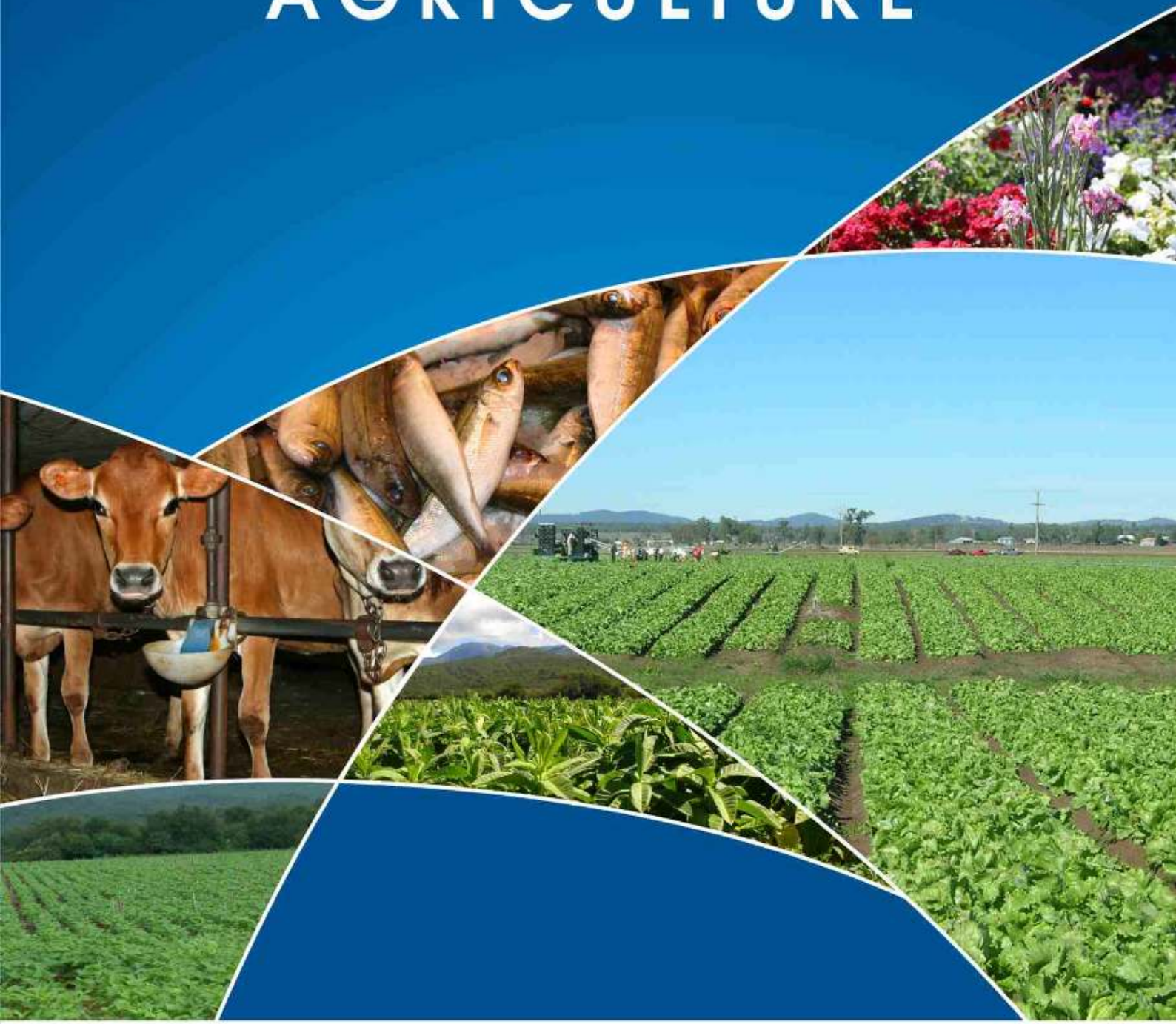
HIGH VALUE AGRICULTURE



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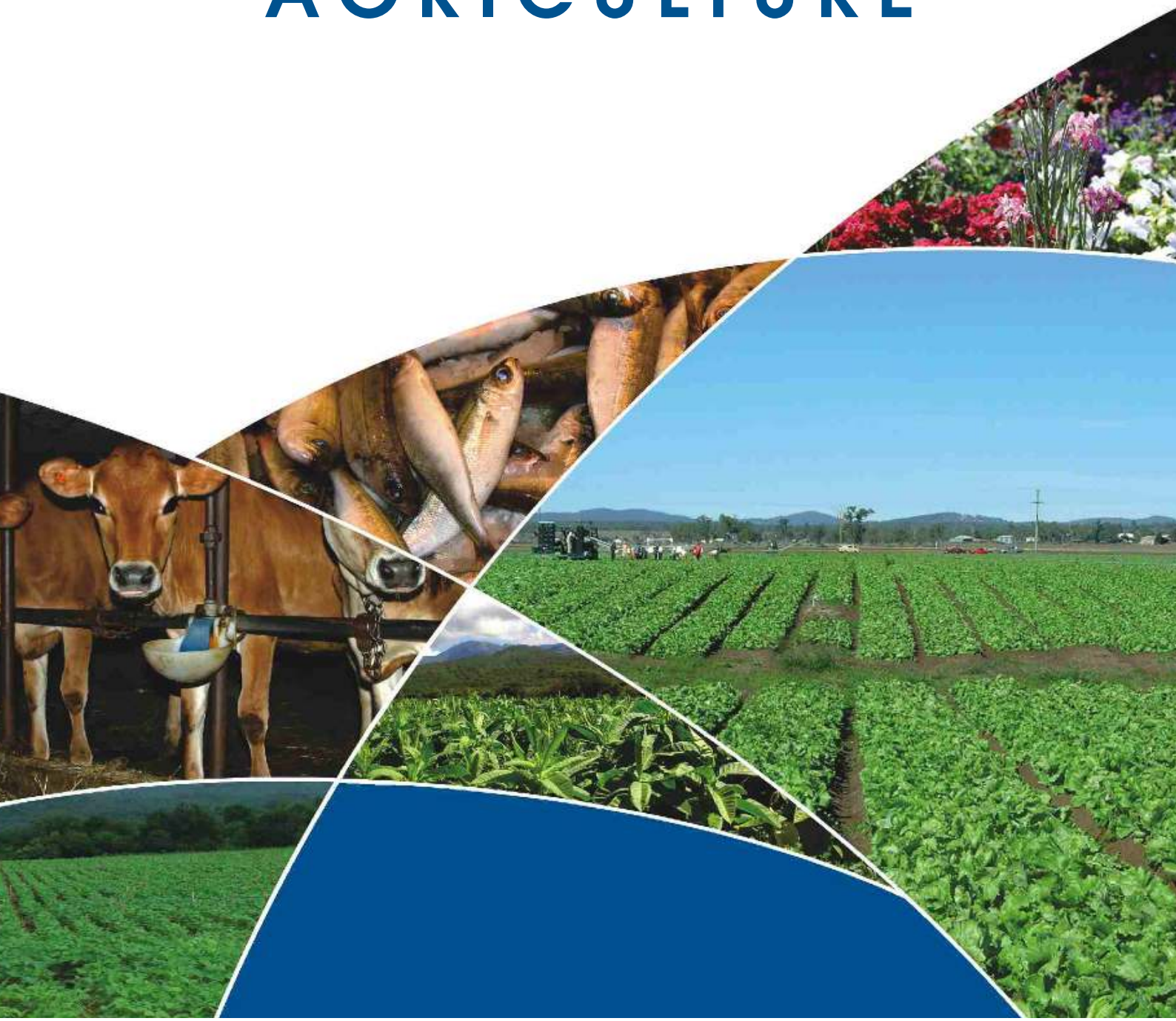

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TITLE

High Value Agriculture

AUTHORS

Food & Agribusiness Strategic Advisory and Research (FASAR) Team - YES BANK

YEAR

November 2012

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Foreword

Foreword

The Indian economy has undergone a structural change over the past few decades and so has Indian agriculture. Increasing income levels of the middle class population, changing age group composition, escalating health consciousness and increased demand for a balanced diet and variety on food plates has stipulated a change in the production pattern of Indian agriculture. Changing demand patterns have resulted in farmers recognizing the significant growth prospects of High Value Agriculture.

The realm of High Value Agriculture includes sectors like Dairy, Horticulture, Fisheries, Livestock, Poultry, Medicinal & Aromatic plants and Organic products. Scaling up of these sectors is evident from the fact that production, consumption and trade of these products have seen a consistent increase in the past few years.

This Knowledge Report **'High Value Agriculture'** by YES BANK provides a brief overview of the aforementioned sectors, their market structure, trade dimensions, the challenges faced and a strategic roadmap to drive growth in these sectors. Besides this, there exist several enabling factors like farm inputs, irrigation facilities, farm mechanization, agriculture infrastructure, supply chain and extension services that strengthen the potential of High Value Agriculture.

These changing trends call for judicious use of farm inputs, extensive mechanization, a strengthened supply chain, state of the art infrastructure and far-reaching extension services. Information Technology is another support system of the changing dynamics. The accuracy, availability and applicability of the information can provide impetus to changing production patterns.

I am confident that a new approach concerted with effective public and private partnerships will become the driving force for High Value Agriculture. A concerted effort will thus ensure that this sector in turn becomes a driver of growth for Indian Agriculture and thereby the Indian Economy.

Regards

Dr. Rana Kapoor
Founder, Managing Director & CEO

YES BANK

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Executive Summary

EXECUTIVE SUMMARY

The shifting food basket towards High Value Agriculture produce like Fruits and Vegetables, Dairy Products, Meat and Meat Products, Organic Food etc. has added a new dimension to Indian agriculture. The growing demand for high-value food commodities has opened up opportunities for farmers to diversify towards commodities that have promising growth and higher returns on factors of production.

The shift in production pattern can be verified from the fact that foodgrain production since 2006 increased by 11%, while horticulture production increased by 20% over the same period. Similar developments were observed for sectors like Dairy, Poultry, Fisheries, Livestock etc. which in recent years have shown substantial potential for growth and trade. India is now the world leader in milk production, ranks second in the production of fruits and vegetables and is the second largest global player in aquaculture.

The above stated facts paint a sanguine picture of the High Value Agriculture scenario in India. However, these sectors face numerous challenges in their growth path. These challenges come in the form of lack of market access, non customized farm inputs, outdated technology and extraneous extension services. Moreover, the requirements for High Value Agriculture produce are altogether different from traditional crops. The perishable nature of these products necessitates that they are transported to the consumption centers or stored or processed immediately after harvesting. India is yet to develop a supply chain efficient enough to tackle these problems.

Enabling factors like timely availability and accuracy of information, judicious use of fertilizers, technological updates, an efficiently driven supply chain and adequate infrastructure can give a boost to High Value Agriculture in India. Availability of these factors leads to improvement in productivity and reduction in marketing and operational costs.

Introduction

- ✓ In recent years, global agriculture has transformed from being supply-driven to being driven by demand. Consumers now demand better quality, prefer multiple choices, value food safety and seek convenience.
- ✓ This change has been driven by rising income levels and increased awareness as well as rapid consolidation of global retail chains.
- ✓ The demand for high value products like fruits and vegetables, dairy products, meat and meat products has been on a constant rise for the past few years and the demand projections through 2020 show that diversification in consumption patterns towards High Value Agricultural products will become more pronounced with consistent income growth and changes in other determinants such as increasing youth population, health consciousness amongst people and rapid urbanization.
- ✓ Better freight linkages and advancement in Information Technology has further created opportunities for export of High Value commodities.
- ✓ The importance of High Value Agricultural crops can be derived from the fact that these products account for 70% of the wholesale price index (WPI) basket for primary food items and the food inflation during recent years was largely due to the constraints experienced in increasing the supply of these commodities, as compared to their demand.

Shift Towards High Value Agriculture

- ✓ Growing demand for high-value food commodities has opened up opportunities for farmers, especially to diversify towards commodities that have strong potential for higher returns on land, labour and capital.

- ✓ Agricultural diversification towards high-value products like fruits and vegetables, dairy, livestock, fisheries, organic crops and medicinal plants can potentially increase farm incomes, especially in a country like India where demand for high-value food products has been increasing more rapidly than for staple crops.

- ✓ While High Value Agricultural goods, such as horticultural and livestock products tend to be highly perishable and more susceptible to food safety problems, they also command higher prices than traditional staples in many markets.

- ✓ Moreover, these products have a higher potential to bring in foreign currency to the country through exports.

A synopsis of the key sectors of High Value Agriculture has been consolidated in this report. These sectors include:

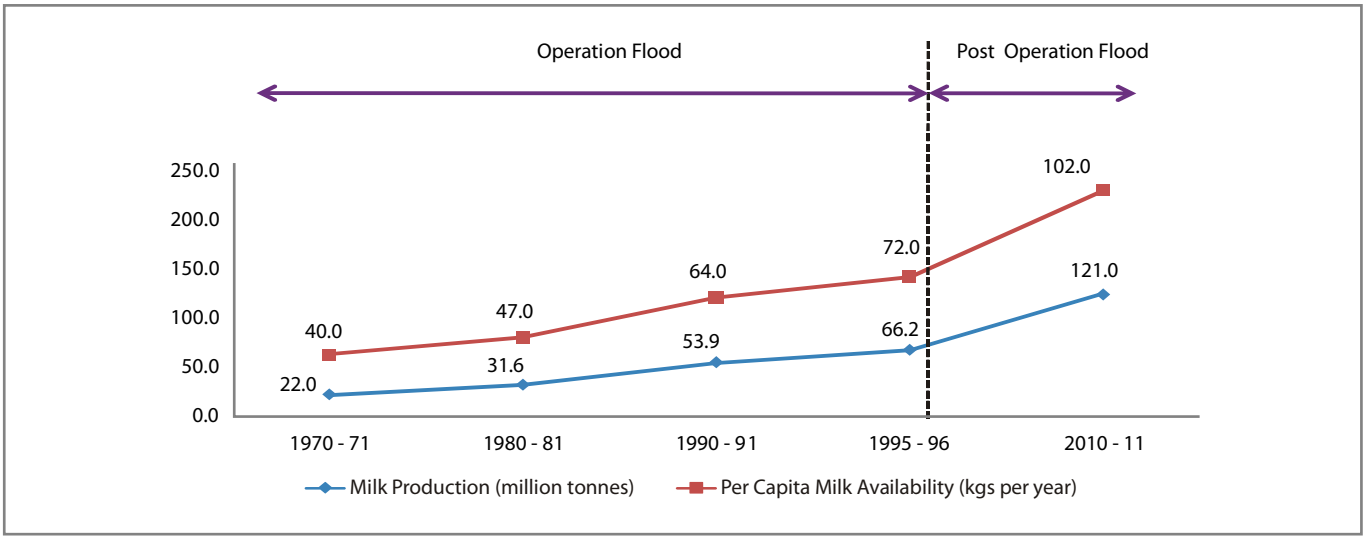
- Dairy
- Fisheries
- Horticulture
- Livestock
- Poultry
- Organic Farming
- Medicinal and Aromatic Plants

Dairy

Introduction

- ✓ Fourteen years ago, India scripted history by achieving the pole position in global milk production. This was made possible by one of the world's most successful rural development programs – "Operation Flood" (OF) which ushered in the White Revolution - transforming India from a milk deficient country to a self sufficient one.
- ✓ India has retained the leadership position in milk production estimated at 121 million MT during 2010-11, accounting for 17% of global milk production.
- ✓ This fact emphasizes the importance of dairying which has played a crucial role in the agro-based Indian economy and has been acknowledged as the most successful transformational enterprise in India.
- ✓ In India, more than 70 million of the 147 million rural households depend upon dairy, in varying degrees, for their livelihood.

Exhibit1: Milk Production and Per Capita Milk Availability during OF and post OF period

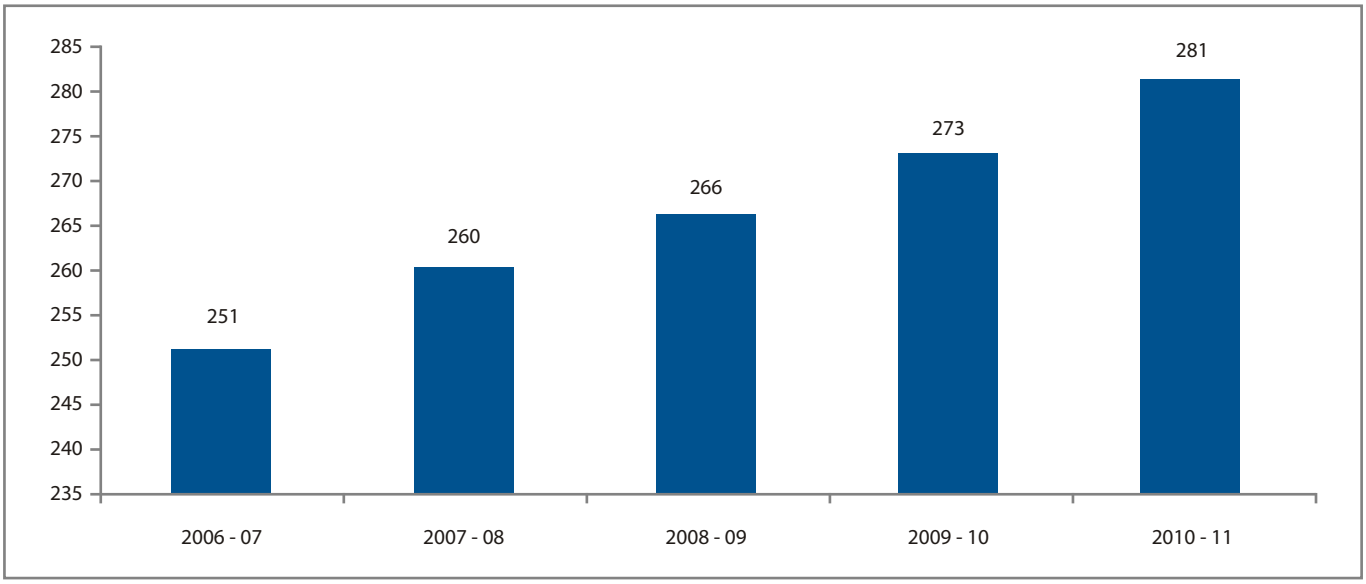


Source: Ministry of Agriculture, YES BANK Analysis

- ✓ The Indian dairy sector is the largest contributor to the agricultural GDP. Livestock sector comprises 28-30% of the agricultural GDP and milk makes up 70% of the livestock GDP.
- ✓ In terms of output, milk is now the single largest agricultural commodity in India, consumed domestically by 1.2 billion largely vegetarian population for whom milk and milk products are important components of food and nutritional security.

- ✓ India generally exports a small percentage of its total production on account of its growing supply deficit and increasing domestic dairy prices. The share of India in the global trade of dairy products is quite insignificant (less than 1%).
- ✓ The per capita availability of milk has also increased from 112 grams per day in 1968-69 to 281 grams in 2010-11.

Exhibit 2: Per capita milk availability in India (grams/day)

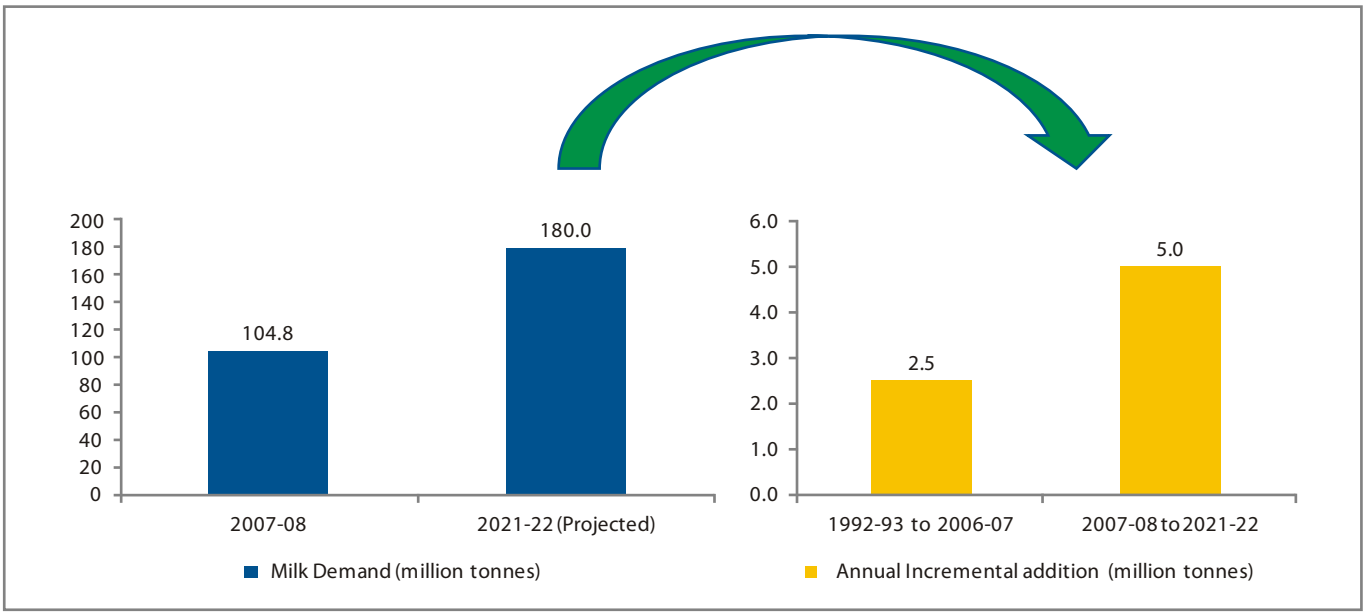


Source: Department of Animal Husbandry, Dairying and Fisheries, Government of India

Market Structure

- ✓ Considering the current scenario, estimates suggest that the milk demand is expected to reach 180 million MT by 2021-22.
- ✓ An annual incremental growth of 5-6 million MT is needed over the next 15 years to meet the growing demand of milk in the country
- ✓ The industry is stated to witness a boom in the demand for milk in the next decade due to the following factors:
  - Milk serves as an important source of protein for a sizeable portion of India's large vegetarian population.
  - Rising income and aspiration levels further accelerated by impact of the 6th Pay Commission in urban India and policy initiatives such as Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) in rural India.
  - Advent of urbanization leading to demand for greater variety of value added dairy products.
  - Rising health consciousness driving product innovations in the global dairy market like probiotics and other fortified dairy products.

Exhibit 3: Projected Milk Demand and Annual Incremental Addition required to achieve 2021-22 production target



Source: Government of India

- ✓ The processed milk market is estimated to reach INR 5 lakh crore by 2015 with an annual growth rate of 10%.
- ✓ The markets for dairy products like butter, cheese, ice cream etc. is growing at 8-10% every year.
- ✓ Approximately half of the milk produced is marketed, with only about 30% of the marketed milk handled by the organized sector (private and cooperatives).
- ✓ Of the total milk distributed jointly by the organized and unorganized sectors, approximately 46% is consumed in fluid form and the balance is converted into various milk products like powder, butter, yoghurt etc.

Exhibit 4: Product Mix

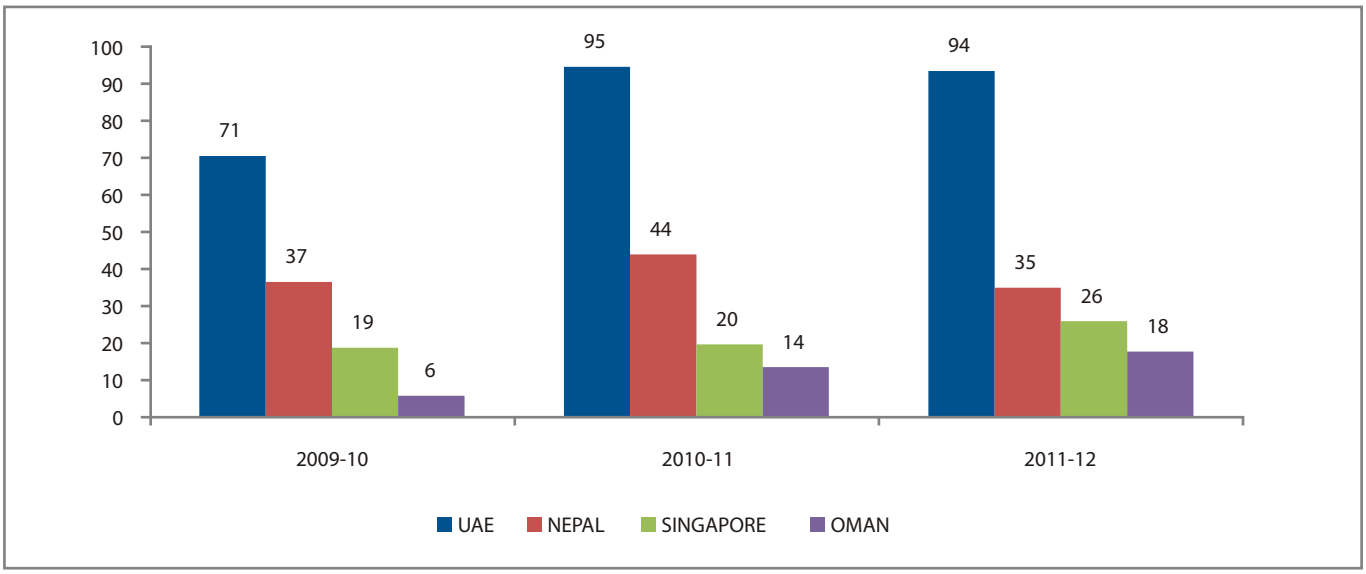
Liquid Milk	**46.0 %**
Ghee	**27.5 %**
Butter	**6.5 %**
Yoghurt	**7.0%**
Khoa	**6.5%**
Milk Powder	**3.5%**
Paneer	**2.0%**
Others including ice cream	**1.0%**

Source: Industry Estimates

Trade

- ✓ Since 2001, India has become a net exporter of dairy products. After 2003, India's dairy imports declined while exports increased at a considerable rate.
- ✓ Yet the country's share in global dairy trade remains at miniscule levels of 0.3% and 0.4% for exports and imports respectively.
- ✓ This is due to the direct consumption of liquid milk by producer households as well as the demand for processed dairy products that has increased with the growth of income levels, which results in little dairy surplus for export.
- ✓ The major export destinations of milk products from India are United Arab Emirates (UAE), Nepal, Singapore and Oman.

Exhibit 5: Value of dairy exports from India (in crore)



Source: Agricultural and Processed Food Products Export Development Authority (APEDA)

Challenges

Some of the key challenges in the dairy value chain are:

- ✓ The momentum of milk production has declined over the last decade with growth stagnating at about 5% per annum. Some of the key bottlenecks hindering growth in milk production are:
  - Rapidly shrinking and degrading grazing areas resulting in shortage of green fodder. By 2020, the deficit of dry fodder, concentrates and green fodder is estimated to be around 11%, 35% and 45% respectively from the current deficit of 10%, 33% and 35% respectively.

- Increasing feed prices resulting in use of low quality feed.
- Low milk productivity of indigenous breeds.
- Low technology based system of production in rural areas.
- Rise in heat stress among cattle on account of global warming resulting in loss of close to 2% of total milk production.

✓ Lack of required infrastructure of chilling plants and bulk coolers leading to deterioration in the quality of milk.

✓ Unable to get fair and remunerative prices for milk, farmers often tend to give adulterated milk at the collection centers. They often add additives like vegetable fat, animal fat, starch etc. to increase the fat content of the milk and get a better price for the lot.

✓ India, being a tropical country, has a hot and humid climate which affects the animals resulting in fluctuations in milk production. The seasonality factor leads to surplus of milk exceeding the processing capacity on one hand during flush season and the underutilization of the processing plants in the lean period.

✓ High level of taxation and duties on dairy equipment and machinery amounting to almost 35 to 40% of the basic prices leads to increase in the final price of the product and thus lesser utilization of the quality equipment and machinery at farm as well as processing levels.

Roadmap

Recent efforts by the National Dairy Development Board (NDDB) to address the milk supply-demand gap through the ambitious National Dairy Plan (NDP) are commendable. However the need of the hour is to chalk out innovative supply side strategies that are sustainable, inclusive, scalable and profitable in the long term.

It is important that a framework be designed to change the paradigm of dairying from "subsidiary" occupation to "mainstream" activity. Greater emphasis needs to be placed on achieving economies of scale and continuous yield improvements. This would need conceptualization and implementation of new production models that would inculcate the following crucial requirements of high tech dairying:

✓ Mechanization and automation of dairy farms

✓ Sustainable measures to provide better quality feed and fodder by developing technologies that increase productivity of crops in rain-fed areas

✓ Provision of improved seed varieties for fodder cultivation and encouraging seed replacement

✓ Maximization of environmental benefits through adoption of green energy measures such as reutilization and effective disposal of manure

✓ Establishment of community based high herd size farms which would ensure investment in scaling up, thus improving dairy management systems

Fisheries

Introduction

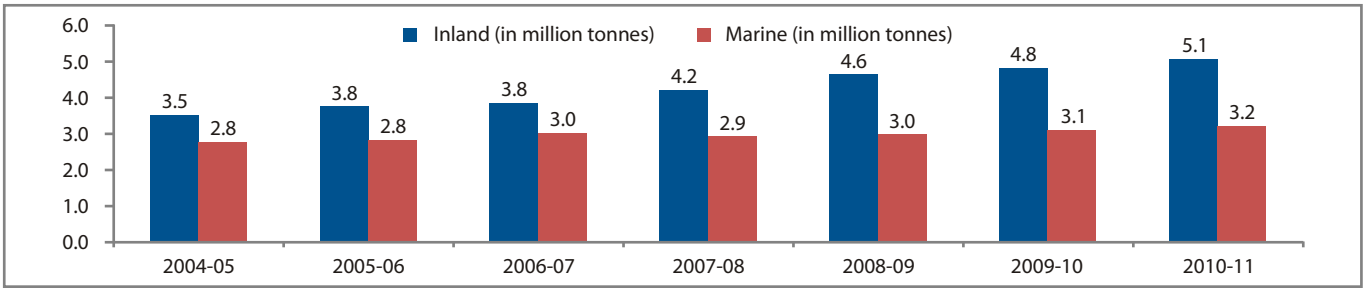
- ✓ The fisheries sector has been playing an important role in the Indian economy by way of employment generation, income augmentation and foreign exchange earnings and provision of nutritional security.
- ✓ The sector contributed around 0.96% to the total GDP at factor cost during 2009-10 and 5.4% to the agricultural and allied sector GDP. It comprised a lion's share of the Indian agricultural exports, amounting to INR 12,902 crore in 2010-11.
- ✓ India now ranks as a global leader in fisheries (3rd rank in total and 2nd rank in aquaculture) with an annual catch of 8.2 million MT (2010-11).
- ✓ Fishery has impacted the livelihoods of thousands of fishermen and sea food processing industries with an installed capacity of 2.5 million MT which has also provided enormous employment opportunities.
- ✓ About 7 million fishermen depend exclusively on fishing for their livelihood and 14.5 million fishermen are actively engaged in the sector.

Market Structure

Production scenario

- ✓ Fish production has been growing at a CAGR of 4.7% in the past seven years.
- ✓ Since marine production has come to a standstill, the major engine of growth has been inland fisheries.
- ✓ The inland sector has been growing at a CAGR of 5% and will continue to grow in the future, thus helping India in its food security mission.
- ✓ The share of the inland sector to the total production increased from 50% to 61% in the year 2010-11, thus playing an important role in fisheries production.

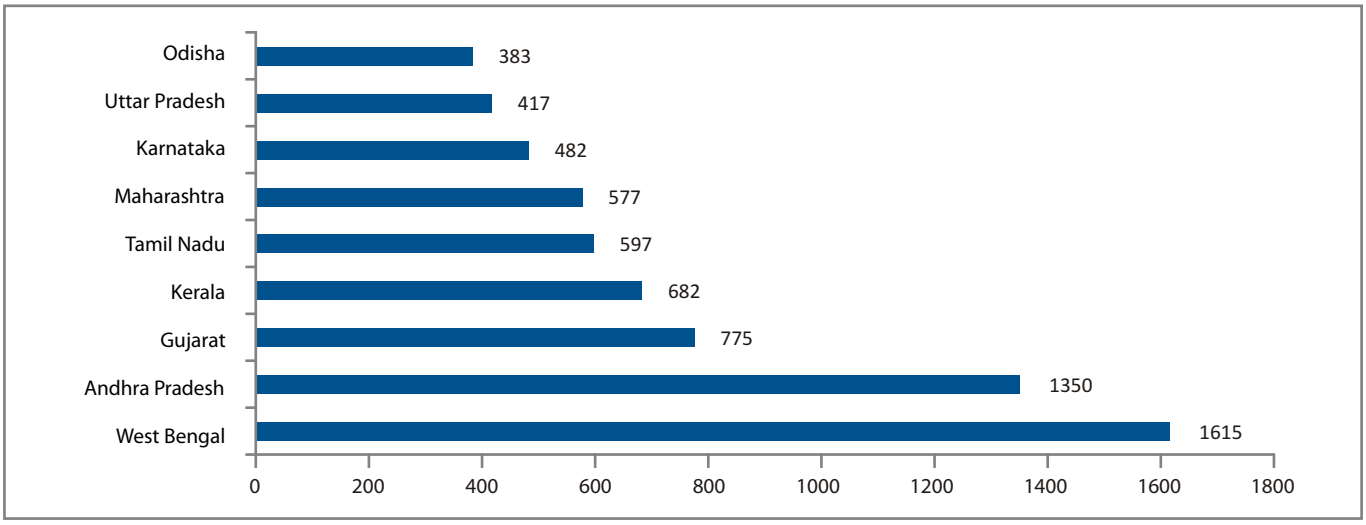
Exhibit 6: Fish Production Trends (Marine and Inland)



Source: Department of Animal Husbandry, Dairy and Fisheries (DAHD), Ministry of Agriculture and YES BANK Analysis

✓ The major fish producing regions in India are West Bengal, Andhra Pradesh, Gujarat and Kerala.

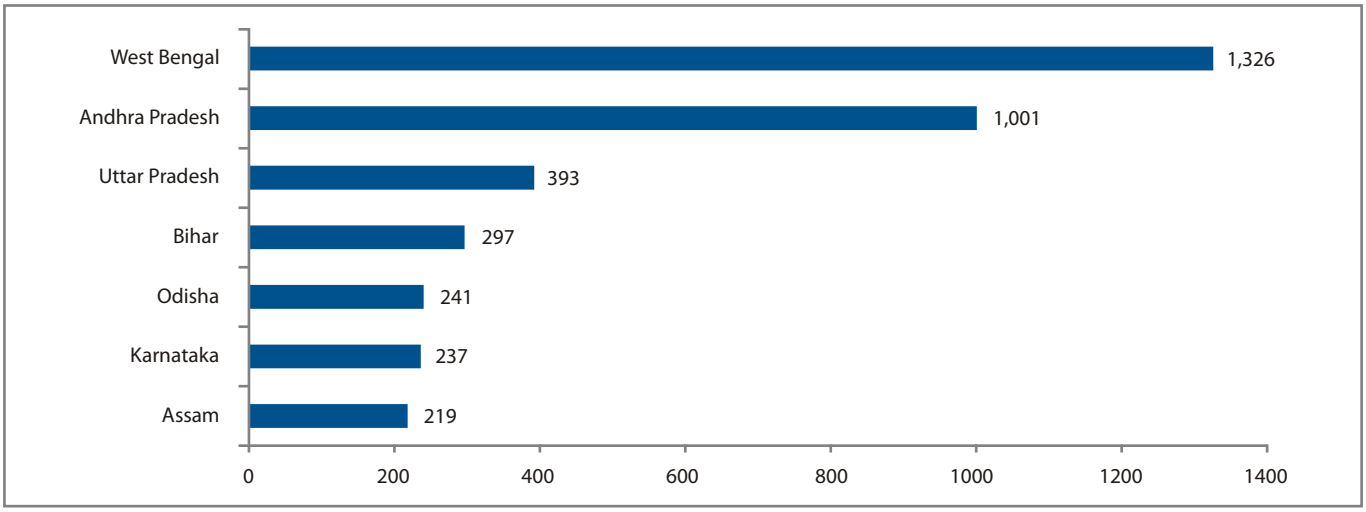
Exhibit 7: Major Fish Producing Clusters in 2010-11 (Inland & Marine) (in thousand MT)



Source: Department of Animal Husbandry, Dairy and Fisheries (DAHD), Ministry of Agriculture and YES BANK Analysis

✓ The fish production from inland fish resources was 5.1 million MT in the year 2010-11. The major fish producing states were West Bengal, Andhra Pradesh, Uttar Pradesh, Bihar, Odisha, Assam and Tamil Nadu contributing about 76% to the total inland production.

Exhibit 8: Major Inland Fish Producing States in 2009-10 (in thousand MT)



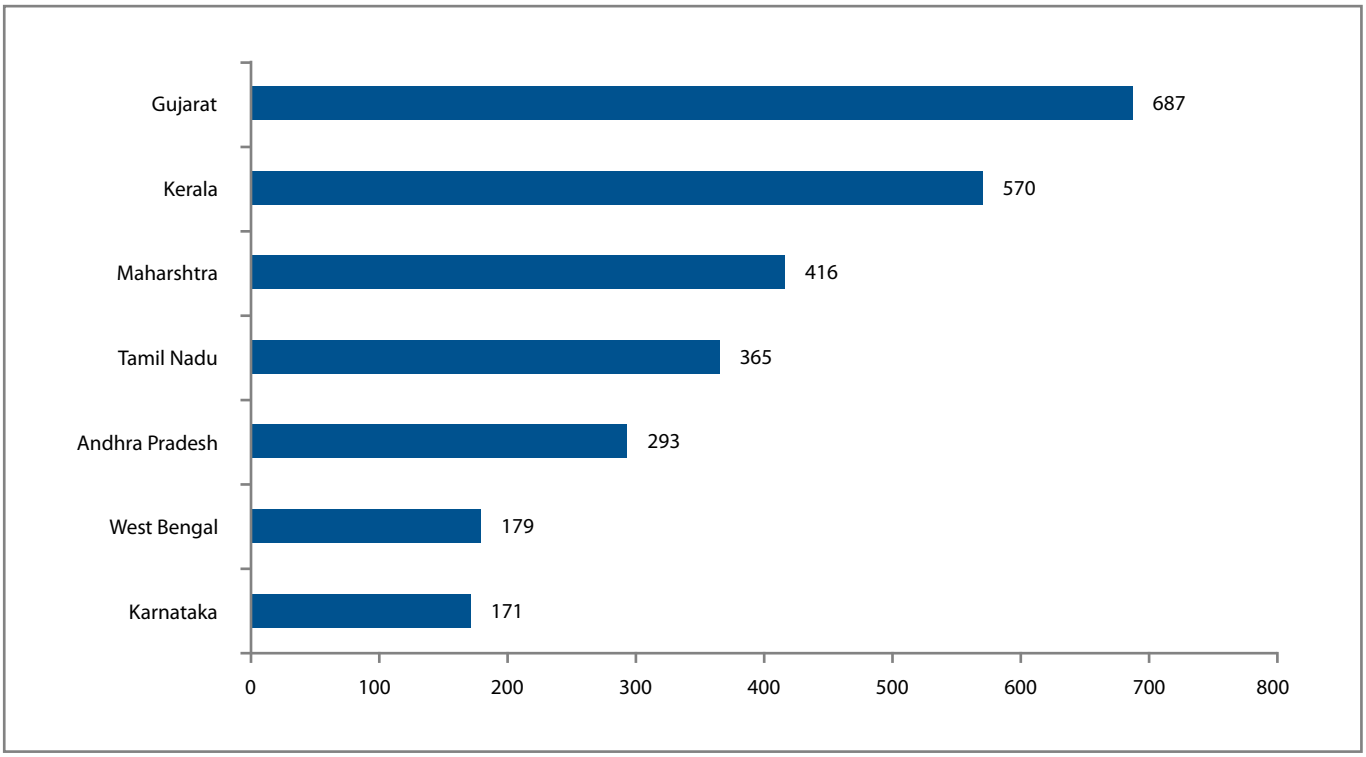
Source: Ministry of Agriculture, YES BANK Analysis

✓ Marine fisheries in India can be broadly classified into coastal fisheries or inshore fisheries and offshore fisheries.

✓ The marine fishery resource has been estimated at 3.9 million MT and the present harvest of 3.2 million MT is near to the sustainable potential limit.

- ✓ The major states for marine production are Gujarat, Kerala, Maharashtra, Tamil Nadu and Andhra Pradesh. These five states constitute nearly 75% of the total production.

Exhibit 9: Major Marine Fish Producing States in 2009-10 (in thousand MT)



Source: Ministry of Agriculture, YES BANK Analysis

Industry Scenario

- ✓ India is the third largest fishing nation with 399 processing plants out of which 221 are approved by the European Union.
- ✓ Marine products industry is a major earner of foreign exchange for the country with exports growing at a steady rate.
- ✓ The installed freezing capacity of the fisheries industry is around 7,500 MT/day i.e. 27 lakh MT/year. International export destinations like the USA, EU and Japan are highly quality sensitive and have compelled the processors to modernize.
- ✓ As such the industry has emerged as a modern, high technology food processing industry handling highly perishable food items with international benchmarked hygiene standards and quality parameters.

Exhibit 10: Built up capacity of the Indian Seafood Industry

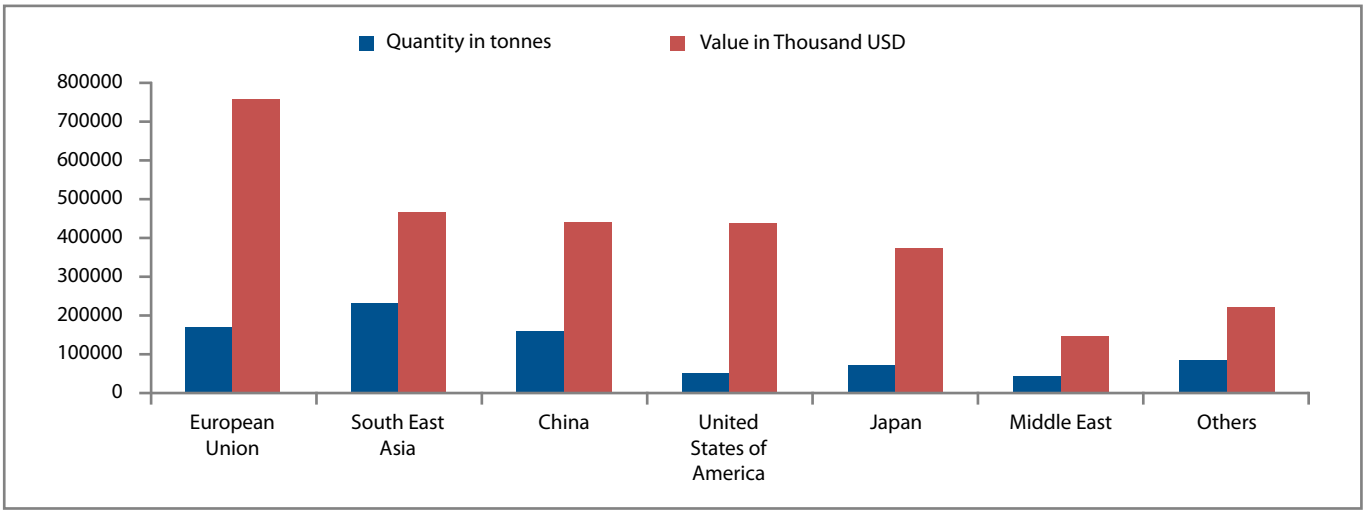
Name of the State	No. of Exporters	No. of Processing Plants	Freezing Capacity (MT per day)	No. of Cold Storages	Storage Capacity (MT)
Kerala	287	124	1,586	169	23,087
Tamil Nadu	286	48	525	67	5,900
Karnataka	43	14	186	26	3,540
Andhra Pradesh	95	52	780	53	7,200
Goa	9	7	104	9	1,275
Gujarat	64	55	2,216	57	22,925
Orissa	30	21	220	20	2,460
Maharashtra	268	41	1,327	39	19,372
West Bengal	99	37	340	30	3,500
Delhi (UT)	92	--		1	15

Source: MPEDA, YES BANK Analysis

Trade

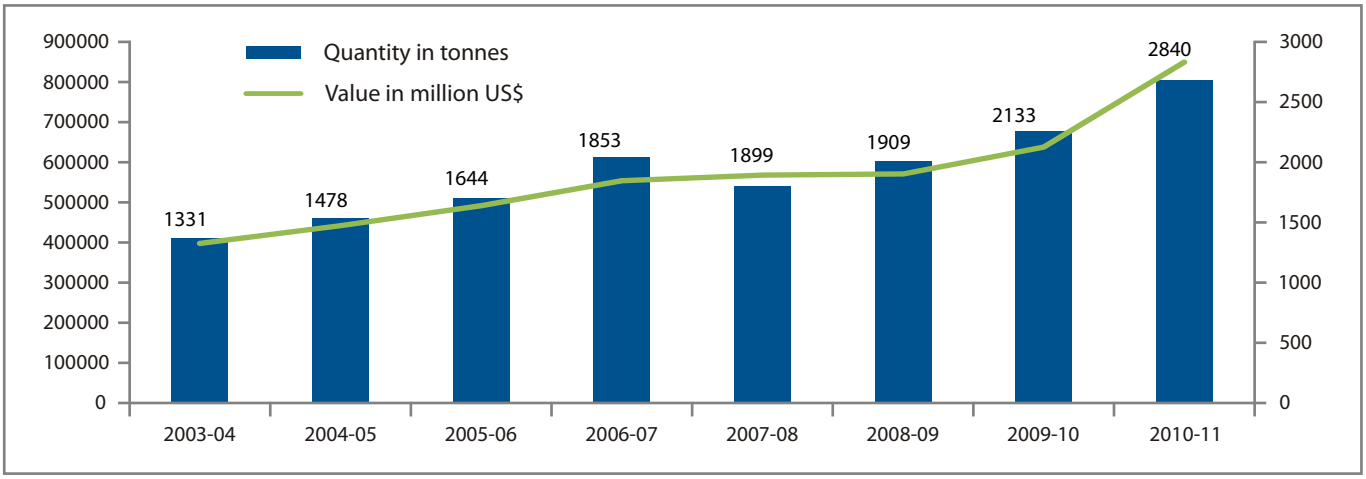
- ✓ The marine product export earnings crossed the USD 2 billion mark in 2009-10 and export earnings rose to USD 2.84 billion in the financial year 2010-11.
- ✓ Indian sea food export in value terms has been growing at a CAGR of 7% since the last five years.
- ✓ The marine products export market has come a long way from exporting dried items to neighboring countries to becoming a major player in the international market.
- ✓ The progression was the result of development of infrastructure for freezing and value addition in the key production areas for export processing in the late sixty's.

Exhibit 11: Major Export Destinations from India in 2010-11



Source: Marine Products Export Development Authority (MPEDA), YES BANK Analysis

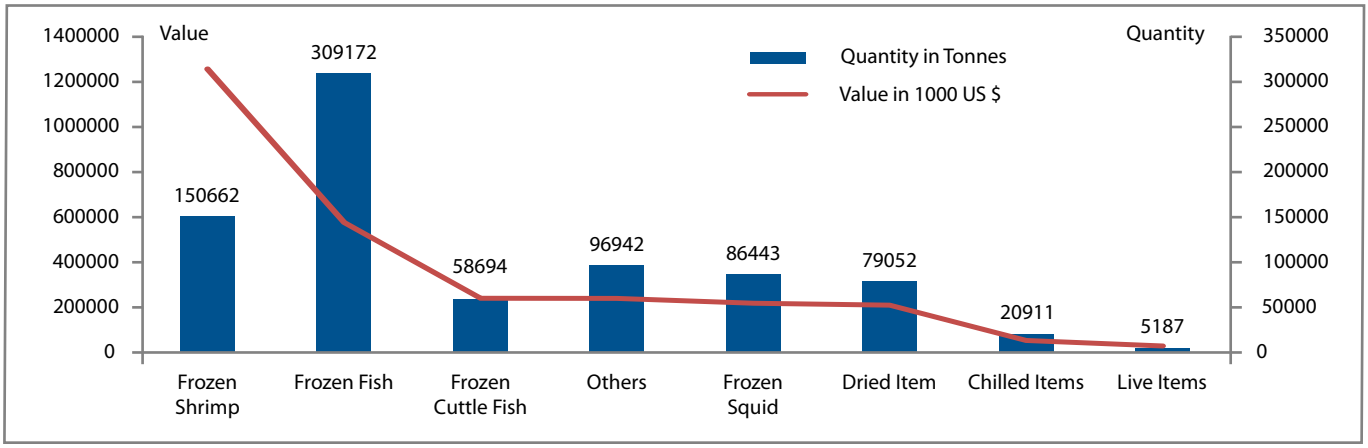
Exhibit 12: Export Trends in the Recent Years (Quantity and Value)



Source: Marine Products Exports Development Authority (MPEDA), YES BANK Analysis

- ✓ Black tiger, freshwater shrimp, frozen squid and cuttlefish, fresh sail fish, frozen versatile fish and frozen skip jack are some of the prominent items in the seafood export basket.
- ✓ Frozen shrimp continues to be the major export item accounting for 44% of the export earnings in dollar terms in 2010-11.
- ✓ Shrimp exports during the period increased by 15% in quantity terms and 42% in terms of value of export in US dollar, over the same period.
- ✓ Frozen fish is the principal export item in quantity terms and the second largest export item in value terms, comprising of 38 % of the quantity and 20% by the value.

Exhibit 13: Major Items of Export and their Export Value in 2010-11



Source: Marine Products Exports Development Authority (MPEDA), YES BANK Analysis

Challenges

- ✓ Aquaculture in India is dependent on few species and predominantly on two bio-categories, carps and shrimps. The full potential of the rich Indian fishery biodiversity needs to be tapped by developing more commercial cultivable species.
- ✓ The marine fish resources have reached potential sustainable fishing levels and catch from sea has stagnated. Mariculture of key commercial species needs to undertaken as its potential has not been tapped in India.
- ✓ There is a huge infrastructure deficit in the domestic marketing front which is vital for the growth of the sector. Fisheries infrastructure with better landing facilities, modern fish wholesale and retail markets and integration with cold chain facilities is the need of the hour.
- ✓ As the global fishery supply chain becomes more integrated and modern trade in India expands, food safety is bound to gain importance. There is a pressing demand for establishing testing laboratories to certify fish/shrimp seeds for cultivation and to check the residue levels in the aquaculture production clusters. Capacity building on food safety initiatives needs to be undertaken for farmers and establishment of national quarantine and disease controlling mechanisms needs to be established.

Roadmap

Value addition

- ✓ The total processing capacity of the seafood industry is around 2.5 million MT per year with only 25% of the total capacity being utilized.

[1]Aquaculture involves cultivating freshwater and saltwater populations under controlled conditions

2 Mariculture is a specialized branch of aquaculture involving the cultivation of marine organisms for food and other products in the open ocean, an enclosed section of the ocean, or in tanks, ponds or raceways which are filled with seawater.

- ✓ The level of value addition at 7% in India is still behind Philippines where it is to the tune of 23%.
- ✓ Processing capacity can be increased to almost 50% thereby increasing the foreign exchange earnings.
- ✓ This can also be done by importing raw materials under the new free trade regime for re-export and India can emerge as leading seafood processing hub of the world.
- ✓ Major items exported from India are in the form of frozen products and the importing countries then add value to the product. As a future strategy, India should focus on export value added products and ready to eat forms.

Integrated processing clusters

- ✓ There is a need for establishing concentrated clusters for fish processing based on the proximity to production and ports.
- ✓ These Integrated Processing Clusters will help achieve scale and can be modeled under the Mega Food Park Scheme under the aegis of Ministry of Food Processing.
- ✓ There is a potential for three such Integrated Processing Clusters which can be planned along the coast line of India, keeping supply and regional production potential in mind.

Addressing food safety challenges

- ✓ The industry needs to keep pace with the international issues concerning food safety, traceability of the product, fair trade and demand for organic products.
- ✓ Improving yields and adherence to stringent environmental regulations like Hazard Analysis and Critical Control Points (HACCP) and International Food Quality Standards will play a pivotal role in further enhancing the business prospects of export of Indian aquaculture fisheries.

New channels for growth

- ✓ The fishery industry requires integration with the domestic market through development of new channels for growth, catering to the aspirations of modern retail in the country.
- ✓ This would create an alternative market for the well equipped export oriented processing industry and also help in mitigating currency risks.
- ✓ A clear strategy needs to be drawn for product innovation by offering domestic consumers a variety of fishery products in ready to eat and ready to cook forms in various packages, forms and price points.
- ✓ The streamlining of the domestic value chains by creating better marketing facilities for fish products will remove market imperfections.

- ✓ The development of cold chain infrastructure around major consumption centers/cities will help in increasing the demand around such areas.

Strengthening avenues in aquaculture

- ✓ Indian aquaculture has demonstrated a six-and-a-half-fold growth over the last two decades, with freshwater aquaculture contributing over 95% of the total production.
- ✓ India utilizes only about 40% of the available 2.36 million hectares of ponds and tanks for freshwater aquaculture and 13% of a total potential brackish water resource of 1.2 million hectares.
- ✓ Thus, there is room for both horizontal and vertical expansion of these sectors. The annual production has seen a drastic increase in recent years because of aquaculture.

Mariculture

- ✓ As the marine catch production has stagnated in the recent past, mariculture needs to be promoted among the fishermen, by providing skills and resources for integrated cooperative farming practices to supplement their incomes.
- ✓ There is also a need for development of sustainable commercial mariculture by promoting private investments into sea-cage culture systems, which needs to be supplemented with adequate marine fish hatcheries infrastructure along the coast for providing fish seed commercially.

Ornamental fish culture

- ✓ World ornamental fish trade is growing at an extraordinary pace and is valued at USD 18 billion which includes accessories and feed.
- ✓ The wholesale value of the global ornamental fish trade is estimated to be USD 1 billion. India, endowed with abundant natural resources of 500 species of freshwater and marine ornamental fish, can tap this lucrative trade which has tremendous growth opportunities and can provide large scale employment.
- ✓ Also the unit value of ornamental fish is high compared to fish for food purposes. Although ornamental fish exports have increased from INR 3.2 crore in 2001-02 to INR 5.6 crore in 2006-07, it remains quite insignificant compared to other developing countries.
- ✓ The Marine Products Exports Development Authority (MPEDA) has evolved a vision to boost export oriented ornamental fish trade and achieve an export target of USD 50 million by 2012.
- ✓ Ornamental fish culture needs to be promoted by developing the requisite infrastructure, providing technical expertise and mapping potential areas for production and export.

Horticulture

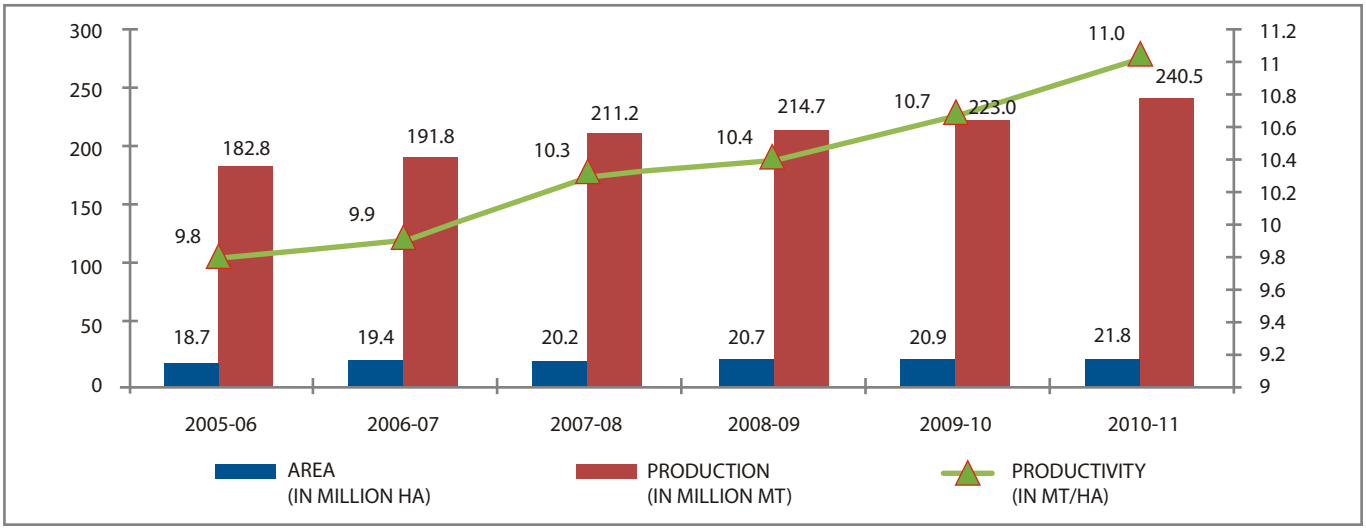
Introduction

- ✓ India has emerged as one of the leading producers of fruits and vegetables in the world.
- ✓ India ranks second in the production of fruits and vegetables with a total production of 7,48,78,000 MT covering an area of 63,83,000 Ha for fruits and 14,65,54,000 MT covering an area of 84,95,000 Ha for vegetables.
- ✓ However the productivity of fruits and vegetables in India (11.7 MT/Ha) is higher than the world leader China (10.7 MT/Ha).
- ✓ Among fruits, India leads in the production of banana, mango, guava and papaya. In vegetables, India is the leading producer of okra in the world.
- ✓ Besides, India occupies the second position in the production of brinjal, cabbage, cauliflower, onion, potato and is third in tomato production in the world.
- ✓ In 2010-11, Tamil Nadu accounted for the maximum share (13.3%) in terms of fruit production followed by Maharashtra (12.7%) and Andhra Pradesh (12.6%).
- ✓ For vegetable production the maximum share was contributed by West Bengal (18.2%) followed by Uttar Pradesh (12.1%) and Bihar (10%).

Market Structure

- ✓ At an all-India level, the share of fruits and vegetables in the total value of agricultural output increased from 14.1% in 1983-84 to 15.4% 1993-94 and 16.9% in 2007-08.
- ✓ With a promising growth trend, horticulture is expected to play a dominant role in the overall development of agriculture in the country. Fruits and Vegetables, together constitute about 92% of the total horticultural production in the country.
- ✓ For horticulture there has been an addition of 3 million Ha between 2005-06 and 2010-11. The sector registered growth due to the focused intervention of horticulture mission programs implemented by the Government of India.

Exhibit 14: Area production and productivity of horticulture in India



Source: Indian Horticulture Database, 2011

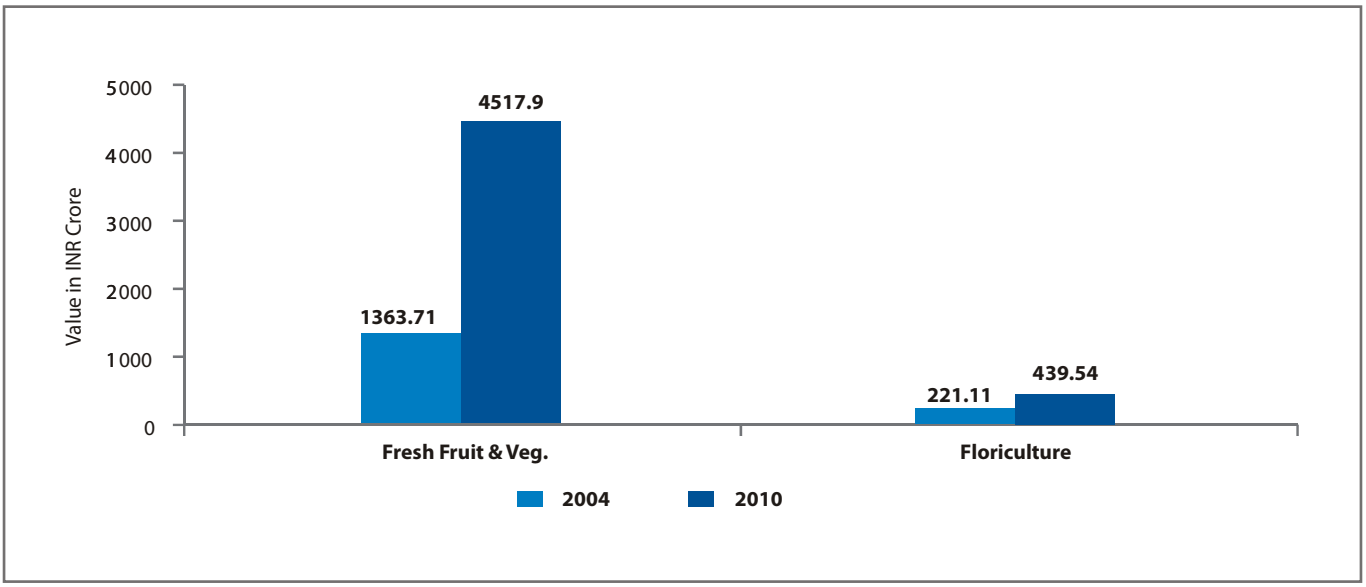
- ✓ The major fruit crops produced in India in the year 2010-11 were Banana (39.8%), Mango (20.3%), Citrus fruits and Papaya.
- ✓ For vegetables the maximum share of production was for Potato (28.9%) followed by Tomato (11.3%), Onion (10.3%) and Brinjal (8.1%).
- ✓ The share of fruits and vegetables in consumer expenditure has increased from 10.7% in 1987-88 to 15.7% in 2007-08 in rural and from 13.9% to 16.6% in urban India.
- ✓ As per the 66th round of the National Sample Survey Organization (NSSO) survey the per capita consumption of vegetables per annum has shown a steep increase for rural and urban households. The consumption of vegetables increased from 32 kg in 1993-94 to 49 kg in 2009-10 in rural areas. Similarly, for urban areas consumption increased from 35 kg in 1993-94 to 50 kg in 2009-10.

Trade

- ✓ There has been significant improvement in the export of horticultural produce. In terms of value, the export earnings from fruits and vegetables increased from INR 1,363.71 crore in 2004-05 to INR 4,517.9 crore in 2010-11.
- ✓ The share of fruit and vegetable export in the international markets is less than 1%. Also, share of exports is only 0.69% of domestic production with respect to fruits and 1.69% for vegetables.
- ✓ The Ministry of Agriculture has identified some of the fruits (mango, grapes, litchi, mandarins, kinnow, cashew, walnut, pomegranate, aonla), vegetables (potato, onion, chilli, bitter gourd, okra), spices (black pepper, ginger, turmeric, cumin, large cardamom) and floriculture crops (rose, cymbidium orchid, anthurium, cut and dry flowers) for export promotion.

- ✓ In the processed products sector, mango pulp, canned mushroom and gherkins, banana puree, tomato puree, tomato paste, aonla, bael, cashew and apple juice are identified as having good export potentials.

Exhibit 15: Export of Horticultural produce



Source: Indian Horticulture Database, 2011

Challenges

- ✓ Policy reforms related to the Agricultural Produce Market Committee (APMC) Act, direct marketing of produce and contract farming have not been implemented across India.
- ✓ Presence of too many intermediaries has resulted in high cost of goods and services.
- ✓ Inadequate infrastructure for storage, sorting, grading or post-harvest management has caused enormous post harvest losses. At present, 30% of post harvest losses occur in horticulture and only 10% of production of fruits and vegetables is covered by cold storage infrastructure.
- ✓ Private sector is unwilling to invest in logistics or infrastructure under prevailing conditions.
- ✓ Lack of access to timely market information for effective price realization
- ✓ Lack of market infrastructure as only 1,637 grading units at the primary level, which include 125 units with cooperatives and 144 units with others. In regulated markets, only 1,368 grading units are available in a total of 7,246 market yards/sub-yards.
- ✓ Lack of grading of produce at the farm gate - only 7% of the total quantity sold by farmers is graded before sale.
- ✓ Scientific storage capacity is only 30% of the required capacity

Roadmap

- ✓ Expedite implementation of policy reforms like implementation of model APMC Act in all states.
- ✓ Remove restrictions on stock limits and interstate movement restrictions on agricultural produce under the Essential Commodities Act.
- ✓ Fruits, Vegetables, Milk and other perishable commodities may be denotified from the APMC Act or exempted from market fees so as to facilitate direct marketing through alternative marketing channels.
- ✓ Excise/other levies viz. Mandi Tax, Sales Tax/Value Added Tax, Octroi etc. are barriers for free movement of goods, which should be replaced by a system of one single uniform tax across states with a maximum ceiling of 4%.
- ✓ Strengthen and modernize marketing infrastructure by attracting private investment. Allow private sector to build new markets and infrastructure in the overall supply chain – warehousing, post management facilities, collection centers, grading centers etc.
- ✓ Develop Cold Chain transportation system, for example air–conditioned cargo, coaches in railways, roadways etc. and refrigerators/insulated containers for perishables, processed products to minimize post-harvest losses at transportation stage and at retail level.
- ✓ Promote contract farming and entry of retail chains through corporate initiatives to ensure better quality and shelf life of fruits and vegetables for effective price realization and access to domestic as well as overseas markets for small farmers.
- ✓ Putting in place strong and robust traceability programs with respect to major fruits and vegetables.
- ✓ Promote Producer Organizations which could be the best alternative for enabling small farmers/producers to get better remuneration for perishables like fruits and vegetables because it enables aggregation of the produce and in turn gives the necessary bargaining power to get better price
- ✓ Strengthening rural infrastructure in terms of transport, communication, Information Technology and Storage.

Livestock

Introduction

- ✓ Livestock is one of the most vital parts of High Value Agriculture. The sector plays a critical role in the welfare of India's rural population.
- ✓ As per the 18th Livestock Census 2007, the livestock and poultry population in the country was 529.7million and 648.8 million, respectively.
- ✓ In recent years, livestock output has grown at a rate of about 5% a year, higher than the growth in agricultural sector.
- ✓ In 2010-11 livestock generated outputs worth INR 2,075 billion (at 2004-05 prices) which comprised 4% of the GDP and 26% of the agricultural GDP.
- ✓ India's livestock sector is one of the largest in the world. It comprises of 56.7% of world's buffaloes, 12.5% cattle, 20.4% small ruminants, 2.4% camel, 1.5% pigs and 3.1% poultry.
- ✓ Livestock has been an important source of livelihood for small farmers. It contributes around 16% to their income and most prominently in the states of Gujarat, Haryana, Bihar and Punjab.
- ✓ The sector is estimated to employ more than 8% of the population.

Market Structure

- ✓ With 15% of the world's goat population and 6% of its sheep, India is amongst the highest livestock holding countries in the world.
- ✓ As of 2009, it was estimated that the sheep and goat population at 191.7 million, comprised 10% of the world total.
- ✓ In the country, 70% of the goat population is found in the seven states of West Bengal, Rajasthan, Uttar Pradesh, Maharashtra, Bihar, Tamil Nadu and Madhya Pradesh. Similarly, 72% of the sheep population is concentrated in the four states of Andhra Pradesh, Rajasthan, Karnataka and Tamil Nadu.
- ✓ Over two decades, between 1990 and 2009, India's production of goat and sheep meat increased by around 16%, from 0.6 to 0.7 million MT, as compared to the increase in world production by 26%. In 2010 goat meat production was 8,46,000 MT and sheep meat production was 3,69,000 MT.
- ✓ Indian cattle and buffalo stocks were 303.5 million head, consistent with the steady growth of the dairy sector.
- ✓ In 2011 the buffalo meat production rose to 8,05,000 MT from 6,23,000 MT in 2008-09, showing a 29% increase in three years . The reason being increasing domestic and export demand.

- ✓ In the country, 79% of buffalo meat production comes from Andhra Pradesh, Uttar Pradesh, Maharashtra, Punjab and Kerala. There is a significant potential for India to increase buffalo meat production due to the large availability of low-priced animals and the current low level of technology used across the supply chain.

- ✓ The per capita meat consumption in India is estimated at 5.5 kg per year, which is about 50% of that recommended by the Indian Council of Medical Research (ICMR). As per the 66th round of the NSSO Survey, the per capita consumption of goat meat consumed per annum was 0.57 kg and 1.11 kg for rural and urban areas respectively.

- ✓ Despite its high livestock population, the market for meat and meat products in India is relatively small, with the emphasis historically having been on the production of milk, eggs and wool. Study reports estimate that 33% of the sheep and 38% of the goat population is culled for meat in the country.

- ✓ An estimation by the Food and Agricultural Organization (FAO) suggests that 7,18,560 MT of goat and sheep meat was produced in the country in 2009, of which two third was goat meat. This constituted 6% of the world's chevon and mutton production.

Trade

- ✓ The buffalo meat share in total meat exports from India is more than 90% (in value terms), followed by a 3% share of goat and sheep meat and the rest comprised of poultry meat and animal casings.

- ✓ Export of pork, poultry and processed meat are almost negligible due to high costs, inadequate meat processing facilities, and infrastructure constraints.

- ✓ Exports of beef and veal have increased during the past 20 years, particularly to the Middle East and some South Asian countries. In 2009, 66,729 MT of meat (sheep and goats—fresh, chilled or frozen) was exported from India. The main importing countries were Saudi Arabia, Egypt, Iraq, Kuwait and Malaysia.

- ✓ This constituted a diminutive share (6%) of the total world exports of goat and sheep meat (by weight) and an even smaller 3.7% in terms of value.

- ✓ The export of meat and meat products is handled by 25 export-oriented modern combined slaughterhouses and meat processing plants registered with the APEDA, Ministry of Commerce. Of these, two units (at Deonar, Mumbai, and Gurgaon, Haryana) exclusively handle sheep meat, one unit (at Gautam Budh Nagar, Uttar Pradesh) is for sheep as well as goat and 10 units process sheep and goat meat along with buffalo meat.

- ✓ Additionally, there are 35 meat processing and packaging units (of which 22 are registered with the APEDA), which source dressed carcasses from government-approved municipal slaughterhouses for export.

Challenges

- ✓ Scarcity of feed and fodder
- ✓ Anti-cow slaughter legislation in several states
- ✓ Research and development constraints
- ✓ Inadequate market infrastructure, unorganized markets for livestock products, and a poor cold chain network
- ✓ Animal health and welfare issues
- ✓ Food safety issues
- ✓ Environmental constraints
- ✓ Poor value addition along the value chain
- ✓ Lack of by product utilization due to unorganized meat market
- ✓ Lack of awareness about cattle insurance and poor insurance cover - livestock insurance scheme launched in 1970 has managed to cover only 7% of the cattle population

Roadmap

- ✓ Modernization of traditional abattoirs for hygienic meat production, effective utilization of by-products, waste disposal and environment conservation
- ✓ Livestock ownership is more equitable than land and serves as an important support system for small holders. Hence livestock products like meat should be recognized as an agricultural product which serves as a buffer under stress conditions for small and marginal farmers
- ✓ Various tax incentives and subsidies for agro development should be equally applicable to the livestock sector.
- ✓ The need for cold storage houses and inspection of slaughterhouses to maintain sanitary condition is vital for the organized development of this industry which is rapidly growing
- ✓ Legal support mechanism to facilitate the gainful utilization of the culled buffalo and surplus male buffalo.
- ✓ Need for consistent and uniform policy across different states for livestock slaughter for export. Male buffalo calf rearing for meat export

Poultry

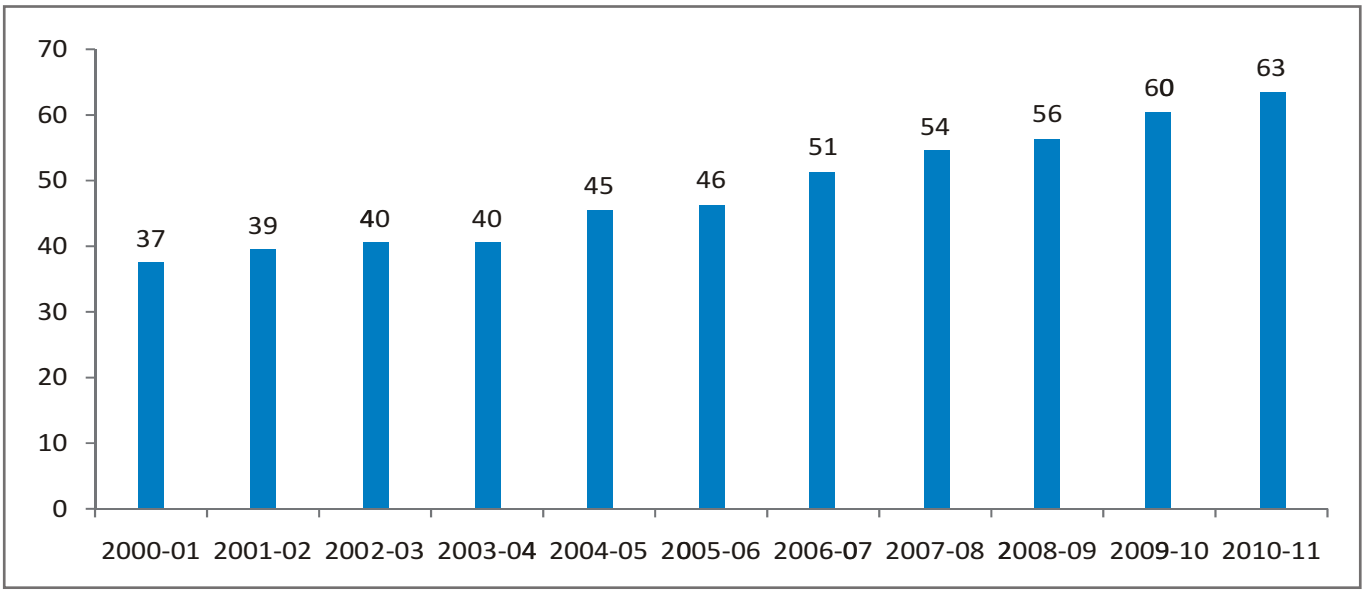
Introduction

- ✓ Poultry, meat and eggs are important constituents of the human diet as these are rich sources of high quality proteins, minerals and vitamins.
- ✓ The meat industry is an important sector of food industry in the world. However, in India this industry is not as developed due to religious taboos and economic conditions.
- ✓ Poultry industry is one of the success stories of High Value Agriculture. It contributes about INR 400 billion accounting for about 0.7% of the national GDP and provides employment to more than 5 million people in the country.
- ✓ Starting from a backyard venture poultry has come a long way into a profitable agri-business segment. India is the third largest egg producer after China and the USA.

Market Structure

- ✓ The poultry sector has shown tremendous growth during the last decade. As per statistics from the Department of Animal Husbandry, Dairying and Fisheries, egg production has almost doubled during the last decade. The production has increased from 37 billion in 2000-01 to 63 billion in 2010-11.

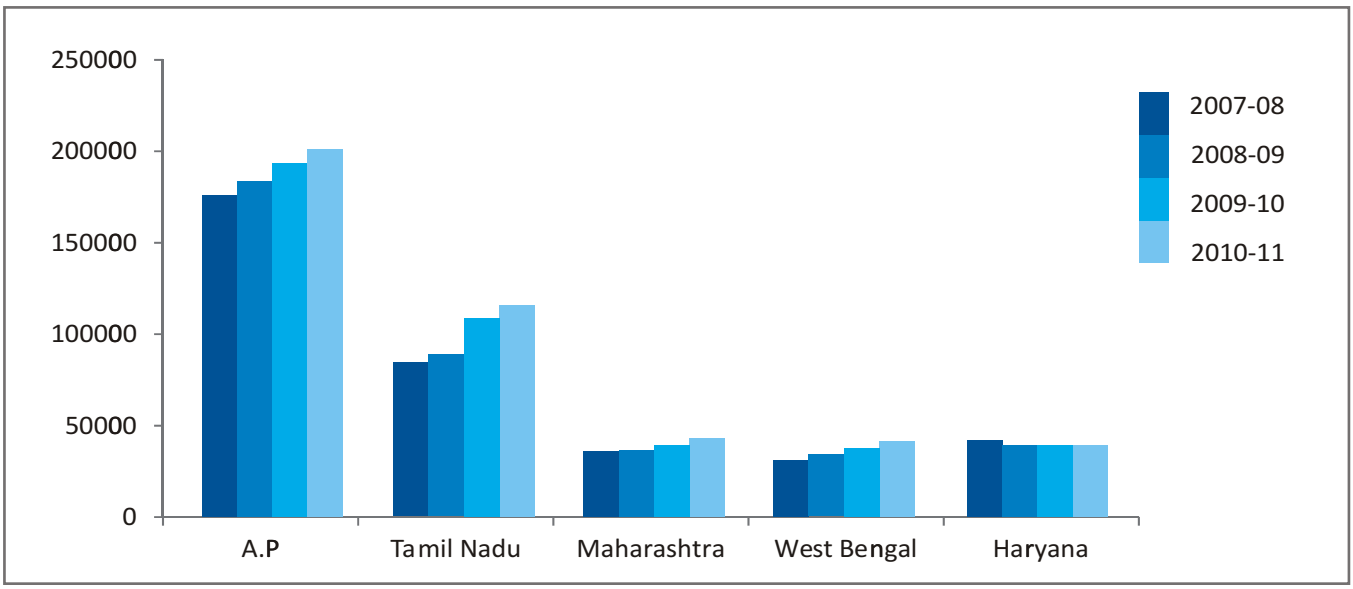
Exhibit 16: Egg production in India (Billion nos.)



Source: Department of Animal Husbandry, Dairying and Fisheries, Government of India

Andhra Pradesh and Tamil Nadu are the leading producers of eggs as illustrated below:

Exhibit 17: Egg production in major states (In lakh nos.)



Source: Department of Animal Husbandry, Dairying and Fisheries, Government of India

- ✓ Andhra Pradesh, Tamil Nadu, Maharashtra, Haryana and West Bengal are the leading producers of poultry meat in India.
- ✓ The Per capita consumption of chicken is also rising steadily in both urban and rural areas as shown by various rounds of the NSSO Survey. As per the 66th round of the NSSO Survey the per capita consumption of chicken consumed per annum has increased to 1.50kg and 2.19kg for rural and urban areas respectively in 2011 from 0.24kg and 0.37 kg in 1993-94.
- ✓ The per capita consumption of eggs per annum (in nos.) was 21 and 32 for rural and urban population respectively.
- ✓ The per capita availability of eggs (nos./per annum) has more than doubled from 25 in 1990-91 to 53 in 2010-2011.
- ✓ High mutton prices, religious restrictions on beef and pork and the limited availability of fish outside coastal regions have all helped to make poultry meat the most preferred and most consumed meat in India.
- ✓ Expanding domestic production and increasing integration have pushed poultry meat prices downward and stimulated its consumption.

Trade

- ✓ At present the Indian poultry sector accounts for a mere 0.4% of the global trade.
- ✓ The major markets identified for the purpose of exports are Japan, Poland, Belgium, Hong Kong, Germany, the USA and Australia.

- ✓ The chicken meat export is however limited to the Middle East countries.
- ✓ Currently, the major poultry products exported include table eggs, frozen eggs, egg powder and poultry meat.

Challenges

- ✓ Scarcity of feed: Maize and Soy are the most widely used feed ingredients. Shortfall in maize production and rising prices may hit broiler and egg production
- ✓ Disease outbreaks like Avian Influenza and Highly Pathogenic Avian Influenza (HPAI) hit the poultry industry hard. Integration of poultry farms also remains a challenge as it poses a threat to animal health, where even a disease of low virulence may seriously affect the entire flock.
- ✓ Lack of refrigeration and cold storage chains for perishables, poor transport links, red tape at state borders and too many intermediaries in the poultry value chain
- ✓ Lack of effective utilization of by products such as slaughter waste, hatchery waste, poultry droppings and litter manure poses a serious threat to the environmental safety
- ✓ Growth of poultry industry is restricted to pockets of South and West. Contract farming agreements have benefitted small farmers through assured market, eradication of intermediary and price security. However, vertical integration has moved slowly in Northern and Eastern part of India

Road Map

- ✓ Addressing infrastructure requirements, especially cold chain and transportation
- ✓ Ensuring regular supply of feed at a competitive price for poultry industry
- ✓ Various tax incentives for agriculture should be applicable to poultry. Poultry faces restrictions on its use of agricultural land, attracts higher electricity tariffs and sales tax than agriculture, pays tax on income earned from poultry farms, and is subject to different land and labor law
- ✓ Encouraging contract farming and vertical integration between corporate and farmers across India would benefit small farmers through relaxing the burden on land and complementing farm income. Efforts may be taken to broad base vertical integration across region

Organic Farming

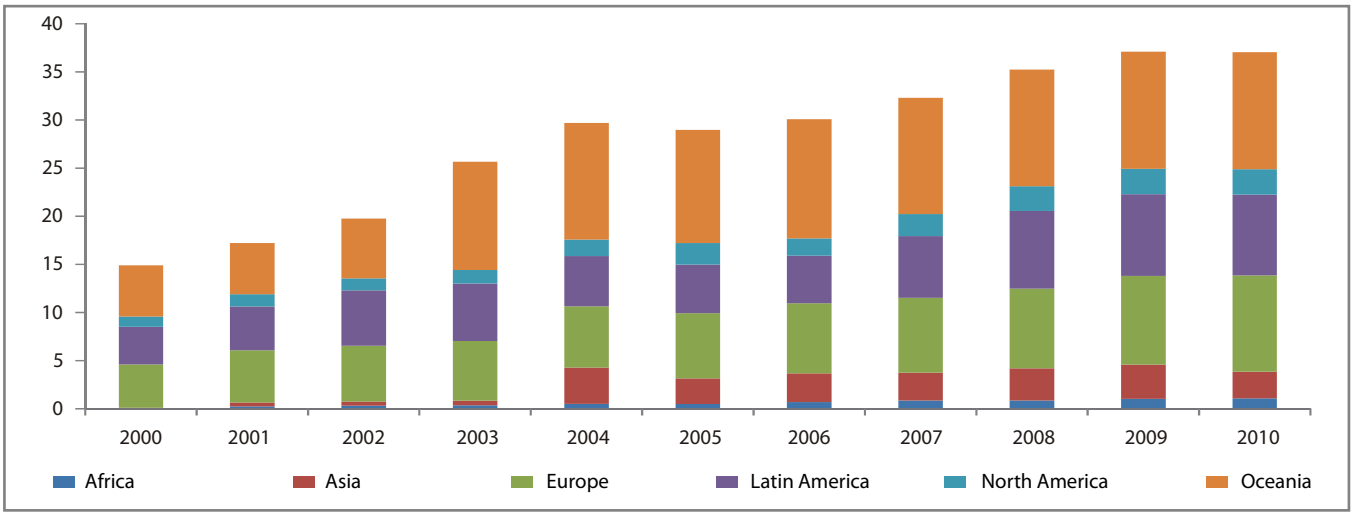
Introduction

- ✓ According to Codex Alimentarius (drafted by the Food & Agriculture Organization and the World Health Organization) organic agriculture is a holistic production management system which promotes and enhances agro ecosystem health, including biodiversity, biological cycles and soil biological activity.
- ✓ Organic agriculture is based on the principle of health, ecology, fairness and care. In particular it intends to produce high quality, nutritious food that contributes to preventive health care and well-being.
- ✓ Organic farming practices are designed to encourage soil and water conservation and reduce pollution. It does not make use of conventional methods to fertilize, control weeds or prevent livestock disease.
- ✓ International Federation of Organic Agriculture Movements (IFOAM) is the worldwide umbrella organization for the organic movement. The Principles of Organic Agriculture serve to inspire the organic movement in its full diversity.

Market Structure

- ✓ The growth in global organic food and beverages market is driven by increasing awareness about health benefits of organic foods which has led to increased organic farming in the world.
- ✓ The global organic food and beverages market is expected to grow from USD 57.2 billion (2010) to USD 104.5 billion in 2015 at an estimated CAGR of 16%.
- ✓ In 2010, Europe had the largest share in the global organic food and beverages market with a revenue of USD 27.8 billion.
- ✓ Global turnover in organic food was almost USD 55 billion or approximately EUR 40 billion in 2009. Of the world's total organic agricultural land i.e. 37.2 million hectares about one quarter is in Europe (9.2 million hectares).
- ✓ Fresh fruits and vegetables are the highest selling organic food categories with 37% of the organic foods segment in terms of revenue.
- ✓ In 2014, the global organic food market is forecast to reach a value of USD 100 billion, increasing at more than 50% since 2009.

Exhibit 18: Continent wise growth of land under organic farming (in million hectares)



Source: Foundation Ecology and Agriculture (SOEL), Research Institute for Organic Agriculture (FiBL) - 2010

- ✓ The off-shore demand for organic food is one of the major drivers of organic agriculture in India. The current size of the domestic market for organic food is pegged at about INR 1,000 crore.
- ✓ Currently, India ranks 33rd in terms of total land under organic cultivation and 88th for agricultural land devoted to organic crops compared to total farming area.
- ✓ India produced around 3,96,997 MT of certified organic products, including all varieties of food products from Basmati rice, pulses, honey, tea, spices, coffee, oilseeds, fruits, processed food and cereals, to herbal medicines and their value-added products.
- ✓ The major organic products for which a growing demand is anticipated are tea, spices and bananas.

Exhibit 19: Major Segments - Product Growth in 5 years (%)

Spices (all)	14%
Pepper	5%
Turmeric	4.5%
Tea	14%
Rice	11%
Fruits (all)	8%
Banana	15%
Mango	5%
Orange	5%
Pineapple	5%
Herbal extracts	8%
Cotton	8%
Coffee	6%
Oil seeds	6%
Honey	6%
Groundnut	6%
Baby food	6%
Coconut	6%

Source: Private Research, YES BANK analysis

Trade

- ✓ According to the APEDA, India exported 86 items of organic products in 2010-11 with the total volume of 69,837 MT.
- ✓ The export realization was around USD 157.22 million registering a 33% growth over the previous year. Organic products were mainly exported to the EU, the USA, Australia, Canada, Japan, Switzerland, South Africa and the Middle East.

Exhibit 20: Major continents – India Organic Exports (2010-11)

Continent	Quantity(in MT)	Value (INR crore)
EU	30,814	365
Canada	15,061	100
USA	13,392	115
Asia	8,867	108
Australia	910	8.3
New Zealand	609	1.9
Africa	185	0.9
Total	69,837	699

Source: Agricultural and Processed Food Products Export Development Authority (APEDA), YES BANK Analysis

- ✓ The following table gives a glimpse of the exports of organic products from India:

Exhibit 21: Category wise exports (2010-11)

Product Category	Export Volume (MT)	% Share
Oil Crops (except Sesame)	17,966	25.73
Cotton & Textiles	17,363	24.86
Processed Food	8,752	12.53
Basmati Rice	5,243	7.51
Tea	2,928	4.19
Sesame	2,409	3.45
Honey	2,409	3.45
Rice	1,634	2.34
Dry Fruits	1,472	2.11
Cereals	1,348	1.93
Spices-Condiments	1,174	1.68
Medicinal & Herbal Plants/Products	627	0.90
Coffee	320	0.46
Vegetables	167	0.24
Aromatic Oil	39	0.06

Source: APEDA, YES BANK analysis

- ✓ Oil crops rank first amongst all categories with a share of 25.73 %
- ✓ The traditional markets of EU are the biggest contributor and are the largest consumer of organic tea, textiles and processed food from India.

- ✓ Organic foods industry currently is predominantly metro-based. At least 95% of the brands market exists in the Top 10 metros viz Delhi (NCR), Kolkata, Mumbai, Pune, Chennai, Bengaluru and the other Tier II cities – e.g. Indore, Nasik, and Nagpur etc
- ✓ In terms of brands, leading brands of organic products are: Conscious Foods, Ecofarms, 24 letter Mantra, Down to earth and Organic India.

Challenges

The challenges in organic farming are spread across; right from farm practices to the final consumption at consumer level. The major challenges underlying organic farming are:

- ✓ Conversion from conventional agriculture to organic farming- A major challenge lies in convincing the farmer and sustaining his interest, season after season for atleast three consecutive years for having his land certified as "organic".
- ✓ Procurement – The firms willing to procure organic produce face challenges in ensuring that the organic output adheres to organic standards; managing the timely availability and ensuring a remunerative price for the farmer.
- ✓ Storage and processing- Owing to lack of scientific storage and understanding of organic and "chemical-free" storage method coupled with processing of produce under organic conditions and no usage of any chemicals is a major challenge in this domain. A breakage in the link anywhere can challenge the authenticity of the produce. Moreover, processing multiple products within one unit and preventing cross contamination is a major challenge for the organic sector.
- ✓ Traceability- "Traceability" is essential to ensure credibility especially for exported organic produce. Owing to lack of sophisticated tracking techniques from "farm-to-fork" this becomes a major hurdle.

Roadmap

A roadmap to organic farming in India would need to take into consideration the fact that the farm production in the sector is under small farmer holding; hence making the farmer aware of the organic sector, educating him of the pros; and more importantly – ensuring that he gets a premium pricing for his organic output compared to conventional crop produce is very important. The following are some recommendations whereby the some of the current guidelines can be tweaked for use in organic sector:

- ✓ Vegetable Initiatives for Urban Clusters- This is being championed by The Department of Agriculture & Cooperation under Ministry of Agriculture in which farmers are being encouraged to grow organic produce and enhanced funding is provided to them.
- ✓ Study tours to organic farming groups for learning organic standards to EU and other organic focused countries. – State governments should set up a corpus fund and sponsor producer groups for such awareness tours so that they get acquainted with world class practices and are able to incorporate them in their fields.

- ✓ State governments to take lead for subsidizing group certification of organic products so as to reduce the overheads for farmers wishing to take up organic farming
- ✓ Encourage setting up "Community Based Organizations" (CBO) for organic farming in villages. State government to provide subsidy schemes for capacity building to such groups by organizing subsidized training programs in organic farming through NABARD.
- ✓ State government support to Organic farming producer groups by forming "Organic farmer markets" in urban centres for direct sales to consumers by producer groups.
- ✓ Enhancement of organic foods exports by special duty drawback scheme under VKUY (Vishesh Krishi Upaj Yojana) scheme

Medicinal and Aromatic Plants (MAPs)

Introduction

- ✓ Medicinal plants are the richest bioresource of drugs for traditional systems of medicine, modern medicines, nutraceuticals, food supplements, folk medicines, pharmaceutical intermediates and chemical entities for synthetic drugs.
- ✓ The use of plants for medicines is by far the biggest use of plants in term of the number of species specifically targeted.
- ✓ The increase in demand for MAPs has induced farmers to undertake the cultivation of these high value products, besides the principal crop production.
- ✓ The scale of trade in MAPs ranges from local to international. Much of this trade is unrecorded or poorly documented in official statistics. Due to the poor documentation, decision makers usually have little awareness of the significance of trade and consumption of medicinal plants.
- ✓ The global pharmaceutical market was worth USD 680 billion in 2006 and as per IMS health estimate is expected to have exceeded USD 825 billion by the current year.
- ✓ It is estimated that world market for plant derived drugs may account for about USD 60 billion per year with a growth rate of about 7% and by the year 2050 it would be touching a value of USD 5 trillion.

Market Structure

- ✓ In the recent past the Indian herbal medicine market has been growing at a steady pace of 15%-20% every year.
- ✓ World trade in medicinal plants is increasing very fast. One of the interesting features of this trade is that the direction of trade is from developing countries to the developed countries.
- ✓ Although India has a strong knowledge base in traditional medicine and vast natural resources of biological diversity with two (i.e. Eastern Himalayas and Western Ghats) of the 14-mega diversity areas of the World located within its border, it contributes only 1.5-2.0 % to the global market share, while China occupies nearly 40% of the market.
- ✓ Currently, estimated area under the medicinal crops in India is in the range of 2 lakh hectares. Nearly 75% of the plant material used in indigenous medicines is collected from forests and wild habitats.
- ✓ The demand for herbal remedies in the developed countries is driven by:
  - Increasing costs of institutional, pharmaceutical-based health care

- Interest of consumers and national governments in greater self-reliance in health care
- Interest of communities and national governments in small and large-scale industrial development, based on local/national biodiversity resources
- Increasing success in validating the safety and efficacy of herbal remedies
- Search for new drugs and treatments of serious and drug-resistant diseases

Trade

✓ The largest global markets for medicinal and aromatic plants are China, France, Germany, Italy, Japan, Spain, UK and USA.

✓ Japan has the highest per capita consumption of botanical medicines in the world.

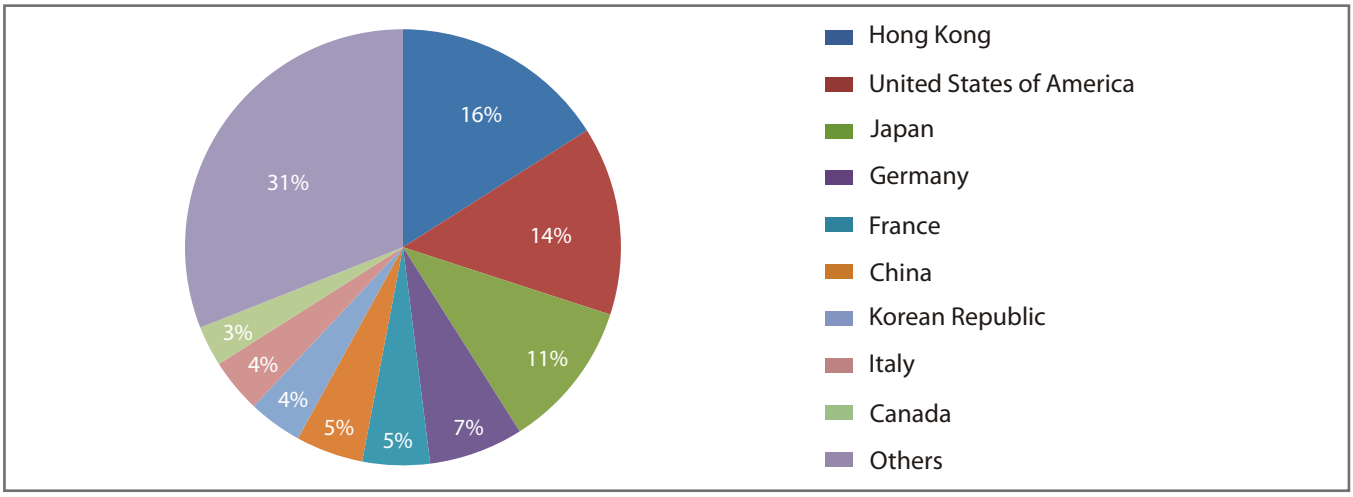
✓ There have been fluctuations in the overall market demand for MAPs, but over the last two decades the average growth rate in volume has exceeded that for the general consumer health industry and has been in the order of 10% per annum in Europe and USA, and is projected to grow at the same rate.

✓ India and China are the two major producing countries, having 40% of the global biodiversity and availability of rare species.

✓ Key importers of medicinal and aromatic plants are Hong Kong, USA, Japan, Germany, Korea and France. However, key exporters are China, Hong Kong, India and Mexico.

✓ About 80% of the worldwide imports and exports are handled by only 12 countries and dominated by the temperate Asian and European countries.

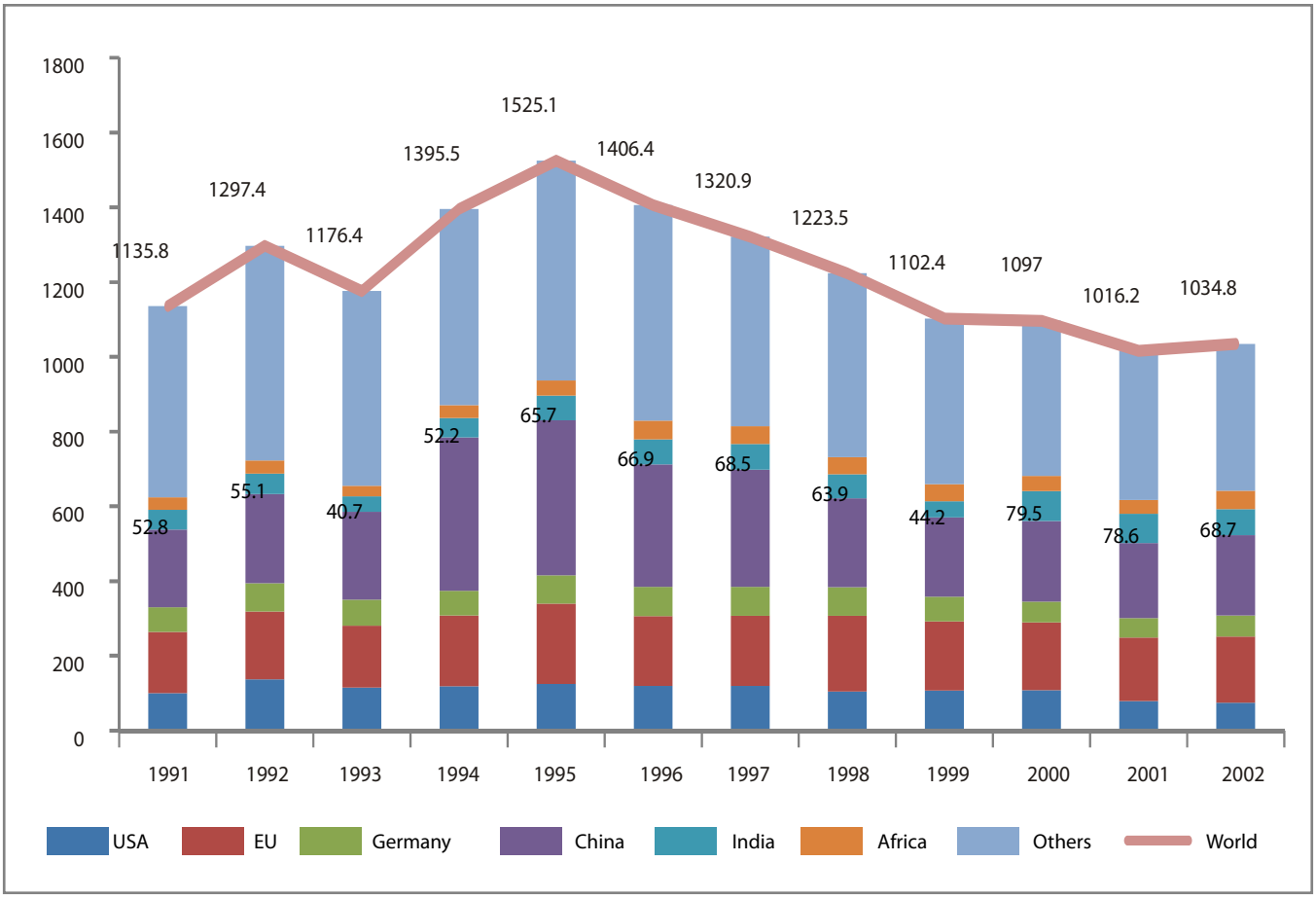
Exhibit 22: Major Importers of Medicinal Plants - 2010-11



Source: National Medicinal Plants Board, International Trade Centre, YES BANK Analysis

- ✓ The high ranking on both the export and import side highlights the importance of USA, Germany and Hong Kong as important trade centres in the MAP trade.

Exhibit 23: World Export Value of Medicinal Plants (in million USD)



Source: National Medicinal Plants Board, International Trade Centre, YES BANK Analysis

- ✓ 75 - 80% of total exports from India are sent to six countries – France, Germany, Japan, Switzerland, UK and US.
- ✓ The principal herbal drugs that have been finding a good market in foreign countries are Aconite, Aloe, Belladona, Acorus, Cinchona, Cassia tora, Dioscorea, Digitalis, Ephedra, Plantago (Isabgol), Cassia (Senna) etc.

Exhibit 24: Major export products (2010-11)

S. No.	Items	Value (in lakh)	Percentage of total value(%)	Quantity in MT	Percentage of quantity (%)
1	Psyllium (Seeds + Husk)	16,775.80	32.53	20,578.59	35.56
2	Senna (Leaves & pods)	2,911.40	5.64	10,924.05	18.87
3	Henna (Leaves & powder)	2,878.00	5.58	4,089.44	7.06
4	Myrobalans	1,974.00	3.82	4,009.86	6.93
5	Sandalwood chips & dust	1,422.40	2.76	105.47	0.18
6	Karaya gum	984.30	1.91	832.10	1.44
7	Jojoba seed	927.50	1.80	867.22	1.50
8	Pepper long	696.80	1.35	812.77	1.40
9	Cassia tora seeds	298.10	0.58	1,572.46	2.72
10	Cassia tora seeds	298.10	0.58	1,572.46	2.72
11	Others (All Miscellaneous)	6,236.20	12.09	12,036.17	20.8
12	All extracts	16,098.80	31.21	1291.71	2.23
Total		**51,577.30**	**100.00**	**57,879.51**	**100.00**

Source : National Medicinal Plants Board, International Trade Centre, YES BANK Analysis

- ✓ The annual exports of India's herbal sector added up to INR 807 crore for the year 2004-05 as per DGCIS data. This included exports worth INR 354.80 crore relating to plant raw drugs, INR 161 crore relating to plant extracts and INR 291 crore relating to medicants of Ayurvedic, Unani, Siddha and Homoeopathic system.
- ✓ The finished herbal products constituted nearly 36% of the total exports of India's herbal sector and the balance 64% exports were in the form of raw materials and extracts.

Challenges

- ✓ Much of the plant material traded is wildcrafted (collected from the wild) and therefore is of inconsistent quality.
- ✓ There is no standardization in agricultural practices for the species being cultivated, leading to low yields and poor quality of produce.
- ✓ Use of chemical fertilizers and pesticides is not always tightly controlled, and the soil on which the plants are cultivated often have high levels of agrochemicals.
- ✓ Harvesting methods and post-harvest treatment practices are inappropriate as the farmers are unskilled, often damaging the constituent characteristics of the material.
- ✓ Little research has been done on the development of high-yielding varieties and of propagation and cultivation protocols.
- ✓ Shelf life is given least attention at the time of harvesting quality raw material, which accounts for maximum deterioration of quality during post harvest handling, packaging and transportation.
- ✓ Medicinal plant parts are identified and their grading and quality assurances are carried out purely through crude, physical observation methods.
- ✓ Good manufacturing practices (GMPs) are not generally followed in the manufacture of plant-based drugs technologies are sometimes antiquated and inadequate attention is given to quality control.
- ✓ Growers of medicinal plants have little direct access to the market, resulting in high degree of wastage, and low returns for farmers.
- ✓ The marketing channel for medicinal plant parts in particular, is unorganized and unregulated. This allows a great amount of illegal trade, unfair practices and share of revenues, and inadequate attention paid to quality control.
- ✓ Lack of information on the source of raw materials is also a key concerns.
- ✓ An individual would have to deal with both National and State laws and taxation for the same item.
- ✓ Movement of goods from one State to (or through) another State could involve a plethora of permits and various restrictions.

Roadmap

- ✓ Skill development: The cultivation practices of medicinal plants not only vary from the staple crops but also amongst themselves. The specifications to grow medicinal and aromatic plants need to be incorporated effectively to retain the medicinal and aromatic properties of these plants. Thus training needs to be imparted to farmers to so that there is minimal loss to the plant properties and farmers get remunerative prices.

- ✓ R&D: Research and development in the field of medicinal and aromatic plants is still in its nascent stages. Nothing much has been done to harness the rich biodiversity of the Indian herbs. Research needs to be developed not only in the cultivation practices but also the extraction methods and storage techniques.
- ✓ Customized tools: There is a need to bring in customized tools for this specialized section, as it is very necessary to keep the plant constituents intact to get the maximum returns. The medicinal and aromatic plants contain their special extracts in different parts like roots, leaves, seeds etc, thus precision is required during the harvesting of these crops which can be made possible through enhanced techniques and customized tools.
- ✓ Modernization of existing pharmacies and production units is a necessary step towards development of this sector.
- ✓ And to increasing the competitiveness of these units and their products in the global marketplace.
- ✓ To give a boost to this segment, the products should be exempted from sales tax/VAT.

Enabling Factors for High Value Agriculture

Farm Inputs

- ✓ Agri-inputs form an indispensible structural and functional component of Agriculture. The quality as well as quantity of these inputs determines the strength and sustainability of the Agri sector.
- ✓ The major farm inputs include seed, fertilizers and plant protection chemicals. Farmers have traditionally been using these inputs to enhance the productivity, but the judicious use of all these inputs is lacking in India.

Exhibit 25: Production and use of Agriculture Inputs

	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11
Seeds (lakh quintals)										
Breeder Seeds	0.46	0.48	0.62	0.67	0.69	0.74	0.92	0.94	1.05	1.19
Foundation Seeds	5.44	6.14	6.50	6.90	7.40	7.96	8.22	9.69	10.50	17.53
Distribution of Certified/Quality Seeds	91.80	98.03	108.59	120.26	126.75	155.01	179.05	215.81	257.11	277.34
Consumption of Chemical Fertilizers (lakh tonnes)										
Nitrogenous (N)	113.10	104.74	110.77	117.13	124.23	137.73	144.19	150.91	155.80	165.58
Phosphatic (P)	43.82	40.19	41.24	46.24	52.04	55.43	55.15	65.06	72.74	80.50
Potassic (K)	16.67	16.01	15.98	20.61	24.13	23.35	26.36	33.12	36.32	35.14
Total	173.60	160.94	167.99	183.98	203.40	216.51	225.70	249.09	264.86	281.22
Per Hectare (kg)	91.13	91.48	88.05	94.52	105.50	111.76	115.27	127.21	135.27	144.14
Consumption of Pesticides (in thousand tones)	47.02	48.30	41.00	40.67	39.77	41.51	43.63	43.86	41.82	55.54

Source: Ministry of Statistics and Program implementation, Government of India

- ✓ With the changing cropping patterns and shift towards high value agricultural products a new approach is required for the use of the farm inputs

New Approach for High Value Agriculture

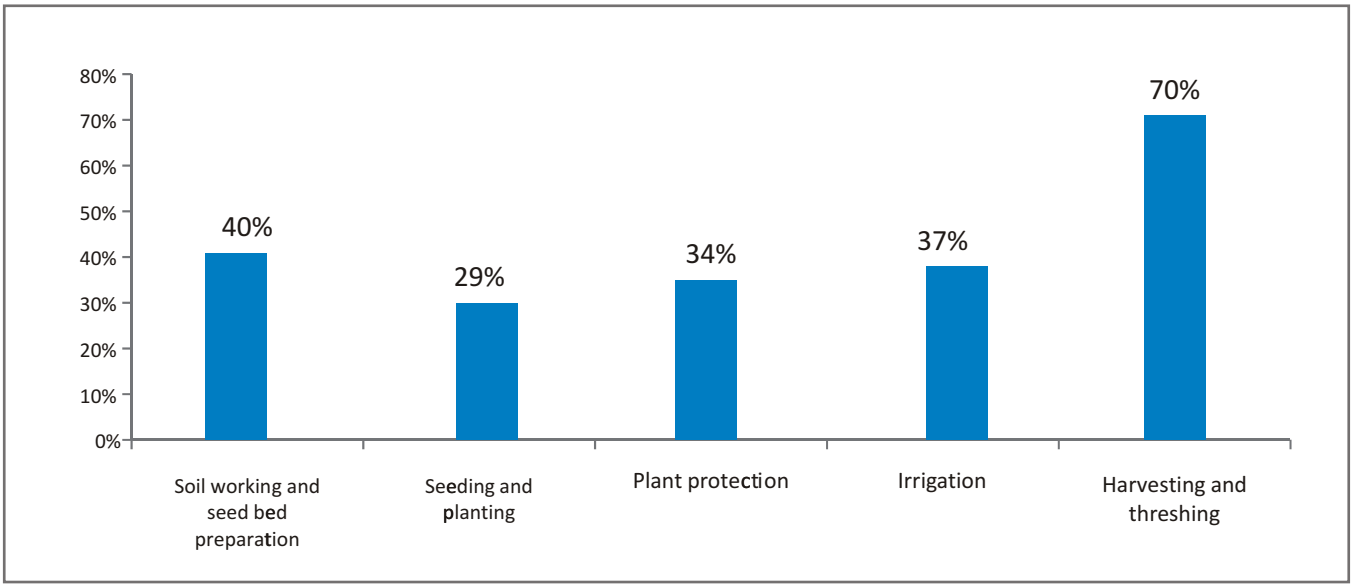
- ✓ Over or under application of crop nutrients results in reduced efficiency or losses in yield and crop quality. Therefore, time specific application, method and dose of fertilizer application are essential to achieve higher fertilizer use efficiency.
- ✓ Encouraging the use of customized and complex fertilizers to the farmers becomes essential to meet the growing demand for High Value Agricultural products.
- ✓ Soil testing remains one of the most powerful tools available for determining the nutrient supplying capacity of the soil. Developing adequate skills in the rural youth for soil testing can prove to be beneficial.

- ✓ Farmers need to be exposed to a genetically diverse portfolio of improved crop varieties that are suited to a range of agro-ecosystems and farming practices and resilient to climate change.
- ✓ Research and development efforts specially in case of seeds, need to be market oriented to meet the needs of the end consumers so that the acceptance level of the hybrid is high and the efforts put, in terms of time and money, do not go in vain.
- ✓ Dependence and overuse of synthetic fertilizers, pesticides and herbicides reduces long-term soil fertility, causes soil erosion, pollutes water, poisons fragile ecosystems, exposes farmers and farm workers to toxins, and contributes to climate change through greenhouse gas emissions. However, this does not mean that pesticides usage should come to a standstill. All that is required is the safe and judicious use of pesticides in the fields.
- ✓ Exports have given a boost to High Value Agriculture crops but the producers need to maintain the sanitary and phytosanitary standards and monitor the pesticide residues in food and agricultural commodities.
- ✓ The way out is to proactively train and educate farmers regarding the quantity to be used, the right application methodology and appropriate chemicals to be used for identified pest problems.
- ✓ The Plant Protection Chemicals industry also needs to re orient itself and broaden the product offerings to address the changing needs of the farmers as they move towards GM crops, integrated pest management and organic farming.
- ✓ Indian companies also need to focus on specialty products like agro chemicals and fertilizers for Medicinal and aromatic plants so that their medicinal properties remain intact and for feed and fodder for milch animals, so that their productivity can be increased.

Farm Mechanization

- ✓ The increased purchase of farm inputs in agriculture has necessitated the use of farm implements to increase their use efficiency.
- ✓ The timeliness of operations has assumed greater significance for obtaining optimal yields from different crops, which has been possible by way of, mechanization.
- ✓ The case becomes stronger for High Value Agriculture where timeliness and accuracy in operations is very essential to maintain the quality of produce.
- ✓ The various operations such as land leveling, irrigation, sowing and planting, application of fertilizers and plant protection chemicals, harvesting and threshing need a high degree of precision to increase the efficiency of the inputs and reduce losses.

Exhibit 26: Level of mechanization for various farm operations



Source: State of Indian Agriculture, 2011-12

- ✓ In India, the level of mechanization is maximum for harvesting and threshing operations and minimum for seeding and planting operations. There lies immense potential for the industry to increase these levels significantly.
- ✓ Mechanization reduces weather risk to quite an extent and risk of non-availability of labor
- ✓ Timely marketing is also made possible by quick mechanical transportation, cleaning and handling.
- ✓ The use of farm mechanization also enlarges the employment opportunities both on farm and nonfarm sectors through increase multiple cropping practices, development of agro-industries and related services.
- ✓ The expansion of cultivation of High value agricultural crops like fruits and vegetables and the increase in their production requires the backing of appropriate tools and techniques.
- ✓ The need for special types of machinery or cultivation equipment arises when it is necessary to work between fruit trees in orchards, where the tree crop already exists and the equipment has to conform to it.
- ✓ Similar equipments are required for medicinal and aromatic plants so that the medicinal and aromatic properties remain intact.
- ✓ Efficient Tools with the latest technologies in place need to be developed for aquaculture and dairy farming so that the potential of these sectors is fully explored.
- ✓ Indigenous milk product industry is very large, unorganized and thus need support for process mechanization and technology upgradation.

- ✓ Meat sector needs to aim at organizing Indian meat industry on scientific and modern lines with focus on developing technologies for clean meat production and processed meats with value addition.

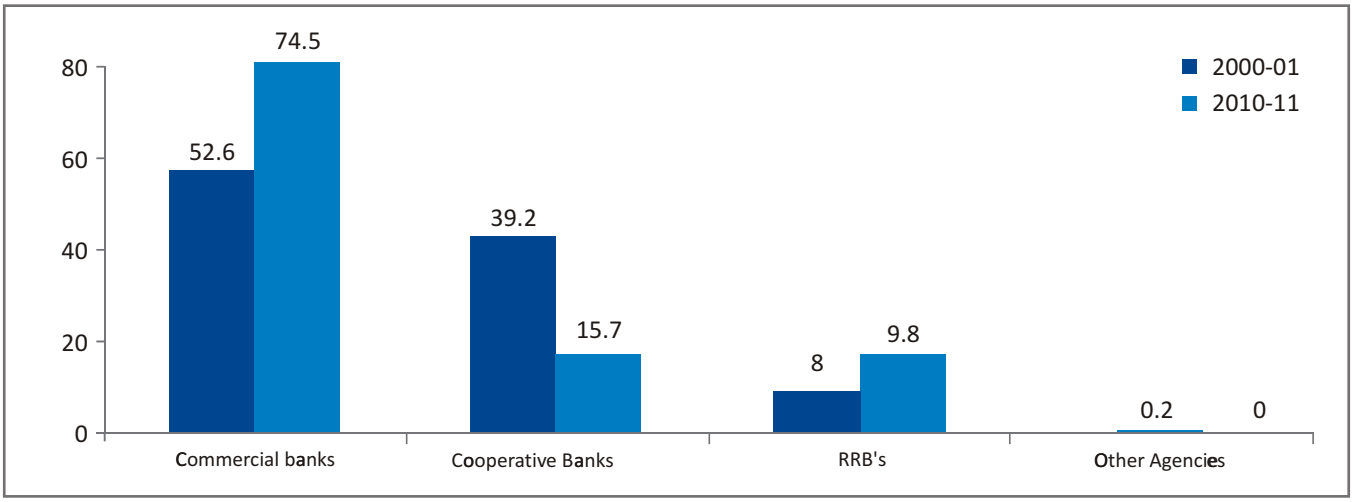
Irrigation

- ✓ Irrigation is one of the most important inputs for crop cultivation. The time and amount of water application is a very important consideration for crop growth.
- ✓ By 2050, about 22% of geographic area and 17% of the population will be under absolute water scarcity. In 2010, per capita availability of water was 1,704 cubic meters and is projected to slide down to 1,235 cubic meters till 2050. Therefore prudent use of water is the need of the hour.
- ✓ Irrigation plays an important role in increasing crop intensity, changing the cropping pattern and increasing crop yield. This feature holds great importance for high value agricultural products, supplies of which need to cope with the rising domestic and overseas demand.
- ✓ Since every crop has unique requirement of water at different stages from pre sowing till final harvest of the crop, farmers need to be aware of these timings to get the maximum yield.
- ✓ Application of micro irrigation results in more water use efficiency (WUE) and about 30-70% of water saving compared to traditional flood water irrigation. Thus micro irrigation must be propagated extensively for High Value Agriculture.
- ✓ Modern techniques such as micro-irrigation, water shed management, rainwater harvesting, ground water recharging etc are important and viable techniques that can be employed in a broader scale to achieve better water use efficiency and address the challenging issue of water shortage.

Agri- Finance

- ✓ India has perhaps the world's largest network of rural financial institutions, boasting of more than 30,272 nationalized commercial bank branches; 2,934 other commercial banks; 14,241 rural regional bank branches and about 1,22,000 credit outlets from the cooperative sector which cater to the credit requirements of the priority sector.
- ✓ The demand for agricultural credit basically arises due to time lag between the realization of income and actual expenditure.
- ✓ Agriculture credit has been growing consistently since the past few years. As against the target of INR 4,75,000 crore of credit flow to agriculture for 2011-12, the banking system disbursed INR 5,09,040 crore as on 31st March 2012, achieving 107.2 % of the target.
- ✓ Commercial banks, Cooperative banks and Regional Rural Banks disbursed INR 3,68,616 crore, INR 86,185 crore and INR 54,239 crore, respectively, constituting 72%, 17% and 11% of the total credit flow during 2011-12.

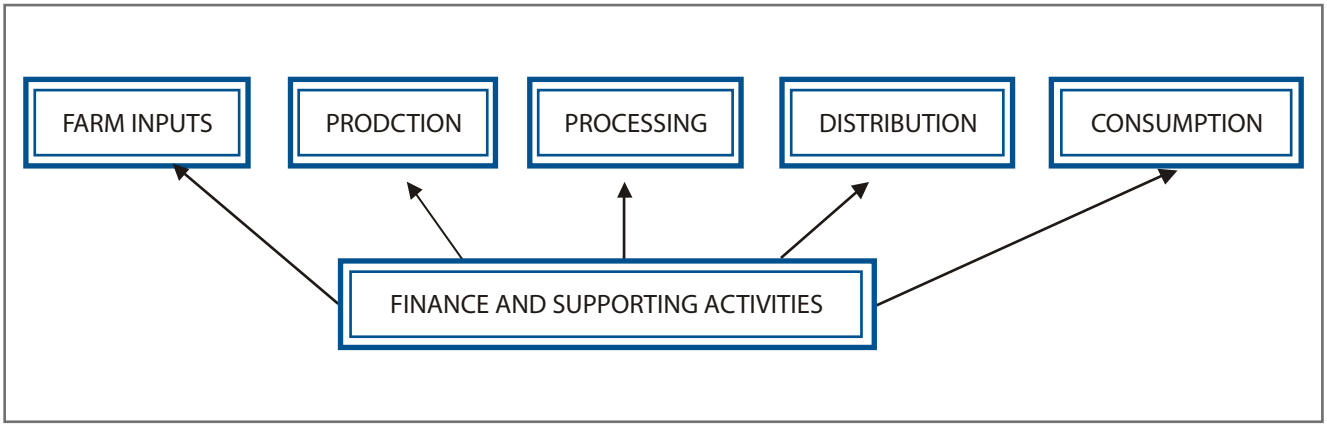
Exhibit 27: Sources of Institutional Agricultural Credit (%)



Source: National Bank for Agriculture and Rural Development (NABARD)

- ✓ As India moves towards producing more of High value Agricultural products, the Financing strategies need to change to respond to the changing agrifood systems.
- ✓ Financial institutions should now move more towards financing the entire value chain and not only the producers.

Exhibit 28: The Farming Ecosystem



Source: YES BANK Analysis

Agri- Infrastructure

- ✓ Agri infrastructure is one of the major requirements for taking the High Value Agriculture forward. This sector can actually bring in a revolutionary change in the food security and nutritional requirement of the country
- ✓ Agri infrastructure includes infrastructure that supports on-farm production (irrigation, soil and water management , transportation, pre- and post-harvest storage), ensures efficient trading and exchange (information and communication technology, wholesale and regulated markets), adds value to the domestic economy (agro-processing and packaging facilities), and enables produce to move rapidly and efficiently from farm-gate to processing facilities, and finally to wholesalers and retailers (logistics, transportation and storage).
- ✓ As India suffers an estimated food grain and agriculture produce (fruits and vegetable) loss of over INR 500 billion due to inadequate post harvest infrastructure and inefficient supply chain management, creation of Agri-infrastructure become all the more critical for the country.
- ✓ The Post-harvest losses in the country range from 5-10% for non-perishables and about 35% for perishables.
- ✓ Research studies have shown that marginal returns on agri-investments are 5 to 10 times higher than for agri- input subsidies. This clearly confirms that impetus should be more on creating agri infrastructure than giving out various subsidies which have had no major impact on agriculture till now.
- ✓ The current scenario of agri infrastructure in India is not very promising
    - In terms of value, market size of warehouse in FY09 was INR 19,200 crore and it grew to INR 22,810 crore in FY11 and is expected to grow to INR 35,100 crore in FY 16 with a CAGR of 9%. In this, only 12% accounts for agro and 88% industrial warehousing
    - India has nearly 23 million MT of cold storage facilities where as it needs currently at least 9-10 million MT more of capacity.
    - Uttar Pradesh, West Bengal and Punjab accounts for around 70% of the capacity.
    - Existing cold storage facilities are available for a single commodity and around 80% of them are utilized for potato storage.
    - The overall market size of the cold storage segment is expected to grow at a CAGR of 16-17% in next 3-4 years.
- ✓ Owing to the perishability of most of the high value agricultural products, like fruits and vegetables milk, meat etc. agri infrastructures like warehouses and cold storages are required to maintain quality and prevent losses. As of today a large percentage of fruits and vegetables, fish, meat and other products disintegrate before reaching processing factories/market.
- ✓ In the fisheries sector, construction of ponds, aerators, hatcheries, fishing gear, cold containers etc. require specialized technology. Similarly the meat industry requires cold storages with precise temperature and moisture

content. Creating such specialized structures can advantage the stakeholders involved in the entire value chain of High Value Agriculture produce.

Extension

- ✓ Shift of small farmers to High Value Agriculture depends much on knowledge transfer, infrastructure facilities, marketing linkages, credit support and skill development.
- ✓ The growing competitiveness of the market demands highly skilled manpower at each stage of the value chain. But, at present the agri sector is highly deficient in such human resource with a broad range of skills.
- ✓ The prime reason being that producers believe that specific skill sets are required only for the purpose of exports, however this is not the case. Today domestic market demands similar quality products.
- ✓ Farmers practicing High Value Agriculture require information related to the most appropriate technological options, management tools, optimal use of inputs, changing farm systems (mixed farming and diversification, animal husbandry, fisheries), Collective action with other farmers and assessment of consumer demands for products in terms of quality as well as quantity.
- ✓ Therefore, Agricultural extension now needs to play an extensive role in developing human capital, enhancing skills and disseminating knowledge for production and processing, facilitating access to markets and trade, organizing farmers and producer groups and working with farmers towards achieving world quality standards for high value agricultural produce.
- ✓ For this, the extension workers need to have a full fledged information backup with latest updates, novice techniques of engaging farmers and a complete knowledge of the market dynamics for different high value agricultural products like marine products, meat, fruits and vegetables, medicinal and aromatic plants and organic produce.
- ✓ An efficient network of extension service needs to be developed to stimulate and encourage flow of information between farmers, extension workers, and research scientists to promote the requisite extension activity.
- ✓ Information dissemination through agri fairs/exhibitions is an excellent platform to demonstrate the latest technological advancements and dissemination of information to the farming community and also promoting agribusiness opportunities.
- ✓ State operated Krishi Vigyan Kendras (KVKs) must strengthen links between farmers and research stations to help farmers adopt the latest technologies and farm operations.

Supply Chain

- ✓ The existing supply chain in India suffers from many inefficiencies like unnecessary intermediation, low realization to farmers, lack of infrastructure, lack of skills to handle perishables with care and many more.
- ✓ Owing to the perishability and shorter shelf life of the High Value Agriculture produce an efficient supply chain is imperative to reduce losses and earn remunerative prices.

- ✓ Currently each stakeholder in the agri value chain works in silos, aiming to get the highest margin for himself.
- ✓ According to Directorate of Marketing and Inspection these costs and margins account for 45-55% in fruits and vegetables.
- ✓ In case of fisheries the fishermen realize only 25% of the actual price of the produce. The main reason being that the fishermen are the most disorganized group in the supply chain and are inadequately equipped to handle the technical, financial and legal developments in their industry.
- ✓ Similarly the value chain for livestock suffers from various complexities. The complexity starts from the feed in terms of safe inputs and continues through processing and retailing of the products.
- ✓ On the production side the livestock sector faces constraints in terms of lack of high quality feed grains or oil meals and shrinking grazing ground. Animal mortality is also significantly high in India and is reportedly at 7.5% in cattle and 9.6% in buffaloes.
- ✓ On the processing front the level of meat processing in India is only about 6%, which includes pork and beef.
- ✓ The above scenario calls for an overhaul in the entire value chain in terms of increased productivity, improved storage facilities, favorable intermediation and higher value addition.

Marketing of High Value Products - Use of Technology in Marketing

Introduction

- ✓ With increasing prospects of high value agricultural crops like fruits and vegetables, dairy products, meat products, medicinal plants etc, agricultural marketing and external trade in agricultural are assuming increasing importance.
- ✓ Such changing environment makes information not merely useful, but necessary to remain competitive in the domestic and moreover in the export market.
- ✓ Globalization has also brought about a drastic change in India across all sectors and more so on agriculture. On one hand it has opened up excellent export opportunities for farmers and specially for those involved in High Value Agriculture, and on the other it has brought several challenges and threats like uncertainty in prices, fluctuating demand and extensive competition with developing as well as developed nations.
- ✓ To make India competitive in the global arena an effective market Information System is required.
- ✓ The four pillars of an efficient and effective Market Information System are Availability, Accuracy, Applicability and Analysis

Exhibit 29: The Four A's of an Effective and Efficient Agri market Information System

Accuracy	Availability	Applicability	Analysis
Necessary to make the information actually meaningful. Farmers Must understand to which product, quality, variety, etc. the prices and other information refer.	Accurate information is meaningless if not provided in time	Farmers need to be able to apply the accurate information made available to them.	Farmers require long-term data, which can been analyzed in a way that decisions can be made on its basis. E.g when to plant and harvest and what new crops to diversify into.

Source: YES BANK Analysis

Challenges

- ✓ Limited access to the market information.
- ✓ Literacy level among the farmers is low.

- ✓ At present, the Indian farmer depends on information inputs from conventional sources including the middlemen which are slow and unreliable.
- ✓ Farmers are not conversant with the complexities of the marketing system which have become more and more complicated with time.
- ✓ The producer is handicapped by several disabilities as a seller. He sells his produce at an unfavorable place, time and price because of incomplete or no information about the existing market demand and prices along with inadequate storage system.
- ✓ In order to access larger markets, farmers also require to know about the market requirement in terms of quality, packing and safety standards. In the absence of such awareness, the outreach continues to be restricted to local market places where intermediaries take away a major share of the price.

Role of IT in Marketing

- ✓ Information Technology is an important facilitating function in the agricultural marketing system as it has a major role to play in the key decision making activities.
- ✓ Information Technology facilitates marketing decisions regarding the choice of crops, time of operations, prevailing market prices etc.
- ✓ Regular, timely and reliable market information is needed by farmers in planning production and marketing, as well as by other market participants in arriving at optimal trading decisions.
- ✓ IT also facilitates the role of extension workers who work for the benefit of farmers. If these workers are unable to get the latest information, it hinders their ability to serve the farming community effectively.

Current Scenario

- ✓ In India, the traditional farming is rapidly being transformed into a commercial venture to cater to the needs of domestic as well as export markets.
- ✓ The farmers involved in the practices of fruits and vegetables, dairy, poultry etc, are in dire need for reliable and timely market information for a decision support system.
- ✓ However, receiving timely and accurate information remains a challenge for all the stakeholders of value chain.
- ✓ The system of providing market information to the farmers varies across states. However, the common feature remains that these prevailing systems are mostly based on conventional methods of getting information as well as transmitting it, due to which communication of information to target groups usually gets delayed loses its relevance.
- ✓ Currently the market information is provided by the APMC's in most of the states as they contain the statistics of arrival, sales, and prices of foodgrains and horticultural crops.

- ✓ Displaying the prices prevailing in the market on the notice boards and broadcasting through All-India Radio remain the most common methods of information transfer.
- ✓ To overcome the existing deficit of market information, the government came up with system to link the market data on prime agricultural commodities at the national level through AGMARKNET.
- ✓ Through AGMARKNET the day to day market trade information is collected at all important Agriculture Produce Market Committees (APMC) and fed on a common portal so that all the APMCs become aware of the latest market trends all over India within a day.
- ✓ However this portal also remains limited to the users who can access internet. Thus most farmers remain deprived of the advantages of this initiative.

Roadmap

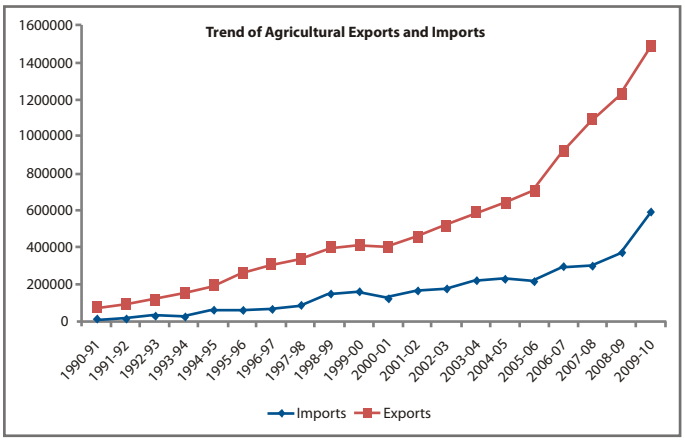
- ✓ Information Technology alone cannot bring a revolutionary change in the Indian agriculture unless it is supported by an adequate literacy levels so that farmers can atleast read the information provided and a basic knowledge of internet usage to access the information.
- ✓ Information Technology can only provide the communication to the entity, how to utilize the information for highest returns depends on the skills of an individual. These skills need to be developed in the Indian farmers through extension methods
- ✓ There are many areas in the country which lack basic facilities like power and infrastructure. First these basic facilities should be provided so that farmers have access to information.
- ✓ Efforts should be made to collate all information right from weather outlook, application time and method of usage of farm inputs, daily prices etc. should be made available on one portal.
- ✓ The portals should be provided in the regional language for easy understanding to farmers.
- ✓ Since IT can provide adequate knowledge on the price of commodities, efforts should be made for provision of storing the stocks in godowns and warehouses. It helps the farmers to hold the stocks till they can get remunerative prices

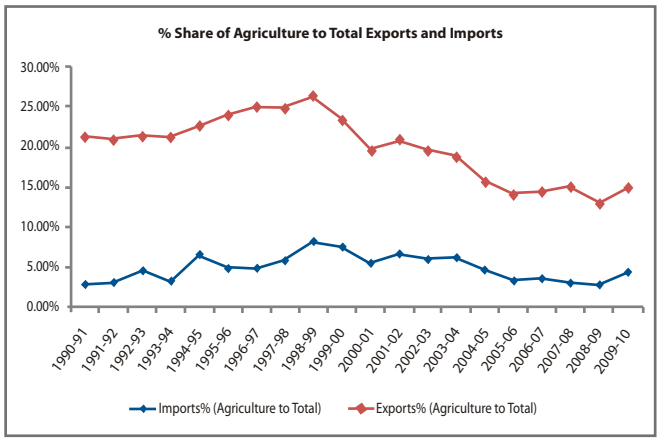
Repositioning the Trade Basket

Introduction

- ✓ The share of agriculture in total export value has declined over the years from about 18.5% in 1990-91 to about 10.6% in 2009-10, while share of agricultural imports to total national imports increased from 2.8% in 1990- to about 4.4% in 2009-10 (Government of India, 2010), touching a point of 8.2% in 1998-99. However the agricultural exports as well as imports have increased over the period with a growth rate of 13.8% and 48.2% respectively

Exhibit 30: Export and import trends





Source: Directorate of Economics and Statistics, Government of India

- ✓ The new trend shows an accelerated flow of exports of high value food products from developing to developed countries.
- ✓ India however is not a significant player in the global trade of agricultural products. It shares only 1.2% of exports and 0.8% of imports.
- ✓ Trade in high-value products has increasingly displaced exports of traditional commodities such as rice, sugar, tea, coffee, tobacco, etc. as a result of which the growth rate in value of exports of rice, sugar, tea, etc., declined, while that of high-value exports grew significantly.

Changing Consumption and Production Pattern

- ✓ With a diversification in the agricultural production portfolio, the food procurement and distribution system has also witnessed institutional changes with Innovations like contract farming, producers' associations, cooperatives and modern retail formats for reaching out to customers like supermarkets and hypermarkets.

- ✓ The high-value segment of agriculture offers considerable opportunities to farmers for improvement in their livelihood as high value commodities have a strong potential for higher returns to land, labor and capital.
- ✓ The recent spurt in food prices was mainly driven by increase in prices of items like fruits and vegetables, milk, meat, poultry, and fish, which account for approximately 70% of the wholesale price index (WPI) basket for primary food items.
- ✓ The table below shows the changing trend in the share of expenditure to the total food expenditure.

Exhibit 31: Item wise share of expenditure to total food expenditure

	Rural (INR crore)			Urban (INR crore)		
	1987-88	2009-10	Growth Percentage	1987-88	2009-10	Growth Percentage
Cereals	41.1	29.1	-29.2	26.6	22.4	-15.8
Pulses and Products	6.3	6.9	9.5	6.0	6.6	10.0
Milk and Milk products	13.4	16.0	19.4	16.8	19.2	14.3
Egg, Fish and Meat	5.2	6.5	25.0	6,4	6.6	3.1
Vegetables	8.1	11.6	43.2	9.4	10.6	12.8
Sugar	4.5	4.5	0.0	4.3	3.7	-14.0

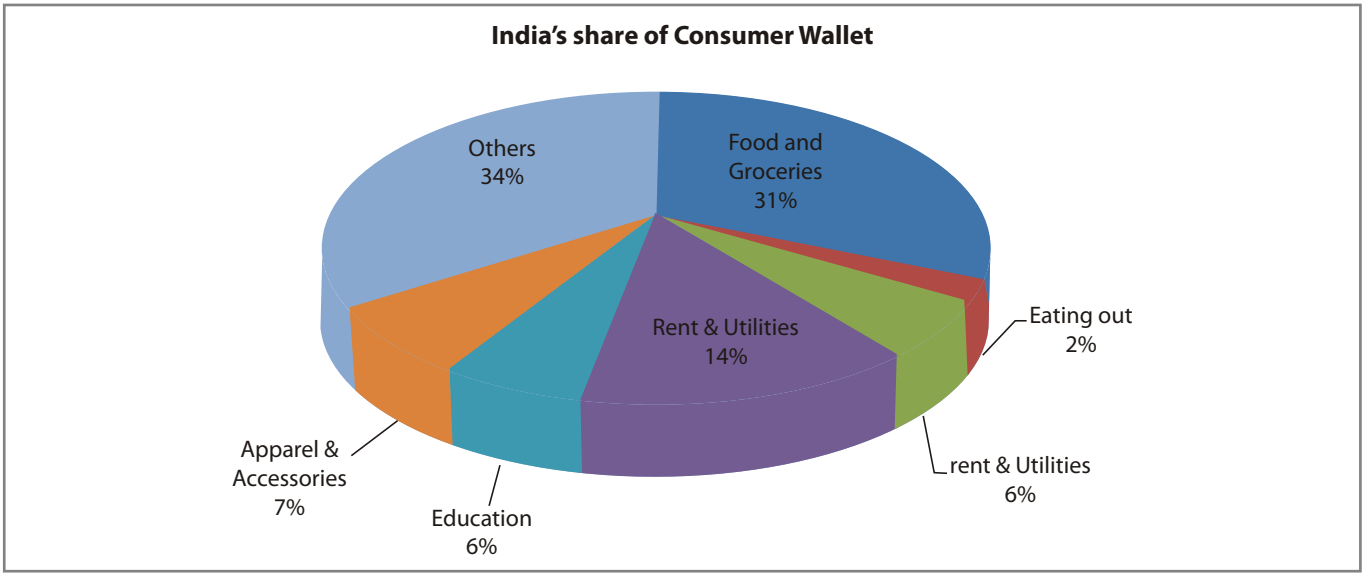
Source: National Sample Survey Office, Government of India

- ✓ There has been a shift in the expenditure pattern of the rural as well as the urban households. The drop in share of cereals in urban areas stood at 15.8%, while the increase in the share of milk and milk products was 14.3%, of vegetables was 12.8% and that of egg, fish and meat was 3.1%.
- ✓ The change has been more conspicuous in rural areas than urban areas.
- ✓ For rural consumers, the share of high-value food commodities like fruits, vegetables and animal products has seen a drastic increase. The share of milk and milk products increased by 19.4%, vegetables by 43.2%, and meat and meat products by 25%. On the other hand the share of cereals dropped by 29.2%, in 2009-10.
- ✓ Though urban consumers spend relatively more on high-value foods, their consumption in rural areas has been growing faster, indicating a tendency of convergence in the consumption pattern.
- ✓ The demand for high-value food commodities is more responsive to income changes as compared to the expenditure on foodgrains. Thus, with increasing disposable incomes, consumers tend to spend relatively more on high-value foods.

Reasons for the Shift Towards High Value Products

- ✓ Changing lifestyles
- ✓ Increasing entry of women in workforce hence increase in household income.
- ✓ Growing nuclear families
- ✓ Increasing use of credit cards
- ✓ Improvements in transport infrastructure
- ✓ Rise of supermarkets and easy availability of all agri products.
- ✓ Increase in per capita disposable income.
  - There has been more than 8% increase in the disposable income over last five years which has led to an increase in per capita consumption expenditure on food by 20% over the same period.
  - The current per capita expenditure on food is one-sixth that of China and one-sixteenth that of US with a significant lower than these countries and poses opportunity for growth in the future.

Exhibit 32: India's share of consumer wallet



Source: National Sample Survey Office, Government of India

Changing Dynamics of Food Production

- ✓ Since high-value agricultural commodities and processed foods represent a larger share of the food budget of high-income consumers, farmers are also responding to market signals and shifting from meeting domestic demand to meeting international demand.

- ✓ Thus the production mix has changed from staple crops toward high-value agricultural commodities.
- ✓ This is reflected in the changing share of high value crops in total value of output from agriculture.
  - The area under foodgrains has grown at a CAGR of 0.4%, while the production by 2.68% in a span of five years. On the hand the horticultural crops which come under high value products saw an increase of 2.38% (CAGR) in area and 4.77% in production over the same period.

Exhibit 33: Area and production of Foodgrains and Horticultural crops

	Foodgrains		Horticultural Crops	
Year	Area (million Ha)	Production (million MT)	Area (million Ha)	Production (million MT)
2006-07	123.71	217.28	19.39	191.81
2007-08	124.07	230.78	20.21	211.24
2008-09	122.83	234.47	20.52	214.44
2009-10	121.33	218.11	20.76	223.16
2010-11	125.73	241.57	21.30	231.14
CAGR(%)	**0.40**	**2.68**	**2.38**	**4.77**

Source: Directorate of Economics and Statistics, Government of India

- ✓ Consecutively, the area under foodgrains has seen a growth of 0.40% (CAGR) since 2006, while under horticultural crops has seen a growth of 2.38%. Similarly the production of foodgrains and horticultural crops saw an increase of 2.68% and 4.77% (CAGR) respectively.
- ✓ The change in trade policies due to liberalization and globalization has also led to the changing production pattern.
- ✓ Policies to promote trade, including lower tariff barriers, market-determined exchange rates, and deregulation of international trade, have created opportunities for India to export agricultural commodities to the developed as well as developing nations.
- ✓ Both the facts that developing countries have reduced the import barriers and India has increased the incentives for export, has facilitated the export of high value products.

Role of Public and Private Sector in High Value Agriculture

- ✓ The role of PPP in High Value Agriculture is essentially required so that the entire supply chain moves in unison, sharing similar goals and objectives. The coordination of various players through horizontal as well as vertical linkages is fundamentally required.

- ✓ However PPP involves considerable transaction costs in terms of coordination, information and communication. Therefore, successful PPPs must generate benefits that outweigh the costs. Two essential requirements for creation of a PPP are:

  (1) The existence of common interests between public and private parties

  (2) Positive benefit-cost ratios for both the public and private sectors

Role of Public and private sector in the supply chain management of High Value Agriculture:

	Public Sector	Private Sector
Production	• Pricing policies for farm inputs and output (MSP) • Regulation of market competition	• Following the prescribed standards for production of the final goods • Producing customized inputs for dairy, horticulture and other high value sectors
Procurement	• Pricing policies for farm inputs as well as output • Regulating market competition	•Purchase of Inputs for production
Logistics	• Public Distribution of Commodities	• Manage logistics to carry out distribution activities
Marketing	• Public certification • Promotion of crops	• Brand development • Appropriate labeling • Commodity promotion and retailing

	Public Sector	Private Sector
Credit	•Public Sector Banks •Credit Subsidies	•Private sector banks •Microfinance • Informal credit lending
R&D	• Public spending on R&D • Production for seeds, inputs, new varieties	• Private R&D • Production for seeds, inputs, varieties for High Value Agriculture
Infrastructure Development	• Public Infrastructure like roads, ports, storage facilities • Basic facilities like power, water etc	• Private Infrastructure like processing units and storage systems • Use of latest technologies in the infrastructure
Extension Services	• Technical assistance to producers for farm practices	• Provide latest industry updates to extension workers
Information Services	• Provide statistics on prices, yield etc. • Transfer information from Research units to farms through extension	• Incorporate latest technologies in the system to disseminate information

Needed role for Supply Chain Management, Market Failures and PPP prospects

	Needed roles for SCM	Market Failures	PPP Prospects
Production	• Production of HVA crops • Addressing the quality issues • Meeting customized consumer needs	• Scale of production • Limited skills, • Poor price incentives, • Lacking market awareness	• Linking Farmers with private sector buyers through public support agencies
Input Procurement	• Use of High quality inputs. • Customized inputs for sectors like dairy and poultry	• High taxes/ subsidies • Lack of credit access for input procurement • Production of low quality inputs	• Creation of producer organizations to procure inputs in bulk to reduce costs
Logistics	• Reduce transaction costs in distribution	• Poor infrastructure • Low market access for remote area • Lack of private sector activity	• PPP to link distribution activities in remote communities • PPP in creation of infrastructure
Marketing	• Product differentiation • Market segmentation, branding strategies • Value addition at each stage	• Limited scale of operations • Lack of knowledge about branding, marketing strategies	• Establishing partnerships with retailers for branding and marketing of products through NGO's or producer organizations
Credit	• Access to credit to purchase high quality inputs and increase scale of production	• Limited access to credit on account of high transaction cost • Prevalence of informal credit	• Provision of microcredit
R&D	• Development of new technologies • Transfer of existing technologies to farms • Customization of • technologies	• Private profitability of varieties with social benefits may be low or negative	• Research partnerships to develop socially beneficial inputs to production

	Needed roles for SCM	Market Failures	PPP Prospects
Infrastructure Development	• Manage product flows efficiently for timely delivery to buyers • Maintain adequate specifications of warehouses and cold storages	• High transportation costs • Erratic information flows • Inadequate specifications of infrastructure	• PPP to create and maintain basic infrastructure. • PPP to create state of the art infrastructure
Extension services	• Knowledge of specialized techniques for high value products • Skill development	• Limited knowledge of new techniques • Under funding of services • Traditional methods of services	• PPP to leverage public and private delivery of specific types of extension services.
Information Services	• Integrate information flows across supply chain actors • Two way flow of information	• Imperfect information • Smallholders still depend on information provided by intermediaries. • Lack of accurate information in time	• Integrating govt. statistics agencies with private producer associations to develop MIS • Use of IT to disseminate market information

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About YES BANK

YES BANK, India's fourth largest private sector bank, is the outcome of the professional & entrepreneurial commitment of its Founder, Dr. 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 Branch Banking (Individuals and SMEs) and Corporate clients. As a part of this knowledge driven approach, YES BANK focuses on key growth sectors like Infrastructure, Lifesciences, Food & Agribusiness, Telecommunications, Information Technology, Renewable Energy, Media & Entertainment, Manufacturing and Textiles, among others.

YES BANK's differentiated approach to banking provides industry specific financial solutions which facilitate superior structuring and tailored financial solutions. YES BANK is steadily evolving as the Professionals Bank of India with the long term mission of "Building the Best Quality Bank of the World in India".

About NSFI

NSFI is a not-for-profit Foundation started by a group of leading professionals from Agri business background and is primarily focused on the objective of skill building and development of vocational opportunities for India's large but relatively "unskilled" workforce. National Skills Foundation of India works towards poverty reduction through skill endowment and capacity building of unskilled labour force at the bottom of the pyramid. NSFI partners with Private Sector, Government, Universities, Institutions and Multilateral Agencies for skill development through: policy advocacy and research on building a holistic skill development eco system in the country. Execution of demand based market driven skill development training programs in emerging sectors like Agriculture, Agri supply chain, Food Processing, Retail, Logistics, Warehousing, Rural Distribution, Hospitality etc.; building strong knowledge base using research and development leading to policy formation and/or reforms; demand led training programs which nurture & develop employability and sustainable livelihood concerns of urban & rural youth, farmers, small vendors, women entrepreneurs and Workers in unorganized sector.

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