NIFTEM
KNOWLEDGE · INNOVATION · OUTREACH

M⊙FPI
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National Institute of Food Technology, Entrepreneurship & Management (NIFTEM)

National Workshop on Skill Development and Consultancy Initiative

By
NIFTEM

Food Processing Sector

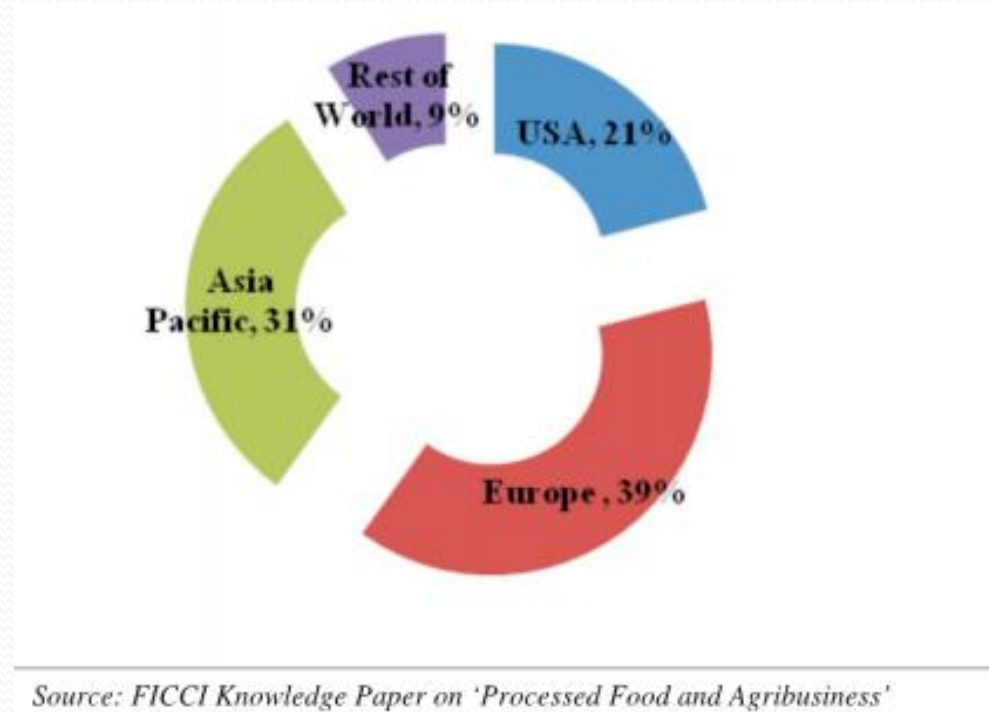**<u>Importance</u>** | Outlook | Requirements

Current Standing

Agriculture accounts for about 1/4th of the Indian economy but employs about 2/3rd of its population.

Food Processing is employment intensive as for every Rs. 1 million invested, 1.8 jobs and 6.4 indirect jobs are created

The Processed Food Industry is divided into the following broad segments:

- **Primary Processed Food** – which includes products such as fruits and vegetables, packed milk, unbranded edible oil, milled rice, flour, tea, coffee, pulses, spices, and salt, sold in packed or non-packed forms.

- **Value-added Processed Food** – which includes products such as processed fruits and vegetables, juices, jams, pickles, squashes, concentrate, processed dairy products (ghee, paneer, cheese, butter), processed poultry, processed marine products, confectionary, chocolates, alcoholic beverage segments:

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Major markets for sale of processed food

Rest of World, 9%

USA, 21%

Asia Pacific, 31%

Europe, 39%

Source: FICCI Knowledge Paper on 'Processed Food and Agribusiness'
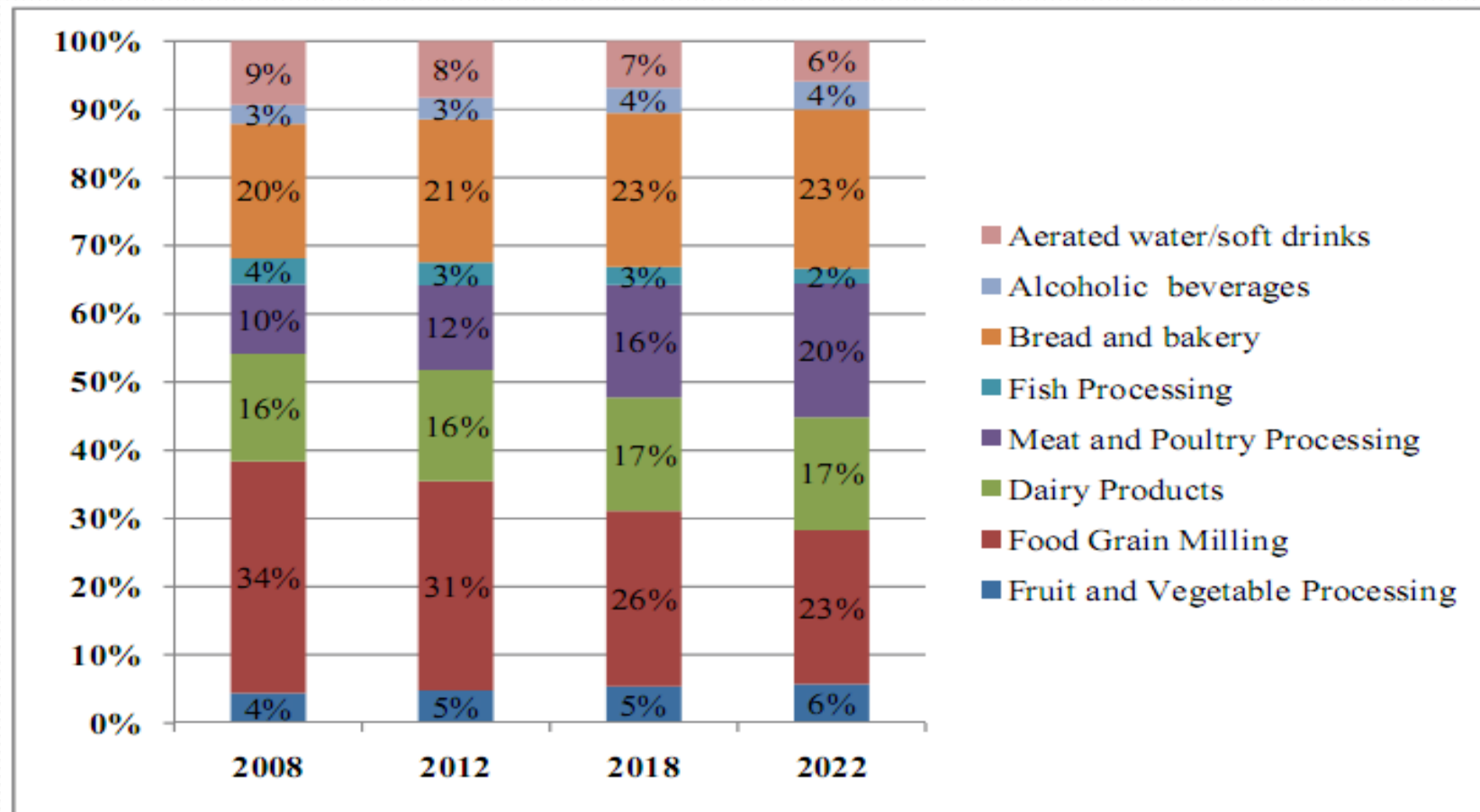
- The share of India in the global processed food trade is currently 1.6%.
- MOFPI Vision 2015 aims to increase India's share in world processed food trade to 3%

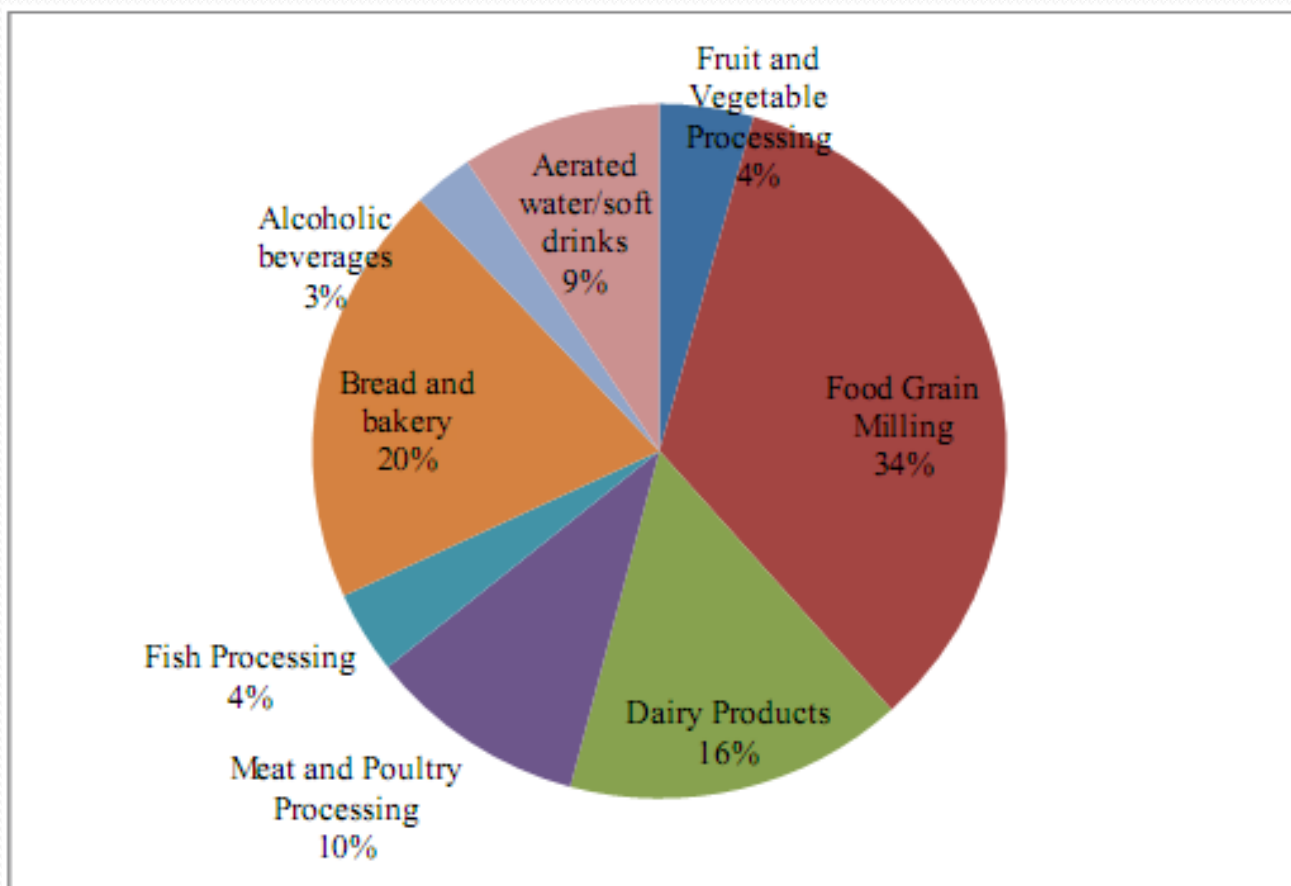# Overview of India's Food Processing Industry
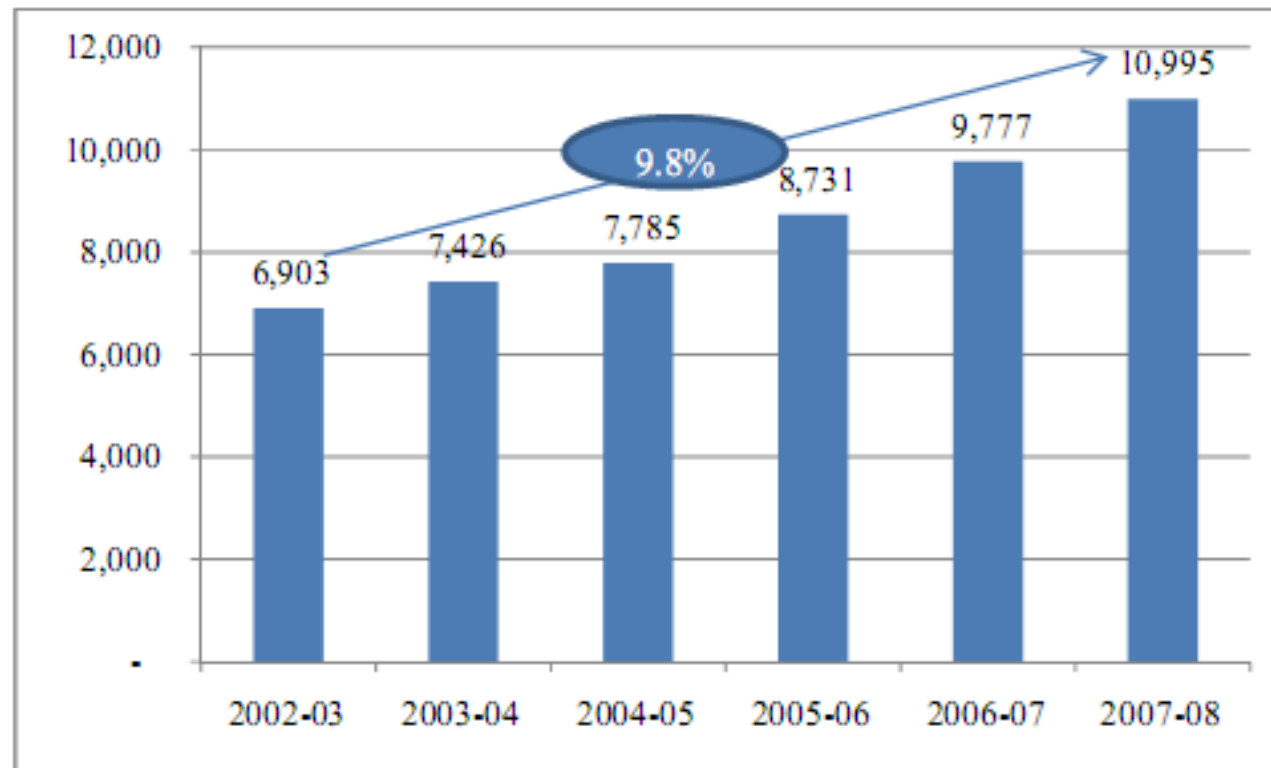
Source: CSO and IMaCS analysis

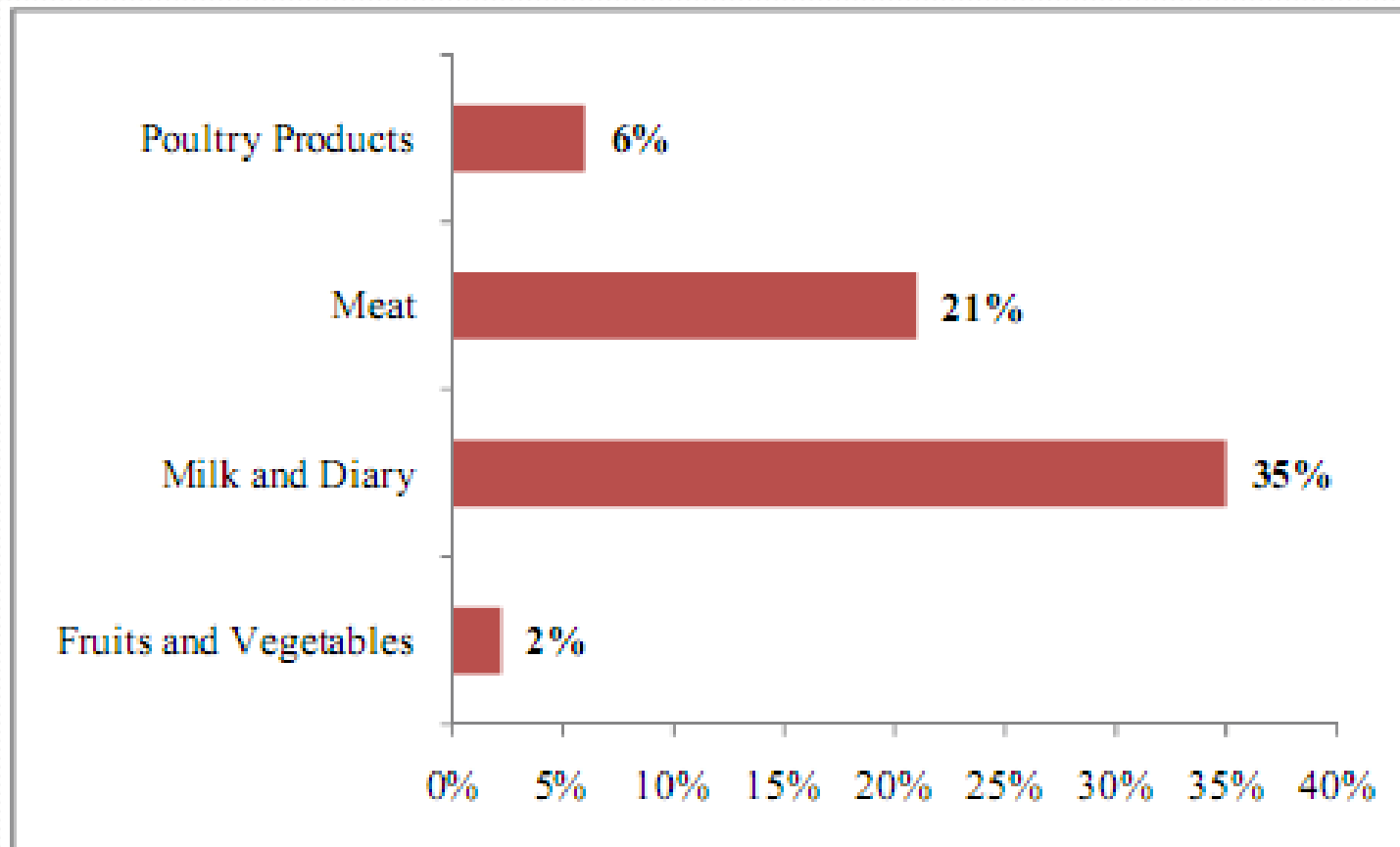# Emerging Trends in the Food Processing Sector in India

Source: ASI, NSSO, MOFPI Vision 2015, and IMaCS analysis

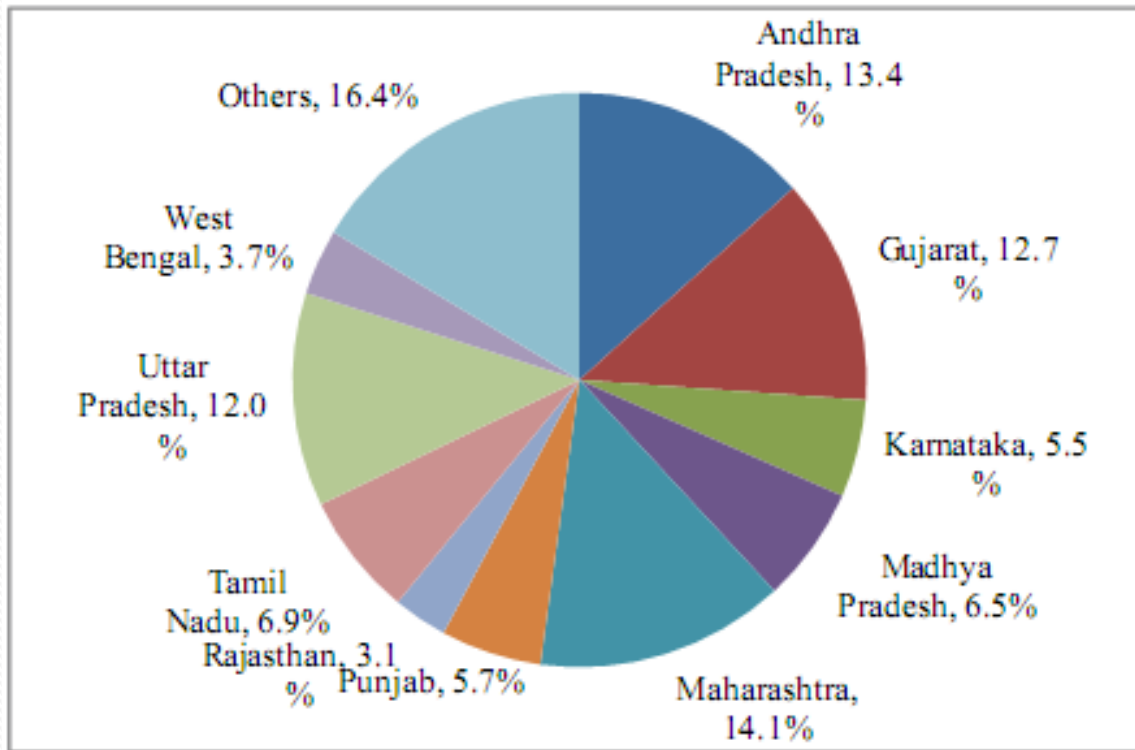# Major markets for sale of processed food

Source: Annual Survey of Industry (ASI), MOFPI and IMaCS analysis;

Level of processing in India in select segments

Source: MOFPI and IMaCS analysis

The Major Food Processing States in India
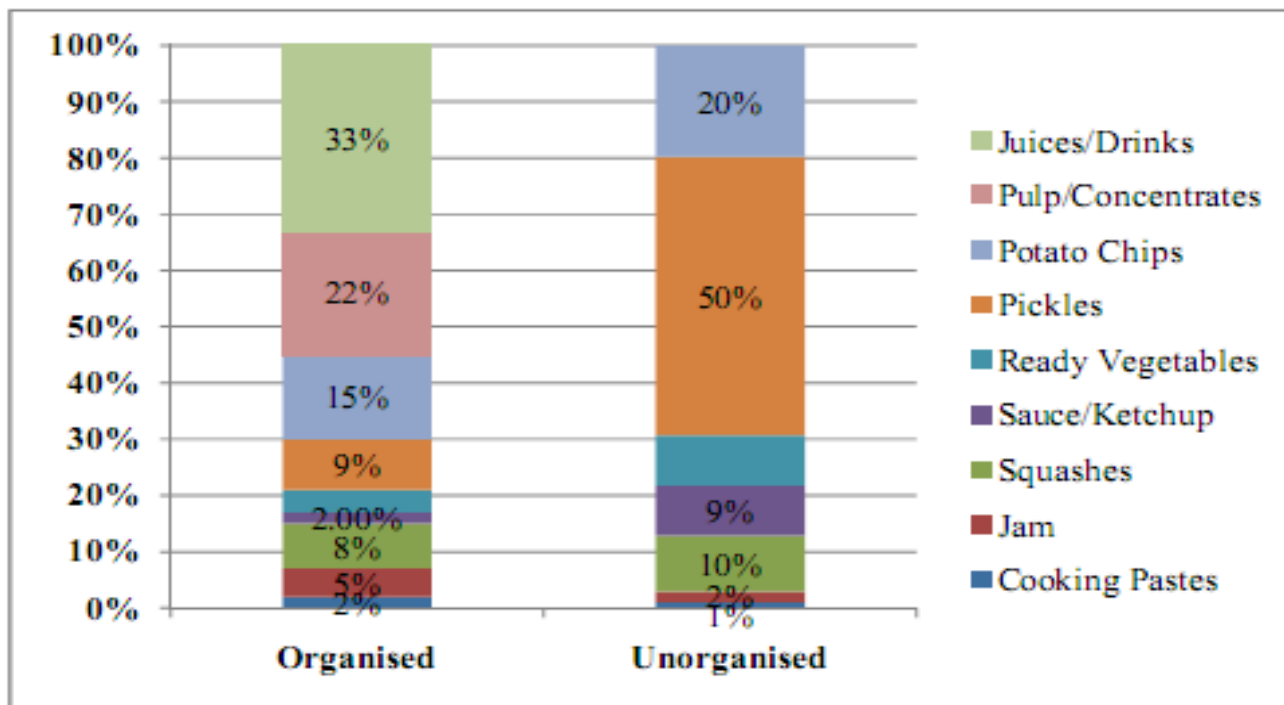

Source: ASI and IMaCS analysis

Andhra Pradesh (13.4% of India's Food Processing industry, and a centre for fruits, vegetables, and grains),

Gujarat (12.7%, and a centre for edible oils and Dairy),

Maharashtra (14%, and a centre for fruit, vegetables, grains, and beverages), and

Uttar Pradesh (12%, across almost all product categories).
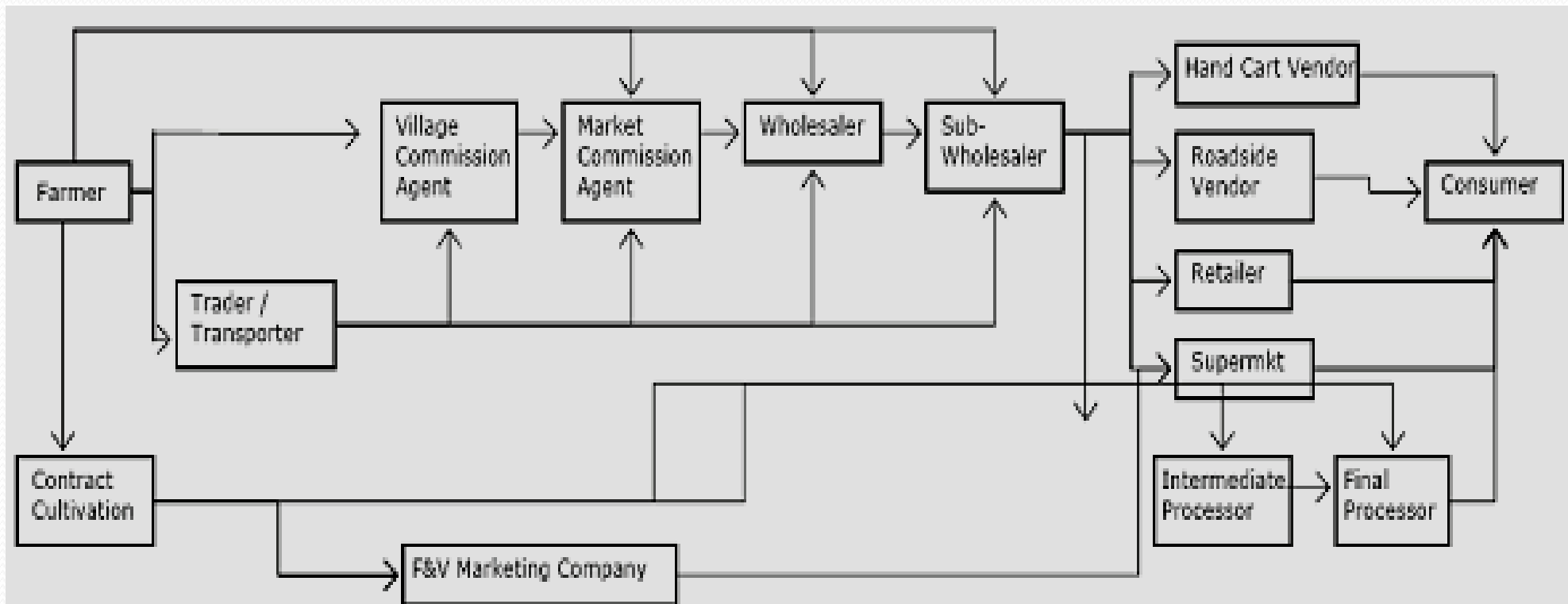
Fruits and Vegetables

Source: FICCI Knowledge Paper on 'Processed Food and Agribusiness'

India is the second largest producer of Fruits and Vegetables (F&V), accounting for 82 million tonnes and 10.9% of global fruit production, and 47 million tonnes and 8.4% of vegetables production

Fruits and Vegetables – Value Chain

Source: Rabo India Finance Limited

Edible Oils

- Edible Oils market in India is expected to touch Rs. 700 billion in 2010 and grow at 6.5%.

- India has more than 15,000 oil mills

- A large proportion of the edible oils is sold loosely in unbranded form (about 90% of consumption),

- Only 10% by volume in sold in branded form.

- In the next 10 years, it is estimated that the **unbranded segment** would grow at 5.5% and the **branded segment** would grow at a CAGR of 12%. Dependence on imports would be at about 40% of consumption, especially palm oil imports.

Grain-based Products

- Grain-based products are the largest contributor the Food Processing Industry, accounting for over 28% to 30% of revenues.

- The total rice milling capacity in the country is about 200 million tonnes per annum.

- Over 90% of the produce falls under the segment of Primary Processed Food.

Value Chain for Marine Products

Source: IMaCS analysis

Value Chain for Meat Products
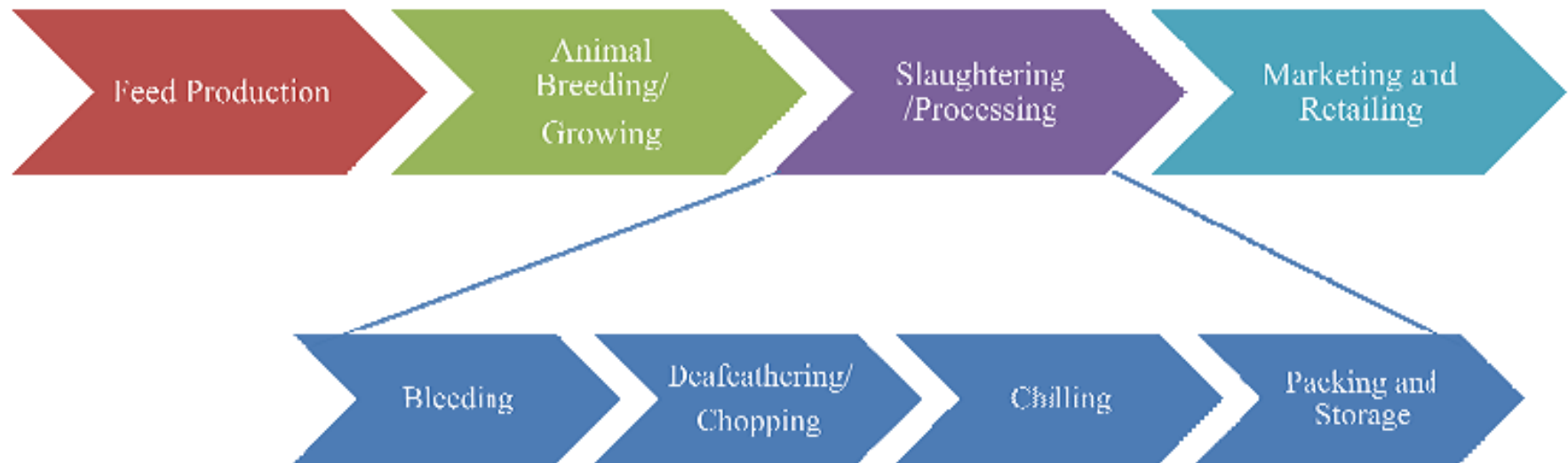
Source: IMaCS analysis

Demand Drivers

- The Key Demand Drivers for the sector are increasing income levels fuelled by GDP growth leading a rising middle class.

- **India is expected to the only BRIC country forecasted to record GDP growth between 5% to 6% consistently up to 2050**

- India's middle class (expected to touch 500 million persons by 2010-12) is further fueling consumerism.

- The increased consumption of Value-added Processed Food, movement to convenience foods and RTE foods, shopping at retail chains and increasing brand consciousness

Key Success Factors and Risk Factors in the Food Processing Industry

Segment	Key Success Factors	Key Risk Factors
Fruits and Vegetables	• Ability to establish forward and backward linkages through contract farming, cold chains, and a strong distribution network. •ƒUse of modern technology in F&V processing rather than manual methods •ƒUsing hybrid seeds to improve yields •ƒLarge number of innovative products and branding.	•ƒAbout 35% of agricultural produce is wasted due to poor cold chain linkages during storage and transportation •ƒInternational trade rules and increasing protectionism in export markets •ƒPoor performance of the agricultural/primary sector.

Key Success Factors and Risk Factors in the Food Processing Industry

Segment	Key Success Factors	Key Risk Factors
Dairy Products	•ƒAbility to increasing scale of output •ƒWide product portfolio of high-value products such as yoghurt, sweets •ƒAbility to tap into export markets •ƒDeveloping a portfolio of milk-based products.	•ƒLow productivity in milch animals despite the largest bovine population (250 million) •ƒLack of scale in the industry despite of success stories such as AMUL.

Key Success Factors and Risk Factors in the Food Processing Industry

Segment	Key Success Factors	Key Risk Factors
Meat and Poultry	•ƒ Ensuring quality and sustained branding. • Ability to tap into export growth in the value-added segment .	•ƒQuality and hygiene is low in street-side wet markets ƒImperfect slaughtering •ƒ High supply chain costs as feed constitutes 60% of total broiler costs •ƒ Relatively unregulated slaughter facilities to the extent of 50%. The country has only 3,600 slaughterhouses, 9 modern abattoirs and 171 meat processing units, and a limited number of pork-processing units •ƒPrimitive rearing techniques.

Food Processing Sector

Importance | **Outlook** | Requirements

Outlook for the Food Processing Industry

The major growth segments are likely to be:

- F&V, growing at 13%

- Dairy, growing at 11.5%

- Meat and Poultry, growing at 16.3%

- Marine Products, growing at 14.8%

- Beverages growing at 14.1%.

The hubs of growth in this will be Andhra Pradesh, Gujarat, Karnataka, Maharashtra, Uttar Pradesh, Karnataka, and Madhya Pradesh

Current Employment in Food Processing Industry

Sector	Number of persons (million)	Share (%)
Organised	1.53	18%
Unorganised	7.00	82%
Total	8.53	100%

Source: Annual Survey of Industry, NSSO 62nd round - Unorganised Manufacturing Sector in India - Employment, Assets and Borrowings, and IMaCS analysis

Functional distribution of human resources

Function	% of employees
Procurement	10%
Testing & Quality	20%
Production	55%
R&D	1-2%
Storage	2-3%
Other (sales and other support functions)	10%

Source: Primary Research and IMaCS Analysis

- In the organized sector, a typical Ratio for operation of a large Unit for post-graduate: graduate: diploma/ certificate holder is 1:2:4 in the Food Processing Industry.
- This proportion of persons is largely similar across the various segments of the industry.

Functional distribution of human resources

Typical profile of persons employed in the Food Processing Segment (Organised sector)

| Title of statistics	Typical indicators	Remarks about function
Post Graduates: Graduates	1:2	Management, Technology adoption, Production
Post Graduates: Diploma-Certificate-holders	1:4	Production, Supervisory, and Quality Control
Function-wise classification of trained people required per 100 employees		
Post Graduates (in Food Technology and Management)	1	Management, Technology adoption, Production
Graduates	2	Production and Quality Control
Diploma-holders	2	Supervisory and Maintenance
Certificate –holders	2	

Source: Primary Research and IMaCS analysis
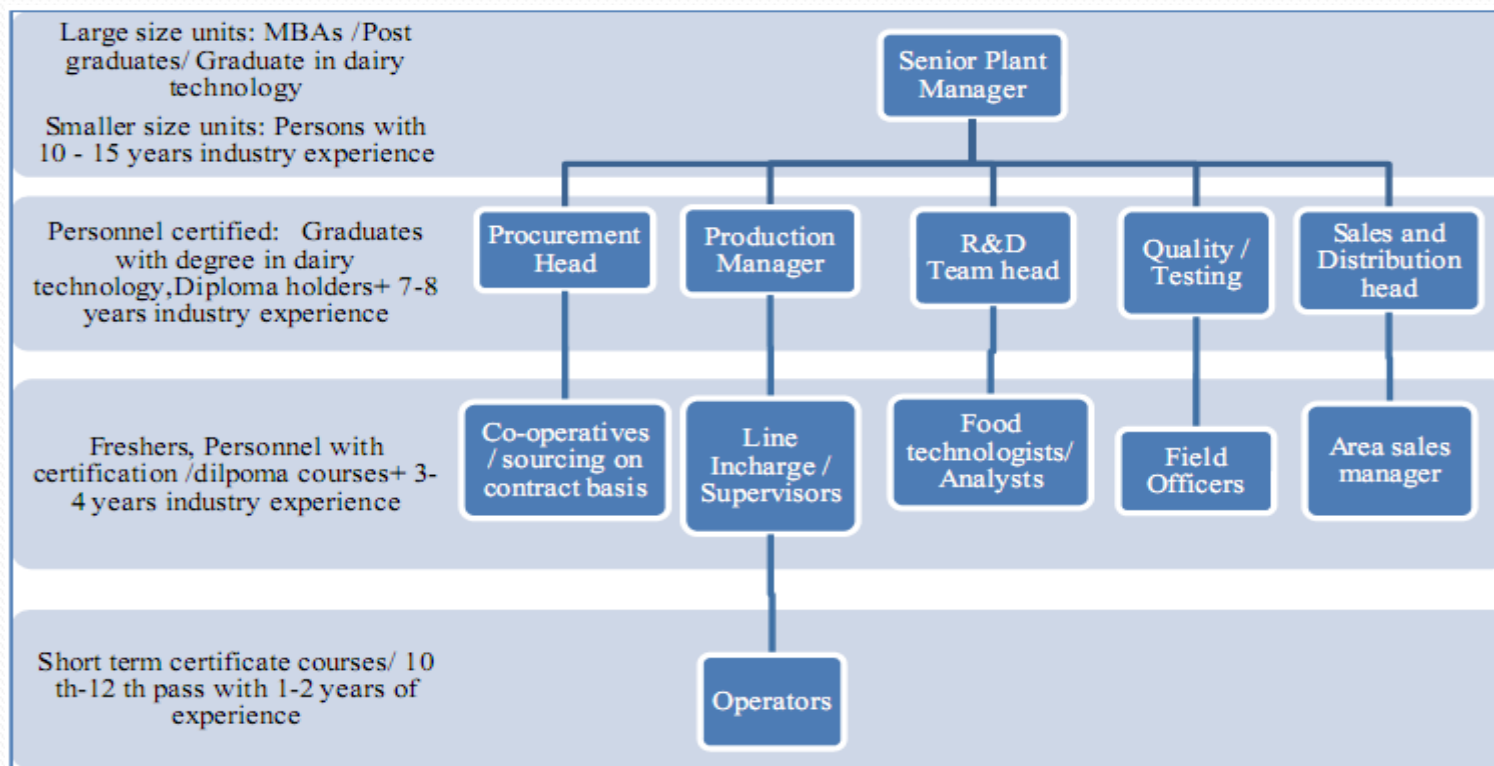
Food Processing Sector

Importance | Outlook | **Requirements**

Projected Human Resource Requirement
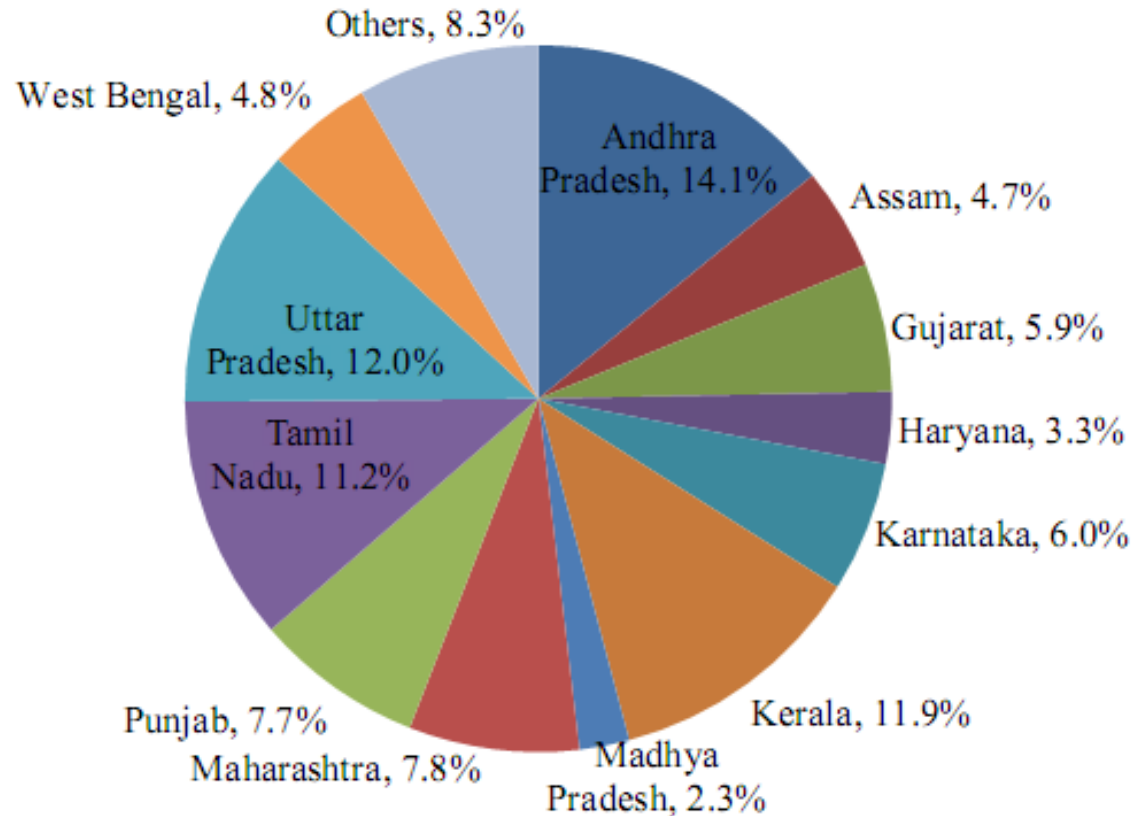
The major centres in India where this employment generation would take place are Andhra Pradesh, Tamil Nadu, Uttar Pradesh, Kerala, Maharashtra, and Karnataka.

Profile of people employed in the Dairy Processing Segment (organized)

Large size units: MBAs /Post graduates/ Graduate in dairy technology Smaller size units: Persons with 10 - 15 years industry experience	Senior Plant Manager
Personnel certified: Graduates with degree in dairy technology, Diploma holders+ 7-8 years industry experience	Procurement Head — Production Manager — R&D Team head — Quality / Testing — Sales and Distribution head
Freshers, Personnel with certification /dilpoma courses+ 3-4 years industry experience	Co-operatives / sourcing on contract basis — Line Incharge / Supervisors — Food technologists/ Analysts — Field Officers — Area sales manager
Short term certificate courses/ 10 th-12 th pass with 1-2 years of experience	Operators

Skill Requirements and Skill Gaps in the Dairy Processing Segment

Function	Level	Skills required	Skill gaps
Production	Producer of milk (person owning cattle)	• Identifying a loyal consumer locally, or becoming a member of village level co-operative for getting the best prices of the produce • Understanding the basic quality requirements and ways to maintain hygienic conditions • Implementing basic value addition in terms of pre-heating, etc. for minimising wastage	• Inadequate education of farmers about latest techniques for minimising wastage • Inadequate knowledge of ways of maintaining the quality of produce
	Helper / Operator	• Knowledge of basic controls of milk processing machines • Basic importance of quality maintenance in terms of consistency to rules • Understanding basic quality requirements and adequate knowledge of maintaining hygiene while cleaning and packaging.	• Inadequate knowledge of machine handling • Poor knowledge of operating in a hygienic environment

Skill Requirements and Skill Gaps in the Dairy Processing Segment

Procurement	-	• Networking skills to maintain good relationship with the farmers and milk producers/village cooperatives • Ability to forecast daily demand and maintain procurement at appropriate levels. • Understanding of the safety measures during transport from procurement centres to plant.	• Inadequate ability to forecast demand • Inadequate communication skills, especially in local language because of diverse dialects
Testing/ Quality check	-	• Understanding of correct sampling methods • Adequate knowledge of Food Act, the specifications of product wise acceptable constituent levels • Adequate practical knowledge on conducting tests, recording results, and reporting.	• Inadequate ability to practically conduct tests and record results

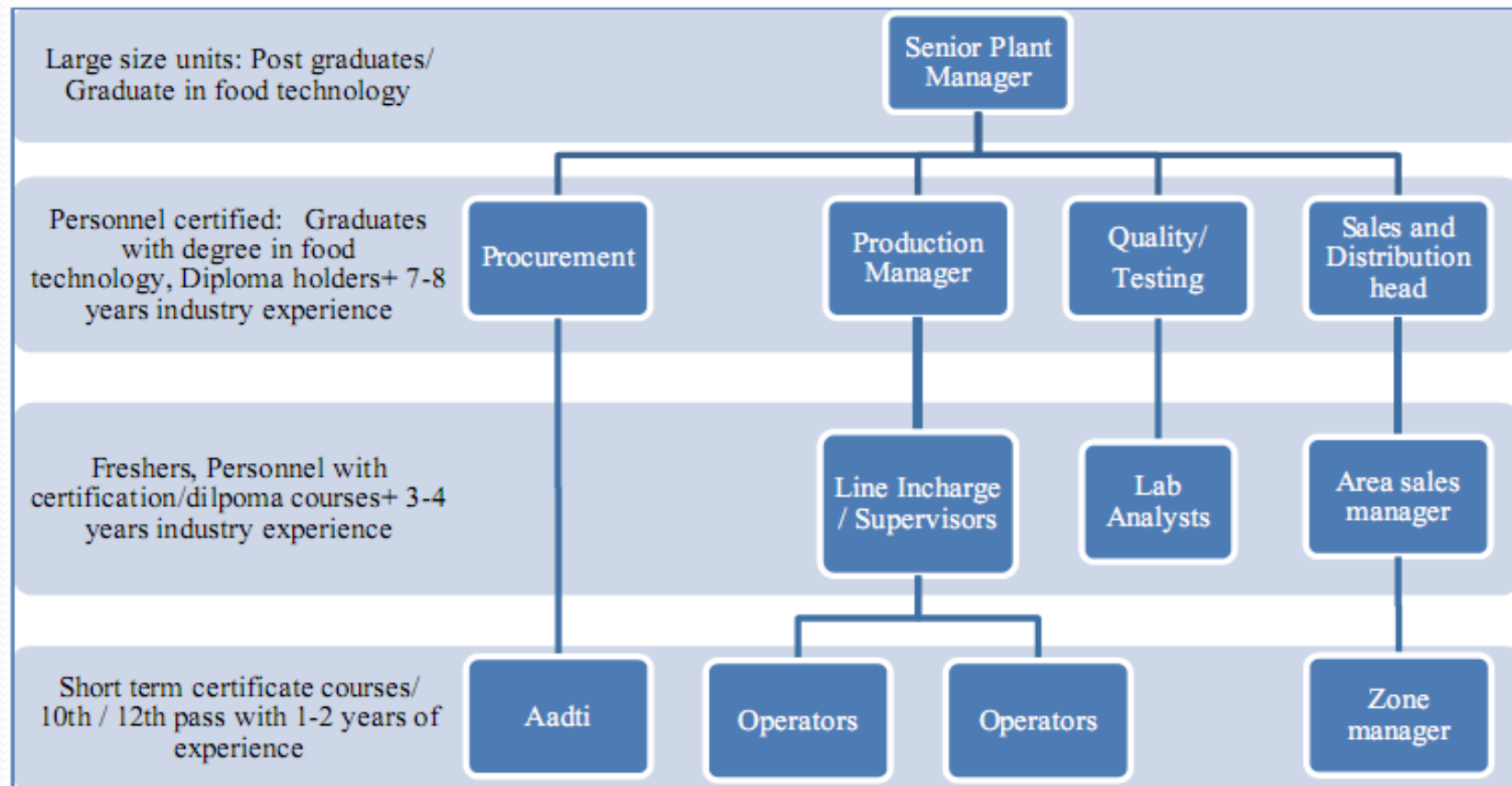*Source: Primary Research and IMaCS analysis*

Skill Requirements and Skill Gaps in the Food Grain Milling Segment
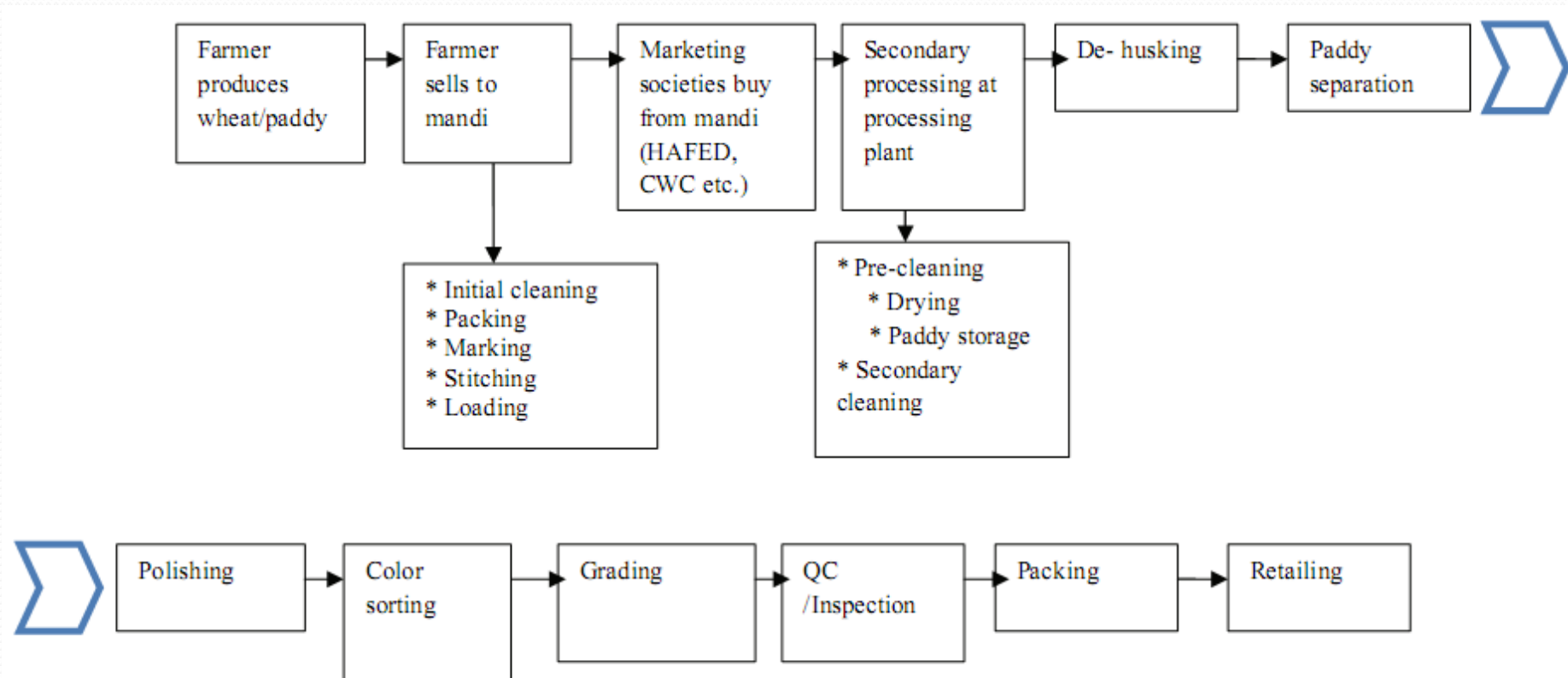
Source: Primary Research and IMaCS Analysis

Rice mills • Flour mills • Pulse processing • Coarse grain processing

The profile of people employed in the Food Grain Milling Segment

Source: Primary Research and IMaCS analysis

Skill Requirements and Skill Gaps in the Food Grain Milling Segment

Function	Level	Skills required	Skill gaps
Operations	Experienced personnel	• Ability to handle breakages/breakdown in machine parts, inadequate inventory • Ability to effectively communicate with the team and brief them of production objectives • Technical knowledge of milling machinery	• Inadequate team handling and worker handling skills • Inadequate planning of work schedules

Skill Requirements and Skill Gaps in the Food Grain Milling Segment

Function	Level	Skills required	Skill gaps
	Helper level	• Knowledge of basic controls and settings of machines being worked on • Understanding of basic mathematics to identify and accordingly implement the instructions of the supervisor pertaining to production schedules. • Basic importance of quality maintenance in terms of consistency with respect to. following rules / guidelines	• Inadequate understanding of machine controls in • Inadequate understanding / knowledge of ways to minimise breakage
	Worker at Artiya[8] shop	• Ability to stitch gunny bags neatly so as to avoid leakage • Ability to appropriately mark gunny bags / index them such that markings are unambiguous	• Inadequate ability to stitch gunny bags well, leading to leakages from the bags • Inadequate ability to follow rules of marking gunny bags

Skill Requirements and Skill Gaps in the Food Grain Milling Segment

Function	Level	Skills required	Skill gaps
Procurement	-	• Understanding of appropriate ways for proper transport of produce till the processing plant • Correct forecasting for demand and accepting produce on the same basis from artiyas • Networking skills to maintain good link with the producers	• Inadequate ability to forecast the demand accurately • Inadequate training skills for encouraging the producers for better productivity and quality
Testing	-	• Visual examination skills for faster segregation and checking of input/output • Ability to record the results as they are observed and reporting non adherence to standards	• Inadequate practical expertise in conducting tests

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Skill Requirements and Skill Gaps in the Food Grain Milling Segment

Function	Level	Skills required	Skill gaps
Contract famer/ Farmer selling Produce in open market	-	• Ability to decide which crop to grow in what quantity and find out the requisite inputs relating to appropriate seed, fertiliser, irrigation, etc. • Ability to undertake pre-processing at the farm – i.e. the ability to undertake initial sorting, grade the produce for commanding better price in Mandi, etc. • Knowledge of best handling practices and transport practices which ensure least wastage due to moisture, microbes, etc.	• Inadequate knowledge of latest / best farming practices with because of lack of training /access to other information sources • Inadequate knowledge of percentage increase in value with minimal value addition to produce

*Source: Primary Research and IMaCS analysis*

Available Supply of Human Resource and Demand-Supply Gap

Available Skilled Human Resource Supply in Food Processing on an Annual Basis

Category	10th Plan Period	2008 to 2014
Post Graduates (PG) in Food Technology	1,000	1,700
Graduates in Food Science/Technology	900	1,530
Graduates in Food Science and Quality Control	600	1,020
Diploma	600	1,020
Certificate (ITI/ITC)	2,500	4,250
Short-term courses	6,400	10,880
Total	12,000	20,400

Source: Assessment of Requirement of Food Technologists, Managers and Entrepreneurs for the Food Processing Industries', IAMR

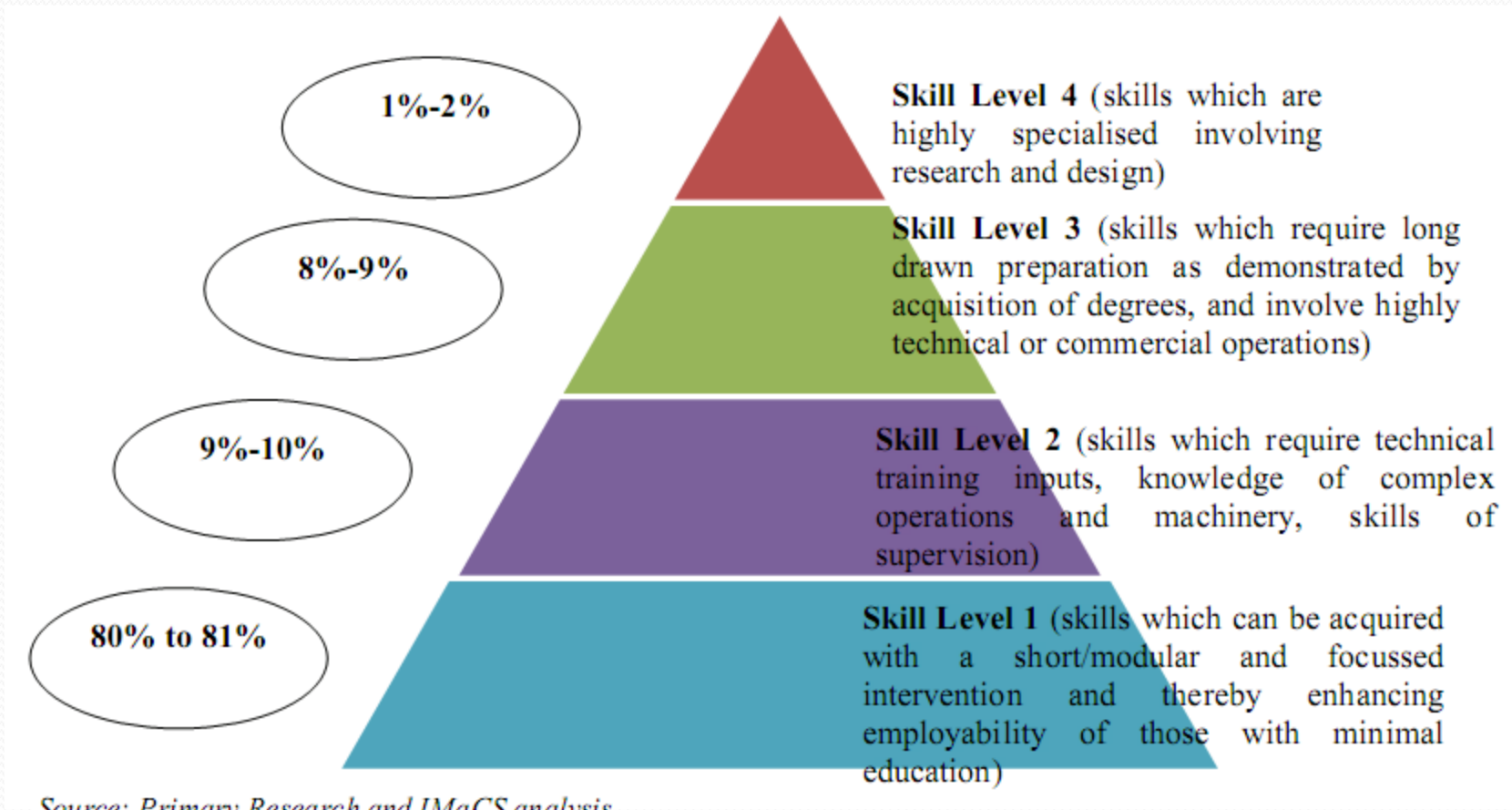# NIFTEM's Initiative in Skill Development in the Food Processing Sector
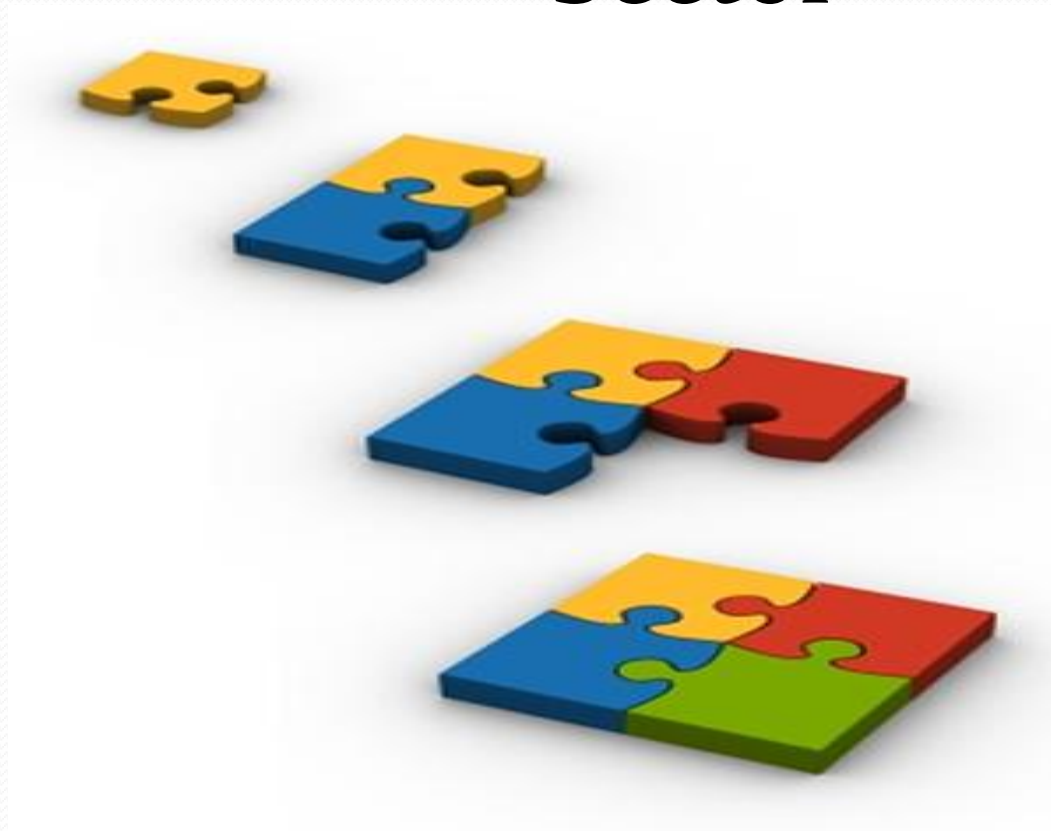
What is Skill Development?

- The term "skill" refers to any expertise or ability that has a market value and has the potential of generating income/ employment.

- It may be imparted formally or informally.

- Skill acquisition encompasses education, pre-employment training, on- the- job training, continuous learning and re-training.

- Acc. to the NSS (1999-2000)on employment .

- In rural areas unemployed men and women possessed specific marketable skills 16.4% and 18.8% respectively.

- Only 2% of the population had formal skills and 8.2% had informal skills.

Importance of Skill Development.

- Enhances the productivity of an individual, industry and nation.
- Skill development is linked with livelihood promotion especially in the case of unorganized sector workers.
- Fast changing knowledge economies call for new core competencies among all learners in the society.
- Matching skills to markets has led to a call for dismantling existing systems of skill provisioning and an overhaul of VET's.
- Mapping 'new' needs which are perceived or acquired in globalised economy.

Skill Pyramid

1%-2%

8%-9%

9%-10%

80% to 81%

Skill Level 4 (skills which are highly specialised involving research and design)

Skill Level 3 (skills which require long drawn preparation as demonstrated by acquisition of degrees, and involve highly technical or commercial operations)

Skill Level 2 (skills which require technical training inputs, knowledge of complex operations and machinery, skills of supervision)

Skill Level 1 (skills which can be acquired with a short/modular and focussed intervention and thereby enhancing employability of those with minimal education)

Source: Primary Research and IMaCS analysis

The Challenge of Skill Development.

- Identification of sector specific skills and skill development system that ensures inclusivity in terms of:
- Gender equitability and sensitivity, Rural/ Urban, organized/ unorganized ,Traditional and contemporary, large proportion of unemployed youth.
- Who will provide it? (Govt/ NGO/Employer)
- Where will it be provided?
- Who will bear the cost?
- The workforce which is informally trained and unorganized is highly heterogeneous.

- Therefore, how would the issue of poor literacy and numeracy be addressed?
- How will the poor and uneducated be motivated? (even a token fees can work as a barrier in participation)
- Bulk of employment (80%) is in the unorganized sector.
- Therefore, skill requirements of the unorganized sector have to be visualized quite differently from the organized sector.

Possible Focus Areas for Skill Building

Segment in Food Processing Industry	Areas for Skill Building
Food Grain Milling Industry	- Operation of power machine used for milling (knowledge of speed of operation, feeding of input, collecting output) - Handling of output while packing - Packing of gunny bag (stitching, labelling)
Bakery-related	- Roasting/swelling to make breakfast foods - Mixing - Preparing flour and dough making for bread, biscuits, cakes etc. - Making of Pappads, masala, etc. - Packaging and labelling
Diary Products	- Handling of milk after mulching - Cold storage and transportation - Manufacture of ice-creams and sweets

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The way ahead…

- National Mission for development of skills in the unorganized sector by the NSDB

- Expansion of Vocational Education Training for the informal sector workers, for school dropouts and development of modular courses, registration of training providers and certification by third party agencies.

- The expansion of skill development programmes for the unorganized workers have to be coordinated between public and private initiatives at the local level.

- Initiatives such as Cluster Development Programme of the MSME needs to be integrated with skill development programme. (Mega Food Parks)

- De-centralized training facility at the village, block and district level.
- Integrating the poorest of the households with skill development training and employment guarantee schemes (NREGA) for sustained livelihood promotion.
- Provide right kind of training at the grass-roots where informal sector workers live and work.

NIFTEM'S initiative

- Facilitate in the development of a national level structure that can provide the backbone to national skill development in Food processing sector.
- National level "skill councils" in different sectors of the FPI.(MFPI has set up respective boards for promoting meat industry and wine industry such as IGPB, NMPPB.
- Address the heterogeneous needs of work force in the food processing industry by developing various courses to bridge the skill gaps.
- Recognition and accreditation of training providers and certification.
- Provide continuing education and skill up gradation.

Consultancy Division of NIFTEM

Mandate

- There is an urgent need for a global standard consultancy in the Food processing sector which can fill in the gaps across the entire value chain from farm to fork.

- To strengthen the food processing sector by universalizing the core competencies in the sub sectors and thereby integrating it with the knowledge economy.

- Enhance business capabilities of SME's by offering end to end solutions in each sector.

- Single window catering to clients across the sector in wide range of services.

Range of consultancy services

- **Technical Services** -Technology upgradation, design and food engineering services.

- **Management Services**– Project planning, Entrepreneurship and new business development. Total quality Management and certification assistance.

- **HR &Training** – Training module development, setting up of training systems and facilities, engineering and technical skills training, management development programmes, training of trainers, preparation of curricula for imparting knowledge and skills in the FP sector.

THANK YOU