storage, neither can they use the technology to fan the dust out from their products. As a result they tend to sell out from their end as soon as they can in whatever reasonable price they are having. This state of affairs put them off from the fair bargaining ground and gives the buyer the sole control to determine the price. As a result they (farmers) often get deprived from their deserved price. Furthermore, it is also being observed that these collectors are collecting the quantity based on the demand and price determine by the feed millers. So, even if the total quantity of production and supply at the local markets are sound or high, there is uncertainty of sells existing at the farmers end. And as the demand and price is being determined by the feed millers or the midlevel large scale collectors solely, the sound flow of demand and supply is being hampered causing the farmers being deprived from their deserved price.

Feed Mills: They hold the position as a largest buyer of the entire local production. Around 90% of the local production of maize is going to feed mills. They are the ultimate and actor who hold s the control of the current market solely. Large scale collectors / traders play the roles of biggest suppliers for them. And the supply quantity depends on their demand and determined price. As there is no price policy is given from the government level for maize, they solely control the price in the current market. The quality of the product depends on the moisture level (12 % - 14%), cleanliness and the size of the grain. The buying quantity and price both depend on these factors too. In the current market scenario farmers have no direct linkage with these feed mills. Throughout the study it's been found that demand of raw maize for feed mills are continuously increasing and around 70% of the demands are being fulfilled by the local production and remaining 30% is being imported. However, as the feed millers determine the maximum portion of demand of the current market they also hold the control of the market price. Their buying and storing quantity and capacity can create unusual behavior in the sound flow of demand and supply.

Potential Market for Value Added Maize Product

Feed for livestock and Fishery: The processor who are using maize for poultry and fish feed are purchasing from contractors or from wholesalers. For this reasons the farmers are not getting the much benefit. Linkage between farmer and processor can be made which will benefit both parties. Linkage can be done by contract faming which will ensure the sales of produced maize. Maize will be produced according to the demand of the processor and that maize will meet quality conditions of processor. Farmers will get higher price which will increase their profit margin (BDT 30 to 80 per mound). Processors will get the maize at lower price compared to current price.

Food Ingredient (Bakery Items): Bakery items (*Chanachur,* bread and biscuits) producers are using maize as supplement of wheat. Flour mills are commonly using maize with wheat for making fours. Mix of maize and wheat thus decreases the production cost of flour. On the other hand the end level consumer of these products is mostly unaware of such issues. They are neither aware of the nutritional values of maize or in some cases consumers might have to some extent a negative response if they come to know about the mixer as they usually know or expect that it is wheat that is solely used to produce those products. Branding and promotional activities regarding the nutritional values and diversification of different maize products can contribute remarkably to increase the market.

Others: *Popcorn*, *Flavored Popcorn and Roasted corn* can be potential value added products. Popcorn is a popular item in urban area but it is not so much known to local people. Popcorn can be introduced in district city and upazilla level it can be a popular item for customer of all age level. Popcorn is made from popcorn variety. 50% of total popcorn variety grains produce in Bangladesh and other 50% imported from Australia. If the beneficiaries can be motivated to produce this variety it can be a potential sector in the market. Roasted corn can be a seasonal business. Roasted corn will be a good one if quality of maize is ensured.

Gendered Market Analysis

Position of men and women across maize value chain

Being at the rural distance from the modern or urban civilization, the social infrastructure, norms or culture of the study areas have its own different face which, in some extant are not encouraging or for women in the community. But for sake of survival and betterment of life each and every individuals are called out to take part, contribute and to fight away the challenges that stands firm against them. Thus, the women of the community and their treasured participation in agricultural production and advancement are undeniable. Considering the poverty strains and odds it is a necessity to share the load between men and women of the households. Women of studied area are vital participants in the production activities.

Besides their customary household works they are taking part and found to be more involved in post-harvest activities for maize farming, with some sporadic participation in on-farm operations. Women's contributions are above 80% in the areas of harvesting and shelling maize ears, and processing the maize kernels (performing jobs like drying, cleaning, sorting, etc) On the other hand, men (household or labors) are found to be mostly performing activities that involve intensive physical-strength (like tilling, weeding, sowing etc.) and also chemical-exposure (fertilizing, spraying pesticides etc.).They are also more prevalent in activities that require travelling far distances, or to mainland market places, to purchase inputs, or to transport their produce to the markets, and the likes. Notably, in male-absent households, women perform the typical male-prevalent activities, or manage it with the help of neighbors. The study data calculates that roughly 41.5 man-days are required per bigha every season for the whole bundle of activities under maize farming. This, however, is not indicative of the total time required for the entire maize cultivation in a season, as it excludes the waiting time of each activities.

In some area under study, (especially in Jamalpur) it is being noticed that the society is a bit conservative regarding the outdoor involvement of women in different income generating activities (IGAs). Same scenario is reflecting in maize value chain as well. Women are playing important and significant role in post-harvest level but as the reachable local markets are not women friendly, they have to depend on male members. Their limitation of technical skills and knowledge stands as drawbacks and reason to depend on male members too. Being inadequate about the market trend and bargaining skill at the forward market, women are also being mistreated or deprived from their rightful price for their products or other facilities. Distance and poor transportation facilities are also considered as a major barrier for women where absence of male members brings them to a dead end and expenses for hired labor reduce the profit margin. Besides, as their daily on-firm involvement is much demanding and engaging them in the field or other firm work, their other household members specially children are being deprived from proper time and guidance.

But it is noticed that if the surrounding factors like societies, transportation or distance and Market places can be supportive and women friendly then the community women are willing to be more involved in further forward market activities.

Activity Map

	Activities	Job distribution		Man-days (per bigha)	Comments
		Male	Female		
Land Preparation	**Purchasing Inputs**	80%	20%	1	--
	Tilling (3 times)	60%%	40%	3	In case of manual tilling using cattle, its average man-days are 6.5. However here we assume power tiller which happens in 90% cases.
	Weeding	40%	60%	2	--
	Irrigation	60%	40%	2	Man-days vary on the degree of water necessity
	Fertilizing & pest controlling	100%	--	1	--
	Furrowing (in rows)	50%	50%	2	
	Sowing	10%	90%	2	Man days vary based on farmers' expertise and density of sowing
	Irrigation	70%	30%	12	Varies on the degree of water necessity; general practice of watering in *Char* land is 6 times after sowing, each requiring 2 man-days
	Re-fertilizing	80%	20%	2	--
	Pest Controlling	100%	--	1	--
	Land Re-cleansing	30%	70%	2	--
	Harvesting	20%	80%	2	Depends on maize production
	Fetching to Home	90%	10%	3	Depends on distance and maize production; average of common responses (2-4 man-days)
	Processing (Shelling)	20%	80%	2.5	--
	Processing (Drying, Cleaning, Sorting etc.)	20%	80%	3	Man-days depends on sun, level of dryness desired by farmers etc.
	Selling	70%	30%	1	Selling
	Total			41.5	

Knowledge Map

The study found that women are mostly involved in the post-harvest activities. Maize cobs are shelled either by hand or machines. Shelling machinery was not widely available or affordable. In most cases, shelling is done by women at home. Shelling by hand is time consuming, and can cause damage to the hands of the women who shell huge loads. Women lack knowledge on drying techniques and moister contain. Women are also not aware about the market price as well as value added products.

Women Leadership in Maize Value Chain

From last few years the demand and production of maize has increased remarkably in the study area. It's been found that Women are involved significantly in/with on-firm activities especially in post harvests level except the work that demand intense physical labor. In the overall picture of maize sector under the study area it is also being observed that their role and function can be formalized and their skills can be improved. Training or workshop relates to their involvement and their role (on-firm or in the market) will ensure the progress of the entire value chain and also can provide the betterment of their livelihood as well. A community base approach can be fruitful to encourage the women to have a leadership position. Whereas training them according to their function will turn them in to skillful actors in the value chain. Supports to avail technological supports, transportation system, storing facilities and markets that is women friendly and training to increase their knowledge to produce different verity of maize can give the community women a robust stand the in the value chain. In the present practice the society is somewhat reluctant to engage the women beyond on-firm activities in the value chain. But, some forceful approach from the community level with the support of the local NGOs can bring them out of traditional drawbacks. Empowering the women leadership in community level or construction of women focused CBOs to encourage them for group base or individual entrepreneurship can be obliging. Moreover, training and workshop to make the community women skillful and erudite in order to set them forward for some direct linkage with the market can be prolific.

Forward Market Constraints

Key constraints in forward market of maize value chain are:

- Poor linkage between farmers and feed mill leads farmers to sell produces to intermediaries result in less profit
- Lack of knowledge of farmers about production technique of value added product resulting low income

Forward Market Opportunities

Linkage potential with Processors (Feed Mills)

A calculation of return benefits:
At farmer level cost per maund is Tk. 300

Different actors	*Farmers selling price to different actors*	*Profit ratio of farmer*
Trader	550	83.33%
Contractor	600	100%
Processor	650	116.66%

From the above table it reflects that farmers have different profit ratio to different actors, which also indicates an opportunity to obtain maximum profit margin from farmers end. In the typical current practice the farmers are selling out to different collectors/traders initially. Whereas, if they (farmers) can have the capacity, facility and the technology to ensure the storage and quality of their products and if they can have a dependable linkage directly with the processor then their profit margin can reach up to **116.66**% even in the current market.

Linkage with Processors (As Food Ingredients):
At present 90% of the maize production is going to the feed mills, and making these processors as the prime controller of the price and the demand or supply flow in the current market. Diversified use of maize can create more channels for the farmers. The possible channels that the farmers can be linked to are the food processors_ such as bakeries, chips companies, noodles companies and popcorn processors. Maize or maize flour is used in producing food items such as biscuits, chips, noodles. Therefore, if the farmers could be linked with such processors to supply the maize grain or grinded maize then it may bring out some other profitable prospect for them.

Presently it is not practiced but if a linkage could be done then it has possibilities to supply a major portion of the maize production to the food processors as such and it can create scopes for the farmers to generate more income from their produce. The feed processors are exercising market price control and if more diverse supplier channel could be linked then there would be more room for the farmers to get higher price for their produce.

On the other hand, diversified use of variety (seed) can create more opportunities. Presently the farmers produce the variety which is used for feed. Introduction of varieties such as Popcorn, which has a whole different use of maize, can increase the market for the farmers.

Enterprise Plan for Potential Value Added Maize Cottage Industry

Feed Mill

Feed mill is a potential opportunity for the producers to add value to their produce and increase their income. Maize is a major ingredient for the feeds. Feed is made by mixing maize, mustard cake, rice bran and powdered dry fish. It can be started with an initial investment of Tk. 300000. The ingredients and the quantity used for producing fish feed and poultry feed are similar but the proportion is altered in each case.

Financial Plan for Feed Mill: A small scale feed mill can be set up to produce poultry feed and fish feed. The quantity and the ingredients required for producing fish and poultry feeds are similar but proportion is altered in each case. Feeds have high demand in the local and regional market and can yield high turnover for the farmers.

Venture Cost Estimation

Venture Cost	**BDT**
Machine	200000
House	30000
Electricity Installation	70000
Total Cost	**300000**

The initial set up cost for a small scale feed mill is Tk. 300000. It can be started with a farmers' cooperation.

Estimated Sales Revenue Projection for 1 year

Revenue Per 1000 Kg Feed		**BDT**
Sales	(Tk 57000 per 1000 Kg)	57000
Total Revenue		**57000**

Estimated Profit and Loss Account (For 1 year)

Revenue Per 1000 Kg Feed		**BDT**
Sales	(Tk 57000 per 1000 Kg)	57000
Total Revenue		**57000**
Cost for 1000 kg Feed		
Maize	Tk (13.75x450 Kg)	6188
Musard Cake	Tk (35x150Kg)	5250
Rice Bran	Tk(25x330Kg)	8250
Powdered Dry Fish	Tk(2x75)	150
Grinding and mixing cost	Tk (2.5 per Kgx1000 Kg)	2500
Electricity (3 unit per Maund)	Tk (9 x 75 units)	675
Labor	Tk 1000	1000
Total Cost		**24013**
Net Profit per 1000 Kg		**32988**

A profit of Tk 32988 can be earned approximately from selling 1 ton feed. Value addition from producing 1 ton of feed is 142.42%

Target customers and price: Poultry and fish feed is a demanded product in the local and regional market. With rising poultry firms and fisheries the demand for feed is also increasing. The target customer for poultry and fish feed are the local poultry firms and fisheries. It can be marketed to the local markets and district market. A distributors channel can be developed to have more product flow. Dealer workshop, banner and leaflets and farmers meeting can be an effective measure for the promotion of the product. The price of one ton of feed is Tk. 57000.

Promotional plan: Dealer workshop, banner, leaflets and farmers meeting can be an effective measure for the promotion of the product. A distributors channel can be developed to have more product flow.

Popcorn

Corn in the form of hard yellow seeds that burst open and become soft and white when they are heated is called popcorn.

Financial Plan for Popcorn:

Popcorn can be a potential maize product which can yield considerably high income with a small investment. After analyzing the current market situation and on the basis of the field survey it has been identified that popcorn consumption is rising in the cities of Bangladesh. Though it has a low demand in the local market but in the cities and other areas where there are more schools, recreational areas and public squares, the demand for popcorn is rising. With a small investment a good amount of profit earning is possible in popcorn business. The setup cost is low the turnover is high. The detailed financial plan for popcorn is given below:

Venture Cost Estimation

Venture Cost	**BDT**
Van With Popcorn Machine	50000

For starting a popcorn business it requires a Mini Van installed with popcorn machine, the cost of the van ranges from Taka 40000 to Taka 60000.

Estimated Sales Revenue Projection for 1 year

Revenue for 1 Year	**BDT**
Sales (BDT 2000 Per Day)	600000
Revenue For 1 Year	**600000**

Estimated Daily sales amounts to Taka 2000 per day.

Estimated Profit and Loss Account (For 1 year)

Revenue for 1 Year	**BDT**
Sales (2000 Per Day)	600000
Total Revenue	**600000**
Less: Cost for 1 Year	
Grain (15xBDT 47.5x300 Days)	213750
Chanda (BDT 50 Per Day x 300 Days)	15000
Gas (1500 Per Month x 12 months)	18000
Oil (160 Per Day x 300 Days)	48000
Total Cost	**294750**
Net Profit	**305250**

For making popcorn the cost factors are grain, 'Chanda', Gas and oil. The cost of 1 kg grain varies from Taka 30 to Taka 65 based on the market situation, in the estimated profit and loss analysis, and average of Taka 47.5 is considered. On the other hand the vendor has to pay Taka 50 'Chanda' daily, the cost of gas is Taka 1500 per month. In addition to that, the oil cost for daily production is Taka 160.

It is estimated from the profit and loss statement that an estimated Net profit of Taka 305250 can be earned early from the popcorn business. Value addition for per kg grain can be determined, which is as follows:
Total revenue per kg grain= Tk. 133
Total cost per kg grain= Tk. 64.13
Value addition Tk. 68.17 or 106%

Target customers and price: Popcorn is a popular product in the cities and also in the rural areas. This maize product has high potential in the market as people of all ages and income group can be a potential customer for popcorn as the price of Tk.10-20 is reasonable among all demographic groups.
Promotional plan: It can be sold with the use of outlets in the form of small vans equipped with popcorn making machine. Also it can be marketed in a large scale by branding and packaging at industrial scale. If flavor can be added to popcorn industrial scale producing will be profitable. Though large scale marketing is not possible in the local market but it can be done at the national level. With better positioning and marketing this product can generate high income.

Financial Plan Roasted Corn:

Roasted corn can be marketed for three month. Though the business period is small but it can generate a high turnover within this short period.

Venture Cost Estimation

Venture Cost	**BDT**
Van	20000
Machine	500
Total	**20500**

To start up a roasted corn business, a small van is required which costs approximately Tk.20000. A small blowing machine is required which has a cost of Taka 500.

Sales Revenue Projection for 3 Months

(This Business can be run for three Months in a year)

Revenue	**BDT**
Sales (100xBDT 10 per Day)	90000
Revenue for three months	**90000**

Each day, an estimated 100 roasted corns are sold at Taka 10 each.
A revenue of Taka 90000 can be earned from three months of operation.

Profit and Loss Account (For Three Months)

Revenue	
Sales (100xBDT 10 per Day)	90000
Total Revenue	**90000**
Less: Cost for 3 Months	
Raw Maize (100xBDT 4.5x3 Months)	40500
Coal (BDT 40 Per Day)	3600
Rickshaw Fare (BDT 60 per Day)	5400
Total Cost	**49500**
Net Profit	**40500**

The major cost factor for roasted corn is raw maize which costs approximately Taka 4.5 each. Apart from that Taka 40 daily costs for Coal and Taka 60 for Rickshaw fare. Value addition for per piece cob can be determined, which is as follows:
Total revenue per piece Cob= Tk. 10
Total cost per piece Cob= Tk. 5.50
Value addition Tk. 4.50 or 81.81%

Target customers and price: Corn roasting business is a very good source of income because it does not need a very high capital to start the business. A lot can be earned by selling roasted corn during the peak season. This business can be run for three months in a year. The target customer of roasted corn is people of all ages. The price of roasted corn that one piece of cob can be Tk.10. Quality of cob is a major issue in roasting.

Promotional Plan: Though it does not have high demand in the local market but in the cities the demand for roasted corn is considerably high. But demand can be created if it is marketed properly. Low cost strategy can be a fine way to capture the local market. People of all ages and all income groups will consume if the price is considerably low. Minivan in front school or public square or recreational area can be introduced to distribute the product to the consumer.

Maize Mixed Flour

Flour can be made by mixing powdered wheat and powdered maize.

Financial Plan for Maize Mix Flour:
Using maize to make flour has a potential market. It can be used for household consumption and also for producing bakery items. The cost of maize is lower than wheat so the mixture cost is low. To make 100 kg of this mixture, 75 kg wheat is mixed with 15 kg Maize. From grinding 100 kg of this mixture 93 kg flour is produced.

Venture Cost Estimation

Venture Cost	**BDT**
Machine	32000
House	10000
Electricity	70000
Grinder (30'Bel,30'Pulley,Chaki, saring)	13500
Total Cost	**125500**

For set up; Grinding machine costs Taka 32000, House Lease Taka 10000, Electricity installation Taka 70000, Grinder (30' Bel, 30' Pulley, Chaki and Saring). A total Venture cost of Taka 125500 is required to start the grinding business. Individual grinding quantity and cost for wheat and maize are shown below:

(Flour Mix: 75 Kg Wheat & 25 Kg Maize)

Wheat (For 75 Kg)	**Unit**	**BDT**
Wheat cost	Tk (20.50x75)	1537.5
Grinding Cost	Tk(2x75)	150
Total		**1687.5**

Maize (For 25 Kg)	**Unit**	**BDT**
Maize cost	Tk (13.75x25)	343.75
Grinding Cost	Tk(2x25)	50
Total		**393.75**

		BDT
Total Cost of the Mixture =		**2081.25**

(From 100 kg mixture 93 kg flour can be produced)

The Grinding cost and other cost factors are mentioned below:

Variable Cost

Per Kg Cost Tk. (2081.25/93)	22.38
Packaging cost	2
Total Cost	**24.38**

Fixed Cost for 1 year

Labor (Tk 500 per day)	150000
Electricity (Per mound 3 Unit)	405000
Total Fixed Cost Per Year	**555000**

After grinding, if the mixture is sold without further processing or packaging it can be sold at Taka 26.48 per kg

Profit and Loss Estimation for Grinding

Yearly Production in Kg **480000**

Yearly Profit or loss Estimation	
Revenue (Griniging) (240 Days)	12662400
Total Revenue	**12662400**
Less: Cost	
Grinding and mixing cost	11702400
Total Fixed Cost Per Year	**555000**
Total Cost	12176400
Yearly Profit	**486000**

A yearly profit of Taka 486000 can be earned yearly from grinding producing this flour mix. Value addition for per kg mixed wheat can be determined, which is as follows:
Total revenue per kg Mixed wheat= Tk. 26.48
Total cost per kg Mixed Wheat= Tk. 25.37
Value addition Tk. 1.11 or 4.37%

Profit and Loss Estimation with Branding and Packaging:

If Branding is done, Selling price will be BDT 30

Yearly Production in Kg **480000**

Yearly Profit or loss Estimation After Branding and Packaging	
Revenue (Grinding)	14400000
Total Revenue	**14400000**
Less: Cost	
Grinding and mixing cost	11702400
Branding and promotional Cost	40000
Total Fixed Cost Per Year	**474000**
Total Cost	12216400
Yearly Profit	**2186300**

If branding and packaging can be done, Taka 2142600 year profit can be earned. For branding and packaging a cost of Taka 40000 will occur. Value addition for per kg mixed wheat can be determined, which is as follows:
Total revenue per kg Mixed wheat= Tk. 30
Total cost per kg Mixed Wheat= Tk. 25.45
Value addition Tk. 4.55 or 17.87%

Target customers and price: This flour can be used for household consumption and also for making bakery products. The price will be for flour Tk. 26.48 (without branding) and Tk. 30.00 (with branding).

Promotional plan: As the price of maize is lower than wheat, so the flour made from mixing maize and wheat can be produced at a lower cost. This flour will have a lower price and has a potential consumer market. Mixed flour can be used in bakeries, household consumption and industries that use flour as raw material. To market this mix flour firstly should take the permission from legal authority.
The constraint in this business is that such type of flour is not introduced in the market yet and the consumers' acceptance of the new product is a factor to be considered.Also the BSTI's approval is also to be considered.

Marketing Plan at a Glance

Potential product	Target Customers	Pricing	Promotional plan	Placement	Competitive product
Popcorn / Flavored corn	People of all ages specially school students. Public square, diabetic patients.	Tk. 10-20 per packet	Flavor can be added to make it attractive and campaign program to inform about the hygienic factor of maize and health benefit of maize.	Small outlets can be introduced (minivan with popcorn machine). Industrial scale production, packaging and branding.	Chips, bakery items, Puffed Rice
Roasted corn	Same as pop corn	Tk. 10 per piece	By ensuring quality market can be captured and informing about the hygienic factor of maize and health benefit of maize	Minivan in front of school and public square	Puffed Rice, Roasted Nuts, 'JhalMuri'.
Flour	Household, processor (bakery item)	Tk. 26.48 per kg (without branding) Tk. 30.00 per kg (with branding)	By communicating different uses of Maize mixed Flour to the bakeries, households and industries that are using Flour as their raw materials. Attractive Packaging, Branding and advertising about the maize mixed Flour	Supply to different Bakeries, households and industries who uses flour as raw material	Wheat Flour.

Financial Plan for Proposed Products at a Glance

Particulars	Measuring Unit	Venture Cost	Production Cost (a)	Revenue (b)	Profit (b-a)	Value Addition in %
Raw maize	33 Decimal Land	Nil	9000	16500	7500	78.94%
Raw Maize Directly to Processor with Moisture (12-14%)	33 Decimal Land	Nil	9000	19500	10500	116.66%
Popcorn	300 days	110000	294750	600000	305250	106%
Roasted Corn	3 months	20500	49500	90000	40500	81.81%
Flour (Grinding)	240 Days	125500	12176400	12662400	486000	4.37%
Flour (With Branding and Promotion)	240 Days	125500	12216400	14400000	2183600	17.87%

THE END

Conclusion for Dairy Forward Market Scopes

Farmers, being on the bottom line of the chain are often being deprived from the profitable prospect that lies ahead of the value chain. The REECALL projects with its activities aiming to emphasize on the drawbacks and the possible opportunities which can lessen the poverty strains for the farmers. Throughout the study, considering the traditional present practice, it shows that few alternation and initiatives can bring positive changes. Farmers often fail to point out the prospects that can lead them to obtain maximum benefit. In the most case scenario milk or dairy products are not their sole income source. Besides being inadequate of business knowledge and limitation of investment capacity the opportunity and the initiatives are being ignored as for them the cattle are the assets and milk is its by-products only. However, the direct linkage which will ensure the sales and facilities that will support the storage and transportation system will encourage the farm level production. Moreover, some initiatives to establish community base or individual enterprise from the bottom-line producers can contribute and enhance the market as well as the consumption behavior.

Conclusion for Maize Forward Market Scopes

The farmers of the study area are recently tenting to cultivate maize more than ever before. But being on the bottom line of the chain and confine with the common poverty strain, they are often being deprived from the profitable prospect that lies ahead of the value chain. During present study it has been observed that majority of the total maize production is used in the feed mills for feed for livestock. But farmer are not having any direct or dependable linkage with large scale processors. As the feed mills and the large scale collectors are solely controlling the current market, often the farmers are being run down and remain in the bottom. Moreover due to lack of awareness and inadequate knowledge about the benefits of maize, both in producers' and consumers' level, use of maize as a food ingredient is being ignored. Diversified use of maize for producing food products can increase the market of maize and yield a high margin for the farmers. Especially in the local market, introducing the idea of diversified use of maize as food ingredient besides feed for livestock can increase the future market for maize.

ANNEX 1: LIST OF PARTICIPANTS

Participant: Collectors/Traders/Contractors				
Respondent's Name	**Designation**	**Organization**	**Contact Number**	**Contact Address**
Jamalpur				
Md. Tajul Islam	Owner	M/s. Bhai Bhai Traders	01740883120	Jhalur Chor Bazar
Abdur Rahim	Owner	Shohag Enterprise	01719536601	Jhalur Chor Bazar
Humayun Kabir	Trader		01712368467	Jhalur Chor Bazar
Rangpur				
Mansur Ali	Trader Contractor	Mansur Ali Traders	01768995595	Topikol Bazar, Kaunia
Md Abul Bashar	Trader/Collector	Nazmul Traders	01714524376	Topikol Bazar, Kaunia
Abdul Khalek	Trader		01714925701	Topikol Bazar, Kaunia
Md Akmal Hossain	Contractor		01839098726	Haldibari, Railgate, Kaunia
Abdur Razzak	Contractor		01727103788	Haldibari, Railgate, Kaunia
Puspendra Barman	Contractor (owner)	Sathi Rice Mill & Rita Shar & Biz Store	01721218822	Rajendra Bazar, Nichpara, Kaunia

Nilphamari				
Md. Ibrahim Khalil	Owner/Contractor	Ms SI Krishi Ghar	01713755011	Satrai Coloni Bazar, Dimla
Md Solaiman Khan	Owner/Trader	Khan Traders	01710048610	Satrai Coloni Bazar, Dimla
Md Anisur Rahman	Owner/Trader	Lata Shar Ghar	01713720559	Goya Bari, Dimla
Ziaur Rahman	Propitor	Zia Traders	01713937651	Goya Bari, Dimla
Farhad Hossain	Goala		01724162120	Dakkhin Dahal Para, Dimla
Md Jamal Uddin	Trader	Jamal Store	01717545953	Uttor Titpara, Vatiapara, Dimla
Md Amzad Ali	Propitor & Trader	Rumi Traders	01761752925	Uttor Titpara, Vatiapara, Dimla
Md Abdul Jalil	Trader		01713763950	Bhatia Para, Dimla

Individuals Interview Participant: Processors & Other Enterprises				
Respondent's Name	**Designation**	**Organization**	**Contact Number**	**Contact Address**
Enamul Haque Bhola	Owner	Bhola Feed Mill	01715039842	Babu Para, Alaul Nagar, Rangpur
Md Abul Hossain	Owner	Three Brothers Flour Mills	01710265506	Dimla Bazar, Nilfamari
Khaled Hasan	Manager, Supply Chain	Siddiq Seeds	01714105294	Dimla Bazar, Nilfamari
Sri Sumon Chandra Roy	Owner	Ma Laxmi Mistanno Hotel	01710198748	Tunir Hat, Dimla, Nilfamari
Sanowar Hossain	Owner	Sumon & Brothers Mistanno Vander	01719243212	Babur Hat, Dimla, Nilfamari
Shumon	Owner		01744603507	Dimla Bazar, Nilfamari
Mst. Shahida	Processore	Khan Para Jui Zono Songothon		Khan Para, Dimla, Nilfamari
Shishil Kumar Dev	Owner	Raj Lakkhi Sweets	01723111931	Babur Hat, Dimla, Nilfamari
Md Ashraf Ali	Owner	Paira		Dimla Bazar, Nilfamari
Md. Biplob	Owner	Baishakhi Restura	01723588656	Dimla Bazar, Nilfamari

Respondent's Name	Designation	Organization	Contact Number	Contact Address
Ratan Dash	Owner	MA Sharda Sweets		Dimla Bazar, Nilfamari
Md. Dulal	Owner	Unnamed	01965587399	Bakshigong, Jamalpur
Md. Ataur Rahman	Junior office	Rangpur Dairy	01719487652	Holdibari, Kaunia, Rangpur
Md. Rashedul Islam	Incharge	PRAN Dairy	01759588074	Kaunia, Rangpur
Rabiul Islam	Owner	Bhai Bon Misty Dahi	01734342358	Kaunia, Rangpur
Md. Shahalam	Owner	Tasty point resturent	01917452049	Kaunia station road, Kaunia, Rangpur
Tariqul Hasan (Bipul)	Area sales Manager	Salo food products	01723720030	Iqbalpur, Jamalpul
Md. Jahir	Owner	Ma Mistanno VanDhar	01933733452	Simer par, Bakshigong, Jamalpur
Enayet Kabir	MCC	BRAC Chiling Center	01730784520	Dimla Bazar, Nilfamari

Individuals Interview Participant: Partners KII/NGO's				
Respondent's Name	**Designation**	**Organization**	**Contact Number**	**Contact Address**
Biva Roy (Group of 5 Participants)	Staffs of Seeds	Seed	01839997607	Kaunia, Rangpur
Puran Chandra Barmon (Group of 7 Participants)	Project Coordinator	Pollisree	01973491031	Dimla, Nilfamari
Md Shafiquzzaman	Training & Service Coordinator	CLP Bogura	01727608617	RDA Campus, Bogura
Md Baha Uddin	SAO	DAE-Dimla, Nilfamari	01714677995	Dimla, Nilfamari
S.M. Shafiqul Islam	ULO	Upazila Livestock Officer	01937006411	Dimla, Nilfamari
Nasrin Akhter	Staff of Gonochetona	Gonochetona	01728094299	Bakshigong, Jamalpur

Individuals Interview Participant: Consumer				
Respondent's Name	**Designation**	**Organization**	**Contact Number**	**Contact Address**
Md Lutfor Rahman	Head Master	--	--	Balapara, Kaunia, Rangpur
Group of 16 Guardians	--	Upazilla Shishu Niketon	--	Kaunia, Rangpur
Group of 8 Teachers	--	Zila Parishad School & Collage	--	Dimla, Nilfamari

FGD/Group Interview Checklist Participant: Beneficiary				
Date	**Field**	**Union**	**Thana/Upazila**	**District**
28-May-2015	Maize	Hativanga	Dewangonj	Jamalpur
28-May-2015	Milk	Merurchar	Bakshigonj	Jamalpur
26-May-2015	Maize + Milk	Balapara	Kawnia	Rangpur
26-May-2015	Maize	Barapara	Kawnia	Rangpur
26-May-2015	Milk	Tepamodhupur	Kawnia	Rangpur
24-May-2015	Maize	Tepakholabari	Dimla	Nilfamari
24-May-2015	Maize + Milk	no info	Dimla	Nilfamari
24-May-2015	Milk	no info	Dimla	Nilfamari