



cutting through complexity

Innovation of Agriculture Logistics

Managing Food Inflation



About the study

This is a briefing paper written by KPMG that assesses the underlying reasons for the high levels of inflation in the food economy of the country and its subsequent impact on innovations in business models from both a corporate and policy perspective.

Our study starts with a brief overview of the key reasons for the high levels of food inflation, government initiatives to overcome the constraints, changing business models and innovations in the private sector.

We then highlight 13 different cases of innovation that have helped the food economy deal with the problem of inflation. The crisis also presents an opportunity to deliver greater value to consumers from both an economic and social standpoint.

Foreword

Double digit food inflation is an extremely topical concern that has plagued the Indian economy for the past three years showing no signs of abating. A high level of food inflation has a cascading impact on the overall health of the economy on account of the resulting interest rate regime that chokes the availability of capital to fund the economic growth engine. Reduction in food inflation has hence become a serious concern for the wider business community with implications beyond the food and agri-business sector.

The reasons for the high levels of inflation are essentially structural in nature arising from supply constraints on account of the inefficiencies in production, processing, distribution and retail of fresh produce and food products. These constraints have been further exacerbated by an increase in demand led by growing per capita consumption of food driven by the economic advances of the past decade. Patterns of food consumption have also changed as Indian consumers evolve up the food pyramid from a predominantly grain based regime to a better balanced diet comprising of higher intake of animal proteins including dairy, fruits, vegetables and processed food products and services.

It is in this context that some food and agribusiness firms have developed innovative business models to not only profit from the surge in demand but also improve efficiencies of the agricultural supply and demand chain by investing in modern production, processing and distribution practices. Policy has also been active both nationally and in a few states to promote the growth of agricultural output from a yield and productivity standpoint. This report highlights some of these leading practices from a corporate and government viewpoint that can serve as illustrations of the potential way forward to mitigate the serious challenges impeding capacity building in this crucial sector.



Ramesh Srinivas
Partner
Management Consulting
KPMG in India

Foreword

Modern India's appetite for food is insatiable making food retail – whether through QSRs, fine dining, modern retail formats or even the kirana shops – one of the fastest growing industries in India. Rise in incomes, changing lifestyles, urbanization and easy availability along with fast changing demographics are only some of the reasons fuelling this exponential growth. However, fast growth in an environment limited by supply side constraints leads to high food inflation. India is no exception with its persistent double digit food inflation.

Supply side constraints are often amplified by operational and logistical challenges made further complex by the perishability of products in a food supply chain. However, there exist, as we found out only recently, numerous examples of innovation in supply chains of food and agricultural products positively affecting supply chain efficiency, cost optimisation and market development. And the fact that all this has been achieved within the limitations of our physical and legislative infrastructure is remarkable, to say the least. This suggests that the industry is not waiting for a favourable tide but pushing against it.

We are grateful to KPMG for mobilizing the case studies contained in this paper from across the industry. We also have admiration for the several organizations who actively participated in the development of this paper and shared ideas and information without fear or prejudice for the good of the industry and its customers.

This paper well represents the very purpose and the DNA of the Supply Chain Leadership Council. SCLC is dedicated to be the playground as well as the platform of the Indian transportation and logistics community. In its role as the playground, SCLC will create quality and frequent interaction opportunities between the members of this community – cargo owners, service providers, investors, infrastructure creators and policymakers. In its role as the platform, SCLC will crystallize the opinions, discussions and wishes of the Indian transportation and logistics industry to the attention of the industry itself but also policymakers. Accordingly, we are glad to have provided the platform of India Food Retail & Supply Chain and Agro Logistics Summit 2011 for the release of this paper.



Gautami Seksaria
Founder & Partner
Supply Chain Leadership Council
gautami@sclc.in
www.sclc.in



Acknowledgement

This report has been authored by Anshuman Mishra and Sanjeev Gupta from the Management Consulting Practice at KPMG Advisory Services Private Limited. The document has been formatted and designed by the KPMG Markets Team.



Table of Contents

Preface – food inflation	06
Structure of the report	08
Food Inflation and Agri-logistics Innovations	10
Innovation case studies for Agribusiness	12
Innovative takeaways for Agribusiness	26



Preface – food inflation

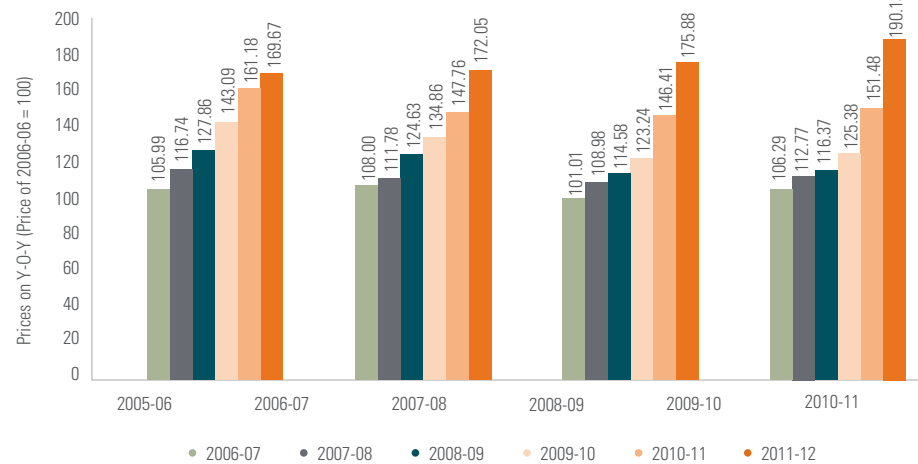
“It was the best of times. It was the worst of times ...” The opening line from Charles Dickens’ “Tale of Two Cities” is an appropriate opening as you can find to reflect on an eventful and challenging year for anyone buying, directly or indirectly, food or labour.

Best of times because our economy has been keeping up despite the eurozone crisis, the US recession, oil prices and increasing trade deficit. IT, BFSI, Oil & Gas, Education and the Healthcare sectors have all witnessed robust growth. Worst of times because of the spiraling prices for food articles, further driving rises in labour and services provision. vng rises in labour and services provision.



Sources: xxxxx

Though the rate of food inflation is decreasing, it still remains markedly positive. The high level of food prices is indeed a matter of concern as the prices of protein-based items, which have a higher share in the consumption basket, are showing larger increases. Moreover, there is continuing shortage of food items such as pulses and edible oils. India currently imports around three million tonnes of pulses (around 20% of its total consumption) and 8 million tonnes of edible oil (about 60% of its total consumption). Despite the growth in production and increased food supply, prices for food products have grown much faster than other non food commodities in the past six years as measured by wholesale price index. The growth in the food prices in India have accelerated to double digit growth rates since June 2009



Sources: xxxx

There is a considerable risk that food inflation will become a structural issue for India. Increase in food price will have one of two negative feedback loops on the Indian economy. Scenario one could be that food prices will drive up inflation and impact on labour and non-food commodities or labour will remain at current levels and purchasing power will be impacted, causing decrease in quality and quantity of nutrition available to lower classes. In the second scenario, subsidised food will need to be paid for from state and Government budgets. Fiscal drag here will demand increased taxation, with deflationary pressures resulting if left untreated

The value chain for food comprises of the following elements



Agri-logistics refers to the collection, aggregation, storage and transport of agricultural produce from the farm to the consumer and all intermediate levels such as the processing facility (factory), market (mandi) and retailers. It is in this sphere that the advantages of applying these supply chain management techniques are numerous, like the reduction of product losses, increase in sales, reduction of transaction costs, a better control of product quality and safety and the dissemination of technology, capital and knowledge among the chain partners.

Supply chain development not only benefits the private sector but also creates spin-offs that stimulate social, economical and environmental sustainable development in the region (employment generation, added value, decreases of product losses, etc.). Public support (e.g. development of the institutional infrastructure) plays an important role to create an enabling environment for private sector development

Structure of the report

This paper reviews issues of the development of supply chain in agri-business in India with special focus on the innovative approaches employed by firms and the impact created both in terms of cost optimization as well as market development.

In the following section, we present a case by case analysis of thirteen examples of innovation from across industry segments and companies. Also, the area or type of innovation for each of these varies significantly. So, while one case is about conversion of cargo from road to more optimal modes, another is about a technology driven solution to a complex challenge and still another is about client-specific service customization to a fascinating extent. Besides, it is interesting to note that different innovations are based on significantly varying constructs and tools for changing agri-logistics.

In the case of the thirteen examples of innovation covered in this paper, the following table captures these variances. These are by no means the only cases or even these types of cases and have been hand-picked as showpieces of entrepreneurship and creativity in challenging some of our long standing issues.

Business Model for Innovation / Business Case	Services	Markets	Policy	Partnerships	Products	Structure	Technology	Processes
Gujarat Government			✓					
Oilseeds			✓					
PPP in Bihar				✓				
Jain Irrigation					✓		✓	
Sodexo's food Services					✓			
Land banks outside India		✓						
Snowmen Logistics	✓							
Suguna Chicken								✓
Mahindra's Shubh Labh				✓				✓
Pepsico's contract farming				✓				✓
Agriwatch							✓	
Mega Food parks						✓		
Co-operative revolution						✓		

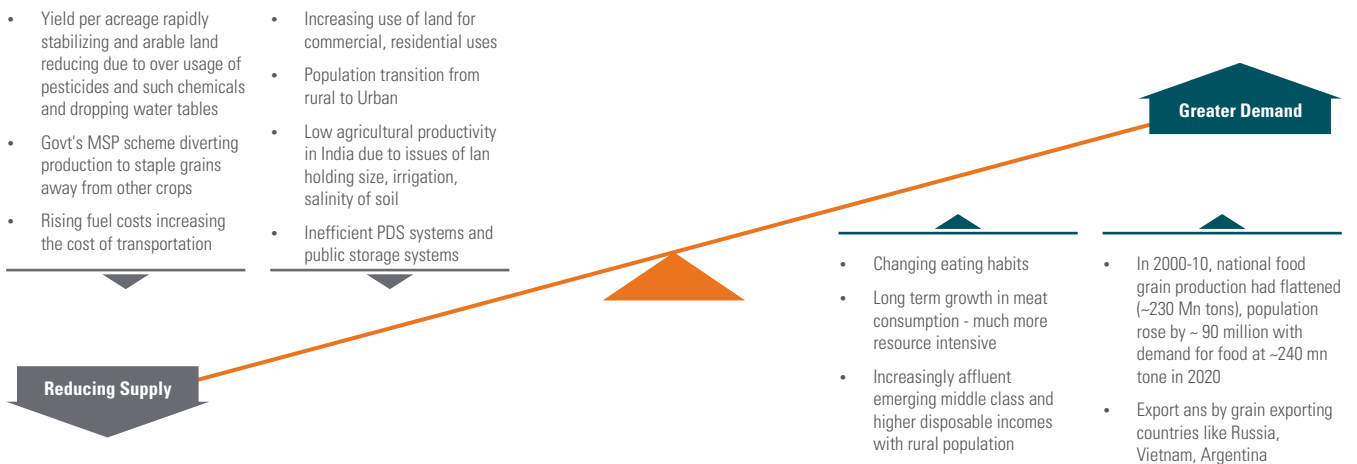
Sources: Industry discussions with companies, KPMG Analysis





Food Inflation and Agri-logistics Innovations

Food inflation which was ~ 7.5 % in 2006-07 increased to 14 % in 2010-11, reached 12.21% in October 2011. Food inflation has been driven by two factors, the weight of the item in the overall food basket and the price change of these items. Both of these are impacted by supply side and demand side concerns.



A recent research paper¹ by IFPRI and IMF has identified animal source food, fruits and vegetables, processed food and cereals as key contributors to food inflation in India. While demand factors like rising incomes affect income elastic food items like milk and sugar, the supply side constraints have been a key contributor to the rising prices.

	Production deficit	Low Yields	Inadequate Storage	Poor Distribution	Changing land usage patterns from agri to non-agri
Milk	✓				
Cereals	✓	✓		✓	✓
Edible Oil		✓			
Fruits and Vegetables	✓		✓	✓	✓

1. 'Explaining Inflation in India: the role of food prices' – IMF, IFPRI

While demand factors have also played a significant role in rising prices

	Rising disposable income (urban and rural)	Consumption pattern shifting to convenience products and services	Growth of organized retail
Staple grains			
Cereals & pulses			
Milk		✓	✓
Fruits and Vegetables	✓		✓
Egg, poultry and meat	✓		✓
Processed Food	✓	✓	✓





Innovation case studies for Agribusiness

Case 1

Indian Poultry industry faces a big issue with respect to securing credit for investments. As poultry products are perishable and have limited shelf life, there is significant risk involved in investing. Due to this, farmers often find it difficult to get help from the banks and other financial institutions, thereby facing difficulties in buying the required farm inputs. Farmers are also often exposed to the market risks to a high degree due to price fluctuations and demand-supply dynamics while there is no buyer assurance

The problem of funding can be solved by integrating the value chain and reducing the intermediaries. While a permanent buying arrangement from farmers will help shield them from the market risks, it will also enable them to secure finances from the banks. With the higher availability of money, the farmers will be able to purchase specialized inputs for the poultry farms leading to higher production and sustainable supply for the buyers.

Suguna solved the problem of funding in poultry by introducing 15,000 rural entrepreneurs across 10 states

- The lack of technical skills needed to produce poultry on commercial lines
- Lack of credit or liquidity to purchase specialised inputs or to make investments
- Incapability to bear the risk associated with producing perishable commodities like poultry; other factors such as greater price fluctuations, risk of spoilage, and shelf life
- Lack of assured access to information about the quality of output from specific smallholder farms

Snapshot of Indian Presence

Output	✓	The broiler production growing at > 10% y-o-y 2005-10
Hygiene	✓	Key consumer concern of bird diseases and hygiene is regular
Support to farmers	✓	Farmer receives, feed, medicines, day-old chicks, guaranteed pay by weight
Operating Efficiency / COP	✓	80% of the broiler industry is now vertically integrated. India is only behind Brazil in COP
Product Upscaling, processing	✗	Not present in processed meat

Innovative Approach from company

- Integrated the value chain and reduced the levels of intermediation from 14 to 4. Grew grandparent stocks and released the day-old stocks for growing to the CF
- Daily visits by company field staff to evaluate the health of the livestock
- Farmers are paid a growing charge per kg of the live bird which ensures that they are concerned about the mortality and weight gain

Benefits for smaller farmers

- Tie up with bankers for financing work-sheds
- The farmers are insulated from market risk

The Poultry Ecosystem Model

Concern on various counts

- Regional competitors who enjoy local concentration
- Land cost has been increasing and farmers might expect higher returns for themselves
- Need to develop management professionals in various capacities like marketing
- Cold chain and logistics capabilities for enhancing the operations
- Move from marketing live birds to processed meat which can fetch higher yields

Year	Qty sold (Tons)	PAT
2005	2,460	321
2006	3,286	842
2007	4,206	1,121

Going ahead

- Claims to be the largest producer of broiler chicken in India and the fourth-largest in the world
- Will soon commission Asia's largest feed mill near Bangalore. It currently operates 38 feed mills across the country
- Operates 35 hatcheries with an aggregate capacity of 350 million eggs per annum
- Sells 8.5 lakh branded eggs a month

Key Learnings

- Integrates several stages in the supply chain to ensure synergy in production and distribution of inputs, streamlining marketing channel
- Reduction of risk. Integrator is ensured of well orchestrated supplies and farmer is assured of input supplies and revenue

Sources: Company Reports

Suguna solved this problem of funding with the help of 15,000 rural entrepreneurs spread over 10 Indian states. It integrated the poultry value chain and significantly reduced the number of intermediaries from 14 to 4. In the price arrangement with farmers, the farmers are paid a growing amount for each Kg of the bird due to which farmers strive for higher weights, leading to lower mortality and more weight gain. With these arrangements, while on one hand farmers are securing the required amounts from banks for investing into their farms and are protected against market risks, on the other hand Suguna is assured of timely supplies and already claims to be the largest producer of broiler chicken in India and the fourth-largest in the world.

Case 2

Several Eastern states of India have been identified to have huge potential for agriculture/ food processing industries. This is owing to the fact that climatic conditions and abundance of water make some of these regions quite conducive to agriculture/food related activities. Some of the eastern states have even been estimated to have the potential to become the next Punjab or Haryana of India due to the high soil fertility. However, this potential is still largely untapped due to inadequate government incentives and lack of an effective partnership model to attract investments

Public-private partnership with sufficient support from government can help solve this problem and fuel the growth of agriculture and food processing industries in eastern India. Capital subsidies from government can encourage not only the institutional investors but also some of the individual investors. Government should provide funds for initial development of the basic infrastructure in the industrial clusters while private players bear the responsibility of successfully setting up and running their operations.

The Bihar government is giving up to INR 10 crores of capital subsidy for investments in the food processing sector

<ul style="list-style-type: none"> The National Commission on Farmers has concluded that Bihar and Eastern India present uncommon opportunities for becoming another "fertile crescent" even as the present fertile crescent (Punjab, Haryana and Western Uttar Pradesh) have reached a state of economic and ecological distress Water is abundant in Bihar and govt support for FPI Product specific cluster based approach under a Public-Private Partnership (PPP) mode 	Region	Vacant land available (acres)	Largest Plot available (acres)	Average price of land (lac/acres)	Ease of doing business	✓	Stability in new government with public acceptability
	Patna	239	2.8	320 to 350	Access to key markets	✓	Key markets of UP, NCR, AP, WB are directly connected
	Bhagalpur	262	150	40 to 50	Access to raw material	✓	Bihar is rich in F&V and paddy is available from West Bengal
	Darbhanga	99	2.5	35 to 40	Competitive scenario	✓	Not many players and access to markets with supply shortage
	Muzzafarpur	284	3.5	~ 100	Government support	✓	Financial assistance in CAPEX on FPI infrastructure and also for individual industrial setup
					Distribution facility	✗	Low on infra but impetus on development and contractual service

Innovative Approach from company

- The present action plan envisages an investment of INR 1,670 crore including a proposed budgetary outlay of INR 770 crore during the Eleventh Five Year Plan. Assuming a leveraging ratio of 2.5, an investment of INR 1,670 crore in the sector can lead to a total investment of INR 4,175 crore
- Using thumb rule of creation of 140 jobs per crore of investment, an investment of INR 4,175 crore will lead to creation of 5,84,500 additional jobs
- Additionally, assuming a reasonable turnover ratio of 2, a total investment of INR 4,175 crore will lead to an additional aggregate turnover of INR 8,350 crore to the state's economy.

Benefits for smaller farmer/INR

- Income levels of farmer/INR are envisaged to grow by at least 30 per cent by 2015 by way of increase in processing by 15 per cent and reduction of at least 15 per cent in wastages.

Location of F&V Units

District	Number of Units
Muzzafarpur	7
Patna/Fatua	12
Vaishali	5
Nalanda	1
Gaya	1
Bhagalpur	1
Rohtas/Kaimur	2
Begusara/Barauni	2

PPP Strategy Plan

- Identify existing and potential Economic Clusters
- Public funds for development of core infrastructure in potential clusters
- Financial support to private investment in basic infrastructure in FPI e.g. pre-cooling facilities, cold chain, packaging, etc.
- Convergence of services/policy support for developing Bihar specific niche FPI brand

Eligibility and funding

- Grant up to 40% of the project cost, subject to maximum of INR 10 Crores for SPV in case of common cluster infrastructure and up to 35% of the project cost subject to maximum INR 5 Crores in case of an individual investor

Action Plan

- Create a Directorate of Food Processing, Develop a food processing policy, awareness campaign, Identify the geographical and sectoral priority
- Design and establish three regional capacity building centres
- Establish a strategic distribution centre for facilitating retail under PPP
- Prepare an action plan for strengthening the backward linkages
- Establish/Upgrade quality control laboratory/food testing laboratory

Bihar government has already taken steps in this direction and is setting up an example for other states. It is giving up to Rs. 10 Crores to institutions or up to Rs. 5 Crores to individual investors for investments in the food processing sector in Bihar. The government is identifying various potential clusters for the industry and developing core infrastructure in the same. It is helping private players set up a strong supply chain network in the state including pre-cooling facilities, cold chain, packaging, warehousing, transport etc. These initiatives, coupled with increased policy support, are bound to put Bihar's agri/ food industry on a high growth path.

Case 3

Most of the retail logistics firms face customer satisfaction issues due to lack of integrated data management systems. While some firms don't have enough systems in place, others have systems which are not aligned with the business activities and are not integrated enough. This often leads to slow customer response and poor service levels.

This issue can be solved by deploying a highly integrated data management system which is customized to the needs of the business so that it can support the business activities efficiently. Where on one hand availability of real time information increases likelihood of getting more business, on the other hand tight integration between business and technology ensures quicker response to the customers, thereby improving the service levels.

Snowman Frozen Foods is addressing growing complexity in the cold storage management through technology interventions

Challenge faced by Snowman

- Disparate set of technology based applications used for various operational activities led to incompatibility of data points
- Wide network coverage led to challenges of data consolidation and redundancy, challenges in sales data management, logistics tracking and information management

Need of the Hour

- Integrated Data Management System

Innovation

- Snowman deployed a highly customised integrated technology system to support the business activities
- Deployed a unique Fleet Management module which was integrated with core operations
- Technology integration of warehouse and inventory management functionality with financial management, customer relationship management, supply chain management and other business processes

Benefits

- Increased productivity due to timely billing to customers
- Increased efficiency due to better resource utilisation and reduced duplication of efforts at branch level
- Real time information on space availability in warehouses increases business opportunities
- Improved customer satisfaction through flexible and faster response to customers, achieved by tighter integration of business and technology

About the Company

- Snowman Frozen Foods Ltd. is a cold chain logistics service provider, whose investors include Gateway Distriparks Ltd., Mitsubishi Corporation, Mitsubishi Logistics Corporation and Nitchirei Logistics Group of Japan and IFC (World Bank group)
- It offers services such as transportation, storage, handling and retail distribution of entire spectrum of chilled and frozen foods
- Revenue for FY 2009-10: U.S.\$7.6 million

End to End Supply Chain Network of Snowman Frozen Foods



Snowman, which is a prominent cold chain service provider in India, has implemented such a solution to improve its service. While earlier it was facing issues with respect to data consolidation, data redundancy, sales data management, logistics tracking etc, the introduction if a highly customized as well as integrated data management system enabled increased efficiencies, better utilization levels and reduction in duplicated efforts. It deployed a unique Fleet Management module integrated with the company's operations and also took help of technology to integrate various business processes. These initiatives led to increased productivity and faster customer billing, improving the service levels as well as customer satisfaction levels.

Case 4

Indian agriculture is increasingly facing reduction in arable land area. This is due to the overuse of pesticides/ other chemicals as well as the drop in water tables. Also, more and more land is being directed towards residential/ commercial uses by the government. At the same time, average size of a farm is going down creating the problem of land fragmentation, which leads to lowering of operating efficiencies as the operating scale goes down.

This problem can be tackled in a number of ways. The farmers can look at limiting the use of harmful chemicals which would stop further degradation of the arable land. The government should not create residential/ commercial complexes at the expense of agricultural land and at the same time should put in efforts to restore the level of water tables. Furthermore, to counter land fragmentation, firms can look at consolidating existing farms to the extent possible and simultaneously look for alternate land areas for agriculture across the world.

19 Indian agricultural companies have gone international in their search for land to create ultra-large scale farms

<ul style="list-style-type: none"> Population growing faster than agricultural production Yield per acreage rapidly stabilising and arable land reducing due to over usage of pesticides and such chemicals and dropping water tables Diversion of land for residential and commercial purposes Export bans by grain exporting countries like Russia, Vietnam, Argentina 	<p>Snapshot of Indian Presence</p>	<table border="1"> <tr> <td>Land Availability</td> <td>✓</td> <td>45 million hectares of large scale farmland deals in 2008 -09</td> </tr> <tr> <td>Availability of water source</td> <td>✓</td> <td>Most of the land banks are leased with access to water</td> </tr> <tr> <td>Govt support</td> <td>✓</td> <td>GOI has been supportive with EXIM norms/loans</td> </tr> <tr> <td>Ease of doing business</td> <td>✓</td> <td>Produce and profits can be repatriated in full</td> </tr> <tr> <td>Political Climate</td> <td>✗</td> <td>Local political instability and socio-economic conditions</td> </tr> <tr> <td>Post Harvest Management</td> <td>✗</td> <td>Infrastructure, security to be improved</td> </tr> </table>	Land Availability	✓	45 million hectares of large scale farmland deals in 2008 -09	Availability of water source	✓	Most of the land banks are leased with access to water	Govt support	✓	GOI has been supportive with EXIM norms/loans	Ease of doing business	✓	Produce and profits can be repatriated in full	Political Climate	✗	Local political instability and socio-economic conditions	Post Harvest Management	✗	Infrastructure, security to be improved
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<p>Innovative Approach from company</p> <ul style="list-style-type: none"> Large land tracts enable mass mechanisation with operating efficiencies Crop varieties range from cane to maize to bio-fuels to flowers Export potential Ex. Onions, Non-Basmati rice <p>Benefits for smaller farmers</p> <ul style="list-style-type: none"> Growth in GDP, local social infrastructure e.g. schools, hospitals, roads Technology spillover into other industries 	<p>Operating Model</p> <ol style="list-style-type: none"> Govt support with EXIM loans, easing of FDI outflow norms and high-level trade diplomacy 80 Indian companies have invested about US\$ 2.4 billion in buying or leasing huge plantations in countries in Africa, such as Ethiopia, Kenya, Madagascar, Senegal and Mozambique Long term (99 yr) leases, large tracts ('000 hectares), lowered costs and operating efficiencies 	<p>Concern on various counts</p> <ul style="list-style-type: none"> Environmental concerns over mono-cropping, heavy usage of chemicals, ground water depletion Impact on indigenous living and ethnic modes of livelihood Local price increases of basic food commodities, labour issues 																		
<p>Going ahead</p> <ul style="list-style-type: none"> Started from 2 countries in Africa. Trend being realised in South America, Central and South East Asia ~ 80 Indian companies have invested about £1.5 billion (~ Rs 11,300 crore) the farming sector in Africa 	<p>Going ahead</p> <ul style="list-style-type: none"> Range of cash crops along with food grains. Cotton, Flowers, Bio-fuels Localised food processing units for ease of exports 	<p>“... Farmland in sub-Saharan Africa is giving 25 percent returns a year and new technology can treble crop yields in short time frames, which, was attracting governments, corporations, multinationals and other investors”. “Agricultural development is not only sustainable, it is our future. If we do not pay great care and attention now to increase food production by over 50 percent before 2050, we will face serious food shortages globally”</p> <p>Susan Payne, Chief Executive of Emergent Asset Management, a UK investment fund seeking to spend USD 50m on African land</p> <p>Source: http://www.guardian.co.uk/environment/2010/mar/07/food-water-africa-land-grab</p>																		

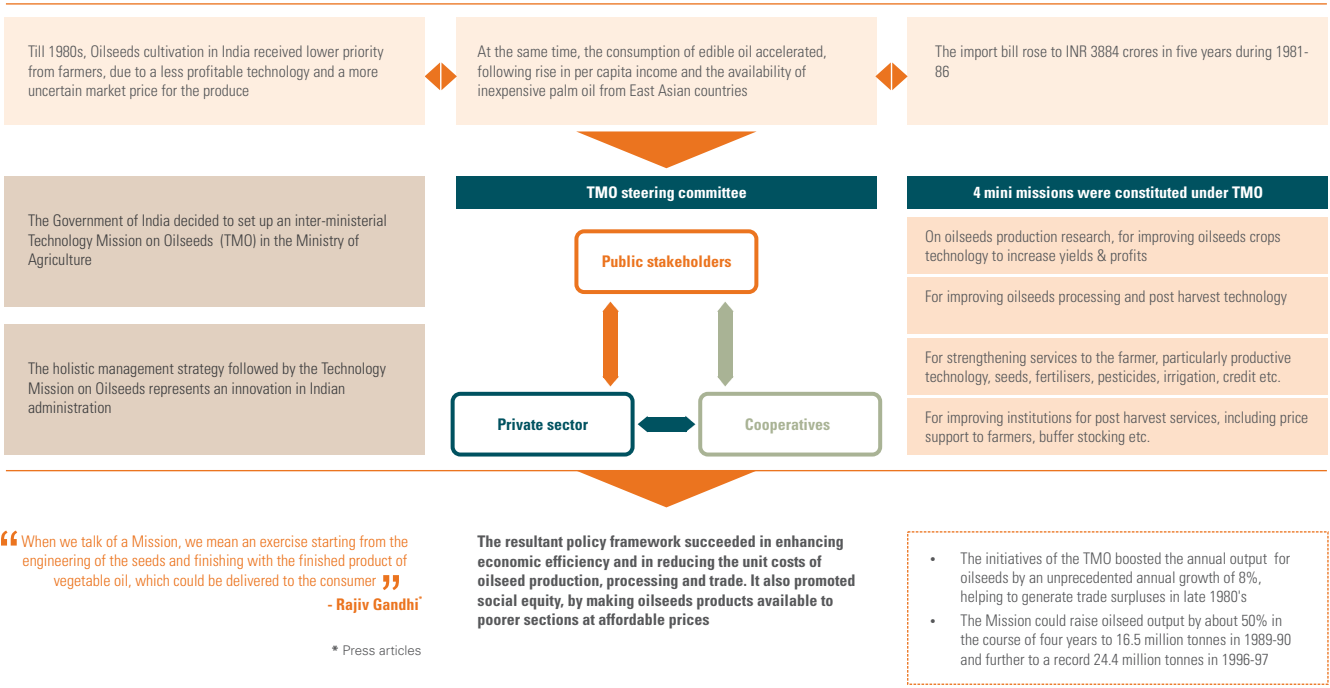
A number of Indian firms have expanded their market reach in order to overcome land shortage/ land fragmentation in India. They have acquired large –size farms at a number of places in Africa, along with in countries like Brazil, Argentina, Mongolia, Indonesia etc. While procuring ultra-large scale farms in these places enables mass mechanization with high operating efficiencies, it also leads to growth in GDP and improvement in local social infrastructure.

Case 5

In 1980s, Indian oilseeds industry faced a lot of issues. As oilseeds cultivation employed a costly technology and the market price used to fluctuate a lot, Indian farmers refrained from cultivation of oilseeds. On the other hand East Asian countries were producing cheap oils and exporting them worldwide. As a result, India started importing a large amount of oils to cater to the increased domestic consumption due to rising incomes.

The situation called for a major intervention from the Indian government. While government had the responsibility of revamping the industry by devising a policy framework conducive to industry’s growth, it had to keep in mind the interests of all segments including private sector and co-operatives. A policy which promotes oilseed production by bringing down production costs and provides higher incentives to farmers by the means of support prices, availability of credit, farm inputs etc was required

Oilseeds: Industry revamped due to the Technology Mission



The government reacted positively to the challenge and created an inter-ministerial Technology Mission on Oilseeds (TMO) in the Ministry of Agriculture. The steering committee of the mission included stakeholders from public, private as well as co-operatives. The TMO had four mini missions under it which separately focused on oilseeds production research, oilseeds processing and post harvest technology, strengthening services to the farmer and improving institutions for post harvest services. This policy framework positively affected the Indian oilseeds industry by reducing the costs of oilseed production, processing and trade. It led to increasing the oilseed production and bringing the imports down to a large extent, helping India become self-sufficient with respect to oilseeds

Case 6

Agricultural Industries across the world suffer from the problem of insufficient marketing and lack of a body that takes up proactive promotion and planning of the agriculture and related industries. Due to this, industries face a number of issues ranging from fluctuating market prices and lack of credit to reduced bargaining power of farmers and increased logistics costs.

These problems can be overcome by incorporating independent institutions that focus on agricultural marketing in the country and become a single point of contact for all the associated smaller organizations as well as the farmers. Such institutions should also focus on launching several programs from time to time to improve farm productivity, promote latest technology, increase storage facilities and ensure easy and cheap transport

Cooperatives in India: Driving the growth of agriculture



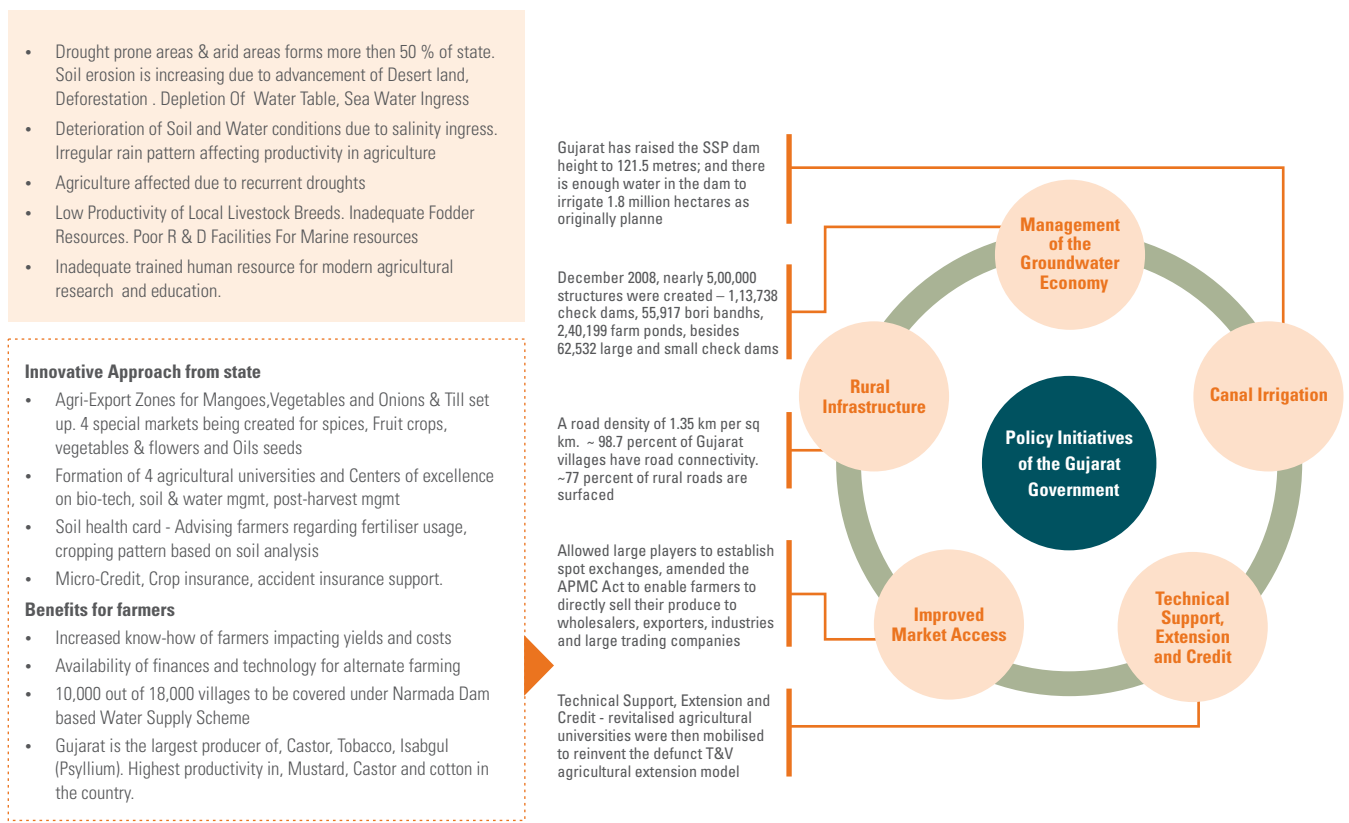
In India, this role has been played by various co-operatives which showcase perhaps the most successful structural innovation in agribusiness in the country. To promote agricultural marketing, National Agriculture Cooperative Marketing Federation (NAFED) was established in India in 1958 that takes up domestic as well as export marketing for a large of agricultural organizations in the country. Another prominent body is the National Cooperative Development Corporation (NCDC), established in 1963, that promotes various programs for production, processing, storage, marketing and trade of a large of agricultural and related products. Today, India has a large number of co-operatives which command majority of the share in segments like agricultural credit disbursement, fertilizer distribution, sugar production, wheat procurement, storage facilities, cotton/ edible oil marketing and distribution etc. A noteworthy success is that of National Dairy Development Board (NDDB) that supports the development of dairy cooperatives by providing them financial assistance and technical expertise. Based on their success in milk marketing, and taking advantage of the NDDB cooperatives and infrastructure, the NDDB is also involved in fresh produce marketing (since 1988). There are at least 225 fruit and vegetable (SAFAL) associations located in niche production areas, supplying fruit, vegetables, and dairy through 300 retail outlets of a NDDB subsidiary, Mother Dairy

Case 7

A significant portion of India, specially that in western India, is arid or semi-arid. The problem is further increased due to continuous soil erosion, deforestation, dropping water tables and increasing salinity. Moreover, there is large dependence on weather and inconsistent rains affect agriculture quite frequently. Also, there is a dearth of skilled people required for modern agricultural research and education. All these issues pose a tough challenge against states like Gujarat and Rajasthan with respect to their agriculture industry.

Growth of agriculture industry of any state has to be promoted by working along multiple dimensions. First, excellent irrigation facilities need to be built in the state including multiple dams, canals, farm ponds etc and groundwater needs to be conserved. Second, enough research, development and educational institutes need to be set up in the state which can create large enough pool of skilled people to cater to the state's agricultural industry. Third, the farmers need to be given enough incentives for crop production. This could include direct access to the market, minimum support prices, input subsidies, tax cuts, credit facilities etc. In addition, improvement of basic infrastructure in rural areas like increased road connectivity, availability of electricity etc also contribute towards growth of agriculture in the area

Gujarat - Focused efforts to attract agri-investments - Semi-arid Gujarat has clocked high and steady growth at 9.6 percent per year in agriculture state domestic product since 1999-2000



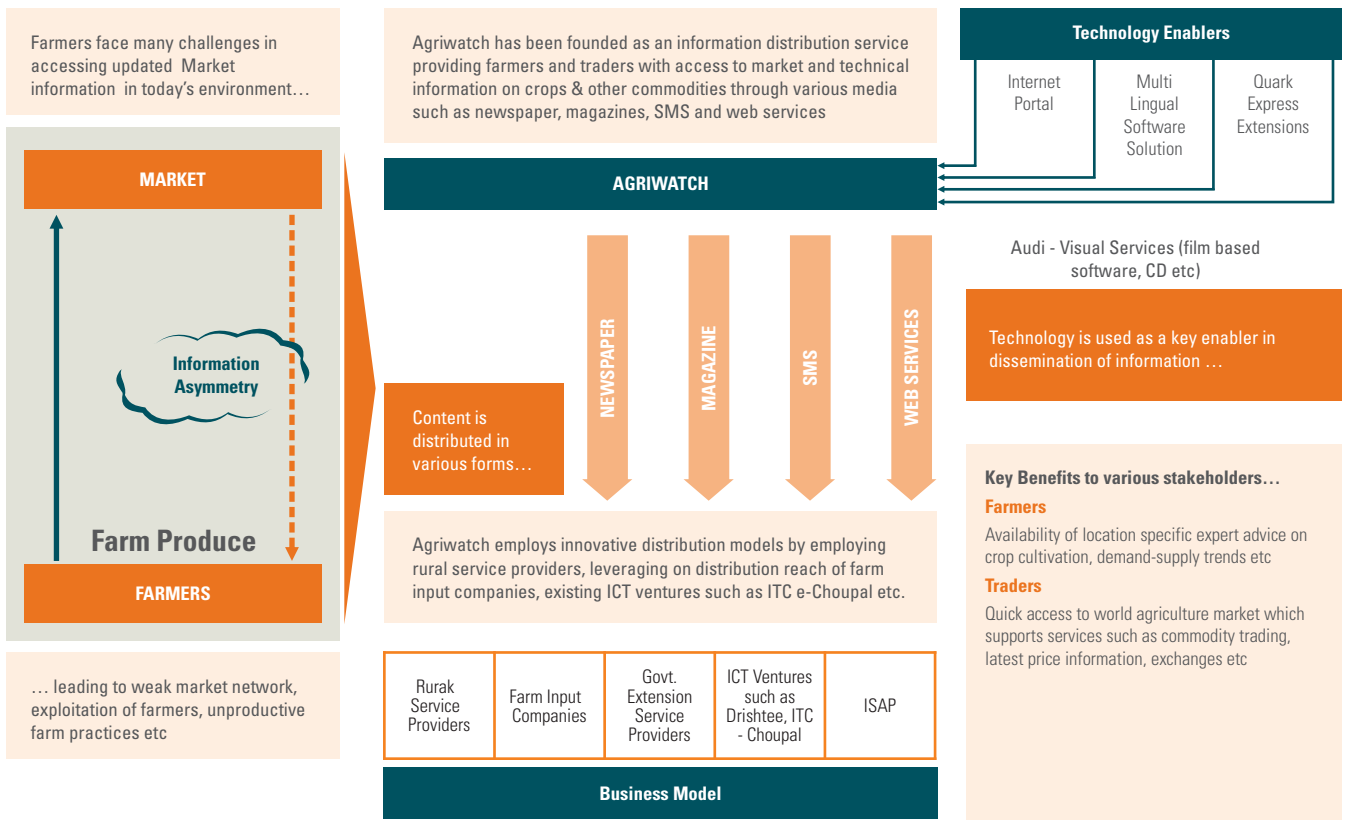
The state of Gujarat has set an example in agricultural innovation with its industry favoring and mature agricultural policies. Even when more than 50% of the state's area is arid, it has been able to register a high agricultural growth rate of 9.6% during last 10 years. This has been possible because of innovative agricultural policy approach of the state. It has created special export zones for agri-products like vegetables, mangoes etc and special markets for spices, fruits, vegetables, flowers, oil seeds etc. Several agricultural universities and institutions have been set in Gujarat with focus on areas like soil & water management, post-harvest management, biotechnology etc. The state effectively manages the groundwater economy as there are a large number of structures supporting agricultural land irrigation. The core rural infrastructure has been developed to a large extent and farmers have sufficient financing and credit options to support farming. With these initiatives, Gujarat has already become the largest producer of several agricultural products in the country and is considered as an epitome of policy innovation in agriculture

Case 8

Indian agriculture is often marred by lack of communication between the market and the farmers. While farmers focus only on their produce to cater to the market needs, there is often insufficient dissemination of information from market side to the farmers. Due to this, farmers often continue with unproductive farm practices, have little or no insight on market dynamics and become prone to the exploitation by the market. Furthermore, agri traders also often have lack of sufficient information which hinders effective trading.

Establishing effective means of communication between the farmers and the market is vital for the growth of the agricultural industry in India. This can be done with the help of several channels which include print media, telecommunication, web services, digital content etc. There should be a body that takes care of these requirements and ensures spreading high quality information to farmers and traders on a regular basis. While farmers stand to gain from customized crop cultivation advice and knowledge of product's supply-demand trends in the market, traders would gain from the latest price information and information of agricultural markets across the world.

Agriwatch embarked on an innovative business strategy to bridge gaps in information and communication between the market and farmer leading to empowered farmers and enhanced market efficiency



One of such notable initiatives has been Agriwatch, which underscores the importance of innovation with respect to technology in Indian agriculture. Agriwatch is a service that provides market as well as crops related technical information to a large number of farmers and traders. It uses various means like newspapers, magazines, SMS, Internet etc. in order to spread the information. What is noteworthy is that it produces its content in multiple languages which helps reach out to a large number of farmers across the country, and uses various technology enablers like audio-visual services and internet portal etc that highlights the importance of technology for agriculture in today's environment. Agriwatch has used various innovative distribution channels by employing several rural service providers, taking assistance from farm input companies and existing services like ITC e-Choupal etc. With these innovations, Agriwatch is bridging the communication gap between the market and the farmers, thereby empowering farmers and enhancing market efficiency.

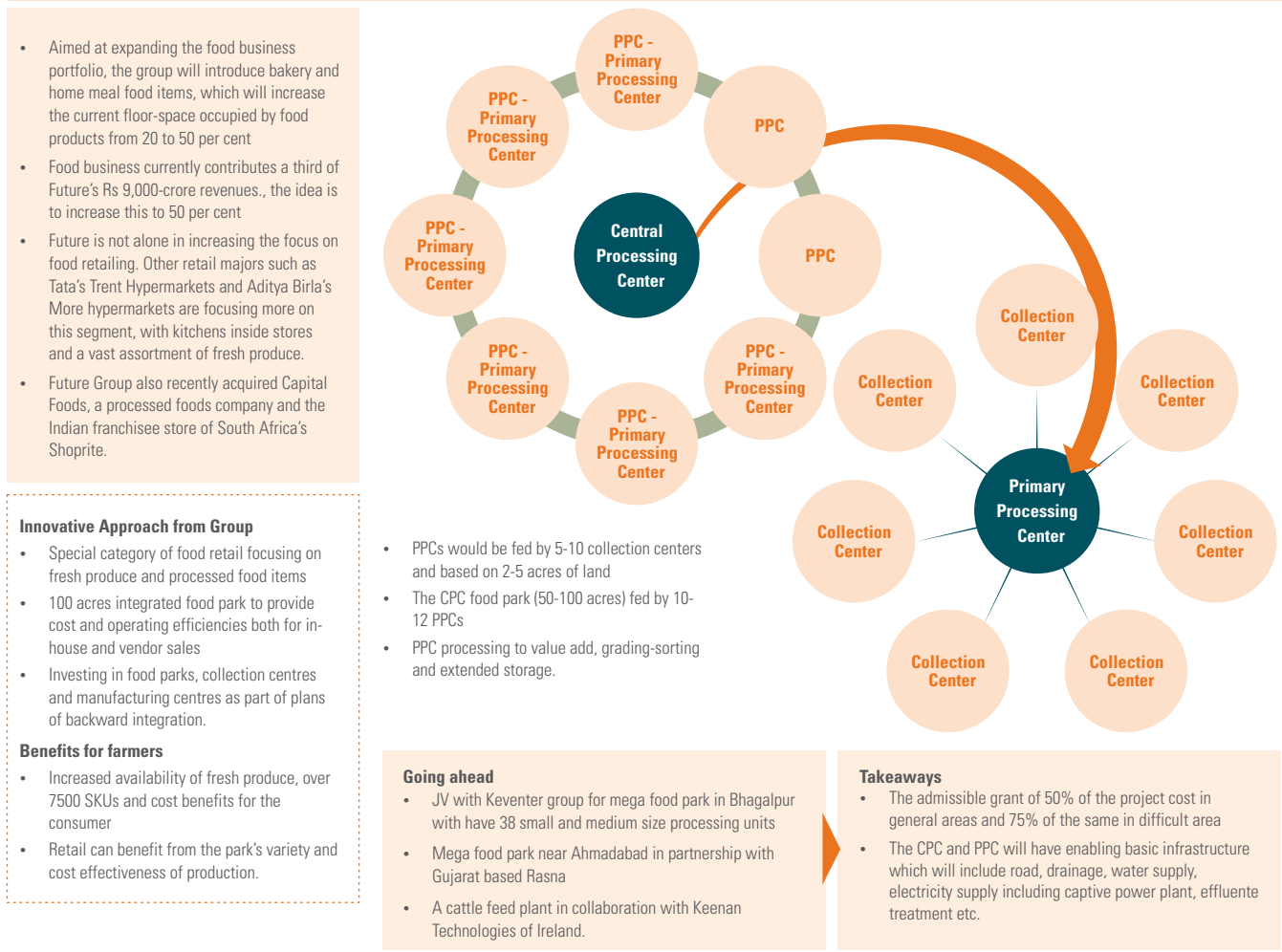
Case 9

Indian retailers often find difficulty in keeping the costs down and maintaining enough SKUs to attract a large number of customers. While procuring small amounts from a number of places increases costs, it also poses a challenge with respect to the supply aggregation. The problem is quite significant specially for perishable food items and other fresh produce that lose its freshness in a small period of time. In turn, customers find it difficult to get fresh food products at reasonable prices, affecting retailer sales as well.

The problem of collection and aggregation can be solved by revamping the operations structure by having large scale procurement. Forming clusters/ parks etc. specially dedicated to a product line such as foods will not only reduce costs to suppliers but also enable them to keep a large number of SKUs to cater to the consumers. For this, retailers need to invest generously in developing such large centers and always be on a lookout for partnerships with existing players in different regions

Mega food parks initiative - Way forward through backward integration

The future group targets mega food parks to procure produce for its range of stores focusing on food items



Future group has accomplished such a structural innovation by targeting mega food parks for getting food items for its specialized stores focusing only on food products. It has invested in food parks, collection centers as well as manufacturing centers. There are a number of collection centers that feed into a larger primary processing center. Such primary processing centers, in turn, feed into a 50-100 acres central processing center which is like a food park. This has led to cost efficiencies for the group as well as for the vendors. With larger availability of fresh produce, future group offers more than 7500 SKUs for food products to its consumers at very competitive prices

Case 10

Indian agriculture faces water irrigation problems due to a number of reasons. There is scarcity of water in many regions due to lack of rivers, canals and dams etc and several regions are still primarily dependent on rain. The uncertainty associated with monsoon further increases the risk. While farmers holding large chunks of land are able to use already available advanced irrigation systems in the market which utilize water efficiently and bring in cost advantages for them, those having less than 2 hectares of land still largely follow old irrigation methods leading to wastage of water. These farmers are unable to buy the irrigation systems meant for large sized farms due to high costs.

There is a need to design and develop advanced irrigation systems meant specially for small sized farms. Such a product has to be innovative enough to retain the quality and efficiency of modern irrigation systems for larger farms, and at the same time it should be economically viable for farmers with small land pieces to purchase. Moreover, the innovator should put in efforts to spread awareness about such a product. The farmers need to be educated about the efficacy of the product and trained in order to enable them to effectively utilize its potential

Jain Irrigation is India's largest producer of micro-irrigation systems. Jain Irrigation makes a range of drip and sprinkler irrigation systems, as well as plastic pipes and wood substitute plastic sheets. The company also sells dehydrated vegetables, tissue culture banana, plants, and hybrid and grafted plants, greenhouses and bio-fertilisers

CONTEXT	INNOVATION	IMPACT
<p>Agriculture sector is the largest consumer of fresh water in India with 77 percent usage levels</p> <p>Increasing population and over-exploitation has led to water scarcity in several regions, heavily impacting agriculture, especially at small scale levels.</p> <p>Significant portion of farmers hold land less than 2 hectares and largely engage in traditional flood irrigation methods which lead to wastage of water.</p> <p>Need of the Hour An affordable small scale irrigation system with high efficiency of water usage.</p>	<p>Solution An economical drip irrigation system, suited for small farms to reduce wastage of water</p> <p>Innovations to the Solution</p> <ul style="list-style-type: none"> * Presale diagnostic study of each individual farm for identifying measures to increase water usage efficiency and crop productivity * Precision Farming Services - optimising use of fertilisers, pesticides, water and energy to increase yields * Aid in funding of agri input purchase activities * Localised marketing approach aimed at spreading knowledge on sustainable farming practices. 	<ul style="list-style-type: none"> * Water savings up to 50% compared to the previously used flood irrigation systems * Yield increase of those using Jains Irrigation System between 30% and 200% * High quality yield leading to higher return on investment * Over 1000 acres of barren land brought under cultivation due to drip irrigation system implementation * Employment to rural graduates * A sustainable farming model in harmony with the ecosystem.

Jains - A sustainable technology driven social entrepreneurship model

Jain Irrigation Systems, which is India's largest producer of micro-irrigation systems, has come up with an innovative product to help farmers with small land pieces to irrigate their farms more efficiently. It has designed and introduced an economical drip irrigation system, which is specially suited for small farms and reduces wastage of water up to 50%. This product is enabling farmers to increase their farm yields by anything between 30% and 200%, and achieve higher returns on their investments. At the same time, Jains has also undertaken rural marketing to spread knowledge about sustainable farming practices and to educate farmers about its new product. Due to these efforts, already over 1000 acres of barren land has been brought under cultivation in India and more is expected to be brought in the future

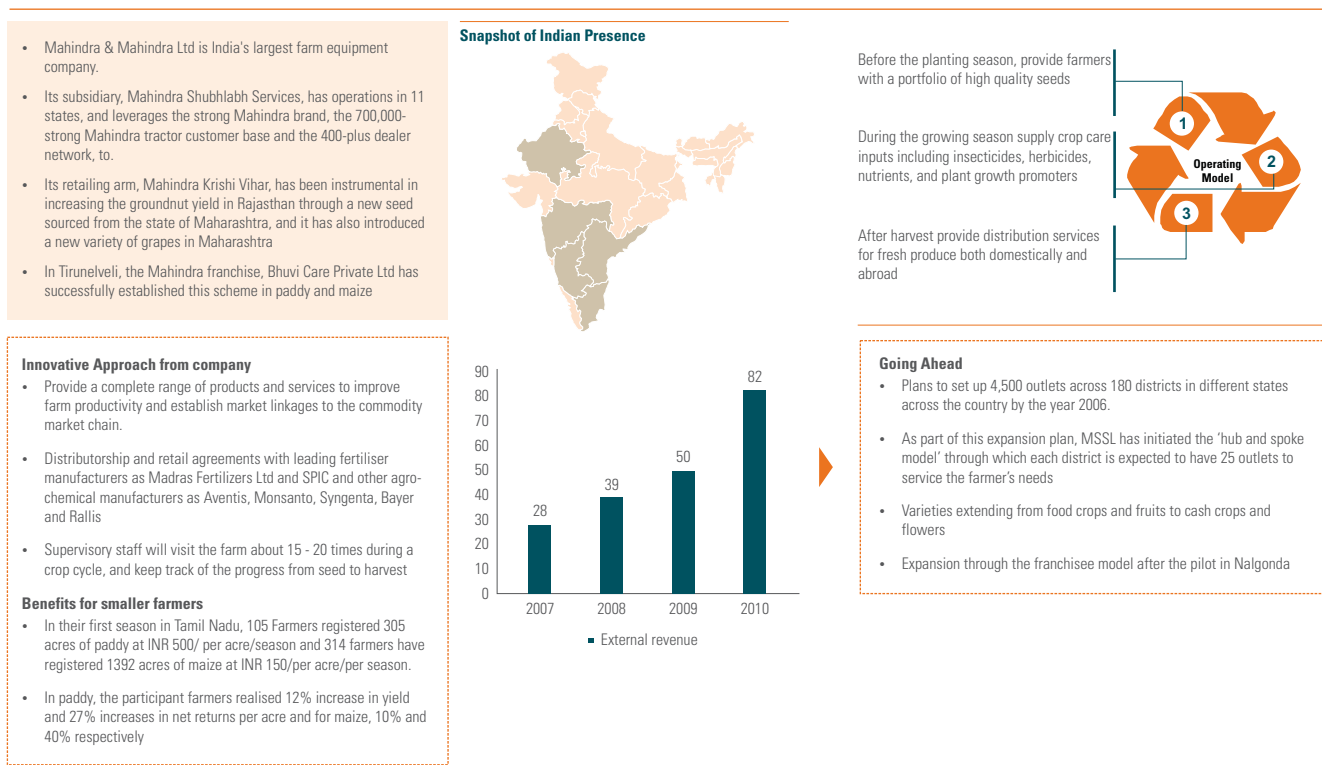
Case 11

Indian farmers suffer from the problems of low farm yield and low prices for their produce. This is due to limited availability of various farm inputs like seeds and agro-chemicals and low linkage between farms and commodity markets. Farmers also suffer due to limited private sector participation leading to difficulties in securing good quality farm inputs and post harvest distribution services.

Deployment of a robust process where participation of private sector is pursued to provide inputs to the farms on a sustainable basis and farmers are provided assistance right from sowing the seeds to securing post harvest service is required to overcome these issues. While major farm input players should be brought under agreements to supply high quality products regularly, farmers should be educated about the modern farming practices and trained to best use the farm inputs. Moreover, the progress of the crop needs to be monitored continuously in order to ensure a high output

Mahindra & Mahindra - Betting big on an integrated agribusiness presence

Mahindra Shubhlabh Services, has operations in 11 states, while Krishi Vihar, has been instrumental in increasing the yield in groundnut and grape



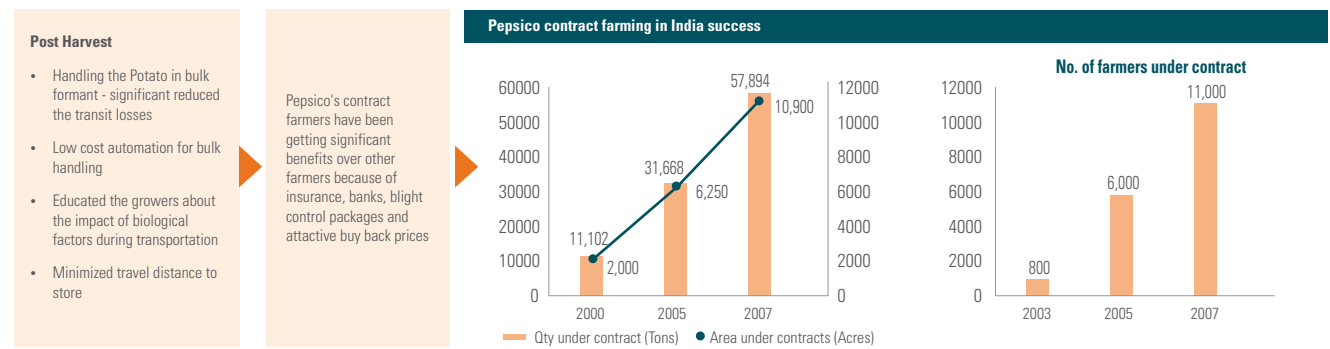
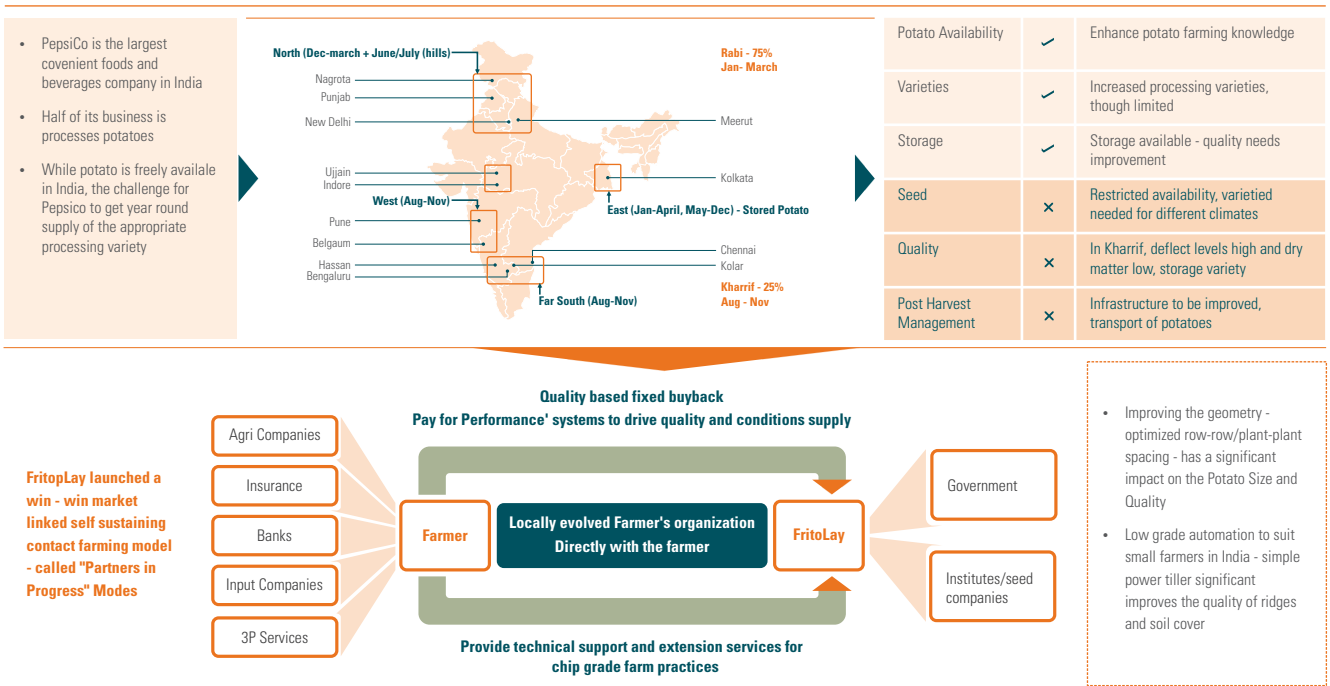
Such a process innovation has been carried out by Mahindra Shubhlabh Services, a subsidiary of Mahindra & Mahindra Ltd - India's largest farm equipment company. It is providing a complete range of products and services to improve farm productivity and establish market linkages to the commodity market chain. As it has got into long term arrangements with some of the biggest agro-chemicals players such as Monsanto, Syngenta and Bayer, it is able to provide farmers with a range of high quality seeds as well as agro-chemicals

Moreover, it provides end to end distribution services to farmers for selling their produce in India as well as abroad. It also organizes regular farm visits by the experts during cultivation to monitor the crop and its progress. With the help of this innovation, the participating farmers have achieved higher yield and higher prices, notable examples being paddy and maize farmers in Tamilnadu. On the other hand, Mahindra Shubhlabh has grown quickly over a short period of time and looking to expand further via the franchising route.

Case 12

Most of the Indian FMCG firms face problems due to agricultural issues like high agri-produce wastage, inability to retain freshness/ quality for a long time and limited geographic availability produce. There are significant losses during the transit and supply centers are located far from the demand centers. Moreover, farmers don't realize the importance of biological factors during the transportation, are unaware of farm practices employing latest technology and are exposed to high risks due to issues like blight and uncertain demand from the buyers.

An effective approach to reduce these problems is high level of organized contract farming. The need for organized contract farming in India is driven by growth of segments requiring contract farming such as food processing and food services as well as growth in consumption of perishables due to increasing population and per capita consumption. Agile contract farming provides benefits to both the market player as well as the farmers. While it enables the market player to get year round supply of the farm produce and reduce procurement costs, farmers gain from the technical and financial support provided by the company and are better guarded against crop damage and market risks



One of the best examples of organized contract farming in India is PepsiCo's 'Partners in Progress' model for farming of potatoes used for making chips. The model assures farmers of insurance, help from banks, blight control packages, attractive buy back packages, assistance with respect to farm inputs and other third party services. They also receive technical support and extension services for chip grade farm practices from PepsiCo that helps them increase the farm output. On the other hand PepsiCo, which has half of its business as processed potatoes, gets year round supply of the appropriate processing variety of potatoes. The program has been quite successful and the number of farmers doing contract farming for PepsiCo, contract quantity as well as area have been increasing each year

Case 13

The processed food output in Dollar terms should reach 95.6 Billion by 2013 from a base of 55.6 Billion in 2005. During the same time, per-capita packaged food spending is expected to rise from 9.6 USD to 18.3 2 USD , indicating the tremendous potential of the market going forward. Growing interest of multinationals in Indian market and huge expansion plans of Indian corporate in organised retail are catalysing the growth of the Food Processing sector. At the same time, Food wastage has been a perennial problem for India with estimates ranging from INR 58,000 crores in 2004 to INR 30,000 crores in 2010, with over 30% of produce being wasted. The perishable nature of products makes it necessary to have adequate storage facilities, optimal handling of produce and efficient transportation and distribution networks

To reduce the increase in cost of served food in proportion to the increase in prices of raw materials, economics and creativity both need to play a strong role. Suppliers need to be aggregated to gain scale and reduce losses. Also new ways of transportation, packaging and usage (e.g. usage of dry onion flakes, mashed potato chunks and mango pulp rather than the raw items saves costs of transport and wastage) need to be introduced to maximize savings.

Sodexo is able o limit the need for food cost increase to less than 10% allowing the client to deliver costs increases below market expectations

- On an annual basis, cereals prices have risen by 4.9%. The 52 week average inflation for cereals & pulses remain at elevated levels of 10.09% and 21.1% respectively
- Milk prices increased by 21.65% in Oct 2011 compared to same period last yr.
- Prices for eggs, meat & fish increased by 28.1% during Oct on y-o-y basis. Significant increase in feestock prices are having negative impact on poultry production
- Rising percentage of Middel Class in India which is demanding increasing quantities of better quality food products
- National rural employment guarantee schemes which hasled to higher wages and purchasing power in rural India
- Lower Agricultural growth in India compared to the much faster GDP growth

Category	% age over last 2010
Wheat	9
Milk	24
Egg, Meat Poultry	31
Cereals, Pulses	35

Negotiation with chosen suppliers to concentrate economies of scale and rationalise supply base

Mitigation by using alternate, items, stop using redundant items, new menu items

Operationalise and actively re-engineered its supply chain with its distribution partners

Innovative Approach from the firm

- Work closely with chosen suppliers to concentrate economies of scale and rationalise
- Recipe management tool, supported by the central development team, allows menus to be created and managed which meet both commercial and customer requirements
- Explore the availability of alternative products and substitute within the range e.g.
 - Dried onion flakes to reduce cost and wastage
 - Unhealthy ingredients such as vanaspati ghee (high in HVOs) and sugar (replaced with sucralose) were removed from main mean menus
 - Fixed portion menu introduced, with thali preportioned and served to request

Going Ahead

- Benchmark existing suppliers against potential suppliers to ensure that the prices are optimised, both at times at renegotiation of a deal and ongoing reviews
- Resource dedicated to mapping and monitoring the impact of food, ensuring moving proactively in order to limit the impact on client pricing
- Promote products at lower prices to drive volume through a structured promotional platform
- Training of customer facing staff in the art of delivering to agree specification and waste management

In this regard, Sodexo is working closely with chosen suppliers (using its purchasing power parity) to concentrate economies of scale and rationalize supply base and thus deliver a better price. Sodexo's recipe management tool, supported by the central development team, allows menus to be created and managed which meet both commercial and customer requirements. By adapting the menus and range of products, creating menus that can counteract the effects of inflation. For example, using dried onion flakes in some of our menus, stoping usage of salt in rice, create pre fixed menus for thalis - ensures they can manage pricing, stabilise costs and reduce wastage.



Innovative takeaways for Agribusiness

The high levels of food inflation witnessed over the past three years has helped bring focus on the deep structural problems plaguing Indian agriculture. While policy has been addressing the inflation concerns from a money market and interest rate regime perspective – the long term structural deficiencies from a supply chain standpoint have not been adequately addressed. High levels of wastage, low productivity levels, falling private and public investments, scarcity of land, water facilities and labor are some of the issues that have led to this supply constraint. The mismatch between demand and supply has been further exacerbated by the rapid increase in food consumption on account of demographic changes. The improvement in developmental indices on account of sustained economic growth has also resulted in a shift in focus from

food grains to other food categories such as animal protein, pulses, oilseeds, dairy and processed food.

This period of rising food inflation has however seen the emergence of new business models that can assist in building capacity to meet the supply constraints currently plaguing Indian agriculture. The innovations have not only arisen in the corporate sector but have also included co-operatives and public sector organizations. Some state governments have also been extremely innovative in attracting agricultural investments to their respective regions. All of these serve as potential lessons to help address the supply constraints within the food economy from both a near term and long term perspective

Areas of Benefit/Scope of Innovation	Gujarat Govt.	PPP in Bihar	Oilseeds	Jain Irrigation	Sodeo Food Service	Land Banks outside India	Snowmen Logistics	Saguna Chicken	Shubb Labh	Pepsico contract farming	Agri-watch	Mega food parks	Co-operative revolution
Increased yield		✓	✓										
Mass mechanization				✓		✓					✓	✓	
Increased availability of fresh produce						✓		✓					✓
Increased funding	✓		✓										
Lower production costs	✓		✓	✓		✓					✓		
Risk reduction (demand/supply)		✓						✓	✓	✓			✓
Better communication								✓	✓	✓			✓
Reduced logistics costs		✓					✓					✓	
Economies of scale			✓		✓	✓				✓		✓	✓
Reduction in intermediaries	✓	✓			✓			✓	✓			✓	✓
Reduced dependence on imports			✓							✓			
Reduced wastage		✓			✓			✓					✓
Higher farmer incomes	✓		✓					✓	✓	✓			✓
Improved delivery timings								✓			✓	✓	
Standardization of product					✓		✓			✓			✓



Contacts

Rajesh Jain

Partner and Head

Markets

T: +91 22 3090 2370

E: rcjain@kpmg.com

Ramesh Srinivas

Partner

Management Consulting

T: +91 80 3065 4300

E: rameshs@kpmg.com

Anand Ramanathan

Associate Director

Management Consulting

T: +91 80 3065 4475

E: anandramanathan@kpmg.com

kpmg.com/in

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