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Value Chain Financing in Agriculture: Case Studies from India

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Prasun Kumar Das
Marlowe Ubaldo Aquino

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Preface

Agricultural value chain finance (AVCF) has emerged as an important aspect in augmenting rural finance in the developing countries. It is commonly observed that the agricultural production, processing, other post-production/processing operation and marketing systems of various commodities are closely linked and highly dependent on the efficiency of each participants in the value chain. Access to finance by each of the actors in the chain play important role in improving the efficiency. Keeping this in view, the Asia-Pacific Rural and Agricultural Credit Association (APRACA) commissioned study to document the best practice on agricultural value chain finance in its member countries. This study was funded by the IFAD-supported FinServAccess project which is currently under implementation 5 member countries of the region.

Presently, the agricultural value chain finance best practices, initiatives, strategies and trends were documented for India, Republic of Korea, Thailand, and the Philippines. These documents are intended to map the flow of finance along the value chain and showcase the role of the financial institutions and other interest groups supported the productivity, profitability, sustainability and efficiency of agricultural commodities through appropriate and timely financial activities of their clients.

The different country documentations are being published in a series which is meant to serve as a learning tool for key players and stakeholders in rural and agricultural finance and development. We hope that this will encourage exchange of ideas and insights between and among the APRACA member institutions and its partners as well as other individuals engaged in rural finance. The series will be presented as follows:

- India AVCF Experience
- Republic of Korea AVCF Experiences
- Thailand AVCF Experiences
- Philippine AVCF Experiences

We acknowledge the contribution of the country researchers/writers and their partners in describing the experiences of their countries that are relevant to rural and agricultural development.

Secretary General
APRACA

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The insightful comments of Dr. Ganesh Thapa, Regional Economist, Asia-Pacific Region, IFAD was very helpful in preparing this document.

Prasun Kumar Das
Marlowe Ubaldo Aquino

Executive Summary

Agriculture continues to be an essential instrument for sustainable development and fight against poverty in India and other countries in Asia-Pacific Region. The credit strategy for agricultural development in India has been founded on the philosophy of "growth with equity". Various measures like administered interest rates, setting targets of lending to the agriculture sector, coupled with availability of refinance to the banks at softer terms had helped in increasing the flow of credit to the agriculture sector. Despite the expansion in credit flow the demand for credit in agriculture in India has not been fully met. As per the latest available data, the gap between supply and demand was estimated to be widening. The major challenges being faced by this sector include: (1) Provision of timely and appropriate loan and credit services; (2) high transaction costs for both borrowers and lender; (3) high risks faced by both borrowers and lenders; (4) lack of reliable financial information about rural households (compounding transactions costs and risk); and (5) financial products ill-suited to the financial flows of the borrowers or lenders.

One of the measures to tackle this situation is to develop agricultural value chains which are in its nascent stage in India due to the inefficiency of the actors both in down and upstream to move the products and services from *farm to fork*. The accesses to finance by all the actors in the value chains definitely play a vital role for its effectiveness and not much has been done in this direction. The small holder producers are still not exposed to the price discovery mechanism and they have to rely on the most convenient way of selling of their produce which always do not attract the right price apart from the other problems they face in marketing. This is a wakeup call for the policy makers and other stakeholders to analyze the most convenient ways to improve the efficiency of the value chains to unleash the potential of this sector to contribute in the growth of the country's economy.

Understanding the flow of the products and finance along the value chain is very important to design the products and services to match the requirements of each of the actors involved in the chain. The paper tried here to give an overall idea of agriculture value chains and the flow of products and finance in Chapter 2. The Chapter 3 dealt with the flow of credit to agriculture sector in India and the challenges it is facing. Three case studies of commodity value chain financing in India are documented in Chapter 4 which has three sections (Maize in Section 1, Milk in Section 2 and Section 3 dealt with a minor commodity 'Mentha'). It was felt that the case studies on value chain finance will not be completed if there is no case discussion on the financial service provider and the value chain finance products and deliver models by Yes Bank Ltd. were discussed in Chapter 5. The case studies were selected based on their discrete character, importance to the small holder farmers and the acceptability by the financial institutions. The final chapter (Chapter 6) dealt with the general conclusion and future direction which could help to develop financing services and products for the value chain actor so as to improve the effectiveness and efficiency of the value chains.

List of Abbreviations

CGTMSE	Credit Guarantee Trust Fund for Micro & Small Enterprises
CIMAP	Central Institute of Medicinal and Aromatic Plants
DEDS	Dairy Entrepreneurship Development Scheme
FYM	Farm Yard Manure
GCMMF	Gujarat Cooperative Milk Marketing Federation
IDDP	Integrated Dairy Development Programme
INR	Indian National Rupee
KCC	Kisan(Farmer) Credit Card
MCX	Multi commodity Exchange
MFI	Microfinance Institution
MSMAE	Micro Small & Medium Agro Enterprise
MSME	Micro Small & Medium Enterprise
MSP	Minimum Support Price
NABARD	National Bank for Agriculture and Rural Development
NABCONS	NABARD Consultancy Services
NCDEX	National Commodity & Derivative Exchange
NDDB	National Dairy Development Board
OMFED	Orissa State Cooperative Milk Producers' Federation Limited
PPP	Public Private Partnership
RBI	Reserve Bank of India
SBI	State bank of India
SIDBI	Small Industries Development Bank of India
SLBC	State Level Bankers' Committee
STLG	Small Teal Leaf Growers
TMC	Terminal Market Complex
VDC	Village Dairy Cooperatives

Table of Contents

Page

Preface iii

Acknowledgements iv

Executive Summary v

List of Abbreviations vi

Chapter 1 INTRODUCTION 1

1.1 Overview 1
1.2 Background 2
1.3 Objectives of the study 3
1.4 Scope of the Document 4

Chapter 2 INTRODUCTION TO AGRICULTURAL VALUE CHAIN FINANCE 5

2.1 Agriculture Value Chains 5
2.2 Agriculture Value Chain Finance 6
2.3 Business Models 7
2.4 Products and Instruments 7
2.5 Demand and Supply of Agriculture Value Chain Finance 8
2.6 Internal and External Financing in Value Chains 9

Chapter 3 AGRICULTURAL VALUE CHAIN FINANCE IN INDIA: INSTITUTIONAL FRAMEWORK AND KEY CHALLANGES .. 11

3.1 Institutional Framework of Agriculture Value Chains Finance in India 11
3.2 Key Challenges 12
3.3 Rational of selection of the case studies 13

Chapter 4 CASE STUDIES OF VALUE CHAIN FINANCE TO AGRICULTURAL COMMODITIES IN INDIA 15

4.1 Value chain finance to Maize in Odisha, State of India 15
4.1.1 Overview of Indian Maize Industry 15
4.1.2 Maize Production in Odisha 17
4.1.3 Value Chain of Maize in Odisha 18
4.1.4 Comprehensive MAP of Maize Value Chain 21
4.1.5 Finance to Maize Value Chain 22
4.1.6 Lessons Learned 26
4.2 Dairy Value Chain in India and Financing Arrangements 28
4.2.1 Overview of Dairy Industry 28
4.2.2 Milk Production and Productivity in India 29
4.2.3 Value Chain of Milk 30
4.2.4 Mapping the Value Chains 35
4.2.5 Finance to Milk Value Chain 35
4.2.6 Lessons Learned 39

Table of Contents *(continued)*

Page

4.3 Mentha Value Chain Finance in India 40
4.3.1 Overview 40
4.3.2 Production Scenario 41
4.3.3 Value Chain of Mentha 42
4.3.4 Mapping the Value Chain 44
4.3.5 Finance to Value Chain 45
4.3.6 Lessons Learned 46

Chapter 5 VALUE CHAIN FINANCE MODELS OF YES BANK 47

5.1 About the Bank 47
5.2 Knowledge Banking: the Key to Success 48
5.3 Inclusive and Social Banking 49
5.4 Food and Agribusiness in Bank's Business 50
5.5 Financing Agriculture Value Chains 52
5.6 Innovative Financial Products and Services Offered 52
5.6.1 Finance to small teal leaf growers 52
5.6.2 Finance to milk aggregators by innovative financing model 53
5.7 Conclusion 54

Chapter 6 CONCLUSIONS AND FUTURE DIRECTIONS 55

6.1 Conclusions 55
6.1.1 General Lessons learned 55
6.1.2 Key Areas of concern 55
6.2 Future Directions 56

BIBLIOGRAPHY 57

ANNEXES

Annex I 58
Annex II 62
Annex III 64

List of Tables

Page

Table 1:	Agency-wise Credit Flow to Agriculture in India (1998-1999 to 2012-2013)	3
Table 2:	Actors and Activities in Agriculture Value Chains	5
Table 3:	Typical organizational models of smallholder production	7
Table 4:	Categories of products and financial instruments used in Value Chain Finance	8
Table 5:	Demand and Supply of finance to in agriculture value chains in India	9
Table 6:	Area, Production and yield of Maize in India (2002-2012)	15
Table 7:	Contribution of major Indian states in Area, Production and yield of Maize in India (2011-2012)	15
Table 8:	Decadal growth of three major foodgrains in India	15
Table 9:	Seasonality of Maize production in India	16
Table 10:	Area, Production and Productivity of Maize in Odisha	17
Table 11:	Seed companies and allotted districts with area coverage	18
Table 12:	Brief description of the Scenarios	24
Table 13:	Scenario Analysis of Value Chain Finance in Maize in Odisha	25
Table 14:	Risk and opportunities at various transaction points	25
Table 15:	Population of Cattle and Buffaloes in India vis-à-vis Global Scenario	28
Table 16:	Estimates of Global Milk Production 2001 to 2010	29
Table 17:	Top 10 Milk producing States of India	30
Table 18:	Three tier structure of cooperative milk production and Marketing in India	32
Table 19:	Access to finance by the milk vale chain actors in India	36
Table 20:	Leading States in Mentha Production in India	42
Table 21:	Cost of cultivation of Mentha in Uttar Pradesh, India	43
Table 22:	Demand and supply of finance in mentha value chain	46
Table 23:	Key features of Modern Terminal Market Complex	49
Table 24:	Benefits derived by the stakeholders	52
Table 25:	Key Areas of Concerns	55

List of Figures

Page

Figure 1: Institutional Framework of Agriculture Finance in India 11
Figure 2: Maize Consumption categories 16
Figure 3: Comprehensive mapping of maize value chain and finance 22
Figure 4: Value Chain of Milk in India 35
Figure 5: Export of Menthol by India in quantity and value 41
Figure 6: Countries Importing Mentha Oil 41
Figure 7: Production of Mentha Oil in India 42
Figure 8: Typical Value Chain of Mentha Oil in India 45
Figure 9: Flow chart of Terminal Market Complex 49
Figure 10: Mega Food Park model developed by YES BANK 51
Figure 11: Business model of Mega Food Park 51
Figure 12: Innovative Financing Model to Small Tea Leaf Growers 53
Figure 13: Customized financial product for milk aggregators 54

List of Boxes

Page

Box 1: Agriculture Credit Policy in India 2
Box 2: Policy measures of Government of Odisha 17
Box 3: Hybrid seeds of helped farmers to adopt Maize cultivation 18
Box 4: Farmers of Nabarangapur, Odisha braces maize cultivation 19
Box 5: New maize processing plants in Odisha 20
Box 6: Special Programme for Dairy Development in India 30
Box 7: AMUL model vis-à-vis other Milk Federations 33
Box 8: Dairy Entrepreneurship Development Scheme (DEDS) 37
Box 9: Doodh Ganga Yojana 38
Box 10: Harvesting & primary Processing of Mentha 40
Box 11: Production – Marketing Ecosystem of Mentha Oil in India 44
Box 12: Food and Agribusiness Research Management Group of YES BANK 47
Box 13: ISB initiatives in YES BANK 50
Box 14: Mega Food Park (MFP) Scheme of the Government of India 50

CHAPTER 1
Introduction

1.1 Overview

The rapid change in global agriculture during the recent years is characterized by increased demand for food due to growth in population, income, urbanization and changes in consumer preferences. Collectively, these changes contribute to a paradigm shift in the way food is produced, processed, marketed and consumed. To satisfy this increased demand, food value chains emerged as the most important process to ensure sustainable supply. This has also created opportunities for the primary producers and agribusiness entrepreneurs to transform commodities into products that are demanded by consumers across the globe.

Asian continent is not an exception to these global phenomena. While the supply side (both quantity and quality of production) and agriculture value chain[1] development has not been able to keep pace with time, the demand side trends in the emerging and developing economies of the Asia have been quite attractive (in some cases catching up with those of the developed economies). There is thus a significant gap between the supply and demand sides of food in the value chains. This gap again observed to be wider due to the non-competitiveness in the upstream of the value chains[2] (mainly the smallholder farmers). According to Thapa and Gaiha [1], 87% of the world's 500 million small farms[3][2] are in Asia and the Pacific region. China and India alone account for 193 million and 93 million small farms, respectively. The other Asian countries with a large number of small farms for example Indonesia (17 million), Bangladesh (17 million) and Viet Nam (10 million) occupy an important segment of Asian food market. They present a compelling opportunity for buyers, lenders and other actors in the value chain to enhance their activities; however, in real sense they are facing many obstacles which hinder their competitiveness. The main obstacle is perhaps the unmet demand for formal finance and tailor made financial products and services to cater their needs.

In India, agriculture continues to be an essential instrument for sustainable development and fight against poverty. This sector is the largest employer in the Indian economy with approximately 600 million people engaged in it. There has always been a strong correlation between the performance of this sector and that of the overall economy. In order to achieve higher growth in Gross Domestic Product (GDP), agriculture sector need to be a decisive driver, despite its reduced share in GDP from 58% (1950-1951) to about 14% (2011-2012). Over the years, there has been a significant shift from the subsistence level of production to market oriented production. Diversification and commercialization in agriculture have resulted in shifting of cropping pattern from traditional crops to new crops and new markets. Development of agriculture value chains in the country is in nascent stage due to the inefficiency of the actors both in down and upstream to move the products and services from *farm to fork*. This is a wakeup call for the policy makers and other stakeholders to analyze the most convenient ways to improve the efficiency of the value chains to unleash the potential of this sector to contribute in the growth of the country's economy.

[1] Food and Agriculture Organization of the UN (FAO) defined 'Agriculture Value Chain' as a series of activities that add value to a final product, beginning with the production, continuing with the processing or elaborating of the final product, and ending with the marketing and sale to the consumer or end user.

[2] Upstream is defined as the first set of activities in a value chain (e.g. production), as juxtaposed with downstream (e.g., marketing and export) activities.

[3] According to IFPRI (2007), definitions of small farms vary from country to country based on the land holding pattern. The most obvious measure is farm size, and several sources define small farms as those with less than 2 hectares of cropland. In a similar but less precise vein, others describe small farms as those with "limited resources," a definition that includes land as well as capital, skills, and labour.

1.2 Background

The experiences across the globe with special reference to the Asian continent however reinforced the fact that the large sized players in agriculture and agribusinesses do not face much difficulty in access to credit through financial systems with special reference to the commercial banks. On the other hand, many smallholder producers and small and medium sized agribusinesses remain under-served probably due to the obstacles mentioned above. Over the past decade, the commercial banks and multinational buyers have experimented with models to provide financing to the weaker players who are tightly integrated into sourcing value chain. These models have been successful in many cases but are still in pilot stage with a reach to small section of the value chain actors.

The credit strategy for agricultural development in India has been founded on the philosophy of "growth with equity" (Box 1). Various measures like administered interest rates, setting targets of lending to the agriculture sector, coupled with availability of refinance to the banks at softer terms had helped in increasing the flow of credit to the agriculture sector. The Table 1 below shows that the growth in agriculture credit is quiet impressive and also distinctly high during the years 2003 to 2007 (area highlighted). Yet, financial constraints in agriculture remain pervasive, and they are costly and inequitably distributed, severely, limiting smallholder's ability to compete. This leads to a disproportionate growth of credit in relation to "savings" and there is also a disproportionate growth of credit in relation to the agricultural productivity itself. The changes in the demand of food by the consumers in recent years in India calls for increased investment in agriculture at all levels of the food value chains The conventional measures and approaches are not able to address these constraints effectively; hence a more holistic approach is required. The Financial sector development through more diversified and market-driven financial products and services, with broad-based outreach in rural areas to serve the value chain actors will ensure the access to finance.

Box 1. Agriculture Credit Policy in India

Agriculture Credit Policy in India since its independence in 1947 has been a process of gradual replacement of non-institutional by institutional sources and increasing the outreach to the last mile making it a 'mass banking' rather than 'class banking'. Delivery of agricultural credit has substantially increased during the last two decades due to various policy decision adopted by the government and Reserve Bank of India (central bank of the country) coupled with innovations in products and services and technology adaptation by the formal banking system in the country. The policy focus was on increasing the flow of agricultural credit during 10th (2002-2006), 11th (2007-2011) and 12th (2012-2017) five year plans.

(**Source:** Various plan documents of the government of India)

Despite the expansion in credit flow as shown above, the demand for credit in agriculture in India has not been fully met. As per the latest available data, the gap between supply and demand was estimated to be widening[4]. The increased demand is on account of the shift towards market oriented farming and focus on higher quality production for remunerative markets in the established value chains as mentioned by Das and Baria [3]. This shift includes many more processes and more specialization and consequently more participating "Partners" or "Actors" along the path from 'Farm to Fork' – 'the value chain'. These partners, made up of the producers, traders, processors, marketing companies, etc., as well as the banks and service providers, have a common interest which is being competitive in what they do.

[4] Reserve Bank of India (2011). Speech of Dr. D. Subba Rao, Governor of RBI.

Table 1: Agency-wise Credit Flow to Agriculture in India (1998-1999 to 2012-2013)

(INR in Billion*)

Year	Agencies				Total	Growth (YoY[c] in %)
	Cooperative Banks	Regional Rural Banks[a]	Commercial Banks[b]	Others		
1998-1999	159.6	24.6	184.4	0	368.6	–
1999-2000	182.6	31.7	247.3	1.0	462.7	25.5
2000-2001	207.2	42.2	278.1	0.8	528.3	14.2
2001-2002	235.2	48.5	335.9	0.8	620.5	17.4
2002-2003	236.4	60.7	397.7	0.8	695.6	12.1
2003-2004	268.8	75.8	524.4	0.8	869.8	25.0
2004-2005	312.3	124.0	814.8	1.9	1,253.1	44.1
2005-2006	394.0	152.2	1,254.8	3.8	1,804.9	44.0
2006-2007	424.8	204.4	1,664.9	0	2,294.0	27.1
2007-2008	482.6	253.1	1,810.9	0	2,546.6	11.0
2008-2009	459.7	267.7	2,289.5	2.3	3,019.1	18.6
2009-2010	635.0	352.2	2,858.0	0	3,845.1	27.4
2010-2011	701.1	439.7	3,327.1	0	4,467.9	16.2
2011-2012	876.9	544.5	3,686.2	0	5,107.6	14.3
2012-2013 (T)	840.0	710.0	4,200.0	0	5,750.0	12.6

* 1 USD = INR 61.58 as on 29.10.2013 (Reserve Bank of India)

[a] Regional Rural Banks are the specialized banks in India promoted by NABARD, Commercial banks and State Governments to cater the needs of the rural population

[b] Commercial Banks includes public Sector and Private Sector Banks;

[c] YoY: Your on Year basis

T: Target as per the Ministry of Agriculture, Govt. of India

(**Source:** GoI, Reserve Bank of India, The Fertilizer Association of India, 2013)

1.3 Objectives of the Study

Agriculture value chains are organized linkages between groups of producers, traders, processors, and service providers (including non-government organizations) that join together to improve productivity and the value added from their activities. In a well-managed value chain, the value of the end-product is often greater than the sum of individual value additions. By joining together, the participants in a value chain increase competitiveness and are better able to maintain competitiveness through innovation. Ensuring financial access to the actors in the upstream of the value chains in general has always been difficult and challenging. The challenges include: (1) Provision of timely and appropriate loan and credit services; (2) high transaction costs for both borrowers and lender; (3) high risks faced by both borrowers and lenders; (4) lack of reliable financial information about rural households (compounding transactions costs and risk); and (5) financial products ill-suited to the financial flows of the borrowers or lenders.

The agricultural value chain financing (AVCF) are being facilitated to address the challenges mentioned above by different approaches to reduce the ecosystem imbalances and aims to improve the chain efficiency and inclusive growth of the actors in the value chains and reduces the perceived risks of the lending agencies. By doing so, key players and stakeholders in the value chains obtain the best services in rural and agricultural development conducive for individual and collective growth. These approaches are translated as best practices and innovations necessary in delivering the best rural finance and banking services possible. The objective of this paper is: (i) to identify and document the best practices and innovations on value chain financing in India and (ii) to discuss the challenges and draw lessons from the findings of the case studies for the future.

1.4 Scope of the Document

One of the major drivers that facilitate the transformation of agricultural value chain finance (AVCF) is the availability of and access to innovative financing. The types of value chain financing vary, depending on whether the flow of financing is from within the chain segments, or between and among chain actors (internal finance), or obtained from outside the chain (external finance), which is related either directly or indirectly to linkage arrangements in the chain. This document is unique combination of both primary and secondary study on the best practices to deliver appropriate financial products and services to the small holder growers, micro and small *agripreneurs*[5] from the internal and external sources. The paper also highlighted various innovations in financial products and services at various levels of the stake holders responsible for growth and development of agricultural value chains. The information in this document has been put together to support the efforts of the national government and other financial institutions in India, various International organizations (FAO, IFAD, GIZ, UNIDO, World Bank, ADB etc.), and other interested organizations to design appropriate value chain financing framework in Asian continent.

The document is organized as follows: *Chapter-2* on Introduction to Agriculture Value Chain Finance deals with the definition, framework for understanding and analyzing the structures and process of agricultural value chain financing. Detailed illustrations on internal and external financing mechanism were also made to clarify the importance of both in the agriculture value chain finance context. In the *Chapter 3*, the institutional framework and the challenges of the agriculture value chain finance in India were discussed. The *Chapter 4* focuses on cases of agriculture commodity based value chain financing practices, instruments and their economic relevance. Two major commodities (Maize and Milk) and one minor commodity with very high potential (mentha) were dealt in this chapter while *Chapter 5* throws light on the case study on the innovative business models and financing instruments used by a private sector commercial bank (Yes Bank Ltd.) to cater the needs of the actors in the agricultural value chains to augment the agriculture finance and mitigate the risk of financing. Finally, the conclusions and few suggested future directions were given in *Chapter 6*.

[5] The terminology *agripreneurs* used here to denote entrepreneurs who undertake variety of activities in agriculture and its related sub-sector. The *agripreneurs* are the risk-takers and has the opportunity to initiate and to implement decisions which deal with the uncertain agricultural business environment within which the firm operates.

CHAPTER 2

Introduction to Agricultural Value Chain Finance

2.1 Agricultural Value Chains

In general, the agricultural value chain encompasses four (4) main industries: i) Agri-Production Industry; ii) Agri-Logistic Industry; iii) Agri-Processing Industry and iv) Agri-Marketing Industry. These industries do also have important actors with specific activities as illustrated in Table 2 below. This clearly shows that each of the actors in the value chain is engaged in specific activities and effectiveness of the chain will definitely be dependent on their performance and linkages which leads to their sustainability.

Table 2: Actors and Activities in Agriculture Value Chains

Industry	Actors	Major Activities
1. Agri-Production	a) Input Suppliers b) Primary Growers	The major activities of the input suppliers such as seed suppliers, livestock breeders, fertilizer suppliers, researchers and propagators provide production inputs, directly or indirectly through traders or other intermediaries, to primary producers composed of Farmers, growers and livestock raisers.
2. Agri-Logistic	a) Aggregators (small and large) b) Transport and packaging b) Ware house c) Cold storages	The small aggregators play an important role to bring commercial value to the produces and the transporters help in movement of products from farm gate to the large aggregators, processors etc. With the modernization of the transport and packaging industry, the movement of agricultural products from one geographical region to other became easier. The warehouses and cold storages also improved the shelf life of the products and price realization at the producer's level.
3. Agri-Processing	a) Primary processors b) Final processors	Actual processing of the produce by millers or factories, may involve two stages of value-adding activities composed of initial processing, where the physical form of the product is first changed, and further manufacturing, where the initially processed product undergoes another round of physical and higher value transformation to eventually become the end-product purchased by consumers.
4. Agri-Marketing	a) Wholesalers b) Exporters c) Organized Retail b) Small Retailers	The last stage in the chain is the marketing and distribution of the product by wholesalers, exporters and retailers. Here, wholesalers, exporters or importers purchase products (either raw or processed) from producers, initial processors or food manufacturers for distribution to retailers, who are the ones directly involved in the sale of end-products to consumers. In many instances, traders again serve as intermediaries between producers/assemblers/processors and large distributors such as wholesalers/exporters/importers.

(**Source:** Illustration by Author; 2013)

Agricultural value chains are difficult to organise and stabilize in countries like India with large number of small farm holdings except in case of the niche products like. The production and aggregation activities in the value chains need to be efficient to ensure realization of higher returns to the smallholder farmers. Building the confidence of farmers to move away from subsistence farming to market oriented farming, and increasing their awareness on application of improved inputs and adoption of better technology of cultivation are important interventions in creating a sustainable value chain. Aggregation of several small farms pose challenges in terms of highly dispersed collection of produce, transport arrangements, and quality assurance mechanisms at every level. These not only entail costs but also time outlays in the aggregation process. The production effort has to be organized in clusters so that the distances and time are kept within manageable levels.

2.2 Agricultural Value Chain Finance

Access to timely and reasonably priced financial resources also plays an important role in facilitating inclusion of smallholders into competitive markets. Without these timely resources, it is difficult to meet the market demands. Typical loans from banks involve relatively high transaction costs on the part of both the lender and the borrower, and coupled with the climatic and market risks of the sector make such loans unattractive to the lenders and unavailable or unattractive to the smallholders. Likewise, the typical short-term, relatively high-cost financing of most microfinance loan products are not well adapted. Value chain finance in agriculture offers a response to the above-mentioned dilemma in two dimensions. For bankers and financiers, value chain finance in agriculture is an approach to financing that uses an understanding of the production, value added and marketing processes to best determine financial needs how best to provide financing to those involved. By understanding the agricultural chain, the lender can make more informed decisions of how to structure financing to reduce the costs and the short and longer-term risks such that financing becomes attractive. Funding may be done at many levels in the chain or could enter the chain at one point and then flow up and/or down through the chain to others.

Value chain financing is defined as financing provided to a player or actor in the value chain in order to increase value-chain growth and competitiveness. Growth and competitiveness must also take into account increasing benefits to the small players. Value chain financing is an approach to identify where the financing needs are, where the financing gaps, which can provide the financing, are and what are the ways to improving access to financing. Value chain financing has various kinds in different parts of the chain. Part of the approach is to identify what are the different types of financing that is happening in the chain, who are providing the financing, and ultimately to identify what can be done to improve and increase the availability of those financing.

Value chain finance, by definition, requires a relationship and exchange of products, services and finance within the value chain actors and its supports. This is little bit in contrast to financing individual actors in the value chain, where access to financial services by one actor is independent of others. Value chain finance in agriculture is not new; however its application has now expanded significantly in newer ways.

Agricultural Value Chain Finance (AVCF) for different commodities is emerging in India at different paces. Important drivers of AVCF development in the country include urbanization, income growth, changing dietary preferences, increased female labour force participation, and access to better household technologies and information about food. A typology of AVCFs in terms of the nature and degree of vertical integration between and among the different actors in the chain includes (i) traditional AVCFs, which are typified by their weak connection and involvement of many players in the production, processing, marketing, and distribution activities, resulting in numerous risks, huge transactions costs, and low financing; (ii) transitional AVCFs, which have less player intermediation at the postharvest to market levels but have limited options for risk mitigation and financing; and (iii) modern AVCFs, which are characterized by stronger integration of the supply chain players that ensure economies of scale and scope through seamless logistics, and technical and financial support, as well as wide market outlets.

One of the benefits of value chain financing is changing the mindset of farmers. Instead of having a production-based mentality where farmers insist on bulk producing commodities without much regard to the demands of the market, through the value chain approach, farmers and fishers are transformed into market-driven entrepreneurs responding quickly to the requirements of the consumers. This widens farmers' access to priority commodities and eventually the farmers graduate from merely being subsistence producers to self-reliant, techno-based, sustainable, market-driven food and agribusiness entrepreneurs.

2.3 Business Models

With models that promote economies of scale and reduce risks for lenders and buyers, smallholder farmers are more viable contributors to modern agricultural systems. Because smallholder production is important in many value chains for both economic and social considerations, special emphasis must be given to models which allow them to fully participate in value chains. Miller & Jones [4], illustrates the typical organization of smallholder production and marketing – that is, the relation of farmers to the market and/or the larger system. This analysis offers a basis for value chain business models, and the accompanying finance as illustrated in Table 3.

Table 3: Typical organizational models of smallholder production

Business Models	Driver of Organization	Rationale
1. Producer-driven (Association Model)	• Small-scale producers, when formed into groups such as associations or cooperatives • Large-scale farmers	• Access new markets • Obtain higher market price • Stabilize and secure market position
2. Buyer-driven	• Processors and Exporters • Retailers and Traders • Wholesalers and other traditional market actors	• Assure supply and Increase supply volumes • Supply more discerning customers – meeting market niches
3. Facilitator-driven	• NGOs and other support agencies • National and local governments	• 'Make markets work for the poor' • Regional and local development
4. Integrated	• Lead firms • Supermarkets • Multinationals	• New and higher value markets • Right price for right quality • Level playing market

(Adapted from Miller & Jones, 2010)

2.4 Products and Instruments

Agriculture value chain finance is a tailor made product and services which were designed after determining the financial needs of actors in the chain and how best to provide financing to those involved. Many diverse and innovative financial instruments are being applied or adapted to meet specific financial needs. Commodities and cash-flow projections are generally used to secure financing and reduce risk. There are many ways to categorize the modalities and describe the various financial products and instruments that can be used to meet the need of finance by the various actors in the agriculture value chains. The following five (5) categories of products and sixteen (16) instruments were considered in this document for general understanding as given in Table 4 below:

It is needed to organize the modalities differently, according to the analysis of the practical application of the various mechanisms. It must be noted that the use of terms varies somewhat between countries and even between sectors. In some cases, a precise legal term may be applied in some contexts but the use of the terms in agriculture may often encompass a broader meaning and application.

Table 4: Categories of products and financial instruments used in Value Chain Finance

Category	Instruments
Product financing	• Trader credit • Input-supplier finance • Marketing and wholesale company finance • Lead-firm financing
Receivables financing	• Trade-receivables finance • Factoring • Forfaiting
Physical-asset collateralization	• Warehouse receipts finance • Repurchase agreements (repos) • Financial leasing (lease-purchase)
Risk mitigation products	• Insurance • Forward contracts • Futures
Financial enhancements	• Securitization instruments • Loan guarantees • Joint-venture finance

(Adapted from Miller & Jones, 2010)

2.5 Demand and Supply of Agriculture Value Chain Finance

The demand in agriculture finance starts with the primary producers' need for finance for inputs such as fertilizers, seeds, agrochemicals, fuel, tools and equipment, adoption of improved technology and the labour used to plant, harvest and transport their crops to market. For some, only short term working capital is needed, while for others, investment capital is important to carry out the production at a sustainable scale. Financial services such as short and longer-term loans, line of credit, letters of guarantee, payments and transfers, leasing and insurance can help producers overcome seasonal income fluctuations and adopt more competitive technologies such as irrigation systems, farm mechanization etc. Other value-chain actors (e.g. input suppliers, agro processors, aggregators and traders) also require access to financial products and services to support their short and longer term capital needs. Table 5 below provides an indicative list of demand and supply side of the value chain finance in agriculture and allied activities.

The role of the value chain actors in providing the much needed finance (either in cash or in kind) cannot be ignored. Nevertheless, the challenges here lies in creating more and stronger bridges between value chain actors and financial institutions (that is, external finance), while recognizing the lending arrangements between the value chain actors (that is, internal finance). In case of internal finance arrangements, the actors within a value chain cater to financial requirements of other actors by entering into non-cash transactions and negotiations to better manage and coordinate the effective functioning of the value chain. These transactions are more often visible in a relatively weak financial system. External finance is more common phenomena in the developed/developing economies like India. Here, financial institutions (Financial intermediary) strategically position themselves to cater the financial needs all the actors in the viable and potential value chains. In India, government sometimes became the suppliers of value chain finance in terms of subsidised rate of interest, subsidy in inputs and tax relief for the producers and formulating schemes for financing the actors in the agricultural value chains.

Although the array of financing instruments used in financing agriculture value chains are not new, the emerging providers of finance do not mainly come from formal financial institutions. The innovative application of various institutional, contractual, managerial, and technological arrangements is also essential to adapt to the needs of AVCFs for stronger and more demand-driven value chain

Table 5: Demand and Supply of finance to in agriculture value chains in India

Sl. #	Value Chain Actors	Demand Side	Supply Side	
		Need for Finance	Financial Intermediaries	Non-Financial Intermediaries
1	Input Suppliers	To stock Seeds, fertilizers, pesticides, Livestock Feed, medicines, farm equipment	Commercial Banks, Regional Rural Banks, Microfinance Institutions	Input marketing companies, farm equipment suppliers
2	Primary producers	To produce Crops, dairy products, fisheries and other livestock	Commercial Banks, Regional Rural Banks, Cooperative Banks Insurance companies	Input and equipment suppliers, marketing companies
3	Local Aggregators	For grading, sorting and primary storage of local produces and payment to producers	Microfinance Institutions,	Large traders, wholesalers, processors, exporters
4	Large Aggregators	To aggregate and store large amount of produces and payment to the small aggregators	Commercial Banks, venture capital, Insurance companies	Large traders, lead firms, wholesalers, processors, exporters
5	Storage & Warehouse	To create Storage facilities for grains, fruits, vegetables, milk, fish etc.; Cold chains & logistics	Commercial Banks, Insurance companies	Processors, exporters, producers; companies
6	Primary Processors	Creating primary processing facilities at the local level for supply to the end processors	Commercial Banks	Farmers' organization, Large processors, trading and marketing companies
7	Final Processors	Creating large facilities for processing plants, packaging facilities etc.	Commercial Banks, Insurance companies	Wholesalers, exporters
8	Wholesalers	Trading and branding	Commercial Banks, venture capital funds	Exporters, Corporate
9	Exporters	Pre-shipment and post-shipment credit facilities	Commercial Banks, Venture capital funds, Private equity funds	Corporate sector
10	Retailers	Retailing of produces	Microfinance Institutions, commercial Banks	Family and friends

Note: Government subsidy on inputs (fertilizers, electricity etc.), exports and tax exemption on income from agriculture also considered as a source of finance.
(**Source:** Compilation by Author, 2013)

coordination. Whether these novel arrangements respond to the effective demand for financing to agriculture value chains (be it smallholder farms or SMAEs), and meet their investment threshold needs were examined in the following chapters.

2.6 Internal and External Financing in Value Chains

Providing financial facilities by the non-financial intermediaries (as shown in Table 5) to the value chain actors generally builds on established relationships between value chain actors that facilitate credit screening and monitoring, resulting in faster service and fewer obstacles. Financing the value chains by the formal financial institutions is a longer-term process that complements and builds on the strength of VC relationships and risk perception. The benefits of these relationships – secure markets and improved skills – make potential borrowers more creditworthy thus attractive to financial institutions.

Lending by financial institutions is more explicit than by the non-financial intermediaries, because it is not embedded in another commercial transaction – financial institutions know how profitable their lending is, whereas VC actors generally look only at their overall profitability. Ultimately, lending by financial institutions may well be more sustainable, since it taps into a larger potential pool of funds and transfers responsibility for the actual lending to a specialized entity that sees lending as their core line of business, rather than as a necessary but secondary activity. Finally, because of the involvement of regulated financial institutions, clients may have access to a greater range of services, including savings, transfers and investment credit. Here, indirect finance (external) refers to the formal finance system where direct finance (internal) refers to the non-formal finance system.

The financing facilities extended by the non-financial intermediaries are playing a crucial role in fulfilling the gap of finance by the formal system, which is why it may be stated that the roles of both the financial and non-financial intermediaries are complementary to the growth and development Ag VC. However, when this Ag VC is viewed in its entirety, VCF through capturing the cash flow emerges as a way of ensuring that all the actors have access to finance as and when necessary. This system allows financial institutions to mitigate the risks of the lack of security of actors lower in the VC. In an ideal VCF system, a financial institution enters into an arrangement with some or all the actors in a particular VC to extend finance to them.

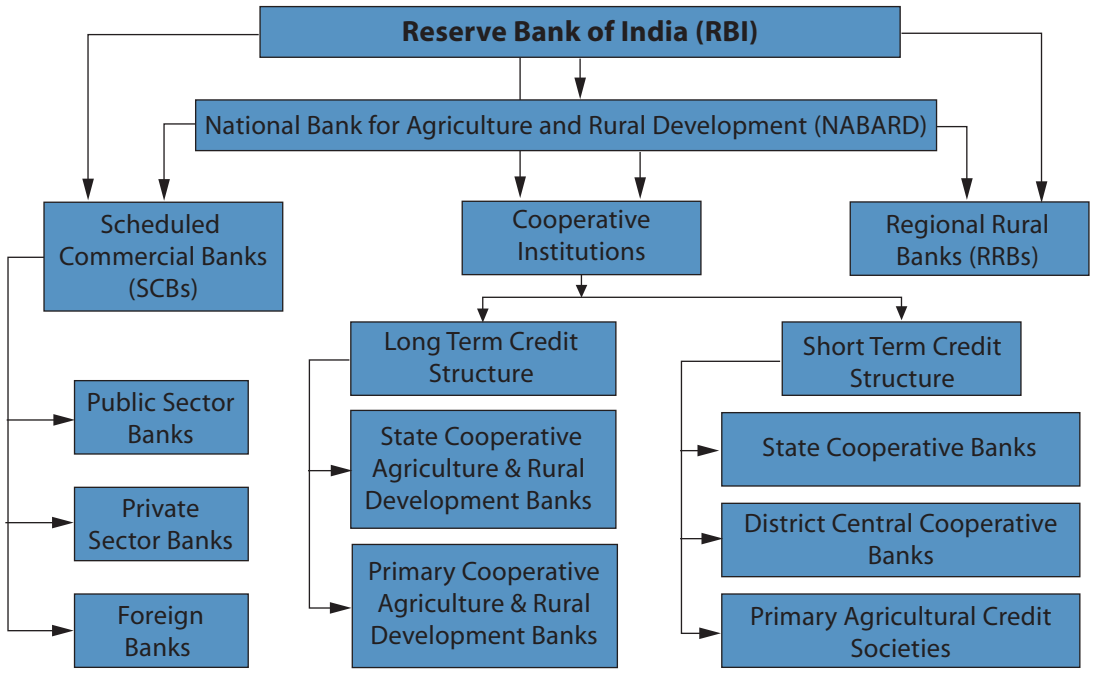
CHAPTER 3

Agricultural Value Chain Finance in India: Institutional Framework and Key Challanges

3.1 Institutional Framework of Agricultural Value Chain Finance in India

The institutional framework for agricultural value chain financing comprises of various ministries, government agencies, banks, financial institutions and apex bodies like Reserve Bank of India (RBI) and National Bank for Agriculture and Rural Development (NABARD). The framework indicates vast network of financing institutions across the country. Figure 1 below provides a diagrammatic representation of the institutional framework of financing agriculture in India. The framework has a tiered structure where the apex bodies like RBI and NABARD are at the top while the Primary Agriculture Credit Societies (PACS) are at the village levels.

Figure 1: Institutional Framework of Agricultural Finance in India



Apart from the above mentioned institutional framework, there are many informal and traditional mechanism of value chain financing existing locally. These may be in the forms of traders, input financers mainly at the farm gate. The financial sector policy towards agricultural financing always focused on bringing more and more farmers to the formal banking sector as the traditional financial arrangements were exploitative in nature. For commercial bankers, value chain finance in agriculture is an approach to financing that uses an understanding of the production, value added and marketing processes to best determine financial needs how best to provide financing to those involved. By

understanding the agricultural chain, the lender can make more informed decisions of how to structure financing to reduce the costs and the short and longer-term risks such that financing becomes attractive. Funding may be done at many levels in the chain or could enter the chain at one point and then flow up and/or down through the chain to others.

3.2 Key Challanges

While agricultural credit in India is growing at a disproportionate rate unlike the growth of agriculture itself, this growth might be coming from a very large institutional credit disbursement gap and the gap has still not been filled up and there is scope for further credit absorption or that the ultimate amounts are possibly not being utilized for agriculture. As the demand side is highly diverse, ranging from semi-subsistence households to micro and small enterprises engaged in agricultural and non-agricultural activities, and medium/large enterprises engaged in production, processing, trade and services, their financial needs differ widely in terms of amounts, terms and conditions as well as the degree of sophistication of financial services. This requires product and services innovations to address the varied need and plug the gaps in the credit delivery. There is a strong need to sustainably modernize agriculture in India, combined with increased value addition in the processes following primary production. This, however, comes with a heavy demand for investment capital. The key challenges identified in this regard are as follows:

- Most of the rural economic activities in India are subject to seasonality and gestation periods, which often lead to a slow rotation of the invested capital and are reflected in the cash flows of rural entrepreneurs. This applies to farming as well as to other related activities such as agro-processing, input supply and service provision. Longer loan maturities and irregular repayment schedules are more risky and present additional challenges to liquidity management.
- More than in any other sector, the profitability of agricultural enterprises depends significantly on external factors such as the weather, major pest and disease outbreaks or prices of inputs and outputs, which are largely beyond the control of the farmer. In addition to idiosyncratic risks affecting individual clients (e.g. illness or death of family members, theft of productive assets, etc.), agricultural enterprises are exposed to covariant risks arising from the abovementioned external factors, which may simultaneously affect numerous farmers in a given area.
- Agriculture is a politically sensitive sector prone to government interventions. Although permanent interventions through lending quotas, interest rate ceilings or direct government provision of financial services have been reduced substantially in the last two decades, governments continue to intervene on an ad-hoc basis. Such interventions include loan rescheduling in case of natural calamities or loan waiver (Agricultural Debt waiver and Debt Relief Scheme, 2008) and preferential lending programmes for specific target groups, which are often granted after major economic downturns and especially in the advent of elections. They create additional uncertainties for financial institutions and tend to weaken the repayment culture.

Financing value chains in the agribusiness sector amidst restructuring in the system becomes more challenging as the agricultural sector is inherently risky relative to other sectors. This is particularly true in the context of improving access to finance by small-scale producers. This is compounded by the fact that transaction costs in rural areas are also very high. Underlying these changes, agricultural value chain is the goal of all actors to maximize benefits, minimize costs and risks. From the development point of view, promoting equitable distribution of benefits can be added as another dimension of chain performance. That is, to promote the competitiveness and market efficiency within the chain.

3.3 Rationale of Selection of the Case Studies

The case studies were selected based on their discrete character, importance to the small holder farmers and the acceptability by the financial institutions. There are three commodities namely Milk, maize and mentha were selected as these commodities are very popular among the small holder producers and have the potential to develop further with the support of both the internal and external financial services. Most of the banks in India are providing the loans and advances to the actors in the agricultural value chains; however most of them rely on the broad band products and services. In case of YES BANK Ltd., it is noteworthy that the products and services offered by them to agriculture sector are quiet innovative and they consider the importance of the value chain actors in the middle and downstream of the chain.

CHAPTER 4

Case Studies on Value Chain Finance to Agricultural Commodities in India

4.1. Value Chain Finance to Maize in Odisha State of India

4.1.1 Overview of Indian Maize Industry

The maize production in India has shown increasing trend and reached 21.28 million tonnes in 2010-11 as against paltry 12.04 million tonnes in 2000-01 which shows slight decline in 2011-12. The productivity also increased from 1.82 million tonnes to 2.50 million tonnes during the same period. Karnataka tops the list of the major maize growing states of India with an area coverage of 1.24 million hectare (contributing 18% of total production) followed by Rajasthan (1.09 million ha), Madhya Pradesh (0.83 million ha), Maharashtra (0.79 million ha), Andhra Pradesh (0.78 million ha), Uttar Pradesh (0.71 million ha) and Bihar (0.63 million ha). The area under maize cultivation in Odisha was recorded at 225,000 hectare (Tables 6 & 7).

Table 6: Area, Production and yield of Maize in India (2002-2012)

Year	Area (million hectare)	Production (million tonnes)	Yield (kg/ha)
2001-2002	6.58	13.16	2,000
2002-2003	6.64	11.15	1,681
2003-2004	7.34	14.98	2,041
2004-2005	7.43	14.17	1,907
2005-2006	7.59	14.71	1,938
2006-2007	7.89	15.09	1,912
2007-2008	8.12	18.96	2,335
2008-2009	8.17	19.73	2,414
2009-2010	8.26	16.72	2,024
2010-2011	8.49	21.28	2,507
2011-2012	8.27	20.32	2,384

Source: Ministry of Agriculture, Govt. of India

Table 7: Contribution of major Indian states in Area, production and yield of Maize in India (2011-2012)

Name of the States	Area (million hectare)	Production (million tonnes)	Yield (kg/ha)
Karnataka	1.24	3.01	2,430
Rajasthan	1.09	1.15	1,044
Madhya Pradesh	0.83	1.04	1,256
Maharashtra	0.79	1.83	2,302
Andhra Pradesh	0.78	2.76	3,527
Uttar Pradesh	0.71	1.04	1,476
Bihar	0.63	1.48	2,341
Odisha	0.25	0.53	2,295
Other	1.95	7.48	1,998
All India	**8.27**	**20.32**	**2,384**

Source: India stat; Ministry of Agriculture, Govt. of India

The decadal average growth (2001-2002 till 2011-2012) in area, productivity and production of maize in India increased at a faster rate than that of rice and wheat during the same period. The area under maize cultivation grown at a rate of 25.5% as compared to the negative growth (-6.3%) in rice area. The productivity and production of maize registered a growth of 21% and 52.2% respectively (Table 8).

Table 8: Decadal growth of three major foodgrains in India

Particulars	Decadal growth (%)		
	Rice	Wheat	Maize
1. Area	-6.3	10.8	25.5
2. Productivity	12	4.5	21
3. Production	4.8	15.9	52.2

Source: Directorate of Maize, Govt. of India, New Delhi

Maize in India is grown in both *Kharif* (80%) and *Rabi* (20%) seasons. In *Kharif*, it is sown in June-July till mid-August and harvested from mid-September. The arrivals extend from late September to February. In *Rabi*, maize is grown in Karnataka and coastal region of Andhra Pradesh. It is shown in November-December and the arrivals start from late March and extend up to June (Table 9). The average yield of *Rabi* crop is higher than the *Kharif* crop. Bulk of the maize produced in the country goes for production of poultry feed.

Table 9: Seasonality of Maize production in India

States of India	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar
Andhra Pradesh (K)												
Andhra Pradesh (R)												
Rajasthan (K)												
Madhya Pradesh (K)												
Bihar (K)												
Uttar Pradesh (K)												
Karnataka (K)												
Karnataka (R)												
Odisha (K)												

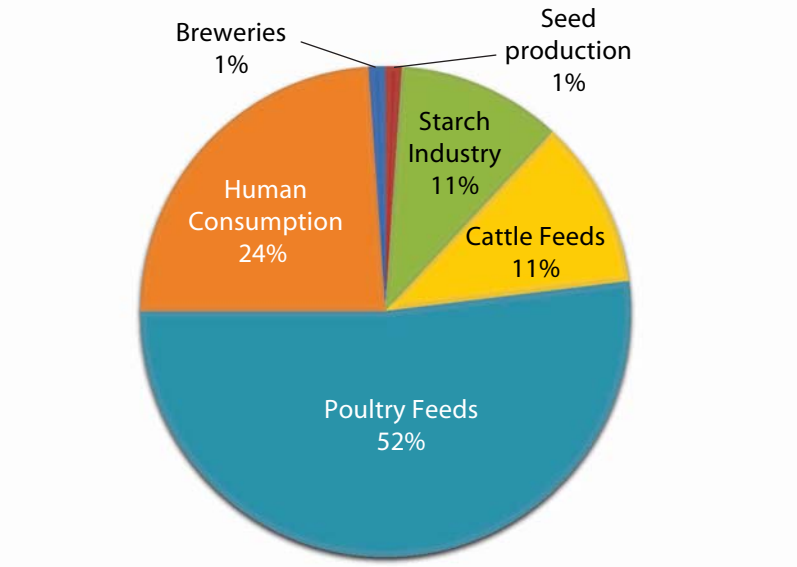
K: Kharif (Autumn); R: Rabi (Spring)

Sowing Harvesting

(**Source:** Hand Book of Agriculture, Indian Council of Agricultural Research, New Delhi)

As per the current estimates, 52% of maize output is used as poultry feeds, 11% as cattle feeds, 24% for human consumption, 11% in starch[6] industries, and 1% both for breweries and seed purpose (Figure 2). It is estimated that the demand for maize from the poultry industry would rise by about 6% which is likely to substantially hike maize consumption to go over 30 million tonnes by 2020.

Figure 2: Maize Consumption categories



Source: Directorate of Maize, Govt. of India, New Delhi

[6] In India, the prime source of starch is maize and the textile industries in the country are the largest consumers of maize starch.

4.1.2 Maize Production in Odisha

As can be seen from the Table 10 below, the total maize area in the state of Odisha has been on a steady increase between the years 2001-2002 and 2011-2012, there has been a 27.8% increase in the area and 146.3% increase in production. Average yield of maize has also increased to the tune of 86% during this period due to adoption of hybrid varieties and increase in irrigated area under the crop. Districts like Nabarangapur, Ganjam, Kalahandi, Koraput, Malkangiri and Kandhamal have the highest areas under irrigated maize in the state[7].

Table 10: Area, Production and Productivity of Maize in Odisha

Year	*Kharif* (Autumn)			*Rabi* (Spring)			Total		Pro-ductivity (kg/ha)
	Area ('000 ha)	Pro-duction ('000 MT)	Pro-ductivity (kg/ha)	Area ('000 ha)	Pro-duction ('000 MT)	Pro-ductivity (kg/ha)	Area ('000 ha)	Pro-duction ('000 MT)	
2001-2002	170	210	1,234	6	8	1,273	176	218	1,235
2002-2003	156	175	1,119	8	11	1,287	164	186	1,125
2003-2004	152	170	1,118	6	7	1,244	158	177	1,123
2004-2005	166	183	1,101	9	12	1,389	175	195	1,116
2005-2006	176	230	1,305	9	15	1,649	185	245	1,322
2006-2007	179	263	1,468	8	17	2,092	187	280	1,496
2007-2008	190	299	1,575	9	20	2,147	199	319	1,602
2008-2009	204	453	2,216	10	28	2,824	214	481	2,245
2009-2010	207	471	2,243	10	31	2,850	217	502	2,268
2010-2011	209	479	2,237	12	30	2,815	221	509	2,275
2011-2012	211	503	2,240	14	34	2,866	225	537	2,295

[**Source:** Govt. of Odisha; Economic Survey (various issues including 2012-13)]

Government of Odisha has taken some important measures to improve the maize cultivation practices in the state keeping in view its importance as an agrarian economy. One of them is to tie up with the seed companies to ensure uninterrupted supply of hybrid maize to the farmers and the government entered into PPP (Public Private Partnership) in the year 2010 with leading seed companies of the country and allotted 21 districts to them to avoid conflict of interests (Box 2).

Box 2. Policy measures of Government of Odisha

Productivity of maize in Odisha is sub-optimal compared to other states which may be due to non-availability of hybrid seeds. Keeping this in view, the government of Odisha started implementing a PPP (Public Private Partnership) project in the state focused on the promotion of hybrid maize under the "Green Revolution in Eastern India" programme that the Government of India had announced in its 2010 Budget. During the Kharif (Autumn) season of 2010, the Government of Odisha undertook 'Project Golden Days' in 30,000 hectares in the state and partnered with Monsanto India Ltd. (MIL) for the tribal districts of Bolangir, Kalahandi, Nayagarh, Nuapada and Khurdah covering 8,000 hectares. Another 9,000 hectare of area covered by the Pioneer Seeds in the districts of Gajapati, Rayagada, Ganjam, Mayurbhanj, Sambalpur, Bargarh. By means of the project, farmers had access to the high yielding hybrid maize seeds and training on improved agronomic practices. As a result, maize farmers in Odisha were able to increase yields and improve their quality of life through enhanced incomes.

(**Source:** Dept. of Agriculture, Govt. of Odisha)

[7] Department of Agriculture, Govt. of Odisha

4.1.3 Value Chain of Maize in Odisha

The special maize scheme is a variation of a project the Odisha agriculture department had launched in 2010 to wean farmers away from rice cultivation and hook them to maize. During 2011 this programme is again a partnership with private seed companies and will cost INR 155 million. This is a 26.6% jump over last year's outlay of INR 120 million to give farmers a generous kit of seeds, fertilizers, bio-fertilizers and pesticides. Area covered under this scheme was 30,000 ha during 2010, which increased to 40,000 ha during 2011 and remained same in 2012.

Input suppliers

The most critical input for maize production is seed. Proper seed use could change the level of production significantly (Box 3). Recent policy reforms have brought major changes to India's maize seed industry. Since seed laws were liberalized in late 1980's, private investment in maize research has been rising sharply, and seed companies have captured a significant share in the market. Farmers are mostly dependent on private seed companies for maize seed. These seed companies supply seeds to the farmers in credit and repayment they take either in the form of cash or in the form of produced maize grains. With the reduction of public sector stake to about 10% in the total volume of maize seeds supply, the private sector seed companies are entering in to the market to fill up the gap. The farmers in Odisha largely use home saved maize seeds and only 35% purchase improved seed and 40% of them are estimated to use due doses of fertilizers and pesticides.

Box 3. Hybrid seeds of helped farmers to adopt Maize cultivation

The level of production with the adoption of hybrid seeds of maize increased to 160% during the last 3 years which the farmers still feel that not reached the potential. The farmers of Odisha adopted Hybrids maize to produce bold grains which generally fetches better prices in the market. It was observed during the survey that if the 100 gram of maize grains contains less than 350 numbers of grains higher prices could be received by farmers.

(**Source:** Author, 2013)

The Government of Odisha identified 8 private seed companies to enter in to an agreement under PPP mode and allotted 21 districts for supply of hybrid maize seeds (Table 11) at a predetermined price of INR 100 per kilogram.

Table 11. Seed companies and allotted districts with area coverage

Sl. #	Seed Companies	Districts allotted	Area (Hectare)
1	J K Agri-genetics	Ganjam	4,000
		Sonepur	1,000
2	Bisco Bio-Sciences Pvt. Ltd.	Mayurbhanj	2,000
		Nuapada	2,000
		Jharsuguda	1,000
3	UPL Advanta Ltd.	Gajapati	4,000
		Nayagarh	1,000
4	Bayer Bio-Science Limited	Kalahandi	3,000
		Bolangir	2,000
5	PHI Seeds Private Limited	Sambalpur	4,000
		Bargarh	1,000
6	C P Seeds Pvt. Limited	Koraput	2,000
		Malkangiri	2,000
		Anugul	1,000

Table 11. *(continued)*

Sl. #	Seed Companies	Districts allotted	Area (Hectare)
7	Nirmal Seeds Pvt. Limited	Keonjhar	2,000
		Kandhamal	2,000
		Boudh	500
		Khurdah	500
8	Mahyco Seeds Pvt. Limited	Dhenkanal	1,000
		Sundergarh	2,000
		Rayagada	2,000
TOTAL		**21 Districts**	**40,000**

(**Source:** Department of Agriculture, Govt. of Odisha)

Growers

Small scale farmers represent 48% of the total maize farmers in Odisha, and are estimated to produce 40% of the total output followed by the medium scale farmers (26%) who produce 30% of the output. The marginal farmers in Odisha represent 16% of the maize growers[8]. Rice is the principal crop in the state of Odisha but due to the low productivity of rice in the recent years, the small and marginal farmers are shifting their interest in the maize crop (this crop also grow during the rice season). The other reasons might be the availability of the hybrid seeds, reduced cost of cultivation, less water requirement and less risk compared to rice. The increase in number of farmers adopting cultivation of maize in Nabarangapur district of Odisha could be cited as an example of the tacit knowledge of the farmers to adopt the risk mitigation (Box 4).

Box 4. Farmers of Nabarangapur, Odisha braces maize cultivation

Predominantly an agricultural district Nabarangapur, more than 90% of its inhabitants depend on farming for their livelihood. They have been traditionally cultivating paddy, but in the absence of sufficient irrigation facilities, had to largely depend on rain god.

Nabarangapur has emerged as major maize producing district of the country and the leading one in the state. Taking up maize cultivation, as it requires less irrigation, has helped them in more ways than one. As per the field study it revealed that there is a major shift from traditional paddy to maize cultivation as it proved to be more profitable in the irrigation starved district. In general, Maize is being cultivated with 70 kilograms of manure per acre of land whereas in case of paddy 120 kilogram of manure is used to till the same area of land.

Nabarangapur district has 64,000 hectares of land under maize crop (2012) and one hectare of land produces 1.95 MT of maize on an average, which is sold at INR 10,000 per MT (Minimum support price of Govt. of India, 2011-2012). There is a long standing demand of the maize farmers of the district for setting up of proper marketing facilities and processing units in the district, which would help them in getting proper price for their produce.

(**Source:** Primary survey by author, 2013)

Traders

The traders (who are present in numbers) are very active in the maize value chain in the state of Odisha and are virtually controls the output market. The small sized traders are present in the block towns and district head-quarter across the state. The rural traders operate in villages (especially in the tribal districts

[8] Govt. of Odisha (2011). Based on operational land holdings, the farmers in India are broadly classified in to 5 categories by the NSSO: Marginal farmers (up to 1 ha of land); Small farmers (more than 1 ha up to 2 ha); Semi-medium farmers (2.01-4.00 ha); Medium farmers (4.01-10.0 ha) and Large farmers (more than 10 ha).

of the State) and are the major market outlet for subsistence farmers. Transactions with farmers are conducted on a spot market basis (purchase done at the farm gate), with immediate cash payment but at a very low price as compared to Minimum Support Price (MSP). Most of these traders are meeting their need for finance from the District level traders and the millers. The rural traders do not have the storage facilities, so they immediately dispose the collected maize grains by dispatching the same to the nearby district headquarters where the district level traders have the storage facilities. These traders also sell maize grains to the millers.

Some of the big traders are also located in the state capital at Bhubaneswar[9]. These big traders often provide short term cash advances to the rural traders so that they can in turn pay cash to the growers and also supply significant amount of maize in the national level market. They assemble stocks in storage facilities until there is enough to justify their business. They clean, assemble, fumigate, re-bag and bulk maize, and act as sources of market information regarding prices and volumes in their areas of operations. These state level traders are self-financed, and are a source of finance to the district level suppliers.

Processors

The processing of maize in the state is being done by two types of industries. Millers convert maize to maize meal (corn flakes) for human consumption while animal feed manufacturers use yellow maize for the manufacture of poultry and cattle feeds. Maize processing is an important activity of the medium level industries in the state which are categorized as MSME units. The processing units get subsidy from the central government and some other benefits from the state governments. An average investment in a processing plant with 30,000 tonnes (TPA) capacity of maize grain processing is INR 20 million[10]. The commercial bank like State Bank of India, UCO Bank, Andhra Bank finances these processing units under the MSME projects. Majority of the maize processing plants Nabarangapur district of Odisha which produces almost 50% of the maize production alone have three small scale maize processing unit having an installed capacity of 4,720 tonnes which is not sufficient to cater the production of 1.25 million tonnes. Government of Odisha cleared some of the new big sized maize processing units which will improve the processing capacity of the state and facilitate higher revenue by the farmers (Box 5).

Box 5. New maize processing plants in Odisha

The State Level Single Window Clearance Authority (SLSWCA), Government of Odisha approved the Seashore Group's plan to set up a maize processing unit at Papdahandi block in Nabarangapur district at a cost of INR 1.6 billion (11th June, 2010). The facility will come up on 123 acres of land and will require two lakh liters of water per day. The project will create 96 direct jobs besides creating indirect employment opportunity for around 6,000 people.

LMJ International, a Kolkata-based export firm will be setting up a maize processing complex in south Orissa's Nabarangapur district at an investment of around US$ 30 million. The company has signed the Memorandum of Understanding (MoU) with the Orissa government for this purpose and government allotted 120 acres of land. The maize processing complex will help raise the income level of maize producers in the state through enhanced production as well as better processing and marketing,

(**Source:** http://www.sify.com/finance/slswca-clears-proposals-worth-rs-4920-26-cr-news-news-kglbkmgeehe.html)

[9] Bhubaneswar is the capital city of Odisha state. One of the big trading companies named 'Swadeshi Trading Company' trading with Yellow maize with a brand name of 'Swadeshi Maize'. Contact address: Plot No-96, Satya Nagar, Bhubanesawr-751007, Odisha, India; Tel: +91-674-6571310.

[10] NABARD Consultancy Services (Consulting arm of NABARD); website: http://www.nabcons.com/maize.aspx.

Exporters

Substantial exports of maize are being made to Far-East nations such as Malaysia, Singapore and Indonesia. It is expected that the exports to Vietnam to pick up from June after its domestic crops gets over. Egypt is another important importer of Indian Maize that is buying in break bulk consignments. Total export of maize from India was recorded at 2.4 million tonnes in 2010-2011 which is 33% higher than 2009-2010. Indian maize (corn) is quoted at $ 260 a tonne f.o.b in the international market for the crop harvest during *Rabi* (spring) and $ 250 for the harvest during *Kharif* (autumn). In comparison, US corn is quoted upwards of $ 270 f.o.b. Majority of the Indian exporters are located in the states of Andhra Pradesh, Tamil Nadu, Maharashtra and West Bengal. The only major exporter of maize in Odisha is M/s R.K. Modern Raw & Boiled Rice Mill in the District of Kalahandi. The wholesalers and the millers generally sell their stocks to the exporters of Calcutta and Hyderabad who are having their filed offices in Nabarangapur District of Odisha.

Commodity Exchanges

Commodity exchanges play an important role in maize market with special reference to availability of industrial grade maize. Both the national level commodity exchanges (NCDEX & MCX) deals with the maize spot and future price and the volume traded are very much significant. The average spot price of maize in the National Commodity Exchange (NCDEX) were analyzed for the autumn and spring arrivals in the Nizamabad market recorded at INR 1,139 per quintal which is more than the minimum support price i.e. INR 980 per quintal declared by the Government of India for the year 2011-12[11]. The National Spot Exchange of India has planned to open a trading platform at *Umarkote* of Nabarangapur district of Odisha to facilitate marketing of maize in the district and expose the farmers to the price discovery mechanism. While analysing the market price during 2011-12 it was observed that the prices have gradually increased in spite of the overall increase in production, except for the price drop in the beginning of 2012 which may be due to the growing and sustained demand for maize. The general trend is that prices tend to hike between December and January and hit the bottom of the market between October and September. Trading in future of maize is also a popular transaction in the commodity exchanges of India and the price quoted in various exchanges varies according the contract expiry dates.

4.1.4 Comprehensive MAP of Maize Value Chain

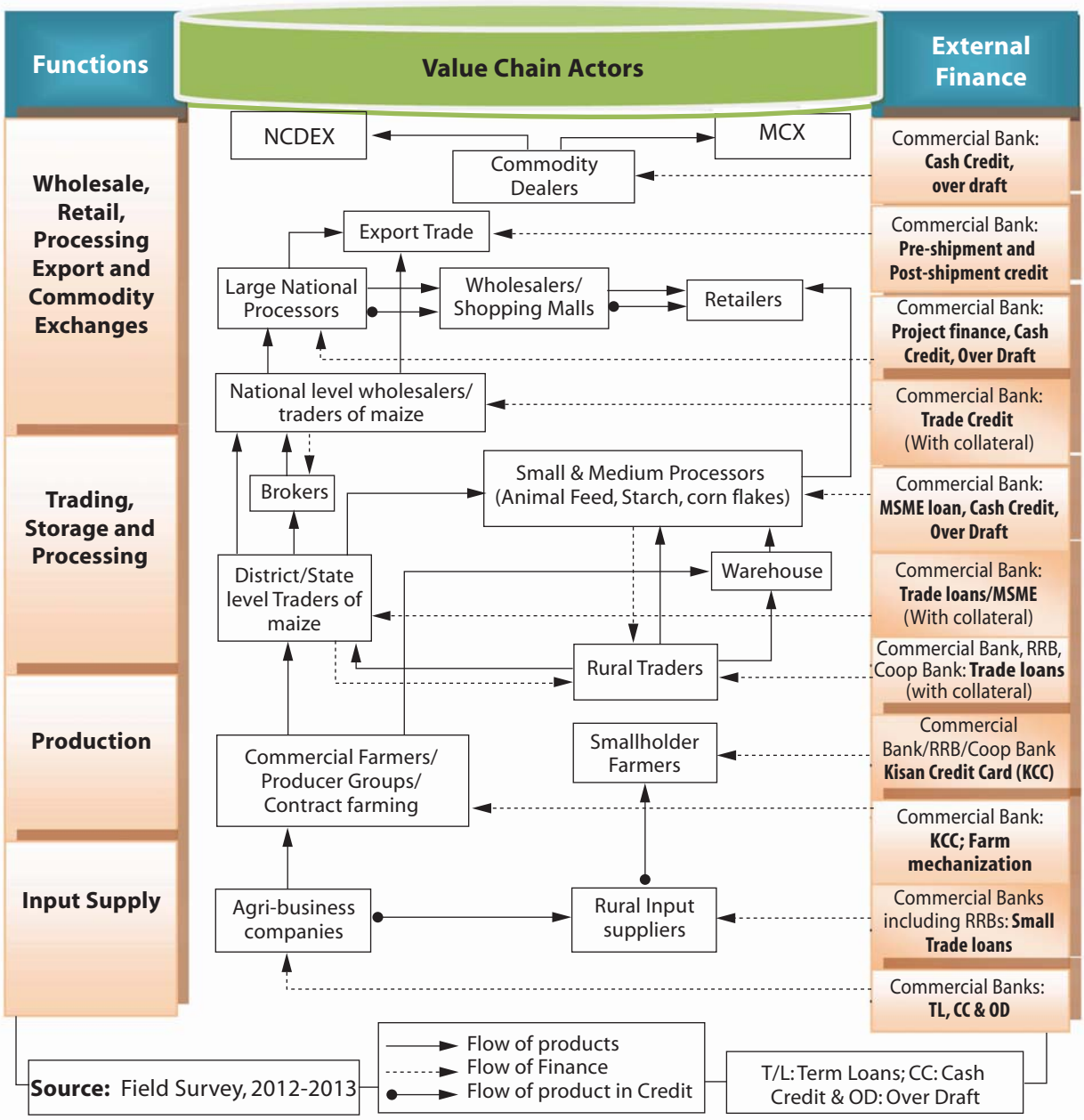
The value chain of maize in Odisha could be divided in to three sectors. The primary sector consists of input suppliers (especially the seed suppliers), primary producers and local traders. The secondary sector consists of district and state level traders, millers and animal feed manufacturers. The tertiary sector consists of regional level traders, retailers and transporters. The commodity exchanges also play important role in the value chain of maize.

In addition to the direct functions within the value chain, supporting services are required for the system to function efficiently. These supporting services can be represented by interconnected value chains, such as public and private sector laboratories and institution support the hybrid seed production, Agribusiness companies (e.g. Monsanto, J K Agro etc.) ensures availability of the hybrid seeds at the village level through a network of dealers and retailers. Other services (such management services rendered by the seed companies or extension services provided to the farmers) or financial services (including investment capital, working capital, or insurance) which cut across each function of the value chain. The Commercial Banks, Regional Rural Banks and Cooperative Banks are also very active in extending the much required credit facilities to the maize farmers[12]. Commodity exchanges, where the product can be transparently traded, are the other important service within the value chain (Figure 3).

[11] MSP for Maize as declared by the Government of India for the cropping season 2011-12 (as on 25.10.2011) was INR 980 per quintal.

[12] Financing maize cultivation and processing are categorized as direct credit to agriculture and MSME respectively which recognized as the priority sector credit in India.

Figure 3. Comprehensive mapping of maize value chain and finance



The next step in the chain, purchasing from farmers by traders, is exclusively market based. As such no examples of former contract farming were found in the maize value chain but some of the farmers are selling maize to the traders which are due their long standing relationship. However, at the next step of trade from rural and district level traders to Bhubaneswar based traders, there is no contracting. The final step in the large volume segment of the value chain, the sales to the processors or export markets, is the sole place where buyers and sellers regularly enter into contracts at established prices. These contracts enable access to finance from financial institutions.

4.1.5 Finance to Maize Value Chain

It is quite clear from the maize value chain map (shown in Figure 3 above) that both the internal and external financial arrangements are equally strong. At the base of the value chain, productivity is low as compared to the country average (Average yield of maize in Odisha was 2.5 tonnes/ha during 2011-12); very low proportion of growers use improved inputs (fertilizer or improved seed) and, when

used, are purchased at market prices. Therefore there is less demand for input credit except in case of Nabarangapur district of the state where the majority of the farmers are small holder and they depend on the input suppliers to supply the inputs on credit apart from the bank finance. The banks in the state extend finance to the maize growers in the form of *Kisan* (Farmer) *Credit Card*[13]. It was found that almost 40% of the farmers surveyed are availing the *Kisan Credit Cards* from Co-operative banks, Regional Rural Bank and the commercial banks, of which the share of commercial bank lending to the primary producers are significantly higher than other formal lenders. Cost of cultivation[14] along with some element of consumption credit also included while fixing the limit by the formal credit institutions as per the extant guidelines of the Reserve Bank of India. From the cropping season of 2011-2012, the Govt. of Odisha state launched a special scheme to popularize maize cultivation by reimbursing[15] the cost of fertilizers which will benefit 45,000 maize farmers across the state. It was also observed that the amounts of finance extended by the banks are inadequate to meet the requirement of the maize farmers and they resort to credit facilities extended by the rural input suppliers who charge interest @4% per month. Out growers model is almost absent may be due to the market governance structure and price volatility which constrain value chain actors from entering into any advance contracts with other actors. However, few of the growers also being contracted by the rural traders and the finance charge is 3% per month.

The Commercial banks in the state is active in financing collateralized trade loans to the traders dealing with the maize (both the village and higher levels). The processors[16] are availing the lending from the big traders, exporters and the commercial banks under MSME[17]. There are no specially designed financial products and services for the maize processors. The top exporter who is situated in the state had quarter (Bhubaneswar) avail both the pre-shipment and post-shipment credit from the large commercial bank. The exporters in turn allow some loans to the aggregators (traders at the district levels) to ensure smooth supply of the produce. It was also observed that the microfinance institutions (MFIs) are not active in the state in financing this agricultural produce although they extend aggressive lending to the non-farm sector. The scenario varies according to the financial capability and the reach of the formal financial institutions which is explained below.

4.1.5.1 Scenario Analysis in Value Chain Finance of Maize

While analyzing access to finance by the value chain actors of maize, it was observed that there is a strong network of rural and semi-urban bank branches in the state of Odisha[18]. As on 31st March, 2011, loans to agriculture sector in the state was recorded at 31.2% of the total advances by the commercial banks. The strong networks of bank branches and directed finance to agriculture (Priority sector credit) have a positive impact on the availability of finance to the actors of maize value chain. However, it was observed that the credit facilities from the banking sector (Commercial Banks, Regional Rural Banks and the Coop Banks) available are not sufficient to cater the demand of the value chain actors. Extending finance facilities by the value chain actors were found in case of input suppliers, producers and traders by the agribusiness companies, traders and processors respectively.

[13] KCC has emerged as the strongest instrument to extend short term credit facilities to the growers which is hassle free and renewable after every three years

[14] Cost of cultivation is calculated at the state level based on the current prices of inputs and circulated to all banks every year before the start of the season.

[15] The amount of reimbursement is limited to INR 3,500 for every hectare the farmer cultivates.

[16] They are mainly the animal feed processors and process the maize depending on the demand of the traders and the exporters.

[17] MSME (Micro Small & Medium Enterprises) financing are available to the processors and traders from the commercial banks whose investments in plant and machineries not exceeds INR 100 million and INR 20 million respectively.

[18] As on 31st March, 2011 there are 2,643 branches of commercial banks in rural and semi urban areas of the state of Odisha (http://www.orissa.gov.in/finance/slbc/SLBC_Banking_Glance.pdf)

It was also observed that there are quite a few cases of combined finance by both the value chain actors and the external financing entity. In case of big sized traders and processors, it was observed they sometime finance their activities from their own resources. Keeping these in mind, we carried out a scenario analysis to understand the efficiency of financing to the value chain actors. All the chain actors were analyzed in the light of three most common scenarios as shown in the Table 12 below.

Table 12. Brief description of the Scenarios

Scenarios	Input suppliers	Producers	Traders	Processors
Scenario 1	Finance from Banks with interest @1% pm (limit allowed up to INR 500,000)	Finance from Bank (Commercial Bank/ RRBs/Coop Banks Interest @1% pm for 6 months. Maximum limit INR 100,000.	Trade Finance from Commercial Banks Maximum Limit INR 500,000. Interest @1.25% pm for 2 months	Loan from Commercial Banks. Interest @1.25% pm for 4 months.
Scenario 2	Credit allowed by the Agribusiness companies (limit allowed up to INR 200,000; credit period of 30 days; interest rate 2% pm)	1. Finance from Bank (Commercial Bank/ RRBs/Co-op Bank) Maximum Limit INR 50,000. Interest rate 1% pm for 6 months. 2. Credit for inputs (seeds & Fertilizers). Interest rate 4% pm for 6 months.	1. Finance from commercial Bank: Maximum Limit INR 250,000. Interest @1.25% pm for 2 months 2. Credit from processors: Maximum limit INR 250,000. Interest @2% pm for 2 months	1. Finance from commercial Bank. Interest @1.25% pm for 4 months. 2. Credit from exporters. Interest @2% pm for 4 months.
Scenario 3	1. Credit allowed by the Agribusiness companies (limit allowed up to INR 200,000). Interest rate 2% pm 2. Finance from Bank up to INR 250,000). Interest rate 1% pm	Finance from Retail traders (for production and consumption purpose); maximum limit of INR 50,000. Rate of interest 3% pm for 6 months	Investment from own sources. Opportunity cost @1.5% pm for 2 months.	Investment from own sources. Opportunity cost @1.5% pm for 4 months.

(**Source:** Field survey)

The scenario analysis of the value chain finance in maize (Table 13) clearly states that both the internal and external finance are equally important to cater the need of the maize value chain actors. While the producer, national level traders and processors are availing finance from the formal financial system (external finance), the rural input suppliers get large share of their financial requirements from the agribusiness companies in the form of trade credit.

When the input suppliers (scenario-1) avail finance from the commercial banks, RRBs and Co-op banks, it proved to be the most efficient where the margin by the input suppliers are more (INR 750) and lowest (INR 650) in case of finance availed from the Agribusiness companies. Here the selling price has been kept constant at INR 10,750 for the inputs required for 1 hectare of land cultivated under maize.

Cost of production of maize in each hectare of land is lowest (INR 18,020) in case of the finance availed form the commercial banks and highest (INR 20,060) in case of finance received from the retail traders (who deals with the maize seeds and fertilizers). The combination of finance from the input suppliers and the banking system is also efficient (INR 19,550 per ha) and due to absence of adequate finance available from the financial system this combined financing mechanism is working well.

Table 13. Scenario Analysis of Value Chain Finance in Maize in Odisha

(Value per hectare expressed in INR)

Category of transaction	Scenario 1	Scenario 2	Scenario 3
1. Input Retailers			
Total cost of inventory	10,000	10,100	10,050
Pricing by Retailer	10,750	10,750	10,750
Value added	750	650	700
Return on Investment (ROI) %	6.5	2.3	3.7
2. Production			
Total cost of Production	18,020	19,550	20,060
Farm gate price	30,550	30,550	30,550
Value added	12,530	11,000	10,490
Return on Investment (RoI) %	11.3	3.3	2.5
3. Local/District level Traders			
Total cost at traders level	34,900	31,250	30,750
Selling price by the traders	38,000	38,000	38,000
Value added	3,100	2,850	2,930
Return on Investment (RoI) %	2.7	1.6	1.9
4. Processing of maize (Dry Rolled Corn)			
Total cost at processors level	42,400	43,020	42,670
Selling price by the processors	46,000	46,000	46,000
Value added	3,600	2,980	3,330
Return on Investment (RoI) %	0.8	0.1	0.3

(**Source:** Field survey)

In case of local and district level traders, the most efficient route of availing finance is the commercial banks followed by investment from own resources. Combination of both commercial bank and credit from processors is the least efficient financing avenues. To the Processors, the most efficient way of getting finance is investment from own resources followed by the loan from the commercial banks. The combination of commercial bank finance and the finance from the exporters turned out to be the least efficient. Details of each of the scenario vis-à-vis value chain actors are given in **Annex I**.

4.1.5.2 Analysis of Risk and Opportunities at various Transaction Points

The table 14 below indicates many of the risks at each transaction point along this value chain and proposes opportunities for analyzing and mitigating these risks in order to make sound lending decisions and enable the capture of profit opportunities.

Table 14. Risk and opportunities at various transaction points

Risks	Opportunities
1. Transaction Point: Input Supply	
Retail price fall due to competition because margins are thin.	Short-term lending product of only one to two months to limit the exposure of the lender.
2. Transaction Point: Production	
Inputs for production are late or inadequate.	Monthly phased disbursement lending product to limit the exposure of the lender.
Farm gate price may fall below cost of production.	Forward contracting by major buyers, for example District level traders and major processing plants guaranteeing price and quantity prior to planting. Popularize insurance products compensating for low price years from earnings of high price years through a commercial insurer. Credit guarantee facilities may improve the credit flow from the formal system.

Table 14. *(continued)*

Risks	Opportunities
Loan term is longer than production and marketing cycle.	Adjust the term of the loan product to match the seasonal production and marketing cycle (4 month loan tenure for maize is less risky than 6 month loan though it is less profitable).
Yield is lower than expected.	Design the loan product to pre-finance only a portion of the total cost of production. Opt for loans based on warehouse receipts so as to lend only post harvest.
Operational acreage borrowed for is not realized.	Design the loan product to disburse in phases where financing is only released as key tasks in the production and marketing cycle are realized.
3. Transaction Point: Local/District level Traders	
Transport is inadequate.	Offer finance and/operating leases for trucks and carriages. Make contracted transport a prerequisite for the loan contract.
Price is below cost of procurement.	Finance only against forward contracts provided in advance of borrowing from Local/District level traders. Develop insurance products compensating for low price years from earnings of high price years through a commercial insurer. Opt for loans based on warehouse receipts so as to lend only post delivery.
Local Traders may default willfully.	Finance only borrowers who assign their sales contracts with their buyers to the lender for deduction of repayment.
Quality (moisture content, foreign matter, etc.) may be below contract specification.	Finance only regional traders who have verifiable access to proper cleaning and drying machinery; or, Finance cleaning and drying facilities in addition to trade finance.
4. Transaction Point: Processors	
Smooth Supply of raw material	Majority of the processing units are categorized as MSME and finance are available at a lesser cost.
Side selling by the traders or the producers at the time of high demand	Avail the facility of CGTMSE (collateral free credit guarantee programme) developed by SIDBI.
Animal feed industry (especially poultry sector due to avian flu) is highly volatile	Export finance products can be developed for the Export oriented Units.

4.1.6 Lessons Learned

The major lessons learned after detailed study of the maize value chain and access to finance by the actors of the chain:

- Both the internal players and the external financing entities are playing important roles in access to finance by the value chain actors.
- The most efficient financing in the maize value chain in Odisha is the combination of both trader's credit and the finance from the commercial banks.
- Banks are less willing to lend money to farmers because the farmers do not take a share in the risks but they are willing to finance to the value chain actors whose products are vertically linked with other actors.
- Banks prefer to deal with the group of farmers/producers/cooperatives that are bigger legal entities than directly with the farmers.
- Low level of farmer's financial literacy exacerbates the risk to the financial service providers; the farmers may improperly utilize the loan or sometimes fear that credit could lead to expropriation of their asset.

The following points emerged as the way forward for smooth flow of products and finance along the maize value chain

A. Development of warehouse and storage networks

- Facilitate the establishment of warehouse networks across the key maize-producing districts of Odisha.
- Encourage implementation of a warehouse receipt system in the state through advocacy and networking with the State Level Bankers Committee (SLBC) which will increase demand for warehouse storage, increase the liquidity of the farmers and build the basis for price risk management services.
- Facilitate improvements in grain transportation and handling especially bulk in the hilly region of Odisha.
- Encourage investment in commercial production, storage, transport and services.
- Develop partnerships with cross border firms, industry associations and government agencies involved in the maize value chain to help them extend trade, investment and other services.

B. Improved access to inputs for production and marketing facilities

- Develop better information on opportunities in maize value chain investment (e.g. inventory/ analysis of grain storage options).
- Promotion of organic maize cultivation so that the farmers could fetch better price.
- Organize buyer/seller missions and participation at major trade shows that will bring greater access to better inputs, markets and technology for producers.
- Improve market price information services, and more price transparency, through support of commodity exchanges with a regional focus.
- Opening of Spot exchange in the major maize producing districts of Odisha (e.g. Nabarangapur).
- Promote development of yellow maize as commercial cash crop as a feedstock into animal feed.

C. Improved Governance and access to finance

- Develop new financial instruments to improve access to finance by the value chain actors with special reference to the small holder producers.
- Financial literacy amongst the small holders and micro entrepreneurs will improve the accessibility of the available financial facilities (e.g. Kisan Credit Card).
- Development of new business models especially the producers driven business model so that the growers could be in a position to take greater part in the value chain governance.
- Adequacy of lending will improve the position of the small holders in respect to their holding capacity of the produce.

4.2. Dairy Value Chain in India and Financing Arrangements

4.2.1 Overview of Dairy Industry

The Indian dairy industry is one of the leading sectors of Indian economy as it contributes significantly to total output of the country[19]. The dairy sector in India has shown remarkable development in the past decade. Now, India is the largest producers of milk and value-added milk products in the world. The country also has largest domestic market for dairy products with a great potential with more than a billion people, vast territory and abundant resources. India is well known as the "oyster" of the global dairy industry, with opportunities galore for the entrepreneurs globally. The main objective of the Indian Dairy industry is to manage the national resources in a manner to enhance milk production, upgrade milk processing using innovative technologies and entrepreneurship development.

Milch livestock population contributes to the production of milk and milk products. Livestock census data of India shows that there is a significant change in the livestock population and the share of cross breed which replaces the indigenous population. In the 18th Livestock Census 2007, for the very first time digital data up to the household level has been processed at the central level through the National Informatics Centre. The Table 15 below on livestock population from 1951 to 2007 shows that cattle population in the country was increasing till 15th Livestock Census 1992. However, cattle population decreased from 204.58 million in 1992 to 198.88 million in 1997 and further decreased to 185.18 million in 2003 which increased to 199.08 million in 2007. However, population of buffaloes in India is increasing steadily and as per the latest census the share of buffaloes is 55% to the world population. During the inter-censal period from 2003 to 2007, cattle population increased by 7.5% and buffaloes by 7.6%.

Table 15. Population of Cattle and Buffaloes in India vis-à-vis Global Scenario

(Number in millions)

Sl. #	Species	Population in India based on Livestock Census*							World Stock as on 2010*
		1951	1961	1972	1982	1992	2003	2007	
1	Cattle	155.3	175.6	178.3	192.5	204.6	185.2	199.1	1,428.7
	of which, adult females	*54.4*	*51.0*	*53.4*	*59.2*	*64.4*	*64.5*	*73.0*	*Not Available*
2	Buffaloes	43.4	51.2	57.4	69.8	84.2	97.9	105.3	194.2
	of which, adult females	*21.0*	*24.3*	*28.6*	*32.5*	*43.8*	*51.0*	*54.5*	*Not Available*
3	Total Cattle & Buffaloes	198.7	226.8	235.7	262.4	289.0	283.1	304.4	1,622.9
	of which, adult females	*75.4*	*75.3*	*82.0*	*91.7*	*108.2*	*115.5*	*127.4*	*Not Available*

Sources: *Livestock Census, Directorate of Economics & Statistics, Animal Husbandry Statistics Division, Department of Animal Husbandry, Dairying & Fisheries, M/O Agriculture, Govt. of India (2012).
** FAOSTAT production data, www.faostat.org

The latest census (2007) shows that the population of exotic and crossbred cattle registered a significant increase of 33.9% whereas the indigenous cattle increased by only 3.4%.The exotic and crossbred milch cattle increased by 28.3%, indigenous milch cattle increased by 2.5% and milch buffaloes increased by 3.0%. The proportion of in-milk animals to the total milch animals has increased from 72.8% to 74.4% for crossbred cattle, from 59.0% to 63.9% for indigenous cattle and from 70.6% to 73.3% for buffaloes.

[19] The contribution of Livestock sector in the National Economy at current prices was 3.6% in 2010-2011. The value of output in 2010-11 from livestock sector was INR 3,883.7 billion at current prices, out of which Milk and Milk products was INR 2,622.15 billion (Livestock census Report, 2012 released by Department of Animal Husbandry, Dairying & Fisheries, Govt. of India)

4.2.2 Milk Production and Productivity in India

The Indian Dairy sector has acquired substantial growth momentum from 9th Five Year Plan[20] onwards (1998-2002) as a result of which an annual output of about 127.9 million tonnes of milk was recorded during 2011-12 compared to 121.8 million tonnes in 2010-2011 (Table16). This represents sustained growth in the availability of milk and milk products for the growing population of the country. Dairying has become an important source of income for millions of rural families and has assumed the most important role in providing employment and income generating opportunities particularly for marginal and women farmers. The per capita availability of the milk has reached a level of 290 grams per day during the year 2011-2012, which is more than the world average of 284 grams per day and is expected to touch 370 gram in 2020. The shares of milk production by exotic/crossbred cows, indigenous/non descript cows, buffaloes and goats was 24.3%, 20.8%, 51.2% and 3.8% of total milk production respectively. Most of the milk in the Country is produced by small, marginal farmers and landless labourers. About 14.78 million farmers have been brought under the ambit of 148,965 village level dairy corporative societies up to March 2012[21].

Table 16. Estimates of Global Milk Production 2001 to 2010

Year	Milk Production (in million tonnes)					
	Cow	Buffalo	Goat	Sheep	Total*	India to world
2001	497.7	69.3	12.9	8.2	589.5	83.4
Share in %	*84.4*	*11.7*	*2.2*	*1.4*	*100.0*	*14.2*
2002	510.4	70.9	13.3	8.2	604.3	84.8
Share in %	*84.5*	*11.7*	*2.2*	*1.4*	*100.0*	*14.0*
2003	517.6	73.5	13.8	8.4	614.9	86.7
Share in %	*84.2*	*12.0*	*2.3*	*1.4*	*100.0*	*14.1*
2004	527.2	76.1	14.1	8.6	627.5	91.1
Share in %	*84.0*	*12.1*	*2.2*	*1.4*	*100.0*	*14.5*
2005	543.1	78.9	14.5	8.8	646.9	95.6
Share in %	*83.9*	*12.2*	*2.2*	*1.4*	*100.0*	*14.8*
2006	559.1	81.4	14.6	9.2	665.8	99.3
Share in %	*84.0*	*12.2*	*2.2*	*1.4*	*100.0*	*14.9*
2007	569.6	83.9	14.8	9.2	679.2	103.3
Share in %	*83.9*	*12.4*	*2.2*	*1.4*	*100.0*	*15.2*
2008	578.7	89.6	15.2	9.1	694.2	109.0
Share in %	*83.4*	*12.9*	*2.2*	*1.3*	*100.0*	*15.7*
2009	580.5	90.3	15.1	9.0	696.6	110.0
Share in %	*83.3*	*13.0*	*2.2*	*1.3*	*100.0*	*15.8*
2010	599.6	92.5	16.6	10.0	721.0	117.0
Share in %	*83.2*	*12.8*	*2.3*	*1.4*	*100.0*	*16.2*

* Milk total for World includes Camel milk
(**Source:** FAOSTAT production data, www.faotat.org)

As per the available data, top 10 states of the country contribute more than 80% of the total milk production (Table 17). The other states are not self sufficient in production and depends on those states who produces excess of the demand. Milk production in the country has progress steadily and the year on tear (YoY) growth registered at 5% during 2011-12. The states like Uttar Pradesh, Rajasthan and Gujarat have shown remarkable growth in milk production during the last few years. The growth of milk production was stagnant in the states like Punjab and Haryana. Per animal milk production needs to be improved through various government initiatives and programmes for dairy development.

[20] Five-year plan in India is a centralized and integrated national economic programme launched in 1951 to signify the serious approach of the national government towards development of the country.
[21] Annual Report (2012-2013); Department of Animal Husbandry, Dairying & Fishery; Ministry of Agriculture, Govt. of India

Table 17. Top 10 Milk producing States of India ('000 tonnes)

Sl. #	States of India	2008-09	2009-10	2010-11	2011-12
1	Uttar Pradesh	19,537	20,203	21,031	21,875
2	Rajasthan	11,931	12,330	13,234	13,895
3	Andhra Pradesh	9,570	10,429	11,203	11,585
4	Punjab	9,387	9,389	9,423	9,522
5	Gujarat	8,386	8,844	9,321	9,755
6	Maharashtra	7,455	7,679	8,044	8,620
7	Madhya Pradesh	6,855	7,167	7,514	7,945
8	Tamil Nadu	6,651	6,787	6,831	7,055
9	Bihar	5,934	6,124	6,517	6,822
10	Haryana	5,745	6,006	6,267	6,480
Total		91,451	94,958	99,385	103,554
All India Production of Milk		112,183	116,425	121,848	127,946
Share of top states to total (%)		81.5	81.6	81.6	80.9
YoY Growth in milk production (%)		3.9	3.8	4.7	5.0

Source: Basic Animal Husbandry Statistics, 2012, Dept. of Animal Husbandry, Dairying & Fisheries, Ministry of Agriculture, Govt. of India

4.2.2.1 Intervention by National Government

Government of India intervene time to time to keep the demand and supply balance for example, in March 2010 allowed tax-free imports of 30,000 tonnes of milk powder and 15,000 tonnes of butter oil, commodities which until then attracted 60 and 30% import duty respectively. Apart from this the National government launched a special programme for dairy development to supplement the protein hunger among the Indian population (Box 6).

Box 6. Special Programme for Dairy Development as a part of National Mission for Protein Supplements under Rashtriya Krishi Vikas Yojana (RKVY)

National Mission for Protein Supplements (NMPS) will be implemented in identified States during financial year 2012-13 under Rashtriya Krishi Vikas Yojana (RKVY), at an outlay of Rs 500.00 (Rupees Five Hundred Crore only) of which, Rs 200.00 Crore (Rupees Two Hundred Crore only) has been earmarked to the sub-scheme for dairy development named as Special Programme for Dairy Development under National Mission for Protein Supplements (SPDD-NMPS). Under the scheme projects will be funded for expansion of animal husbandry and dairy development activities with priority given to improving productivity of milch animals through measures such as productivity improvement programme, improving nutritional balance of animal feed concentrate, fodder development activity and improving milk procurement, processing and marketing infrastructure in the indentified area of implementation.

Source: Annual Report (2012-13); Department of Animal Husbandry, Dairying and Fisheries, Govt. of India

4.2.3 Value Chain of Milk

The milk produced from the dairy farms will pass different channel before it reaches the final customer. The milk value chain in India may be classified in three major groups: a) value actors, b) value chain supporters and c) value chain context. The chain actors are also further classified as direct and indirect actors. The entities involved and responsible for movement of milk and product from primary producers to the end customers are explained hereunder.

4.2.3.1 Value Chain Actors

Input Suppliers

Breed of the dairy animal and feeding them are the two most important inputs in value chains and the supply of milk and other products are on their quality and ability to produce milk. Of the 73 million adult female cattle in the country, only 11.8 million are cross bred with average milk yields of 6.63 kg per day (GoI, 2012-13). Average milk yielding capacity of the indigenous cattle population is only 2.22 kg per day. Average daily milk yield from buffaloes are 4.58 kg. The average milk yield across all large ruminants was less than 4 kg per day. The data shows that there is a marginal increase in average milk production due to the special breeding programme taken up by the government.

Feed is the major financial input into dairy accounting for an estimated 60-65% of the production cost and is a major constraint to increasing production. In India, reduced access to grazing and rising opportunity costs for producing fodder crops has led to considerable increases in feed prices. Concentrate availability is limited because of the priority in most of the country of allocating land to food crops to ensure food security. Improving feed supply through green fodder and forage production has largely failed because of severe constraints in the availability of arable land and irrigation water. Production of concentrate as supplement to the green fodder showed a slow progress due to low demand by the small holder producers also due to lack of on time availability. Knowledge and extension on feeding livestock remains inadequate.

Producers

Most of the milk in the Country is produced by small, marginal farmers and landless labourers. Milk production in India is highly fragmented and unstructured. Traditionally, bulk of the milk production (around 98%) comes from small and landless farmers, who take up milk production as a supplementary source of income. However, due to high proliferation of co-operative societies, most of these farmers are members of cooperatives and leverage the organized dairy collection network run by co-operatives/ government dairies. About 14.78 million farmers have been brought under the ambit of 148,965 village level dairy corporative societies up to March 2012 (GoI, 2012-13). Private dairies also procure milk from small farmers directly or through agents. There is a huge opportunity for the lending institutions to extending financial support to the small producers. The commercial banks are aggressively financing to the primary producers.

Processors

Most milk is consumed as liquid milk—only about 18-20% of the milk produced is processed either by the cooperatives or private sector dairy companies. Cooling facilities are limited and restricted to the organized sector, leading to considerable food safety issues. The process of sourcing in case of cooperatives are very simple as the farmer (primary member) need to bring a minimum amount of milk for a particular year which will be noted in the book supplied by the society. The village level aggregators will then carry it to the nearby chilling plant (in some cases the villages also have the chilling plant of different capacities for example Gujarat state of India). The milk is processed in a medium to large processing unit and then dispatched through the milk routes through cold chains. Apart from packaging the milk for direct consumption, numbers of products are also prepared to capture the vast domestic market. Traditional Indian milk products are the largest selling and the most profitable segment. This segment accounts for almost 50% of total milk produced and 95% of total milk products consumed in India. The major strength of traditional products is its mass appeal. The market for these products far exceeds the market for universal products like milk powder, table butter, and cheese. The margins for the traditional products are also much higher than those for universal products.

Procurement and Marketing

Cooperatives are the central players in the formal dairy sector. The cooperatives have a three-tier structure – i) primary societies at the village level, ii) unions at the district level and iii) federations at the state level. Currently, there are 14 federations in India. The village co-operative societies collect and cool milk from villagers. The district unions consolidate society shipment and operate manufacturing plants to handle fluid surpluses. Marketing and coordination is handled by the state federations (Table 18).

Table 18. Three tier structure of cooperative milk production and marketing in India

Levels	Location	Cooperative structure	Key activities
Level 3	State	Federation	• Evolve and implement policies and strategies on cooperative marketing (processing, packaging, branding) of liquid milk and milk products • Decide on product-price mix and negotiate with the vendors/ wholesalers • Arrange finance for the primary members • Manage centralized input services (AI, breeding etc.) on behalf of the union • Capacity building of the primary members
Level 2	District	Milk Union	• Milk procurement • Milk processing & marketing • Provide technical inputs and extension services • Strengthen milk cooperative movements
Level 1	Village	Society	• Milk collection and testing • Sale of cattle feeds • Provide veterinary services (AI, vaccination, Deworming etc.)

(**Source:** Author's Survey, 2013)

The success of the Gujarat Cooperative Milk Marketing Federation (GCMMF), known for its *AMUL* brand and its AMUL model of cooperative, is acclaimed. However, there is a perception that cooperative organizations generally have failed in other parts of the country. A less recognized fact is that the cooperatives in other states are organized differently than the GCMMF cooperatives (Box 7). The GCMMF cooperatives operate as a true representative of farmers and are run by professionally qualified managers. In most other states, the cooperatives are managed by civil servants, function more as government bodies and are weak representatives of farmers. Of the 14 major state cooperatives in the country, 10 have state government equity, of which 6 have government equity in excess of 51%. The governance structure influences the functioning of the entire chain, from the state federation to the village societies and thus significantly impacts farmers' involvement in the chain. During April-November 2012, the average milk procurement by dairy cooperatives was around 30.6 million litres per day (provisional) as compared to more than 26.2 million litres per day during the same period last year, registering an increase of 16.6%. The cooperatives marketed an average of about 23.7 million litres of milk per day as against around 230 lakh litres per day, registering a rise of about 2.8% over the corresponding period last year (GoI, 2013). To understand the role of cooperatives in the milk value chains, a complete case study on AMUL (GCMMF) is given in Annex II.

Box 7. AMUL model vis-à-vis other Milk Federations

The primary differences between the GCMMF cooperatives and other state cooperatives are price and services. In Gujarat, the price paid to farmers is based on fat content; there is regular testing of milk each farmer supplies. In most of the other states, there is hardly any testing of milk. In other state cooperatives, the village society president wields a lot of power and typically decides the prices paid to farmers. Reportedly, farmers with some degree of influence receive higher prices while those without receive lower remuneration. Being the lead organizations, the cooperatives also set a benchmark for prices paid by other buyers, such as local vendors and private dairies, who tend to pay INR 1.00 more per litre of than that paid by the cooperatives. Thus, if the farm gate price paid by the cooperative is low, other players also pay a low price.

(**Source:** Gujarat Cooperative Milk Marketing Federation (GCMMF)

For most of the private dairies, agents procure the milk from farmers. Some private dairies have established village societies for milk collection that follow the cooperative model. However, this model requires much larger investment and is not economically feasible, considering that cooperatives receive considerable development support from the government (such as feed subsidies). It is not uncommon for private dairies to make loans to farmers, which is a key reason for the somewhat large share of milk directed to this channel.

4.2.3.2 Value Chain Supports

Support Services

Animal health services are very variable regionally within India with a large number of producers having little or no access to veterinary services. Even where veterinary services exist they often have inadequate facilities and a lack of operational funds. Only in limited areas have private suppliers been able to successfully establish the delivery of animal health services. Similarly livestock extension services are usually nonexistent or very limited. Animal diseases such as foot and mouth disease, brucellosis and haemorrhagic septicaemia cause large economic losses. A new, innovative, practical and cost effective technique, loop mediated isothermal amplification (FT-LAMP) for the rapid detection of foot and mouth disease (FMD) virus serotypes was standardized which can now be exploited as a penside test. Use of FTA cards was found very practical and safe for transport of FMD suspected samples from the place of outbreak to the laboratory for diagnosis by molecular methods.

In general the key services necessary to improve dairy animal productivity and management are found to be fragmented, uncoordinated and non-integrated. Services are rarely tailored to the need of smallholders. Their high transaction cost is a further element discouraging participation of poor producers in dairy value chains.

Enabling Environment

The dairy sector in India has traditionally been highly regulated. The government projects and programmes in place for enhancing dairy development include subsidies for developing infrastructure for milk processing and testing. The scheme 'Integrated Dairy Development Programme (IDDP) in Non-Operation Flood, Hilly and Backward Areas' was launched in 1993-1994 and subsequently modified during 2005. The main objectives of the scheme are: a) Development of milch cattle b) Increasing milk production by providing technical input services. c) Procurement, processing and marketing of milk in a cost effective manner d) Ensure remunerative prices to the milk producers e) Generate additional employment opportunities f) Improve social, nutritional and economic status of residents of comparatively more disadvantaged areas.

The Clean Milk Production Programme is a centrally sponsored scheme that is being implemented by the State Department of Animal Husbandry, Dairying and Fisheries with several objectives: a) the creation and strengthening of necessary infrastructure for the production of quality milk and milk products at the farm level up to the points of consumption; b) improvement of milking techniques; and c) training to enhance awareness on the importance of hygienic milk production. Several other rural development initiatives support dairying, such as through the District Rural Development Agency and women's self-help groups.

To improve the milk production, procurement and marketing structures, the producer companies were incorporated in Rajasthan and Gujarat where New Generation Cooperative (NGC) initiatives were being undertaken. NDDB Dairy Services facilitated the Producer Companies in framing the Articles and Memorandum of Association and in raising share capital from the members.

Financial Institutions

The service providers like commercial banks, regional rural banks, cooperative banks, microfinance institutions, insurance companies etc. are supporting the milk value chain to access to the much needed financial support to grow. The financial services they provide include loans, pre-financing, shareholdings, factoring, leasing arrangements, and so on. All the commercial banks are aggressively financing this sector as the return comes little early than other agriculture production activities.

4.3.2.3 Chain Context

The chain context addresses the overall macro level issues which frame the scope of the operation of the value chain. These include the relevant policies, proclamation, the legal system and enforcement tools in place, the political system, national standards, the infrastructure available, the economy, the security, and cultural issues. Some of the relevant chain context to the milk value chain in India described below:

The cooperative law: The cooperation law has paved the way for the formation of the coops and milk unions with bunch of incentives and support. The legal system is ensuring the compliance of contractual agreements and maintenance of the harmony in business dealings. There are complaints however in relation to the lengthy lead-time to get a verdict because of the capacity of courts.

National Standards: There are standards for dairy products developed by the National Dairy Development Board (NDDB). During the survey some of the professionals in the dairy sector expressed their concern on the weak or absence of enforcement on the quality standard of pasteurized milk with special reference to the milk products. The lack of enforcement may encourage unethical processors to avail substandard products at the expense of consumers and fair competition.

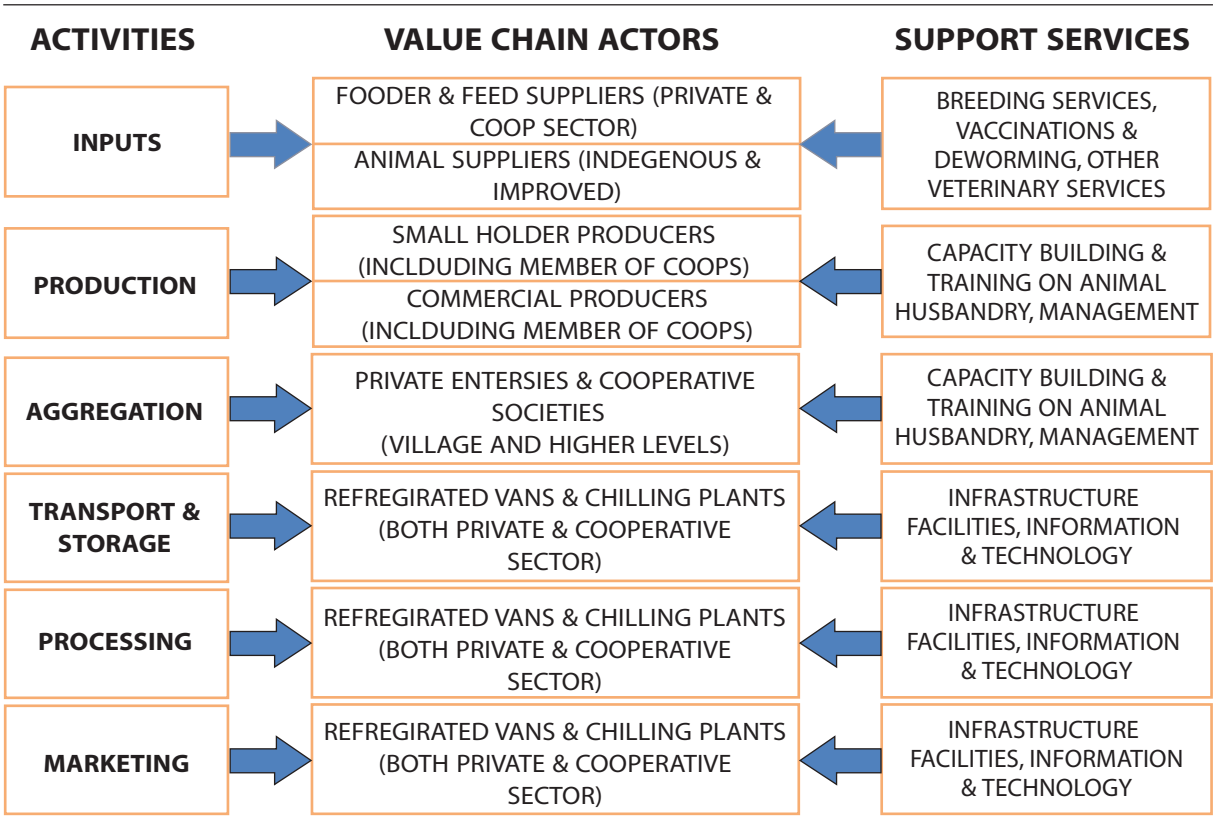
Infrastructure: Infrastructure especially the road emerges to be the major concern in the rural areas. Apart from the roads, the absence of chilling plants, power to run the plants and the refrigerated vans are also very important infrastructure which are absence in most of the places. These hamper the growth and development of the milk value chain in the country. Based on the survey farmers and their organization it was found that the mobile technology has helped them for a better communication with the other actors in the value chain.

Economic Environment: the growth in the economy is expected to increase the household income which may in turn increases the demand for milk and milk products. As shown in the Table 16 both the supply and demand for milk is increasing at almost equal rate which shows the further potential of the growth and development of the milk value chain in the country.

4.2.4 Mapping the Value Chains

Apart from smallholdings and three tier co-operative structures, India dairy industry's uniqueness also emanates from imbalance in the collection and consumption pattern. Milk is predominantly (as high as 98%) collected from millions of smallholding farmers residing in villages and is sold to the urban centers through a complex distribution structure. The processing sector is dominated by co-operatives, though the prominence of private dairy processors is gradually increasing. Apart from this, the unorganized sector (local sweet makers etc.) processes a large portion of the total liquid milk output. In fact, the unorganized sector outnumbers the organized sector (both co-operatives and private players combined) in dairy processing capacity in the ratio of 3:2. The consumption pattern of dairy products in India is very different from many western countries, the primary reason being conventional dietary habits of Indian households. Approximately 55-60% of the milk produced is consumed in liquid form. The rest of the milk products consumed are predominantly traditional Indian dairy products like *ghee*, *paneer*, *chhana*, *dahi* and other traditional sweets. Universal dairy products like cheese, table butter, ice creams are consumed in moderate amounts, even though the growth rate of some of these products are healthy. The typical value chain of milk in India is given in Figure 4. below.

Figure 4. Value Chain of Milk in India



(**Source:** Author's Illustration, 2013)

4.2.5 Finance to Milk Value Chain

The actors in the dairy value chain need finances to perform different activities. The input suppliers (fodder and concentrate, animal sellers) need finance to keep their stock to run their business smoothly while the primary producers need finance to buy milch animals, food and other inputs for production. The demand for finance by the aggregators varies according to their scale of operation so as to able to buy the milk and the capital items like equipments and vehicles. The milk processors need large amount of capital to install their processing plants and also to buy products from traders and/or other

actors in the upstream. One financial institution may support one or more actors in the chain. Outside the formal financial institution, actors often have trade finances like sales on credit and advance payments and government subsidies etc.

4.2.5.1 Finance along the value chain

The common financial relation between actors in financial institution and actors is a one two one (bilateral relation). The other type of relation is where one or more financial institutions are working together with more than one actor in the value chain. Farmers get a credit from microfinance institution and delivery the product to the trader and the trader pays the loan repayment to the financial institution behalf of the farmer, and remit the remaining value of the product to the farmers. This type of arrangement is called triangular value chain finance. The agreement covers product, finance, and information exchange and risk management. The generic value chain financial arrangement in the dairy milk value chain is given below (table 19).

Table 19. Access to finance by the milk vale chain actors in India

Value Chain Process	Value Chain Actors		Roles and Responsibilities	Financial Arrangements	
	Private Sector	Cooperative Sector		Private Sector	Cooperative Sector
Input supply	Private enterprises	Village Dairy Cooperatives (VDCs)	Supply of fodder/ concentrates/milch animals	Trade credit from Banks	VDCs take loan from District Milk Unions
Production	Smallholder Farms/ Commercial Farms	Primary members	Purchase of milch animals, husbandry, milk production	Investment in animals/sheds with loans from banks. Feed on credit from input suppliers	Investment in animals/sheds with loans from VDCs. Feed on credit from VDCs if needed
Aggregation	Village/ Block level aggregator (MSMAEs)	Village Dairy Coops (VDCs)	Daily Procurement from farmers, quality testing, storage in bulk coolers if required	Trade credit from commercial banks	Credit from Coperative banks/ District milk union
Processing, packaging & transport	Private Enterprises/ processing units	District/State Milk Unions (e.g. OMFED)	Transport to medium/large dairy units. Processing & packaging milk, milk products, branding with own brand/ packing in the brand name of District/ State Milk Unions	Term loans from commercial banks to buy plant and machinery. Working capital from banks.	Plant and machinery funded by District/State Milk Unions/NDDB. Working capital from banks.
Marketing	Private enterprises	District/State Milk Unions (e.g. OMFED)	Generally through own/dealer network by private sector/ district/state milk unions depending on nature of product, market and branding	Trader credit for the enterprises/ franchises	District/State milk unions borrow from banks and NDDB (both for investments and working capital requirements)

(**Source:** Survey by Author, 2013)

While undergoing this study, it was found that the competition among the suppliers of the finance in India are skewed towards the primary production and some of the other actors in the value chain are neglected which created a void in the chain and they became weak link. This reduces the efficiency of the value chains. The following issues were emerged during the discussion with the financial institutions:

a) The financial products and services are not matching with the requirement of the other actors in the value chains. For example, the private sector participation in the Artificial Insemination (AI) business is very poor in the country as the banks are reluctant to finance this subsector due to perceived high risk.

b) The loan products for primary producers and small scale processor are considered to be the Priority sector[22] and not the other loans. So majority of the Public sector banks (controls almost 85% of the banking business) introduced their loan products for primary producers. An example of the loan product targeted for the primary milk producers by the State Bank of India (largest state owned bank of the country) is given in **Annex III**.

c) The investment in plant and machineries for milk processing plant are not a stand-alone proposition, it should include the transport and storing facilities. So the approach should be integrated which incidentally culminate into higher level of due diligence by the banks. The existing risk management framework in the commercial banks allows only A^{+} and B^{++} category of borrowers are eligible to receive this type of loans. The high rated business houses are not much interested in this highly perishable product.

In view to rationalize the gap of demand and supply, the Government of India launched various measures so that the actors in the value chain should not be starved of finance. One of these is creating Dairy and Poultry Venture capital fund launched in 2005-06. Recognizing the importance of milk in the country, this scheme was segregated into Dairy and Poultry Venture Capital Funds during the year 2009-10. The mode of implementation of Dairy Venture Capital Fund is changed from interest free loan to capital subsidy and a revised scheme Dairy Entrepreneurship Development Scheme (DEDS) has come into effect from 1 September 2010 (Box 8).

Box 8. Dairy Entrepreneurship Development Scheme (DEDS)

A. Objectives

- To promote setting up of modern dairy farms for production of clean milk
- To encourage heifer calf rearing thereby conserve good breeding stock
- To bring structural changes in the unorganized sector so that initial processing of milk can be taken up at the village level itself.
- To bring about up-gradation of quality and traditional technology to handle milk on a commercial scale.
- To generate self-employment and provide infrastructure mainly for unorganized sector.

B. Activities covered

- Small dairy farms – Cross bred cows, Indigenous descript breeds and Graded buffaloes (upto 10 animals) – INR 0.5 million
- Vermicompost (with milch animals unit) – Rs 20,000/-
- Heifer calf rearing – upto 20 calves – INR 480,000/-
- Purchase of milking machines/milk testers/bulk milk coolers (upto 2000 lr. capacity) – INR 1.8 million

[22] Priority sector refers to those sectors of the economy which may not get timely and adequate credit in the absence of this special dispensation. Typically, these are small value loans to farmers for agriculture and allied activities, micro and small enterprises, poor people for housing, students for education and other low income groups and weaker sections. Priority sector loans are many times subsidized by the national government to promote the activities covered.

Box 8. *(continued)*

- Indigenous milk products manufacturing units – upto INR 1.2 million.
- Dairy product transport facilities and cold chain – INR 2.4 million.
- Cold storage for milk/milk products – INR 3.00 million.
- Private veterinary clinic – INR 240,000 – Mobile Units, INR 180,000 – Stationary Units
- Dairy parlour – Unit cost is INR 56,000/-

Source: Annual Report, NABARD (2013); Website: www.nabard.org/english/dairy_dev_scheme.aspx (Last accessed to website on 29.10.13)

Doodh Ganga Yojana, another Government of India dairy venture scheme that provides partial interest free loans and capital subsidy provisions to promote organized dairy farming and create employment opportunities in Himachal Pradesh state of India (Box 9).

Box 9. Doodh Ganga Yojana

The scheme was started by the Department of Animal Husbandry, Government of India as a dairy venture capital scheme to be implemented through the National Bank for Agriculture and Rural Development (NABARD). The scheme helps to transform micro enterprises engaged in dairy farming into organized dairy business enterprises. Doodh Ganga Yojana plans to economically uplift 50,000 rural households through the formation of 10,000 Self Help Groups within a span of three years. The scheme makes comprehensive provisions to sell dairy products on a larger scale.

The primary objective of the scheme was to create alternative livelihoods for local populations. The secondary objective was to call for a 'white revolution' through the successful implementation of the scheme. The scheme has been successful in raising the economic status of the rural population involved. To date, Doodh Ganga Yojana has supported 2531 cases. Out of the proposed target of INR 3.00 billion, loans to the tune of INR 0.5 billion are already advanced to the beneficiaries.

Source: Annual Report (2012-13); Department of Animal Husbandry, Dairying and Fisheries, Govt. of India

4.2.5.2 Financing Challenges and Opportunities

The Reserve Bank of India (RBI) has increased its scope by emphasizing lending to dairy, fisheries, animal husbandry, poultry, bee-keeping and sericulture up to an aggregate unit of INR 20 million. It was informed during the discussions that the said lending by banks to corporate including farmers producers companies of individual farmers, partnership firms and cooperatives of farmers in agriculture and allied activities — dairy, fisheries, animal husbandry, poultry, bee-keeping and sericulture upto an aggregate unit of INR 20 million would qualify for priority sector lending. It has however clarified that "banks should ensure that loans under priority sector are for approved purposes and the end use is continuously monitored. The banks should put in place proper internal controls and systems in this regard." Despite clear cut instructions by RBI, lending institutions still flocking for financing to small size dairy unit with 2-5 dairy animals which may be termed as a livelihood finance and generally do not qualify to be entrepreneurship activities. Consequently, these sectors have to depend on internal credit system which seems to be costly due to higher interest rates as well as it is not sufficient to meet huge requirements. Unfortunately, this aspect has not received enough attention in various programmes for dairy development in the country since the milk producers cooperative societies set up on Anand Model (Amul) do not encourage their involvement in providing credit to the farmers through their members or otherwise. The magnitude of the financing problem varies from actors to actors. It is essential to view the financing challenges by actors in the chain. As already mentioned, the majority of the milk is routed through the private supply chain, the problems faced by them are being discussed here in details.

Processors: For established processors in private sector with a better collateral base and successful past credit history, financing is not as such a challenge. Most of the processors are quite comfortable in this regard. For new comers, however, financing is a challenge especially when they don't have the required quality of collateral. There is a long tradition of buying milk on a 15 days credit term from milk suppliers and the new entrants do not have sufficient working capital to cover the requirement.

Commercial Dairy Farmers: Commercial dairy farmers have access to commercial banks. Most of their assets are dairy cows stock and the cow-sheds. The problem they often encounter is collateral issues. Some of them are unaware of the possibilities of using the cows/buffaloes as collateral. Based on the discussion made with Insurance companies (majority business done by Public sector companies), the recent increase in the premium is playing a negative role to increase their hard size.

Retailers: Retailers, mainly supermarkets, have access to bank loans mainly when they have collateral for the loan. As much of their property is on inventory items, they are known for no or limited valid collateral assets like building. As most of the retailers stocks are fast moving, it is not convenient to get a merchandise loan. In addition, their balance sheet is often show a large amount of current liabilities, which are resulted from large credit purchases.

Collectors: individual collectors buy milk on cash basis. Unlike the processor collectors, they are not benefited from the 15 days credit purchase from the farmers. According to the tradition, farmers are willing to deliver on credit only to established companies. Hence, collectors have to finance themselves. These collectors are delivering their milk to processors on a credit sales basis like the farmers are doing. Accordingly, they need to have a working capital at least to the extent of 15 days milk purchase. The source of financing for many of these individual collectors is own equity and loan family or relative.

Milk Cooperatives and Milk Unions: Cooperatives need financing for expansion and purchase of equipments. Coops get credit facility for the purchase of inputs (feed and vet supplies) from the Union and sell their products to the Union on credit. Some of the cooperatives have also taken a loan from the Unions for creating assets (e.g. purchase of office buildings, milk trucks etc). The repayment is made after calculating the net balance of loans and the credit sales. Very few milk coop society received loan from other sources due to various reasons of which main being the governance.

4.2.6 Lessons learned

- Value chains comprising widely distributed small farmers work better in the cooperative from. The cooperative form lends itself to set up localized entities and aggregate financial needs of small farmers in to economic size.
- Participation of producers and autonomy of institutions of producers ensure that economic decision-making is objective and secures member interests. This facilitates better income realization to the members. Member based organizations invest more in production and productivity enhancement and member capacity building.
- Professional management is a necessary condition for the cooperative producer collectives to succeed. This is necessary not just to interact with the markets and adopt appropriate technology but also to inject objectivity in decision making by the member dominated boards.
- Smallholder value chains take a long time to realize their full potential and require hard work. Social capital and visionary leadership are often needed to stabilize the organizational and financial arrangements in the initial stages.
- Awareness of animal health care and improved production practices have to be created in the farm households and the higher-level organizations in the value chain should pay attention to this.
- Competition from private sector is likely to be intense and members might fall prey to the competition unless the organization is vigilant and provides a comprehensive set of services apart from remunerative prices for pooled produce.

4.3. Mentha Value Chain Finance in India

4.3.1 Overview

Mint descends from the Latin word *mentha*, which is rooted in the Greek word *minthe*, mentioned in Greek mythology as *Minthe,* a nymph who was transformed into a mint plant. In Central and South America, mint is known as *hierbabuena* (literally, "good herb"). In Brazil, mint species are popularly known as *Hortelã*. The native Place of Mentha is Japan and is also known as *Japanese Mint*. After Japan, its cultivation began in Argentina, Brazil, China and India. Mentha crop was introduced in India as a *rabi* crop (winter season) and prospers on sandy soil that is having high water content. Water logging and low rainfall provide hindrance in proper growth of the crop. Time of harvesting (May and June months) and primary processing of Mentha crop is very important extraction of oil as summarized in Box 10 below.

Box 10. Harvesting & primary Processing of Mentha

When the mentha crop reaches the flowering stage, it is harvested as it is during this period when the oil content in plant is at its highest. The harvested crop is then dried in sun, 2-4 hours a day, till it gets reduced to one-third of its weight, and then it is sent for distillation. It is dried as the distillation of dried leaves is much cheaper than non-dried leaves. Over drying the crop may result in soaked up oil content.

In India, Mentha Oil is produced by steam distillation of Mentha Crop, which is an annual crop, is planted during the month of Feb/Mar and harvested by June/July after that farmers are free to use their land for any other crop. Mentha can be combined with potato and maize to get a higher return and increased profitability. Harvesting is done at least twice a season.

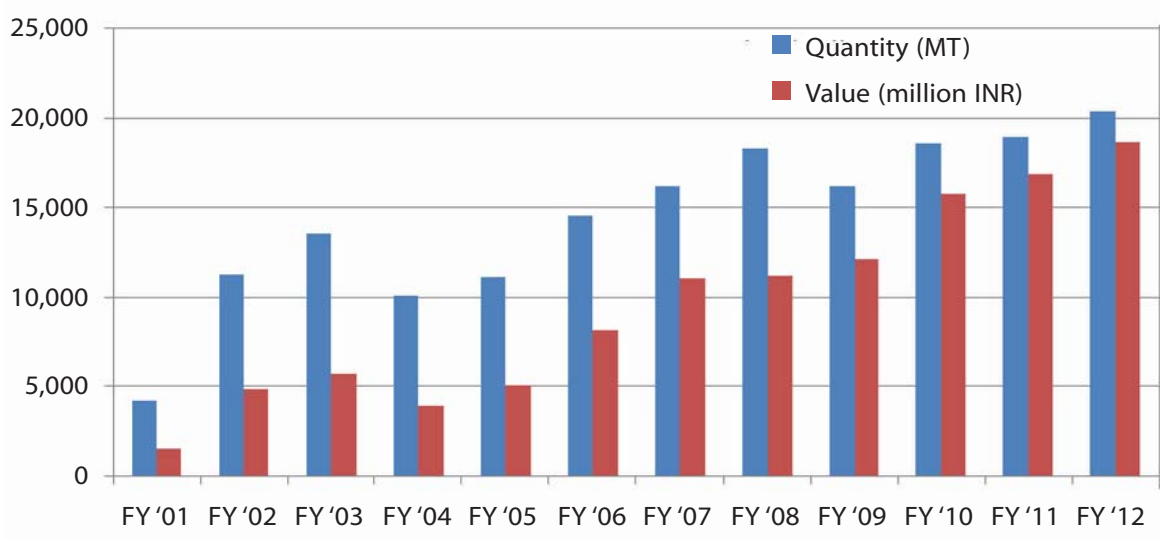
Source: Author, 2013

Mentha oil has registered extensive use in different industries in India and across the world. The major usage of this oil has been listed below:

- Mentha Oil is widely used in food industry, pharmaceutical industry and also in perfumery and flavoring industries.
- Menthol, a major derivative Mentha oil is widely used in the manufacture of balms, cough drops, inhalers, toothpastes, mouthwashes
- 50% to 60% dementholized oil is obtained from mentha oil in the production process of menthol, is used in confectioneries and peppermint oil.
- Mint which is again a derivative product of Mentha oil has many medicinal uses. Peppermint Oil is used to cure indigestion, headaches, colic, gingivitis, irritable bowel syndrome, spasms and rheumatism. It is also used in the manufacture of Mint sweets and chocolates.
- In India Mentha is mostly used for *chatni* and household purposes (edible purposes).

India started exporting menthol way back in early 80's. Till 1999-2000, earnings from export were not so significant. With the globalization of cross border trade and technological upgradation of the product process coupled with more growers joined the bandwagon of mentha production, the exportable menthol increased manifolds. This was also further fuelled by the pressing demand from the export and domestic market. The Figure 5 below shows the exports made by the country during last 10 years.

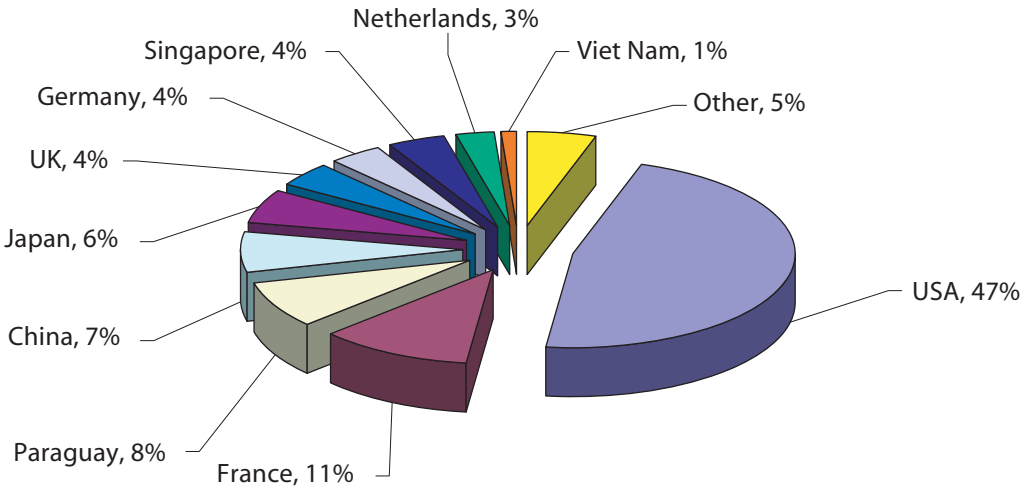
Figure 5. Export of Menthol by India in quantity and value



(**Source:** Spice Board of India; Website: www. spiceboard.in/index.php)

It is clear from the chart above that there was a considerable increment in export value of menthol from INR 1,550 million in FY'2001 to INR 18,717 million during FY2012 barring FY2004 due to fall in export demand. As the demand of menthol is increasing in the international market, it attracted all the value chain actors (with special reference to the exporters) to be more efficient to improve the flow of products and services. United States of America (USA) is the major (47%) importer of menthol followed by France (11%), Paraguay (8%) and China (7%) as shown in the Figure 6. below.

Figure 6. Countries Importing Mentha Oil

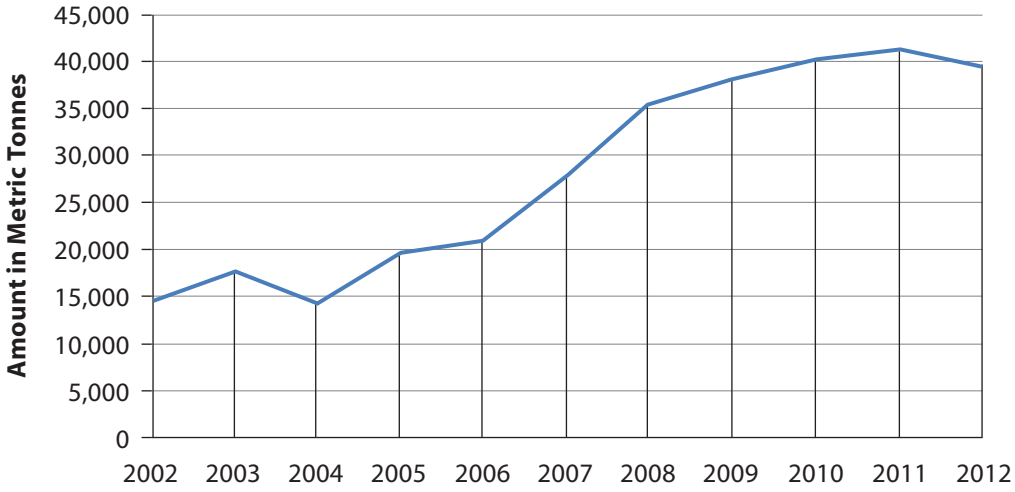


(**Source:** Spice Board of India; Website: www. spiceboard.in/index.php)

4.3.2 Production Scenario

Mentha Oil production between 2002 and 2012 registered tremendous growth which increased from 14,497 MT to 38,000 MT (Figure 7) and this growth brought in a new era in the domestic and export mentha oil market.

Figure 7. Production of Mentha Oil in India



(**Source:** Agriculture situation in India, 2012-13; Ministry of Agriculture, Govt. of India)

The foothills of the Himalayas in India with a semi-temperate climate support mentha production. Major share of mentha is cultivated in these areas only and the prime producing areas are Uttar Pradesh (96% of the total production), Punjab, Haryana, Himachal Pradesh, and Bihar (Table 20).

Table 20. Leading States in Mentha Production in India

Year	Amount of production (Metric Tonnes)			
	Uttar Pradesh	Punjab	Other States	Total
2002	13,952	490	55	14,497
2003	17,243	516	52	17,811
2004	13,944	475	60	14,479
2005	18,581	870	43	19,494
2006	20,050	884	50	20,984
2007	26,492	1,177	62	27,731
2008	33,850	1,327	100	35,277
2009	36,650	1,226	249	38,125
2010	36,890	1,786	1,394	40,070
2011	38,025	1,755	1,405	41,185
2012	35,984	1,645	1,854	39,483

Source: Multi Commodity Exchange (MCX)

4.3.3 Value Chain of Mentha

Production of mentha

Mentha was introduced as a *rabi* crop i.e. it was sown in the winter season. It continues to be the scenario currently. This crop prospers on sandy soil that is having high water content. Water logging and low rainfall provide hindrance in proper growth of the crop. Once the crop reaches the flowering stage, it is harvested as it is during this period when the oil content in plant is at its highest. The harvested crop is then dried in sun, 2-4 hours a day, till it gets reduced to one-third of its weight, and then it is sent for distillation. Mentha can be combined with potato and maize to get a higher return and increased profitability. The technical and financial parameters of growing and processing of mentha crop in India is shown in Table 21 along with the economics of cultivation of the improved verities of mint which clearly shows that the return of the mentha crop is about INR 15,500 per acre of land which is higher in comparison to the other crop cultivated during the same season.

Table 21. Cost of cultivation of Mentha in Uttar Pradesh, India

Technical parameteinr		Financial parameteinr (amount in INR)	
Varieties (number of varieties are being used but the most prevalent varieties were considered)	Himalaya, Kushal, Koshi, Saksham	Planting Material (INR/kg)	20
Maturity	90-100 days	FYM (INR per MT)	1,200
Spacing	30 x 30 cm	Vermicompost (INR/kg)	12
Planting material (quantity in kg)	150	Labour (INR/man day)	150
Type of Planting Material	Suckers, Stolons	One Irrigation water (INR/acre)[a]	500
Vermi-compost (kg/acre)	200	Charges for distillation (INR/per kg of Oils[b])	20
FYM (tonnes/acre)	2	Cost of cultivation (INR per acre)[c]	25,200
Average labour man day/acre of crop	50	Average Sale Price of mentha oil (INR per kg)[d]	700
No. of irrigation (Two cuttings)	12	Total sales proceeds (amount in INR)	63,000
Average yield of mentha herbage in two cuttings (quintal/acre)	140	Less: a) Interest paid to the Bank[e] b) Opportunity cost of the land[f]	 500 15,000
Average oil recovery from mentha leaves (%)	0.65	Net income of the producer (INR per acre)	47,500
Yield of mentha oil (kg/acre)	90	Income over Expenditure (Net Profit)	15,500

[a] Cost for 1 hour of irrigation was INR 50 and 1 acre requires 10 hours of irrigation
[b] As per the information received from the local processors
[c] Cost of cultivation was calculated per acre by adding cost of planting materials, FYM, vermin-compost, labour, irrigation and cost of distillation (all cost calculations are based on current price of 2013)
[d] Average selling price as on March, 2013
[e] Majority of the small farmers have a bank loan and average size of the bank loan was INR 20,000.00 per acre (average rate of interest was 10% p.a). The loan repaid within 3 months
[f] Existing rate of rent for one acre (average of the 4 location in Uttar Pradesh)
(**Source:** Authors calculation based on survey, 2013)

Processing and extraction of essential oil

The mentha plants get processed in the processing unit for essential oil extraction. To obtain essential oil, fresh or semi dried mentha is packed in distillation tank uniformly. The steam that comes out of the tank is then passed through a condenser receiving the steam, carrying the oil extracted from the herbage in the tank is kept constantly cool by circulating cold water. The condensed oil and water mixture is collected in a receiver. The oil floats on the surface of the water in the receiver where oil is skimmed off and collected. Usually the straw of the mentha plant is used as fire wood for the distillation and abstraction of essential oil. If necessary, the entrepreneurs buy the wood for firework from market. The cost of firewood and labour to keep burn the broiler is arranged and borne by the farmers. The owner of the processing units do only job work and receive INR 200 to INR 250 for the distillation of one tank of mentha. In the distillation of one tank of mentha around 4 Quintal mentha plant is required which produce around 10 litres of essential oil. Generally 6 to 8 hours are required for the distillation of one cycle of mentha. However the time for the distillation of one cycle of mentha and the quantity of produce in terms of essential oil is vary on the quality and maturity of mentha plants and season.

Marketing

Apart from the small and medium size farmers, the corporate buyers of menthol also entered into the crop growing business either through contract farming or through lead firm route, which increases the production and brought innovation and risk management system in practice. The Central Institute of Medicinal and Aromatic Plants (CIMAP), a Government of India Research centre started imparting training to mentha growers and entrepreneurs and also involved in research and developed four improved varieties of mentha currently used in the country, namely Himalaya, Koshi, Kushal and Saksham. The detailed producer-marketing ecosystem in mentha oil in India is given in Box 11 below.

Box 11. Production – Marketing Ecosystem of Mentha Oil in India

Farmer sells the distilled mentha oil to the commission agent or local brokers. Both of them charge 1% of oil from the farmer. Sometimes broker purchases the oil from the commission agent at an additional margin of 1%. Then there are traders, manufacturers and investors who purchase oil from brokers at a margin of 2.5% respectively. Manufacturers also purchase the oil from Investors and traders for manufacturing Menthol crystals. They further export it, or purchase Menthol crystal from manufacturers, at a margin of 4%. There is about an addition of *Rs 125/kg* as margin from farmer to the end-consumer.

(**Source:** Ann E Berg (2007): Potatoes, Mentha Oil, and Cardamom Commodity Futures Markets in India-An Assessment by USAID & FMI)

Anticipating huge demand for mentha crystal and flakes in both overseas and domestic markets, pharmaceutical companies in the northern region plan to take up mentha cultivation under contract farming. These companies have already upgraded their processing facilities in order to meet the demand for mentha derivatives. Surya Pharmaceuticals Ltd., a large exporter of mint/menthol derivatives like flakes and crystal and exports to countries like China, Europe and the USA is procuring mentha oil from the state of Uttar Pradesh now plans to bring 5,000 acres under contract farming in Punjab during 2009-10.

The local aggregators, traders, brokers are very active in the mentha growing areas and offers a range of services to the growers. Some small-scale distilleries and crystallization unit was also set up by the local entrepreneurs to attract the growers. The banks and the financial institutions supported this growth by extending financial solution.

Commodity Exchange

After launching of mentha oil futures by the Multi Commodity Exchange of India Ltd. (MCX) during 2005, the commercialization process of the mentha oil got big push. It was observed that with the introduction of this crop in commodity exchange platform, the traders exposed to better price discovery, neutrality and transparency in the market. While analyzing the MCX Mentha Oil contract, it was also observed that this attracted wide participation due to its high liquidity across segments like farmers, processors, traders, exporters, chemical, pharmaceuticals, and FMCG industry. The mentha oil price in India shows that the price fluctuation (difference between high and low) has been reduced to a great extent since 2005-2006 till 2012-2013 probably due to streamlining the demand and supply position and commercialization of production and processing.

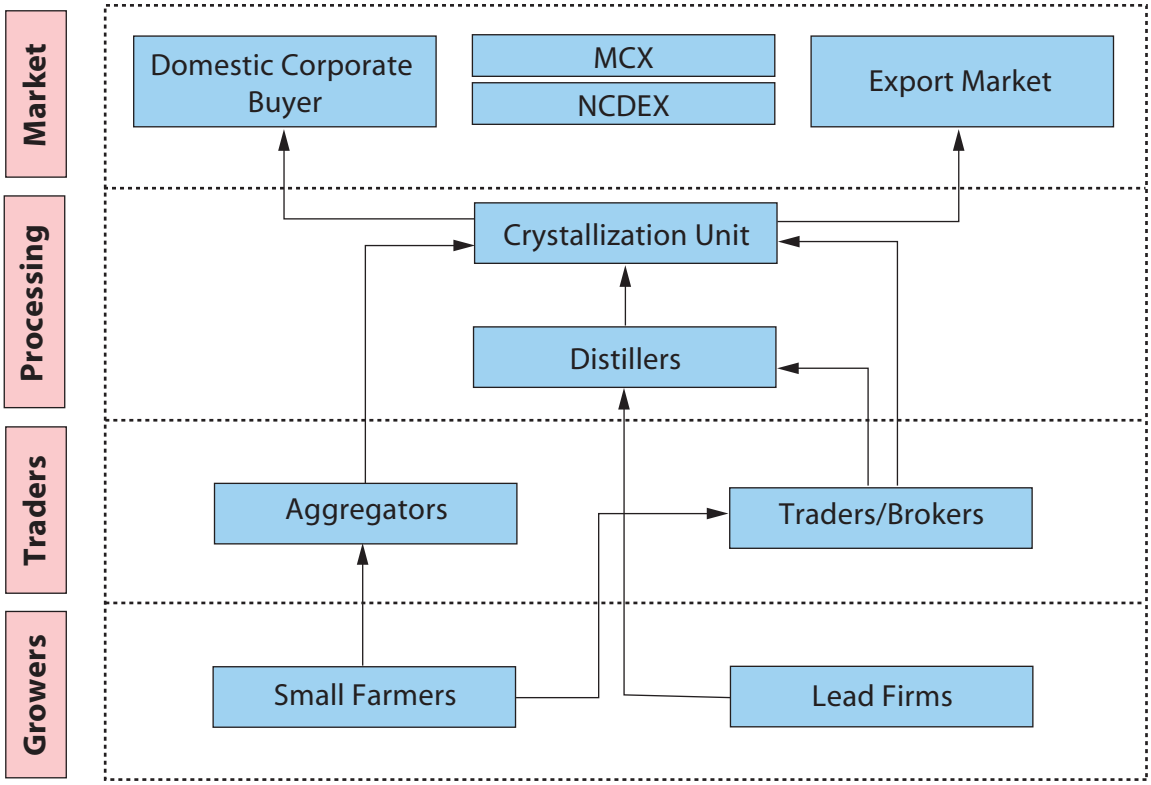
4.3.4 Mapping the Value Chain

The critical development of the mentha value chain over the past 10 years (2004-2013) has been the movement of the major exporters and the corporate buyers who set up the distilleries and the crystallization units. The driving force for this change has been the rapid growth in production and the coverage of area under production. According to the state of agriculture in India (2013), the mentha growing has steadily increased from 100,000 hectares in 2007 to 160,000 hectares during 2010 and further increased to 210,000 hectare in 2011 which however declined to 190,000 hectare. This shows that the crop has a high potential to grow for the export market to fetch higher prices by the small farmers.

Mentha value chain is a classical example of more than one actor feeding each of the nodes of the chain which made this value chain competitive and scalable. The other important indicator of the dynamic trend of mentha value chain was it's entry into the futures market on 26th April 2005 and like other derivatives, mentha oil futures contracts poised to complement and offer market support for price risk management. The volume of mentha oil being traded in the MCX-commodities future market in India

is very high and there is a rising trend for last five years. The value chain of mentha got further boost with its entry into the structured commodity market during 2005 and today it is being treated as one of the most important commodity traded in the commodity market space (MCX/NCDEX are the trading platform for futures of mentha). The typical map of mentha value chain as observed cross the country is given in Figure 8 below.

Figure 8. Typical Value Chain of Mentha Oil in India



(**Source:** Survey by Author, 2013)

4.3.5 Finance to Value Chain

Access to finance by the growers and other value chain actors in mentha value chain has been the key factor for increasing production to increase the export earnings. The data regarding the magnitude of financial support by the commercial banks to this particular activity are not available as it is an integral part of their total agriculture lending portfolio. Most of the farmers growing this crop are small and marginal in their land holdings status that do not have the facility of processing the crop, and they are selling it to aggregators in two/three cuttings and the price realization are very less as compared to the farmers who have the facilities for processing their crop. The Commercial Banks are financing the farmers by issuing Kisan (Farmer) Credit Card but the question of financing the small holders with less than an acre of land remained are still starved of the much needed finance.

The internal finance in the form of financing by the aggregators, processors are also prevalent in mentha growing areas of Uttar Pradesh. The commercial banks do not have any specific products and financial instruments for the small scale growers and the processors. The state horticulture department of Uttar Pradesh imparts training to farmers to extract mentha oil from the plant by installing small distillation processing units. The government provides credit linked back ended subsidy of 25% of the total investment in plant and machineries[23]. For Minimum 500 kg capacity of mentha vaporization plant

[23] As per the available data, the current subsidy up to INR 125,000 and INR 500,000 are available for the medium and big mentha processing units respectively in Uttar Pradesh, India.

needs an investment of INR 100,000 to INR 400,000. While analyzing the demand and supply of finance to mentha value chain, it was found that both the internal and external financiers are equally active as shown in Table 22 below:

Table 22. Demand and supply of finance in mentha value chain

Demand side (Value Chain Actors)	Supply side		Existing financial products and instruments
	Internal Financiers	External Financiers	
Small Farmers	Aggregators, Traders,	Cooperative Banks, Rural Banks, Commercial Banks, MFIs	Kisan Credit Card; Group lending (Joint Liability groups), Land purchase
Lead Farmers	Traders, Distillers	Commercial Banks, Cooperative Banks, Rural Banks,	Kisan credit Card, Term Loans (Farm mechanization)
Traders	Distillers, Crystallization Units	Commercial Banks, Rural Banks	Working capital loans
Distillers	Crystallization Unit, Exporters	Commercial Banks, Financial Institutions, Venture Capital	MSME products (both Term loan and working capital)
Crystallization Unit	Domestic Buyer, Exporters	Commercial Banks, Financial Institutions, Venture Capital	MSME products (both Term loan and working capital)
Domestic Buyer/Exporters	Associations, Importers	Commercial Banks, Venture Capital, Private Equity	Pre-shipment & Post shipment credit (Export units)

(**Source:** Survey by Author, 2013)

4.3.6 Lessons Learned

- The production of mentha leaves depends on the demand of the market and it was quite clear the demand of the export market is more influencing the production pattern. The increase in acreage of growing mentha plant from 100,000 hectare to 210,000 within a span of 6 years is very encouraging keeping in view the high demand of this crop.
- The rate of return to the farmers seems to be impressive in case of the farmers who could avail the processing facilities nearby as this crop could not be stored for a longer period. Majority of the famers surveyed depends on the aggregators for marketing. As the harvesting of mentha is done in two phases, tie up with the aggregators is also a difficult job the farmer has to perform and has to depend on the whims of the processors.
- The efficiency of the mentha value chain is highly dependent on the commodity exchanges and forward trading. The volatility of the market (there is no price support to mentha oil by Government and Industry) leads to low price realization by the farmers leading to reduced area under cultivation.
- The vertical coordination in the value chain is also not very much institutionalized which impacting further increase in area under cultivation and in number of growers with special reference to the small holders.
- The financial institutions are active in financing the farmers but yet to develop customized product to support the growers and the primary processing units. Dedicated financial products by the financial institutions for the producers, processors and exporters will help the mentha value chain to grow to a full-fledged commercial crop.
- The civil society organizations were also not very active in mobilizing the farmers to form group to grow the crop and also start their own processing unit to reduce the dependency on the aggregators and to fetch a better price of their produce.
- As there is no price support to mentha oil by the Government or by the Industry, the price of the commodity is extremely volatile which needs immediate attention to stabilize market price of Mentha Oil which will in turn offer the right price of their crop to the grower. So the business enabling environment for this commodity also required to be revisited keeping in view its huge export potential.

CHAPTER 5
Value Chain Finance Models of YES BANK

5.1 About the Bank

YES BANK, India's fourth largest private sector Bank, is the outcome of the professional and entrepreneurial commitment, vision and strategy of its Founder Rana Kapoor and his top management team, to establish a high quality, customer centric, service driven, private Indian Bank catering to the Future Businesses of India.

YES BANK has adopted international best practices, the highest standards of service quality and operational excellence, and offers comprehensive banking and financial solutions to all its valued customers. YES BANK has a knowledge driven approach to banking, and a superior customer experience for its retail, corporate and emerging corporate banking clients. YES BANK is steadily evolving its organizational character as the Professionals' Bank of India with the uncompromising Vision of "Building the Best Quality Bank of the World in India by 2020!

As a bank committed to develop agriculture and agribusiness in rural India, YES BANK has set up Food and Agribusiness Research Management (FARM) team comprising experienced industry and banking professionals with relevant domain knowledge and skills sets in identified focus sectors. FARM includes Food and Agribusiness Strategic Advisory and Research (FASAR) focusing on Advisory services for Food and Agriculture sector, Inclusive and Social Banking (ISB) focusing on financial inclusion, and Agribusiness and Rural Banking (ARB) focusing on Priority sector lending (Box 12). The experts of diversified sectors work with the stakeholders in the food chain in various capacities to develop risk mitigating and innovative project structures for enhanced financing of the sector. This results in increased commercial viability and ensures sustainable development of the Indian agricultural value chains.

Box 12. Food and Agribusiness Research Management Group of YES BANK

Food and Agribusiness Strategic Advisory & Research Group (FASAR) is a specialized group with the Development Banking space at YES BANK and has emerged as a premier and specialized food and agri-business consultancy and research group in India with prestigious domestic and international mandates. FASAR provides comprehensive advisory service backed by a combination of end-to-end *business strategy – implementation support - financing*. In a short span of time, the bank established itself as a leading agribusiness advisory team in the country with the ability to deliver triple benefits mentioned earlier. Inclusive and Social Banking (ISB) works with the unbanked and under-banked population in urban and rural India by leveraging the Bank's branch network, technology edge and relationship capital. Agribusiness, Rural & Social Banking (ARSB) team has spearheaded the development of innovative financial models, which leverage the outreach of various stakeholders in the Agri value chain, to overcome the 'last mile business challenges' in agribusiness and the rural sectors.

(**Source:** YES BANK, 2014)

5.2 Knowledge Banking: the Key to Success

The bank has established key knowledge verticals across sunrise sectors of the Indian economy. Bank's Product and Relationship Groups leverage Knowledge Capital as one of the key differentiators to develop innovative solutions to reinforce long-term and sustainable partnerships with its stakeholders. A Knowledge driven focus has been institutionalized as a key ingredient in all internal and external processes of the Bank. It helps to facilitate structuring of innovative, superior and sustainable financial solutions, based on efficient product delivery, industry benchmarked service levels and strong client orientation.

The Bank focuses on developing in-depth knowledge base for the future businesses of India such as Food and Agribusiness, Healthcare and Life Sciences, Education and Social Infrastructure, Media and Entertainment, Communications and Technology, Environment and Renewable Energy, Infrastructure and Retailing amongst others. The Bank's in-depth knowledge of emerging sectors has enabled it to deliver efficient and customized banking solutions to these core and sunrise sectors, thereby playing a significant part in driving the economic growth of the country. The Bank also publishes regular reports/newsletters on developments in these sectors to further enhance the Knowledge Banking led approach and serve as a key source of insights to clients, industry associations and policy makers. Some key achievements of knowledge banking approach are listed below:

- The knowledge banking arbitrage, through in-depth domain expertise across key sun-rise sectors has enabled the bank to create mind share with various stakeholders including the clients and deliver efficient and customized banking solutions.
- This approach coupled with strong risk management practices helped minimize the overall impact of the financial crisis during 2008-09.
- Knowledge banking approach helped the Government Relationship Management (GRM) team to understand the financial needs of the Central and State Government undertakings and agencies in their progress and development role towards a growing India.
- The dedicated knowledge banking teams understands the financial needs of Multinational Corporations (MNCs) in their plans to increase their footprint in the Indian market. This differentiated approach helped the bank to become the "Preferred HOST COUNTRY BANK for MNCs".
- Driven by Knowledge Banking and backed by a team of professionals, the Bank delivers a customised bouquet of products, services and resources to meet varied business requirements of Small and Medium Businesses in identified sectors.

A classic example of knowledge banking approach is creating Terminal Market Complexes (TMCs) which is completely different with the excising markets in approach and sustainability (Table 23). YES Bank played a catalytic role in projects of Modern Terminal Market. The Bank has been appointed as National Consultants by the Central Committee set up by the Union Ministry of Agriculture, Got. of India for developing the framework for selection of private enterprises for setting up of Modern TMCs for perishables at important urban centers across the country.

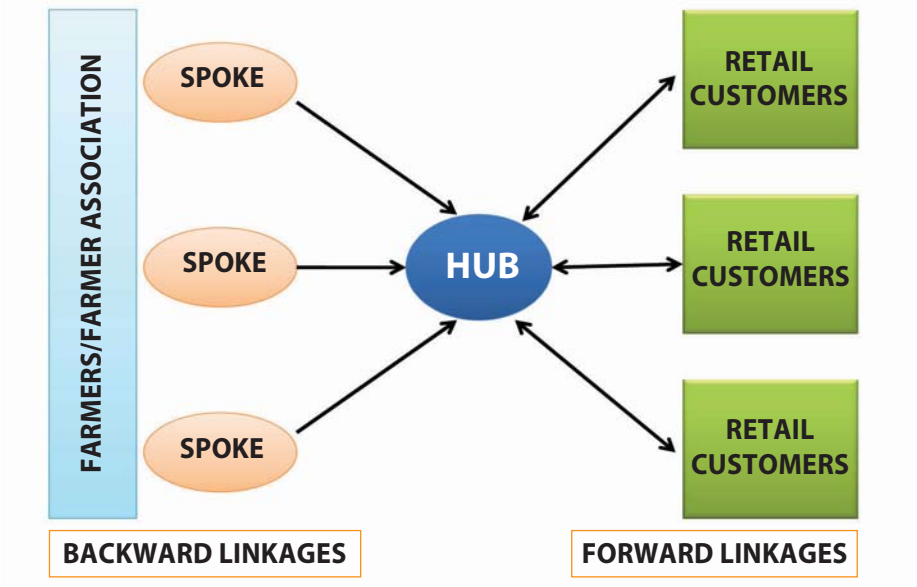
In addition the bank was also involved in the complete process of Bid process management for the selection of private enterprise for the development of TMC at Mumbai which has been approved by the Govt. of Maharashtra. The flow diagrams proposed by YES BANK for backward and forward linkages to cater the needs of the actors are given in Figure 9. The hub here is the Terminal Market Complex which will cater the spokes i.e. the local markets as backward linkages and all types of customers who are willing to buy as forward linkages.

Table 23. Key features of Modern Terminal Market Complex

Particulars	Existing Markets	Proposed Terminal Market Complexes
Ownership	Government	Public Private Partnership (PPP)
Management	Government	Private
System of sale & Price Discovery	In transparent	Fully transparent
Infrastructure	Inadequate	State of the art
Backward Linkages	Weak	Integrated (with CC)
Forward linkages	Through Commission Agents mainly	Will be directly linked to Retailers, Processors, Exporters
Payment solutions	Cash settlement takes 7-30 days	Instant cash settlement
Services	Spread out	All under one roof

(**Source:** YES BANK, 2013)

Figure 9. Flow chart of Terminal Market Complex



(**Source:** YES BANK, 2013)

5.3 Inclusive and Social Banking

YES BANK's Inclusive and Social Banking (ISB) products are targeted to address the financially excluded communities in rural and urban India by leveraging the Bank's branch network, technology edge and relationship capital. It follows the principles of 'creating equal financial opportunities, enabling financial inclusion. ISB has created an eco-system that alleviates poverty and improves livelihood through fairly priced, transparent and suitable financial products and services accompanied with appropriate financial education[24]. The viable business models for providing comprehensive financial services[25] to the 'Bottom-of-the-Pyramid' in a sustainable manner is the core of the bank's success in this sector. In line with the guiding principles of "Frugal Innovations for Financial Inclusion (FI4FI)", ISB developed and launched several innovative and viable business models and forged partnerships leading to their seamless implementation models (Box 13).

[24] YES BANK; Annual Report 2013-14.

[25] It offers direct micro credit, micro-insurance and micro-savings services to its urban, semi-urban and rural customers. The micro-remittance service is also set to be launched soon.

Box 13. ISB initiatives in YES BANK

YES MONEY is a unique new social innovation designed to meet the remittance need of India's vast migrant, unbanked and under-banked population. The Bank has been able to create a sustainable business model and new market segment with YES MONEY due to its convenience and reliability.

YES SAHAJ is an innovative, cost effective micro-ATM model of the bank which has the potential to upscale with the under-banked customers in rural India. It has strengthened partnerships with Business Correspondent Agents (BCA), SHGs, non-profit institutions and local communities.

YES Livelihood Enhancement Action Program (YES LEAP) aims to provide credit, saving and insurance facilities to Self Help Groups through various NGOs acting as Business Correspondents (BC) of the Bank. This has enhanced the bargaining power of the women collectives and other value chain participants. The Bank appointed 35 BCs and 39,034 SHGs were credit linked.

(**Source:** YES BANK Limited, Annual Report-2014)

5.4 Food and Agribusiness in Bank's Business

Food and Agribusiness is one of the core business areas which contributed approximately 16% of the total business of the bank during the financial year 2013-14 (YES BANK Limited, Annual Report, 2014). The Bank offers its unique 'Advisory + Implementation + Lending proposition' to its clients on starting or diversifying into the following areas of agribusiness:

- Integrated Dairy Farms
- Dairy Products Business (Cheese, Butter, Yoghurt, Ice Cream etc.)
- Food Processing
- Agro Food Parks
- Supply Chain Management Business
- Modern Terminal Markets
- Large Scale Commercial Farming in Africa and Latin America
- Acquisition of Overseas Plantations
- Organic Farming and Distribution
- Food Flavours and Additives
- Herbal Medicines
- Integrated Warehousing
- Integrated Cold Chains

Mega Food Park is a new initiative of the government of India to provide impetus to food processing and reduce wastage of agricultural produces (Box 14). YES BANK responded to the call of the government and developed a comprehensive operational model (Figure 10) and end to end solution.

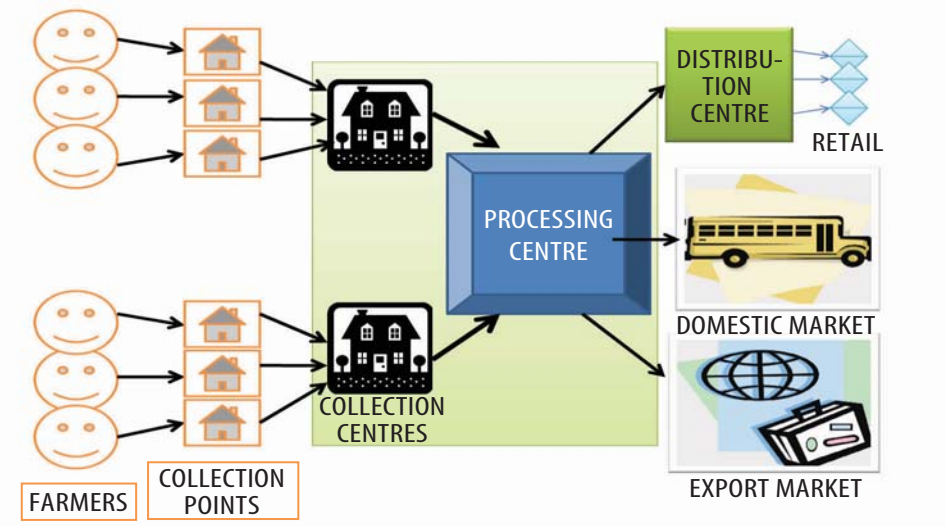
Box 14. Mega Food Park (MFP) Scheme of the Government of India

Mega Food Park Scheme is the flagship programme of the Ministry of Food Processing Industries, Government of India. Mega Food Park Scheme proposes a demand driven/pre-marketed model with strong backward/forward linkages and sustainable supply chain. The primary objective of the scheme is to facilitate establishment of integrated value chain, with processing at the core and supported by requisite forward and backward linkage.

The scheme provides for creating infrastructure for farm level primary processing centre-cum-cold chain in identified clusters, processing of intermediate products, collection centre cum cold chains, centralized infrastructure to take care of processing activities, which require cutting edge technologies and testing facilities, besides the basic infrastructure for water supply, power, environmental protection systems, communication etc.

(**Source:** Ministry of Food Processing, Govt. of India, New Delhi)

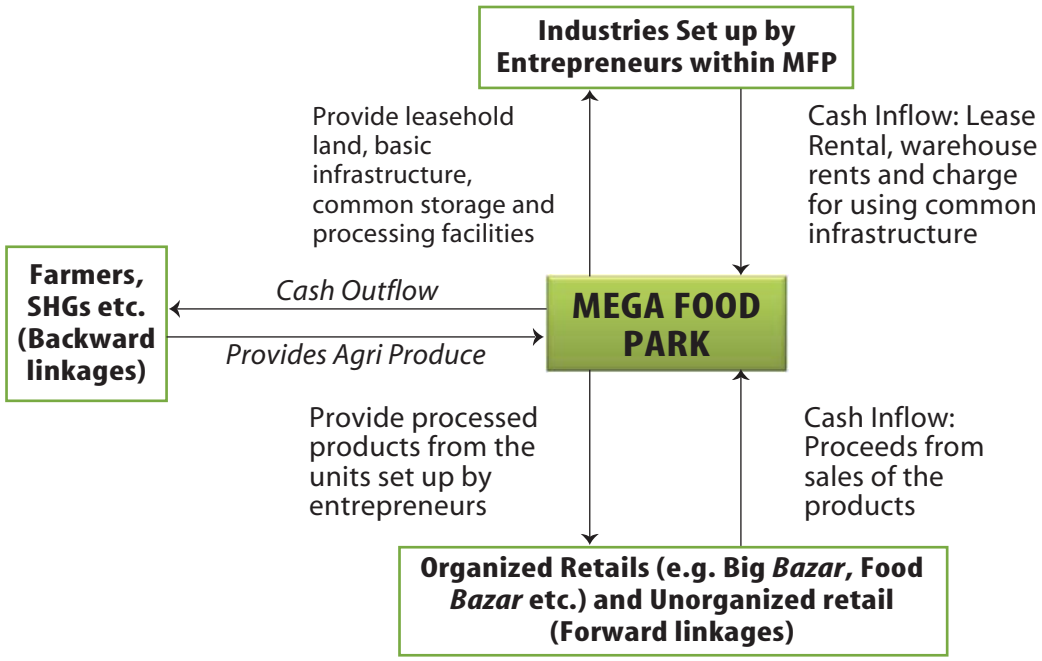
Figure 10. Mega Food Park model developed by YES BANK



(**Source:** YES BANK, 2014)

YES BANK is the Project Management Consultant for Ministry of Food Processing Industries to develop Mega Food Parks in various states of the country and has been actively involved in the complete process of setting up of a Mega Food Park from Advisory to Financing in the states like Maharashtra, Chhattisgarh and Karnataka. As per the business model developed by the Bank (Figure 11), the supply chain will establish on-Farm Primary Processing Centre cum cold chain facilities for aggregation of the produce at village level, which will be linked to the retail outlets/processing parks through appropriate produce aggregation facility and collection centre cum cold chain and Refer van transportation networks. The model envisages to be an entrepreneur driven and implemented on a PPP basis.

Figure 11. Business model of Mega Food Park



(**Source:** YES BANK, 2014)

5.5 Financing Agriculture Value Chains

YES BANK's knowledge approach analyses the value chains, works with and understands the stakeholders and their transactions and applies integrated financial solutions to meet their financial needs. These customized products and services include term loans, cash credits, warehouse receipt finance, letter of credit, bill collection, pre-finance, post-shipment finance, factoring and guarantees. The bank believes that a knowledge based project development approach is needed to transform Indian agriculture thus benefiting all stakeholders including farmers, companies, government and overall the Indian society. The key is to structure and finance bankable agribusiness projects for broad-based development of the agricultural sector, leading to economically and ecologically sustainable development.

5.6 Innovative Financial Products and Services Offered

YES BANK offers comprehensive and highly customized financial solution to producers to meet their credit and saving needs for sectors such as dairy, poultry, tea, coffee etc. The bank offers free 'Mainstream Basic Saving Account (BSA)'. Such financial solution is win-win for the producers and the organized aggregator. Timely availability of credit from a formal source enables the producer to smoothen the seasonality of cash flow and therefore maintain their productive assets. Such credit augurs the efforts of organized value chain participant in developing an assured supply chain by strengthening their relationship with the producer. This results into tremendous efficiency gain for the value chain.

5.6.1 Finance to small tea leaf growers

The YES BANK model uses credit facilities to integrate small tea leaf growers (STLGs) who have been traditionally maintaining business relationships with large corporate, in north east region of the country. The large tea companies own tea gardens and processing facilities in Assam and West Bengal Region of the country. They generally procure tea leaves from their own garden and also from several small tea leaf growers. These small growers need finance for garden development, maintenance and replanting activities among others, which generally are met by some advance payment from the corporate, own sources and financial institutions.

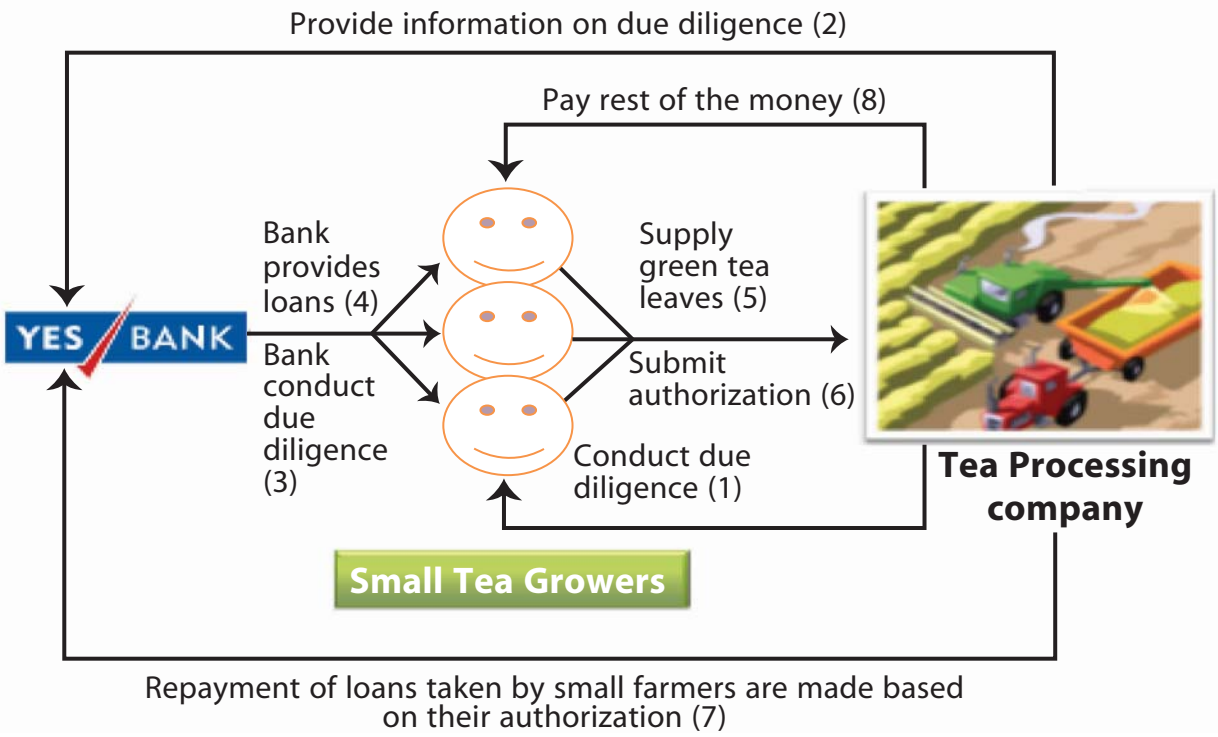
Initial research of the Bank reveals that the small tea growers need financial support during June-July to Oct-Nov when they are engaged in tea growing, plucking and transporting. The big tea companies helped the Bank to identify credit worthy small tea growers who need finances during the peak season. Based on track record and comfort level, the corporates recommend the small tea growers to the Bank; The Bank also conducts its due diligence. The bank then enters into a loan agreement with individual small tea growers. Bank allows working capital loans and intimates the processing company. These small tea leaf growers sign an irrevocable authorization in favour of the procuring company to deduct the loan amount from their payment dues and repay the same to YES BANK directly. The benefits that gained by three stakeholders involved are explained in Table 24 and the schematic diagram of the model explained in Figure 12 below:

Table 24. Benefits derived by the stakeholders

Corporate	Small Tea Leaf Growers	YES BANK
• Strengthens backward linkage with the suppliers. • Increased loyalty of the suppliers thereby reducing the diversion risk.	• Access to direct Bank Linkage for any future standalone funding by the bank.	• Platform to reach out to large number of small tea leaf growers based out in rural hinterlands who are otherwise non bankable • Scope for granular and stable loan portfolio.

(**Source:** YES BANK, 2014)

Figure 12. Innovative Financing Model to Small Tea Leaf Growers



(**Source:** YES BANK[26], 2014)

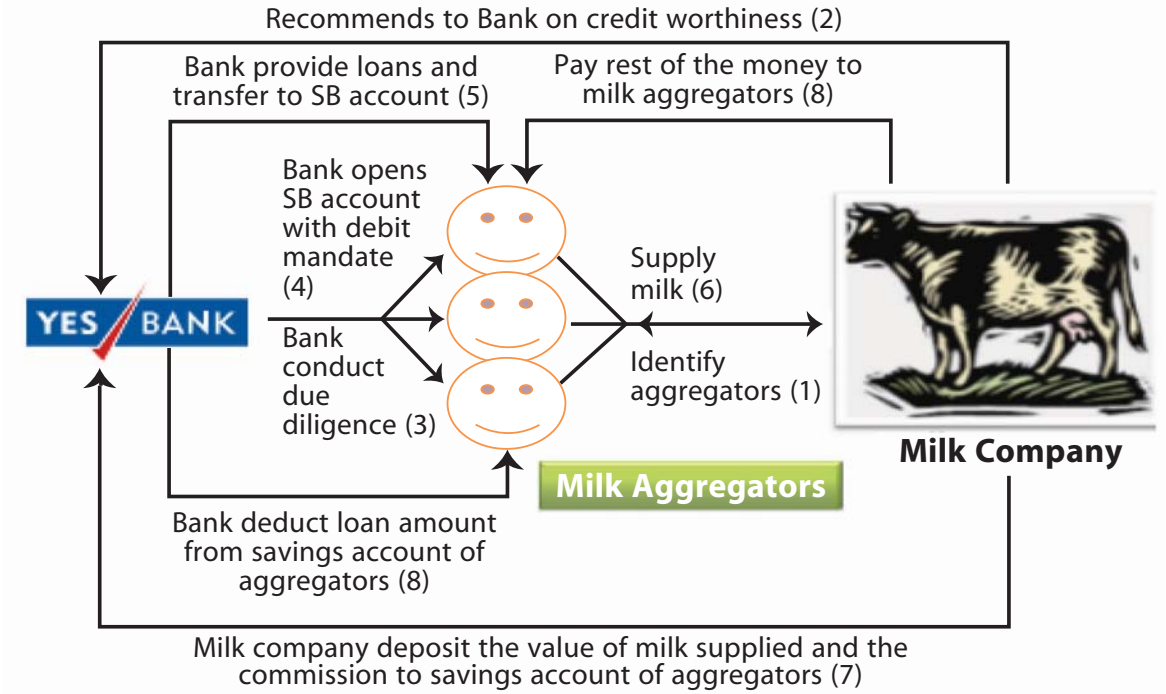
5.6.2 Finance to milk aggregators by innovative financing model

This model provides a platform for clustering of aggregators in the dairy production chains while effectively addressing the inherent deficiencies of the corresponding system. The dairy segment in India is dominated by the large cooperatives and private companies and they work on different model of procurement wherein cooperatives relying more on direct village level procurement and companies relying more on aggregators and middle men for supply of milk. In private company procurement model, a village (or at a group of villages) level procurement centre is established with part financing from company and part from the aggregators operating in the villages. The aggregators procure milk from individual farmers at a common collection centre and in turn hand it over to the company's milk van or to the nearest chilling plants. These aggregators are generally large farmers with larger herd of milch animals and some agriculture land and also supply the milk produced in their farm to the company. These aggregators play a very vital role in value chain in mobilizing farmers to get associated, collection of milk, keeping record and financing to farmers for milch animals.

These aggregators receive payment from the companies in the form of milk payment and commission for the services rendered. They are also in need of working capital for crop production in their own land, maintenance of milch animals, shed for animals etc. YES BANK, with the help of company, designed a term loan product to these aggregators at a competitive interest rate. The companies generally identify such aggregators who are long associated, loyal and credit worthy and recommends them to the bank. The bank conducts its own due diligence procedures finalize the loan terms. The aggregators need to open a savings bank account with the bank and the loan amount transferred to their accounts. The company deposits total payable to the aggregator (for the milk supplies made and commission income) in respective savings account. As per the debit mandate given by the aggregators, the bank deducts the loan installments from their accounts. The loan amount is designed in such a manner that it suits aggregators' financial need as well as its repayment capacity (Figure 13).

[26] Author's illustration based on information received from YES BANK.

Figure 13. Customized financial product for milk aggregators



(**Source:** YES BANK[27], 2014)

5.7 Conclusion

YES BANK is witnessing an exciting phase of growth and it will continue to pursue its strategies with even greater confidence and conviction. The Bank is poised to adapt suitably to the evolving economic and business environment with agility and responsibility. The innovative business model, widening branch presence, inspired culture of professional entrepreneurship and teamwork put the Bank in a strong position to address the needs of their clients, generate higher stakeholder returns and move towards emerging as the 'Best Quality Bank of the World in India'.

As explained, the 'innovative-value creating business models' designed by the YES BANK offers need specific technical know-how, customized financial products, state-of-art infrastructure and marketing solutions to its stakeholders, thus addressing major value chain inefficiencies and effectively mitigating risks associated with the agribusiness. The self-sustainable models provide the farmers with the market opportunities, higher prices and economy of scale benefits not feasible in isolation, thereby substantially increasing net earnings. Successful replication of the innovative models across strategic production/ processing hubs for key agricultural commodities may lead to transition of Indian agriculture and processed food industry from an unorganized, supply-driven, low–value business scenario to an exceedingly well organized, high-tech and safe, demand-led, and high-value orientation with substantial employment perspectives. YES BANK, along with its strategic partnership with the NGOs, National/State Governments and International organizations, is leveraging the experience and expertise gained during implementation of various model in India and intends to implement the unique concept in SAARC[28] countries and other nations across the globe by developing tailor made models to cater specific needs and requirements of those countries.

Note: For further information on YES BANK Limited, please contact Mr. Sumit Gupta (sumit.gupta@yesbank.in) and Mr. Nitin Puri (nitin.puri@yesbank.in)

[27] Authors illustration based on information received from the Bank.

[28] SAARC: South Asian Association for Regional Cooperation started in 1985 involving 8 countries in South Asia (Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, and Sri Lanka).

CHAPTER 6
Conclusions and Future Directions

6.1 Conclusions

6.1.1 General Lessons Learned

The general lessons learned from all the cases discussed in the previous chapters are that the smallholder producers could be a viable part of the value chains if there is a proper identification of the actors their strength and weakness etc. could be mapped properly. This should be coupled with the proper institution building and tailor made financial products and services made available to support the growth and development of the value chain. In general, the smallholder producers have inadequate resources for investments and the farmer collective models plays very important role for accessing finance, technology and markets. As the requirements of the smallholders are small, the financial institutions are not very keen for direct financing, the producers driven business model could be successfully implemented to manage the risk and cost of individual finance. The role of the other value chain actors should not be undermined and they should be encouraged to engage with the smallholder producer in an ethical business partnership. It was also learned that the presence of an intermediary who could provide comfort against loan defaults or make payments on behalf of the producers improves the lending business environment.

6.1.2 Key Areas of Concern

There are issues regarding value chain financing especially from a financing institution perspective. The Development Finance Institutions need to know what the risks are and how these can be addressed. They need to know how the loans will be paid given the risks. In financing value chain, a financial institution needs to have a good handle and understanding of the issues related to the different blocks in the chain; and come up with mitigating measures to address the risks.

Value chain financing requires a healthy risk appetite supported by the required skills set. Farmers are smart, competent and trainable. Their capacities can be upgraded. Bankers will lend if it makes sense to lend. There is a need to make lending to farmers a sensible proposition. In addition to these, infrastructure is inadequate, technology is not fully employed and information is asymmetric. There is not enough data to manage risks. Financial position of lenders is always impaired. Keeping these in view, the key areas which are the main concerns of practitioners, governments and development partners during the next decade are categorized in three major groups as given below (Table 25).

Table 25. Key Areas of Concerns

1. Innovations in financial products and services development	2. Advances in developing institutions to expand sustainable rural outreach	3. Advances in Delivery mechanism
a) Lending methodology needs to be simpler and suit to all activities in agriculture	a) Restructuring agricultural credit Departments/Division of commercial banks	a) Value Chain Finance (All actors in the value chains need due recognition)
b) Strengthening payment services and remittances	b) Strengthening member-based financial institutions (Cooperatives)	b) Business Correspondent/ Agency model of delivery
c) Insurance and other risk Management instruments	c) Enhancing outreach through financial linkages	Use of ICT in financing agriculture

6.2 Future Directions

Value Chain Finance in Agriculture is frequently on top of the international development agenda since last few years. Now, with the triple shocks of the recent years — food, fuel, and finance — the urgency of food and nutrition security has increased greatly and created political pressure to act immediately. There is now broad support for more and better investments to increase agricultural production, to improve marketing of commodities, and to combat poverty. However, there are no quick political fixes and the provision of sustainable financial services for agricultural value chains has proven to be difficult. The past years have demonstrated that neither commercial banks nor the emerging microfinance industry are willing or able to sufficiently meet the financial needs along agricultural value chains, leaving farmers and agricultural MSMEs underserved.

There is a broad consensus that existing mechanisms for agricultural finance are not adequate and that we need to move to innovative and market-based approaches that are scalable and can reach a large number of beneficiaries and could serve all the actors in the value chain. On the basis of the key lessons learned from the case studies on agriculture value chain finance in India, a summary of key areas for taking it forward are outlined as follows:

- ***Develop Commodity specific diagnostics and strategies.*** There is an urgent requirement to undertake a detailed baseline diagnosis of the value chains of the agricultural commodities and proper mapping of the supply and demand for the finance at different level and draw a long term strategy to meet the gap.
- ***Develop a Supportive Legal and Regulatory Framework.*** The legal and regulatory framework of the country needs to be developed to support the development of agriculture value chain finance as a long term development agenda.
- ***Designing Effective Government Support Mechanisms.*** Efficient support mechanism of national government will allow the value chain to develop and flourish. For example, partial credit guarantee program for agriculture may bring more players of financial system to support the value chains to develop.
- ***Building Capacity of Financial Institutions and their Clients.*** Banks and financial institutions require support in training, product development, and risk management specific to agriculture value chains.

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Annexes

ANNEX I

A. Scenario Analysis of Value Chain Finance in Maize (Input suppliers)

Category of Transaction		Rate	Value/ha (INR)
1. Inputs Retailers			
Hybrid maize seed (per hectare)		20 kg @INR 100/kg	2,000
DAP (per hectare)		100 kg @INR 33/kg	3,300
Urea (N = 46) (per hectare)		250 kg @INR 15/kg	3,750
Pesticides (per hectare)		Lump sum	350
Transport, Handling & Overhead (per hectare)		Lump sum	500
Scenrio 1	Finance from Bank (limit allowed up to INR 500,000)	Interest @1% pm for 1 month	100
	Total cost of inventory		**10,000**
	Pricing by Retailer		**10,750**
	Value added		**750**
	Return on Investment (ROI) %		**6.5**
Scenario 2	Credit allowed by the Agribusiness companies (limit allowed up to INR 250,000)	Credit period 30 days Interest @2% pm	**200**
	Total cost of inventory		**10,100**
	Pricing by Retailer		**10,750**
	Value added		**650**
	Return on Investment (ROI) %		**2.3**
Scenaio 3	Credit allowed by the Agribusiness companies (limit allowed up to INR 250,000) and Finance from Bank up to INR 250,000)	1. Credit period 30 days. Interest @2% pm-Suppliers 2. Interest rate @1% pm-Commercial Bank	**150**
	Total cost of inventory		**10,050**
	Pricing by Retailer		**10,750**
	Value added		**700**
	Return on Investment (ROI) %		**3.7**

B. Scenario Analysis of Value Chain Finance in Maize (Production)

Category of Transaction		Rate	Value/ha (INR)
2. Production			
Cost of inputs (Average all 3 scenario) per hectare		10,750	10,750
Cost of labour (hired and own) per hectare			4,000
Cost of hired machinery per hectare			2,250
Scenario 1	Finance from Bank (Commercial Bank/ RRBs/Co-op Bank)	Interest @1% pm for 6 months	1,020
	Total cost of Production		**18,020**
	Farm gate price	Total production/ ha = 2.6 tonnes Farm gate price (MSP) = INR 11,750 per tonne	**30,550**
	Value added		**12,530**
	Return on Investment (RoI) %		**11.3**
Scenario 2	1. Finance from Bank (Commercial Bank/ RRBs/Co-op Bank) 2. Credit for inputs from input suppliers (seeds & fertilizers)	1. Interest @1% pm for 6 months 2. Interest @4% pm for 6 months	2,550
	Total cost of Production		**19,550**
	Farm gate price		**30,550**
	Value added		**11,000**
	Return on Investment (RoI) %		**3.3**
Scenario 3	1. Finance from Retail traders (for production and consumption purpose) maximum limit of INR 50,000	Interest @3% pm for 6 months	3,060
	Total cost of Production		**20,060**
	Farm gate price		**30,550**
	Value added		**10,490**
	Return on Investment (RoI) %		**2.5**

C. Scenario Analysis of Value Chain Finance in Maize (Traders)

Category of Transaction		Rate	Value/ha (INR)
3. Local/District level Traders (all figures are for maize produced in 1 hectare)			
Farm gate price of maize		30,550	30,550
Cost of transport and handling (cleaning and grading)			1,000
Cost of storage for 2 month			750
Overhead cost (including marketing costs)			1,750
Scenario 1	Trade Finance from Commercial Banks	Interest @1.25% pm for 2 months	**850**
	Total cost at traders level		**34,900**
	Selling price by the traders		**38,000**
	Value added		**3,100**
	Return on Investment (RoI) %		**2.7**
Scenario 2	1. Finance from commercial Bank:	1. Interest @1.25% pm for 2 months	**1,100**
	2. Credit from processors: Maximum limit INR 250,000	2. Interest @2% pm for 2 months	
	Total cost at traders level		**35,150**
	Selling price by the traders		**38,000**
	Value added		**2,850**
	Return on Investment (RoI) %		**1.6**
Scenario 3	Investment from own sources	Opportunity cost @1.5% pm for 2 months	**2,930**
	Total cost at traders level		**35,070**
	Selling price by the traders		**38,000**
	Value added		**2,930**
	Return on Investment (RoI) %		**1.9**

D. Scenario Analysis of Value Chain Finance in Maize (Processors)

Category of Transaction		Rate	Value/ha (INR)
4. Processing of maize (Dry Rolled Corn) (all figures are for maize produced in 1 hectare)			
Price of maize from traders		38,000	38,000
Transport, handling			500
Capital cost			500
Cost of Processing (DRC)		INR 150 for each tonnes of maize	390
Overhead cost (including electricity & marketing costs)			1,000
Scenario 1	Loan from Commercial Banks INR 40,000 per MT capacity	Interest @1.25% pm for 4 months (2.6 MT per ha production)	2,010
	Total cost at processors level		**42,400**
	Selling price by the processors		**46,000**
	Value added		**3,600**
	Return on Investment (RoI) %		**0.8**
Scenario 2	1. Finance from commercial Bank INR 20,000 per MT capacity	1. Interest @1.25% pm for 4 months	**2,630**
	2. Credit from exporters (INR 20,000 per MT capacity)	2. Interest @2% pm for 4 months	
	Total cost at processors level		**43,020**
	Selling price by the processors		**46,000**
	Value added		**2,980**
	Return on Investment (RoI) %		**0.1**
Scenario 3	Investment from own sources (INR 100,000 for each 2.5 tonnes capacity)	Opportunity cost @1.5% pm for 4 months	**2,580**
	Total cost at processors level		**42,670**
	Selling price by the processors		**46,000**
	Value added		**3,330**
	Return on Investment (RoI) %		**0.3**

ANNEX II

Gujarat Cooperative Milk Marketing Federation (GCMMF): Popularly known as AMUL

1. History of AMUL

Kaira District Milk Producers Cooperative Federation, Anand (AMUL) had its roots in a milk farmers' strike in 1946. The dairy farmers of Anand protested against the exploitative practices of milk traders who had formed a cartel. With the guidance of regional and national leaders at that time the dairy farmers had formed their own cooperative in 1946 to end the tyranny of the milk traders. This co-operative, the Kaira District Co-operative Milk Producers Union Ltd. began with 247 litres of milk from just two village dairy co-operative societies and is today a very large operation with the iconic brand Amul. Dr. Verghese Kurien was entrusted with operations of the dairy in 1950 and since then the systematic development of this milk cooperative as a value chain has continued without stops. At a time when the concept of a value chain was yet to develop, AMUL had systematically developed its business from production to market as a high quality value chain that focused on small farmers. The objectives of GCMMF are three fold.

- Establishment of a direct linkage between milk producers and consumers by eliminating middlemen
- Milk Producers (farmers) should control procurement, processing and marketing
- The operations should be professionally managed

2. Structure

"AMUL model of GCMMF's" dairy development programme is a three-tiered structure, with the dairy cooperative societies at the village level federated under a milk union at the district level and a federation of member unions at the state level. Farmer members milk their cows twice daily (morning and evening). GCMMF collects the milk twice a day, makes regular payments to the farmer members and provides them with cattle feed, fodder, animal breeding and veterinarian services. Anyone who owns a cow or a buffalo and makes a one-time payment of 11 rupees (10 rupees for the share certificate and 1 rupee for registration) can become a member of the village cooperative society. The applicant must agree to provide a set minimum quantity of milk, generally between 600 and 700 litres, to the society each year. The farmer members elect a managing committee that then chooses a chairman. The managing committee appoints a secretary to discharge the society's administrative functions.

At the second tier, there is a district level union that processes the milk procured from individual societies. Each of the 13 unions has a board of directors chosen by an electoral college drawn from the chairpersons of its affiliated societies. The union board in turn elects its chairman. The final tier is constituted by the GCMMF, which is responsible for marketing the milk procured and processed into various value-added products at the union dairies. All the products are sold under the Sagar or AMUL umbrella brands. The federation's board consists of the chairpersons of all 17 district unions. They elect the federation chairperson and appoint the managing director, who is accountable to the nearly 3.18 million strong AMUL dairy society members.

3. Governance

This cooperative structure is democratic, and the farmers are in control, from the milking of their animals to the final marketing by the federation. For every rupee that GCMMF earns, roughly 75 paise goes to the farmers. The mandate is clear – production by the masses, for the masses, at its efficient best. The farmer members democratically govern the entire cooperative structure to ensure that the higher tier organizations are geared to serve the purpose of the lower levels and that the gains at all levels flow ultimately back to the farmers in a significant measure. The core feature of this structure is farmer involvement in decision-making at all three stages – procurement, processing and marketing of milk and milk products. The value addition at procurement and processing stages can be realized only with effective marketing of products, thus making it an essential feature for success.

4. The Value Chain

The value chain followed by the GCMMF is a large and complex one with several autonomous local cooperatives that collaborate with each other and the higher tier institutions that deliver benefits to the farmers. The value chain has a three tier organizational structure so as to include small holders in its fold. At the base level individual dairy farmers engaged in milk production join as members of Village Dairy Cooperatives. The village Dairy Cooperatives, in turn become member units of a District Level Cooperative Milk union. The district level unions are then federated in to a State Level Cooperative organisation. Thus the GCMMF is a state level federation in Gujarat with a member base at the grass roots of 3.18 million milk producers. Pictorial format of the milk value chain as followed by the GCMMF is given below.

5. Business Model

The GCMMF consists of 17 district unions, involving 16,914 village dairy cooperative societies and nearly 3.18 million farmer members. With an aggregate milk processing capacity of 12.7 million litres per day, it is Asia's biggest dairy business venture. The marketing network encompasses about 3,200 wholesale distributors and over 550,000 retail outlets with a sales turn over of INR 137.35 billion (table below). GCMMF has been exporting UHT-processed milk, ghee, skimmed and whole milk powder, butter, cheese and indigenous milk products to the China, Hong Kong, Singapore and the USA, among others.

Table 1. GCMMF at a glance

Year of Establishment	1973
Members	17 District Cooperative Milk Producers' Unions (16 Members and 1 Nominal Members)
No. of Producer Members	3.18 Million
No. of Village Societies	16,914
Total Milk handling capacity per day	16.8 Million litres per day
Milk collection (Total 2012-13)	4.66 Billion litres
Milk collection (Daily Average 2012-13)	12.7 Million litres
Cattle feed manufacturing Capacity	5,890 Mts. per day
Sales Turnover (2012-13)	INR 137.35 Billion (US$ 2.54 Billion)

(**Source:** http://www.amul.com/m/organisation website visited on 27.102013)

6. Services provided to farmer members

The dairy unions affiliated to GCMMF provide various inputs that contribute to enhancing the productivity and quality standards, such as:

- breed improvement and animal healthcare programmes;
- extension activities;
- supplies of balanced cattle feed on a no profit–no loss basis;
- quality fodder seed distribution at subsidized cost;
- a network of artificial insemination centres aimed at genetic upgrading of the animals using frozen semen of pedigree bulls; these centres are managed by educated unemployed rural youth who provide breeding services to the farmers;
- frozen semen, liquid nitrogen and other consumables;
- 24-hour mobile veterinary services for emergencies.

ANNEX III

***'DAIRY PLUS'* Scheme for financing dairy units to Smallholder Farmer by State Bank of India**

Sl. #	Particulars	Description
1	**PURPOSE**	• For construction of shed, purchase of milch animals, milking machine, chaff cutter or any other equipment required for the purpose.
2	**ELIGIBILITY**	• Individual farmers who are members of the milk procuring societies or located on milk route. • They should be less than 65 years of age. • Individual dairy unit having less than 10 animal – should own minimum 0.25 acre of land for every 5 animals for growing fodder and be in a position to procure the balance requirements locally. • Individual dairy unit having 10 animals and above – should own or lease a minimum of one acre of land for cultivation of fodder for every 5 animals.
3	**SPECIAL TERMS AND CONDITION**	• Animal purchase should be in 2 batches. • Only buffaloes producing more than 7 liters of milk per day and cows producing more than 8 liters of milk per day are financed. • Animals in first and second lactation alone are eligible for finance
4	**LOAN AMOUNT**	
	a) Term Loan (Repayable in 3-5 years)	• 100% of the cost for loans up to INR 50,000.00 and in case of loans above INR 50,000.00 with a maximum of INR 0.5 million 90% of the cost.
	b) Working Capital (converted to term loan)	• A working capital @ INR 2,500/- per animal per year may be sanctioned for purchase of feed, fodder and medicine along with the term loan
5	**SECURITY**	• Hypothecation of assets created out of bank finance for loans upto INR 100,000. • For loans Over INR 100,000 – Mortgage of landed property (or) third party guarantee worth for loan amount (or) group guarantee of other 2 dairy farmers.
6	**REPAYMENT TERMS**	• The loan should be repaid in monthly installments' over a period of 5 lactations.

(**Source:** State Bank of India website: www.sbi.co.in/user.htm?action=print_section&lang=0&id=0,8,66,763; last visited on 29.10.2013)

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