



Decide with Confidence

Study on Skill Development in the MSME Sector

Report on Findings from Skill Development
Survey in MSME Clusters

A photograph of a magnifying glass with a wooden handle and a brass rim, resting on a newspaper. The magnifying glass is focused on a specific section of the newspaper, which appears to be a financial or business page. The background is a blurred newspaper page with various columns of text and numbers.

Dun & Bradstreet

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Executive Summary

MSME Financing and Development Project (MSMEFDP), a multi activity, multi-agency Project on Financing and Development of MSMEs attends to demand and supply needs of MSME sector through provision of financial and non-financial services and creation of enabling environment wherein sustainable growth of MSMEs are assured & ensured. While Department of Financial services, MOF GOI is the nodal agency, SIDBI, as an implementing agency, extends umbrella support to international partners World Bank and KfW who have extended credit Facility for meeting financial needs and DFID UK, KfW and GtZ Germany who have extended Technical Assistance to meet non-financial needs.

The project adopted a super goal to increase income and employment in Micro, Small and Medium Enterprises (MSMEs) in India and goals of:-

- Fostering MSME growth, competitiveness and employment creation.
- Improving MSME access to financial and Non-financial services
- Making MSME lending an attractive and viable financing option
- Improved access and terms of finance to MSMEs (World Bank and KfW lead)

SIDBI is implementing a multi-agency / multi activity Project on Financing and Development of Indian MSMEs. While SIDBI has been assigned with the responsibility of implementing the project, the Department of Financial Services, Ministry of Finance, Government of India is the nodal agency for the same. The IBRD, Department for International Development (DFID) UK, KfW Germany and GTZ Germany are the international partners in the Project.

In extending and meeting its first objective of fostering growth, competitiveness and employment creation, the project aims to undertake a Skill Gap Assessment & Development Study with the following objectives:

- Enhancing the competitiveness of identified industry groups by way of increased productivity through skill up-gradation.
- Generating employment opportunities for the unskilled persons, while addressing the issue of urban unemployment among the educated youth.
- Enhancing the skill level of semi-skilled and underemployed persons lead to their self-employment and setting up of new enterprises.

In this connection, D&B India conducted the initial survey across 8 identified BDS clusters under the MSMEFDP programme. The 'Survey Report' is a detailed account of activities carried out and findings obtained during the first phase of the project on 'Skill Development among MSMEs in India'. The survey was carried out in two phases – Qualitative and Quantitative. A number of stakeholders in each of the eight identified clusters were met with during the qualitative phase. This included officials

working with the respective Cluster Development Agencies, Industry Associations, Government / Private Training Institutes and MSMEs. An understanding of internal processes, interactions among the various stakeholders, challenges faced and training required, was critical for preparing the questionnaire that was used for the large sample survey among MSMEs in each of the clusters.

Each chapter in the report covers the findings from surveys conducted in the eight clusters.

Project Overview:

The primary objective of the study is to assess skill gaps in the industry sector(s) of MSMEs and recommend policy action to address the issue(s) emerging thereof. A sample survey has been undertaken among 300 MSMEs / stakeholders in the following 8 clusters:

Cluster	Sector
Ludhiana	Knitted Apparel
Tirupur	Knitted Apparel
Kolkata – Shantiniketan	Leather
Chennai	Leather
Pune	Fruit & Vegetable Processing
Hyderabad	Pharmaceuticals
Chandigarh – Panchkhula – Mohali	Engineering
Bhadohi	Floor Covering

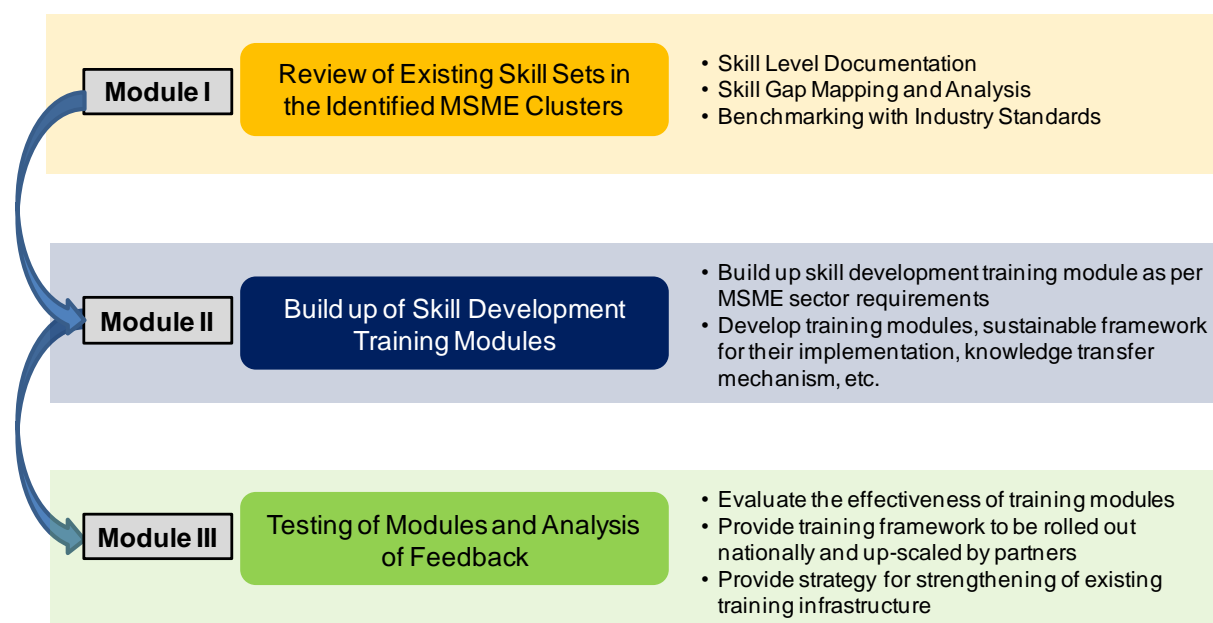
The Skill-gap assessment in the above-mentioned industry sector(s) will aid in addressing the following sectoral needs:

1. Enhancing the competitiveness of identified industry groups by way of increased productivity through skill up-gradation
2. Generating employment opportunities for the unskilled persons, while addressing the issue of urban unemployment among the educated youth
3. Enhancing the skill level of semi-skilled and underemployed persons leading to their self-employment and setting up of new enterprises

Methodology

D&B India is in the process of utilizing its strengths in select domains such as MSME cluster analysis, benchmarking techniques, training and education to achieve the project objectives. Accordingly, D&B India will be executing the assignment under following three broad modules:

1. Module I – Review of existing skill sets in the identified MSME clusters
2. Module II – Buildup of skill development training programs / modules
3. Module III – Testing of modules and analysis of feedback



Sample Survey

D&B India conducted exhaustive qualitative and quantitative surveys across the identified clusters to achieve results of Module I. Representation across micro, small and medium enterprises was ensured while sampling the enterprises in the cluster. Product categories were also taken into account while developing the sample plan.

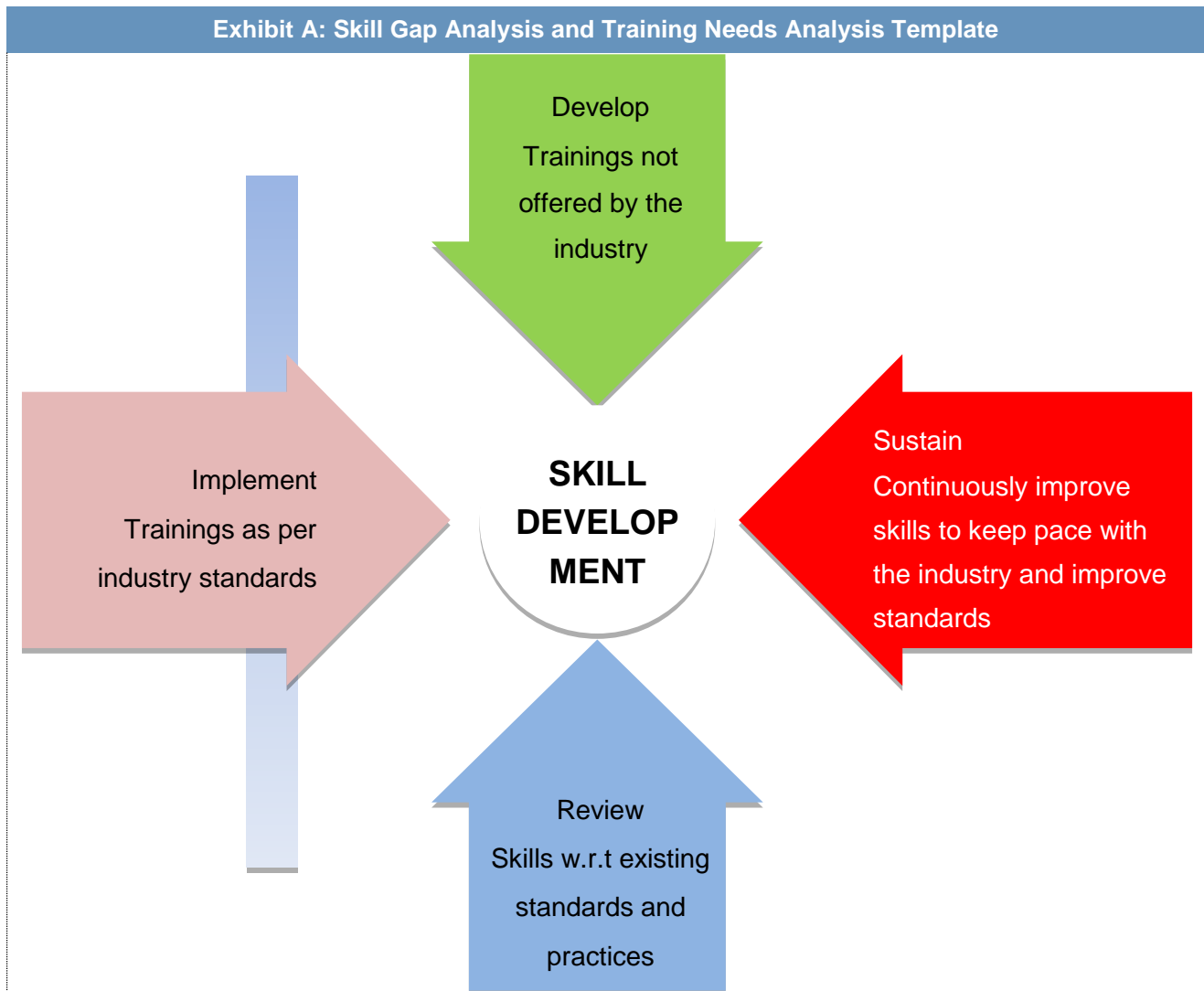
The concept of mapping skill gaps was implemented and assessed at individual firms selected. Due to the varying nature of products across clusters, skill gap assessment should be conducted at the process level as well. The broad functional areas that were covered for mapping the skill gaps were:

- Production including storage, distribution, handling and logistics
- Finance
- Marketing and Sales

The following table provides the summary of the sample survey:

Cluster	Products	Samples Covered
Pune	Fruits & Vegetables Processing	13
	Spices, Pickles & Papads	13
	Ready-to-Eat (RTE)/ Ready-to-Eat (RTC)	12
Kolkata – Shantineketan	Tannery	8
	Leather Goods	13
	Footwear	8
	Industrial Gloves	8
Bhadohi	Knotted Carpets	11
	Tufted Carpets	9
	Shaggy Carpets	9
	Durries	9
Chennai	Tannery	13
	Leather	13
	Footwear	13
Chandigarh – Panchkhula – Mohali	Machining & Sheet metal components	15
	Steel Fabricating Units	12
	Fasteners	12
Ludhiana	Dyeing	7
	Knitting	12
	Garmenting	18
Tirupur	Printing	3
	Embroidery	3
	Knitting	20
	Garmenting	12
Hyderabad	Bulk Drugs	20
	Formulations	18
Grand Total		304

Based on the skill gap mapping, the following training needs assessment matrix has been developed for the individual cluster:



The above template sets the prioritization scheme for the identified skill gap analysis and identified training needs. A matrix of complexity of operations and available skill sets was used to determine the options. The following explains the brief idea for the same:

- **Implement:** This refers to the areas/ processes in an organization where the complexity of process is low and the available skills to perform the processes are also low. Training programs are required to be initiated as soon as possible since this is the simplest way to upgrade.
- **Review:** This refers to those critical processes where the skills required to perform a job are high while the complexity levels of such processes are low. Manpower planning and review of skill sets is required in such cases.
- **Sustain:** For processes where the complexity of operations and available skill sets are both high, sustaining these is a challenge and training programs targeting sustainability of processes and skills are required. These may be support areas like marketing and finance in most organizations.

- **Develop:** This is the most crucial of all the needs. The complexity of operations is high while the skills required to perform are low, hence the need to Develop through structured training programs in order to increase the employable skills of the employees. These can relate to critical production areas where acute shortage of skilled manpower is a common problem.

Ludhiana Knitwear Cluster

Introduction

Ludhiana is the largest industrial hub of Punjab and is also known as the Manchester of India. As far as woollen knitwear is concerned, it contributes to almost 80% of the total woollen or acrylic output of the country. There are over 14,000 MSME's in the cluster which includes registered and unregistered firms. In the year 2009-10, the industry earned revenues worth `8,500 crore.

The raw materials used in the cluster for knitwear garments are pure wool, recycled wool, cashmelon and acrylic. Forward linkages include buying agencies, agents, distributors and retailers in local markets. In the export markets; merchant exporters, buying agents and buying houses assist the knitting and garmenting units. Cluster associations also play an important role in forging forward linkages with the buyers by organizing trade fairs/buyer fairs for members.

The knitting and garmenting units are dependent on yarn producers and suppliers, chemical suppliers, accessory suppliers, packing material suppliers, fabricating units and distribution networks for making their end products. The key processes in the knitwear industry include fibre procurement, spinning, dyeing, knitting, embroidery and manufacturing garments.

Apex Cluster Development Services (ACDS) has been appointed as the field agency for developing BDS in the cluster. It has been active in organising training programs across different levels in the organization since its activities began in the cluster over last two years. Knitwear Club, KAMAL and ATDC are major bodies that provide technical trainings in the cluster.

Skill gaps have been observed at operator and management levels across the value chain of the cluster. However, the operator level gaps are having a direct impact on the productivity of the cluster. Thus, these gaps need to be filled immediately. The cluster is faced with severe shortage of skilled and unskilled labour. The availability of migratory labour has been considerably impacted after introduction of MGNREGA scheme by the Central Government. Mobilization of resources for training programmes is another major issue. There is acute shortage of operators to work on computerized knitting machines, stitching operations, stoll machines, garmenting process, dyeing and printing processes. Similarly, there is a shortage of supervisors to supervise work on these machines. Also, skill gaps have been observed at managerial level jobs for processes including marketing management, production planning, scheduling, inventory management, quality control etc. Apart from technical skills, managers and supervisors also lack soft skills such as communication skills, team development and motivation skills for undertaking their activities.

Cluster Overview

Nature of Industrial Activity

The knitwear textile industry in India is over a century old. It is emerging as the fastest growing segment of Indian garment exports as compared to woven garments and mill-made garments. This can be mainly attributed to the comfort, stretchability and easy breath ability built within the fabric structure.

Ludhiana is the largest industrial hub of Punjab and is also known as the Manchester of India. As far as woollen knitwear is concerned, it contributes to almost 80% of the total woollen or acrylic output of the country. The industry's origin is dated back to 1933 when migrants from Kashmir (because of a famine) settled in Ludhiana. These migrants brought the skills of weaving fine woollen fabrics and embroidery and eventually it got commercialised with the introduction of flat and circular knitting machines. This cluster slowly recognised the export potential from overseas markets and started exporting to Russia and Europe. Later markets such as Middle East and USA were also added.

Garments manufactured in Ludhiana have huge demand in domestic and international markets. The cluster is highly labour intensive and it provides daily factory employment of 55 workers per 1000 population compared to an average figure of 11 for India. However, over 40% of the available labour is migratory and unskilled.

This cluster manufactures the entire range of winter and summer wear for gents, ladies and children. Exhibit 1.1 provides the summary of major products manufactured by MSME's in Ludhiana knitwear cluster:

Exhibit 1.1: Product Range	
Summer wear	T-Shirts
	Cotton and blended socks
	Under garments
	Knitted bed sheet
	Skirts
	Tops
	Sports Wear
	Night suits
Winter wear	Sweaters, Jersey & Blankets
	Woollen Socks
	Pullovers
	Cardigans
	Thermal wear
	Gloves
	Muffler
	Baret Caps
Shawls	

Recently manufacturers in Ludhiana bagged contracts from ICC for Cricket World Cup 2011 and also for the IPL- 4 season to supply merchandise.

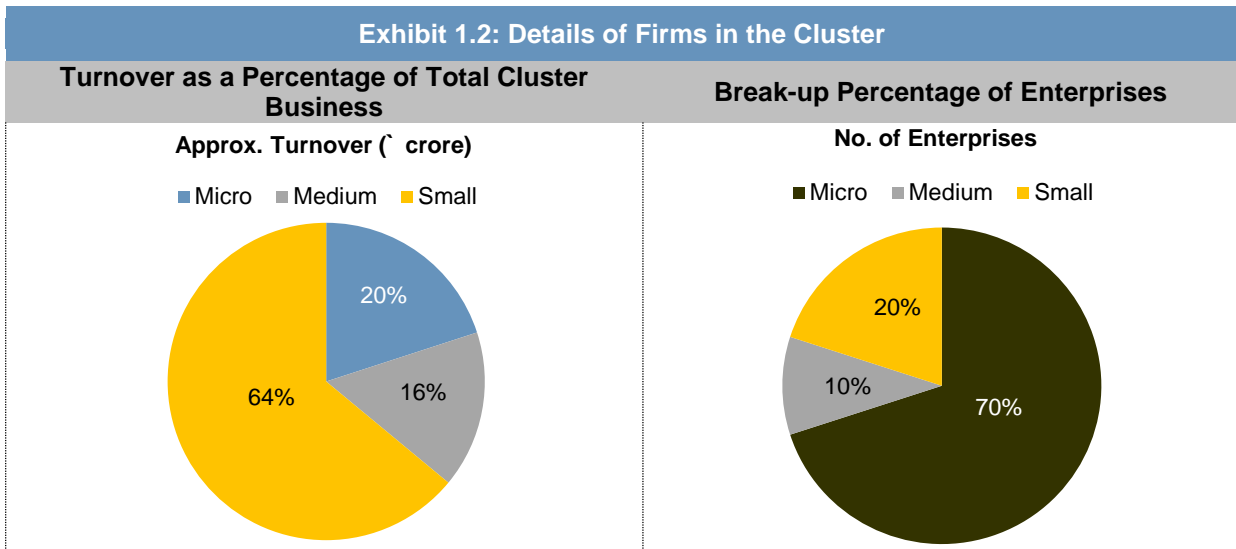
Performance and Financial Metrics

There are over 14,000 MSME's in the cluster which includes registered and unregistered firms. Exhibit 1.2 provides the breakup of units in the cluster by their size of investment in Plant and Machinery. The cluster provides direct and indirect employment to over four lakh people. The knitwear industry has a range of firms employing 50 to 2,500 workers depending upon size of firm, i.e. large, medium or small. Exhibit 1.3 provides the total employment break-up based on the size of the units in Ludhiana.

In the year 2009-10, the industry earned revenues worth `8,500 crore. Exhibit 1.2 provides the share of micro, small and medium sized enterprises in the turnover of the overall industry. In 2007-08, `14 billion¹ was invested in small industries and `67 billion in medium and large industries in Knitwear industry in Ludhiana. Exhibit 1.4 provides a break up of different units in the cluster. The main hosiery knitting centres in Ludhiana are geographically centred within the city and they can be divided into four major blocks:

- Purana Bazar/ Madhopuri
- Sundernagar and Shivpuri Industrial area
- Bahadur Ke Road
- Focal Point (Dhandari Kalan).

Ludhiana knitwear cluster serves both domestic and overseas markets. Ludhiana cluster supplies to most of the major parts of the country and it contributes to around 80% of the woollen garments output of the country and the major export destinations of the cluster include USSR, Middle East, Europe and USA. Bangladesh and Vietnam are posing severe competition to Indian apparel export business by supplying at low prices, thereby also affecting the export business in the cluster. Apparel exports of Bangladesh have increased by 11%, while Indian exports witnessed a decline in 2008. Productivity in Indian companies' is approximately 50% of global standards where as in Bangladesh it is approximately 70-80%.



Percentages above indicates the number of units in the sample

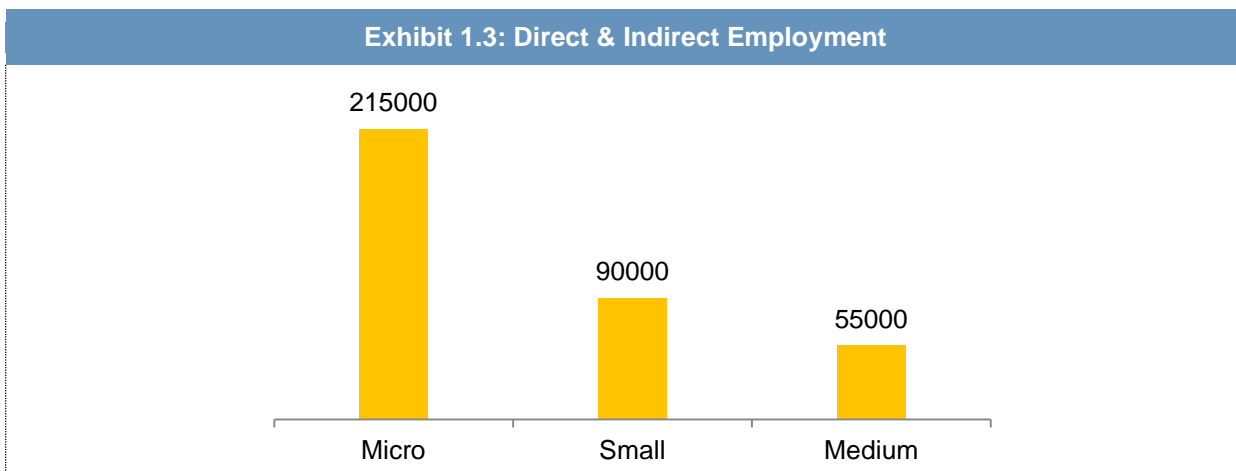


Exhibit 1.4: Different units in the Cluster

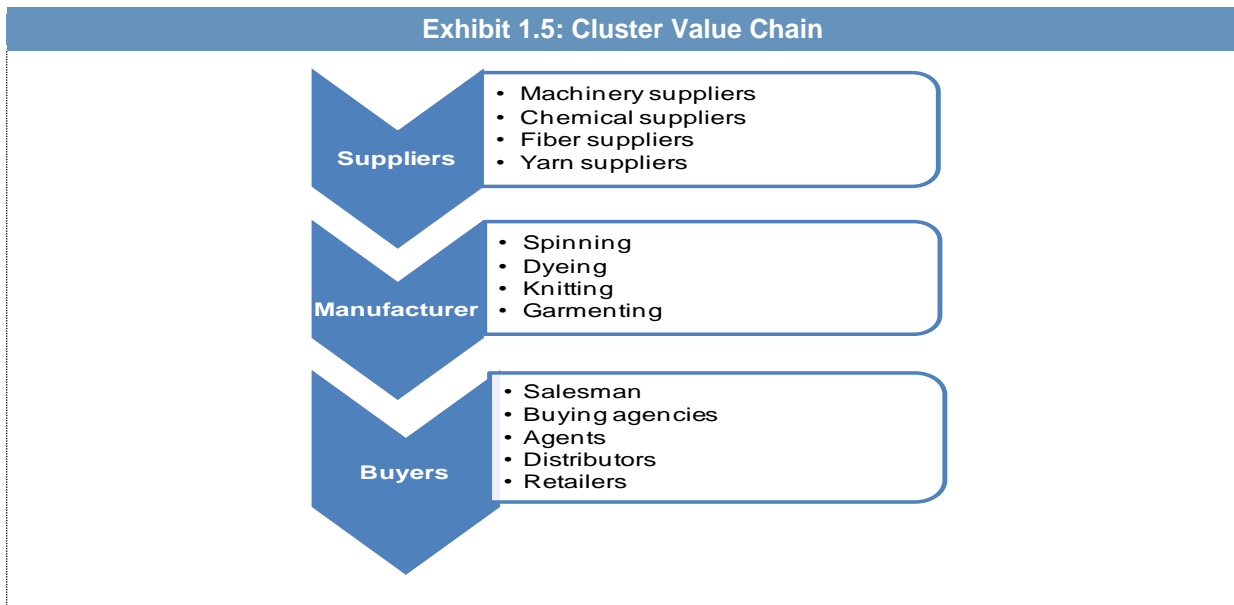
S. No	Type of Unit	No. of units in the cluster
1	Spinning units	55-60
2	Knitting units	8,000
3	Dyeing and processing units	200-250
4	Printing units	100-125
5	Embroidery units	1,250
6	Sub-contracting units(for garment making)	3,000
7	Direct exporters	400
8	Yarn suppliers	150-180
9	Chemical suppliers	200
10	Accessory suppliers	225-250
11	Packing material suppliers	150-200
12	Machinery suppliers	60-70
13	Sewing machine manufacturers	1,000(approx.)

Cluster Linkages & Dependencies

The raw materials used in the cluster for knitwear garments are pure wool, recycled wool, cashmelon and acrylic. The raw material is blended in the proportion of 70-80% wool and 20-30% acrylic. Raw Wool is procured by spinning units through cluster agents from countries such as Australia, New Zealand and China. Woollen yarn supplied by spinning units is the raw material used for fabric knitting. The recent increase in the yarn prices has posed significant challenges to the cluster. Also, the payment tenure has reduced signifying **higher bargaining power of suppliers** and heavy dependence of the cluster on external raw material sources. The machinery used in the cluster is mainly made in Germany and the general trend in the cluster is to buy re-used machines. Machinery suppliers in the cluster also conduct maintenance activities. Most of the labour is migratory in nature and comes mainly from Uttar Pradesh and Bihar. The percentage of migratory labour has registered a declining trend due to MGNREGA (Mahatma Gandhi National Rural Employment Guarantee Act) scheme of the Central Government, which ensures a minimum employment of 100 days in their home state. This phenomenon has adversely impacted the availability of skilled and unskilled labour in the clusters.

Forward linkages include buying agencies, agents, distributors and retailers in local markets. In the export markets; merchant exporters, buying agents and buying houses assist the knitting and garmenting units. Cluster associations also play an important role in forging forward linkages with the buyers by organizing trade fairs/buyer fairs for members.

The knitting and garmenting units are dependent on yarn producers and suppliers, chemical suppliers, accessory suppliers, packing material suppliers, fabricating units and distribution networks for making their end products. Additionally, there are many micro enterprises which offer services like embroidery work, machine repairs, accounting and also legal expertise within the cluster. Exhibit 1.5 represents the value chain of Ludhiana cluster.



Key Processes within the Cluster

The key processes in the knitwear industry include fibre procurement, spinning, dyeing, knitting, embroidery and manufacturing garments. Exhibit 1.6 provides the detailed flow chart of knitwear garment manufacturing process.

- The process starts with spinning of raw wool, acrylic or other synthetic fibres.
- Scouring is the cleaning operation carried out locally for wool by small scale spinning units before spinning the yarn. The larger hosiery units buy the yarn from spinning units directly or through traders and then send it to dyeing units for dyeing in different shades.
- Waxing is done before knitting process. Knitting is done through flat bed or circular knitting machines. Exhibit 1.7 depicts pictures of flatbed computerised knitting machine and flat bed hand operated machine. The circular knitting machines have been predominantly used by most respondents in the cluster. However, the trend has now drifted towards computerised flat bed knitting machines.
- Different designs are made on the fabric through these knitting machines, either manually or mechanically depending upon the machine used.
- Most of the firms in Ludhiana have computerised knitting machines where design inputs are fed through available software programs and the entire fabric making process is automated. Exhibit 1.8 shows the type of technology being used by different firms in the cluster. Although most of the firms use either pre owned or indigenous domestic machinery, some firms use latest imported technology for knitting and other operations. The information w.r.t. latest manufacturing technologies are obtained from machinery suppliers and local BDS agencies. Exhibit 1.9 mentions the sources of information w.r.t latest machinery technologies and trends.

- The fabric then undergoes milling process in which fabric is dipped in chemicals and soap. This process softens the fabric.
- The milled fabric is subsequently ready for cutting and tailoring which is generally done in-house by most of the hosiery units on piece rate basis.
- After cutting and tailoring, manufactured garments undergo washing and dry-cleaning.
- Embroidery work is done after this with linking and button holing followed by washing, checking, labelling and pressing. Exhibit 1.10 shows the picture of sewing machine and linking machine.

The key activities related to firms within this process include fibre and wool procurement, inventory and material handling, production and quality management, marketing, accounting, sub-contracting.

Exhibit 1.6: Process Flowchart

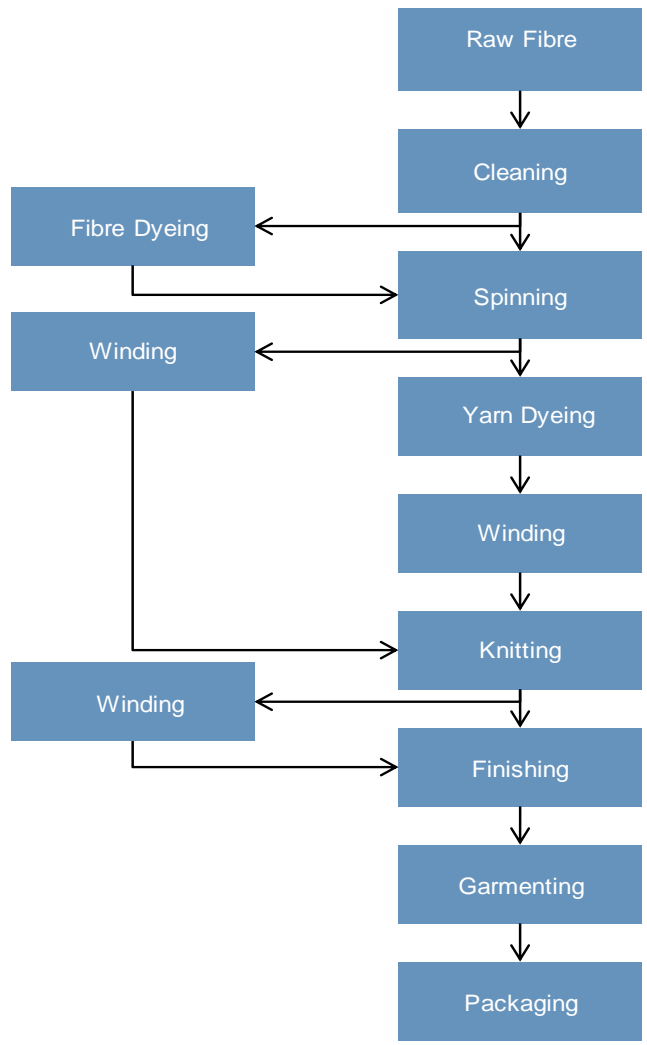
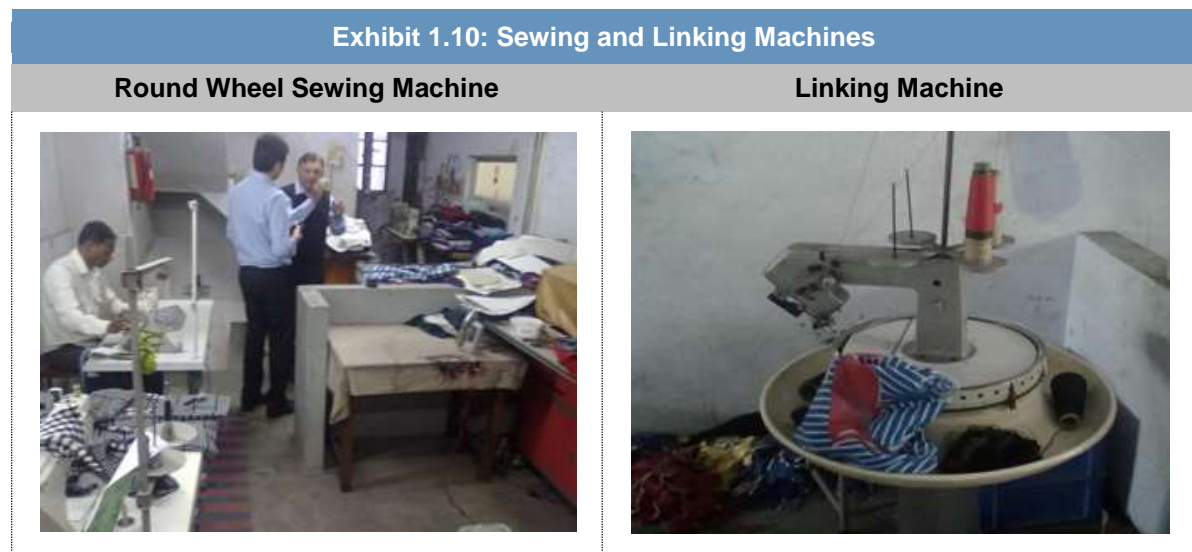
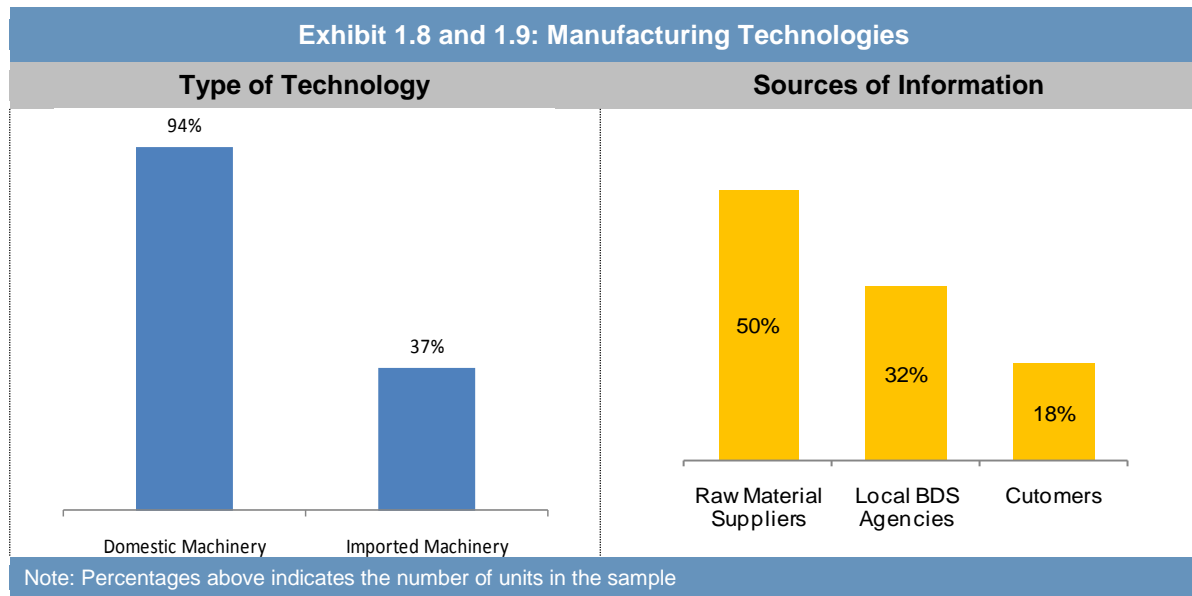


Exhibit 1.7: Knitting Machines

Flat Bed Computerised Knitting Machine Hand Operated Knitting Machine





Skill Gap Mapping and Analysis

Skill Requirements

With the advancement of knitting and garmenting technologies, the productivity requirements from resources working on these machines have also increased. However, the skill levels of existing employees have not kept pace with the expectations. The skill sets of the shop floor or middle management staff play an important role in the overall output of the firm. Currently, the existing skill set of employees required to carry out different production processes has become an important issue to be addressed in the cluster. Most of the firms believe that the existing skills of the workers are sufficient in processes such as spinning, compacting, button holing. However, they also feel that the skill levels of their operators are below expectations for important processes such as winding, mending, knitting, dyeing, stitching, linking and quality checking.

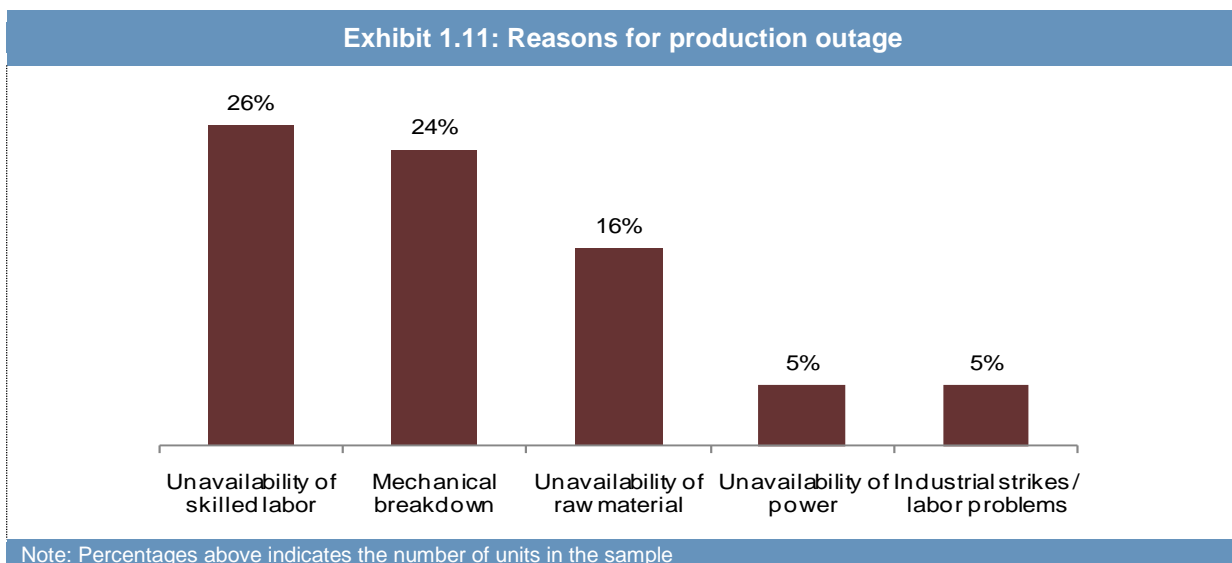
Production

Production is the core activity in the cluster with more than 80% of the firms being involved in the manufacturing of woollen fabric and garments. Wool and acrylic are the major raw materials used and are procured from the local suppliers/agents. The desired characteristics of raw material play a major role in the quality of the fabric. Thus, it is important to procure the right wool/ acrylic as it has a cascading effect on the subsequent production processes.

Raw Materials: Domain knowledge on different raw materials and their characteristics along with negotiation and communication skills are required in order to carry out the sourcing activity. Most of the firms rely on sourcing agents for yarn procurement, which not only increases the cost of the yarn and but also makes them dependent on agents for deliveries and information regarding upcoming supplies and pricing. Lack of this information does not permit the firms to plan their procurement of yarn. Currently, most firms in the cluster are grappling to manage their cost of production and profitability owing to over 70% increase in the cost of yarn and reduced credit period provided by the spinning units. Insufficient knowledge on demand/ supply **conditions of the raw materials** can be mentioned as an important skill gap in the cluster.

Production Planning and Inventory Management: Most of the full time and outsourced labour of the firms is involved in different production activities across the cluster. The manufacturing of woollen garments involves 9-14 different stages depending on the type of garment. The various activities within the garment manufacturing process include spinning, dyeing, knitting, embroidery, garmenting, etc. It is highly important to ensure that every stage of the process is performed meticulously to manufacture a high quality garment. The various skills that are desired for production and inventory control are: a) domain knowledge of textiles and technology related to textile production, b) knowledge of tools and techniques utilized for scheduling, quality control and preventive maintenance, c) problem solving skills for troubleshooting, d) ability to motivate workers and supervisors and e) communication skills.

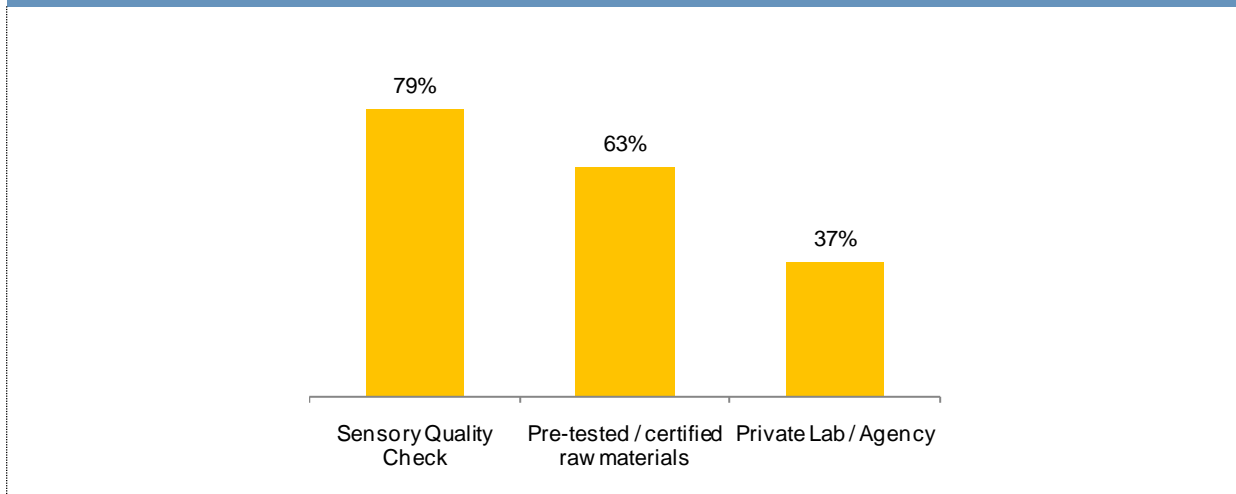
Production planning is an important function within the production process. Most delays in the production can be attributed to lack of planning or improper planning. Planning process forms the basis for and determines the resource allocation in form of workforce, machinery spare parts, accessories and machinery for different orders to achieve the targets set for the production department. Currently, projected sales and availability of skilled labour are the major information areas considered for production planning. Delays in order fulfilment are a common phenomenon observed in the cluster. Among other reasons, these delays are mainly attributed to unavailability of raw materials and also non availability of machinery and manpower due to focus on backlog of previous orders. Accordingly, regular maintenance and raw material availability should also be considered in the production planning process. These delays highlight the **lack of knowledge of techniques related to production planning, scheduling of activities, inventory management and reordering levels** within micro and small enterprises. Very few medium enterprises use sophisticated tools such as enterprise wide ERP to carry out production planning activity. Also, delayed orders are shipped through air to save time, further adding to the cost of manufacturing for the firms. Exhibit 1.11 shows the reasons for production outage across different firms in the cluster.



Quality Control: Quality control is a major process of a production setup and it acts a major price determinant for the final product. In order to manufacture high quality garments, firms need to follow standards, procedures and need to comply with international norms or norms specified by international buyers. Most firms in the cluster do not have any quality policy and formal quality standards and procedures to follow. Exhibit 1.12 indicates the steps currently followed by firms in the cluster to ensure quality of their end products. Across the value chain (80% respondents), quality inspection is done only through visual methods. Other than visual inspection, some medium sized firms ensure quality through usage of certified raw materials. **Quality consciousness was observed to be lacking across the manufacturing value chain especially in micro and small enterprises.** Most of the micro and small level firms are not aware regarding any quality standards for fabric/garment inspection. This has been acting as a major hindrance to the export competitiveness of the

cluster. Also, major concern observed within the cluster was **lack of importance of quality among entrepreneurs and low awareness levels on quality improvement measures and training programmes for quality on topics such as TQM and Lean Manufacturing**. This behaviour percolates to the workers on the floor as it is only the senior management's commitment and definition towards quality that is perceived as important at the lower levels in the firm.

Exhibit 1.12: Quality Measures



Note: Percentages above indicates the number of units in the sample

Maintenance Management: Any production process cannot be completed without support from maintenance department. The maintenance department should ensure smooth plant operations and all its activities need to be aligned to minimize downtime of the equipment. Currently, almost 40% of the firms face production outages due to mechanical breakdown. Most of the firms in the cluster perform maintenance with the help of an in house team and the knowledge levels w.r.t machinery and its technical nuances are observed to be limited within these teams. This limits trouble shooting ability at the time of some serious breakdown issue. Also the firms do not follow any preventive maintenance techniques to reduce the downtime of the equipment. Skill gap in this area is mainly related to **technical knowledge of the machinery and also there are currently no preventive measures taken for reducing the downtime** of the plant.

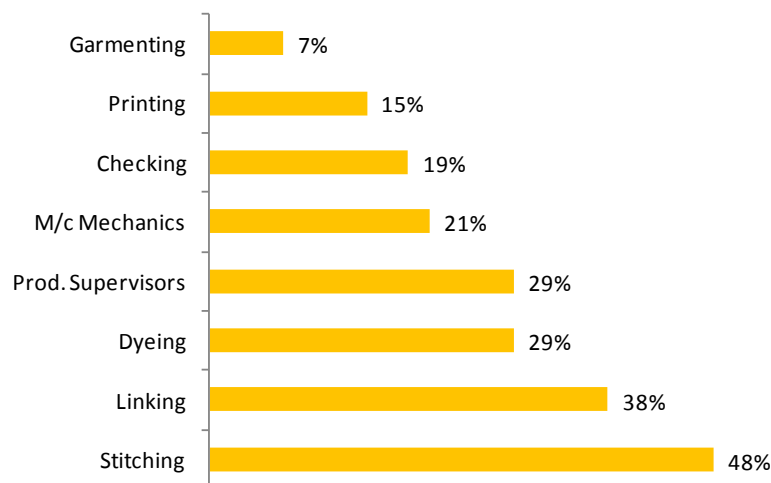
IT: The knowledge level on tools and techniques that can be used by the middle management to control the manufacturing operations can be considered to be limited. **Insufficient knowledge on applications of computers and other technologies in business can be considered to be a gap.** For instance, most of the firms at micro and small level do not possess any standard tools to assess the efficiency and effectiveness of the production operations. These firms are not aware of information systems such as ERP and design softwares and tools such as CAD and CAM. Very few mid sized firms use IT systems to assess the effectiveness of the operations. In most cases, operations are manually monitored by the entrepreneurs.

Labour Shortage: There appears to be a huge **shortage of skilled labour** across the value chain i.e., spinning, dyeing, knitting and garmenting process. The shortage of labour is particularly high for stitching operators, computerized knitting operators, Stoll machine operators, printing and dyeing operators. Also the cluster is facing high shortage of production supervisors and machinery mechanics. Exhibit 1.13 depicts the processes which are constrained by shortage of skilled resources. Even the existing labour pool in the cluster lacks skills required for the operation of computerised knitting machines and cannot **manufacture high quality fabric/ garments in a customised way**.

Limited knowledge of the operation of computerised machinery in spinning, knitting and garmenting processes is a major skill gap observed based on interactions with different firms, associations and training institutes. Thus, the unavailability of skilled labour has become a major constraint to the development of the cluster. The major reason for shortage of labour may be the reduced mobility of labour force from other states of the country owing to MGNREGA scheme of the Central Government. Most of the migratory workers that travel from Bihar and Uttar Pradesh have stopped coming to the cluster because of the minimum 100 days employment guarantee opportunity for unskilled labour under the scheme. Consequently, the quantum of migratory labour visiting the cluster has come down.

Entrepreneurial Skills: The **problem solving skills of the entrepreneurs at micro and small enterprises level have significant scope for improvement**. For instance, with the increase in yarn prices, investment in working capital increased. This impacted the cash flow availability with the firms and reduced their production levels. Post increases in yarn prices, no steps were taken by the entrepreneurs to improve the working capital and maintain their production levels and profitability.

Exhibit 1.13: Shortage of Skilled Manpower



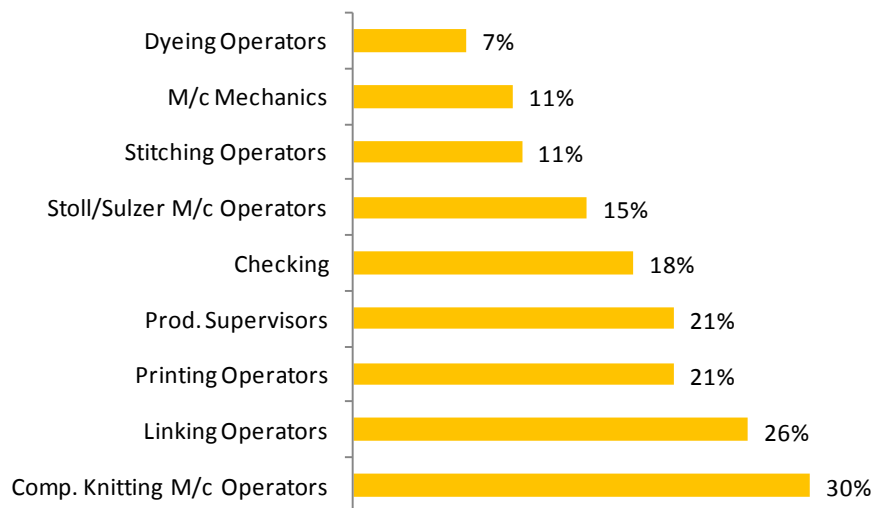
Note: Percentages above indicates the number of units in the sample

Skill Gaps: The cluster currently has 18,000 computerized Stoll knitting machines and 1,500 computerized Sulzer machines. The labour shortage is still unresolved after provision of trainings, as most trainees do not join the workforce after completing the training.

Over and above the shortage of skilled manpower, most enterprises have also indicated skill gaps for critical production processes with the existing employees. Exhibit 1.14 indicates the percentage of firms that require training programs in different production processes for the existing processes. Accordingly, the cluster currently needs trainings and higher workforce count for following processes on priority:

- Garmenting
- Computerized Knitting
 - a) Operator Level
 - b) Designer Level
 - c) M1 designing system
 - d) S series design system
- Dyeing and Printing (No training conducted till date)

Exhibit 1.14: Operator level Skill Gaps



Note: Percentages above indicates the number of units in the sample

The skill gaps in the cluster are much higher at lower levels of management i.e., supervisors and workers. Currently there are hardly any training programs organised to address the skill gaps at these levels. Also the soft skills and managerial skills of the employees in the middle management need improvement.

Marketing

Marketing is an important function because it helps in creating, communicating and delivering value to the customers and it acts as one of the sources of sustainable competitive advantage to the company. However, for various reasons, marketing is not the immediate focus of most entrepreneurs in this cluster. It is considered as a cost head, rather than a revenue enabler. There is very little focus on developing new distribution channels, brand building and effective media communication by most of the enterprises. The most prevalent forms of product promotion adopted by firms are postal mails, own and third party websites. The information provided through these media is almost standardized and in many cases not updated frequently. Thus, these do not allow for regular interaction with the other market forces, knowledge updation and feedback.

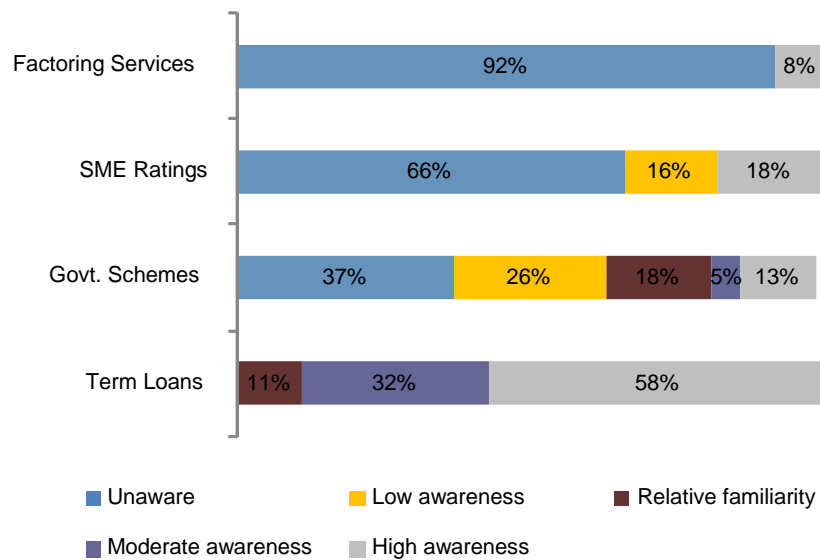
Lack of Knowledge: The skills expected in a marketing unit include negotiation skills, interpersonal skills, communication skills (listening skills), product knowledge, and the ability to gather and analyze information on market and customer needs. However, due to mere absence of any marketing communication with the domestic and international consumers, **ability to gather market information and understand customer needs is understood to be a major skill gap** in the cluster. This is an important gap to be filled considering the changing fashion trends in the international and domestic markets. Moreover, currently majority of the sales are channelized through existing customers of the firms which are mostly retail outlets and bulk wholesalers. These customers are contacted during annual trade fair conducted by the different associations in the cluster. Majority of the sales take place at such events. Remaining sales are done through tie-ups with different agents that market the sample products in national markets and secure orders for the manufacturing units. Currently, micro and small units do not have marketing teams for sales and distribution, new product development and marketing, and brand development activities. Consequently, in absence of any alternate sales channels and customer funnel, entrepreneurs appear to be content in selling their garments to their existing customers at price and quality demanded by their customers; thereby limiting their profitability and growth. Thus, the entrepreneurs lack **skills in identifying new potential markets and building brands**. Very few firms take feedback from customers, local associations and trade fairs w.r.t trends in domestic and overseas markets. Under this scenario, cluster currently relies on the agents for market feedback.

Finance

There are no dedicated finance teams for managing financial processes and activities within micro, small and medium enterprises. Currently, most of the accounting activities are outsourced to a CA/accountant or are managed by the entrepreneurs. Majority of the units in the cluster do not use financial budgeting techniques and also plan their budgets in a rather ad-hoc manner.

A major knowledge gap among the units is lack of awareness w.r.t different government financing schemes available to them such as CGTMSE, technology upgradation fund, etc. and also the financial products offered by banks for small and medium enterprises. Exhibit 1.15 indicates the awareness levels of firms w.r.t. different financing options.

Exhibit 1.15: Awareness of Financing Options



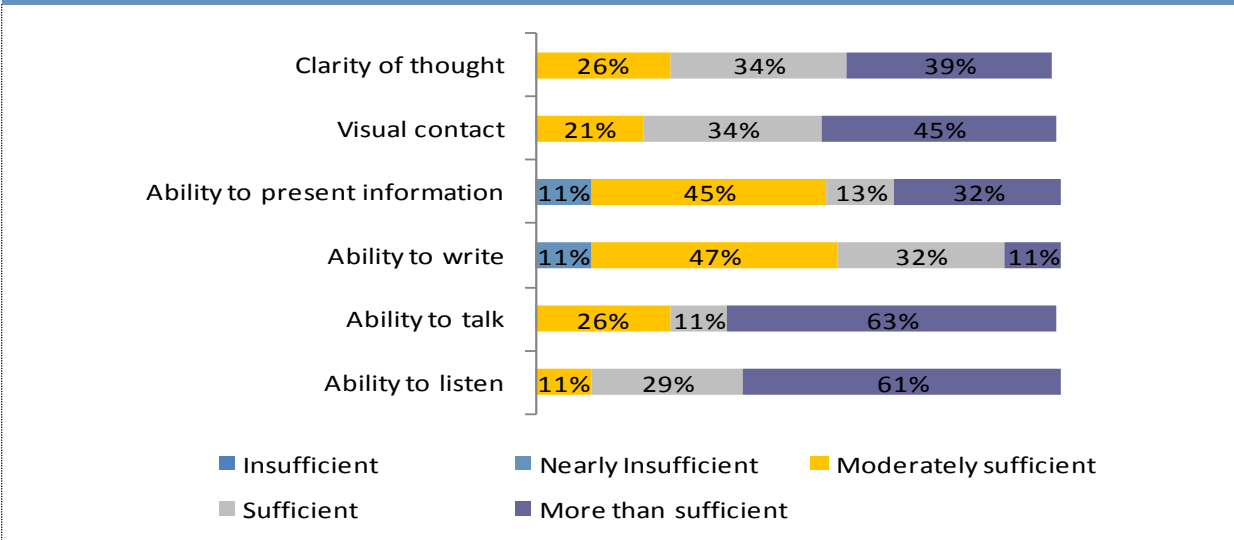
Note: Percentages above indicates the number of units in the sample

Most firms are also facing gaps in understanding and interpreting the export related aspects of business such as customs duty, documents required for duty and overseas buyer credit rating. Also, another skill gap identified can be the **inability to interpret tax sops and incentives declared by government such as duty drawbacks** for the MSME sector. Moreover, entrepreneurs fail to recognize the importance of SME rating and factoring services.

Soft Skills

Possessing these skills is very important for middle and senior management to motivate the workforce and enhance, maintain their productivity levels, professional conduct, right work attitude and to avoid major organization wide issues such as IR issues, mass absenteeism and labour shortage. Existing soft skill levels and gaps therein of the managerial staff have been assessed based on their existing level of communication skills, attitude, personality traits and leadership skills. The responses have been recorded on a likert scale where 5 represents 'more than sufficient' and 1 represents 'insufficient'. Exhibit 1.16 indicates the communication skill levels of the employees at cluster level.

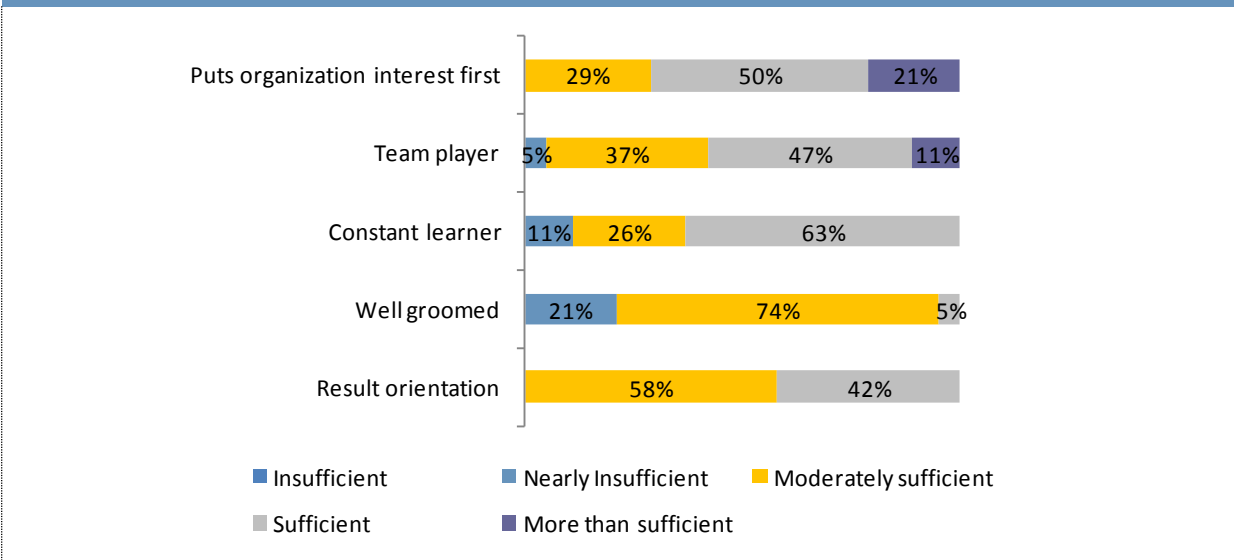
Exhibit 1.16: Communication Skills



Note: Percentages above indicates the number of units in the sample

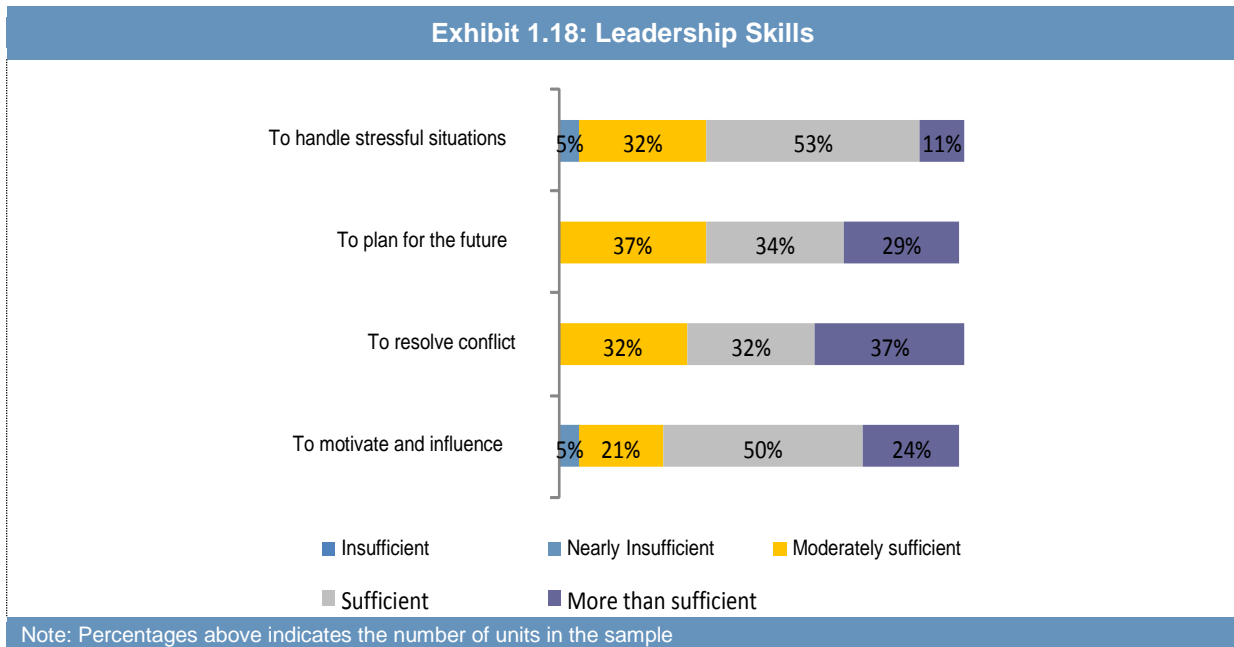
Exhibit 1.17 depicts the attitude of employees towards work, their work ethic and conduct.

Exhibit 1.17: Work Attitude



Note: Percentages above indicates the number of units in the sample

Exhibit 1.18 provides information on the leadership skills of the middle management.



Assessment of NSDC Report on Skill Gap

National Skill Development Corporation (NSDC) has done a detailed study on mapping of human resource skills gaps in textile and clothing industry in India till 2022. The report says that the textile industry is fragmented in nature because of policy restrictions relating to labour laws and also the fiscal advantage enjoyed by the small scale units. The functional distribution of the employees in the industry shows that 75 - 85% of the employees belong to production department and 80-90% of the employees are minimally educated.

The report highlights the importance of technical skills required in the textile industry and also the skill gaps at different stages of the value chain i.e., spinning, fabric manufacturing, fabric processing and garmenting. Exhibit 1.19 provides the skill gaps identified by National Skill Development Corporation across the value chain and across different levels in the manufacturing organizations.

Exhibit 1.19: Skill Gap

Level in Production Department	Production Manager	Supervisor	Operator
Spinning	<ul style="list-style-type: none"> Inadequate cross-functional knowledge especially of maintenance. Inadequate practical knowledge of tools Insufficient soft skills to manage shop floor people. Awareness of modern 	<ul style="list-style-type: none"> Lack of man-management skills to manage shop floor personnel. The supervisors typically have work experience in particular processes of the spinning mill as operator and do not 	<ul style="list-style-type: none"> Knowledge/ Skill confined to single or few machines Lack of knowledge of compliance to quality Inadequate ability to multitask between different types of machines.

	production methods and machines is limited	have a formal training/education of other processes. • Awareness of modern spinning machines is limited.	
Fabric Manufacturing	<ul style="list-style-type: none"> • Lack of man-management skills to manage shop floor employees. • Inadequate knowledge of modern looms – The supervisors typically have work experience in particular type of looms as operator and do not have a formal training/education for modern looms. • Awareness of modern shuttle less looms is limited 	-	<ul style="list-style-type: none"> • Insufficient knowledge of looms, especially shuttle less type of looms. • Inadequate ability to multitask between different types of machines.
Fabric Processing	<ul style="list-style-type: none"> • Inadequate knowledge of both textile manufacturing and chemistry in combination • Inadequate cross-functional knowledge; especially w.r.t effluent treatment processes. • Insufficient soft skills to manage shop floor personnel. 	-	<ul style="list-style-type: none"> • Insufficient availability of personnel who can work in boiler operations. • Inadequate knowledge of various machines and chemicals. • Insufficient knowledge of effluent treatment processes • Inadequate knowledge of CNC machines.
Garmenting	<ul style="list-style-type: none"> • Lack of proper knowledge of sewing machine operations, and different types of seams and stitches • Ability to work across different machines is missing • Quality Control (this is because a large number of managers have been elevated by experience rather than by formal training). 	<ul style="list-style-type: none"> • Insufficient knowledge of various types of sewing machines (refer table listed earlier) – ability work in a cross-functional manner across sewing machines • Inadequate soft skills to manage the shop floor personnel 	<ul style="list-style-type: none"> • Lack of proper knowledge of sewing machine operations, and different types of seams and stitches • Ability to work across different machines is missing

Source: NSDC Skill Gap Assessment In Textile & Clothing Industry in India

The major skills gaps that were revealed in the study are as follows:

- Inadequate knowledge about computerised machinery and limited awareness levels w.r.t maintenance of various machines
- Supervisors lack man-management skills to manage shop floor personnel
- Inadequate understanding of quality requirements w.r.t compliance to international markets
- Availability of trained manpower is also a major issue
- Inadequate training at the operator level and acute shortage of skilled manpower leads to poaching and acts as a detriment to spending on in-house training activities.

Inputs from Diagnostic Study for The Cluster

- A major factor for the competitiveness of the cluster is the availability of cheap and skilled labour force. Majority of the skilled labour in the cluster are migrant labourers from states like UP and Bihar. This trend has changed and the percentage of migrant labour has reduced due to Central Government's MGNREGA scheme in U.P. and Bihar which guarantees at least 100 days of employment.
- There is dearth of trained professionals in the cluster to improve the competitiveness of the cluster and also to prepare the cluster stakeholders for changing business requirements
- There is acute shortage of skilled labour in the cluster and also there are very limited training institutes in Ludhiana that can impart training as per industry expectations
- Moreover, the training institutes' interface with industry is weak which is actually leading to outdated curriculum being offered in most of the training courses
- Majority of the workers receive on the job training to learn how to operate machines, this is leading to low productivity.

Internal Measures Taken for Skill Development

External/In House Training Initiatives

Field agency (ACDS)

Apex Cluster Development Services (ACDS) has been appointed as the field agency for developing BDS in the cluster. It has been active in organising training programs across different levels in the organization since its activities began in the cluster over last two years. Following are some of the major training initiatives undertaken by ACDS:

- ACDS under SIDBI's cluster development program organised a training program at Ludhiana's Central Jail. The inmates were trained on linking machine operation. This was organised to identify and train alternate sources of labour to fulfil cluster requirements of trained personnel. More training programmes in the form of 'sweater making operations' are in the pipeline for jail inmates.
- Ivanna institute identified 60 females from rural and semi urban backgrounds who were keen to work and earn a livelihood but were not equipped with any skills. These women were invited for hand embroidery training program. As part of the course curriculum, women were taught different methodologies of hand embroidery which is generally used for surface ornamentation of garments of knitwear industry. These women were absorbed by the industry with the intervention of association – Knitwear Club of Ludhiana.
- A workshop for upgrading the skills of freelance designers of the cluster was organised on 24th Sept, 2010 at E Resource Center. The workshop was conducted by a leading designer of a major export and domestic manufacturing unit at Ludhiana. The workshop stressed upon the need for designers to be artistic, creative, possess ability to translate ideas in sketches and develop a keen sense of colour. The workshop also emphasised on the software to be used for creating designs.
- ACDS organised a workshop on quality management system on September, 2010 in collaboration with SGS India Pvt. Ltd. The technical manager of SGS India gave a detailed presentation on the quality fundamentals for knitwear industry.
- A workshop on clean development mechanism and carbon credits was organised in the cluster on September 2010. The trainees were informed about the CDM project and its benefits to the developing countries.

In addition to the above mentioned workshops, following training programmes are offered by ACDS to address the needs of shortage of trained workforce in the cluster:

- Stitching operators
- Linking operators
- Computerized Knitting machine operators
- Checking
- Machine Mechanic

- Printing operators
- Designers
- Production Supervisors
- Production Planning

Knitwear Club

Following trainings have been provided by the club in association with SIDBI:

- Garmenting (for women) – Many programmes have been conducted
- Stoll Knitting (for fresher – 6 months duration) – Only one has been conducted. It had good response.

Most of the enterprises feel that it is important to nurture the skills of their manpower for the overall development of the firm but they have not organized any in-house training programs. Major reason mentioned was migratory labour available within the cluster, which is not reliable and easily poached by competing firms. Also most of the firms did not display willingness to bear the training program costs. Instead they preferred to send workers to training institutes.

Interactions with MSM enterprises and key comments

D&B India conducted primary interactions with the entrepreneurs, middle management and the shop floor workers from knitwear units in Ludhiana. Mentioned below are the key issues identified from their interactions:

RR Knitwear:

- Unavailability of skilled and unskilled manpower.
- Limited knowledge w.r.t operation of computerised machinery
- No quality checking procedures to inspect the final garment.
- The entrepreneurs believe that technical training programs need to be organised across all levels of garment production like knitting, sewing, cutting, computerised machinery operation etc.

Om Yarn Plus Ltd:

- Low productivity levels of the existing employees.
- Lack of proper infrastructure to support training needs of inexperienced and experienced workers
- Outdated curriculum and infrastructure of the local training institutes.

Role of Agencies

Industry Associations

Knitwear Club

Knitwear club has been set up in 1984 with the objective of 'Cooperate to compete' within the knitwear and allied industries. It is a non-profit making body contributing to the growth of knitwear industry by bringing forth the problems related to economic, technical and commercial issues of the industry. These issues are taken up with the respective government agencies on behalf of the industry. Owing to the severe shortage of the resources in the cluster, knitwear club has proposed to impart training in knitwear or textile segment by organising seminars, workshops, lectures and training programs to create the skilled workforce required for the industry. The knitwear club has organised several training programs in the cluster relating to garmenting. Recently, a training program for Stoll knitting machines was organised.

Also, following various training programs are offered at knitwear club in association with other partners/institutes:

- **CE program:** This includes short term courses (6 months) on apparel export merchandising, foundation on fashion and design, CAD/CAM etc. Also power packed career booster workshops (3 days) which include smart production system, visual merchandising and retail experiment, fashion business communication are conducted.
- **NIFT: Fashion Knitwear and Production Technology** – It is a continuing education program offered by NIFT and the programme prepares professionals to work as Production Executives, Production Assistants, Quality Control Executive and Merchandisers in knitwear apparel manufacturing companies / buying houses. The duration of the course is one year.
- **NIFT: Pattern making for Hi-Fashion garments** - The course covers topics like Flat Pattern Making, Methods of Basic Draping, Grading, Garment Constructions & Fabric Studies, Production Planning & Control, (Computerised Pattern Making, Grading and Marker Making). The duration of the course is one year.

KAMAL (Knitwear and Apparel Manufacturers Association of Ludhiana)

KAMAL is an association formed by certain leading knitwear and apparel manufacturers of Ludhiana and it provides a common platform for direct interaction between buyers and sellers. It has been set up in 2008 with a vision to bring Ludhiana knitwear industry on the world map. Some of the benefits reaped out of this association in the last two years were arranging exhibitions and industrial visits. Entrepreneurs have benefited by displaying their wide range of garments with best arrangements at low costs.

Implementing Agency

SIDBI is the implementing agency in the cluster and it has organised training programs related to awareness on government schemes and knitting technology. It has organised these programmes with the support of Apex Cluster Development Services, the nodal agency for cluster development in Ludhiana.

Current Training Infrastructure

MSME Development Institute, Ludhiana

MSME-DI, Ludhiana was set up by the Ministry of MSME under Government of India (GoI). It implements various programmes and schemes of GoI for making the Indian MSME's globally competitive. It renders technical consultancy services, techno- managerial assistance, training as well as common facility services for the development of existing and new MSME's located in all the 20 districts of Punjab & UT Chandigarh. The activities of the institute include technical services, training programs, ancillary development, awareness seminars/ workshops, ISO certification, marketing and export promotion, bar coding etc. The institute currently offers two types of training programs for the development of Ludhiana cluster:

- Entrepreneurship skill development program (ESDP)
- Management development programs (MDP)

ESDP's are designed keeping in mind the new market developments and the institute normally offers these training programmes for 6 weeks. Currently, ESDP training programs are offered in different modules like Fashion Designing, Hosiery and Knitwear, etc. for the textile sector. All these courses are designed for educated unemployed youth who are looking for a job or want to take up entrepreneurship as their career.

MDP's are designed to fill the business skill gaps in the local entrepreneurs. The different courses which are offered under MDP are Financial Management, Quality Management, Export Documentation, etc

There is no fixed training calendar prepared at the beginning of the year or a quarter. The institute designs training programs based on the current need in the market and issues advertisements in the local newspaper. Based on the responses received, it schedules different training programs.

Tool Rooms

Central Tool Room (CTR), Ludhiana has been setup under bilateral agreement on technical cooperation between Govt. of India and Govt. of Federal Republic of Germany. It works under the administrative control of Ministry of MSME's, Government of India. The role of CTR is to support the small scale enterprises by rendering technical consultancy services, common service facilities like

manufacture of various types of tools, heat treatment related services. The role of CTR in knitwear cluster development is minimal as it mostly caters to plastics and metal processing industries.

Industrial Training Institutes

There are two ITI's In Ludhiana, one for Women and the other for Men. While the latter has training programmes mainly related to the bicycle and engineering industry, ITI for women organizes training programmes on knitting, embroidery and garmenting. The ITI has both, elementary and advanced level courses in all garment related trades.

Apparel training and design centre (ATDC)

Apparel Export Promotion Council (AEPC) has conceptualised ATDC's all over India to meet the industry's growing requirement for a steady supply of trained workforce and professionals with domain expertise in apparel manufacturing technology. ATDC, Ludhiana offers diploma and certificate courses under different disciplines of knitwear technology. ATDC has started SMART training programs for youth, women and disadvantaged sections of the society which comprises employment oriented courses and career oriented courses. All these training programs are aimed at the development of knitwear cluster. Exhibit 1.20 shows the various training programs offered at ATDC Ludhiana.

Exhibit 1.20 : Training Programs Offered by ATDC			
Type of the Course	Name of the Course	Fee (₹)	Target Trainees
Diploma course (1 year)	Apparel manufacturing technology	35,000	Students (10+2 pass)
Diploma course (1 year)	Apparel Quality Assurance &Technology	70,000	Students and industry professionals
Diploma course (2 years)	Advance Apparel Manufacturing Technology and systems	70,000	Workers with export industry experience
Certificate course (1 year)	Industrial Sewing machine operator	5,000	Student fraternity
Certificate course (6 months)	Apparel pattern making	16,000	Students and industry professionals
Certificate course (6months)	Production supervision and quality control	16,000	Students and industry professionals
Certificate course (250-300hrs)	Industrial sewing machine operator	3,000	Industry workers

Private institutes

Sportking Institute of Fashion Technology (SIFT)

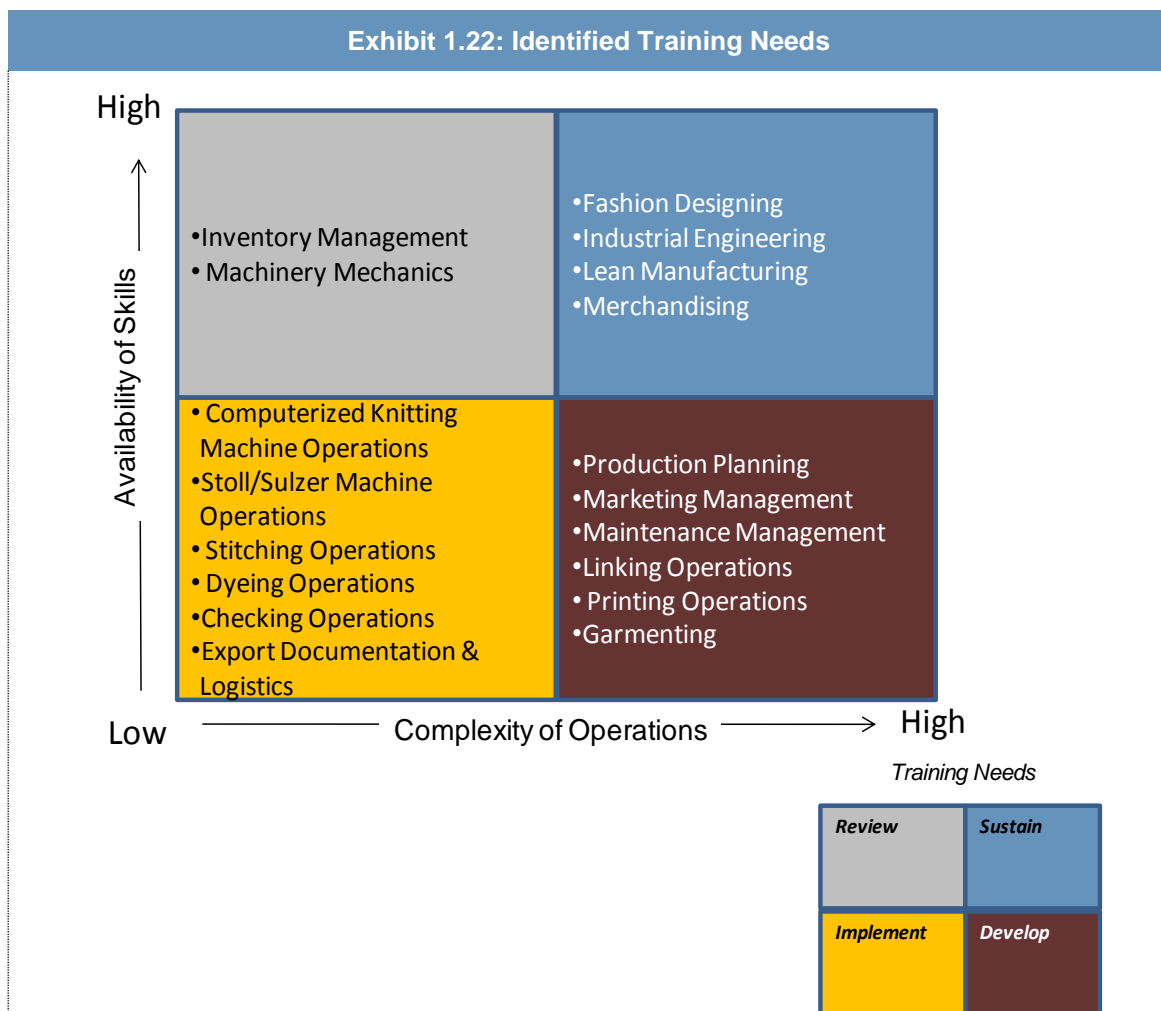
SIFT is a private institute and has been set up by the sportking group of industries. Its objective is to train students with comprehensive range of intellectual skills and to deliver highest standards of education through trained faculty. The institute is reputed for its infrastructure and high quality education. The infrastructure of the institute includes design studio, pattern making and draping workshops, laboratories, computer lab, library, resource centre. The institute – industry interface has been excellent and this is strengthened by the institute's Memorandum of Understanding with many apparel industries, trade and industrial associations. The courses offered by the institute are shown in Exhibit 1.21.

Exhibit 1.21 : Different Training Programs Offered by SIFT			
Type of the Course	Name of the Course	Course Fees	Target Students
Three year diploma courses	<ul style="list-style-type: none"> • Fashion Designing • Knitwear Designing (85% students that attend this workshop have own units) • Fashion Production and Merchandising 	2.5 -3 lakhs	Student fraternity
Medium duration diploma courses (16 months)	Fashion Retail Management	1 lakh	Industry professionals and students
Short duration training courses	<ul style="list-style-type: none"> • M1 Stoll Machine – Knitting Manufacturing Software used for design and knitting • Merchandising – End to end order fulfillment 	10,000 for 3 months 20,000 for 6 months	Industry professionals
Complementary trainings for industry	<ul style="list-style-type: none"> • Fashion forecasting trends • Retailers Training on Sales Management and Technical details of fabrics 	-	-

Identified Training Needs in the Cluster

Skill gaps have been observed at operator and management levels across the value chain of the cluster. However, the operator level gaps are having a direct impact on the productivity of the cluster and accordingly need to be addressed on priority.

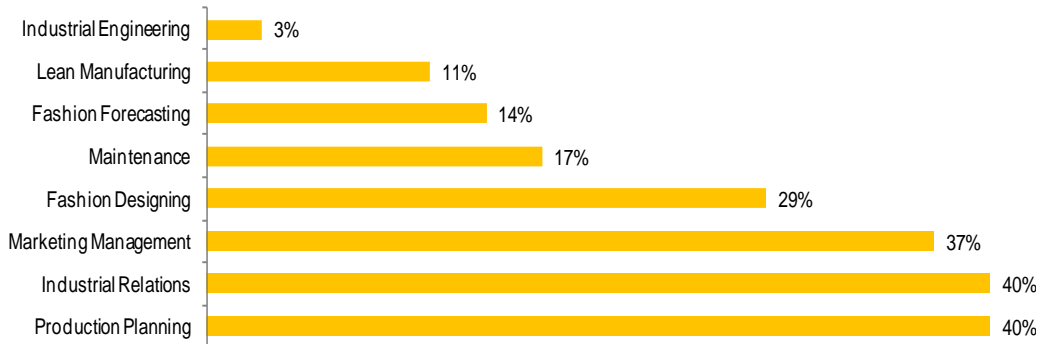
Assessment of available skill set with respect to complexity of operations of the particular process was conducted to obtain insights on key areas where training is critical and required on priority. Complexity of operations were assessed with the sample respondents to obtain an idea of the level of complications involved in the process for e.g. while procurement was indicated as a fairly simpler activity, quality and packaging were indicated as highly complex activities. The available skill sets were rated on the scale of sufficiency as perceived by the owner. The following matrix highlights the key areas where availability of skill set is scarce (immediate training requirement) and also degree of complexity of operations is high or low. Accordingly, the 'yellow' and 'maroon' quadrants (i.e. Implement and Develop) contain the areas where training is required immediately. Among the two quadrants, it is important to address 'yellow quadrant' on priority as the skill gaps can be easily filled in that quadrant due to low complexity of operations.



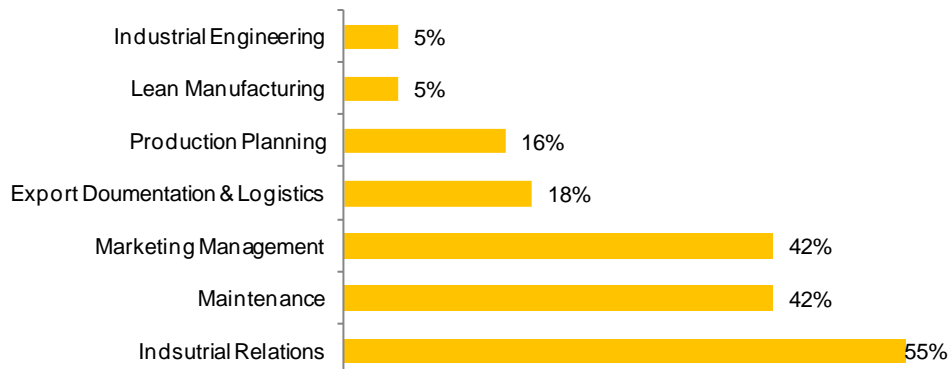
Summary

Skill gaps have been observed at operator and management levels across the value chain of the cluster. However, the operator level gaps are having a direct impact on the productivity of the cluster. Thus, these gaps need to be filled immediately. Mentioned below is a summary of major findings of the study:

- The cluster is faced with severe shortage of skilled and unskilled labour. The availability of migratory labour has been considerably impacted after introduction of MGNREGA scheme by the Central Government.
- Mobilization of resources for training programmes is another major issue. To combat labour shortage, women from rural areas of Punjab are being trained for the operator level positions. However, very few women enroll for jobs after completing the training owing to different socio-cultural issues.
- There is acute shortage of operators to work on computerized knitting machines, stitching operations, stoll machines, garmenting process, dyeing and printing processes. Similarly, there is a shortage of supervisors to supervise work on these machines. In absence of skilled manpower, most firms employ unskilled resources at operator level positions for different processes impacting their productivity.
- Also, skill gaps have been observed at managerial level jobs for processes including marketing management, production planning, scheduling, inventory management, quality control etc. Currently, in absence of skilled resources and no defined recruitment and selection criteria followed by micro and small enterprises, resources are elevated from operator level jobs to managerial level positions based on their experience, rather than their academic qualifications or technical background. In absence of any learning, most of these activities are conducted on ad-hoc basis impacting the productivity and quality of the end product. Apart from technical skills, managers and supervisors also lack soft skills such as communication skills, team development and motivation skills for undertaking their activities. Exhibit 1.23 depicts the different functions where firms believe that there is shortage of skilled managerial resources. Exhibit 1.24 shows the skill gaps with the existing managerial resources employed by the firms across identified functions.

Exhibit 1.23: Shortage of Managerial Resources

Note: Percentages above indicates the number of units in the sample

Exhibit 1.24: Managerial Level Skill Gaps

Note: Percentages above indicates the number of units in the sample

- The cluster lacks updated training infrastructure for operators and managerial level trainings. The machinery utilized is obsolete, curriculum is outdated and the trainers are not updated with the latest manufacturing techniques. Thus, most resources have to undergo on-the-job training on actual production techniques and different processes, limiting their productivity. There is a clear cut need for more co-operation and information exchange between the industry and the institutes to improve the supply of trained resources as per the industry expectations in the cluster.
- The numbers of training programs provided in the cluster are not adequate to address the current needs of the industry. Thus, it is important to increase the frequency of operator level training programmes in the cluster. Also, the training institutes need to design vocational courses that have a component of field training in the industry or in the workshops of the institute as a part of the curriculum.

The following Exhibit illustrates the tip sheet of the Ludhiana cluster.

Exhibit 1.25: Tip Sheet Ludhiana Cluster						
Ludhiana	Shop Floor - Production				Middle Management	
Processes in Value Chain	Knitting	Fabric Processing	Garmenting	Quality Control	Knitting/Fabric Processing	Garmenting
Sub Processes	Scouring, Machine Operations	Bleaching, Milling, Dyeing, Printing, Finishing	Embroidery, Cutting, Stitching, Linking, Button Holing, Assembling, Washing, Pressing, Labeling, Packing	Quality Control and Assurance	Production Planning, Industrial Engineering, Procurement, Logistics, Inventory Management, Maintenance Management	Fashion Designing, Fashion Forecasting, Merchandising
Type of Skill Requirement (Semi-skilled / Skilled)	Semi-Skilled	Semi-Skilled	Semi-Skilled	Skilled	Skilled	Skilled
Availability of Manpower (Low /Medium / High)	Low	Low	Low	Medium	Low	High
Skill Gap (Low/Medium/High)	High	High	High	High	High	Low
Training needs (Review /sustain /implement /Develop)	Implement	Implement/ Develop	Implement	Develop	Develop	Sustain

Available Training Courses	Certificate course on M1 stoll machine – Knitting Manufacturing Software	NA	<p>Diploma Course in Apparel Manufacturing Technology, Certificate course on Industrial Sewing Machine Operator, Certificate course on apparel pattern making, Certificate course on cutting and tailoring Certificate course on embroidery and needle work</p> <p>SMART Courses for sewing operator, finishers and packers, checkers, machine technicians</p>	Diploma course in Apparel Quality Assurance and Technology, Certificate course on production supervision and quality control	Certificate course in merchandising	Diploma course in Fashion Designing, Diploma Course in Knitwear Designing, Diploma course in Fashion Production and Merchandising
Available Training Institutes	Sportking Institute of Fashion Technology	NA	Apparel Training and Design Centre, Industrial Training Institute (Women)	Apparel Training and Design Centre	Sportking Institute of Fashion Technology	Sportking Institute of Fashion Technology

Ludhiana Marketing

Exhibit 1.26: Marketing Tip Sheet				
Processes in Value Chain	Customer Development	Channel Development	Marketing Management	Export Compliance
Sub Processes	New Market Identification, Gathering Market Information, Understanding Customer Needs	Developing Right Channel Mix and Monitoring Channels	Brand Awareness, Targeted Pricing Strategies, Product Management, Media and Promotion	Knowledge of various Export related procedures
Type of Skill Requirement (Semi-skilled / Skilled)	Skilled	Skilled	Skilled	Skilled
Availability of Manpower (Low/Medium/ High)	Medium	Medium	Low	High
Skill Gap (Low/Medium/ High)	High	Medium	High	Medium
Training Needs (Review / Sustain / Implement / Develop)	Develop	Implement/Develop	Develop	Implement
Available Training Courses	No Courses Conducted			
Available Training Institutes	No Institutional Training Available			

Case Studies

RR Knitwear: Case Study - 1

Organisation Profile

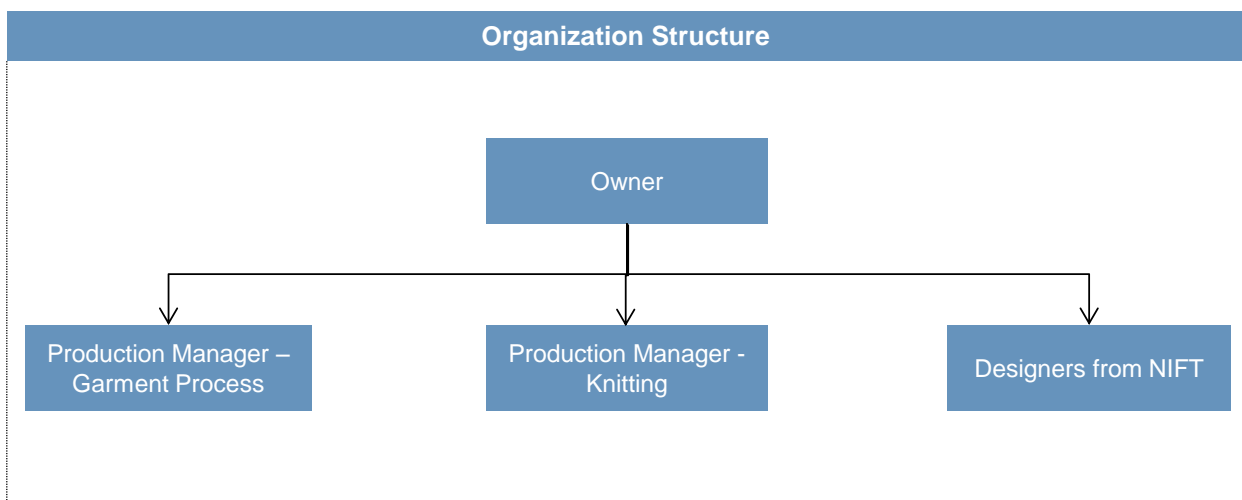
Organization Profile Information	
Name of Enterprise	RR Knitwear
Name of Entrepreneur	Mr. Rakesh Bedi
Type of MSME	Small
Form of organization	Partnership , Family business
Products	Woollen Sweaters for Children
Suppliers	Local suppliers within the cluster

About the Company

RR Knitwear is a small enterprise with employee strength of six persons. There is no formal organisation structure existing in the firm. Most of the major functions of the business are managed by the two owners of the firm. Both the Owners are not technically qualified personnel. One manages finance and accounting, marketing, purchasing, finished garments supply and the other manages design and manufacturing functions of the firm. RR knitwear has got two experienced production heads and they are responsible for smooth manufacturing operations of the firm. There are six full time employees working in the firm and the firm recruits part time employees based on the seasonal variations of the product demand. Most of the operators are recruited on part time basis depending on the available work load. The firm has employed one part time accountant who keeps the firm's books of accounts.

Organization Chart

The following illustrates the organization structure of the company.



Interaction with the owner of RR Knitwear

- The cluster is faced with acute shortage of unskilled labour, inadequate financing channels for capital goods, poor labour productivity, and lack of information exchange among the cluster participants.
- There is a huge demand supply gap existing in the cluster in terms of skilled labour.
- There are very few institutes in the cluster that can fulfil training needs for operators.

Identified Skill Gaps

- The firm is not focused on quality improvement. There are no standard techniques/ methods followed by the firm to inspect the quality of the final garment. Visual inspection is conducted on a random basis to ensure quality of the finished garment. Also, the firm is unaware about various quality measurement parameters.
- The firm lacks in production management functions i.e., inventory management, systems and procedures, preventive maintenance. Most of these functions are carried out on a need basis by the owners.

RR Knitwear has not organized any in-house training programs to improve the skill sets of its employees. The company interacts with other firms in the cluster to improve its processes through knowledge sharing sessions organized by associations like Knitwear Club and KAMAL (Knitwear and Apparel Manufacturers Association of Ludhiana).

OM Yarn Plus: Case Study - 2

Organisation Profile

Organization Profile Information	
Name of Enterprise	Om Yarn Plus Pvt. Ltd.
Name of Entrepreneur	Mr. Sanjay Talwar
Type of MSME	Medium
Form of organization	Single
Products	Woven Fabrics, Knitted Garments
Employees	150

About the Company

Om Yarn is medium sized enterprise employing 150 personnel. The entrepreneur (owner) is a textile technologist graduated from a UK university and started his enterprise in Ludhiana after completion of studies. The company manufactures and sells fabrics and garments in domestic and international markets. The firm has an organisational structure with clearly defined roles and responsibilities for each of its employees.

Interaction with the owner of Om Yarn Plus Pvt. Ltd

Following issues and measures were derived for skill upgradation in the cluster based on the discussion with management and staff of the unit:

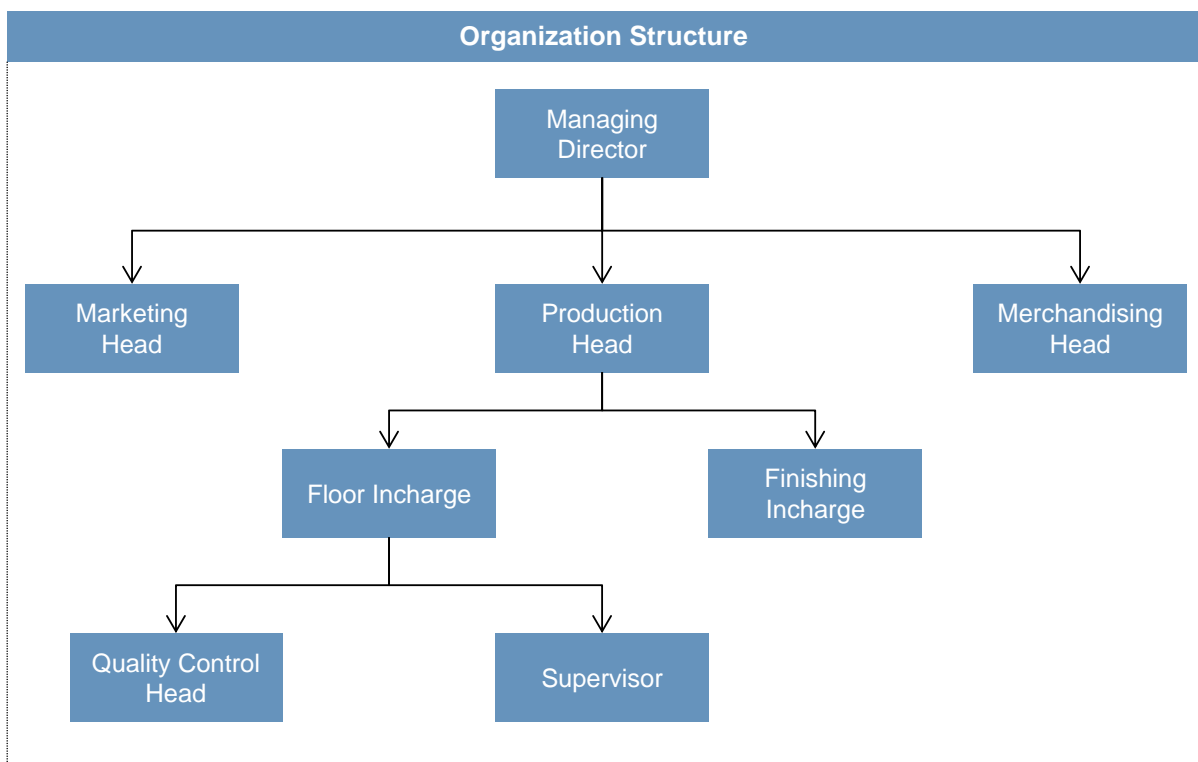
- It is important for the training institutes to offer updated curriculum as per the industry expectations
- The trainers/facilitators of the training institutes are not fully aware of current industry standards, manufacturing practices and their knowledge level is not updated.
- There are very few good institutes in Ludhiana that conduct and support the training needs of the cluster. Also, most of the existing institutes are focusing more on designing related courses than the entire garmenting value chain. Also, few courses are currently catering to training needs of part time and working professionals.
- There exist skill gaps with existing staff on processes and activities related to mending, tailoring, waxing, linking and garment manufacturing.
- Government should provide grants for securing updated machinery (which can be 7-8 years old). Training institutes need to ensure participation from large industries for creating adequate knowledge sharing platforms by dissemination of updated knowledge on processes and machineries.

Identified skill gaps

- The technical skill set of the workers is not up to the industry standards
- Availability of skilled labour is a major constraint
- Lack of awareness on quality related aspects of fabric and garment manufacturing
- Lack of infrastructure and facilities to support the training needs of the cluster
- Limited knowledge of marketing personnel on markets and there is no proper mechanism to capture the information from salespeople on markets and products in order to initiate activities for current market development and market expansion

Organisation Structure

The organization structure is mentioned below



Tirupur Knitwear Cluster

Introduction

Tirupur cluster is primarily involved in manufacture of cotton based apparels. It is mainly comprised of knitwear manufacturers that have grown into integrated manufacturers through backward and/or forward integration. It has historically grown rapidly due to availability of skilled and hardworking labour, availability of raw materials and quality consciousness and customer focus of the entrepreneurs. Also, associations such as Tirupur Exporters Association (TEA) formed to solve the textile industry's problems have been the catalysts in promoting growth of the cluster and increasing its export share.

The cluster receives business from major economies including European Union, U.S.A., Canada, Japan, etc. There are over 24,000 knitting and garment manufacturing units in the cluster. The garmenting units are supported by knitting, dyeing, compacting, embroidery and accessory supplying units in the cluster. The key products that are manufactured in the cluster include T- Shirts, cotton shirts and pants, night wear, cotton gloves, cotton and blended socks, under garments, knitted bed sheets, skirts and tops.

The key processes in the knitwear industry include fibre procurement, spinning, dyeing, knitting/weaving, embroidery and manufacturing garments.

Skill gaps are mainly observed at middle level management and at the supervisor level, which lack people specific skills and knowledge on processes to manage the workers at the shop floor. At the worker level, there are technical process oriented skill gaps and they are attributed to the resource shortage and lack of mobilization of workforce. The cluster is faced with **acute shortage** of skilled and unskilled labour. The availability of migratory labour has been considerably impacted after introduction of MGNREGA scheme by the Central Government. Although the cluster has adequate avenues for training people at shop floor level through ATDC, NIFT – TEA and SIMHA programmes; the major issue faced by the cluster is **resource mobilization and resource motivation** for enrolling for training programmes.

Also, skill gaps have been observed at managerial level jobs for processes including marketing management, production planning, scheduling, inventory management, quality control, maintenance, etc.

Cluster Overview

Nature of Industrial Activity

The knitwear textile industry in India is over a century old. It is emerging as the fastest growing segment of Indian garment exports as compared to woven garments and mill-made garments. This can be mainly attributed to the comfort, stretchability and easy breath ability built within the fabric structure.

Tirupur can be termed as 'the heartland' of the knitwear industry in India. It is primarily involved in manufacture of cotton based apparels. The cluster is mainly comprised of knitwear manufacturers that have grown into integrated manufacturers through backward and/or forward integration. The cluster has historically grown rapidly due to availability of skilled and hardworking labour, availability of raw materials and quality consciousness and customer focus of the entrepreneurs. Also, associations such as Tirupur Exporters Association (TEA) formed to solve the textile industry's problems have been the catalysts in promoting growth of the cluster and increasing its export share.

The cluster receives business from major economies including European Union, U.S.A., Canada, Japan, etc. World renowned companies and labels such as Nike, Lacoste, St. Michael, Benetton, Jockey, Kiabi, Marks & Spencer, C&A, Tape L Oiel, J.C. Penny, Gallery Lafayette, Wal-Mart, H&M, Old Navy, Quick Silver, Decathlon, Mother Care, Tom Tailor, MRK, etc. source their garments and apparels from Tirupur Knitwear Cluster.

Performance and Financial Metrics

The number of domestic and export oriented garment manufacturing units in the cluster is as below

Exhibit 2.1: MSME Garmenting Units	
Turnover (in `)	No. of firms
Exporters	
Up to ` 10 crore (Micro Units)	350
`10 crore – `50 crore (Small Units)	300
`50 crore – `100 crore (Medium Units)	30
`100 crore and above (Large Units)	200
Domestic Manufacturers	
Up to `1 crore (Micro Units)	1,200
`1 crore – `5 crore (Small Units)	350
	120

₹5 crore – ₹10 crore (Medium Units)	30
₹10 crore and above (Large Units)	

Exhibit 2.1 shows the segment wise classification of garment manufacturing units. The table is bifurcated into two parts that mention the number of export and domestic manufacturers.

Exhibit 2.2 provides the turnover estimates of export oriented units and domestic players in the market. The table below displays the concentration of firms in the MSME sector in Tirupur. Most of the firms catering to the domestic market have turnover of less than ₹5 crore and export oriented firms less than ₹50 crore. On an average, a garment making unit having turnover of approximately ₹10 crore, has 150 employees in its operations. The number of people increase depending on other activities undertaken such as own dyeing and knitting operations.

Exhibit 2.2: Turnover Estimates	
Export Oriented	Domestic
Less than ₹10 crore – 350 firms	Less than ₹5 crore – 1,500 firms
₹10 crore – ₹50 crore – 300 firms	₹5 crore – ₹10 crore – 170 firms
Above ₹50 crore – 50 firms	Above ₹10 crore – 30 firms

Exhibit 2.3 provides the count of different units in the cluster. The units mentioned below provide support to approximately 2,400 garment manufacturers mentioned in Exhibit 2.1 in form of knitting, dyeing and bleaching and other ancillary services:

Exhibit 2.3: Different units in the Cluster		
S. No	Type of Unit	No. of units in the cluster
1	Knitting/Stitching units	2,500
2	Dyeing* and Bleaching	750
3	Fabric Printing	350
4	Embroidery	150
5	Compacting and Calendaring	200
6	Other Ancillary Units	250

Note: * Dyeing units in Tirupur are closed currently owing to the Supreme Court judgment.

Cluster Linkages and Dependencies

Cotton is sourced from major cotton producing states including Maharashtra, Andhra Pradesh and Tamil Nadu. The leading spinning and weaving machinery manufacturers in Coimbatore have joined hands with their Chinese and Taiwanese counterparts to upgrade their technology, thus providing advanced machinery to manufacturers locally at competitive prices.

The raw materials used in the cluster for knitwear garments are pure cotton, acrylic, silk, linen, viscose, nylon, etc. The recent increases in the yarn prices and the closure of dyeing units in the cluster have posed significant challenges to the cluster. In absence of dyeing units in Tirupur, manufacturers are now compelled to dye their garments from dyeing units in Erode in Tamil Nadu and as far as Punjab and Madhya Pradesh at very high prices for their pre-booked orders. This has resulted in significant losses to the manufacturers on these orders. However, to combat the price rise, the manufacturers are now passing these costs to the buying units/houses for fresh orders. These events have drastically impacted the profitability and competitiveness of the cluster against its international competitors in Sri Lanka and Bangladesh. They have exposed the level of external dependence by the garment manufacturers in the cluster.

The knitting machinery suppliers themselves conduct maintenance of the machinery supplied to the cluster. The knitting machinery available with the suppliers cover most of the gauges (gg) or tubular width of the fabric and fiber blends with advanced machinery or attachments available from leading manufacturers of China, Japan, Europe and the U.S.A.

Most of the labour is migrant and unskilled. It comes mainly from Uttar Pradesh, Bihar and West Bengal. There is acute shortage of skilled labour in the cluster. Many entrepreneurs, associations and training institutes cited different reasons for the shortage. Prominent among these have been the MGNREGA (Mahatma Gandhi National Rural Employment Guarantee Act) scheme of the Central Government, which ensures a minimum employment of 100 days in their home state and also Tamil Nadu State Government schemes that provide essential supplies at lower than market prices. These facilities are believed to have reduced the motivation of the workforce to enrol for a job and consequently reduced availability of skilled and unskilled labour from Tamil Nadu and rest of the country.

A major strength of the cluster is its backward linkage. A backward linkage is the channel through which information; material and money flow between a firm and its suppliers and create a network of economic interdependence. In terms of backward suppliers, raw cotton and spun yarn is easily available locally. As mentioned earlier Tirupur lies in the heart of a cotton producing region. Local suppliers are able to provide more than 90% of the total fabric requirement of the industry. 70% of the manufacturers procure their yarn from the spinners within the country. This can be a strategic advantage given the fact that most knitting and garmenting units in Sri Lanka and Bangladesh source their cotton from India.

Dyers colour the cloth, while screen printers print the designs. The finished cloth is cut and stitched, finished, ironed and packed by the garment maker, the “main” product manufacturer (and often exporter). All ancillary components, such as thread, buttons, elastic, labels and so on are locally manufactured. While most of the production processes, and components, are clearly distinguishable; there are different types and degrees of vertical integration observed in garment production in Tirupur.

The **key products** that are manufactured in the cluster include T- Shirts, cotton shirts and pants, night wear, cotton gloves, cotton and blended socks, under garments, knitted bed sheets, skirts and tops.

Key Processes within the Cluster

The key processes in the knitwear industry include fibre procurement, spinning, dyeing, knitting/weaving, embroidery and manufacturing garments. The process gets initiated from procuring cotton yarn from spinning mills and adding the correct proportion of petrochemicals. The resulting fabric is converted to grey fabric after the process of knitting. The knitted fabric undergoes dyeing which results in processed/coloured fabric. This fabric undergoes cutting, sewing and tailoring and is converted into finished apparel.

Exhibit 2.4 gives a broad overview of the major processes involved in manufacturing of garments in the cluster. The process is initiated with the procurement of order from the client side. Based on the confirmation of the order; raw materials (namely yarn and other accessories) are purchased by the manufacturer. The yarn is knit into a cloth in the fabrication stage and then sent to the cutting and stitching department where different processes are executed to produce finished apparel. The packaging and inspection department is responsible for quality checks at the end.

Exhibit 2.4: Process Flowchart for a typical Knitting and Garmenting Unit

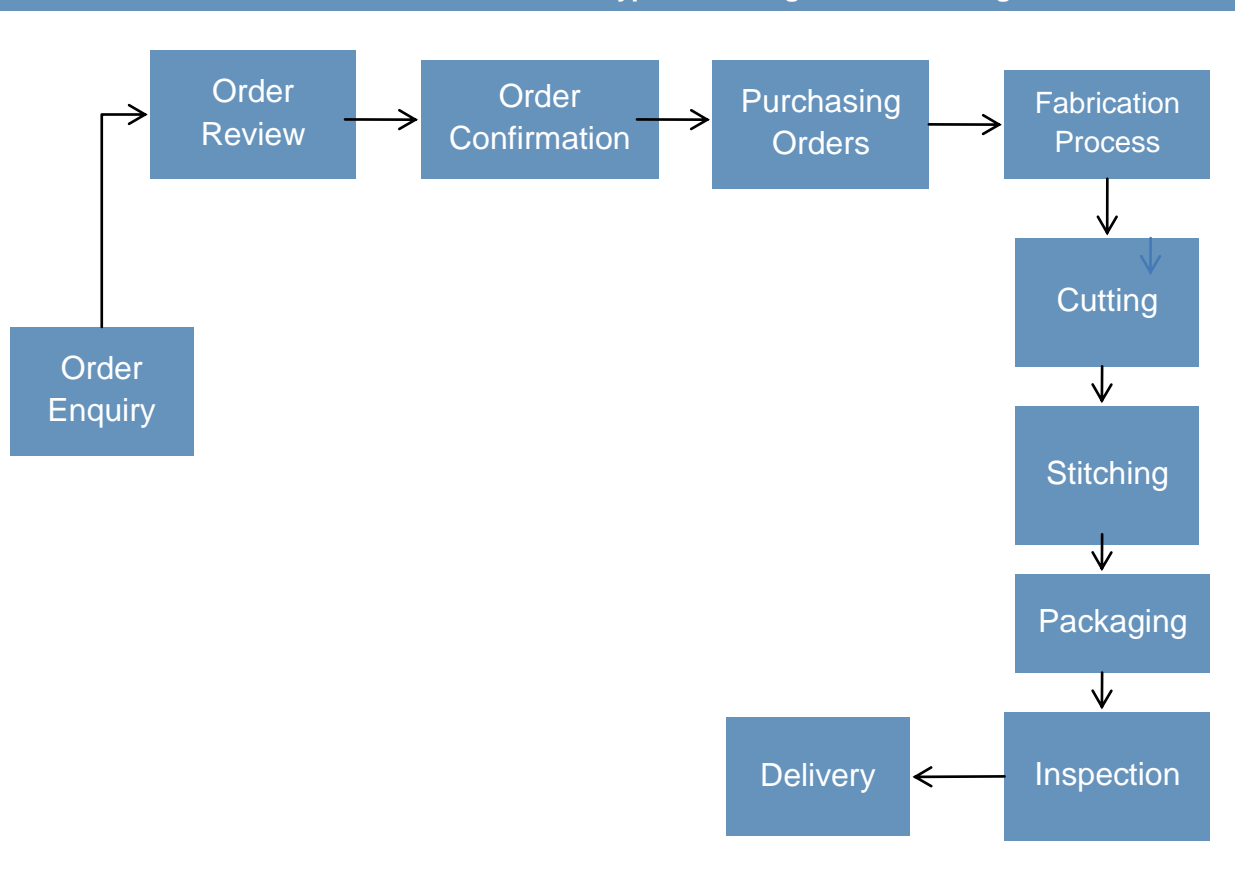


Exhibit 2.5 portrays a circular knitting machine and a compacting machine. Circular knitting is different kind of knitting machine than flat bed machines and is utilized to manufacture cloth from the yarn. Compacting machine is utilized in the finishing stages of the cloth material to control its shrinkage and to improve the dimensional stability.

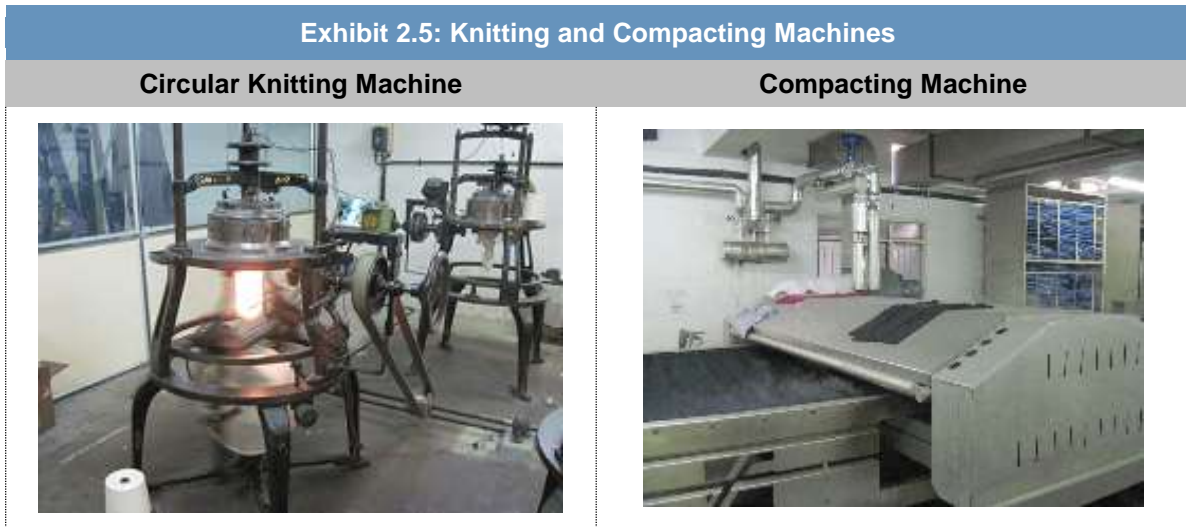


Exhibit 2.6 depicts pictures of typical collar making and ironing machines. The collar making process involves preparing collars and cuffs for the shirts and T shirts. Ironing department is responsible to iron out any shrinkages in the finishing stage. The ironed clothes are sent to the packaging department for final inspection and packing of the material which is then sent to the client.



Exhibit 2.7 depicts the picture of a raising machine and a peach finishing machine. Raising machine is responsible to lift the surface fibers to improve the softness and warmth. It is a process in succession to the compacting process. After the fiber is improved for softness and warmth it is sent for peach finishing, which subjects the fabric to emery wheels, that gives the surface of the cloth a smooth (velvet like) feel. This is special finish mostly required for high end t-shirts.



Skill Gap Mapping and Analysis

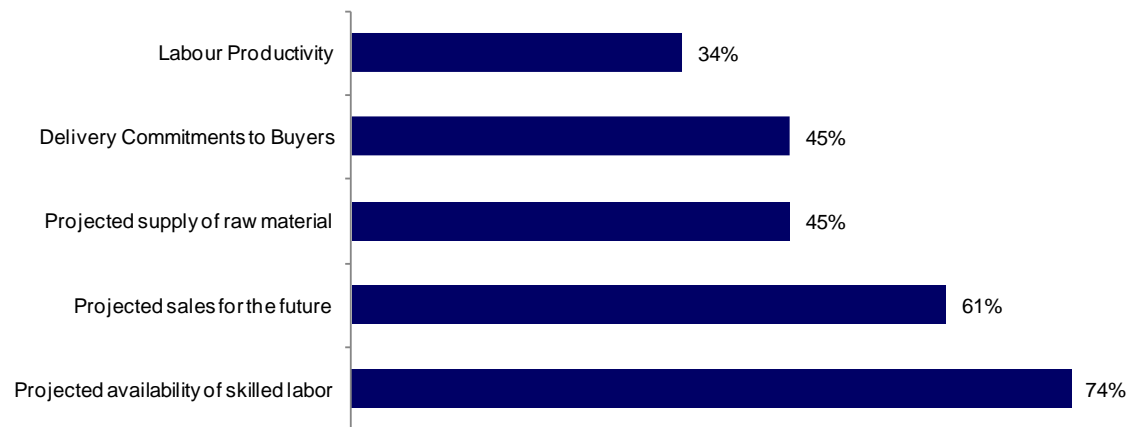
Skill Requirements

Production

Production is the core activity in the cluster as majority of the enterprises are involved in manufacturing of different garments. The production process of an organization includes sourcing of raw materials, the processing of the materials into finished product with the utilization of various machineries. The desired characteristics of raw material play a major role in the quality of the fabric. The sourcing of yarn is considered as a critical activity as it can affect the subsequent process in the value chain. Domain knowledge on different raw materials and their characteristics along with negotiation and communication skills are required in order to carry out the sourcing activity. The firms currently rely upon the local suppliers for the procurement of yarn, which not only increases the cost of the yarn and but also makes them dependent on agents for deliveries and information regarding upcoming supplies and pricing. Lack of this information does not permit the firms to plan their procurement of yarn. Currently, most firms in the cluster are grappling to manage their cost of production and profitability owing to over 70% increase in the cost of yarn. **Insufficient knowledge on demand/ supply conditions of the raw materials** can be mentioned as an important skill gap in the cluster.

Production Planning and Inventory Management: Fabrication, cutting and stitching departments are mainly responsible for the quality and timely delivery of the end garment. However, in many occasions, production delays are attributed to non-availability of raw materials and accessories at the right time. Since most of the raw material for these machines such as accessories and trims are purchased externally, there is huge reliance on these suppliers for timely delivery of good quality accessories. As majority of these suppliers are also small sized firms, they need to be given sufficient notice to plan their supplies. However, in absence of specific production planning and inventory management tools with the knitwear firms, mostly orders for raw materials and spares are released beyond the reorder level which results in outages for these materials and thus impacts the final delivery timelines in an adverse manner. Exhibit 2.8 indicates the inputs that are considered by the firms for estimation of production schedule. It shows that only 45% of the firms consider raw material supply timelines, which is as an important input for production planning process. Thus, there appears to be significant **gaps in production planning and inventory management processes**. In absence of any defined guidelines, most of these activities are conducted in an ad-hoc and need based manner. A case in point is the dependence on accessories and trims by the stitching department. Without the timely availability of these materials from external suppliers, it is almost not possible to meet the delivery timelines for the order.

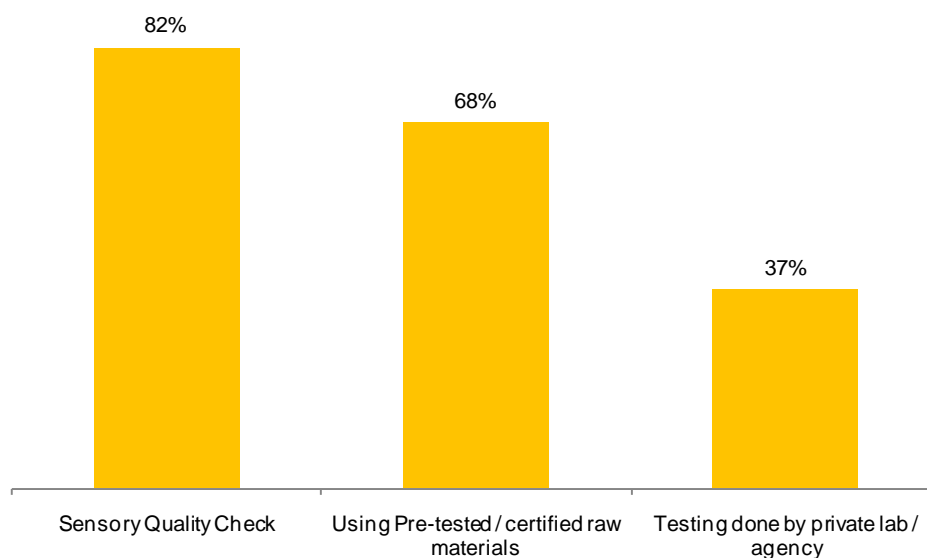
Exhibit 2.8: Estimation of production schedule



Note: Percentages above indicates the number of units in the sample

Quality Control: The quality of the end garment has a high bearing on its price. Currently, quality of product is focused upon after the manufacturing of the end garment rather than maintaining stage by stage quality controls. There is a visible knowledge gap with respect to understanding the difference between the Quality Control (QC) and Quality Assurance (QA). In most of the production lines, both QA and QC are interchangeably used. The quality checking skills also differ from a novice to an experienced operator. The small enterprises only rely on “**Sensory Quality Checks**” implying visual aids, colour of the dye used of the end product. Exhibit 2.9 shows the steps that firms take to ensure quality of the garments. It is understood that most of the firms do not follow any standard procedures for maintaining quality. **Quality as a process is a major skill gap at all levels and in all types of organizations.** In – house quality checks is a priority for most of the enterprises.

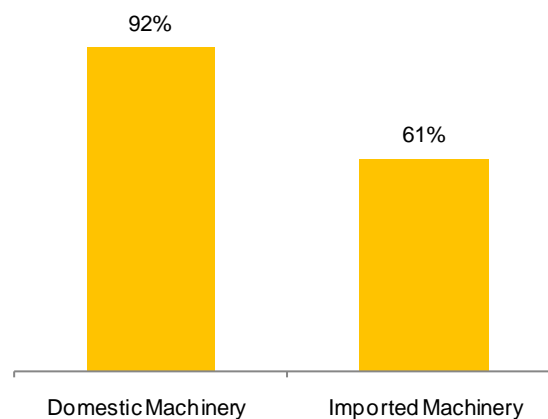
Exhibit 2.9: Quality Measures



Note: Percentages above indicates the number of units in the sample

Maintenance Management: Maintenance plays an important role in ensuring smooth operations of the overall production process. The maintenance team needs to ensure smooth plant operations and all its activities need to be aligned to minimize downtime of the equipment. Most of the firms in the cluster have an in house maintenance team to carry out the general maintenance of the machines. In case of major breakdown, the machinery dealer is communicated. Some of the medium sized firms also engage in preventive maintenance activities. Currently, the **knowledge of preventive, regular and breakdown maintenance can be termed as insufficient** in the cluster. However, it is not an immediate concern as most of the machines have good quality and are fairly modern in technology. Exhibit 2.10 indicates the type of technology that firms are currently using in the cluster.

Exhibit 2.10: Manufacturing Technology



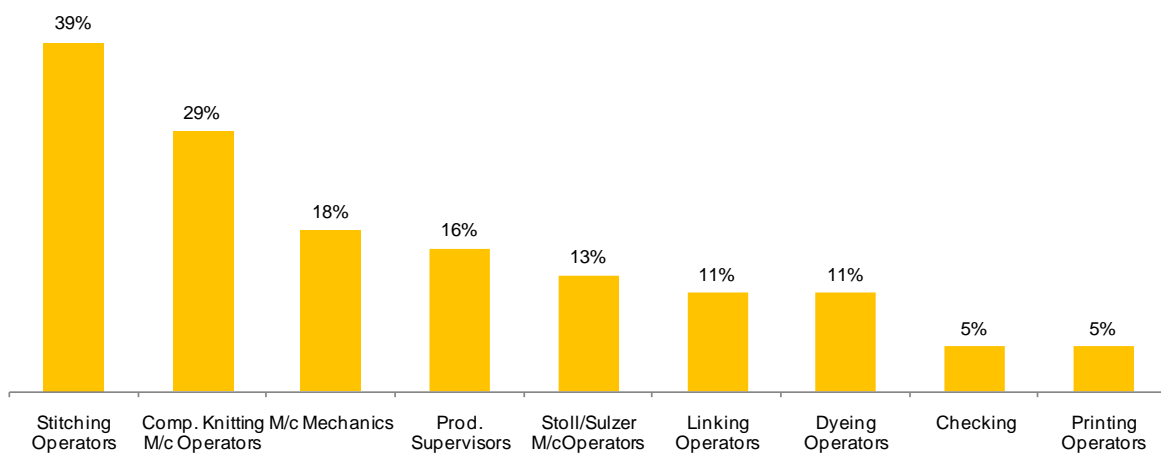
Note: Percentages above indicates the number of units in the sample

Industrial Engineering: Majority of the firms have supervisors that have graduated to their current position based on their work experience and not on their technical skills and know how. Thus, job allocation to workers takes place on an ad-hoc basis. There is **limited knowledge of industrial engineering** and different productivity norms for different cutting and sewing machines. Most of the supervisors and the production team executives are not aware of productivity benchmarks such as GSD, Juki and Brother Standards. Thus, production targets are currently set depending on the current capability of the resources and not the capacity of the machines. This limits the productivity of the workers and consequently of the firms.

Operator Level Resource Shortage: There is an **acute shortage** of operator level workforce in the cluster due to various reasons. Exhibit 2.11 represents the shortage of operators/technicians in different processes of production at cluster level. The shortage is felt across all activities in the manufacturing cycle. The shortage in workforce is particularly high in stitching and computerized knitting processes. Main reason for the shortage is the migrant and unskilled nature of the workforce. It comes mainly from Uttar Pradesh, Bihar and West Bengal. Many entrepreneurs, associations and training institutes cited different reasons for the shortage. Prominent among these have been the MGNREGA (Mahatma Gandhi National Rural Employment Guarantee Act) scheme of the Central

Government, which ensures a minimum employment of 100 days in their home state and also Tamil Nadu State Government schemes that provide essential supplies such as rice at lower than market prices. These facilities are believed to have reduced the motivation of the workforce to enrol for a job and consequently reduced availability of skilled and unskilled labour from Tamil Nadu and rest of the country. Further, most of the labourers get better wages in agriculture related activities during seasonal monsoon rains. Exhibit 2.12 indicates the operator level training programs required for different processes.

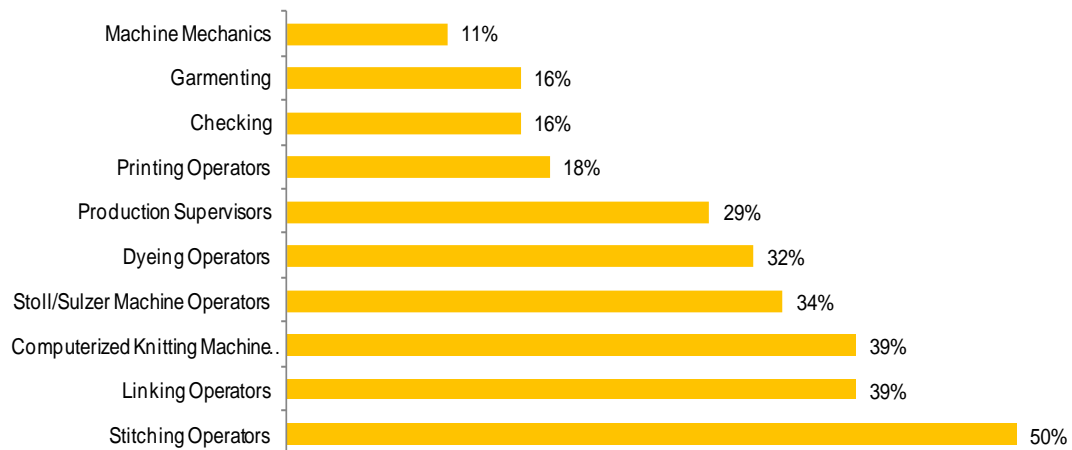
Exhibit 2.11: Shortage of operators in different processes of production



Note: Percentages above indicates the number of units in the sample

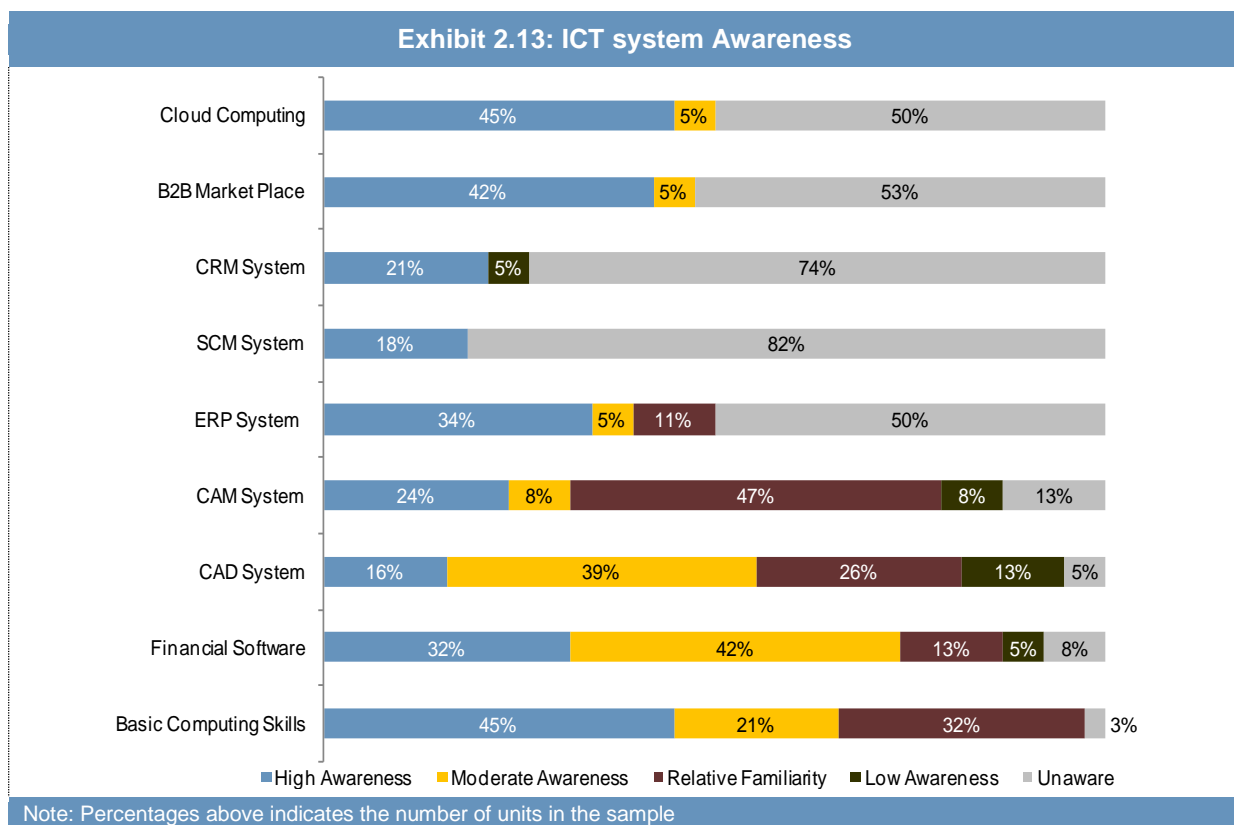
Operator Level Skill Gaps

Exhibit 2.12: Operator Level Skill Gaps



Note: Percentages above indicates the number of units in the sample

ICT Knowledge and Adoption: The knowledge level on tools and techniques that can be used by the middle management to control the manufacturing operations can be considered to be limited. **Lack of knowledge of IT and ERP solutions** was viewed at every departmental activity. There is a visible skill gap in the interlinking of the departments with respect to information sharing. Very few enterprises utilize ERP solutions. **Updated knowledge on systems and IT support** for production and capacity planning is viewed as the key issue by firms in the cluster. Exhibit 2.13 indicates the awareness levels of firms on information and communication systems. Because of poor IT infrastructure existing in the firms, most of the planning process is done manually which leads to the development of non-optimal plans. A non – optimal plan has its effect on order procurement which leads to stock-out situations in critical cases and in-turn results in production delays. As a result of these delays in the product manufacturing, the orders are delivered to the clients by airway logistics which also adds up to the cost of the delivery.



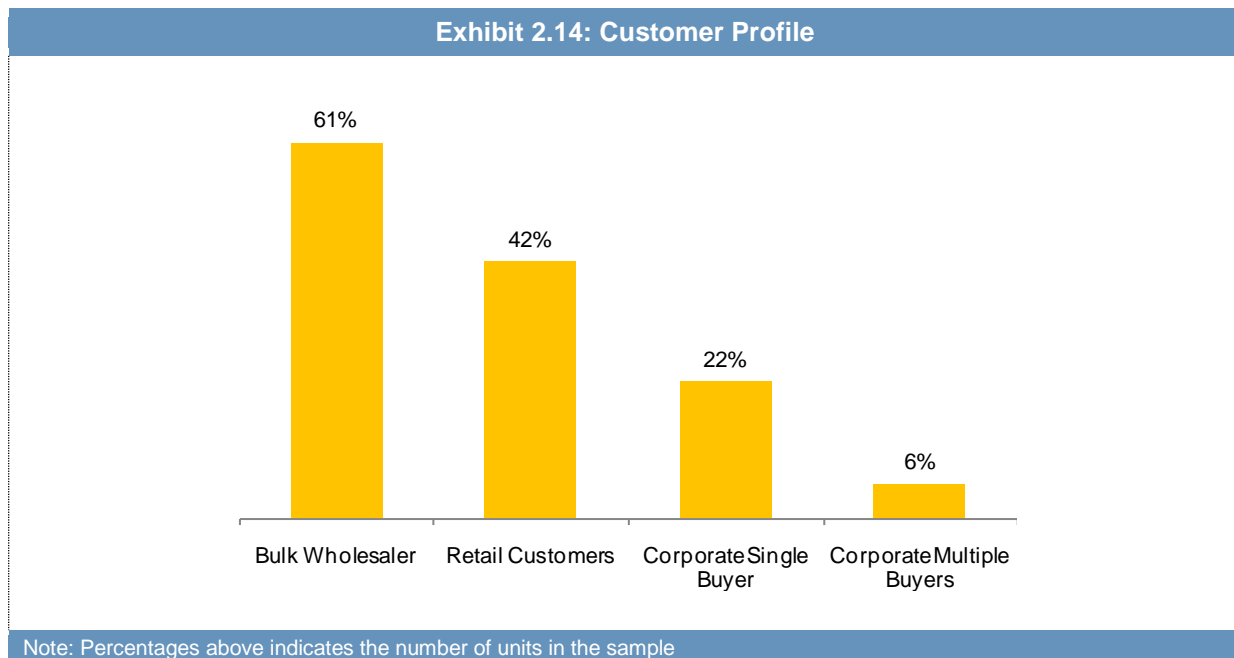
Design Capabilities: As most of the orders are received from international buyers with strict design specifications, most of the enterprises in the cluster have **not developed in house design capabilities**. This is an important skill gap in the cluster, as it limits the enterprises from having garments with its independent designs and brands.

Lack of Leadership Skills: The supervisors and the production in-charge **lack communication and leadership skills** for on the job monitoring. Due to lack of planning in initial stages, the work load on production floor tends to increase many fold as the delivery date approaches. As understood from different agencies in the cluster, this has become a common phenomenon in the cluster. This leads to fatigue, loss of motivation, and to an extent lack of respect for the supervisors. Also, in many cases, it

has impacted the work life balance of the workers. To add to this, very few firms conduct recreation/rejuvenation activities to engage and motivate workers. There appears to be a distinct communication gap between the management and the workers. The supervisors do not effectively communicate with the workers on daily targets, production techniques and quality issues. They do not appear to be conversant with reporting and documentation of the daily activities that are meant for the production team. This has majorly led to high absenteeism with the workforce and also high dropout rates.

Marketing

Marketing is not viewed as a very important activity by most firms. The firms in the cluster mainly deal with fixed clients/international buyers/brands which obviate the need to focus on marketing. Exhibit 2.14 indicates the buyer profile of firms at cluster level. Buying Agents is the largest customer segment in the cluster. They are also known as Bulk Wholesalers. The cluster mostly concentrates its marketing activities to the export markets where the onus is on the buyer to fix the price and design of the product. The manufacturers mostly operate as outsourcing units. Under this scenario, the manufacturers are not in a position to get better price for its garments as they are only manufactured based on client specific needs at pre-determined and client approved price. Very few enterprises conduct any defined above the line and/or below the line promotional activities.



There is no defined and separate marketing team even at mid-size level firms. The top management is primarily responsible for marketing of its capabilities to acquire new buyers. The skills expected with respect to marketing include negotiation skills, interpersonal and communication skills, knowledge of textile business and products and the ability to analyze the information about the market with respect to the client needs.

The major skill gap identified in the marketing function is the lack of marketing management skills in order to identify new markets and potential buyers. The other skill gap identified can be the **lack of**

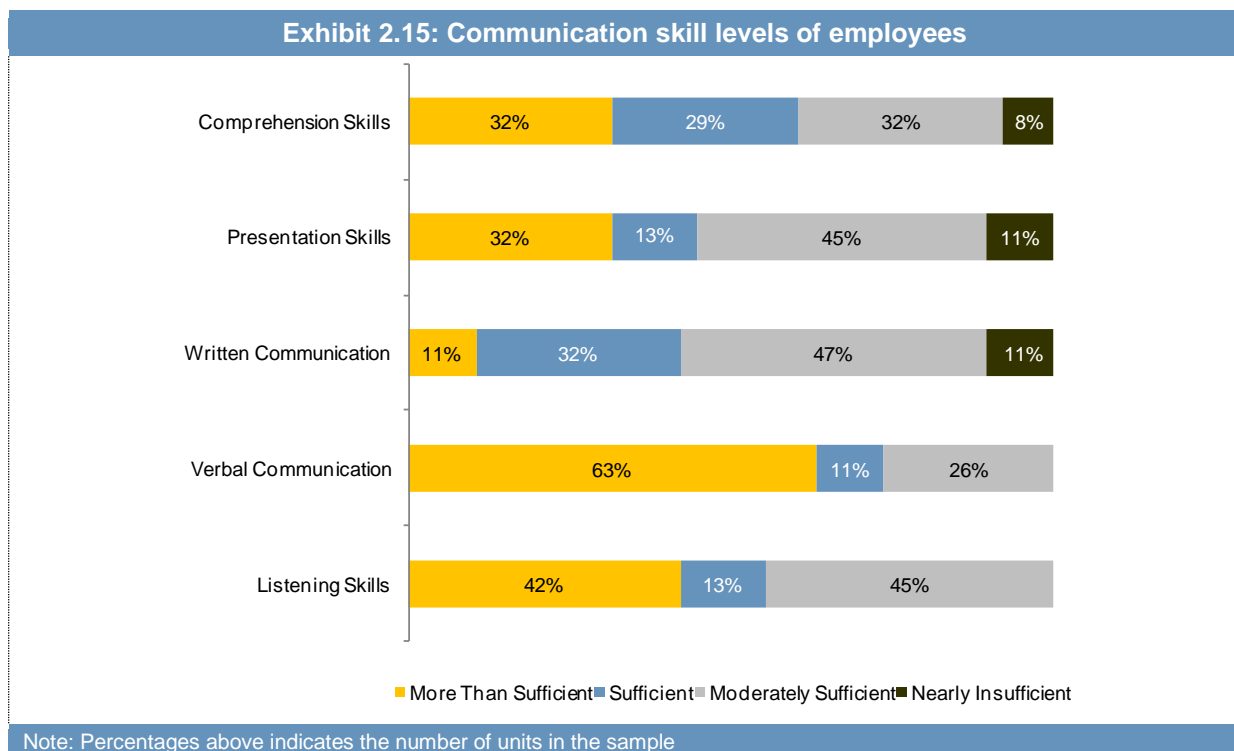
importance and knowledge of brand development and the potential to utilize the domestic markets. The domestic markets are viewed as secondary market where the surplus and neglected garments are sold.

Finance

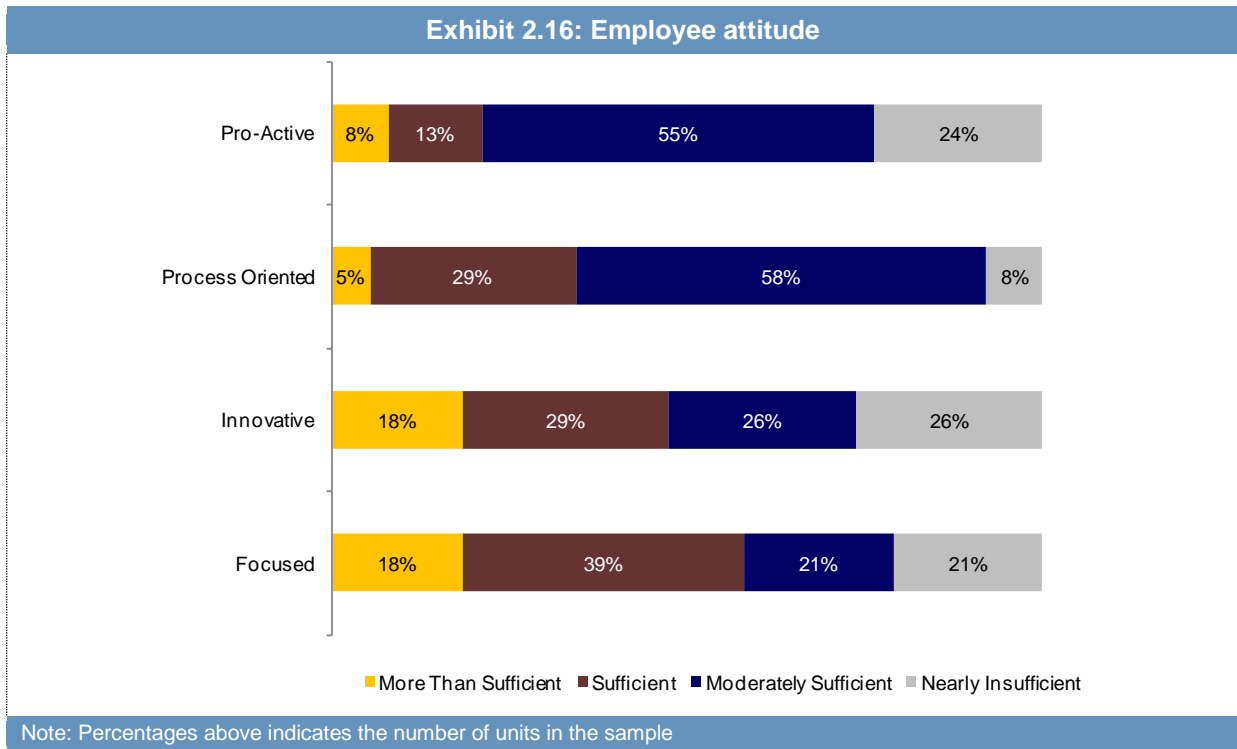
The finance function is mainly responsible for budgeting and other purchase related activities in the cluster. The cluster lacks skilled resources with adequate technical educational background in finance to conduct day to day finance related activities. In such scenario, mostly graduates from non-finance background or undergraduates assist the owner in conducting the finance related functions. This takes away considerable time of the management in conducting routine tasks. Thus, financial planning, annual budgeting and financial forecasting activities are conducted in an ad-hoc manner which has implications on the cash flows and the profitability of the firms and information w.r.t financial health of the company

Soft skills

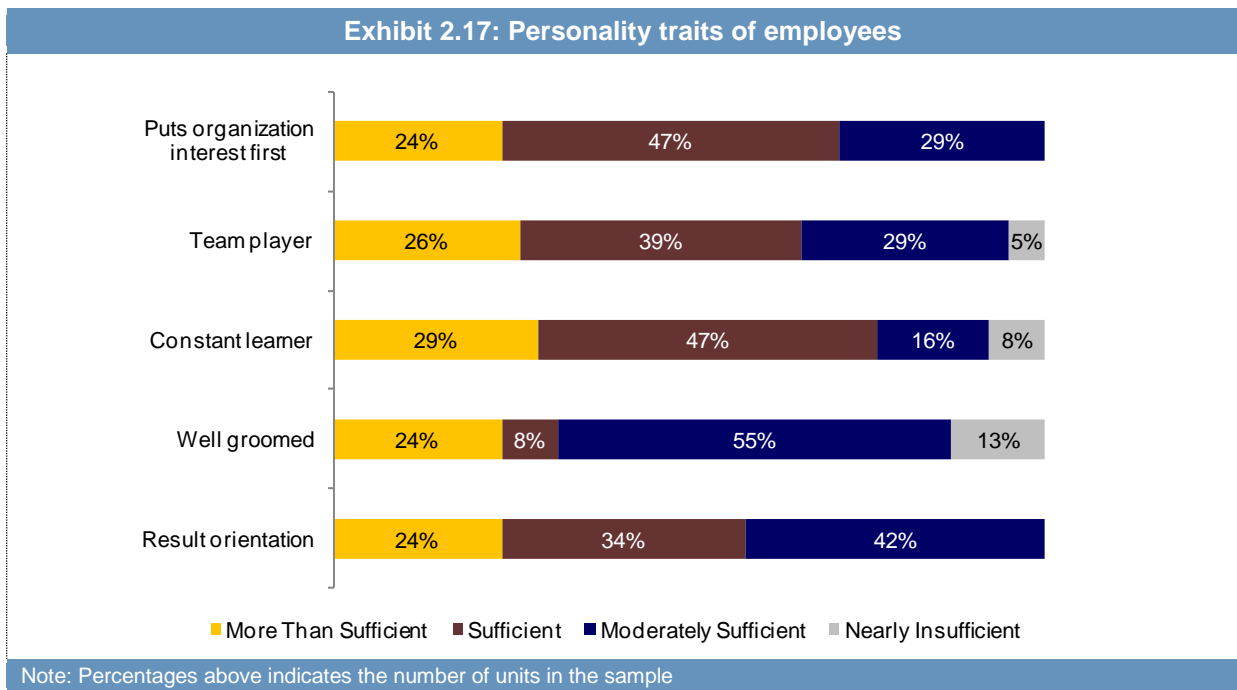
Possessing these skills is very important for middle and senior management to motivate the workforce and enhance, maintain their productivity levels, professional conduct, right work attitude and to avoid major organization wide issues such as IR issues, mass absenteeism and labour shortage. Existing soft skill levels and gaps therein of the managerial staff have been assessed based on their existing level of communication skills, attitude, personality traits and leadership skills. The responses have been recorded on a likert scale where 5 represents 'more than sufficient' and 1 represents 'insufficient'



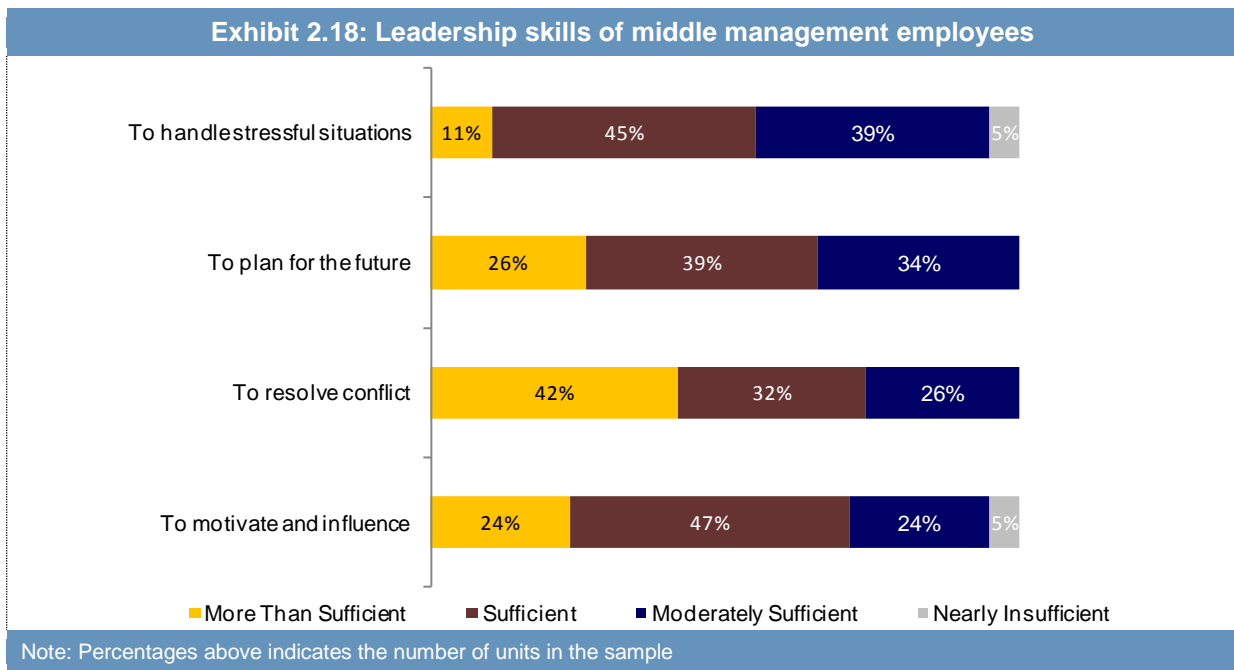
Employee Attitude



Personality Traits



Leadership Skills



Assessment of NSDC Report on Skill Gap

National Skill Development Corporation (NSDC) has done a detailed study on mapping of human resource skills gaps in textile and clothing industry in India till 2022. The report mentions that the textile industry is fragmented in nature because of policy restrictions relating to labour laws and also the fiscal advantage enjoyed by the small scale units. The functional distribution of the employees in the industry shows that 75 - 85% of the employees belong to production department and 80-90% of the employees are minimally educated.

The report highlights the importance of technical skills required in textile industry and also skill gaps at different stages of value chain i.e., spinning, fabric manufacturing, fabric processing and garmenting.

Exhibit 2.19: Skill Gap Assessment (NSDC report)			
Level in Production Department	Production Manager	Supervisor	Operator
Spinning	Lack of adequate communication skills. Inadequate practical knowledge of tools Insufficient soft skills to manage shop floor people.	Lack of management skills to manage shop floor personnel. The supervisors typically have work experience in particular processes of the spinning mill as operator and do not have a formal training/education of other processes.	Knowledge/ Skill confined to single or few machines Lack of knowledge of compliance to quality Inadequate ability to multitask between different types of machines.
Fabric Manufacturing	Lack of management skills to manage shop floor people. Awareness of modern shuttle less looms is limited	-	Insufficient knowledge of looms. Inadequate ability to multitask between different types of machines.
Fabric Processing	Inadequate knowledge of both textile manufacturing. Inadequate cross-functional knowledge; especially w.r.t effluent treatment processes.	-	Inadequate knowledge of various machines and chemicals. Inadequate knowledge of CNC machines.
Garmenting	Lack of proper knowledge of sewing machine operations, and different types of seams and stitches Low ability to work across different machines.	Insufficient knowledge of various types of sewing machines. Inadequate soft skills to manage the shop floor personnel	Lack of proper knowledge of sewing machine operations, and different types of seams and stitches Ability to work across different machines is missing

Major Skill Gaps addressed in the NSDC Assessment Study

- Availability of trained manpower is a challenge in the cluster. There are many avenues for training but there is a lack of resource motivation which results in non-availability of a trained labour pool.
- Inadequate training at the operator level and most of the newcomers learn only through on the job training.
- Lack of knowledge of modern machinery and also insufficient knowledge among the workers employed to operate the computerized machinery.
- Compliance to quality is missing especially with those who work on the shop floor.

Inputs from Cluster Diagnostic Study – Challenges and Issues

- There is an acute shortage of skilled labour force as most of the workers are migrants from Bihar and West Bengal. The workers always shift to their native when they have a good monsoon and in case of a better alternative.
- Acute shortage of water and ban on commercial boring to draw water from earth has made the wet process on to fabric/garment a very difficult task.
- There are challenge w.r.t maintenance of resources and inventory management.
- The other major issue addressed in the diagnostic study is developing secure communication across supply chain.

Internal Measures taken for Skill Development

Training provided by Apex Cluster Development Agency

Apex Cluster Development Agency has been appointed as the field agency for developing BDS in the cluster. Following are the major training initiatives of the Apex Cluster Development.

- ACD was responsible in the introduction of practical training to the workers in the cluster on saving in fabric consumption that could be achieved through the use of CAD in pattern making.
- ACD in joint venture with E – readiness centre is responsible to improve the competitiveness of the cluster through the adoption of Information and Communication Technology.

Current Training Infrastructure

The current training infrastructure is comprised of firms including Textiles Committee (TC), Apparel Export Promotion Council (AEPC), South India Hosiery Manufacturers Association (SIMHA) and NIFT – TEA. The TC is responsible for various training initiatives of the cluster.

The focus areas of the TC are as listed below:

- To undertake, assist and encourage scientific, technological and economic research.
- To establish labs for the testing of textile and textile industry.
- To provide training in techniques of quality control.
- To establish standard specifications for textiles, textile machinery and the packing materials.
- To promote export of textiles.

The focus area of AEPC is as listed below:

- AEPC is entrusted with the task of working towards projecting India's image and introducing Indian Apparel Exporters to the International market.

The focus areas of SIMHA are as listed below:

- SIMHA is the oldest and biggest association that provides various training activities to both the students and the workers.
- It provides consultancy service to the members in the areas of Labour Act, PF and ESI, Inspector of Facilities, Sales Tax.

The focus areas of TEA are as listed below:

- Development of infrastructure needs for Tirupur.
- Promotion of constructive cooperation with workers with fair division of reward.
- General upliftment of quality of life of Tirupur.

- Multilateral growth of knitwear industry and export.
- For foreign buyers, TEA offers conferencing and secretarial service, help in locating suitable suppliers and help in resolving conflicts.

Key comments from MSM Enterprises

D&B India conducted primary interactions with the entrepreneurs, middle management and the shop floor workers from knitwear units in Tirupur. Mentioned below are the key issues identified from their interactions:

Century Apparels Private Ltd:

- Multi – skilled tailors are required for efficient production process.
- Productivity norms are specific to the processes of the company and are based on its most productive operator level resources rather than on a global standard.
- Lack of professionalism in supervisors.
- Frequent shortages of fabric and trims materials.
- High rate of absenteeism among operator level work force.
- Man power shortage and mobilization of labour.

Warsaw International:

- Man power shortage and mobilization of labour.
- Need for collective responsibility at a macro level.
- Lack of professionalism in top management which is reflected at the worker level.
- Lack of delegation of authority.
- Lack of training and mentoring by supervisors.

Role of Agencies

Industry Associations and their Training Initiatives

NIFT - TEA

NIFT-TEA Knitwear Fashion Institute is the premier technical institute in the cluster, which leads for knowledge upgradation in the cluster, by providing regular diploma, certificate, graduate as well as postgraduate level courses for knitting, fashion designing, merchandising, apparel manufacturing and management. The Institute was promoted by Tirupur Exporters' Association (TEA) to improve the human resource skills of the cluster with the technical support from National Institute of Fashion Technology (NIFT). The Institute also offers part time programmes for the employees who are working in the industry and has also created a separate division to have an interface between the industry and the Institute. The Institute has good ICT infrastructure. Among others, it imparts the know-how of software in fashion designing, and conducts training for proper usage of CAD in pattern making. The various details of different training programmes are as listed below:

Exhibit 2.20: Training Programs Offered by NIFT – TEA			
Type of the Course	Name of the Course	Target Trainees	Eligibility
Diploma course (1 year)	Garment manufacturing and merchandising Apparel merchandising and management	Graduate	Any degree or 3 year diploma by DOTE
Certificate Program	Certificate in Apparel merchandising Certificate in fashion designing and garment construction	Students	10 + 2 and above with a minimum age of 20 years
Master Degree Programs (2 years)	MSc in Apparel Production	Graduate	Any degree in textile, apparel and fashion
Bachelor Degree Programs	BSc in Apparel Fashion Designing BSc in Garment Production and Processing BSc in Fashion Apparel Management BSc in Apparel Manufacturing and Merchandising	Students	A pass in Higher secondary
Short Term Training Programs	Pattern Making Computer Aided Apparel Designing Apparel Quality Management Apparel Merchandising and Quality control	Students	10 + 2 and above with industrial experience

Training programs at Apparel Training and Design Centre (ATDC)

Apparel Training and Design Institute (ATDC) is three -years old organization, started in the cluster by Apparel Export Promotion Council (AEPC) to train the people at the shop- floor level. The focus of the Institute is to provide training in garment manufacturing technology. Training at ATDC is provided to the workers for a period of 45 days. The efficiency of the workers is charted and progress is evaluated on a weekly basis. Mentioned below are the details on different training programmes being conducted by ATDC in Tirupur:

Types for the training	: IGNOU and SMART
Target Audience.	: Operators and Supervisors
Topics covered	: Supervisory courses, Apparel pattern making
Duration for IGNOU	: 2 months
Duration for SMART	: 45 days (efficiency measured at the end of every week)
No of batches	: 3 batches (at a time); 25 – 30 students per batch.
No of batches trained till date	: 60 – 70 (under IGNOU) and 4 (under SMART)

Exhibit 2.21: Training Programs Offered by ATDC			
Type of the Course	Name of the Course	Target Trainees	Eligibility
Diploma course (Duration: 1 year)	Knitwear manufacturing technology. Apparel manufacturing technology. Fashion Design Technology. Apparel Pattern making and CAD.	Graduate	Any degree or 3 year diploma by DOTE
Certificate Program (Duration: 6 months)	Knitwear manufacturing technology. Apparel pattern making. Production supervision and Quality control.	Students	10 + 2 and above with a minimum age of 20 years
Associate Degree (Duration: 2 years)	Fashion Design Apparel Manufacturing	Students	10 + 2 pass/fail
SMART program	SMART operator. SMART finishers and packers. SMART checker. SMART machine technician.	Students	8 th pass, 10 th pass, 10 +2 pass/fail

Training programs at SIMHA

SIHMA (South India Hosiery Manufacturers Association) Institute of Fashion and Apparel Training was started by the South India Hosiery Manufacturers' Association (SIHMA) in association with a BDS provider, under the initiative of UNIDO, during their Cluster Development Programme in 2001. The objective of starting this Institute was to provide technical inputs to upgrade the skills of the employees who were working in the industry. It aimed to provide support for the development of middle-level management in the cluster. The infrastructure for the institute was provided by the association and the technical inputs were provided by the BDS agency.

Exhibit 2.22: Training Programs Offered by SIMHA

Type of the Course	Name of the Course	Target Trainees	Eligibility
Diploma course (Duration: 1 year)	Garment Merchandising Knitwear Manufacturing technology	Students	10 + 2 (pass/fail)
Part time courses		To train the industry managers and workers	
Fashion designing and Apparel training		To train the low and middle level managers of the organization	

Training programs at TIF – F – LABS

Tirupur Industrial Federation (TIF) is a network of four major associations: Computer Embroidery Owners Association, Imported Knitting Machine Owners Association, Compacting Machine Owners Association and Raising Machine Owners Association.

Exhibit 2.23: Training Programs Offered by TIF – F – LABS

Type of the Course	Name of the Course	Target Trainees	Eligibility
Diploma course (Duration: 1 year)	Fashion design Fashion jewellery	Students	10 + 2 (pass/fail)
Short term courses	Fashion Illustration CAD	Industry associates	Diploma
Certificate course	Design skill enhancement course	Students	Fresh industry recruits

Agency Role in Implementing Training Programs

IL & FS Cluster Development Initiative

The first partner for NIFT – TEA who aid in providing the training to the workers and the students are the IL & FS (Infrastructure Leasing & Financial Services). Till date they have trained and employed as many as 1100 people. The primary objective of IL & FS is to provide the placement for the workers who get trained under them.

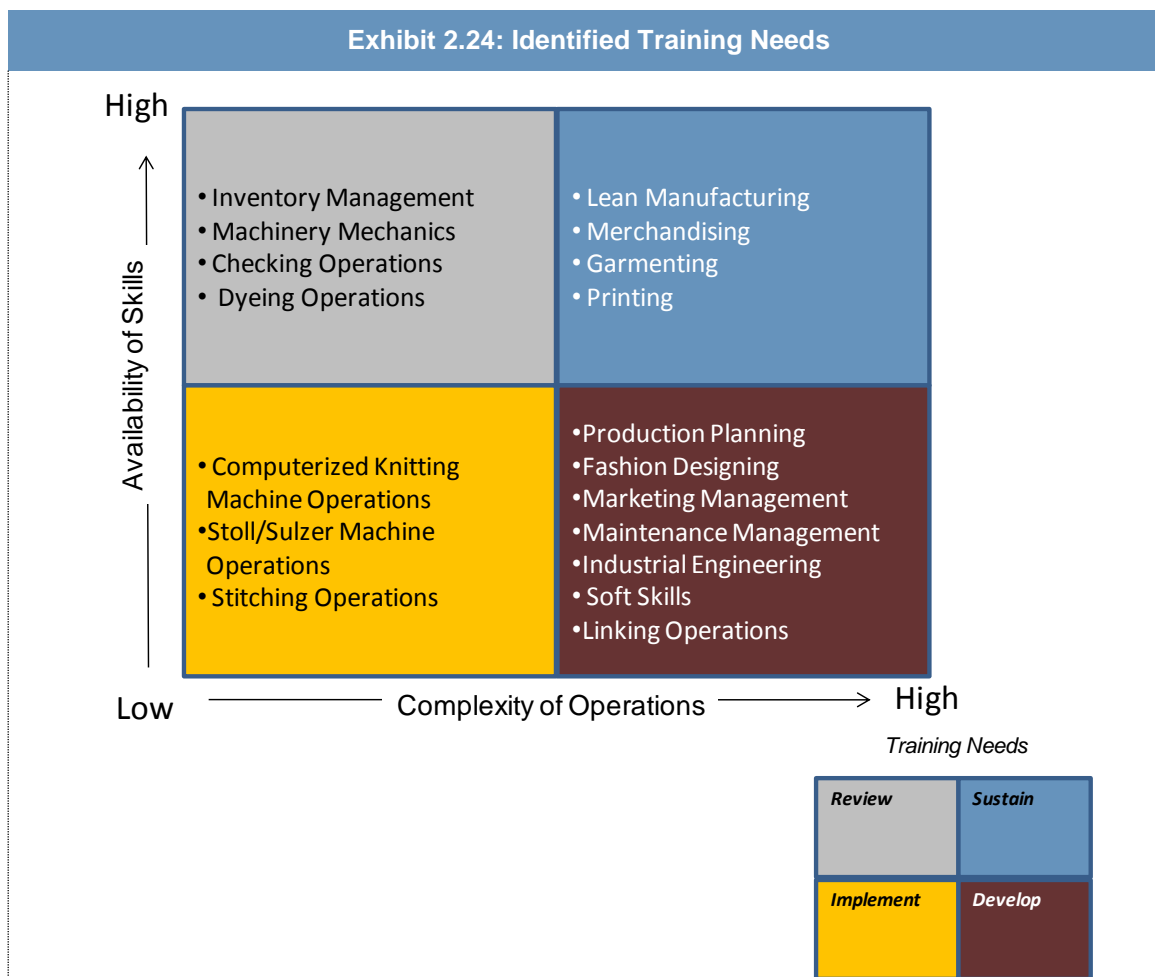
Training:

- Week 1 – basic tests and understanding of the machine parts.
- Week 2 – machine cleaning test and machine handling knowledge.
- Week 3 – needle and threading test where the benchmark is fixed to be 15 seconds for the inserting the thread to the needle and 45 seconds for the actual needling process.
- Week 4 – keeping the machine ready and training is provided on threading specific designs.

Identified Training Needs in the Cluster

Skill gaps are mainly observed at middle level management and at the supervisor level, which lack people specific skills and knowledge on processes to manage the workers at the shop floor. At the worker level, there are technical process oriented skill gaps and they are attributed to the resource shortage and lack of mobilization of workforce. Due to shortage of skilled manpower, most of the unskilled resources are employed by firms that undergo on-the-job learning.

Assessment of available skill set with respect to complexity of operations of the particular process was conducted to obtain insights on key areas where training is critical and required on priority. Complexity of operations were assessed with the sample respondents to obtain an idea of the level of complications involved in the process for e.g. while procurement was indicated as a fairly simpler activity, quality and packaging were indicated as highly complex activities. The available skill sets were rated on the scale of sufficiency as perceived by the owner. The following matrix highlights the key areas where availability of skill set is scarce (immediate training requirement) and also degree of complexity of operations is high or low. Accordingly, the 'yellow' and 'maroon' quadrants (i.e. Implement and Develop) contain the areas where training is required immediately. Among the two quadrants, it is important to address 'yellow quadrant' on priority as the skill gaps can be easily filled in that quadrant due to low complexity of operations.



Summary of Skill Gaps

Skill Gap – Summary

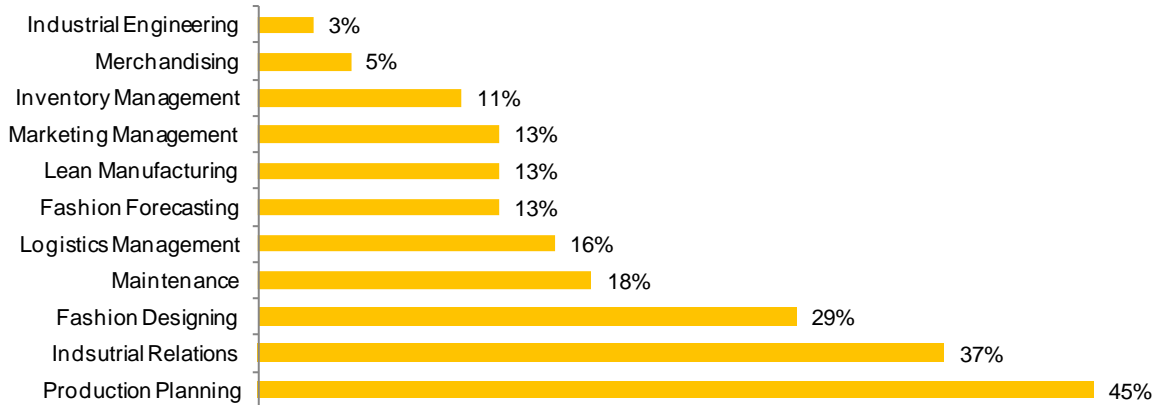
Skill gaps are mainly observed at middle level management and at the supervisor level, which lack people specific skills and knowledge on processes to manage the workers at the shop floor. At the worker level, there are technical process oriented skill gaps and they are attributed to the resource shortage and lack of mobilization of workforce. Due to shortage of skilled manpower, most of the unskilled resources are employed by firms that undergo on-the-job learning.

Mentioned below is a summary of major findings of the study:

- The cluster is faced with **acute shortage** of skilled and unskilled labour. The availability of migratory labour has been considerably impacted after introduction of MGNREGA scheme by the Central Government. The policies implemented by State government (providing complementary rice) have had its impact on the availability of workers. Also, labour shortage is felt more at the time of monsoons as majority of workforce return to their states for agriculture related activities and employment.
- Although the cluster has adequate avenues for training people at shop floor level through ATDC, NIFT – TEA and SIMHA programmes; the major issue faced by the cluster is **resource mobilization and resource motivation** for enrolling for training programmes.
- The cluster immediately needs trainings on the concepts such as Cleaner Production Technologies (CPT), proper pre – treatment of effluents before releasing them into the CETP and process upgradation to minimize water and energy consumption.
- Also, skill gaps have been observed at managerial level jobs for processes including marketing management, production planning, scheduling, inventory management, quality control, maintenance, etc. Currently, in absence of skilled resources and no defined recruitment and selection criteria followed by micro and small enterprises, resources are elevated from operator level jobs to managerial level positions based on their experience, rather than their academic qualifications or technical background. In absence of any learning, most of these activities are conducted on ad-hoc basis impacting the productivity and quality of the end product. Exhibit 2.25 represents the training programs required for middle level management employees in different processes. Exhibit 2.26 represents the shortage of workforce in different processes at managerial level.

Managerial Level Skill Gap

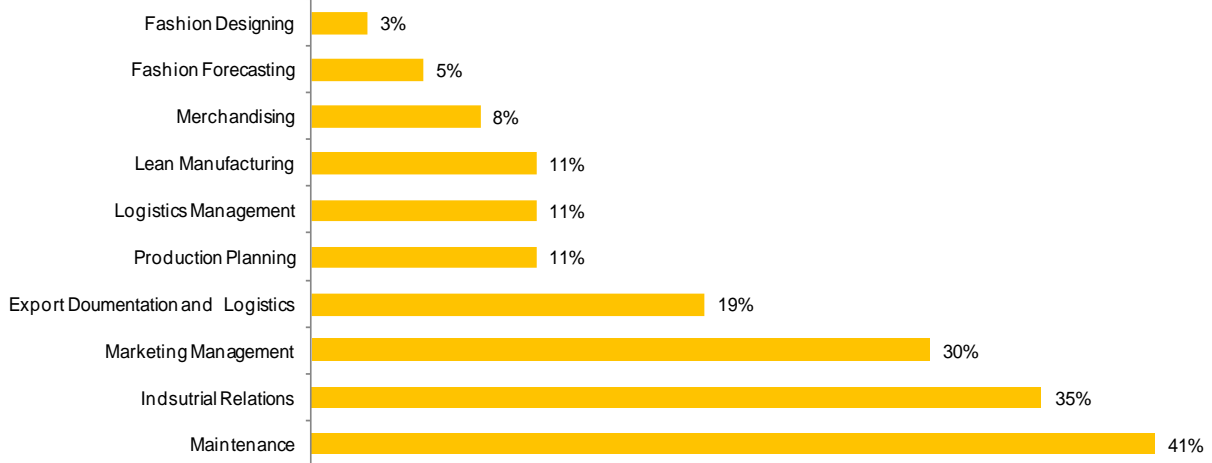
Exhibit 2.25: Managerial Level Skill Gaps



Note: Percentages above indicates the number of units in the sample

Managerial Workforce Shortage

Exhibit 2.26: Managerial workforce shortage



Note: Percentages above indicates the number of units in the sample

- Managers, supervisors and production-in charge lack soft skills such as communication skills, team development and motivation skills for undertaking their activities. To add further, very few firms conduct recreation/rejuvenation activities to engage and motivate workers. There appears to be a distinct communication gap between the management and the workers. The supervisors do not effectively communicate with the workers on daily targets, production techniques and quality issues. This has resulted in high absenteeism with the workforce and also high dropout rates.

- Training initiatives have to be focused on the informing the benefits of proper financial planning, complying with major disclosure norms for most of the firms in the cluster. There is an information gap w.r.t financial assistance schemes available for the benefit of the firms. Programmes that focus on awareness of various tax subsidies, the benefits of SME ratings and the financial subsidy schemes such as the Technology Upgradation Fund (TUF).
- The major skill gap identified in the marketing function is the lack of marketing management skills in order to identify new markets and potential buyers. The other skill gap identified can be the **lack of importance and knowledge of brand development** and the potential to utilize the domestic markets. Currently, the domestic markets are viewed as secondary market where the surplus and neglected garments are sold.
- Currently the use of IT is limited to automating specific functional areas such as Finance and Accounting which have a restricted impact on the operations. An integrated system that would enable seamless information flow between different functional areas would have a far greater impact on the firms' operations. This would also provide the necessary platform for firms to scale up their operations.

Exhibit 2.27 illustrates the tip sheet of Tirupur Cluster.

Exhibit 2.27: Tip Sheet Tirupur Cluster						
Tirupur	Shop Floor - Production				Middle Management	
Processes in Value Chain	Knitting	Fabric Processing	Garmenting	Quality Control	Knitting/Fabric Processing	Garmenting
Sub Processes	Scouring, Machine Operations	Bleaching, Milling, Dyeing, Printing, Compacting, Calendaring, Raising, Finishing	Embroidery, Collar Making, Cutting, Stitching, Linking, Button Holing, Assembling, Washing, Pressing, Labeling, Packing	Quality Control and Assurance	Production Planning, Industrial Engineering, Procurement, Logistics, Inventory Management, Maintenance Management	Fashion Designing, Fashion Forecasting, Merchandising
Type of Skill Requirement (Semi-skilled / Skilled)	Semi-Skilled	Semi-Skilled	Semi-Skilled	Skilled	Skilled	Skilled
Availability of Manpower (Low /Medium / High)	Low	Medium	Low	Low	Low	Low
Skill Gap (Low/Medium/ High)	Medium	Medium	High	High	High	High
Training needs (Review /sustain /implement /Develop)	Implement	Review/Implement	Implement	Develop	Develop	Develop

Available Training Courses	NA	NA	<p>Short term courses on computer aided apparel designing and pattern making,</p> <p>SMART Courses for sewing operator, finishers and packers, checkers, machine technicians</p>	<p>Short term courses/Certificate courses on apparel quality management and quality control</p>	<p>Diploma course on garment manufacturing for graduates</p> <p>Certificate programme on production supervision and quality control</p>	<p>Diploma course in apparel merchandising and management</p> <p>Certificate course on fashion designing and garment construction</p>
Available Training Institutes	NA	NA	NIFT TEA College of Knitwear Fashion, Apparel Training and Design Centre	NIFT TEA College of Knitwear Fashion, Apparel Training and Design Centre	NIFT TEA College of Knitwear Fashion, Apparel Training and Design Centre	NIFT TEA College of Knitwear Fashion

Tirupur Marketing

Exhibit 2.28: Marketing Tip Sheet

Processes in Value Chain	Customer Development	Channel Development	Marketing Management	Export Compliance
Sub Processes	New Market Identification, Gathering Market Information, Understanding Customer Needs	Developing Right Channel Mix and Monitoring Channels	Brand Awareness, Targeted Pricing Strategies, Product Management, Media and Promotion	Knowledge of various Export related procedures
Type of Skill Requirement (Semi-skilled / Skilled)	Skilled	Skilled	Skilled	Skilled
Availability of Manpower (Low/Medium/High)	Medium	Medium	Low	Medium
Skill Gap (Low/Medium/High)	Medium	Medium	High	Low
Training Needs (Review /Sustain /Implement /Develop)	Develop	Develop	Develop	Implement
Available Training Courses	No Courses Conducted			
Available Training Institutes	No Institutional Training Available			

Case Study Analysis

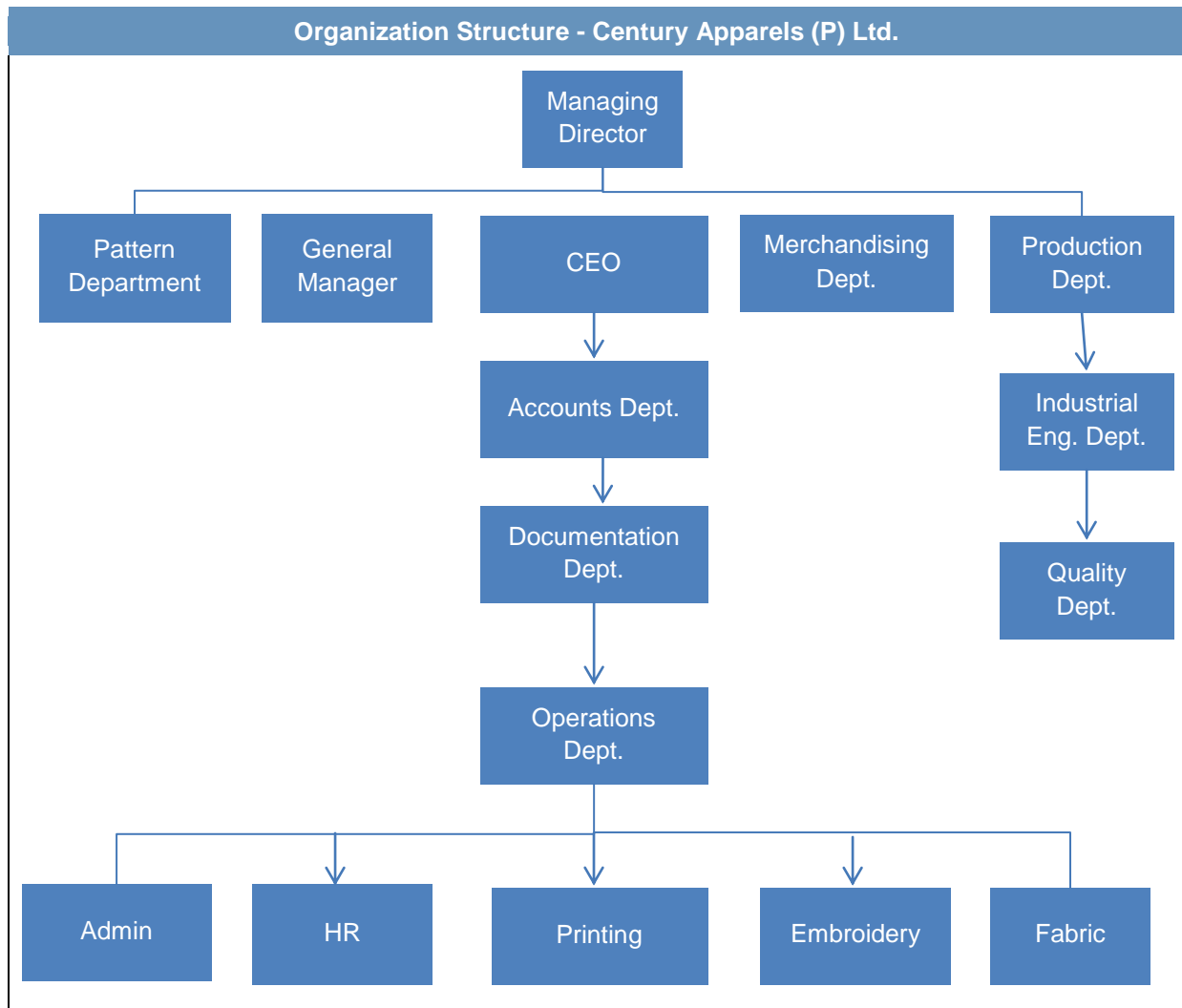
Case I (Century Apparels Private Ltd)

Organization Profile

Name of the enterprise	Century Apparels (P) Ltd.
Name of the respondent	Ms. Parimala J
Designation	HR Manager
Year of Incorporation	2006
Type of MSME	Medium
Form of Organization	Partnership
Products	
a. End – User Driven	Kids wear (0 – 6 years), Infant wear
b. Customer Driven	Yes
Suppliers (Number)	
a. Materials Suppliers	Organic cotton, Own brand: Nature
b. Service Vendors	100% export
Competitive Intensity	
a. Competition in Same Product	
b. Competition in Related Product	
Financial	
a. Employees	600 – (426 workers & 174 middle managers)
b. Investment in P&M	` 9 crore
c. Turnover	Greater than ` 20 crore

Vision, Mission & Objectives	<p>Plan to have big order quantities.</p> <p>To achieve more efficiency in production especially for Value Added Products</p>
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Organization Chart



Identified Skill Gaps – Century Apparels (P) Ltd.

- Shortage of multi – skilled tailors that can work on different needle techniques.
- Productivity norms are specific to the processes of the company and are based on its most productive operator level resources rather than on a global standard.
- Lack of professionalism in supervisors.
- Frequent shortages of fabric and trims materials.
- High rate of absenteeism among operator level work force.

- Man power shortage and mobilization of labour.

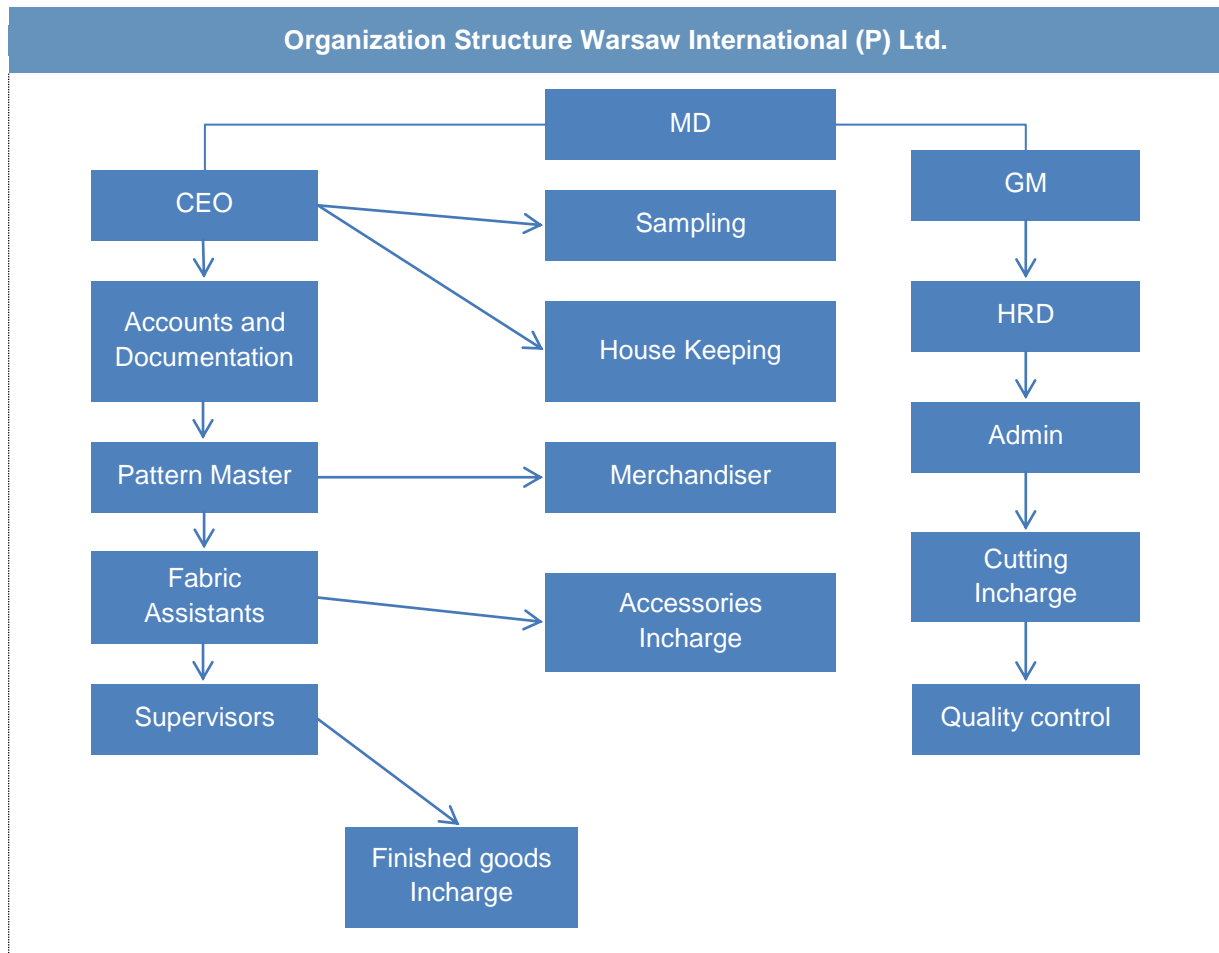
Case II (Warsaw International Private Ltd)

Organization Profile

Name of the enterprise	Warsaw International
Name of the respondent	Mr. Ganesan
Designation	HR Manager
Year of Incorporation	1989
Type of MSME	Large
Form of Organization	Partnership
Products <ul style="list-style-type: none"> a. End – User Driven b. Customer Driven 	<ul style="list-style-type: none"> T – shirts for all ages Tom Tailor – Germany, Kaid – Canada
Suppliers (Number) <ul style="list-style-type: none"> a. Materials Suppliers b. Service Vendors 	<ul style="list-style-type: none"> Organic cotton 100% export (excess lot will be displayed in showroom)
Competitive Intensity <ul style="list-style-type: none"> a. Competition in Same Product b. Competition in Related Product 	<ul style="list-style-type: none"> Yes Yes
Financial <ul style="list-style-type: none"> a. Employees b. Investment in P&M c. Turnover 	<ul style="list-style-type: none"> 1350 ` 8 crores >` 20 crores

Vision and Mission	Aspires for complete customer satisfaction owing to the high quality garments at competitive prices with an on – schedule delivery.
Objective	To deliver the products on time every time

Organization Chart



Identified Skill Gaps – Warsaw International

- Lack of mobilization of labour
- Need for accurate planning, production forecast and inventory planning.
- Lack of professionalism in top management
- Lack of training and mentoring by supervisors.
- There is no in – house training infrastructure and resources are trained through on the job training.

Kolkata-Shantiniketan Leather Cluster

Introduction

West Bengal is one of the States that have been associated with the leather industry from the pre-independence era. Be it manufacturing leather goods like bags, belts, wallets, leather footwear or batik/emboss style Shantiniketan bags. In West Bengal, Kolkata and Shantiniketan are the two clusters synonymous to the leather industry.

In order to assess the nature of skill gaps in the cluster, D&B India conducted a quantitative survey amongst the enterprises in the various categories across the cluster. It was also ensured that the representation of micro, small and medium enterprises was adequate.

Skill gaps in the leather cluster were observed at all levels across the value chain in the cluster. Mentioned below is a summary of major findings of the study:

- The cluster is faced with severe shortage of skilled and unskilled labor. •There are very few training modules focusing on vocational training to equip unskilled workers to perform basic shop floor operations in the leather industry.
- There is not much awareness about modern quality control processes especially among the micro and small units.
- Lack of technological awareness can be mentioned as another skill gap in the cluster.
- Apart from technical skills, managers and supervisors also lack soft skills such as communication skills, team development and motivation skills for undertaking their activities.

Cluster Overview

Nature of Industrial Activity

Kolkata

The roots of the Kolkata leather industry can be traced back to 1910s when an enterprising gentleman named Mr. B.M.Das, got involved in tanning of leather and established Bengal Tanning Industries. This encouraged the Britishers to follow suit. They formed the National Tanning Company Limited and started manufacturing leather. Then in 1936, the industry received a further boost with the establishment of Bata Limited, a Czech footwear company. Later in 1940s, a significant Chinese population migrated to the city and set up their tanneries in the area now known as Tangra.

Kolkata leather cluster houses both organized and unorganized units. Kolkata has a diverse range of products which mainly caters to the export market. The product range includes:

- Finished leather
- Leather goods like bags, wallets etc.
- Footwear
- Industrial gloves

The local Industry comprises of various sub-sectors which operate in different stages of the value-chain. The major sub-sectors here are tanning, leather goods, industrial products and footwear as listed in the table below:

Exhibit 3.1: Kolkata Cluster Information

Sub-Sectors	Locations	Category	No. of Units	Employment	Turnover (Rs.)
Tanneries	Bantala	Tanneries	224	8450	1250
Leather goods like bags, wallets etc.	Kasba, Topsia and Tangra	Manufacturer cum exporter	236	23600	1800
		Merchant exporters	96	1920	
		Fabricator cum manufacturer for the local market	1200	3600	
Footwear	Batanagar, Nungi, Janbazar, Rajabazar, College Street area and Bentick	Large scale manufacturing units (Bata)	1	3000	1500
		Small and medium enterprise manufacturers	19	1000	
		Manufacturer cum exporter	6		
		Fabricator and household units	2000	10000	
Industrial gloves	Belegkata	Manufacturer cum exporter	31	4650	380
		Merchant exporter	11	220	
		Fabricator	200	6000	
Total			4024	62440	4930

Source: Diagnostic Study Report on Kolkata Leather Cluster prepared by Entrepreneurship Development Institute of India (EDI)

Shantiniketan

Shantiniketan leather goods cluster is located the Birbhum district of West Bengal. The nearest railway station is Bolpur. The units in the cluster are spread across several villages like Surul, Ballabpur, Suripara, Hetampur, etc. The cluster products are known as 'Shanti leather products' which have beautiful colored graphic designs with embossed and batik prints. These are made from vegetable tanned leather. These products are classified in the handicrafts category.

The cluster's product range includes:

- Bags like shopper's bag, clutch bag, umbrella bag, pouch bag, file cover etc.
- Small leather goods like wallet, coin pocket, purse, mobile cover, spectacle case, etc.
- Pasted items like ornament box, pencil box, photo frame, piggy-bank, etc.

The cluster mostly consists of micro and household units. The cluster actors are mostly artisans and do not have the infrastructure and production capacity to serve the export market. Merchant exporters located in Kolkata, bridge the gap between them and the foreign market.

There are about 15 organized units operating in the cluster and 65 artisanal units providing employment to around 1200 people. The cluster units work as sub-contractors for the exporters who are primarily based in Kolkata. In addition Shantiniketan leather goods have a strong demand among tourists who visit Shantiniketan.

Exhibit 3.2: Shantiniketan Cluster Information (Rs. Crore)

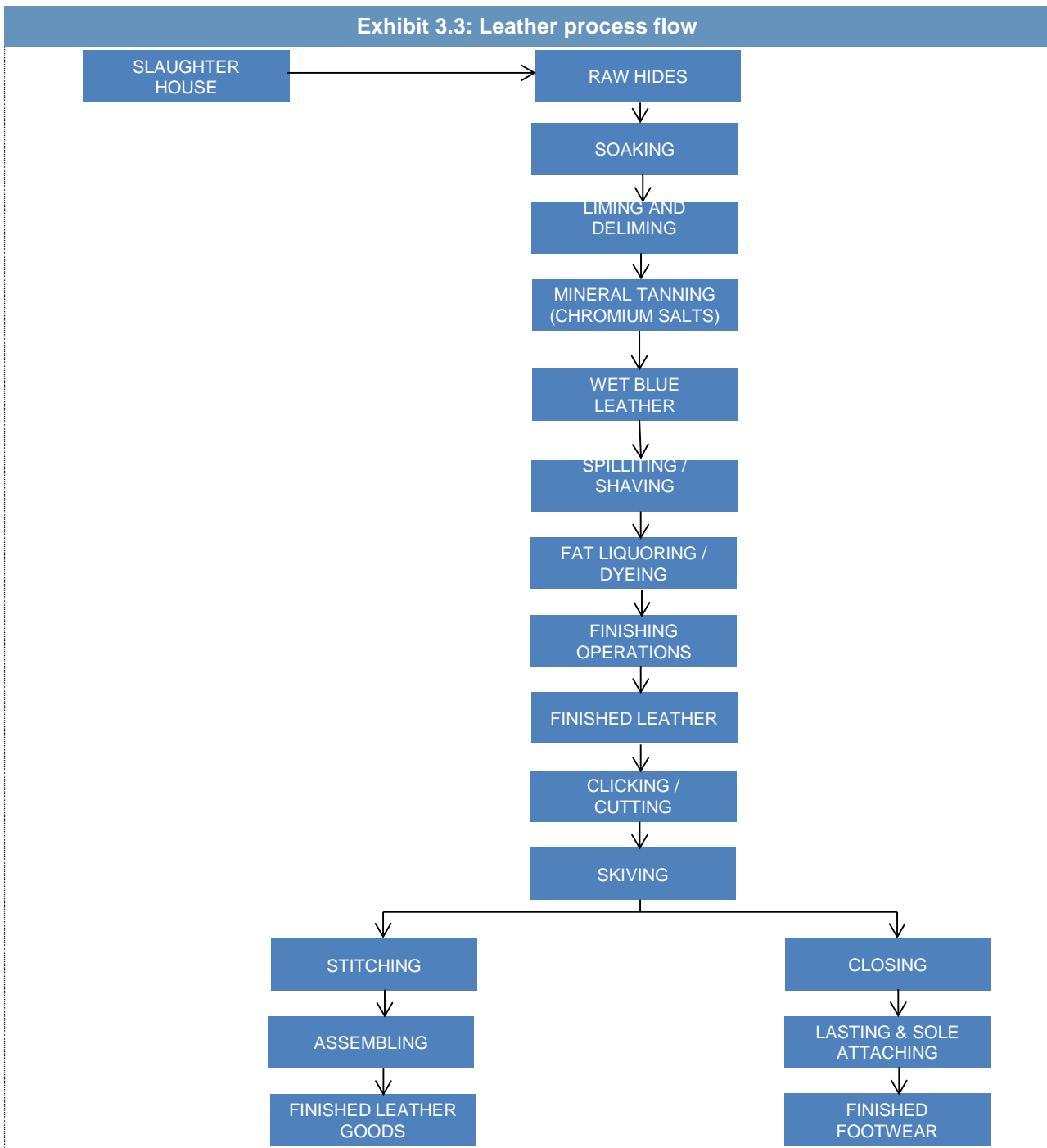
Export	1.5
Domestic Sales	4.0
Total	5.5

Source: Diagnostic Study Report on Shantiniketan Leather Cluster prepared by EDI

Process flow in leather cluster

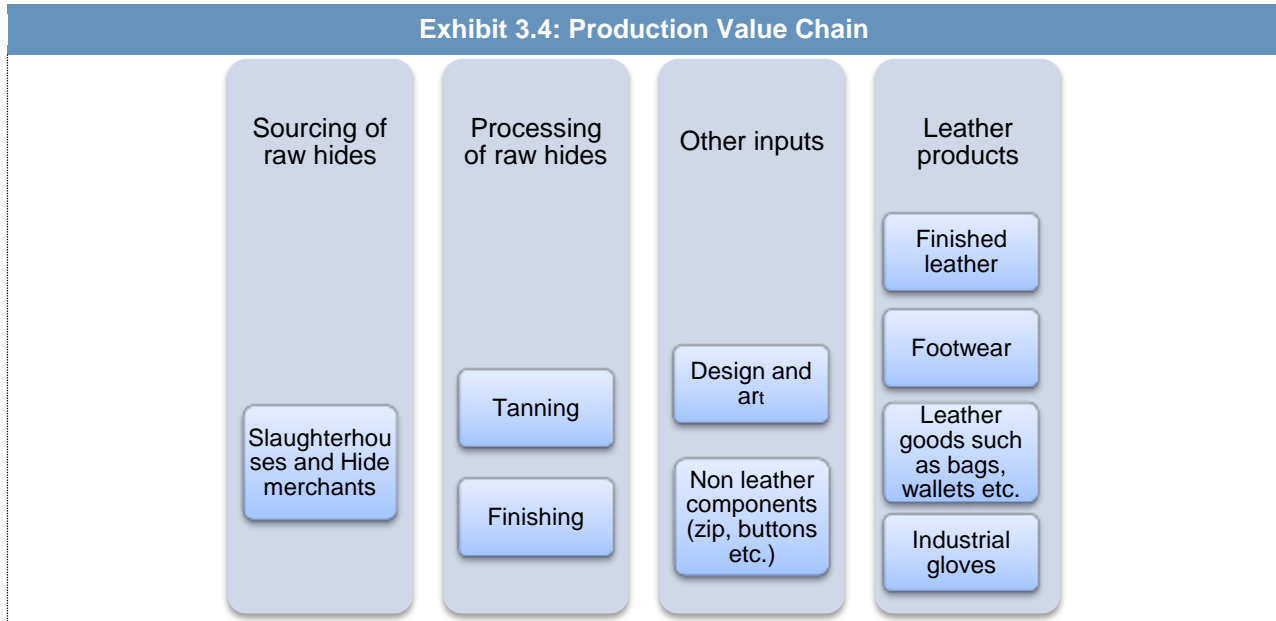
- The key stages in the leather industry include raw hide procurement, process till wet blue, finished leather, and manufacturing leather goods & footwear. Initially the raw hides are soaked in pits and paddles to rehydrate the skin in a process called **soaking**.
- The soaked hides then undergo **liming** process where limestone powder is mixed with water to loosen the hair from the skin. The unwanted flesh is also removed in the liming process. The limed hides are then **de-limed** by removing the liming and other chemicals.
- Post de-liming, **tanning** process is carried out either by using chromium salts or by using natural materials such as bark, woods, roots, leaf etc. When chromium salts are used the process is called Mineral tanning and the processed leather is light blue in colour (**Wet Blue leather**). In Kolkata cluster primarily chrome tanning is carried out.

- Post the tanning process the hides are **split and shaved** to adjust their thickness.
- After this the leather is treated with **fat liquor** to impart flexibility and softness. Along with the fat liquors, **dyes** are added to impart colour to the leather.
- The leather after dyeing undergoes **buffing** to remove unwanted extra flesh sticking to the leather. Finally to increase the colour penetration, leather is finished by **spraying** with pigments and binders.
- The finished leather is the starting point for the leather goods and footwear manufacturers. The first operation performed is **clicking / cutting**. Clicking is the process of cutting out different components of footwear or leather goods as per the approved design or size.
- After this **skiving** operations are carried out to reduce the thickness of the leather at edges so that seams can be produced without additional bulkiness.
- Post skiving, the operations tend to be different for leather goods and footwear. In case of leather goods **stitching** operations are carried out after skiving.
- For footwear after skiving, **closing** of shoe upper is done followed by **lasting** and finished with finally **attaching the sole**. **Lasting** is the process of using a pattern called the last to mould the two dimensional leather into the three dimensional shape of the foot.



Cluster Ecosystem and Inter- Linkages

Exhibit 3.4: Production Value Chain



Kolkata

The **tanneries** procure the raw hides and skins from traders / local suppliers who source the skins from different places in state and also from Bihar and Uttar Pradesh. The slaughter houses supplying raw hides lack proper modern infrastructure for collection of dead animals. Thus there is significant wastage in finished leather because of damages caused by rough handling at the slaughter houses. Certain tanneries **process raw hides only up to the wet blue stage** whereas other tanneries process the wet blue leather into finished leather. Some of the larger manufacturing firms such as Kalpataru International Pvt. Ltd. run their own tanneries in order to ensure quality and timely supply of finished leather. On certain occasions, tanneries are also available on rent where the manufacturers can process their own leather. The recently inaugurated Calcutta Leather Complex at Bantala is the hub of all the tanneries in the city. The finished leather produced by the tanneries is primarily used by the domestic companies involved in manufacturing leather goods, footwear and industrial gloves. The tannery owners have well established customers who procure their entire output. Thus the tanneries **do not invest much effort in marketing activities.**

In terms of **outsourcing**, there are well established linkages between the units in the cluster. The smaller leather goods including industrial gloves and footwear manufacturing units do job work for bigger firms and exporters. The larger firms generally supply the leather cut as per specification and other accessories to the smaller units. The smaller firms are paid on the basis of the number of units they produce.

In terms of **forward linkages** majority of the leather goods including industrial gloves are exported. Leather goods are mainly exported to Italy, Spain, Germany, UK, etc. Some of the firms have well

established relationships and interact directly with foreign buyers. The other firms are dependent on merchant exporters, buying agents and buying houses for selling their products in export markets. Leather footwear primarily caters to the domestic market and only a small quantity is exported. The bigger firms in the cluster such as Bata, Khadims and Sreeleathers have well established retail distribution network.

Shantiniketan

Shantiniketan cluster is **artisan based cluster** and the enterprises in this cluster mainly operate in the unorganized sector. All raw materials including vegetable tanned leather, accessories (zip, buttons), adhesive, lining etc. are sourced from Kolkata. As no source for leather is available locally, the enterprise owners are forced to maintain a substantial stock of leather. This causes a severe strain on their limited working capital resources. In Shantiniketan, the major value addition is done by skilled hand operations of the artisans like hand painting, batik work etc. The investment in plant and machinery is minimal and also the machines used are quite old. Units located outside the cluster (such as in Sodepur) take advantage of this situation and manufacture similar items employing advanced machinery. The local artisans in the cluster do not have the finances to invest in modern machines. In addition there is unavailability of skilled labor to operate the modern machinery.

Shantiniketan products have a **ready export market but none of the cluster units export directly**. Some of them work as sub-contractors for the merchant exporters based in Kolkata. At times these exporters prefer sourcing of Shantiniketan type products from units in Sodepur because of cost competitiveness and better quality. In addition another major drawback of the Shantiniketan cluster has been the inability of the entrepreneurs in the cluster to modify their traditional designs to keep pace with changing customer preferences. Thus there is an urgent need for infusion of new design ideas in the cluster which will increase the appeal of Shantiniketan products in international markets.

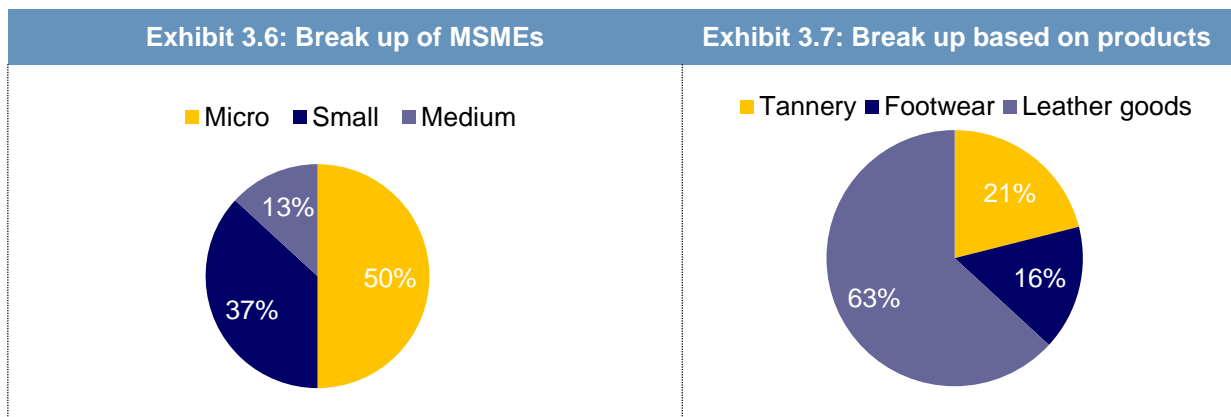
Skill Gap Assessment

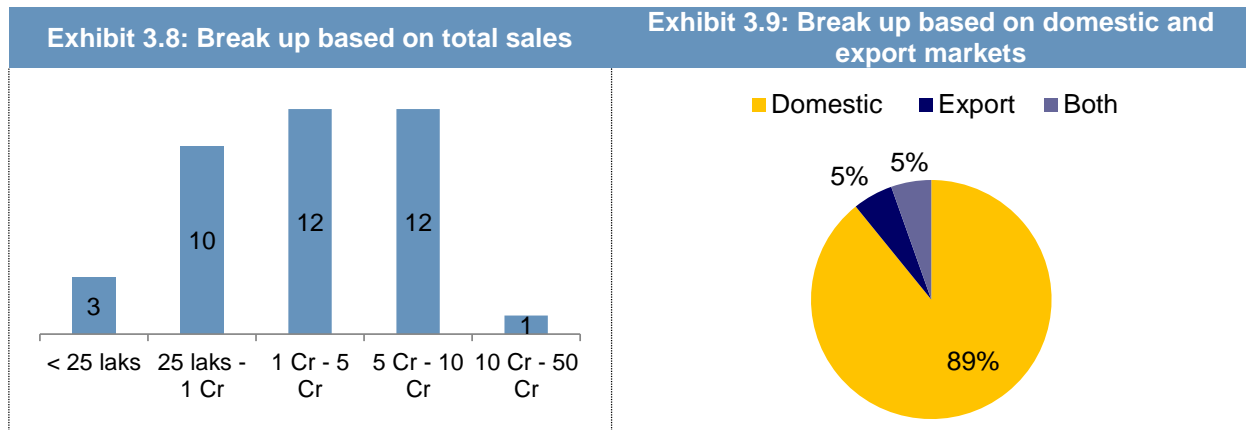
Sampling

D&B India has conducted the initial round of qualitative interactions with various firms in the Kolkata - Shantiniketan cluster. Primary assessments were conducted to understand key linkages and processes within the cluster, primary markets and specific marketing initiatives and knowledge about financing programs. MSME enterprises were selected on the basis of their position in the value chain. The qualitative samples were selected to include one firm from each segment within the leather cluster. It was also ensured that the firms selected could be representative set of the Micro, Small and Medium Enterprises. The following table summarizes the sample coverage for the study.

Exhibit 3.5: Sample Survey Coverage Kolkata	
Products	Samples Covered
Tannery	8
Leather goods like bags, wallets	8
Footwear	8
Industrial gloves	8
Sample Survey Coverage Shantiniketan	
Products	Samples Covered
Leather goods like bags, wallets, ornament box	6

Appropriate mix of samples was covered across the cluster using sales, primary selling markets etc. The following charts represent the sample profiles. Around 89% of the sample firms covered were predominantly operating in domestic markets.





Process Based Observations

Production

- There appears to be a huge **shortage of skilled labor across the value chain** in the cluster. The workers come from the surrounding districts of West Bengal and Bihar and do not have any formal training. The primary reason for the lack of skills among the workers is the lack of suitable training or formal qualifications on the part of the workers. Hence a significant proportion of the enterprises are forced to employ unskilled workers and train them on the job as evident from the exhibit below. The absence of any formal training program means that both the productivity of workers and quality of their work suffer.

Workers are primarily employed on a **contractual basis** thus payments to workers are negotiated on per piece basis so the quality is often neglected as they are concerned in manufacturing more pieces without giving adequate attention to quality.

Recently with the spurt in the construction sector activity, many of the workers have migrated to this sector because of the higher wages offered. In addition the MGNREGA (Mahatma Gandhi National Rural Employment Guarantee Act) scheme of the Central Government, which ensures a minimum employment of 100 days in their home state, has further **reduced the migration of laborers** from rural areas. Hence there is an acute shortage of skilled labor in the leather cluster. Skill development training programs focusing on generic operations such as skiving, clicking, stitching, etc. must be carried out targeting unemployed youth so as to increase the supply of skilled workers.

- In terms of **adoption of modern technology and equipment** majority of the units in the cluster are lagging behind the times. Majority of the **tanneries have not upgraded** their technology and still depend on human skills or older machines for carrying out the tanning process. One of the primary reasons for using orthodox technology is the mindset of the owners who are not interested in latest technology trends or investments to upgrade their units. The entrepreneurs and staff need to be made aware of clean process technologies that consume significantly lower

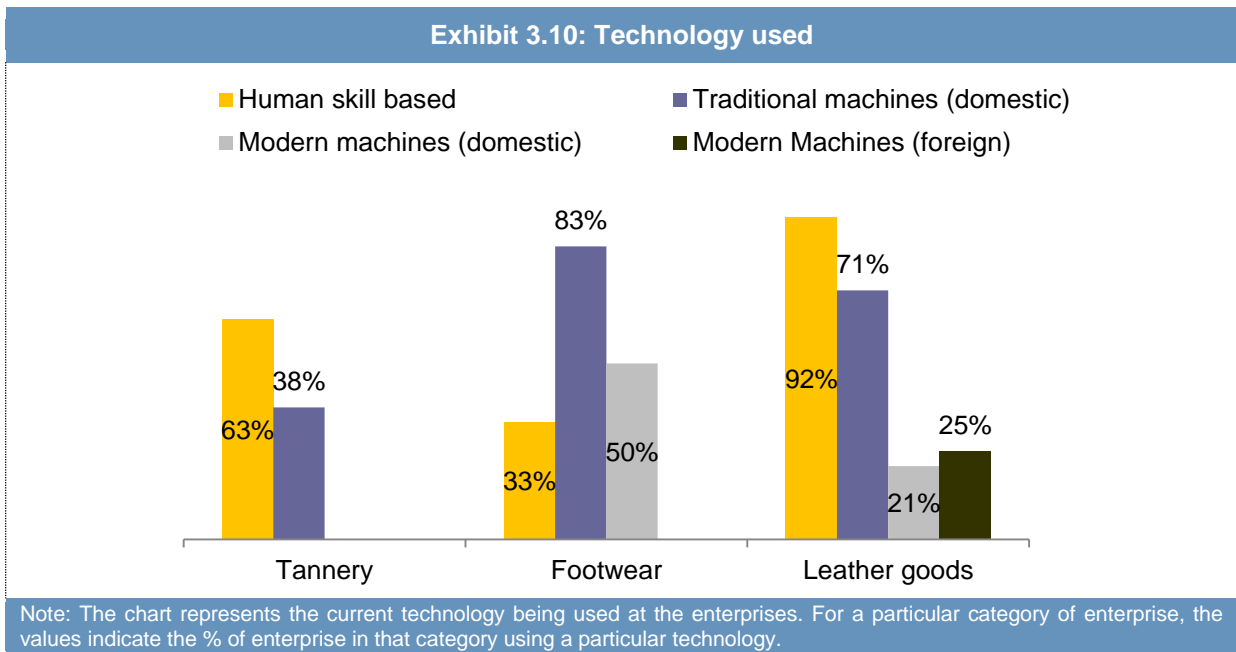
amount of harmful chemicals and water. In addition there is a lack of knowledge about the initial pretreatment processes that need to be carried out on the effluent before releasing it to the Common Effluent Treatment Plant (CETP).

Majority of the tanneries lack qualified staff who could advise them on the chemicals to be used in tanning to comply with the international regulations such as **REACH** (Registration, Evaluation, Authorization and Restriction of Chemicals). REACH is a European Union regulation which imposes restrictions on specific chemicals that can be used for tanning. Increasingly most of the foreign customers are insisting that the finished leather should be compliant with REACH regulations. The qualified leather technologists are shunning the leather industry to avail alternate employment opportunities in other sectors such as IT which offer better pay and working conditions.

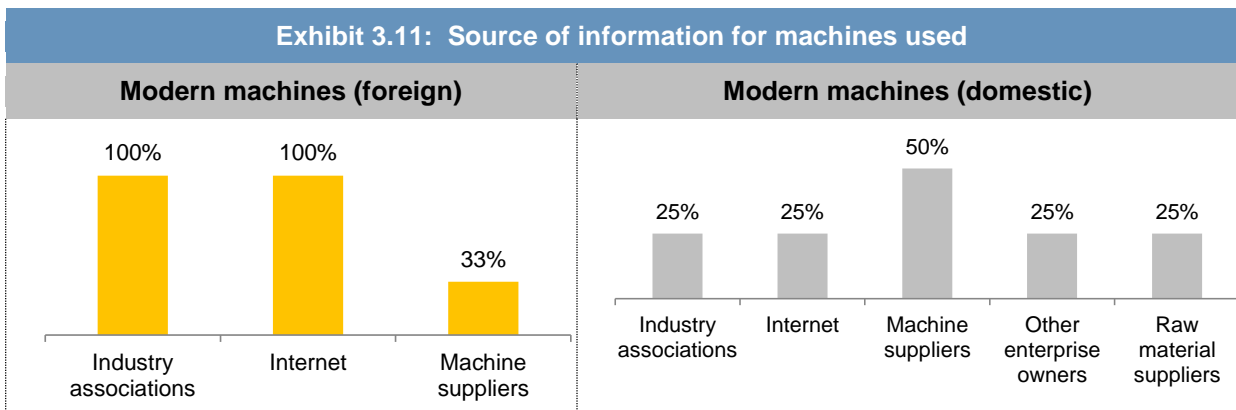
Majority of the **leather goods, footwear and industrial gloves manufacturing enterprises** operate on the outsourcing model where they subcontract a significant portion of the work to the smaller units. This trend of outsourcing has acted as a dampener discouraging the bigger units from investing in modern line manufacturing techniques and advanced machines. The smaller units who are primarily dependent on job work lack the financial resources to invest in modern machines.

In the leather goods manufacturing industry, the units still **operate on the traditional model** where a master tradesman along with his helpers perform all the operations associated with manufacturing a bag. Some of the progressive units are planning to implement production line technique where the various jobs involved in making a bag will be performed in sequence. However currently there is a major skill gap in the cluster of knowledgeable process experts who will be able to identify the sub operations involved in bag making and design a process flow for the same.

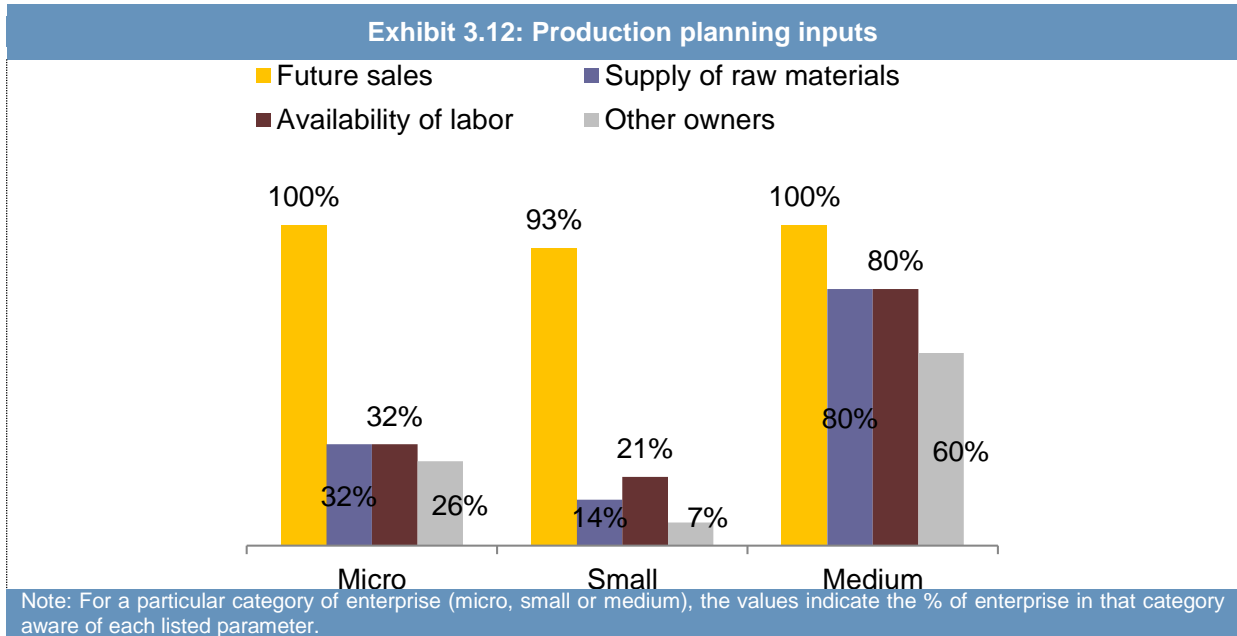
In **Shantiniketan** the enterprise owners still continue to use traditional production methods which are mostly manual. The minimal use of machinery has constrained the productivity of this sector. There is urgent need to change the mindset of the artisans and enterprise owners in the cluster and convince them to adopt modern machinery.



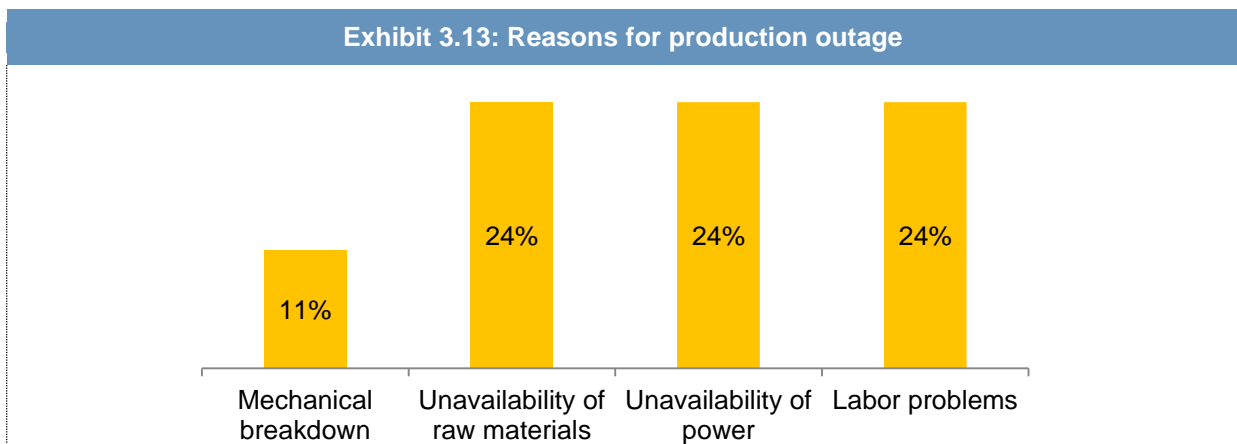
- The entrepreneurs are primarily dependent on the guidance provided by local industry associations and the internet to obtain **information about modern imported machines**. However for **information about latest domestic machines**, the machine suppliers are most active in advising the entrepreneurs about the latest technology. There is need for a more proactive approach especially from the tannery and footwear manufacturers' association to educate their members about the benefits of using modern technology.



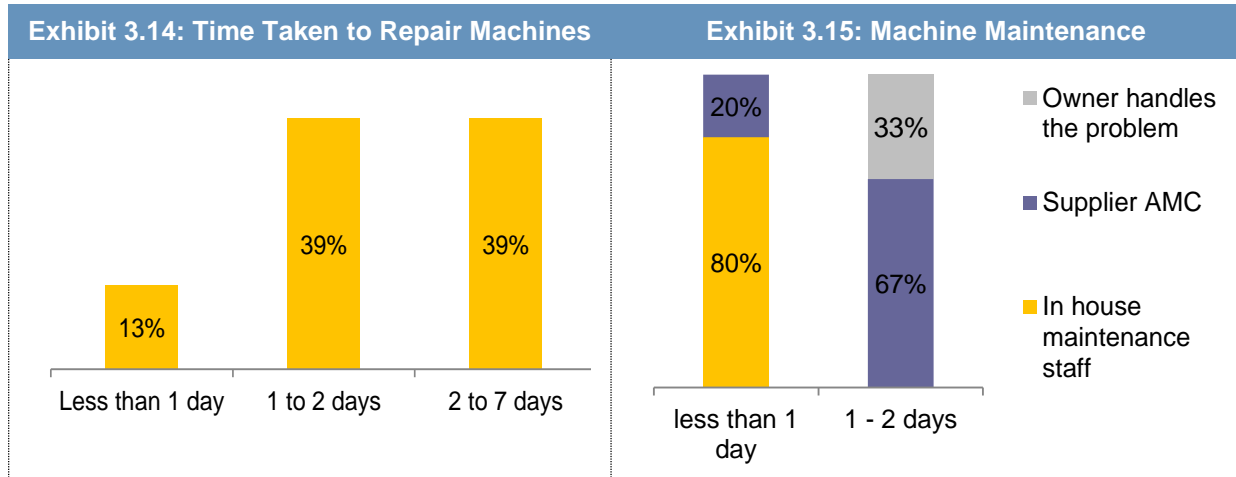
- Almost all the enterprises estimated their future sales so as to derive the **production schedule** for the enterprise. However among micro and small enterprises only a small proportion of the units realize the importance of estimating the future supply of raw materials and skilled labor in formulating the production schedule. Hence the enterprises need to be made aware of importance of the linkages among the various inputs that must be considered in a structured production planning process.



- In terms of **unscheduled production stoppages**, the major reasons are unavailability of power, raw materials, labour problems and mechanical failure of machines. The low proportion of mechanical breakdown among the micro and small enterprises can be explained by the low extent of mechanization among these enterprises. A significant proportion of firms (63%) indicated that they did not experience any production outage. Production outage due to unavailability of raw materials indicates a problem with the procurement function. The procurement staff needs to be trained to improve their sourcing and planning skills. In addition there is a gap in awareness about proper material handling and storage procedures among the sourcing staff. The proportion of firms experiencing labor problems is highest in case of medium enterprises. With increase in the size of the workforce, it progressively becomes more difficult to manage them. Hence there is need for a training module focusing on industrial labor relations.



- In case of **machine breakdown** a significant proportion of the respondents are able to rectify the problem with 2 days of time. Among them the enterprises which have an in house maintenance team are able to correct the problem within a day. The other firms are dependent on their machine suppliers to fix the problem. There is a clear need to impart technical knowledge of the machinery being used and preventive maintenance techniques so as to reduce the time required to repair broken machines.

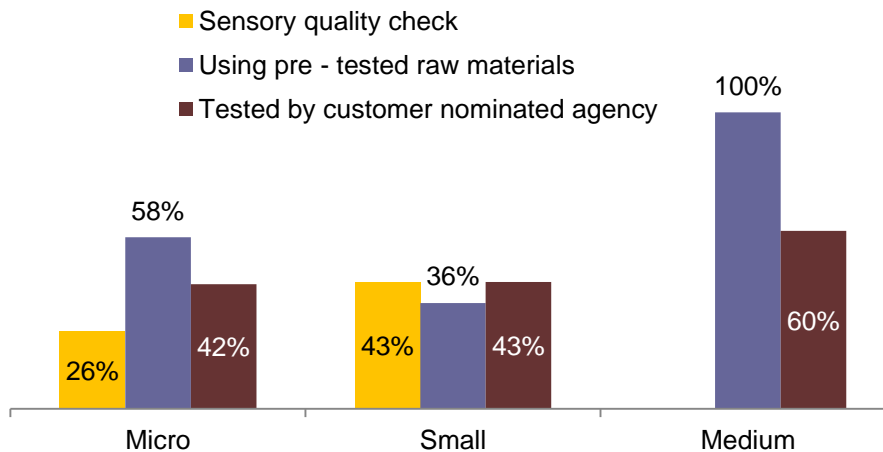


- A significant proportion of micro and small enterprises employ only **sensory quality checking** for their products. However none of the medium enterprises are using sensory quality checks. The awareness level about European CE and other **standard quality norms** is quite good among the medium enterprises. The firms which are directly involved in exports also have good understanding of these norms. However there is a gap in the understanding of these norms among the smaller units. The entrepreneurs need to be made aware of quality standards and importance of formulating a standard quality process for the enterprise.

Although all the medium entrepreneurs are aware of the need for using pre certified / tested raw materials, there is a gap in awareness among the micro and small units. Leather goods manufacturer must ensure that they use finished leather certified by CLRI or other agencies. In case of tanneries, the entrepreneurs must ensure that they use the proper chemicals as per international norms.

There is a lack of stress on quality improvement measures both among the staff and the owners. There is urgent need for quality experts who can prepare a clear implementation road map for modern quality processes such as 5S, kaizen, etc. customized to the needs of the enterprise.

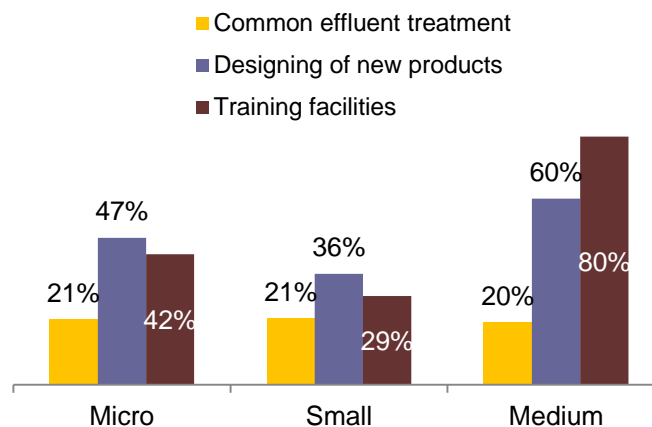
Exhibit 3.16: Quality checks



Note: For a particular category of enterprise (micro, small or medium), the values indicate the % of enterprise in that category doing each listed quality check.

- The enterprises in the cluster voiced that a **common facility center** should provide information about latest design trends and training to augment the skill set of existing design staff in the cluster. In addition the tannery enterprises require guidance on the technology and functioning of common effluent treatment plants. The common facility center should have the necessary infrastructure in terms of classrooms, trained faculty and machinery so as to conduct custom training programs as per the needs of the enterprises in the cluster.

Exhibit 3.17: Expectations from CFC



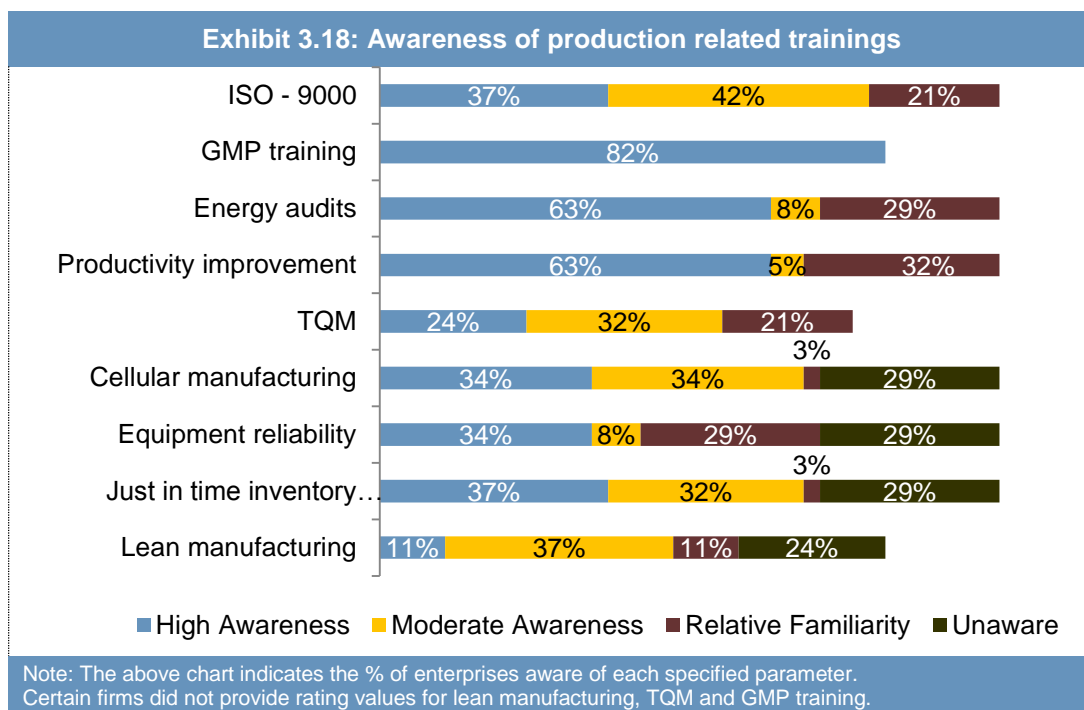
Note: For a particular category of enterprise (micro, small or medium), the values indicate the % of enterprise in that category which voiced the need for each specified option.

- There is a marked gap in awareness about **lean manufacturing** techniques. The entrepreneurs in the cluster need to be sensitized about the benefits of implementing lean manufacturing such as reduction in operating costs, improved productivity, quality etc. There is a lack of knowledge among the entrepreneurs in the cluster about specific facets of the lean manufacturing process such as just in time (JIT) inventory management, preventive maintenance, and cellular manufacturing.

Although there is a high degree of awareness about **productivity improvement techniques** among the entrepreneurs, in actual practice majority of the enterprises do not maintain any employee productivity records. The entrepreneurs are not aware of international productivity benchmarks and how to achieve them.

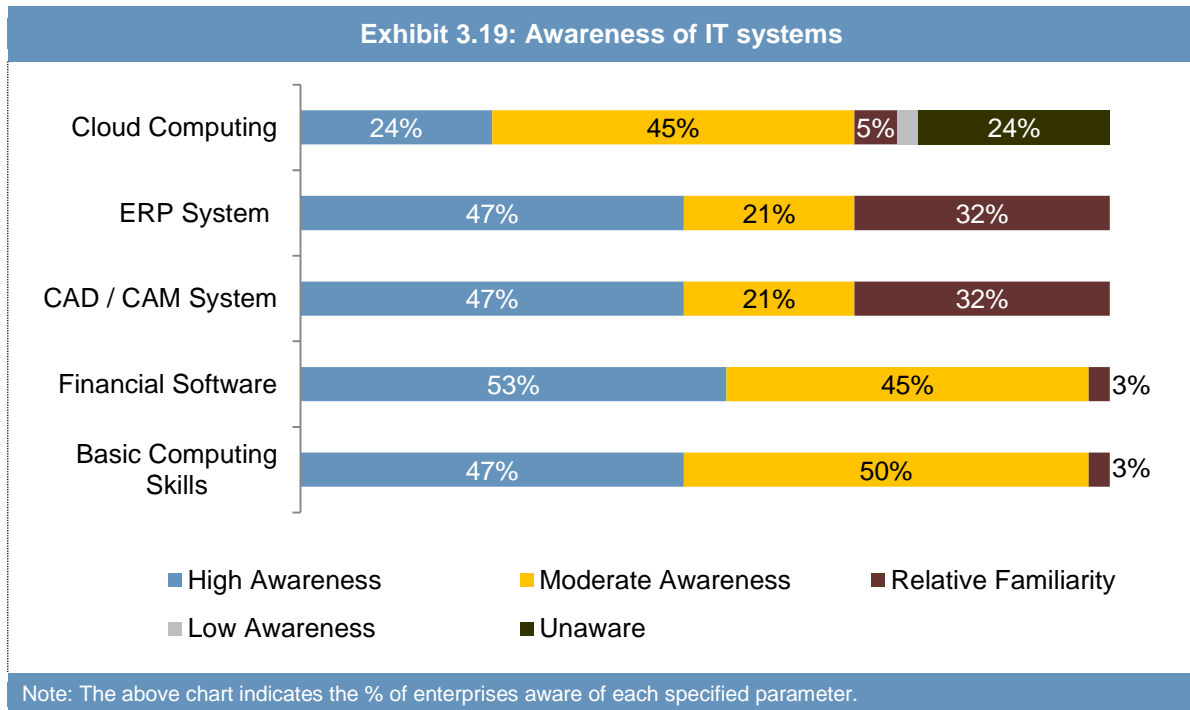
In terms of **energy audits** the awareness level is quite high; however the entrepreneurs have reservations about the magnitude of savings that they can achieve by following the recommendation of energy auditors.

With respect to **TQM**, high awareness levels were exhibited across the firms, however, very few firms have implemented these at the plant locations. The entrepreneurs exhibited a high degree of awareness about Good Manufacturing Practices (**GMP**). However this awareness has not translated into actual practice. Majority of the enterprises being dependent on contract labor do not invest much effort to ensure their health, hygiene or safety. Although the entrepreneurs in the cluster are aware about **ISO** norms, they require expert guidance in how to be compliant with them.



- Although across all MSMEs, entrepreneurs have indicated a high degree of awareness about **IT systems** such as ERP, CRM systems, in actual practice only a few of the bigger players in the cluster are able to afford these systems for operations management, inventory control, customer management. As cost is primary concern, technology service providers should be encouraged to explore the possibility of 'remotely / cloud hosted ERP systems'.

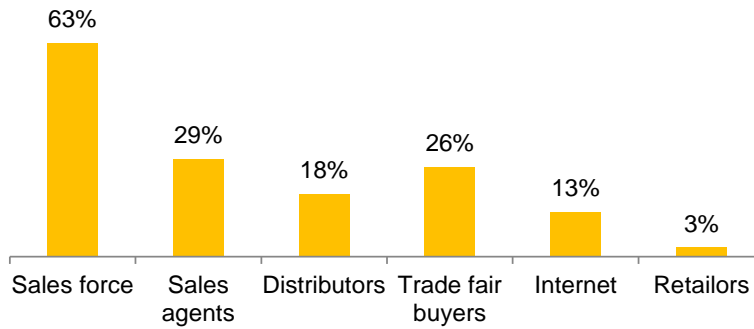
In terms of **financial software** many of the firms are using excel or tally to prepare their financial records. However many of the small or micro units lack finances and skilled manpower to use sophisticated financial software like tally or other Management Information Systems (MIS). With respect to CAD / CAM systems around 47% of the enterprises have indicated a high awareness level. However very few firms actually use the CAD / CAM tools on a regular basis.



Sales & Marketing

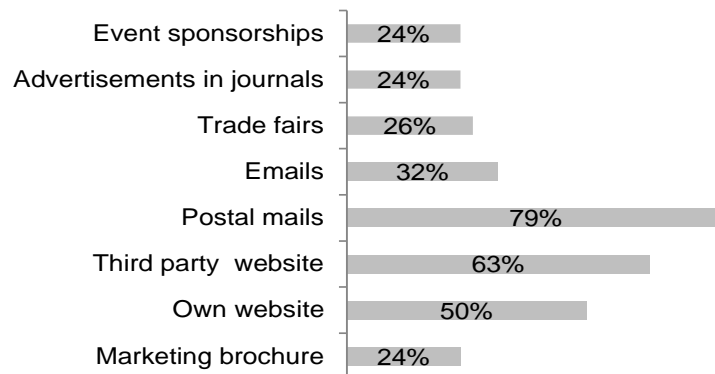
- Majority of the enterprises generated a significant proportion of their revenues by utilizing their own sales force to push their products to the customers. The other significant avenues for **generating sales** are selling agents, distributors and buyers at trade fairs. However many of the micro and small enterprises lack the required funds to participate in international trade fairs. A cost effective alternative for such firms would be to utilize the internet to promote their products and reach potential customers. Although there is awareness about internet marketing tools and Business to Business (B2B) websites the entrepreneurs in the cluster are not able to effectively utilize these tools to generate sales for their products. There is urgent need to hone the skills of the enterprises in the cluster in terms of utilizing e commerce web sites.

Exhibit 3.20: Sales channel mix

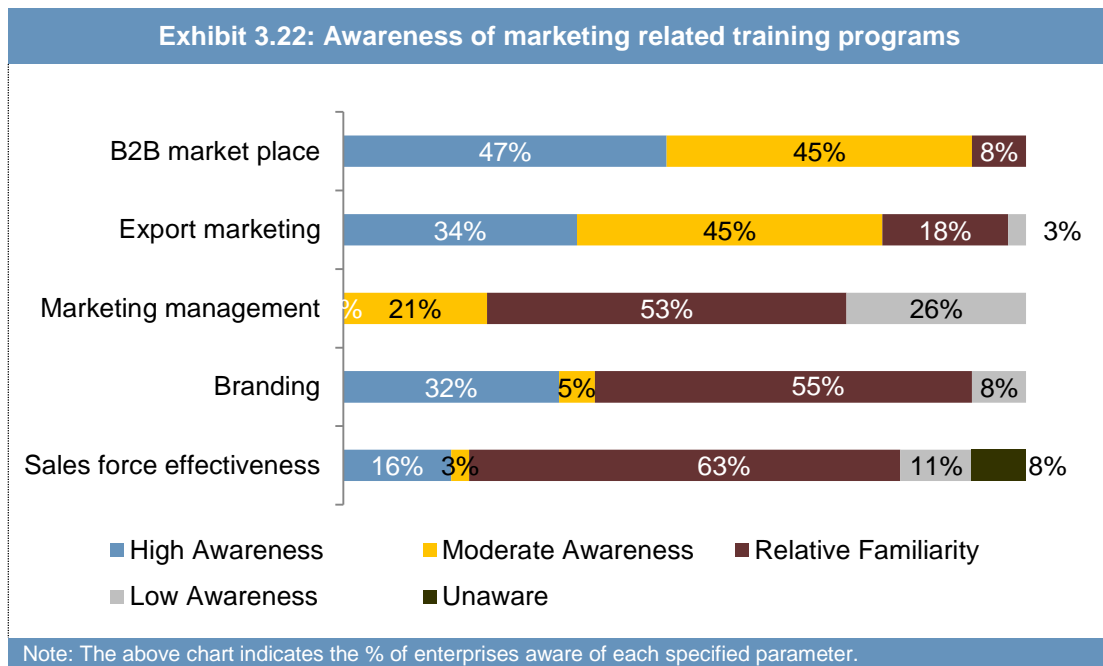


- In terms of **promoting** their products, a significant proportion of the firms maintain their own or third party websites, the sales generated through the internet medium are not much, as already indicated by the previous exhibit. The most preferred mode of communicating with prospective buyers is still through postal mails. The entrepreneurs lack the necessary expertise to utilize ecommerce tools or emails to communicate with their customers. Another major area of concern is the low proportion of firms who have developed and use a marketing brochure. There is clearly a need to train the entrepreneurs in designing a portfolio of their products and use it as an effective marketing tool.

Exhibit 3.21: Promotional methods



- The following exhibit summarizes the awareness level of firms in the cluster with respect to **marketing and brand building**.



There is not much awareness among the enterprises in the cluster about training programs to enhance the **skills of the sales people**. There is need for a structured training program for sales staff focusing on negotiation and communication skills.

A major problem facing entrepreneurs in Shantiniketan is that increasingly units in Kolkata and Sodepur have started **manufacturing products copying the distinct Shantiniketan style**. The end consumer is unable to distinguish between the two. Hence entrepreneurs in Shantiniketan are losing out on potential sales because they have not invested to build a unique brand for their products. There is need to create awareness among the entrepreneurs of the benefits of establishing a unique label by investing in **brand building** activities.

Even in the Kolkata region there is not much awareness among the entrepreneurs of the benefits of **branding initiatives to establish a unique design image** of the enterprise. There is an acute shortage of design expertise in the cluster. Most of the leather goods including industrial gloves manufacturing units involved in export generally follow the design supplied by the customer. Only some of the progressive firms in the cluster have invested in developing in house design capabilities. Even in the footwear sector, big firms such as Khadim tend to be very conventional in their design and product launches. Typically they would identify successful designs from big brands such as Nike, Reebok etc., modify these designs suitably and launch them. There is significant scope for improvement in the area of design development and awareness of contemporary fashion trends in this sector.

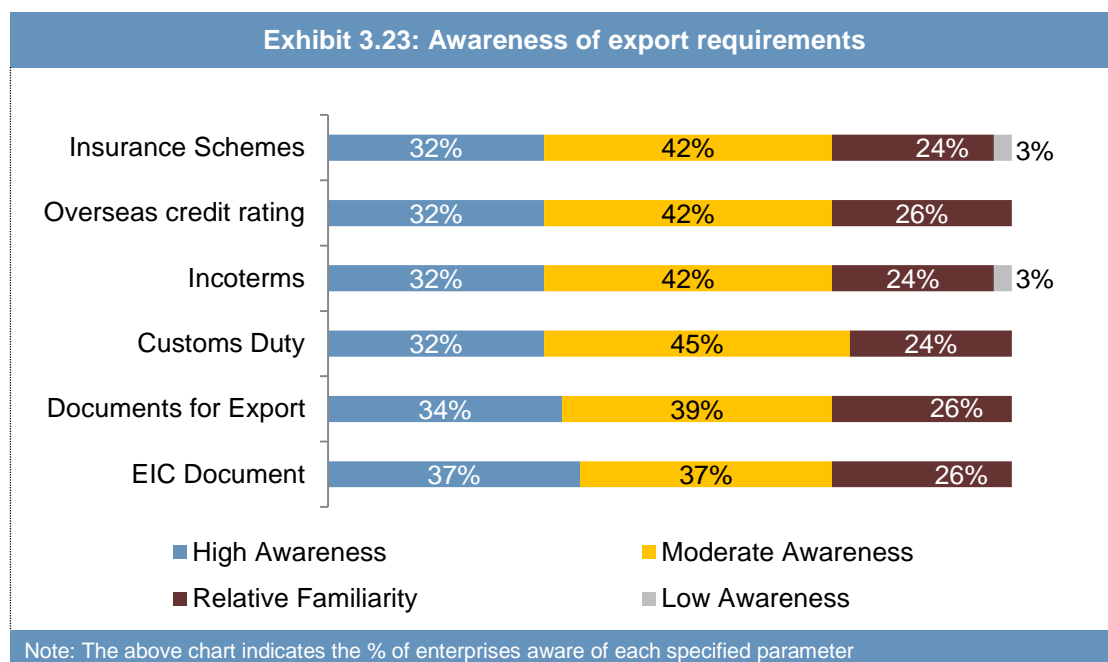
Although the entrepreneurs have indicated a moderate degree of awareness about **export marketing**, in actual practice the firms trying to obtain their first export order are primarily

dependent on agents or consultants for information about new markets. A key concern raised by the entrepreneurs is the lack of knowledge about identifying potential foreign markets and formulating entry strategies. The entrepreneurs require training on marketing and communications strategies targeting foreign buyers.

The entrepreneurs have indicated a high degree of awareness about **e commerce websites**, but in practice the proportion of sales generated by the internet channel is quite less. The enterprise owners require training on how to properly leverage the B2B websites to contact potential customers and generate orders from them.

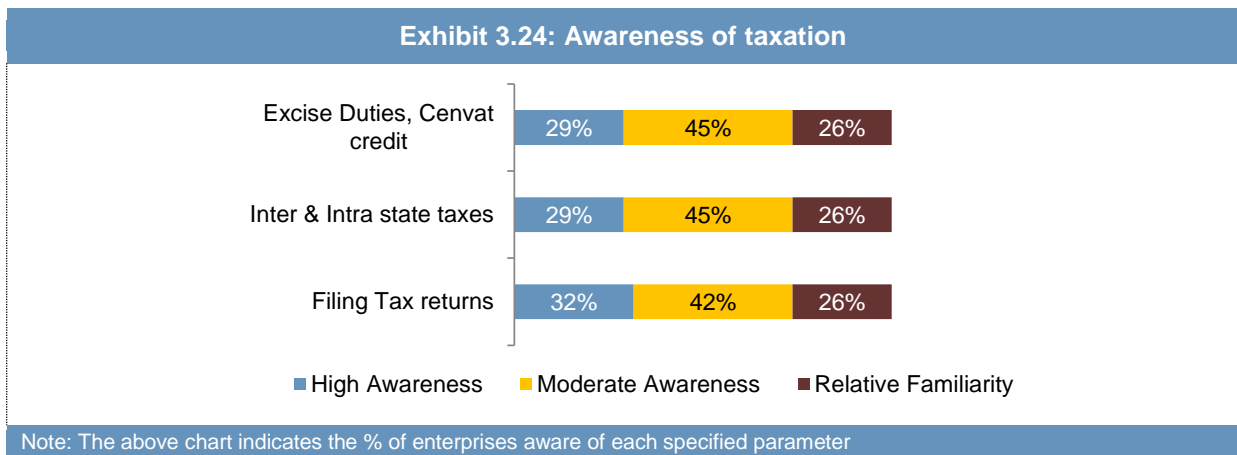
- The enterprises who are already well entrenched in the export business are highly aware of all the various **regulations and documents required for the export process**. However certain areas where the entrepreneurs lack adequate knowledge are rules specific to the importing country and international environmental regulations.

A significant proportion of the enterprises utilize the services of external consultants to help them navigate the various complexities associated with the export process. The enterprises lack the necessary in house expertise and hence tap these consultants who provide a more cost effective solution. For entrepreneurs who want to break into the export market there is a huge **gap in understanding of export regulations** and other information. A specific training module covering export rules, documentation, incoterms, international environmental regulations, importing country regulations and social accounting standards (SA8000) would be very helpful to the entrepreneurs in the cluster.

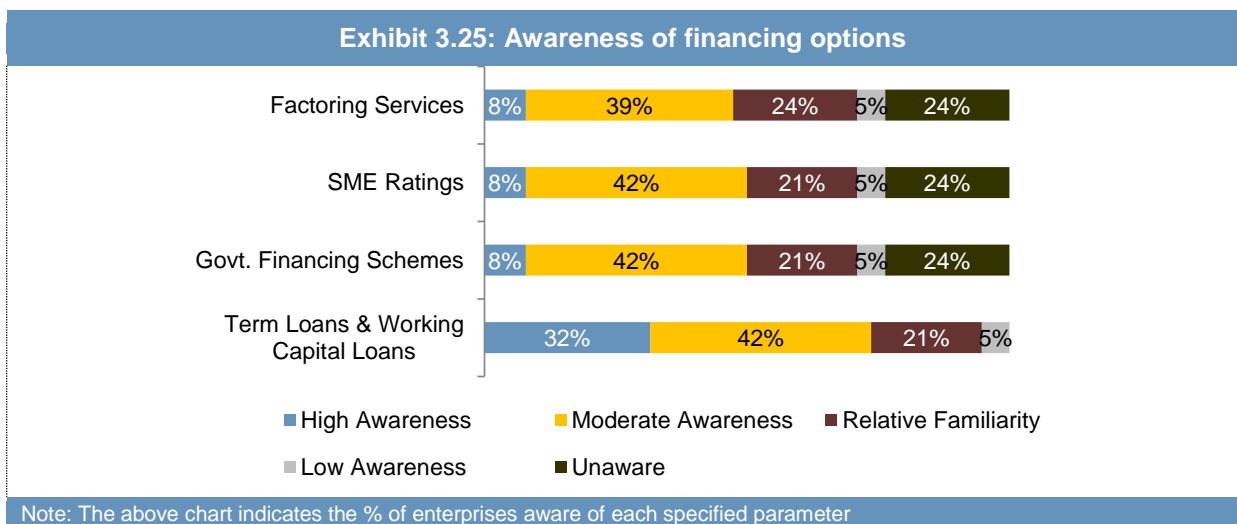


Finance

- Majority of the enterprises employ external tax consultants to prepare their **financial statements and submit their tax returns**. However many of the micro and smaller units are not able to afford the services of external consultants. These units do not maintain proper financial accounts and other documents. Hence they are not able to access institutional means of finance. There is an urgent need to create awareness among the entrepreneurs in the cluster about the benefits of maintaining regular accounts. A major problem in the finance function is the lack of in house expertise for analyzing TDS, CENVAT credit and other duty drawback schemes. Only a third of the units have indicated a high level of awareness about these areas.



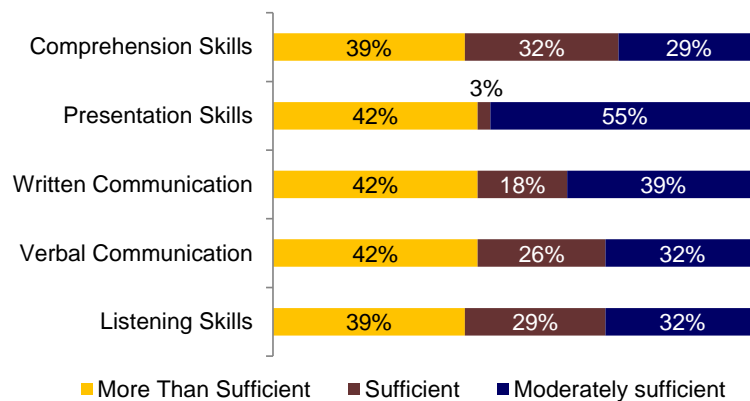
- The entrepreneurs are moderately aware of the **interest rates, tenures and collateral requirement** of the various banks and financial institutions. Generally the entrepreneurs can leverage the banking officials to obtain help on any queries with regard to working capital and term loans offered by that bank. The entrepreneurs need to be sensitized about the various **financing schemes** (such as CGTMSE) offered by the government and benefits of factoring services. There is also a gap in understanding about how SME ratings can lower the financing costs of an enterprise and also various financing options available to the entrepreneur.



Soft Skills

- Among the units in the cluster at the shop floor level, workers communicate using the local language, hence **verbal communication skills** is not much of an issue for the units in the cluster. However one major area of concern is the lack of **presentation skills** among the workers. Presentation skill is critical for those employees, who on a daily basis interact with external stakeholders such as customers, bank officials, government officers etc.

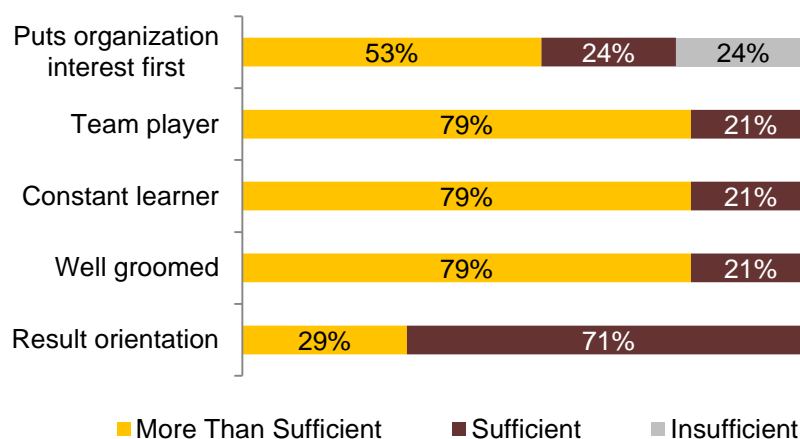
Exhibit 3.26: Level of existing communications skills



Note: The above chart indicates the % of enterprises aware of each specified parameter

- The only area where a significant proportion of entrepreneurs have indicated a shortcoming is that employees are not always putting the interest of the organization ahead of their own personal goals. With respect to **character traits** such as being a team player, constant learner and grooming, around 79% of the units have indicated that the current skill levels of employees are more than sufficient.

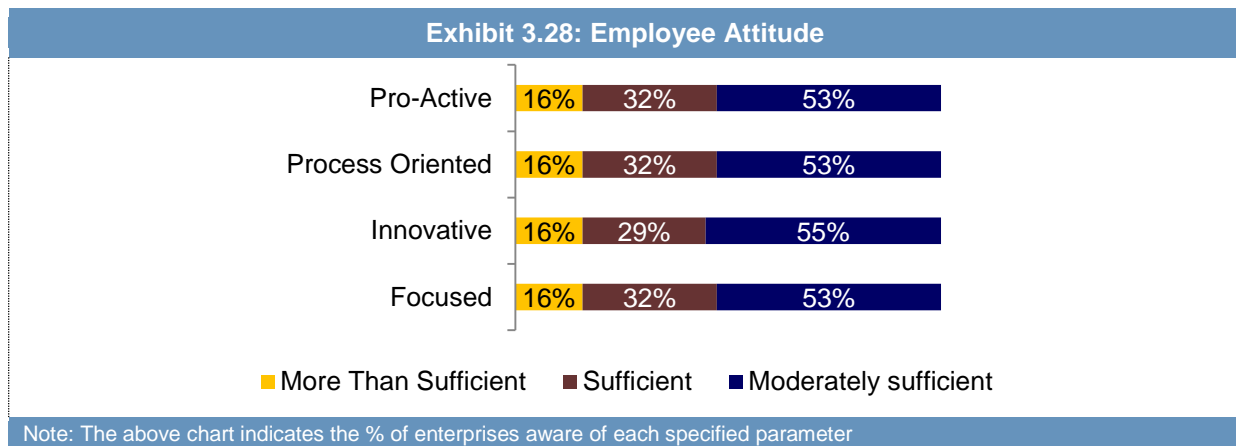
Exhibit 3.27: Personality Traits



Note: The above chart indicates the % of enterprises aware of each specified parameter

- For each of the **attitudinal traits** listed below more than half of the firms have indicated that skill level of their staff is only moderately sufficient. A common issue voiced by the entrepreneurs is

that most of the activities on the shop floor are carried out in ad hoc manner without following the process guidelines. In addition the lack of ability to come up with innovative solutions among the staff is a major concern for the entrepreneurs.



Assessment of NSDC and other reports

National Skill Development Corporation (NSDC) has done a detailed study on mapping of Human Resource and Skill Requirements of the Leather Industry in India till 2022. The report highlights the importance of technical skills, managerial skills, soft skills required in the Leather Industry and also the skill gaps at different stages of the value chain.

However, the NSDC study does not capture skill gaps at enterprise level and hence the skill sets of the industry leader and the laggards are not measurable. Also, the NSDC report focuses on skills through an education and experience route while D&B India has conducted the study through the process-function-domain requirements route. The advantage of the latter method is it enables to define and develop structured training modules for the identified gaps. These skill gaps are specific to the process and not generic. Lastly, the NSDC report applies to the entire Leather Industry while D&B India has concentrated only on the skill gaps in the Kolkata – Shantiniketan leather cluster.

A comparative example in the production process from both the studies would highlight differences in approaches and the level of granularity that D&B India has conducted the study.

Exhibit 3.29: Assessment of NSDC Findings

Function	Level	Skill gaps- NSDC Findings	Skill Gaps- D&B India Findings
Skill gaps in the finished leather segment			
Production	Technicians / Supervisors	<p>Lack of leather technologists and chemical engineers who are willing to work in a tannery</p> <p>Lack of institutes to train workers to work on these machineries</p> <p>Insufficient knowledge about the machinery as operators have come up from the ranks of unskilled workers</p> <p>Not much knowledge of preventive and regular maintenance</p>	<p>Lack of awareness of the latest restricted chemicals that cannot be used as per international norms</p> <p>Lack of knowledge about the various machineries</p> <p>Lack of knowledge about modern practices to reduce energy consumption</p> <p>Lack of knowledge about process up gradations to minimize water consumption</p> <p>Lack of knowledge about proper pre-treatment of effluents before releasing them to the CETP</p>
Skill gaps in the leather goods including industrial gloves and footwear segment			
Production & Quality Control	Procurement Manager & Quality Control Manager	<p>Lack of formal training in material planning and coordination to ensure timely and cost effective procurement</p> <p>Inability to effectively address quality related issues in the input received</p>	<p>Lack of knowledge of modern inventory management tools and techniques</p> <p>Lack of adequate knowledge of ERP and MIS</p> <p>Lack of awareness about</p>

	<p>At senior levels, there is lack of knowledge of planning and budgeting, to establish current and future requirements of the purchasing company, and to help determine budgets for purchases</p> <p>Communication and negotiation skills</p>	<p>latest international norms such as REACH, CE etc.</p>
Technicians / Supervisors	<p>Insufficient production planning skills, especially materials management</p> <p>Inability to control wastage (of material as well as man-hours) effectively</p> <p>Insufficient knowledge of costing</p> <p>Aptitude to conduct thorough quality checks at all levels missing</p> <p>Communication skills and ability to motivate workers needs to be improved</p> <p>Lack of institutes to train people for supervisors in a leather manufacturing set up</p>	<p>Lack of knowledge of modern production planning tools and techniques</p> <p>Lack of adequate knowledge of basic computing skills</p> <p>Lack of ability to investigate and identify the exact point in the production process where a defect is introduced</p> <p>Lack of awareness about health and safety issues</p>
Designer	<p>Lack of practical exposure through internship as a part of course curriculum</p>	<p>Lack of knowledge about contemporary international design trends</p>

		<p>Effectively convert design of a particular sample given by a customer onto paper, in order to start production and give instructions for production</p> <p>Insufficient coordination skills, especially in cases where production is outsourced, to communicate the designs properly to the vendor, handhold the vendor and ensure final products are as per the specifications</p>	<p>Lack of awareness of modern computer aided designing techniques</p> <p>Lack of adequate knowledge to match the right kind of leather with a particular design</p>
Sales & Marketing	Sales Manager	<p>Inadequate communication skills, especially when required to interact with international buyers</p> <p>Basic costing concepts</p> <p>Awareness and knowledge about the international market and changing fashion trends</p> <p>Inadequate negotiation skills</p>	<p>Lack of selling and negotiation skills</p> <p>Lack of ability to identify new potential markets and formulate entry strategies</p> <p>Lack of knowledge of IT and digital marketing etc.</p>

Training Initiatives

Entrepreneurship Development Institute of India (EDI)

EDI is a National Resource Institute jointly promoted by IDBI Bank Ltd., IFCI Ltd., ICICI Bank Ltd., and SBI. It was established in the year 1983. EDI has been appointed as the field agency for developing BDS in the cluster. It has been active in organizing training programs across different levels in the organization. Some of the major training initiatives undertaken by EDI are listed below

- Mr. Werner Morbach a German national conducted a skill development training program on designing and manufacturing of fashion gloves. Fashion gloves are a niche product as opposed to industrial gloves which will allow entrepreneurs to charge a premium price.
- A select group of people were sent to attend a training program organized by Footwear Design & Development Institute (FDDI) in Noida. The training program focused on forecasting of fashion trends, designing innovative products and ensuring superior quality.
- EDI in collaboration with ILPA Infrastructure Development Foundation (IIDF) conducted a 25 day skill development focusing on wallet making. There were 20 participants in the program and they were taught about all the various operations involved in making a wallet. All the participants in the program were either graduates or Class 12th pass.
- Government College of Engineering and Leather Technology (GCELT) held a month long training program on footwear manufacturing. The program was mainly attended by people already working in footwear manufacturing sector. The training module imparted theoretical training on foot anatomy, size system, materials being used, information about lasts and marketing concepts. The practical aspect of the training covered areas such as designing of insole, wooden heel and the upper.
- A seven week long skill development program for manufacturing of leather goods was organized for people belonging to the weaker section of the society. In order to encourage participation, the participants were provided with a transportation allowance and stipend. The program covered the four main operations of cutting, click, stitching and assembling.
- Two workshops were conducted in Shantiniketan with specific focus on increasing awareness of artisans in the cluster about modern design trends, colors etc. The artisans were stressed the need for using good quality accessories like Zippers, Snap fasteners etc. in their products. In addition the artisans were also advised to increase the product variety.
- Freya design institute along with Moda Pelle Academy, Milan, Italy organized a training program focusing on the current trends in Italian and Japanese markets. The aim of the program was to augmenting the skill set of designers in the cluster. The program also covered aspect of brand building and market development.

FREYA design institute:

FREYA is a design and training institute supported by the ILPA Infrastructure Development Foundation. FREYA offers design and pattern-making courses. The design studio has a library, meeting hall, and facilities for conducting training programs.

Skills for Employment in Leather Fabrication (SELF):

IL&FS Cluster Development Initiative Limited under the 'Skills for Employment in Leather Fabrication (SELF)' initiative offers programs to train shop floor operators for employment in leather industry. The training programs lasts for 30 days and is provided free of cost. The technical training module focuses on stitching, fitting and folding, skiving and clicking. In addition candidates are also coached on soft skills, personal hygiene, team behavior etc.

Current Training Infrastructure

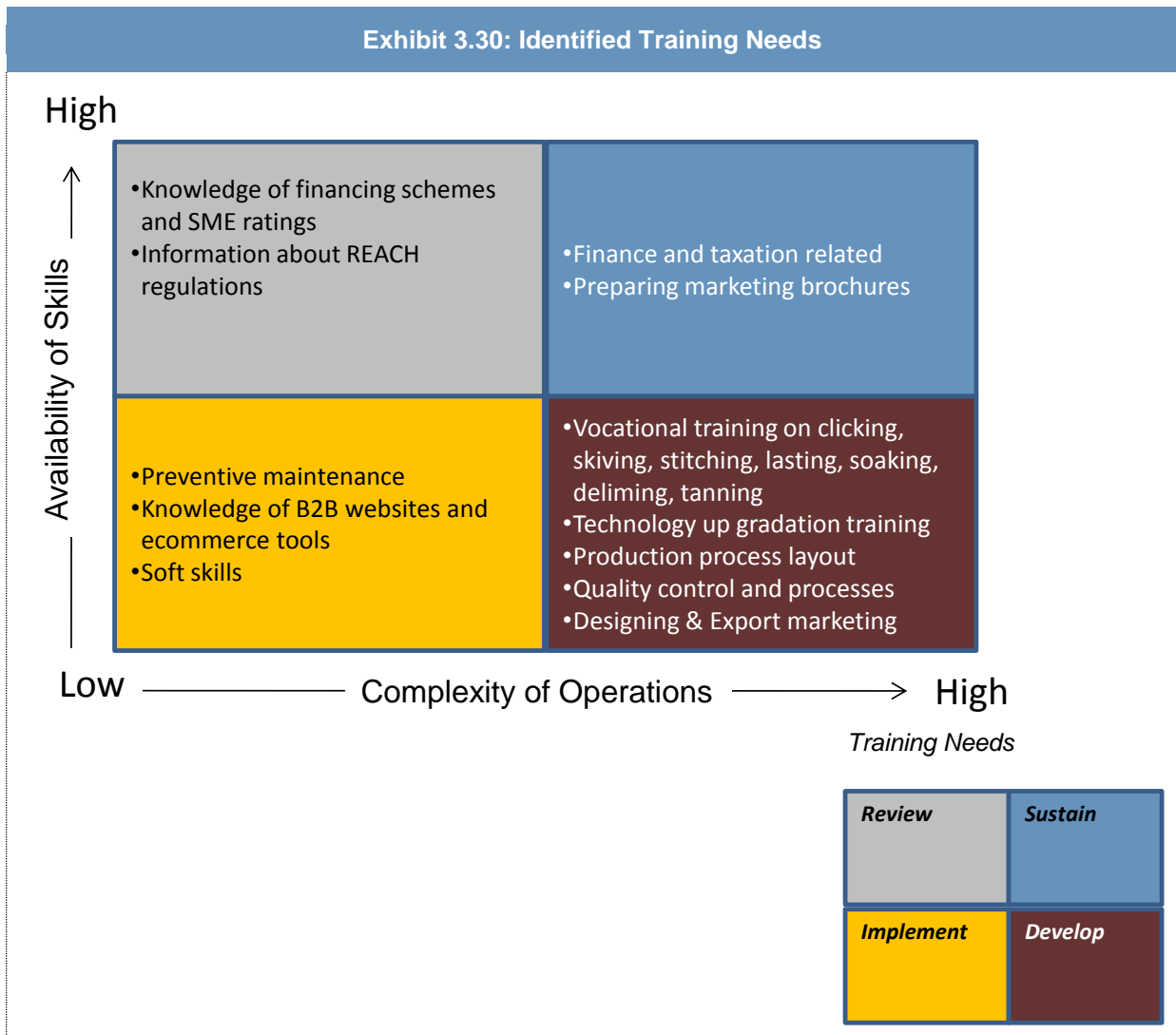
MSME Development Institute (MSMEDI), Kolkata

MSMEDI was set up by the Ministry of MSME under Government of India (GoI). It implements various programs and schemes of GoI for making the Indian MSME's globally competitive. The activities of the institute include technical services, training programs, ancillary development, awareness seminars/ workshops, ISO certification, marketing and export promotion, etc. The major focus areas are:

- Entrepreneur Skill Development Program (ESDP): are designed keeping in mind the new market developments. All these courses are designed for educated unemployed youth who are looking for a job or want to take up entrepreneurship as their career in the leather sector.
- MSMEDI organizes training programs on export management, export packaging, export marketing, export policies and procedures, etc.
- MSMEDI offers consultancy and training services for ISO 9000 certifications.
- Management Development Programs (MDPs) are two week long training program targeting the entrepreneurs or supervisory staff of MSME units. These programs cover industrial management, financial management, production management, marketing management, personnel management and export management. There is also provision to conduct MDPs customized to the needs of the industry.
- Government. College of Engineering and Leather Technology (GCELT): The institute offers a B.Tech. course on leather technology. The institute is planning to install a Pilot Tanning Centre at Bantala leather complex for carrying out education and research work for the industry.
- National Institute of Fashion Technology (NIFT): NIFT offers a three -year degree course and a short term diploma course in leather designing. The course curriculum includes leather garment designing, shoe designing and bag designing.

Identified training needs in the cluster

Assessment of skill set with respect to complexity of operations of the particular process was conducted to obtain insights on key areas where training is critical. The complexity of operations was assessed with the sample respondents to obtain an idea of the level of complications involved in the process. The available skill sets were rated on the scale of sufficiency as perceived by the owner. The following matrix highlights the key areas where training requirements can be seen:



The following table elaborates on the training needs identified across key development areas and managerial levels:

Exhibit 3.31: Training Needs		
Development Area	Worker/ Supervisory Training	Management Level Training
Production	Productivity improvement REACH regulations Pretreatment of effluent before discharge	Technology up gradation Production process layout Production scheduling & planning Cleaner process technologies Lean manufacturing
Total Quality Management	Quality assessment Defect tracking techniques to reduce rejection rate	Quality Norms such as CE Quality control processes
Equipment Maintenance	Basic housekeeping activities Machine knowledge	Preventive and predictive maintenance
Sales & Marketing	E commerce business potential Preparing marketing brochures	Knowledge of export markets Contemporary design trends
Finance	Knowledge about SA8000 accounting standards	Information about financial subsidy schemes and SME ratings

Summary

- The cluster is faced with severe shortage of skilled and unskilled labor. •There are very few training modules focusing on vocational training to equip unskilled workers to perform basic shop floor operations in the leather industry. There is a clear need for increased co-operation and information exchange between the industry and the training institutes to improve the supply of trained resources as per the industry expectations in the cluster. The training institutes need to design vocational courses that have a component of field training in the industry or in the workshops of the institute as a part of the curriculum.
- There is acute shortage of skilled labor to perform stitching, lasting, skiving and clicking operations. In absence of skilled manpower, most firms employ unskilled resources at operator level positions for different processes impacting their productivity.
- There is not much awareness about modern quality control processes especially among the micro and small units. Quality control is an activity that is conducted only as a requirement measure. Defect tracking techniques in order to reduce the rejection rate is not widely followed.
- Lack of technological awareness can be mentioned as another skill gap in the cluster. A large number of small and micro firms especially in the tannery sector still continue to use traditional technology and are not willing to upgrade.
- One major skill gap is the lack of process knowledge among the supervisory and managerial staff of the units. Currently, in absence of skilled resources, shop floor workers over a period of time are elevated from operator level jobs to supervisory level positions. In the absence of any formal learning, they lack adequate knowledge of modern techniques such as lean manufacturing, production planning, six sigma, TQM etc.
- Apart from technical skills, managers and supervisors also lack soft skills such as communication skills, team development and motivation skills for undertaking their activities.

Exhibit 3.32: Production Function Tip Sheet

Kolkata-Shantiniketan					
Production					
Processes in Value Chain	Tanning	Leather goods manufacturing	Footwear manufacturing	Designing	Quality Checking
Sub Processes	Liming, Deliming, Tanning	Clicking, Stitching, Skiving	Lasting	Designing of leather goods and footwear as per contemporary fashion trends	Physical Testing, Chemical Testing
Type of Skill Requirement (Semi-skilled / Skilled)	Semi-Skilled	Semi-Skilled	Semi-Skilled	Skilled	Skilled
Availability of Manpower (Low /Medium / High)	Low	Low	Low	Low	Medium
Skill Gap (Low/Medium/ High)	Medium	High	High	High	High
Training needs (Review /sustain /implement /Develop)	Develop / Review	Develop	Develop	Develop / Sustain	Develop / Sustain
Available Training Courses	Pollution control course offered by CLRI	Advanced certification course in shoe and leather goods making run by GCELT		Designing and Pattern making courses offered FREYA design institute	Quality control methods in leather and footwear manufacture conducted by CLRI
Available Training Institutes	Central Leather Research Institute (CLRI) Govt. College of Engineering and Leather Technology (GCELT) FREYA design institute				

Exhibit 3.33: Marketing Function Tip Sheet

Kolkata-Shantiniketan Marketing				
Processes in Value Chain	Customer Development	Sales Force Effectiveness	Export Compliance	Marketing Management
Sub Processes	New Market Identification, New customer identification, Relationship building with existing customers, Product Innovation	Effective monitoring of sales force, Developing right channel mix	Knowledge of various export related procedures	Brand awareness, Ecommerce marketing tools, Creating marketing collaterals
Type of Skill Requirement (Semi-skilled / Skilled)	Technical: Semi-Skilled Managerial: Skilled	Technical: Skilled Managerial: Skilled	Technical: Skilled Managerial: Semi-skilled	Technical: Skilled Managerial: Skilled
Availability of Manpower (Low /Medium / High)	Low	Medium	Medium	Low
Skill Gap (Low/Medium/ High)	High	High	High	Medium
Training needs (Review /sustain /implement /Develop)	Develop	Implement	Sustain	Sustain / Implement
Available Training Courses	No Structured Training Module Available			
Available Training Institutes	No Institutional Training Available			

Annexures

Annexure 1: Skill Gap Analysis

Complexity of operations involved in the enterprise was evaluated vis-à-vis the available skill set to ascertain the gaps necessary for skill training. The following tables summarize the detailed analysis for the complexity-skill matrix contained in the report. The counts represent the number of firms that have provided the ratings in the sample selected. The highlighted cells are definite training needs where the complexity rating of the activity is higher whilst the available skill to perform the job is lower. Certain areas where complexity is lower but available skills are higher are also identified as training needs.

Soaking		Skill Availability Rating		
Complexity Rating	Neutral (3)	Sufficient (4)	More than sufficient (5)	Total
Somewhat Complex (3)	-	-	1	1
Moderately Complex (4)	-	3	-	3
Extremely Complex (5)	2	2	-	4
<i>Total</i>	2	5	1	8

Liming		Skill Availability Rating		
Complexity Rating	Neutral (3)	Sufficient (4)	More than sufficient (5)	Total
Somewhat Complex (3)	-	-	1	1
Moderately Complex (4)	-	2	3	5
Extremely Complex (5)	1	-	1	2
<i>Total</i>	1	2	5	8

Deliming		Skill Availability Rating		
Complexity Rating	Neutral (3)	Sufficient (4)	More than sufficient (5)	Total
Somewhat Complex (3)	-	1	1	2
Moderately Complex (4)	-	1	1	2
Extremely Complex (5)	2	2	-	4
<i>Total</i>	2	4	2	8

Tanning		Skill Availability Rating		
Complexity Rating	Neutral (3)	Sufficient (4)	More than sufficient (5)	Total
Not very complex (2)	-	1	-	1
Somewhat Complex (3)	-	1	-	1
Moderately Complex (4)	-	1	-	1
Extremely Complex (5)	2	2	1	5
<i>Total</i>	2	5	1	8

Dyeing		Skill Availability Rating		
Complexity Rating	Neutral (3)	Sufficient (4)	Total	
Somewhat Complex (3)	-	2	2	
Moderately Complex (4)	2	3	5	
Extremely Complex (5)	-	1	1	
<i>Total</i>	2	6	8	

Fat liquoring		Skill Availability Rating		
Complexity Rating	Neutral (3)	Sufficient (4)	Total	
Somewhat Complex (3)	-	2	2	
Moderately Complex (4)	2	3	5	
Extremely Complex (5)	-	1	1	
<i>Total</i>	2	6	8	

Splitting		Skill Availability Rating		
Complexity Rating	Neutral (3)	Sufficient (4)	Total	
Somewhat Complex (3)	-	2	2	
Moderately Complex (4)	2	3	5	
Extremely Complex (5)	-	1	1	
<i>Total</i>	2	6	8	

Buffing		Skill Availability Rating		
Complexity Rating	Neutral (3)	Sufficient (4)	Total	
Somewhat Complex (3)	-	2	2	
Moderately Complex (4)	2	4	6	
Extremely Complex (5)	-	-	-	
<i>Total</i>	2	6	8	

Cutting		Skill Availability Rating		
Complexity Rating	Neutral (3)	Sufficient (4)	More than sufficient (5)	Total
Somewhat Complex (3)	2	3	1	6
Moderately Complex (4)	2	11	3	16
Extremely Complex (5)	-	5	3	8
<i>Total</i>	4	19	7	30

Skiving		Skill Availability Rating		
Complexity Rating	Neutral (3)	Sufficient (4)	More than sufficient (5)	Total
Somewhat Complex (3)	6	4	2	12
Moderately Complex (4)	3	5	2	10
Extremely Complex (5)	-	4	4	8
<i>Total</i>	9	13	8	30

Stitching		Skill Availability Rating		
Complexity Rating	Neutral (3)	Sufficient (4)	More than sufficient (5)	Total
Not very complex (2)	-	1	-	1
Somewhat Complex (3)	7	5	-	12
Moderately Complex (4)	-	3	2	5
Extremely Complex (5)	3	5	4	12
<i>Total</i>	10	14	6	30

Lasting		Skill Availability Rating		
Complexity Rating	Neutral (3)	Sufficient (4)	More than sufficient (5)	Total
Somewhat Complex (3)	1	-	-	1
Moderately Complex (4)	-	1	-	1
Extremely Complex (5)	-	3	1	4
<i>Total</i>	1	4	1	6

Designing		Skill Availability Rating		
Complexity Rating	Neutral (3)	Sufficient (4)	More than sufficient (5)	Total
Somewhat Complex (3)	3	3	5	11
Moderately Complex (4)	1	7	5	13
Extremely Complex (5)	-	3	3	6
<i>Total</i>	4	13	13	30

Quality Checking		Skill Availability Rating		
Complexity Rating	Neutral (3)	Sufficient (4)	More than sufficient (5)	Total
Somewhat Complex (3)	13	1	2	16
Moderately Complex (4)	2	5	1	8
Extremely Complex (5)	2	5	1	8
<i>Total</i>	17	11	4	32

Packaging		Skill Availability Rating		
Complexity Rating	Neutral (3)	Sufficient (4)	More than sufficient (5)	Total
Somewhat Complex (3)	-	-	1	1
Moderately Complex (4)	2	12	3	17
Extremely Complex (5)	-	2	5	7
<i>Total</i>	2	14	9	25

Annexure 2: Case Studies

Case I

Organization Profile:

Organization Profile Information	
Name of Enterprise	ASG Leather Pvt. Ltd.
Name of Entrepreneur	Mr. A. K. Sen Gupta
Type of MSME	Small
Products	Leather goods such as wallets, bags, purses, pouches, folders, organizers etc.

The company started its operations in 1998. The company is a 100% export oriented unit. The major foreign markets the company supplies to are Germany, Spain, Italy, USA and Canada. The annual turnover of the company is around Rs 8 Cr.

Skill gaps:

- The company has an order backlog due to unavailability of skilled labor. Recently with the spurt in the construction sector activity, many of the workers have migrated to this sector because of the higher wages being offered. The company still operates on the traditional model where a master tradesman along with his helpers performs all the operations associated with manufacturing a bag. The company wants to implement the production line technique where the various jobs involved in making a bag will be performed in sequence. However the company has not been able to find a process expert who will be able to identify the sub operations involved in bag making and design a process flow for the same. The implementation of the production line approach would require workers to be trained on certain specific operations rather than the current practice of training him on all aspects of bag making. This would also help in reducing the dependence on skilled master craftsmen who are in short supply.
- The company urgently requires shop floor supervisors. However none of the existing institutes offer a course catering to the specific needs of a supervisor. The enterprise owners feels strongly that such a course should be launched covering production processes, materials management, quality processes, communications skills and basic computing skills.

Case II

Organization Profile:

Organization Profile Information	
Name of Enterprise	G. T. International
Name of Entrepreneur	Mr. T. N. Talukdar
Type of MSME	Micro
Products	Leather goods such as wallets, bags, purses.

The enterprise does job work for exporters and other big firms. The annual turnover of the company was around Rs. 45 lakhs in 2008. However after the recession the company turnover has drastically reduced and currently the turnover is around Rs. 12 lakhs. He has been forced to lay off a significant number of workers and currently has 10 workers on his payroll.

Skill gaps:

- The primary concern of the entrepreneur is that he is not able to supply the foreign buyers directly. He lacks the financial muscle to visit international trade fairs. Hence he is not able to showcase his goods to foreign buyers visiting these fairs. He has rudimentary knowledge of Business to Business websites (B2B) but has not explored them in order to obtain foreign orders. In order to sustain his enterprise he requires training on developing marketing brochures, using B2B websites, preparing a representative portfolio of his goods, communication and writing skills.
- The entrepreneur exhibited a very complacent attitude towards quality. The majority of the operations are performed manually thereby making it difficult to ensure product standardization. The unit employed random visual checking on a sample basis to ensure the quality of the goods produced. There is complete lack of awareness about modern quality processes among workers and the owner.
- In terms of quality guidelines only aware that the dyes used should be AZO free (certain AZO dyes being carcinogenic are banned). However strikingly he is not aware of the significance of using AZO free dyes. There is urgent need to create awareness explaining the significance of international norms such as REACH, CE etc.
- The machine supplier advised the entrepreneur as regards to all technical matters including the machinery he should invest in. The entrepreneur did not make any effort to keep himself informed about latest technology advancements.
- The entrepreneur has successfully maintained a credit facility with United Bank of India. However he had no knowledge of financial subsidy schemes offered by government agencies.

Annexure 3: Workshop conducted

A work shop was conducted among micro enterprise owners who are primarily manufacturing leather goods such as bags and wallets. The enterprises were based in the Sodepur area. The main learning from the discussion at the workshop included:

- The level of mechanization was pretty low. The units mainly used traditional domestic machines such as sewing machines, skiving machines etc., in their day to day operations.
- The primary concern voiced by the entrepreneurs was the lack of knowledge about export markets. They are unable to directly get in touch with foreign buyers and hence are forced to do job work for big export houses. The entrepreneurs lack the required financial muscle to go abroad and participate in international trade fairs.
- They did not have much idea about e-commerce web sites such as alibaba.com or how to leverage them to promote their products among international buyers.
- In terms of labor, they conceded that there was a shortage of labor willing to work in the leather trade. The main reason for this was the low wages offered to entry level workers in the leather sector as compared to other sectors such as construction. However more than the lack of workers; the major concern facing these micro enterprises is the drastic reduction in the value of orders. Many of the enterprises in the area have been forced to close down.
- The entrepreneurs again reiterated that their immediate requirement was capacity building in terms of how to identify potential clients and communicate with them.

Annexure 4: List of Firms / Meetings Conducted

Respondents		
Name	Organization	Designation
Mr. S Mallick	ILTA	Hony. General Secretary
Mr. S. P. Ghosh	ILPA	Asst. Director
Mr. D. Ghosh	MSME DI	Asst. Director
Mr. D. Sengupta	Shantiniketani Artistic Leather Goods Manufacturer's Welfare Association	Secretary
Mr. B. Roy	Amar Kutir Society for Rural Development	Production Incharge
Mr. A. K. Sengupta	ASG Leather Private Limited	Managing Director
Mr. A. Chatterjee	Kalpataru International Pvt. Ltd.	Marketing
Mr. T. Sengupta	Khadim's	Technical Advisor
Mr R. Das	Khadim's	Buying & Merchandising
Mr. T. N. Talukder	G. T. International	Owner

Chennai Leather Cluster

Cluster Profile

The leather cluster is located in the district of Chennai and in nearby districts of Ambur, Ranipet, Vaniyambadi, Trichy, Erode and Dindigul. The cluster produces the following products:

- Semi-Finished & Finished Leather
- Men's Footwear
- Leather Garments – Includes jackets, sports-wear and fashion-wear
- Leather Goods – Includes gloves, belts, ladies hand bags, travel goods etc.

In order to assess the nature of skill gaps in the cluster, D&B India conducted a quantitative survey amongst the enterprises in the various categories across the cluster. It was also ensured that the representation of micro, small and medium enterprises was adequate.

Skill gaps were observed at all levels across the value chain in the cluster. Mentioned below is a summary of major findings of the study:

- There is acute shortage of skilled labor to perform stitching, lasting, skiving and clicking operations.
- Lack of technological awareness can be mentioned as another skill gap in the cluster.
- One major skill gap is the lack of process knowledge among the supervisory and managerial staff of the units.
- The training institutes need to design vocational courses that have a component of field training in the industry or in the workshops of the institute as a part of the curriculum.

Cluster Overview

Nature of Industrial Activity

Initially the firms in the area were involved in trading and exporting raw hides and skin and gradually moved up the value chain to that of semi – finished leather and finally on to product manufacturing over the period of the century. The districts surrounding the Chennai cluster accounts for about 36% of the total exports of Indian leather industry. The Chennai cluster is estimated to contribute over Rs. 1000 Crore in terms of leather exports. The leather and leather products cluster of Chennai is closely integrated with global value-chains due to convenient access to large raw material, tannery base and port facilities. The major export clienteles include orders from all the sophisticated world market including Germany, France, Italy, Spain, UK, The world renowned buyers of the cluster include Marks & Spencers and Wal-Mart. The cluster is estimated to have about 800 units in the micro segment and about 60 units in small and medium sector.

The following Exhibit summarizes the information about the leather cluster:

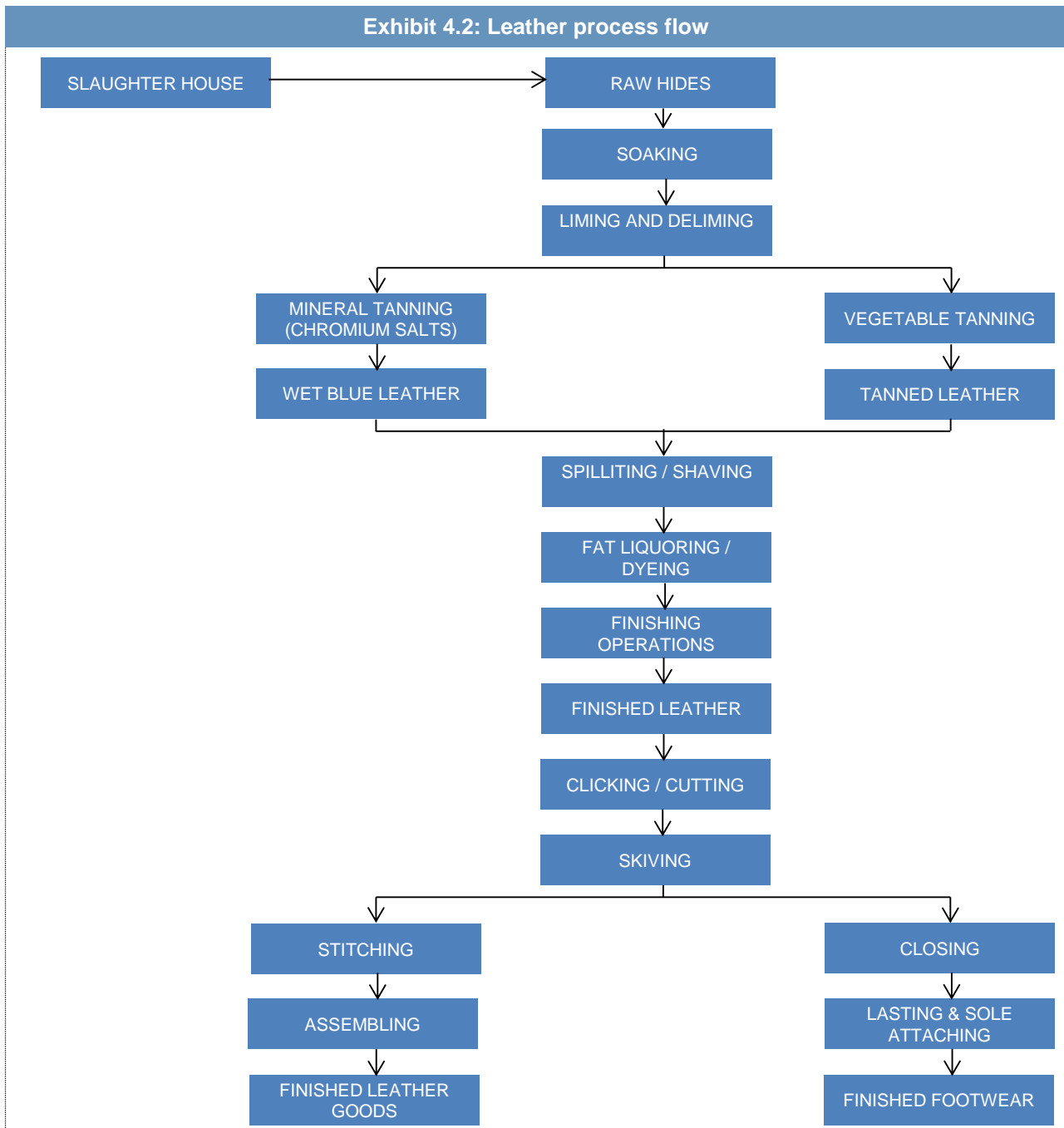
Exhibit 4.1: Chennai Cluster Information			
Particular	Turnover (in Rs. Crore)	No. of Units	Employment (nos.)
Finished Leather (Tannery)	620	150	15,000
Footwear & Component Manufacturing	1040	95	25,000
Goods & Garment Manufacturing	280	250	
Large Integrated Units	More than 80 per unit	4	

Source: Diagnostic Study Report on Chennai Leather Cluster prepared by Entrepreneurship Development Institute of India (EDI)

Process flow in leather cluster

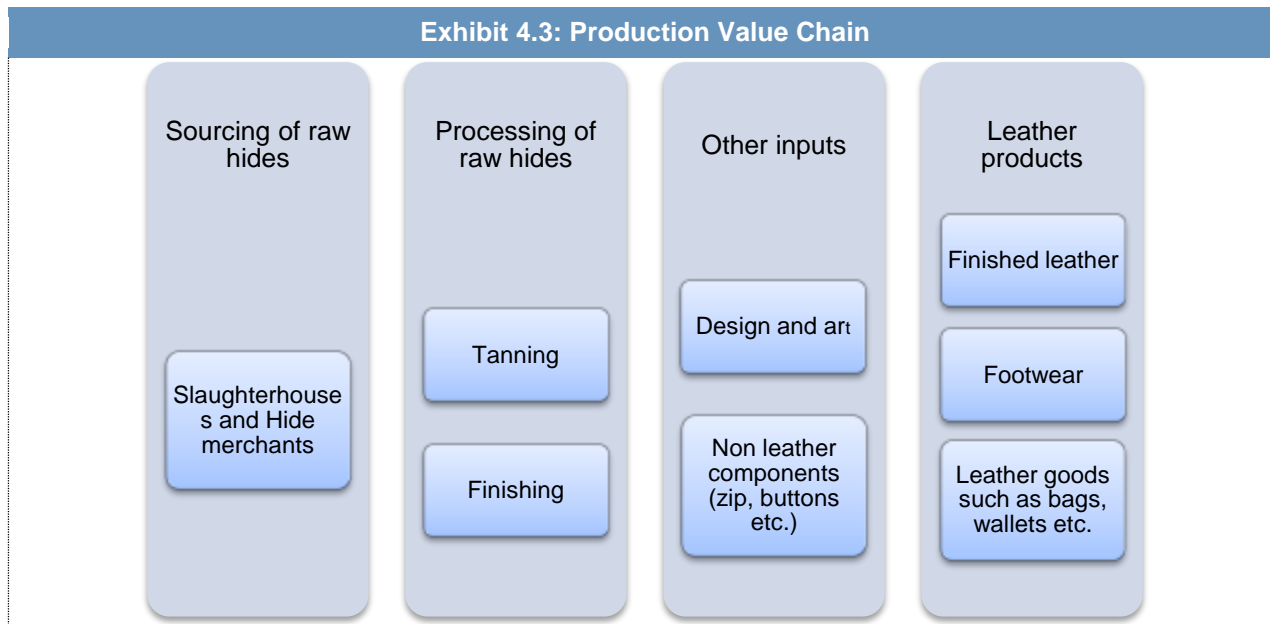
- The key stages in the leather industry include raw hide procurement, process till wet blue, finished leather, and manufacturing leather goods & footwear. Initially the raw hides are soaked in pits and paddles to rehydrate the skin in a process called **soaking**.
- The soaked hides then undergo **liming** process where limestone powder is mixed with water to loosen the hair from the skin. The unwanted flesh is also removed in the liming process. The limed hides are then **de-limed** by removing the liming and other chemicals.
- Post de-liming, **tanning** process is carried out either by using chromium salts or by using natural materials such as bark, woods, roots, leaf etc. When chromium salts are used the process is called Mineral tanning and the processed leather is light blue in colour (**Wet Blue** leather).
- Post the tanning process the hides are **split and shaved** to adjust their thickness.
- After this the leather is treated with **fat liquor** to impart flexibility and softness. Along with the fat liquors, **dyes** are added to impart colour to the leather.

- The leather after dying undergoes **buffing** to remove unwanted extra flesh sticking to the leather. Finally to increase the colour penetration, leather is finished by **spraying** with pigments and binders.
- The finished leather is the starting point for the leather goods and footwear manufacturers. The first operation performed is **clicking / cutting**. Clicking is the process of cutting out different components of footwear or leather goods as per the approved design or size.
- After this **skiving** operations might be carried out if required to reduce the thickness of the leather at edges so that seams can be produced without additional bulkiness.
- Post skiving, the operations tend to be different for leather goods and footwear. In case of leather goods **stitching** operations are carried out after skiving.
- For footwear after skiving, **closing** of shoe upper is done followed by **lasting** and finished with finally **attaching the sole**. Lasting is the process of using a pattern called the last to mould the two dimensional leather into the three dimensional shape of the foot.



Cluster Ecosystems and Inter-Linkages

Exhibit 4.3: Production Value Chain



The tanneries source raw hides from hide merchants/ commission agents and slaughter houses located in and around the cluster and also from other places such as Kolkata, etc. In addition a significant portion of raw hides are also imported. The domestic slaughter houses supplying raw hides lack proper modern infrastructure for collection of dead animals. Thus there is significant wastage in finished leather because of damages caused by rough handling at the slaughter houses.

Forward linked firms include domestic market traders, merchant exporters/importing agents. Many SMEs and all large firms do not use this channel, but directly export. The smaller product manufacturers largely cater to the domestic market through traders while the bigger ones employ all three channels – some directly exporting, some indirectly through agents and others catering to the domestic market through traders.

The enterprises that are in direct contact with foreign buyers are constantly aware of the market needs in terms of continuously changing consumer tastes. These enterprises key focus is on exports; hence they outsource a significant portion of the work to the smaller units. In terms of outsourcing, there are well established linkages between the units in the cluster. The smaller units do job work for bigger firms and exporters.

In 2009 India accounted for 2.94% of global leather trade, there is a huge potential for Indian entrepreneurs to increase this share. However in the Chennai cluster, the entrepreneurs planning to expand their operations are facing constraints in the form of high land prices and acute shortage of skilled labor. These constraints have forced many entrepreneurs to evaluate the possibility of setting up their new facilities away from Chennai in the rural area where both land and labor pool is much cheaper.

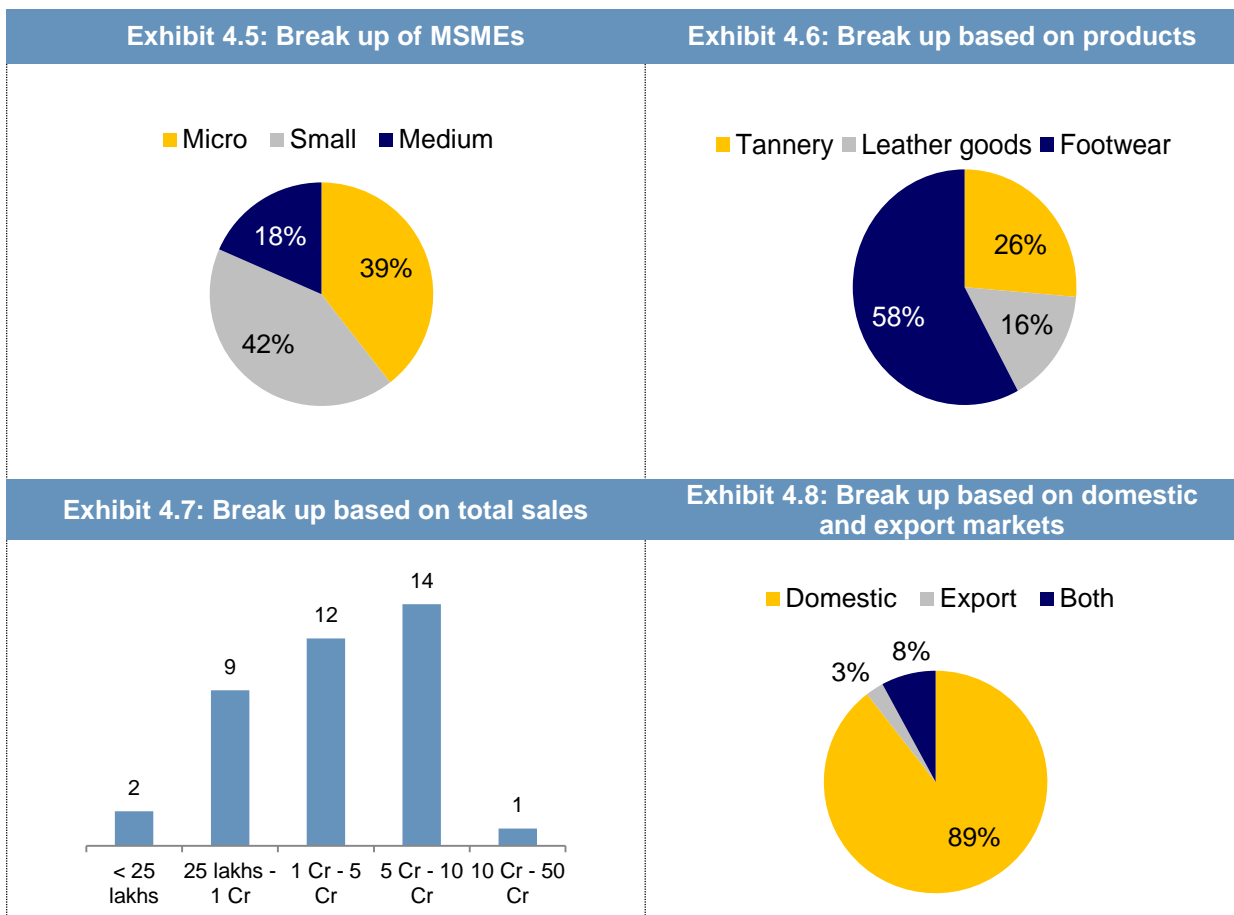
Skill Gap Assessment

Sampling

D&B India has conducted the initial round of qualitative interactions with various firms in the Chennai cluster. Primary assessments were conducted to understand key linkages and processes within the cluster, primary markets and specific marketing initiatives and knowledge about financing programs. MSME enterprises were selected on the basis of their position in the value chain. The qualitative samples were selected to include one firm from each segment within the leather cluster. It was also ensured that the firms selected could be representative set of the Micro, Small and Medium Enterprises. The following table summarizes the sample coverage for the study.

Exhibit 4.4: Sample Survey Coverage	
Products	Samples Covered
Tannery	13
Leather goods like bags, wallets, garments	13
Footwear	13

Appropriate mix of samples was covered across the cluster using sales, primary selling markets etc. The following charts represent the sample profiles. Around 89% of the sample firms covered were predominantly operating in domestic markets.



Process Based Observations

Production

- According to the entrepreneurs there is a **scarcity of trained workers in the cluster**. The higher wages and better working conditions offered by construction sector and manufacturing plants in sectors such as auto, electronics; have caused many of the skilled workers to migrate to these sectors. As local labor is in short supply, the entrepreneurs tried to source labor from other states such as West Bengal, Bihar and Orissa. However the units are finding it difficult to retain these workers too, because the wages in leather industry are below what other industries offer.

In addition the quantum of migratory workers has reduced because of the minimum 100 days employment guarantee opportunity available under the National Rural Employment Guarantee Scheme (NREGS). Hence a significant proportion of the enterprises are forced to employ unskilled, uneducated workers and train them on the job.

The absence of any formal training program means that both the productivity of workers and quality of their work suffer. Skill development training programs focusing on operations such as skiving, clicking, stitching, etc. must be carried out targeting unemployed youth and women from the rural areas so as to increase the supply of skilled workers.

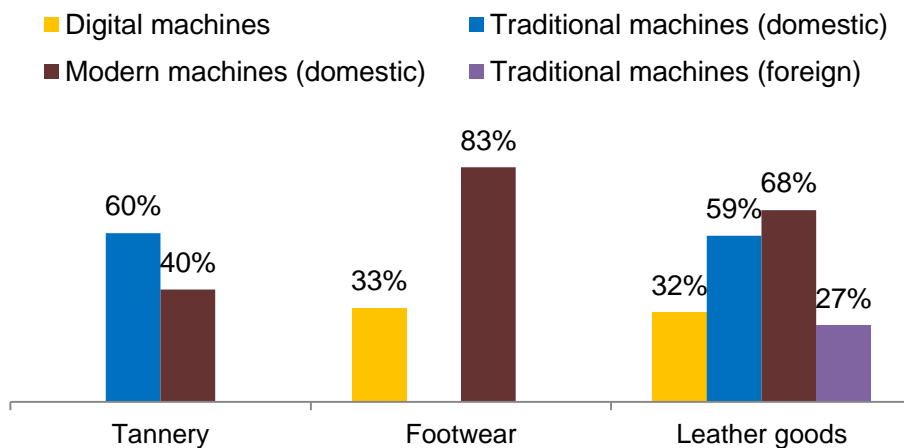
- The **footwear manufacturers are the leaders in terms of technology adoption** using modern machines in their day to day operations. The footwear manufacturers have taken a leaf out of assembly line production technique and employ modern production technology where the material is moved along a conveyor belt and the operations are performed in sequence. Majority of the **leather goods manufacturing units have not yet adopted the modern conveyor belt production technology** which is found in the footwear manufacturing units. However currently there is a major skill gap in the cluster of knowledgeable process experts who will be able to identify the sub operations involved in making leather goods such as bags etc. and design a process flow for the same.

The **tannery sector is still predominantly dependent on traditional technology**. Environment is a major concern for the tanning industry as lot of chemicals is used in the tanning process. The effluent that is released contains high chrome content and other harmful chemicals. CLRI has developed several cleaner processing technologies but the adoption rate for these is very low among the tanneries. There is urgent need to train tannery staff and owners about clean process technologies which would reduce their effluent discharge, energy and water consumption. In addition there is a lack of knowledge about the initial pretreatment processes that need to be carried out on the effluent before releasing it to the Common Effluent Treatment Plant (CETP).

Majority of the tanneries lack qualified staff who could advise them on the chemicals to be used in tanning to comply with the international regulations such as REACH (Registration, Evaluation, Authorization and Restriction of Chemicals). REACH is a European Union regulation which

imposes restrictions on specific chemicals that can be used for tanning. Increasingly most of the foreign customers are insisting that the finished leather should be compliant with REACH regulations.

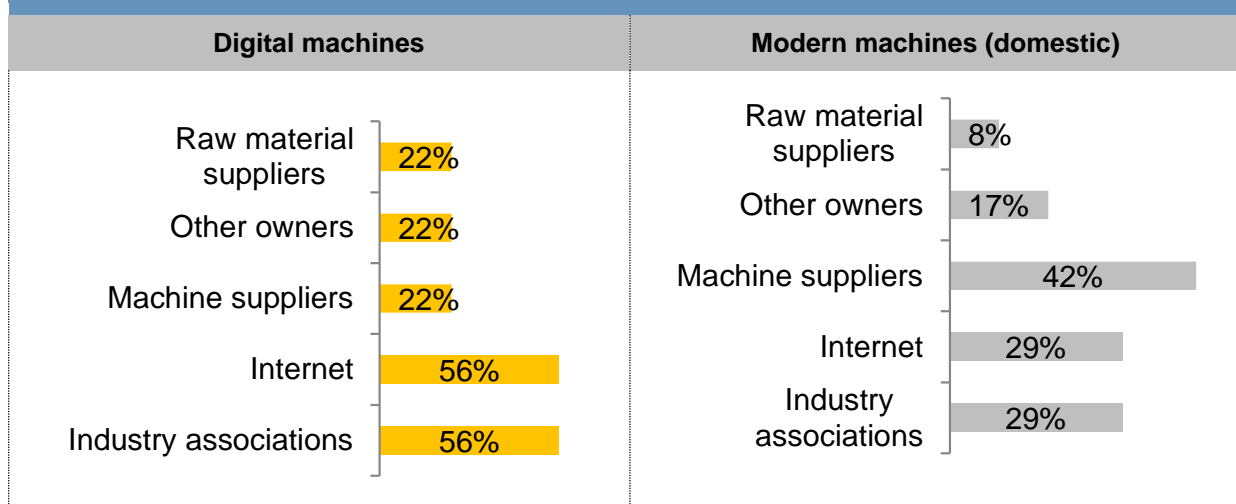
Exhibit 4.9: Technology used



Note: The chart represents the current technology being used at the enterprises. For a particular category of enterprise, the values indicate the % of enterprise in that category using a particular technology.

- The entrepreneurs are primarily dependent on the guidance provided by local industry associations and the internet to obtain information about digital / computerized machines. However for information about latest domestic machines, the machine suppliers are most active in advising the entrepreneurs about the latest technology. In order to obtain **information about the latest machines a sizeable proportion of the entrepreneurs depend on their personal initiative to access the internet**. Hence there is a need for a more structured approach where at regular intervals the enterprises would receive information about the latest technology advancements.

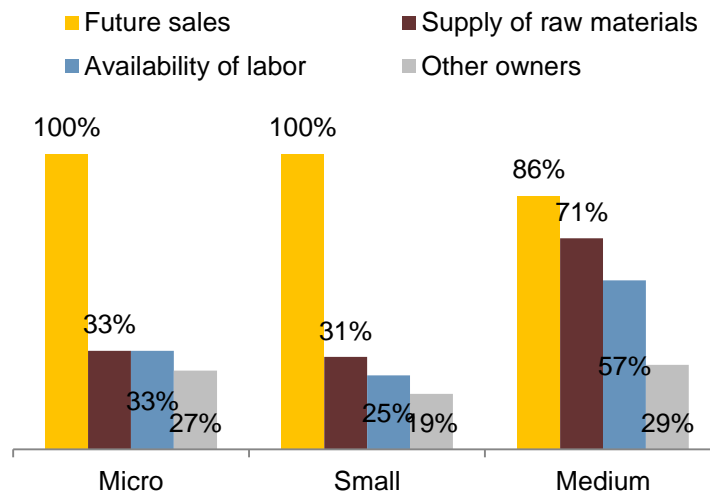
Exhibit 4.10: Source of information for machines used



- Almost all of the entrepreneurs **estimated their future sales so as to derive the production schedule** for the enterprise. The medium firms generally tend to have good visibility in terms of

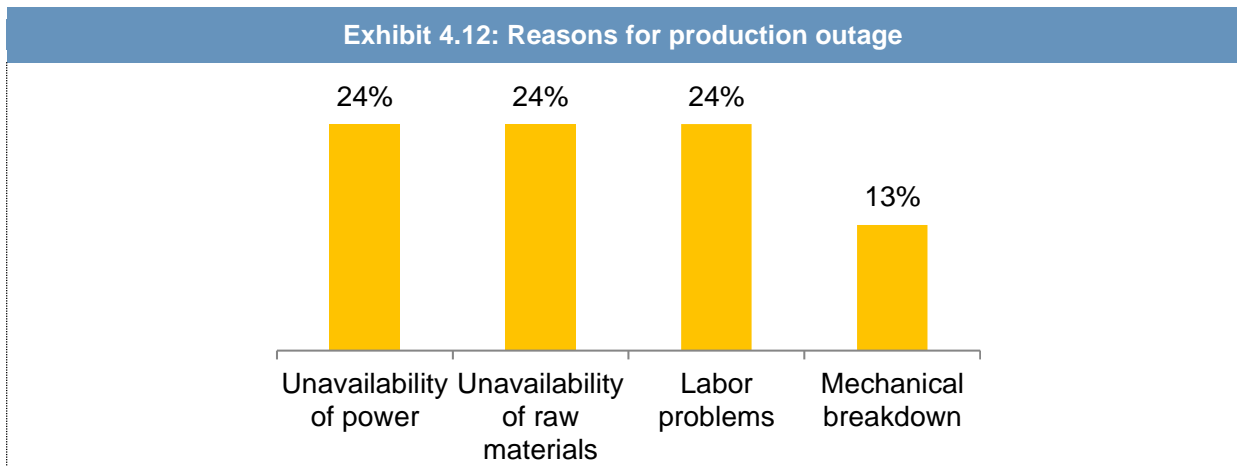
their future order book, thus they can plan ahead and estimate future requirements of labor and raw materials. Among micro and small enterprises, there are only a small proportion of the units realize the importance of estimating the future supply of raw materials and skilled labor in formulating the production schedule. Hence the enterprises need to be made aware of importance of the linkages among the various inputs that must be considered in a structured production planning process.

Exhibit 4.11: Production planning inputs

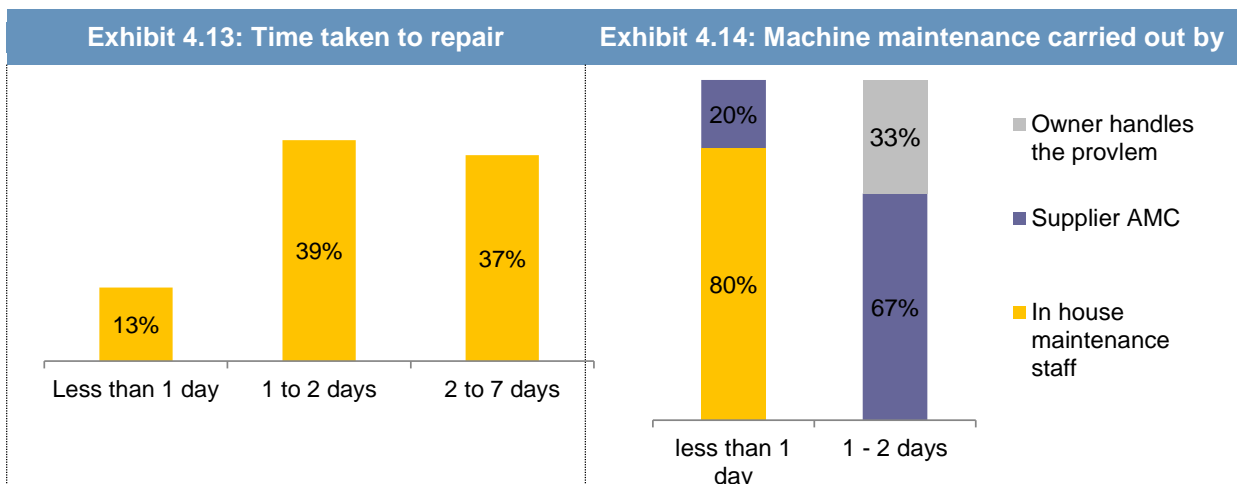


Note: For a particular category of enterprise (micro, small or medium), the values indicate the % of enterprise in that category aware of each listed parameter.

- Similar to Kolkata cluster, the major reasons for **unscheduled production outages** are unavailability of power, raw materials, labor problems and to a lesser extent mechanical failure of machines. A significant proportion of firms (63%) indicated that they did not experience any production outage. In order to ensure a regular supply of raw materials, the enterprise staff needs to be trained to improve their sourcing and communications skills. The sourcing staff must be able to distinguish between the different varieties of leather and their characteristics. In addition there is a gap in awareness about proper material handling and storage procedures among the sourcing staff. The entrepreneurs also require training to improve their handling of labour issues so as to minimize stoppage of work caused by strikes. The issue of mechanical breakdown is discussed in the next point.



- In case of **machine breakdown** a significant proportion (37%) of the respondents take more than 2 days to fix the problem and get the machine back to operating status. Majority of the enterprises which have an in house maintenance team are able to correct the problem on the same day itself. There is lack of in-house maintenance staff expertise among the enterprises. A training program focused on preventive maintenance procedures and technical knowledge about internal machine operations is required to augment the skills of the workforce.

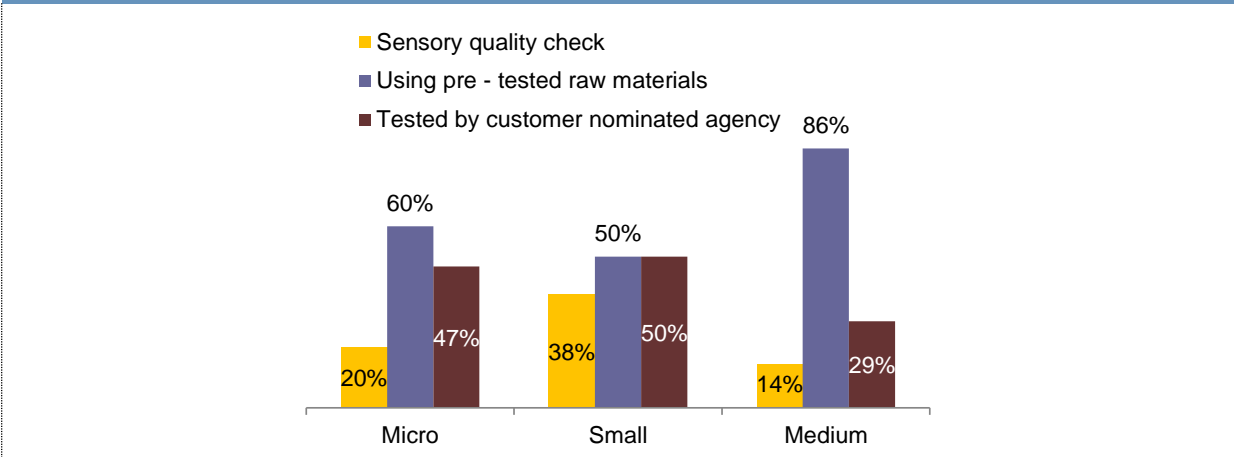


- **Quality certification is of critical significance** to all the firms in the cluster and especially so for those firms which cater to the export sector. Most foreign buyers insist on stringent compliance to standards like European CE norms. There is a need to educate the entrepreneurs in the cluster about the importance of complying with CE norms. Although majority of the medium entrepreneurs are aware of the need for using pre certified / tested raw materials, there is a gap in awareness among the micro and small units. Leather goods manufacturer must ensure that they use finished leather certified by CLRI or other agencies. In case of tanneries, the entrepreneurs must ensure that they use the proper chemicals as per international norms. Majority of the units in the cluster lack adequate knowledge of process documentation, productivity improvement

techniques and identifying critical points in the production process where defects can be introduced.

A significant proportion of units' across the value chain employ **only sensory quality checking** for their products. The entrepreneurs need to be made aware of quality standards and importance of formulating a standard quality process for the enterprise. There is a lack of stress on quality improvement measures both among the staff and the owners. There is urgent need for quality experts who can prepare a clear implementation road map for modern quality processes such as 5S, kaizen, etc. customized to the needs of the enterprise.

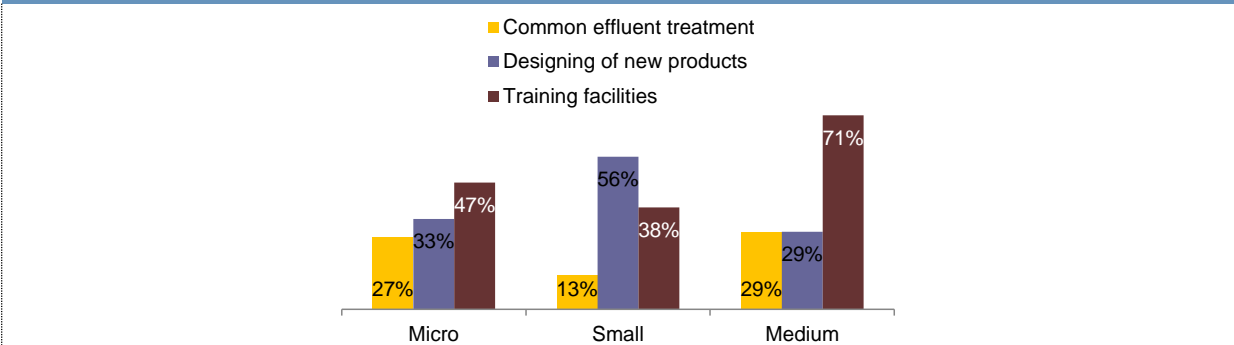
Exhibit 4.15: Quality checks



Note: For a particular category of enterprise (micro, small or medium), the values indicate the % of enterprise in that category doing each listed quality check.

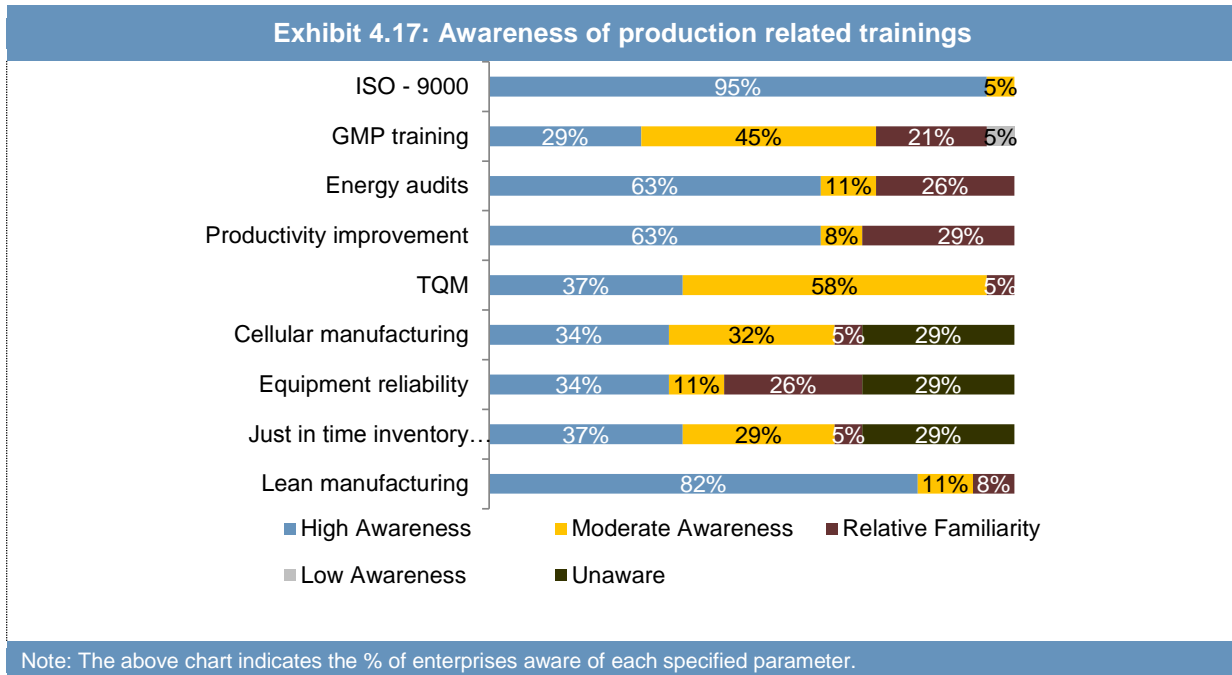
- Across MSMEs in the cluster the primary service that the **Common Facility Center (CFC)** should provide is necessary infrastructure in terms of classrooms, trained faculty and machinery so as to conduct custom training programs as per the needs of the enterprises in the cluster. There is significant scope for improving the design capabilities of the units in the cluster. The CFC could provide information about latest design trends and training to augment the skill set of existing design staff in the cluster. In addition the tannery enterprises require guidance on the technology and functioning of common effluent treatment plants so as to comply with Zero Liquid Discharge (ZLD) norms.

Exhibit 4.16: Expectations from CFC



Note: For a particular category of enterprise (micro, small or medium), the values indicate the % of enterprise in that category which voiced the need for each specified option.

- The following exhibit summarizes the awareness level of firms in the cluster about training programs related to **production and quality**.



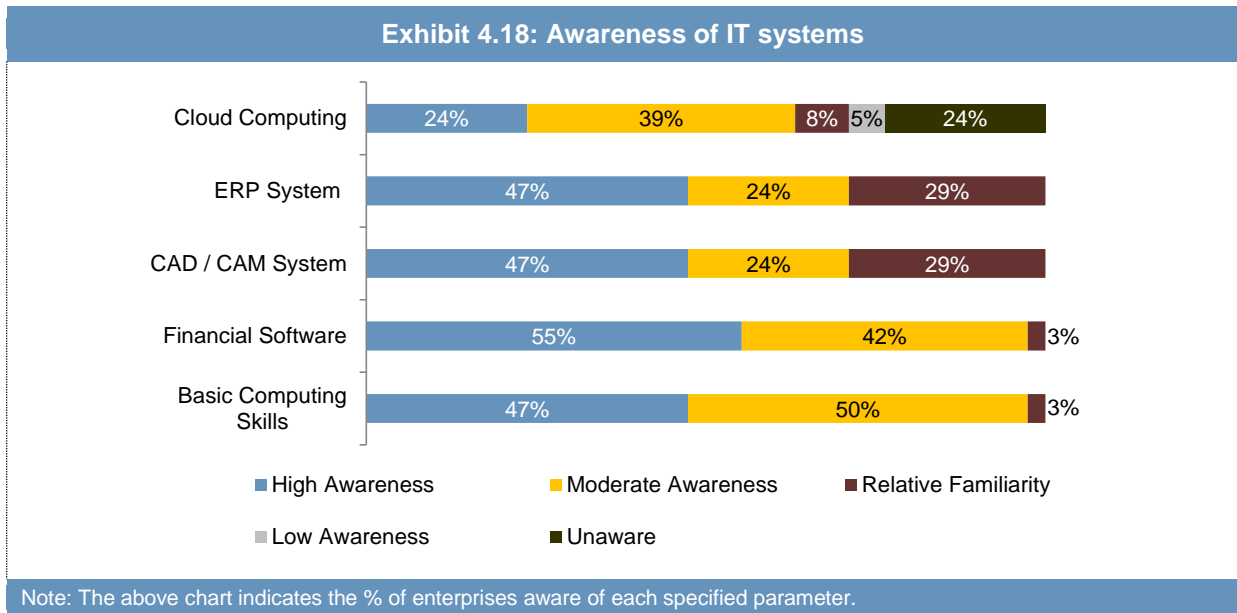
Although the entrepreneurs in the cluster have a broad idea about **lean manufacturing**, they lack knowledge about specific facets of the lean manufacturing process such as just in time (JIT) inventory management, preventive maintenance, equipment reliability (preventive maintenance) and cellular manufacturing. The enterprises lack in house expertise to redesign their workplaces and process flows as per the lean manufacturing guidelines.

The above exhibit indicates there is a high degree of awareness about **productivity improvement** techniques among the entrepreneurs. However in actual practice majority of the enterprises in the cluster do not have any idea of productivity benchmarks or any initiative to improve employee productivity. They need to be sensitized about international productivity norms especially those achieved in China.

With respect to **GMP training, energy audits and TQM**, high awareness levels were exhibited across the firms, however, very few firms have implemented these at the plant locations. There is a very high degree of awareness about the importance of **ISO** norms among the entrepreneurs. However the entrepreneurs employ external consultants to help them comply with ISO norms as they lack adequate knowledge about the compliance process.

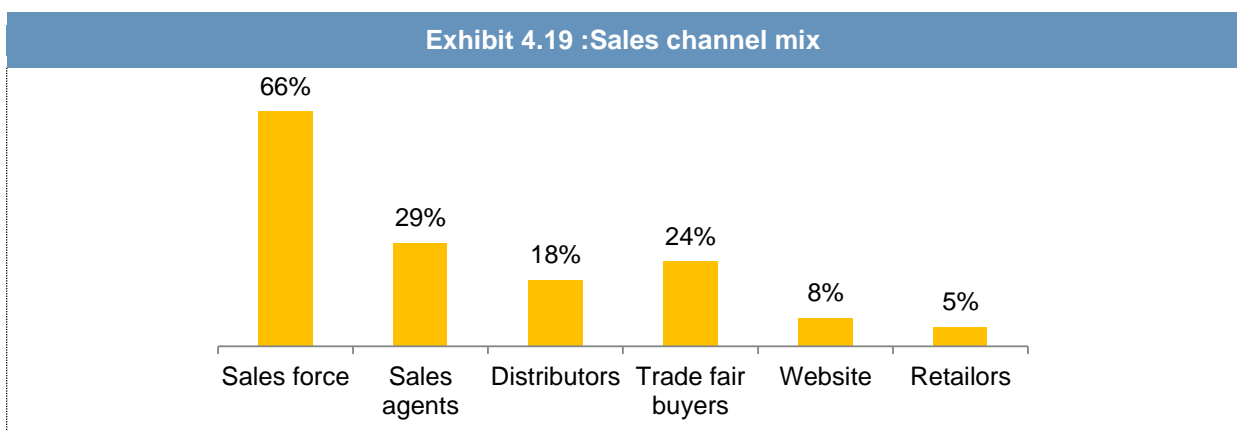
- Although across all MSMEs, entrepreneurs have indicated a high degree of awareness about **IT systems** such ERP, CRM systems, in actual practice only a few of the bigger players in the cluster are able to afford these systems for operations management, inventory control, customer management. As cost is primary concern, technology service providers should be encouraged to explore the possibility of 'remotely / cloud hosted ERP systems'.

In terms of financial software many of the firms are using excel or tally to prepare their financial records. However there is a marked gap evident in micro and smaller units' vis-à-vis larger units in terms of adopting financial software or other Management Information Systems (MIS) to monitor and control intra firm processes and enhance productivity. In terms of CAD/ CAM systems the entrepreneurs in the cluster are quite highly aware but in actual practice very few firms use them in their day to day operations.

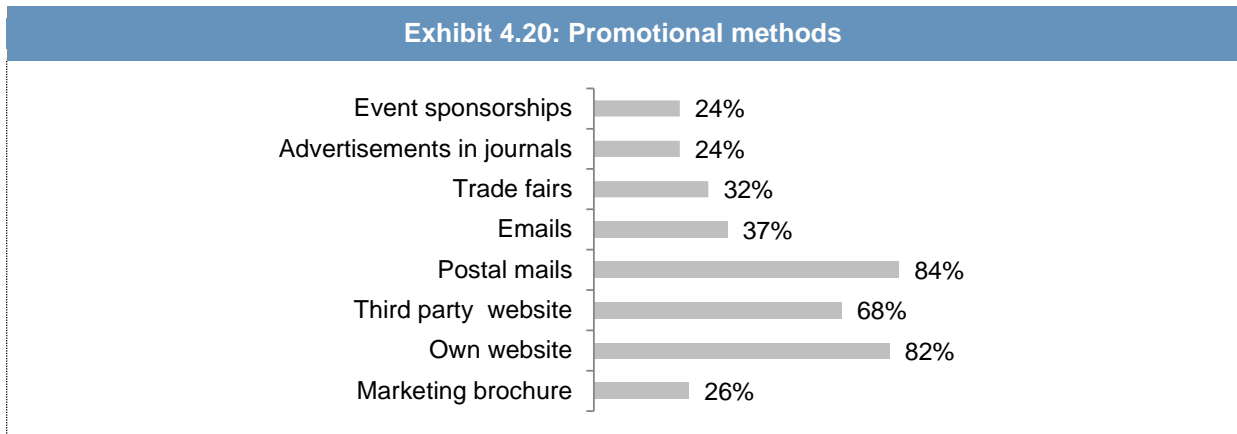


Sales & Marketing

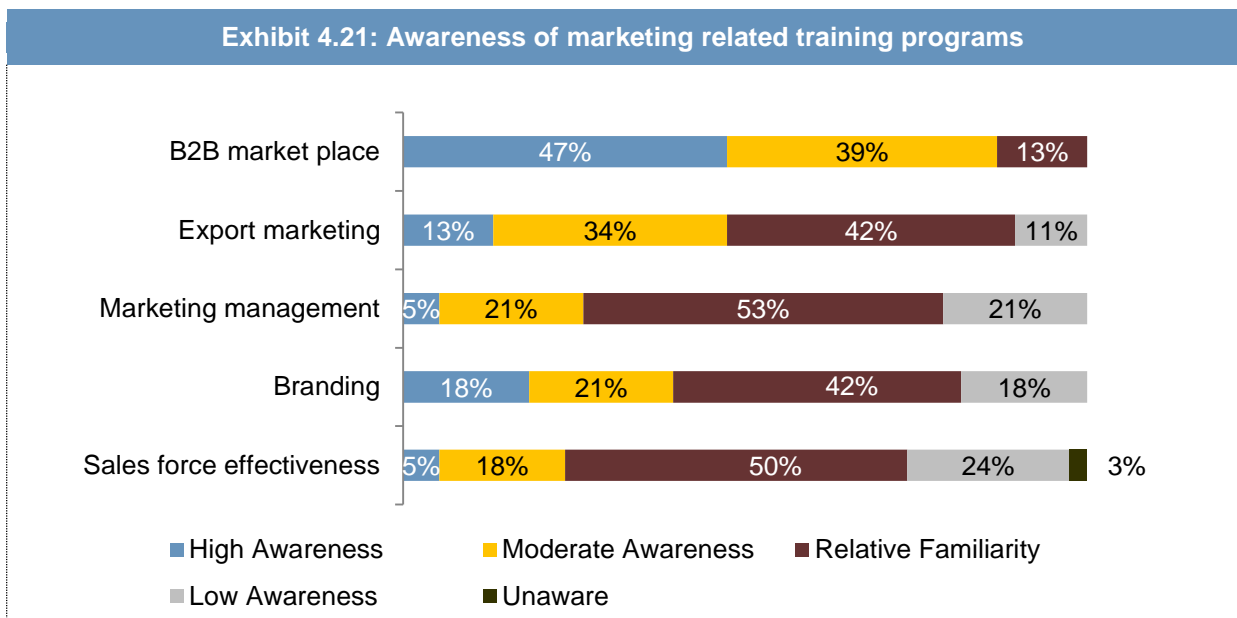
- Primarily the enterprises are dependent on their **sales team to reach their customers**. The other significant avenues for **generating sales** are through **sales agents, buyers participating in trade fairs and distributors**. Some of the enterprises also use retailers to sell their products. The proportion of enterprises generating online sales is very low. Although many of the enterprises' have a presence on the web, they are not able to effectively leverage internet marketing tools and ecommerce channels to reach out to potential customers. The entrepreneurs lack the necessary skills to create online portfolio of their products and to efficiently leverage Business to Business (B2B) websites.



- There is a lack of expertise in designing marketing brochures and using them effectively to **promote the products** of the enterprise. In spite of the fact that a significant proportion of the firms have websites, only a small number of them are able to generate any internet sales as indicated in the previous point. Even today the enterprises prefer postal mails rather than emails to communicate with their clients. The entrepreneurs need to be sensitized about how internet can be leveraged to provide a low cost solution to get in touch with foreign buyers.



- The following exhibit summarizes the awareness level of firms in the cluster about **areas related to marketing both domestic and export.**



Note: The above chart indicates the % of enterprises aware of each specified parameter.

Although a significant proportion of the enterprises in the cluster generate their revenues through in house sales team, not much attention is paid to training programs specifically designed to augment the **skills of the sales people.**

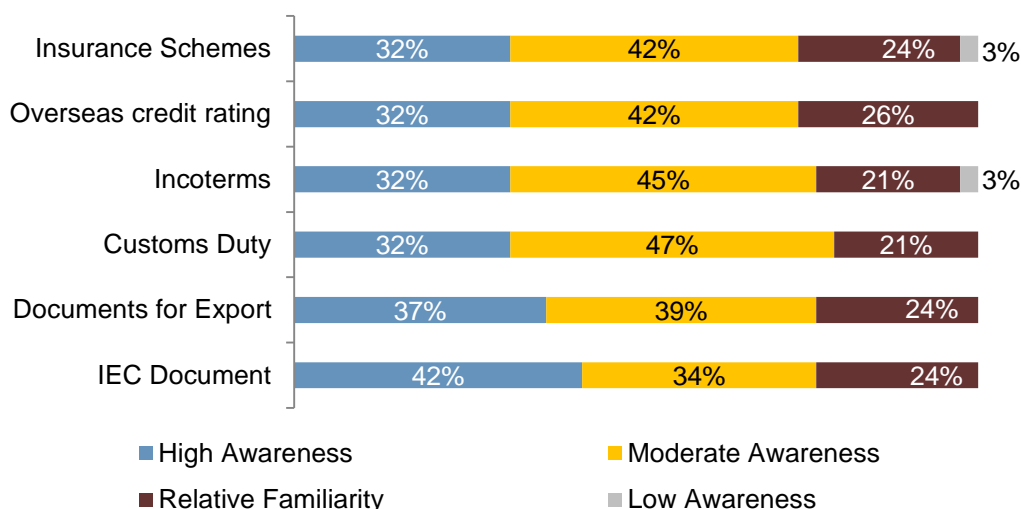
There is need to create awareness among the entrepreneurs about the benefits of establishing a unique label by investing in **branding and design** capacity building activities. Branding activity need to be complemented with investments in design capacity building. There is an acute shortage of design expertise in the cluster. Most of the firms generally follow the design supplied

by the customer or copy the design of big companies with certain modifications. Only some of the progressive firms in the cluster have invested in developing in house design capabilities. There is significant scope for improvement in the area of design development and awareness of contemporary fashion trends in this sector. The entrepreneurs need to be sensitized about the potential of charging premium prices by developing their own designs and branding them.

In the Chennai leather cluster, a significant portion of the finished lather and footwear manufactured are exported. The bigger players have well established linkages with buyers in the export geographies. However even the bigger players lack the necessary expertise to **identify and break into new markets**. They are primarily dependent on agents or consultants for information about new markets. A key concern raised by the entrepreneurs is the lack of knowledge about marketing and communications strategies targeting foreign buyers. The entrepreneurs have indicated a high degree of awareness about e commerce websites, but in practice the proportion of sales generated by the internet channel is quite less. The enterprise owners require training on how to properly leverage the B2B websites to contact potential customers and generate orders from them.

- The enterprises are moderately aware of **documents for export, customs duty and IEC number**. However certain areas where the entrepreneurs lack the necessary in house knowledge are rules specific to the importing country, incoterms and international environmental regulations. For entrepreneurs who want to break into the export market there is a huge gap in understanding of export regulations and other information. A specific training module covering export rules, documentation, international environmental regulations, importing country regulations and social accounting standards (SA8000) would be very helpful to the entrepreneurs in the cluster.

Exhibit 4.22: Awareness of export requirements

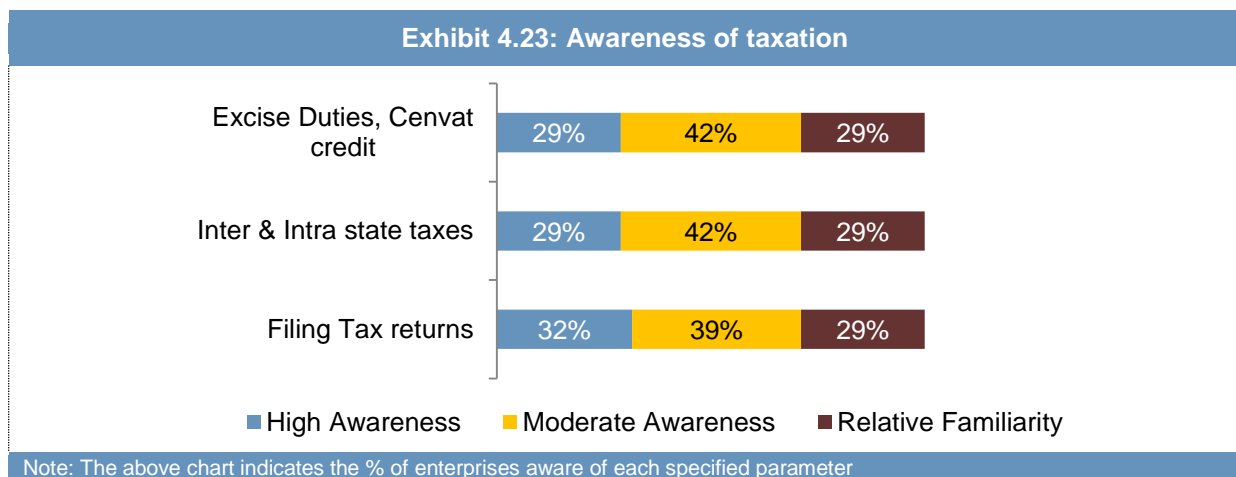


Note: The above chart indicates the % of enterprises aware of each specified parameter

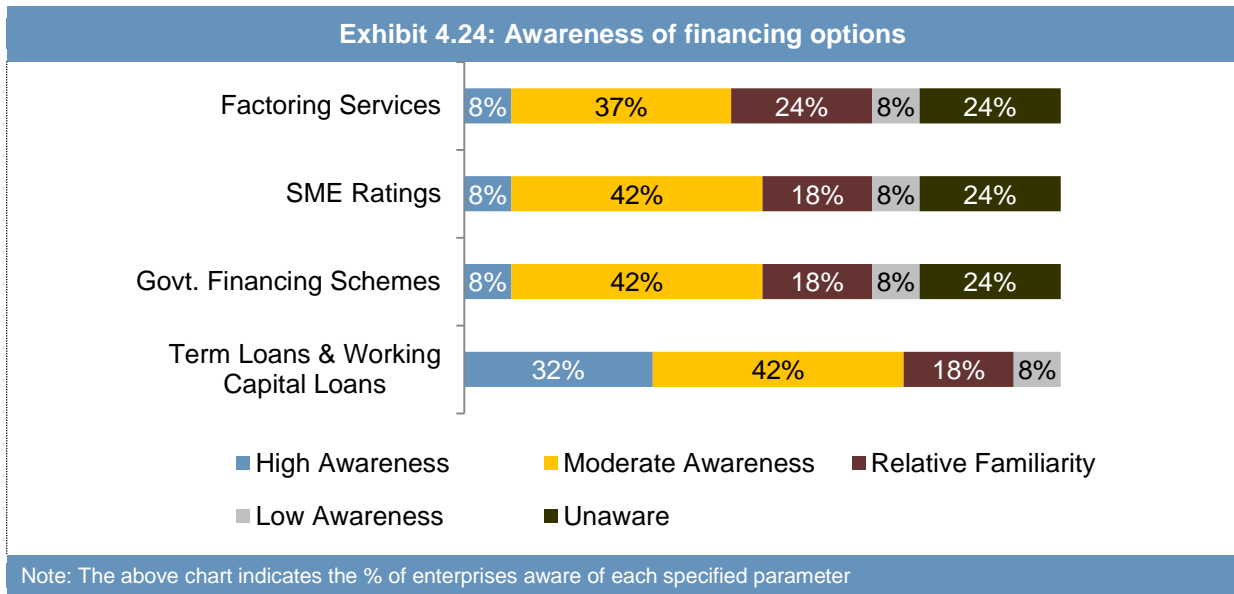
Finance

- The smaller units mainly indulge in cash transaction without any written record and do not maintain **proper financial accounts**. Hence the smaller units are not able to avail institutional funds. There is an urgent need to create awareness among the entrepreneurs in the cluster about the benefits of maintaining regular accounts. The bigger units are having good linkages with banks.

A major problem in the finance function is the lack of in house expertise for **analyzing TDS, CENVAT credit and other duty drawback schemes**. Only a third of the units have indicated a high level of awareness about these areas. These firms rely on the services of external CAs for preparing and filing tax returns. The external CAs / consultants advise the owners regarding preparation of annual reports, understanding of tax and duty related issues. However many of the micro and smaller units are not able to afford the services of external consultants.

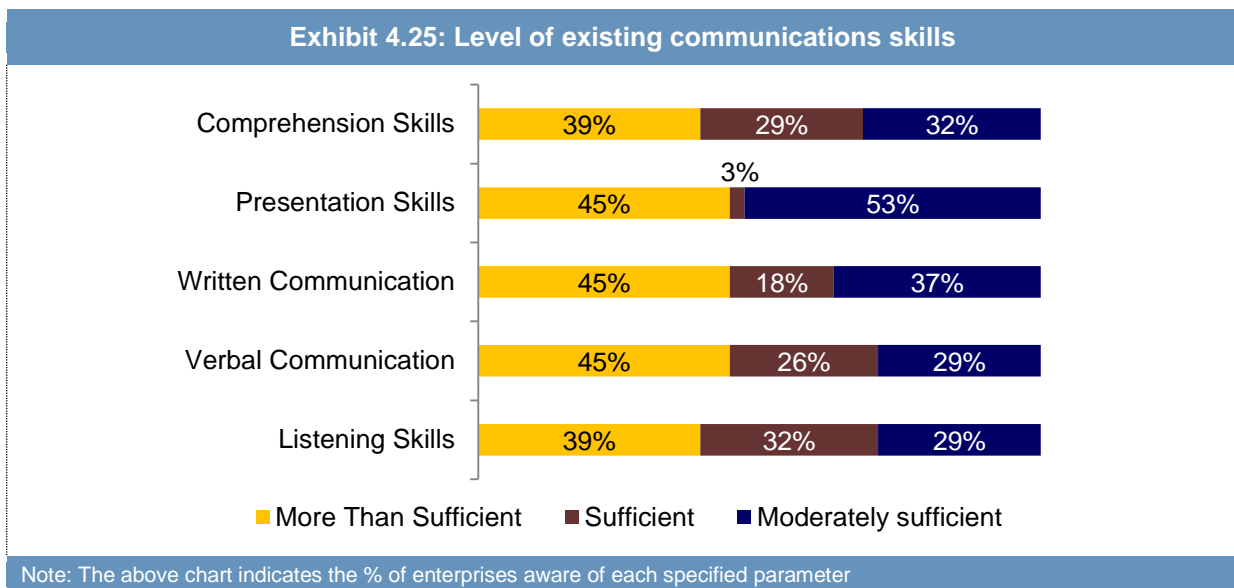


- The entrepreneurs in the cluster primarily tap the banking officials to obtain information about the **working capital and term loans** offered by the banks. The entrepreneurs are moderately aware of the interest rates, tenures and collateral requirement of the various banks and financial institutions. The **financial literacy level** among the entrepreneurs is quite low with respect to the various financing schemes offered by government agencies and factoring services. Around 50% of the firms have little or no knowledge about these topics. The entrepreneurs also need to be made aware of SME ratings scheme as this will enable them to reduce their funding costs.



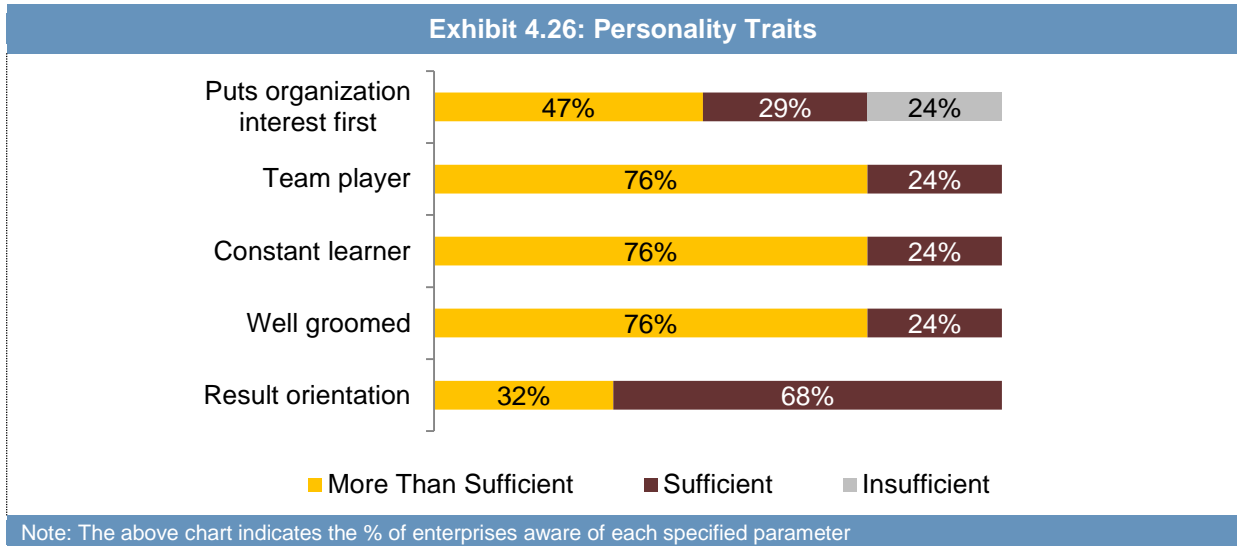
Soft Skills

- As evident from the exhibit below, the major area of concern is the lack of presentation skills among the workers. **Presentation skill** is critical for those employees, who on a daily basis interact with external stakeholders such as customers, bank officials, government officers etc. At the shop floor level workers communicate using the local language, hence **verbal communication skills** is not much of an issue for the units in the cluster.

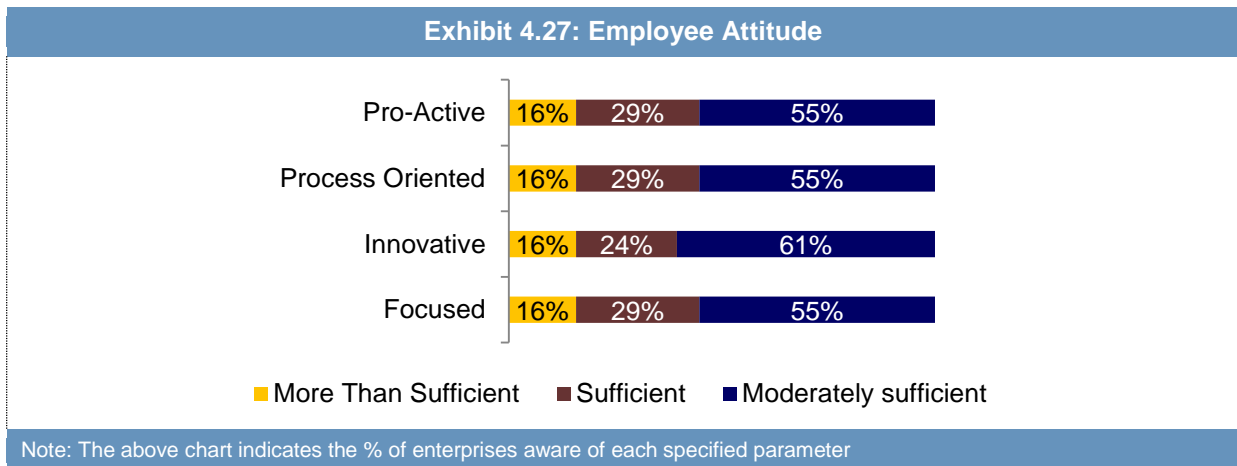


- Majority of the forms have indicated that they are more than satisfied with their employees with respect to **character traits** such as being a team player, constant learner and grooming. However

one area where the entrepreneurs have noticed a shortcoming is that employees are not always putting the interest of the organization ahead of their own personal goals.



- Employee attitude** poses a major problem for the entrepreneurs in the cluster. For each of the attitudinal traits listed below more than half of the firms have indicated that skill level of their staff is only moderately sufficient. The lack of ability to come up with innovative solutions among the staff is a major concern for the entrepreneurs.



Assessment of NSDC and other reports

National Skill Development Corporation (NSDC) has done a detailed study on mapping of Human Resource and Skill Requirements of the Leather Industry in India till 2022. The report highlights the importance of technical skills, managerial skills, soft skills required in the Leather Industry and also the skill gaps at different stages of the value chain.

However, the NSDC study does not capture skill gaps at enterprise level and hence the skill sets of the industry leader and the laggards are not measurable. Also, the NSDC report focuses on skills through an education and experience route while D&B India has conducted the study through the process-function-domain requirements route. The advantage of the latter method is it enables to define and develop structured training modules for the identified gaps. These skill gaps are specific to the process and not generic. Lastly, the NSDC report applies to the entire Leather Industry while D&B India has concentrated only on the skill gaps in the Kolkata – Shantiniketan leather cluster.

A comparative example in the production process from both the studies would highlight differences in approaches and the level of granularity that D&B India has conducted the study.

Exhibit 4.28: Assessment of NSDC Findings

Function	Level	Skill gaps- NSDC Findings	Skill Gaps- D&B India Findings
Skill gaps in the finished leather segment			
Production	Technicians / Supervisors	Lack of leather technologists and chemical engineers who are willing to work in a tannery	Lack of awareness of clean process technologies
		Lack of institutes to train workers to work on these machineries	Lack of knowledge about modern energy conservation practices
		Insufficient knowledge about the machinery as operators have come up from the ranks of unskilled workers	Lack of knowledge about process up gradations to minimize water consumption
		Not much knowledge of preventive and regular maintenance	Lack of knowledge about proper pre-treatment of effluents before releasing them to the CETP
Skill gaps in the leather goods and footwear segment			

Production & Quality Control	Procurement Manager & Quality Control Manager	<p>Lack of formal training in material planning and coordination to ensure timely and cost effective procurement</p> <p>Inability to effectively address quality related issues in the input received</p> <p>At senior levels, there is lack of knowledge of planning and budgeting, to establish current and future requirements of the purchasing company, and to help determine budgets for purchases</p> <p>Communication and negotiation skills</p>	<p>Lack of knowledge of modern inventory management tools and techniques</p> <p>Lack of adequate knowledge of ERP and MIS</p> <p>Lack of awareness about latest international norms such as REACH, CE etc.</p>
	Technicians / Supervisors	<p>Insufficient production planning skills, especially materials management</p> <p>Inability to control wastage (of material as well as man-hours) effectively</p> <p>Insufficient knowledge of costing</p> <p>Aptitude to conduct thorough quality checks at all levels missing</p> <p>Communication skills and ability to motivate workers needs to be improved</p> <p>Lack of institutes to train people for supervisors in a leather manufacturing set up</p>	<p>Lack of knowledge of modern production planning tools and techniques</p> <p>Lack of adequate knowledge of basic computing skills</p> <p>Lack of ability to investigate and identify the exact point in the production process where a defect is introduced</p> <p>Lack of awareness about health and safety issues</p>
	Designer	<p>Lack of practical exposure through internship as a part of course curriculum</p> <p>Effectively convert design of a particular sample given by a</p>	<p>Lack of knowledge about contemporary international design trends</p>

		<p>customer onto paper, in order to start production and give instructions for production</p> <p>Insufficient coordination skills, especially in cases where production is outsourced, to communicate the designs properly to the vendor, handhold the vendor and ensure final products are as per the specifications</p>	<p>Lack of awareness of modern computer aided designing techniques</p> <p>Lack of adequate knowledge to match the right kind of leather with a particular design</p>
Sales & Marketing	Sales Manager	<p>Inadequate communication skills, especially when required to interact with international buyers</p> <p>Basic costing concepts</p> <p>Awareness and knowledge about the international market and changing fashion trends</p> <p>Inadequate negotiation skills</p>	<p>Lack of selling and negotiation skills</p> <p>Lack of ability to identify new potential markets and formulate entry strategies</p> <p>Lack of knowledge of IT and digital marketing etc.</p>

Training Initiatives

Entrepreneurship Development Institute of India (EDI)

EDI is a National Resource Centre jointly promoted by IDBI Bank Ltd., IFCI Ltd., ICICI Bank Ltd., and SBI. It was established in the year 1983. EDI has been appointed as the field agency for developing BDS in the cluster. It has been active in organizing training programs across different levels in the organization. Some of the major training initiatives undertaken by EDI are listed below

- A training program was conducted on the energy efficient processes in tanneries. The participants were informed about international benchmarks of energy saving in different processes. A case study focusing on processing from wet blue to finishing leather was presented which threw light on methods followed to improve energy efficiency.
- An awareness program focusing on collateral free loan and rating methodology was conducted to improve financial literacy level of the entrepreneurs in the cluster. The participants were made aware of the various schemes offered by SIDBI.
- EDI in association with ILIFO arranged a program to sensitize the entrepreneurs about the option of using wind energy to reduce the operating cost of Effluent Treatment Plants (ETPs).
- A week long training program focusing on IT / MIS was conducted. The program had five modules covering areas such as Operations & Management, Finance, Communication, Marketing and Technology Management.
- CLRI conducted an awareness programs on REACH guidelines for the enterprises in the cluster.
- An awareness program focusing on technology up gradation of the enterprises by availing financing options under the Integrated Development of Leather Sector (IDLS) scheme.
- A program was organized focusing on how lean manufacturing techniques could reduce manufacturing cost by eliminating waste as well as unnecessary investment.
- A seminar was conducted on benefits of adopting Enterprise Resource Planning (ERP) systems. The participants were made aware of the various advantages of ERP systems such as minimizing wastes, report generation, sharing of information across various departments, reducing costs, increasing revenues and financial management.
- A soft skill training program was conducted for the enterprises in the cluster.
- A program was conducted focusing on the provisions of the Limited Liability Partnership (LLP) Act. The participants were made aware of the advantages that an LLP can bring to the enterprise.
- A training program was conducted to create awareness among the entrepreneurs about SA8000 accounting standards.

- A five day long Management Development Program was conducted for the owners as well as executives of the enterprises operating in the cluster. The topics covered are listed below:
 - Total Quality Management (TQM) principles.
 - Thinking globally and sourcing locally
 - Improving competitiveness by leveraging modern technology and energy efficiency.
 - Use of management accounting in decision making.

Business Management Organizations

- Indian Finished Leather Manufacturers & Exporters Association (IFLMEA): IFLMEA was established in 1989 publishes a journal “Leather Trends” and organizes workshops about latest technological developments and trends such as knowledge about best practices from auto component industry.
- Madhavaram Tanners Association (MTA): The association has pursued various initiatives for the betterment of shop-floor conditions and work practices. The association tries to raise awareness about worker health and safety issues. The association also actively supports CLRI led technology initiatives.

Current Training Infrastructure

Central Leather Research Institute (CLRI)

CLRI is premier research institute. It provides services ranging from education in leather technology and footwear manufacturing, research, and consultancy, to testing services. It provides services in the area of testing chemical properties of leather and leather products on a fee basis. CLRI has collaborated with SATRA Footwear Technology Centre, UK, an internationally acknowledged testing center for footwear and allied products.

The major training initiatives of CLRI are:

- Advising firms on clean process technologies and energy conservation practices.
- To educate on the various guidelines (SATRA, REACH) and to elaborate on standards on chemical usage so as to be compliant with these guidelines.
- Training program on design of leather goods. The program is aimed at providing necessary technical expertise in pattern designing of leather goods to meet the requirements of fashion and quality conscious international market.
- Training program on quality control methods
- Computer Aided Designing (CAD) course for garments and footwear design. CAD has been making tremendous impact both in the design and manufacture of garments and footwear. CAD software allows manufacturers to cut their time to market dramatically and so boost market share and profitability. The significant advantages that are related to the implementation of CAD are material optimization, lead time minimization, enhanced storage and quick retrieval, production planning and costing analysis.

Central Footwear Training Institute (CFTI)

The institute offers subsidized courses in leather technology and footwear manufacturing. In addition to academic courses the institute also offers technical consultancy services to the enterprises in the cluster in terms of pattern development & grading etc. The major training programs of CFTI are:

- CFTI offers a regular diploma (2 year) and certificate (6 months to 1 year) courses focusing on footwear design & production, CAD, pattern cutting, last making, etc.
- Short term course of 1 or 3 month duration on areas such as design & pattern cutting, shoe upper clicking & closing, last making, etc.
- Outreach program providing skill based training footwear in and access to technical resources to weaker section of the society with special focus on women

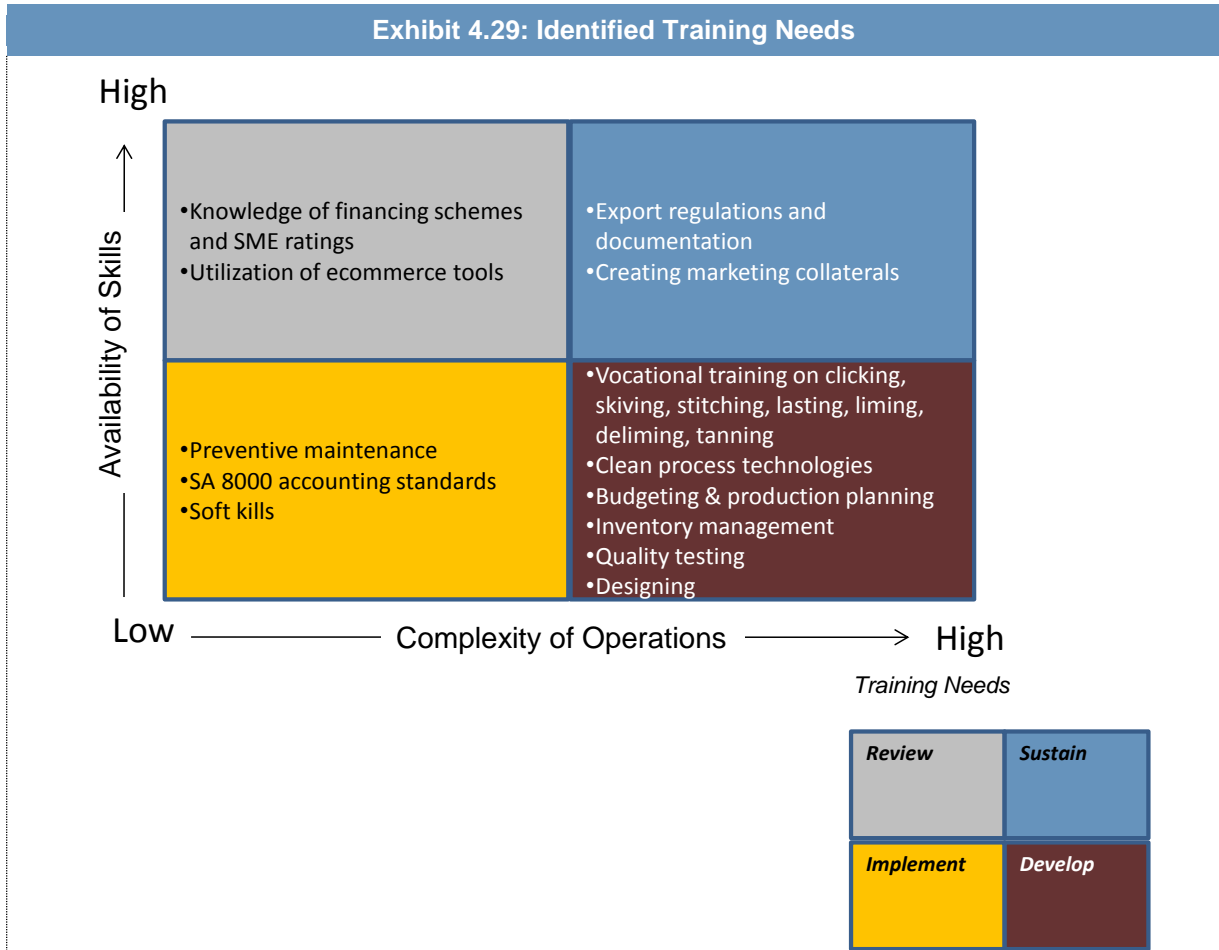
MSME Development Institute (MSMEDI), Chennai

MSMEDI was set up by the Ministry of MSME under Government of India (GoI). It implements various programs and schemes of GoI for making the Indian MSME's globally competitive. The activities of the institute include technical services, training programs, ancillary development, awareness seminars/ workshops, ISO certification, marketing and export promotion, etc. The major focus areas are:

- Entrepreneur Skill Development Program (ESDP): are designed keeping in mind the new market developments. All these courses are designed for educated unemployed youth who are looking for a job or want to take up entrepreneurship as their career in the leather sector.
- MSMEDI organizes training programs on export management, export packaging, export marketing, export policies and procedures, etc. It facilitates participation of micro & small enterprises in International Trade Fairs.
- MSMEDI offers consultancy and training services for ISO 9000 certifications.
- Management Development Programs (MDPs) are a week long training program targeting the entrepreneurs or supervisory staff of MSME units. These programs cover marketing management, financial management, industrial management, production management, materials management, total quality management and export management. There is also provision to conduct MDPs customized to the needs of the industry.

Identified training needs in the cluster

Assessment of skill set with respect to complexity of operations of the particular process was conducted to obtain insights on key areas where training is critical. The complexity of operations was assessed with the sample respondents to obtain an idea of the level of complications involved in the process. The available skill sets were rated on the scale of sufficiency as perceived by the owner. The following matrix highlights the key areas where training requirements can be seen:



The following table elaborates on the training needs identified across key development areas and managerial levels:

Exhibit 4.30: Training Needs		
Development Area	Worker/ Supervisory Training	Management Level Training
Production	Productivity improvement Process training Safety precautions REACH regulations	Raw materials procurement planning Inventory management Budgeting & production planning Cleaner process technologies Implementing lean manufacturing
Total Quality Management	Quality checking procedures Defect tracking techniques	Quality Norms such as CE Importance of product certification
Equipment Maintenance	Machine knowledge	Preventive and predictive maintenance
Sales & Marketing	Using B2B websites and other digital marketing tools Preparing marketing brochures	Brand building and promotional activities Contemporary design trends
Finance	Compliance with SA8000 standards	Information about financial subsidy schemes and SME ratings

Summary

- The cluster is faced with severe shortage of skilled and unskilled labor. The availability of migratory labor has been considerably impacted after introduction of MNREGA scheme by the Central Government.
- There is acute shortage of skilled labor to perform stitching, lasting, skiving and clicking operations. In absence of skilled manpower, most firms employ unskilled resources at operator level positions for different processes impacting their productivity.
- Lack of technological awareness can be mentioned as another skill gap in the cluster. A large number of small and micro firms especially in the tannery sector still continue to use traditional technology and are not willing to upgrade.
- One major skill gap is the lack of process knowledge among the supervisory and managerial staff of the units. Currently, in absence of skilled resources, shop floor workers over a period of time are elevated from operator level jobs to supervisory level positions. In the absence of any formal learning, they lack adequate knowledge of modern techniques such as lean manufacturing, six sigma, TQM etc.
- There is a clear need for increased co-operation and information exchange between the industry and the training institutes to improve the supply of trained resources as per the industry expectations in the cluster. The training institutes need to design vocational courses that have a component of field training in the industry or in the workshops of the institute as a part of the curriculum.

Exhibit 4.31: Production Function Tip Sheet

Exhibit 4.31: Production Function Tip Sheet					
Chennai	Production				
Processes in Value Chain	Tanning	Leather goods manufacturing	Footwear manufacturing	Designing	Quality Checking
Sub Processes	Liming, Deliming, Tanning	Clicking, Stitching, Skiving	Lasting	Designing of leather goods and footwear as per contemporary fashion trends	Physical Testing, Chemical Testing
Type of Skill Requirement (Semi-skilled / Skilled)	Semi-Skilled	Semi-Skilled	Semi-Skilled	Skilled	Skilled
Availability of Manpower (Low /Medium / High)	Low	Low	Low	Medium	Medium
Skill Gap (Low/Medium/ High)	Medium	High	High	High	Medium
Training needs (Review /sustain /implement /Develop)	Develop / Review	Develop	Develop	Develop / Sustain	Develop / Sustain
Available Training Courses	Pollution control course offered by CLRI	Diploma program in Leather processing and leather goods by CLRI	Lasting making & finishing course conducted by CFTI	Designing and Pattern cutting courses offered by CLRI & CFTI	Quality control methods in leather and footwear manufacture conducted by CLRI
Available Training Institutes	Central Leather Research Institute (CLRI) Central Footwear Training Institute (CFTI)				

Exhibit 4.32: Marketing Function Tip Sheet

Chennai Marketing				
Processes in Value Chain	Customer Development	Sales Force Effectiveness	Export Compliance	Marketing Management
Sub Processes	New Market Identification, New customer identification, Relationship building with existing customers, Product Innovation	Effective monitoring of sales force, Developing right channel mix	Knowledge of various export related procedures	Brand awareness, Ecommerce marketing tools, Creating marketing collaterals
Type of Skill Requirement (Semi-skilled / Skilled)	<u>Technical:</u> Semi-Skilled <u>Managerial:</u> Skilled	<u>Technical:</u> Skilled <u>Managerial:</u> Skilled	<u>Technical:</u> Skilled <u>Managerial:</u> Semi-skilled	<u>Technical:</u> Skilled <u>Managerial:</u> Skilled
Availability of Manpower (Low /Medium / High)	Low	Medium	Medium	Medium
Skill Gap (Low/Medium/ High)	High	High	High	Medium
Training needs (Review /sustain /implement /Develop)	Review / Develop	Implement	Sustain	Review / Sustain
Available Training Courses	No structured training module available			
Available Training Institutes	No Institutional Training Available			

Annexures

Annexure 1: Skill Gap Analysis

Complexity of operations involved in the enterprise was evaluated vis-à-vis the available skill set to ascertain the gaps necessary for skill training. The following tables summarize the detailed analysis for the complexity-skill matrix contained in the report. The counts represent the number of firms that have provided the ratings in the sample selected. The highlighted cells are definite training needs where the complexity rating of the activity is higher whilst the available skill to perform the job is lower. Certain areas where complexity is lower but available skills are higher are also identified as training needs.

Soaking		Skill Availability Rating		
Complexity Rating	Neutral (3)	Sufficient (4)	More than sufficient (5)	Total
Somewhat Complex (3)			1	1
Moderately Complex (4)		3		3
Extremely Complex (5)	2	1		3
Total	2	4	1	7

Liming		Skill Availability Rating		
Complexity Rating	Neutral (3)	Sufficient (4)	More than sufficient (5)	Total
Somewhat Complex (3)			1	1
Moderately Complex (4)		3		3
Extremely Complex (5)	1	4	1	6
Total	1	7	2	10

Deliming		Skill Availability Rating		
Complexity Rating	Neutral (3)	Sufficient (4)	More than sufficient (5)	Total
Somewhat Complex (3)		2	1	3
Moderately Complex (4)		1	1	2
Extremely Complex (5)	3	2		5
Total	3	5	2	10

Tanning		Skill Availability Rating		
Complexity Rating	Neutral (3)	Sufficient (4)	More than sufficient (5)	Total
Not very Complex (2)		2		2
Somewhat Complex (3)		1		1
Moderately Complex (4)		1		1
Extremely Complex (5)	3	2	1	6
<i>Total</i>	3	6	1	10

Dyeing		Skill Availability Rating		
Complexity Rating	Neutral (3)	Sufficient (4)		Total
Somewhat Complex (3)		3		3
Moderately Complex (4)	3	3		6
Extremely Complex (5)		1		1
<i>Total</i>	3	7		10

Fat-liquoring		Skill Availability Rating		
Complexity Rating	Neutral (3)	Sufficient (4)		Total
Somewhat Complex (3)		3		3
Moderately Complex (4)	3	3		6
Extremely Complex (5)		1		1
<i>Total</i>	3	7		10

Splitting		Skill Availability Rating		
Complexity Rating	Neutral (3)	Sufficient (4)		Total
Somewhat Complex (3)		3		3
Moderately Complex (4)	3	3		6
Extremely Complex (5)		1		1
<i>Total</i>	3	7		10

Buffing		Skill Availability Rating		
Complexity Rating	Neutral (3)	Sufficient (4)	Total	
Somewhat Complex (3)		3	3	
Moderately Complex (4)	3	4	7	
<i>Total</i>	3	7	10	

Clicking / Cutting		Skill Availability Rating		
Complexity Rating	Neutral (3)	Sufficient (4)	More than sufficient (5)	Total
Somewhat Complex (3)	2	1	1	4
Moderately Complex (4)	2	11	3	16
Extremely Complex (5)		5	3	8
<i>Total</i>	4	17	7	28

Skiving		Skill Availability Rating		
Complexity Rating	Neutral (3)	Sufficient (4)	More than sufficient (5)	Total
Somewhat Complex (3)	5	4	1	10
Moderately Complex (4)	3	5	2	10
Extremely Complex (5)		4	4	8
<i>Total</i>	8	13	7	28

Stitching		Skill Availability Rating		
Complexity Rating	Neutral (3)	Sufficient (4)	More than sufficient (5)	Total
Not very Complex (2)		1		1
Somewhat Complex (3)	6	4		10
Moderately Complex (4)		3	2	5
Extremely Complex (5)	3	5	4	12
<i>Total</i>	9	13	6	28

Lasting		Skill Availability Rating		
Complexity Rating	Neutral (3)	Sufficient (4)	More than sufficient (5)	Total
Somewhat Complex (3)	1			1
Moderately Complex (4)		1		1
Extremely Complex (5)		3	1	4
<i>Total</i>	1	4	1	6

Designing		Skill Availability Rating		
Complexity Rating	Neutral (3)	Sufficient (4)	More than sufficient (5)	Total
Somewhat Complex (3)	3	3	3	9
Moderately Complex (4)	1	7	5	13
Extremely Complex (5)		3	3	6
<i>Total</i>	4	13	11	28

Quality Checking		Skill Availability Rating		
Complexity Rating	Neutral (3)	Sufficient (4)	More than sufficient (5)	Total
Somewhat Complex (3)	10	1	1	12
Moderately Complex (4)	2	5	1	8
Extremely Complex (5)	2	5	1	8
<i>Total</i>	14	11	3	28

Packaging		Skill Availability Rating		
Complexity Rating	Neutral (3)	Sufficient (4)	More than sufficient (5)	Total
Somewhat Complex (3)			1	1
Moderately Complex (4)	2	9	3	14
Extremely Complex (5)		1	5	6
<i>Total</i>	2	10	9	21

Annexure 2: Case Studies

Case I

Organization Profile:

Organization Profile Information	
Name of Enterprise	Noor & Sons.
Name of Entrepreneur	Mr. Mohamed Najeeb
Type of MSME	Micro
Products	Finished leather

Noor & Sons is a micro enterprise involved in the processing of wet blue leather to finished leather. The company mostly does job work for the large leather goods manufacturing units.

Skill gaps:

- The company discontinued supplying to foreign customers a few years ago. The reason being the owner was unable to generate continuous order pipeline. The buyers provide him with the raw material which has reduced his working capital needs. He is only concerned with managing the workers while ensuring that quality and delivery schedules are met. According to the owner he did not possess the requisite communication skills to interact with outside buyers. He also showed lack of knowledge in developing marketing brochures and using the internet for contacting potential customers.
- According to the entrepreneur the workers at the shop floor level of a tannery can be trained on the job. However he stress on the need of formal training for supervisor level workers. Ideally the supervisors should be 12th pass and possess knowledge about chemicals and the various tannery operations.
- A critical area facing the tannery industry as a whole is the lack of knowledge about cleaner process technologies. This has assumed critical significance in light of government notification mandating zero liquid discharge (ZLD). There is urgent need to create awareness about the proper chemicals to be used which will help in limiting the proportion of pollutants.

Case II

Organization Profile:

Organization Profile Information	
Name of Enterprise	Ratha Worldwide Leathers (P) Ltd.
Name of Entrepreneur	Mr. Ratha Krishnan
Type of MSME	Small
Products	Wallets, Ladies bags and belts

Ratha Worldwide Leathers Private Limited is a Chennai based enterprise involved in the production of leather goods such as wallets, bags, purses, belts etc. The enterprise was incorporated in 2000. The enterprise is a 100% export oriented unit. The enterprise is planning to expand production capacity.

Skill gaps:

- According to the entrepreneur the lack of availability of workers at Chennai has forced him to set up his new plant away from Chennai. He is scouting for locations where workers especially women are readily available. He is ready to employ these unskilled workers and provide them with short duration training on the job. However he feels that training institutes and other government agencies should impart basic training relevant to leather industry to people residing in rural areas. In the long term he is planning to shift his entire operations away from Chennai as it is becoming increasingly difficult to retain experienced workers.
- The entrepreneur exhibited awareness about modern techniques such as lean manufacturing, six sigma, TQM, ISO etc. However there was lack of in house expertise in implementing these techniques within the enterprise.
- In terms of quality guidelines the entrepreneur was aware of international norms such as REACH, CE etc. The entrepreneur stressed the need to educate supervisor level workers about these norms.
- The large investment associated with an ERP / MIS discouraged the entrepreneur from investing in one. He was interested to know about cheaper alternatives such as remote / cloud hosted ERP solutions.
- Another critical area is the lack of knowledge about preventive maintenance techniques among his workers. The entrepreneur believed that his production outage due to machinery break down could be significantly reduced by investing in preventive maintenance training for his workers.

Annexure 4: List of Firms / Meetings Conducted

Respondents		
Name	Organization	Designation
Mr. S. Sathyanadhan	CFTI	Director
Mr. R. Viswanathan	MSME DI	Asst. Director
Mr. A Muthuvezhappan	MSME DI	Deputy Director
Mr. D Chandramouli	CLRI	Scientist & Head
Mr. G. Manohar	Sri Sai Leathers	Owner
Mr. G. Jahan	Jahan Leather Exports	Owner
Mr. H Hussian	A. V. Thomas Group	Director
Mr. A Sett	Ankur Footwears (P) Ltd.	Owner
Mr. N Rathakrishnan	Ratha Worldwide :Leathers Pvt. Ltd.	Owner

Hyderabad Pharmaceutical Cluster

Cluster Overview

Nature of Industrial Activity

Hyderabad is the capital of Andhra Pradesh & is called the Bulk Drug capital of India. The pharmaceutical cluster of Hyderabad is a naturally evolved cluster & it shares up to 90% of the total bulk drug production of A.P. It is located in and around Hyderabad city and is spread in a radius of 60 km. in the adjacent districts of Rangareddy, Medak and Nalgonda.

Hyderabad is purely a bulk drug or API cluster since a majority of companies in this cluster are Bulk Drug oriented as opposed to Indore and Dehradun – Haridwar – Roorkee which is a new cluster which are purely formulations cluster.

Key strengths and weaknesses of the Hyderabad cluster include the following:

Strengths of Hyderabad cluster:

- Strong marketing and distribution network (mainly catering to the larger industries)
- High volume domestic and international market
- Competencies in process development and fast adoption of new technologies
- Developed industry with strong manufacturing base
- Access to pool of highly trained scientists
- Well established R&D infrastructure in large firms

Weakness of Hyderabad cluster:

- Lack of knowledge resources to compete with MNCs for New Drug Discovery, Research and commercialization of molecules on a worldwide basis
- Retaining talented manpower
- Lack of market related skills (marketing product and procurement of raw materials)
- Lack of awareness about quality and standard production modules

In order to assess the skill gaps in the Hyderabad cluster, D&B India conducted a quantitative survey using a defined sample as indicated below:

For the larger quantitative survey, the following was the sample break-up for the various categories of firms ensuring adequate coverage of the product-category of firms and the size of the firms.

Exhibit 5.1: Hyderabad Sample

Category	Micro	Small	Medium	Total
Bulk Drugs	5	5	10	20
Formulations	4	5	9	18
Total	9	10	19	38

The following have emerged as overall skill gaps in the cluster. Detailed explanations are contained in the following report.

- Automation of entire production processes remains a key challenge in the cluster. Most of the small and micro enterprises are using limited or no automation. Also, the extent of mechanical automation (lever based) is obsolete and no independent process control rooms, techniques of centralized manufacturing etc. are observed which leads to risks of contamination.
- Quality control norms are known and followed only by a few medium and micro firms. The small enterprises rely on the customers' requirements and hence, quality check is the responsibility of the buyer. Therefore, the small enterprises are less aware of the standard quality norms.
- Machine shop practices and standards of safety are adequately followed. However, with respect to standard operating procedures, c-GMP and GLP are less implemented, though a few medium enterprises have undergone GMP certification.
- With respect to marketing, the skills available can be easily classified as elementary even at the managerial level. The process is complex in the sense that for every order, multiple iterations of price negotiations are required even while dealing with the same buyer for the same product. Further, excessive reliance on sales force was observed amongst the enterprises. The employees involved in the sales jobs are less qualified with respect to pharmaceutical and chemicals knowledge.
- Knowledge of export regulations, international standards and packing is also limited with the medium firms. The micro and small enterprises are relatively less aware of these requirements.
- Training on soft skills, especially with respect to communication and employee motivation is highly important for most of the enterprises within the cluster.

Cluster Profile

Hyderabad is the capital of Andhra Pradesh and is called the Bulk Drug capital of India. The pharmaceutical cluster of Hyderabad is a naturally evolved cluster and it shares up to 90% of the total bulk drug production of A.P. It is located in and around Hyderabad city and is spread in a radius of 60 kms in the adjacent districts of Rangareddy, Medak and Nalgonda.

The age of the cluster is around 25 years. The cluster has come into existence after a major Pharmaceutical firm IDPL witnessed movement of its top management out of the firm. The top management established large pharmaceutical firms themselves and gradually led to development of even smaller firms leading to the evolution of the cluster.

The industry can be divided into Bulk Drugs and Formulations. Bulk drugs include active pharmaceutical ingredients (APIs) and formulations include tablets, syrups, capsules, ointments etc.

Exhibit 5.2: Industry Overview

S.No	Type of manufacturers	Type of firm	No. of firms	P & M Investments (` Cr)	Employment	Turnover (` Cr)
1	Bulk Drugs	Small	86	344	3500	1462
		Medium	180	1620	12000	5400
2	Formulations	Small	75	187	2000	675
		Medium	50	275	2500	650
Total			391	2426	20000	8187

These two categories of firms form the bulk of the cluster. Hyderabad is purely a bulk drug or API cluster since a majority of companies in this cluster are Bulk Drug oriented as opposed to Indore and Dehradun – Haridwar – Roorkee which is a new cluster which are purely formulations cluster. The approximate production volume contribution from the Hyderabad cluster is around 20%. The table below presents the relative performance of the Hyderabad cluster vis-à-vis other Pharmaceutical Clusters

Exhibit 5.3: Hyderabad Cluster Overview

S. No.	Pharma Cluster	Approx. Production Volume (` Cr)	Estimated Employment	Approx. Contribution to Production
1	Mumbai, Pune and Aurangabad	12000-15000	65000	32%
2	Ahmedabad and Baroda	10000-12000	55000	26%
3	Delhi, UP and Haryana	5000	25000	12%
4	Indore	2500	15000	6%
5	Dehradun	2000	20000	5%
6	Hyderabad	8000	20000	19%

Source: Diagnostic Study Report by APITCO

Of the total production volume, around 20-25% of the production volume for Bulk Drugs and around 18-22% of the production volume for Formulations is exported as of 2009-10 data provided by Bulk Drug Manufacturing Association.

A few firms like Aurobindo Pharma, Hetero Pharma and Ranbaxy Labs have evolved from within the cluster and have now reached significant size as the cluster evolved.

Cluster Ecosystem and Inter-Linkages

The cluster is an evolved cluster and hence, various inter-linkages across the firms in the cluster are observed. The small bulk drug manufacturers supply to the micro and/or medium firms in the industry. The micro/ medium firms also tend to sub-contract certain common drugs to the smaller units. However, with respect to pricing and contracting, the smaller firms are exploited by the larger firms through lower prices, stringent delivery schedules etc. The smaller firms also lack access to the export markets directly.

The generic bulk drugs like Omeprazole, Phenyl butazone etc are commonly outsourced. However, the drugs under the Drug Control Act are manufactured and developed by medium firms only due to the stringent regulations and compliance requirements.

With respect to the formulations, large firms like Ranbaxy and Aurobindo used to source their requirements from the smaller API/ Bulk Drug firms in the cluster. However, as these firms have grown in size, they have become backward integrated. As a consequence, out of the 50 odd medium formulation firms, a few firms (around 35¹) buy from the small or medium bulk drug firms. The rest of the firms have or are planning to set up their own API plants to supply to their facilities. The smaller formulation units directly buy from the bulk drug producers in the cluster.

Though the linkages are established, these are fairly weak linkages implying that contractual agreements that are executed may not be renewed for the next term. The major reason for this is the changing requirements of the buyer firm and the price negotiation behavior while purchase. This has led to inefficiencies in production and investment planning for the smaller/ supplier firms.

In terms of backward linkages, most of the raw materials are procured from chemical and molecule processing firms. These firms are also in the vicinity of the cluster firms and the procurements work on standard contractual basis. However, the smaller firms face an issue sourcing material from larger firms and often, delayed deliveries are experienced. Due to the varying products that each firm engages into, collective purchase behavior was not observed amongst these firms.

The handling agents, BDS consultants and export agents act as information carriers about the market. These provide the firms with inputs on marketing and changing customer requirements.

Strengths of Hyderabad cluster:

- Strong marketing and distribution network (mainly catering to the larger industries)
- High volume domestic and international market
- Competencies in process development and fast adoption of new technologies
- Developed industry with strong manufacturing base

¹ Source: As indicated by Bulk Drugs Manufacturing Association and from discussions with APITCO

- Access to pool of highly trained scientists
- Well established R&D infrastructure in large firms

Weakness of Hyderabad cluster:

- Lack of knowledge resources to compete with MNCs for New Drug Discovery, Research and commercialization of molecules on a worldwide basis
- Retaining talented manpower
- Lack of market related skills (marketing product and procurement of raw materials)
- Lack of awareness about quality and standard production modules

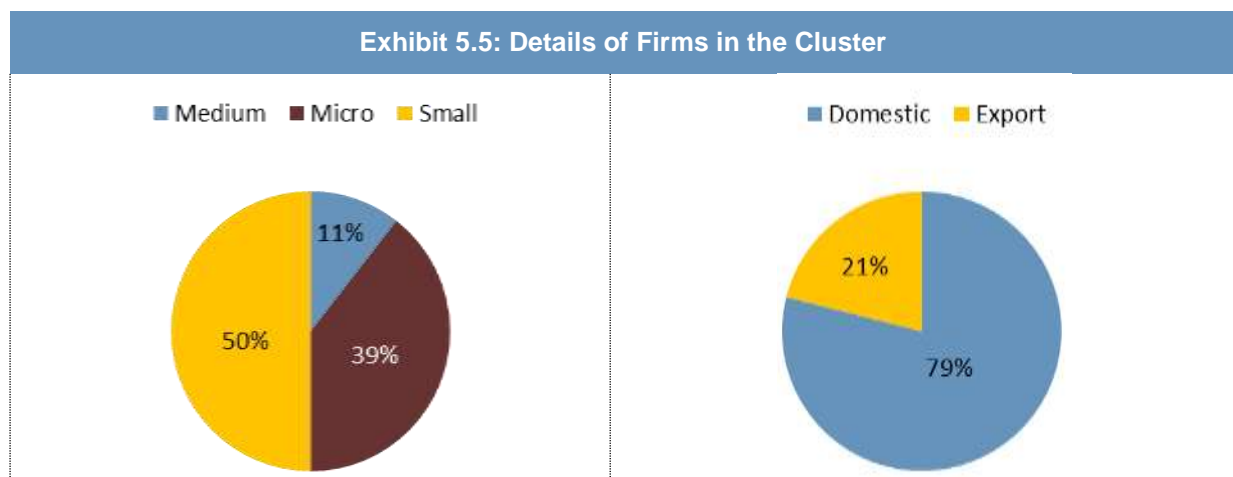
Skill Gap Assessment

Sampling

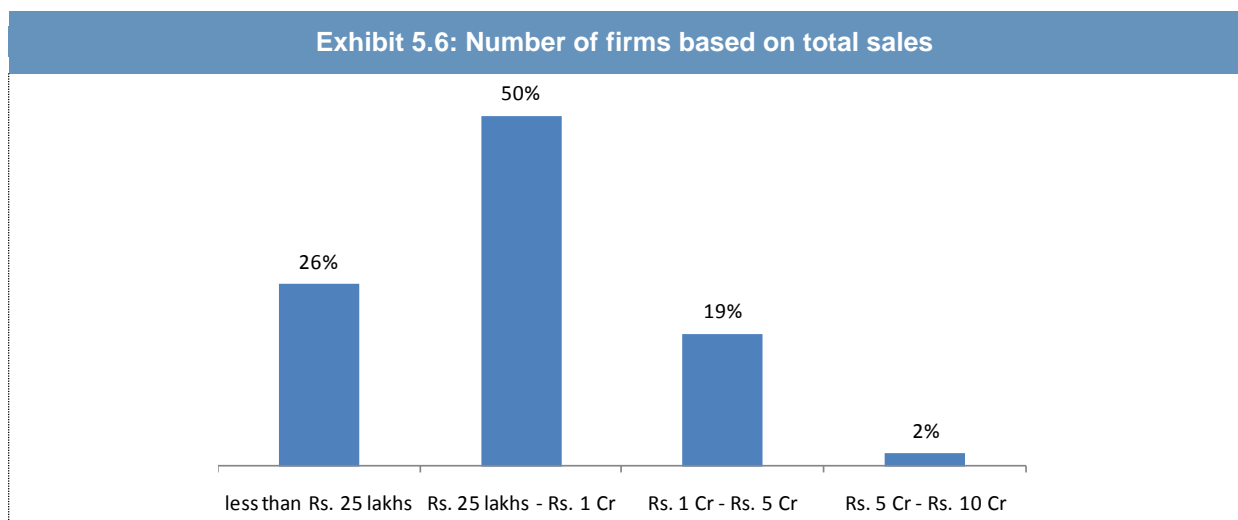
For the larger quantitative survey, the following was the sample break-up for the various categories of firms ensuring adequate coverage of the product-category of firms and the size of the firms.

Exhibit 5.4: Sample				
Category	Micro	Small	Medium	Total
Bulk Drugs	5	5	10	20
Formulations	4	5	9	18
Total	9	10	19	38

The following charts depict the sample coverage of the firms from the quantitative survey



A few firms under the sample also had revenues to the tune of `5-10 crore and were largely export oriented firms.



Interactions with Industry Associations:

Initial focus discussions were held with multiple stakeholders in the cluster. In this regards, detailed interactions were conducted with MSME Development Institute, MSME Tool Room – Central Institute of Tool Design, and Bulk Drug Manufacturers Association (BDMA) by understanding the level of skill gaps that these institutes have assessed. Focused group discussion was also carried out between these institutes' directors and between select firm's directors (Versatil Pharma, Enal Drugs and Shantha Pharmaceuticals). Some key insights that were generated during this discussion were:

- Employment pattern in the industry is seasonal and faces severe problems related to casual and temporary labour
- Information on new products and related research for new molecule/ drug development is conducted only by the largest firms
- Issue of intellectual property needs to be resolved on priority basis
- Compliance and regulatory standards related to domestic market are treated casually by the enterprises and quality control is of an elementary level
- Advancements in technologies for, pulverization, drying and chemical reactor processes is limited only with the senior members in the organization
- Maintenance is done on a ad-hoc basis implying that specific steps like preventive maintenance, process documentation, SOP etc are not followed
- Most of the enterprises are aiming to be c-GMP certified but are unaware about the different modules in GMP

A training program was also attended at BDMA to gather insights on the skill development process. The program helped D&B India understand the nature of training module and the level of skill gaps at the cluster. The program was conducted by Pharmaexil – Pharmaceutical Export Council. Pharmaexil conducts regular training programs like research and development, clinical trials, laboratory best practices etc.

Exhibit 5.7: Training Program Attended



Process Based Observations

Production

Manufacturing processes for Bulk Drugs and Formulations were studied in depth to obtain an understanding of the level of skills required and gather insights on complexities of processes.

Exhibit 5.8: Bulk Drugs Manufacturing Process

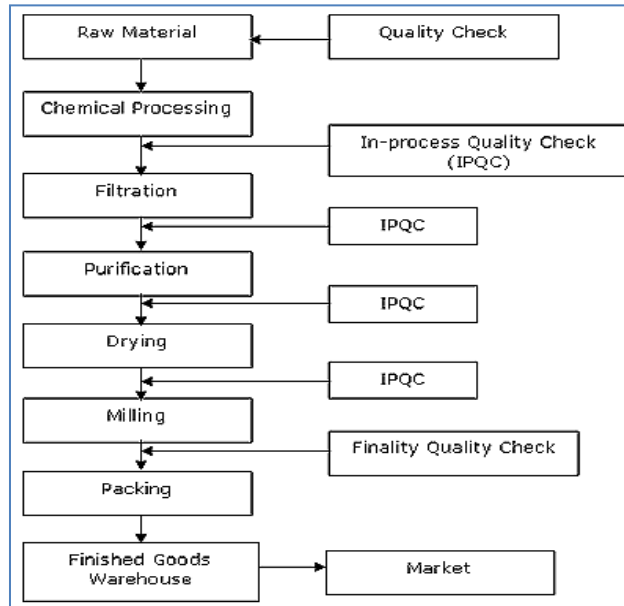
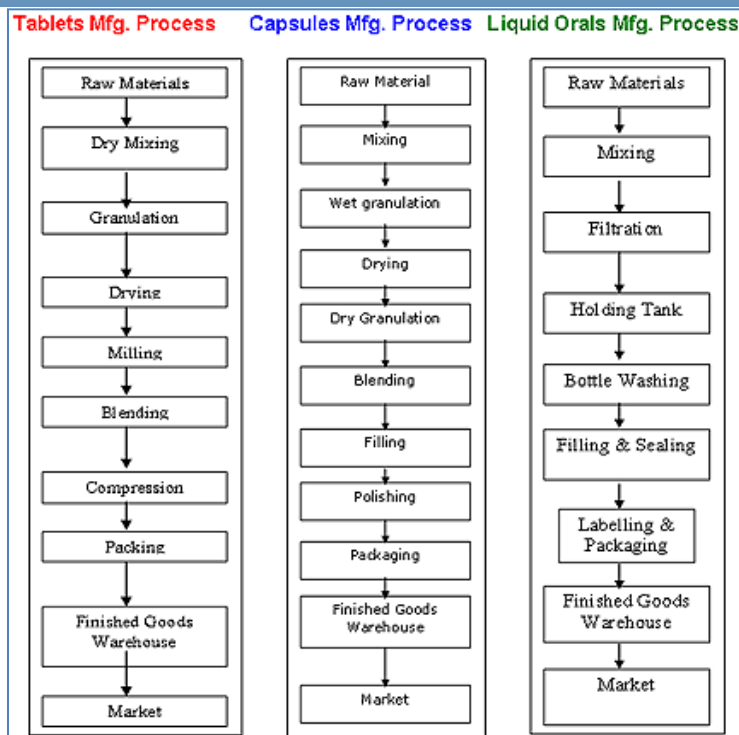


Exhibit 5.9: Formulations Manufacturing Process



The major steps in the production activity include Chemical Processing, Filtration, Purification, Drying, Milling, Packing, finished Goods and Warehousing.

Skill gaps in the **Bulk Drugs Manufacturing Process**:

- **Raw Material Procurement:** All materials like solvents and crystals are procured from registered vendors. However, the major issue while procurement that was highlighted by firms is knowledge of prices and hence, most of the firms are experiencing exploitation from the sellers. Another issue is inability to forecast demand accurately hence the material has to be procured at multiple intervals leading to inefficiencies through dis-economies of scale
- **Chemical Processing:** This mainly involves charging or drying the materials in a reactor. The issue faced in this process is maintaining the technical parameters, heat control and the duration for which the material has to be charged. This is currently done on a trial and error basis through controlled lab experiments. Chemical process handling staff in small organizations is largely trained on the job by the entrepreneur while medium firms can afford to hire employees with some educational backing. However, the gap which is highlighted by most of the small entrepreneurs relate to variations in product that can be obtained through minor changes in chemical processes. This information is not available with the industry currently.
- **Filtration:** The reaction mixture from previous process has to be filtered to separate the main drug ingredient from the liquid impurities. Handling and contamination is most commonly experienced in this process. Industry leaders have installed automated filtration processes to reduce risk of contamination. Small firms like Enal Drugs have also set up semi-automated labs which are mechanically controlled. However, in such cases, knowledge of pneumatics, pressure controls for levers etc is elementary and is often obtained by the process head through their own research. Hazards of contamination are almost ignored by small firms, though they are aware of such risks.
- **Purification:** This process implies further improving the purity of the drug as per the set standards. While most small firms practice this process, the knowledge of accepted standards is not present and traditional or in-house norms are followed. Even in medium enterprises, knowledge of purity standards, acceptable ranges and deviations are done on in-house experience basis. This implies that the acceptable ranges are developed in-house by the most experienced manager in the firm and these are only followed. In small organizations which cannot afford in-house laboratories for product testing tend to conduct such checks through elementary techniques like colour, odour and minor clinical tests.
- **Drying:** The entire wet drug substance in its most purified form is dried at prescribed conditions and environment settings. The knowledge of such temperature controls, humidity and light (darkness) controls is elementary. In large firms, such processes are automated and are a part of a single integrated production process. No material handling is manually done. However, in

smaller firms, material movement within processes is also done manually and hence, when the material is sent to drying process, most of the times it has to wait for availability of drying ovens. During such phases, maximum contamination is experienced since the staff is not aware of conditions in which the process material has to be maintained.

- **Milling:** This process is followed only in those bulk drugs where homogenized powder is the end product. Knowledge of using CNC Milling techniques and automation was only discovered with the industry leaders and such techniques are getting included in regular production activity only lately. CITD has developed structured modules on phase-wise automation and some small firms had contacted them on training for automation in milling processes.
- **Packing:** Packing is most complex activity in Bulk Drug Manufacture since it involves knowledge of various types of packaging material prescribed by law or at times by customer. Such knowledge was found lacking amongst the small and micro firms. The industry leaders had installed automated packaging lines and were able to handle this issue, however, in such firms as well, knowledge of maintenance and GMP was elementary.

Formulations are mainly of three types:

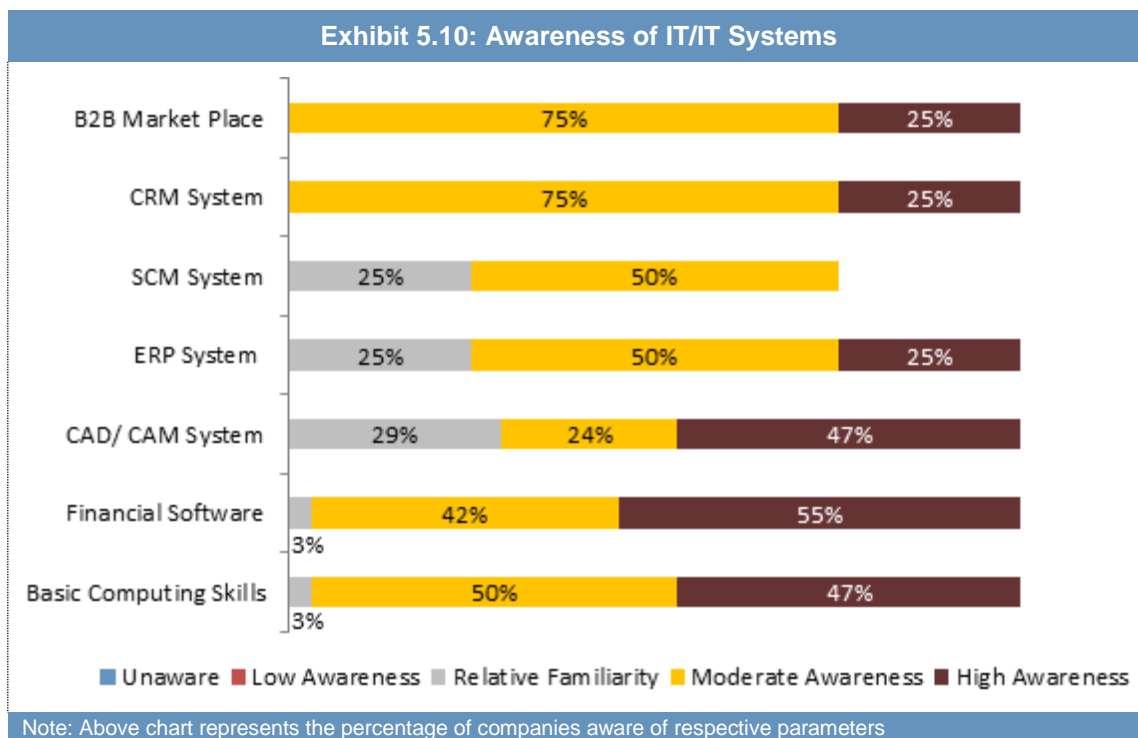
- **Tablet Formulations:**
 - The major activity in this process is the pulverization or creating granules. This activity in most of the small firm is semi-automated leading to increasing contamination risk through manual handling.
 - Large and medium firms have installed automated and integrated production lines that include product formulation in desired shape and thickness, blistering and cartoning in required dimensions.
 - Packaging as per export regulations and norms of importing countries are less known to the smaller firms and hence, they have to rely on information from their export agents
- **Capsule Formulations:**
 - The process is relatively more complex than tablet manufacturing as it involves an additional step involving polishing required to provide a glow to the capsule
 - Major issues that are faced in this process is lack of knowledge of packing and quality checks
- **Liquid Orals:**
 - Material sourcing from non-pharma manufacturers is involved in liquid orals. This material includes glucose or other sweetening agents that are required for the syrups

The level of automation in most of the enterprises is low. This is a more common phenomenon in the micro and small enterprises. Most of the medium firms have now started adopting computer aided

manufacturing techniques, however, micro and small enterprises are still using mechanical automation which is minimal to eliminate risk and contamination.

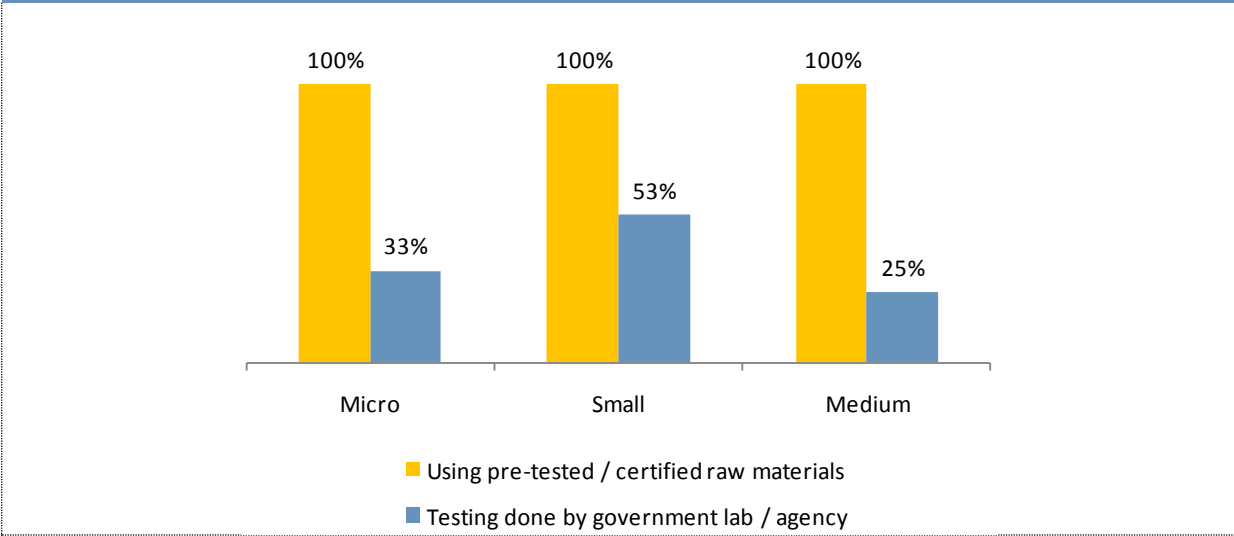
One of the reasons for using orthodox technology that was highlighted was the **lack of technical education at the entrepreneurial level**. At certain organizations however, it was observed that expert scientists were controlling the unit. These enterprises have been successful in terms of cost control, productivity improvement and hence, remained competitive in the cluster. Lack of expertise and proper information avenues on technology i.e. extent and **level of automation, advances in machinery and equipment, computerized tablet designs** etc. have led to a major gap even at entrepreneurial level to ascertain the available technology.

Usage of IT and IT systems is relatively lower since most of the firms are either using mechanical automation or no automation at all. The chart below explains the awareness levels of the enterprises with respect to IT/ IT Systems.



Skill sets desired for handling material and quality checks are most important when it comes to Drug Processing. The workers in the medium/ large manufacturing firms engaged in quality checks were aware of the standard norms, rules and regulations for the Food and Drugs Administration, Good Manufacturing Practices, Good Laboratory Practices etc. The issue is more common in smaller firms where quality checks are mostly done without lab or clinical trials. **Quality as a process is a major skill gap at small enterprises.**

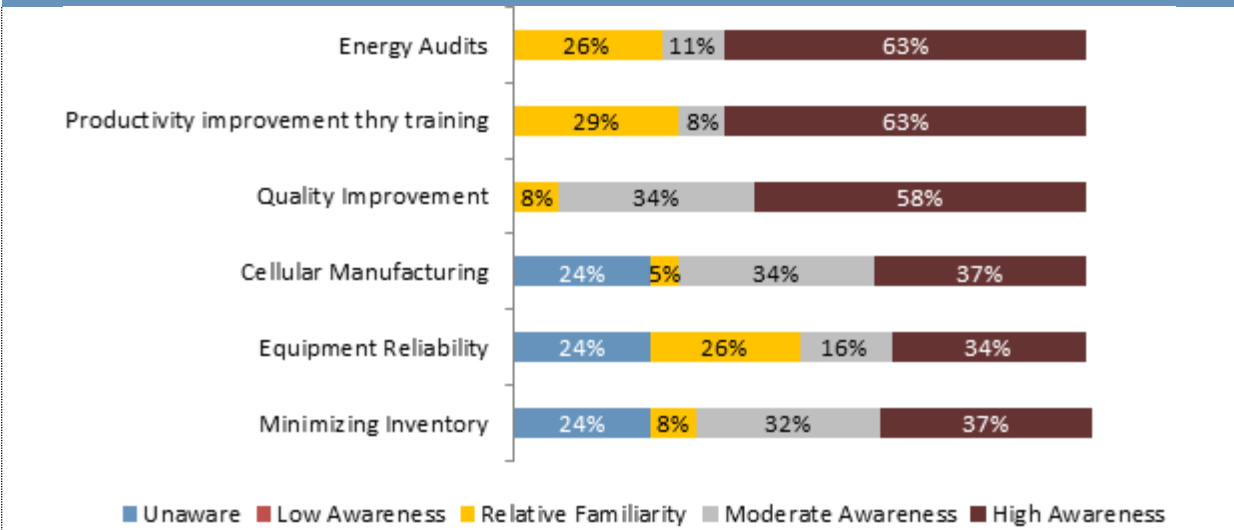
Exhibit 5.11: Quality checks across various firms



Adherence to Schedule M related to rules of pharmaceutical manufacturing and documentation too is a major concern among these enterprises. Availability of testing facilities and common facility centers in the clusters is a major challenge posing the quality checks. **In-house quality checks** and awareness programs for workers without resorting to huge investment in labs etc. is a priority for most of the enterprises.

Most of the medium firms have now started adopting **lean manufacturing** with a view to improve productivity, reduce costs, minimize wastages and achieve overall **energy efficiency**. However, with respect to the smaller firms, such tools are not even known and though these firms have expressed desired to adopt such practices, they are not aware about the process to implement these techniques.

Exhibit 5.12: Awareness of Manufacturing Practices

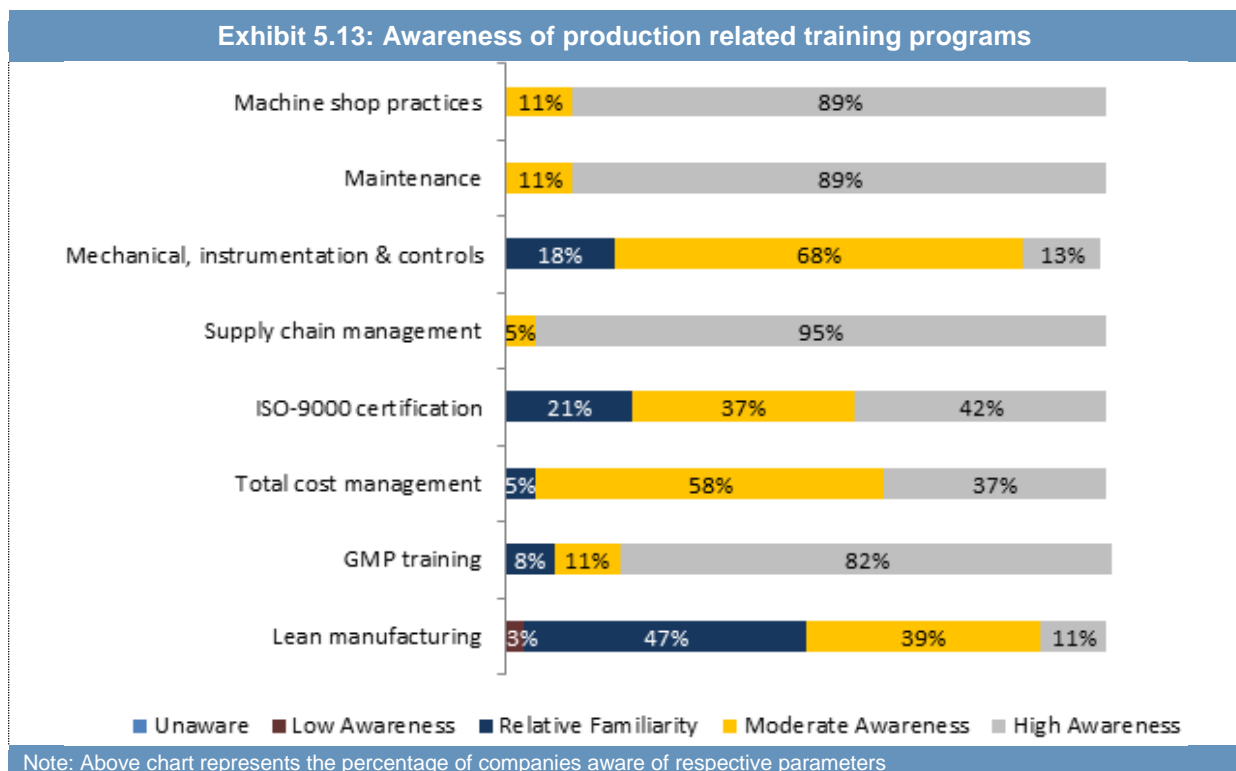


Note: Above chart represents the percentage of companies aware of respective parameters

Around 37% of the enterprises are unaware about energy audits and hence, the implementation of energy efficiency systems is also low. These are typically micro enterprises and hence, training on several modules of lean manufacturing would be required to make these enterprises aware of the developments.

Knowledge about **effluent treatment and measurement** is lacking amongst small firms. These firms face regular issues with the Andhra Pradesh Pollution Control Board (APPCB) with respect to violations and severe penalties. A common effluent treatment plant (ETP) is proposed by major cluster firms and the BDMA which is expected to be operational soon. However, issues related to measurement of effluents and varying standards of the Central government and State government create problems for small firms. These firms are not aware on which norms have to be followed and mandate received from the industry association and the APPCB differ in terms of compliance.

Lastly, knowledge about new techniques in production is also lacking, largely amongst the micro and small enterprises. The following chart summarizes the awareness levels about various production related training programs.

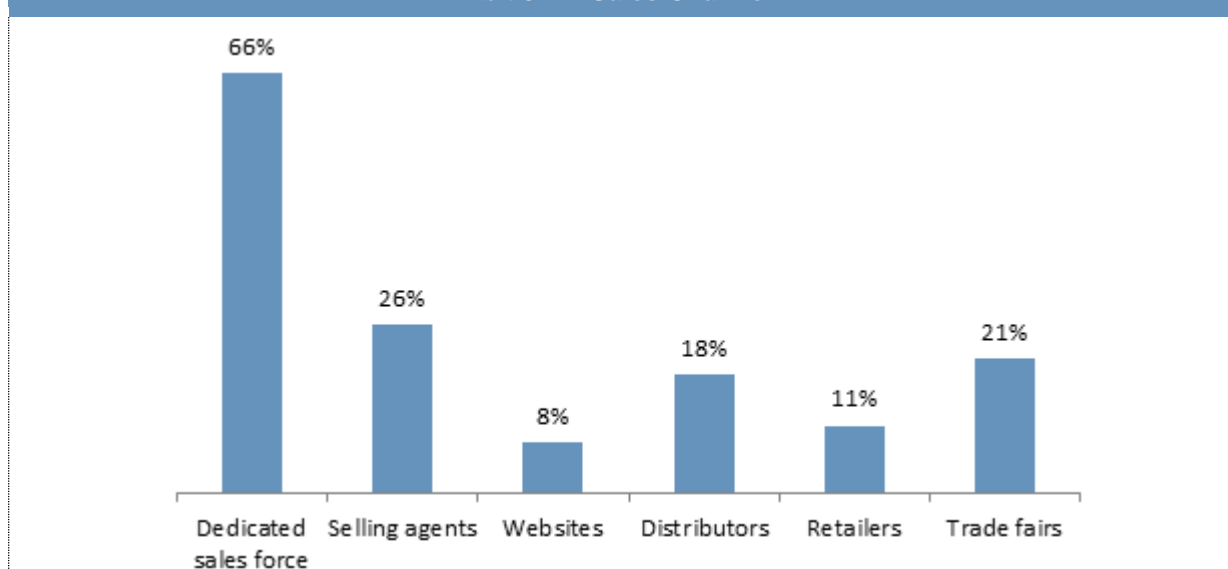


It can be clearly seen in the chart above that around 47% of the enterprises have indicated relative familiarity about Lean Manufacturing techniques.

Sales and Marketing

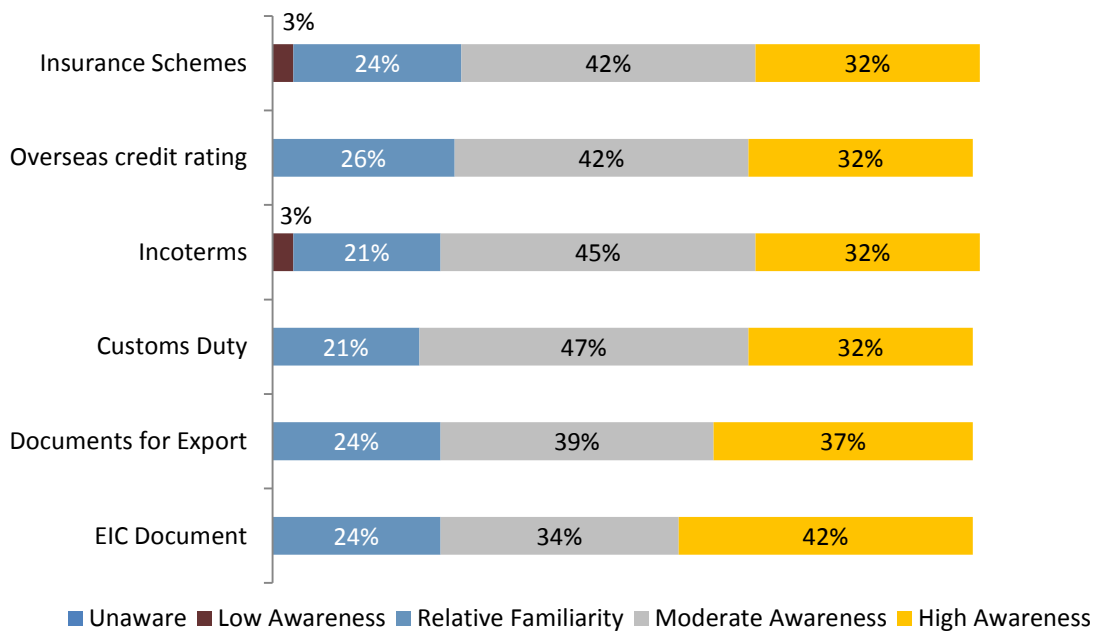
Hyderabad pharmaceutical cluster is growing rapidly and expanding, exports form a significant market for the Bulk Drugs and Formulations categories. While the industry leaders have become efficient in identifying these export geographies, the way they have gathered information is also elementary. There is no objective method to identify potential markets, evaluate geographies, identify penetration levels in various markets and develop a structured marketing plan. Though dedicated sales teams are used by most of the enterprises, these are largely micro to medium enterprises. The small enterprises have to rely on services of selling agents, distributors or retailers.

Exhibit 5.14: Sales Channel Mix



With respect to the export markets, another skill gap identified in the cluster is the lack of **adequate information on the rules and regulations of various foreign markets, certification and packaging requirements**. Bulk of the exports of the cluster is APIs or Bulk Drugs and as such, different kinds of APIs have varied packaging requirement to avoid risk of reactions with packaging medium. Such information was found to be elementary across various levels. The industry leaders however, are absolutely conversant with these processes and requirements and face no issues. With respect to the formulations as well, country norms are not known to smaller entrepreneurs and they rely on their agents for this information. The following charts indicate the levels of awareness on export regulations and related documentations.

Exhibit 5.15: Awareness of export requirements



Note: Above chart represents the percentage of companies aware of respective parameters

As the Hyderabad pharmaceutical cluster has wide variety of companies competing with each other, every company has positioned itself differently with respect to different segments and has different branding strategies for different products. Creating **importance of brand awareness and developing brands** is now being recognized even by smaller firms. However, since sub-contracting is also predominant in the cluster, branding initiatives have been conducted at a low-key level.

Pricing technique is also an area where maximum issues are faced. The entrepreneurs conduct this activity on an ad-hoc basis and hence, most of the times, knowledge of per unit cost, raw material price fluctuations etc are not even considered while pricing the final product. More so, prices are discriminatory and purely depend on the bargaining power of both – the buyer and the seller.

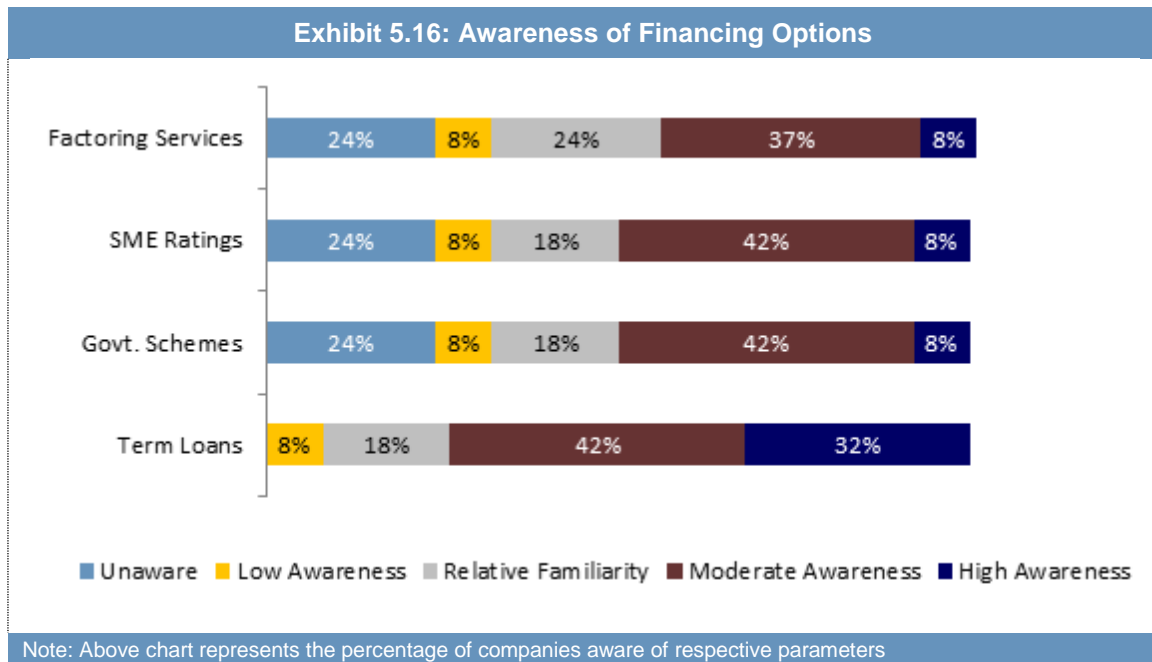
Finance

To mitigate risks of financial compliance, firms rely more and more on the guidance of experienced and qualified financial managers and their owners in compilation of annual reports, understanding tax sops and incentives declared by continuous government announcements.

A major issue of the finance as a function has also been lack of proper skilled labor, for using and analyzing TDS, other tax related issues like CENVAT and Duty Drawback schemes.

Another challenge is the usage of IT in the finance function as well. While most of the activities of the finance function involve usage of IT for filing returns, maintaining regular records, audit related documents etc needs automation.

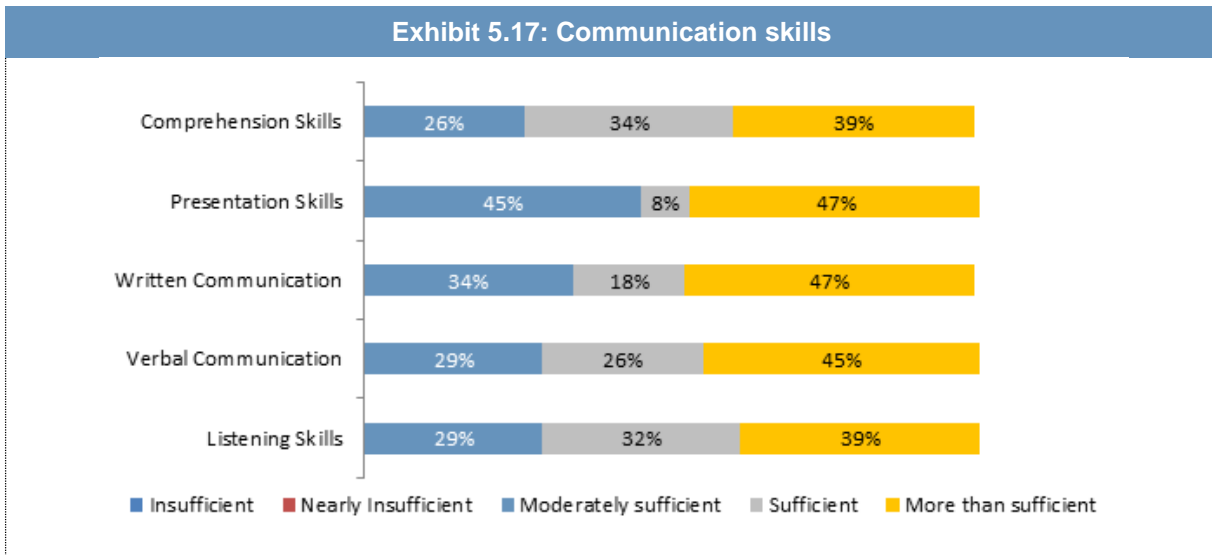
Finally, the chart below summarizes the awareness levels of the enterprises with respect to financing options and schemes available.



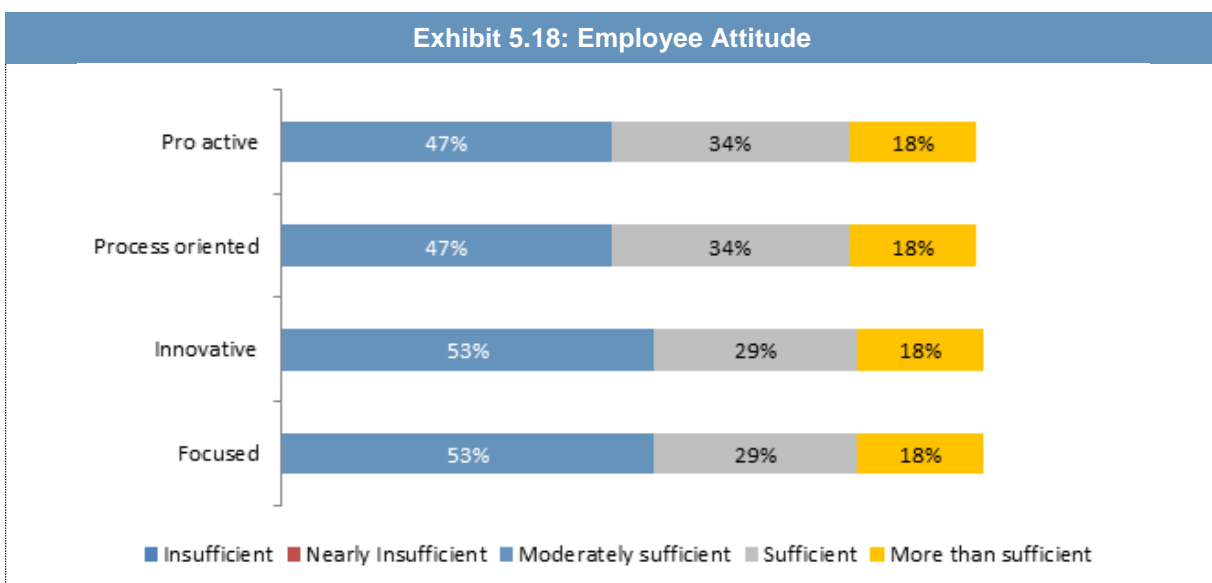
An important aspect to note from the above chart is the lack of awareness with respect to the government schemes – around 32% of the enterprises have indicated lack of awareness about government schemes (specifically SIDBI)

Soft skills

Due to the nature of business predominantly being driven by market demand and sales forecasts, high level of soft skills are required by most of the firms in the enterprises. These are more specifically required by the marketing teams and the financing teams since these have to interact more frequently with the market, both domestic and international.



With respect to communication skills observed amongst the cluster enterprises, around 34% of the firms have indicated written communication as an issue while 29% have indicated issues with verbal communication. These predominantly deal with knowledge of national language and select international languages where necessary.



Another critical element about the soft skills related to employee attitude and around 53% of the firms have indicated that the displayed “Innovative” skills by the employees are insufficient. Overall, training modules on motivation and innovation are key requirements in the cluster.

Enterprise Level Initiatives

It was observed that most of the firms provide on the job training i.e. training on GMP, GLP, Quality Assurance, IPR, Regulatory Affairs, Maintenance and New Product Development to the casual labors with help of trainers who are called from various training institutes. Regular training sessions on various automation procedures, technology up gradation and usage of various software's, skills and managerial ability polishing, handling of various machineries were provided to the upper management/ senior management employees of the firms.

Most of the firms are now trying for C-GMP certification and C-GLP certification where applicable. This would enable them become compliant with certain key requirements of pharma manufacturing. However, though the firms are planning these certifications, they would require in-depth training in these practices and ensuring that these are followed at the enterprise level.

Assessment of NSDC and other reports

The study reveals that Indian pharmaceutical market is small, both by western standards and in terms of per capita consumption. Although India is the world's leading producer of generic drugs, its annual per capita consumption of pharmaceuticals is among the lowest in the world. India is currently recognized as a high quality, low cost skilled producer of pharmaceuticals. It is seen not only as a manufacturing base for Active Pharmaceutical Ingredients (APIs) and Formulations, but also as an emerging hub for biotechnology, bioinformatics, contract research, clinical management and clinical trials. India exports full basket of pharmaceutical products comprising intermediates, APIs, vaccines, biopharmaceutical, Finished Dosage Combinations, clinical services to various parts of the world.

Pharmaceuticals segment, direct employment has increased from 6.9 lakh people in 2006 to 8 lakh people in 2008. Key risk factors are 1) **Technology risk:** R&D plays a very important role in the pharmaceutical industry. Although the industry engages in many forms of innovation, in general the most significant is the discovery and development of new chemical and biopharmaceutical entities that become new therapies. 2) **Increasing competition in international markets:** Emergence of countries such as China can be a major threat to the Indian Pharmaceutical industry. The number of Drug Master Files (DMF) filed by China in the US has grown significantly over the years. 3) **Spurious Drugs:** The spurious drugs not only are a risk to human life but also erode the brand of the industry as a whole.

The report reveals that significant proportion of the workforce is involved in Manufacturing Operations followed by functions such as Testing and Quality and other functions which include Sales and Distribution; support functions such as HR, administration, finance, etc.

However, the NSDC study does not capture skill gaps at enterprise level and hence, the skill sets of the industry leader and the laggards are not measurable. Also, the NSDC report focuses on skills through an education and experience route while D&B India has conducted the study through the process-function-domain requirements route. The advantage of the latter method is it enables to define and develop structured training modules for the identified gaps. These skill gaps are specific to the process and not generic. Lastly, the NSDC report applies to all pharmaceuticals sector while D&B India has concentrated only on the skill gaps in the Hyderabad pharmaceutical cluster.

A comparative example in the production process from both the studies would highlight differences in approaches and the level of granularity that D&B India has conducted the study

Exhibit 5.19: Assessment of NSDC Report

Function	Level	Skill gaps- NSDC Findings	Skill Gaps- D&B India Findings
Production and Quality Control	Managers	<p>Inadequate / restrictive motivational skills</p> <p>Inadequate documentation skills / not conversant with e-reporting / working on computers.</p> <p>Inadequate orientation towards quality management</p> <p>Inadequate understanding of intellectual property management</p> <p>Inadequate understanding of regulatory aspects</p> <p>Inadequate people management and leadership skills</p>	<p>Lack of knowledge of automation and new production techniques</p> <p>Lack of knowledge of specific technologies like milling, pulverization and temperature control processes</p> <p>Lack of knowledge of certification, quality standards and best practices</p> <p>Lack of knowledge about effluent treatment processes</p>
	Supervisors	<p>Inadequate understanding of quality management practices</p> <p>Inadequate practical exposure to high quality lab settings</p> <p>Inadequate communication skills for communicating with operators</p> <p>Inadequate understanding of intellectual property management</p> <p>Inadequate task orientation</p> <p>Inadequate leadership skills</p>	<p>Lack of understanding various processes</p> <p>Lack of knowledge of Various machineries etc.</p> <p>Lack of maintenance techniques like preventive and/ or predictive maintenance</p>
	Workmen	<p>Inadequate knowledge of chemical compounds and laboratory testing Processes</p> <p>Inadequate practical orientation and exposure to machines</p> <p>High degree of handholding required</p> <p>Inadequate self-motivation to enhance and update skills</p> <p>Inadequate ability/knowledge to</p>	<p>Lack of knowledge of product conversion factors, input-output norms etc</p> <p>Lack of knowledge on safety and compliance.</p> <p>Lack of exposure to tools, technology, and processes in various plants</p> <p>Lack of computer knowledge required at this level</p> <p>Inadequate expertise in handling and detecting common issues in machine</p>

		work in the following: Clean Room Air Handling units Current Good Manufacturing Practices (cGMP)	tools
	Technician lab	Inadequate knowledge of compliance to processes Inadequate technical knowledge of Good Laboratory Practices (GLP) Inadequate knowledge of relevant USFDA rules	Lack of knowledge of various regulatory affairs and quality assessment techniques.
Sales and Marketing		Convincing skills and objection handling Relationship management Basic knowledge of logistics, commercial aspects, legal aspects etc	Lack of selling and negotiation skills Effective pricing tools Lack of synchronization between costing and finance with entrepreneurs

Role of Industry Associations

Bulk Drugs Manufacturers Association (BDMA):

The Bulk Drug Manufacturers Association (India) was formed in 1991 with Hyderabad as its Head Quarters. This is an all India body representing all the Bulk Drug Manufacturers of India. It has memberships of 266 members belongs to Hyderabad pharma cluster. The Association has the permanent office infrastructure and being managed professionally. The Association has 4 employees as full time and one employee as part time and these employees have been entrusted with the day to day administration of the Association.

Organization of Pharmaceutical Manufacturers (OPM):

Organization of Pharmaceutical Manufacturers (OPM) is an association for formulations manufacturers. This Association has been formed purely out of necessity to put forth the views and requirements of the members in the area of common concern mainly related to Advocacy. It operates from Hyderabad and has 125 members in the OPM. The association does not have any regular employee on full time basis but have couple of part time employees to maintain the Office and to take of day to day activities of the Association.

Pharmexcil

Pharma Export Promotion Council (Pharmexcil) has been set up for the purpose of export promotion in Pharma industry in 2004. Pharmexcil organize trade delegations and Buyer-seller meet India and aboard it also organize the seminars on exports related issues and make suggestions to Government of India on the policy issues relating to Pharma Exports.

National Institute of Pharmaceutical Education and Research (NIPER)

National Institute of Pharmaceutical Education and Research (NIPER) imparts training to the entrepreneurs and provides skill up gradation training to unskilled, semiskilled, and skilled personnel of the industry. It also gives support in research and development. The institute commenced its operations in Hyderabad an year ago and slowly upgrading its facilities to cater the industry need and presently the usages of its services are meager. In future once the Institution is fully equipped and operational geared up then there is a great scope for utilization of the facilities and services by the cluster firms.

MSME DI HYDERABAD

MSME-DI Hyderabad guides prospective and existing entrepreneurs in selection of product, process and machinery, Plant layout, Raw material selection, Modernization, Quality improvement, Product development, Energy conservation, Pollution control etc.

MSME DI also conducts seminars and workshops in the field of pollution control, biotechnology, energy conservation, cleaner production, problems and prospects of specific industries, IPR, sensitizing MSME's to WTO.

Preparation of project profiles and other reports: This Institute prepares and updates project profiles on select viable projects in the micro and small scale sector. These profiles contain brief information about the product, ISI specifications, manufacturing process, requirement of capital, manpower and materials, economics of working, market and address of suppliers of raw materials and machinery.

Consultancy for acquiring ISO 9000 certificate: To help Micro and Small Enterprises get ISO-9000 Certification, MSME-DI Hyderabad offers consultancy and training. MSMEDI offers a subsidy of a maximum of Rs.75,000/- for Small Scale and Micro enterprises in getting ISO-9000 certification. This Institute processes and recommends units for grant of this subsidy.

MSME TOOL ROOM

MSME-Tool Room, Hyderabad (Central Institute of Tool Design) established in 1968 by the Govt. of India with the assistance of UNDP and ILO, is a pioneering Institution in the field of Tool Engineering in the Country. The Institute was initially established as an United Nations Development Programme (UNDP) Project and was executed by International Labour Organisation (ILO). The Precision machinery and equipment was donated by UNDP and the faculty were trained abroad in the area of Tool Engineering. The UNDP Experts stayed at CITD for about 5 years and trained officers, faculty and staff of CITD in manufacture and design of tooling. The main objectives of the institute are:

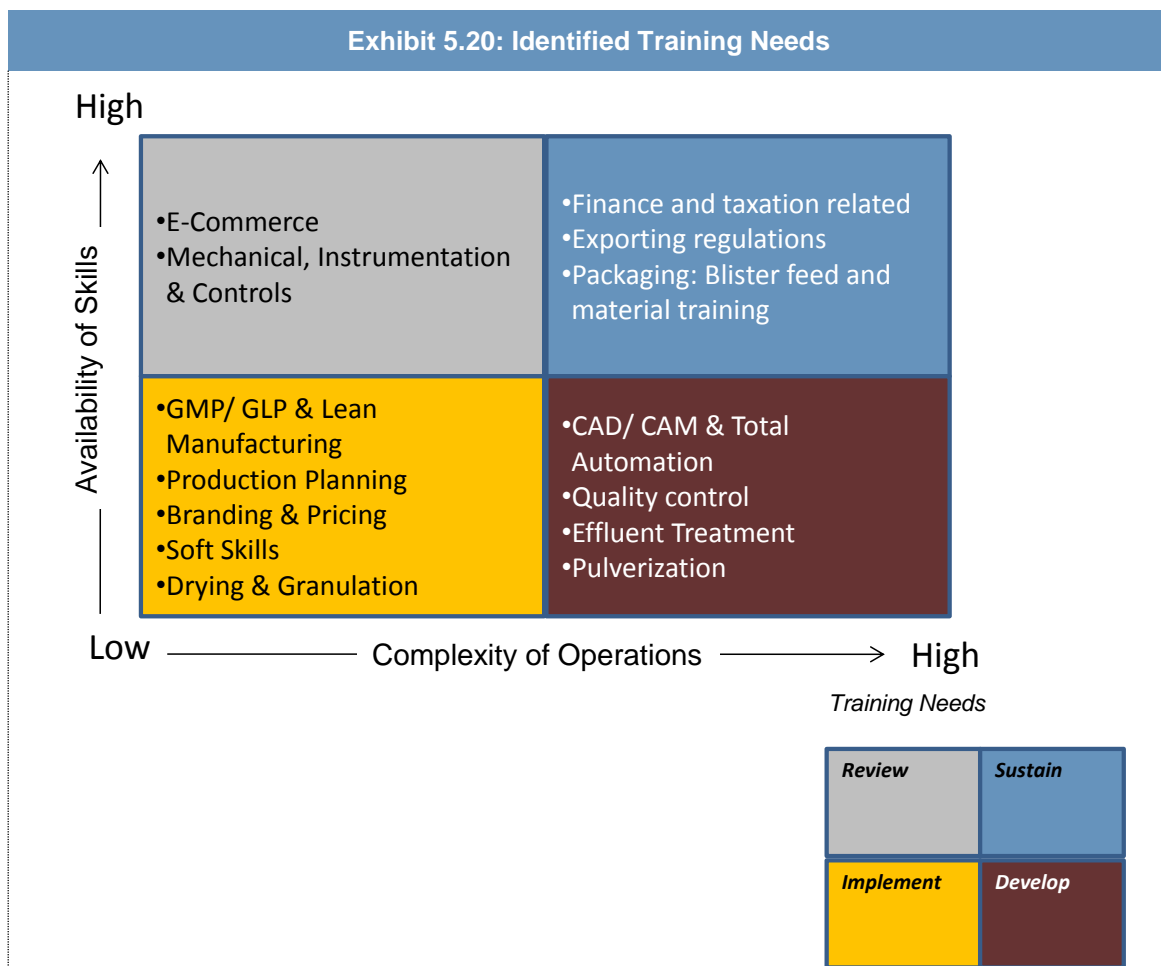
- Training of the technical personnel in Designing and Manufacture of Tools, Dies and Moulds.
- Design and Manufacture of dies, jigs, fixtures and gauges, etc.
- Provision of advisory services to Small Scale Units including assistance in design and developing tools for various processes.

Identified Training Needs in the Cluster

Production is an important area where maximum training efforts are required in the cluster enterprises. This mainly relates to providing knowledge about automation, CAM/ CAD etc, GMP (Good Manufacturing Practices), Lean and GLP (Good Laboratory Practices).

Other areas of skills available and the relative complexity of the process concerned where evaluated vis-à-vis one another to ascertain the complexity-skill available matrix. This matrix was used to determine the training needs in the cluster. Similar needs were observed across bulk-drugs and formulation manufacturing enterprises. Specificities of formulations like packaging (using blister feeds, materials like Aluminum-PVC blisters etc) have also been captured in the training matrix.

The following is the matrix for the Hyderabad Pharmaceuticals cluster.



Detailed skill gap assessment was conducted even at the organizational level. The following table provides an overview of training needs determined through skill gaps at the shop-floor and managerial level in the cluster enterprises.

Exhibit 5.21: Training Needs Identified		
Development Area	Worker/ Supervisory Training	Management Level Training
Production	Productivity Improvement Safety, Health and Hygiene Packaging - Blister feed operations Milling Techniques (CNC Operations)	
Equipment Maintenance	Machine knowledge Spares requirement planning	Preventive and predictive maintenance
GMP and Lean Manufacturing	Health and Hygiene Process sanitization	Standard Operating Procedures Good Laboratory Practices Effluent Treatment Techniques
Quality Control	Clinical Trials and reporting	Standards and norms Process controls Standard operating procedures
Computer Designing	Computer aided processes	CAD, CAM
Soft Skills	Verbal communication skills Attitude and Motivation	Managerial and Leadership Skills Verbal communication, foreign languages

Summary

The Hyderabad Pharmaceuticals cluster is a combination of Bulk Drugs and some Formulation manufacturing enterprises, however, of these, the Bulk Drugs firms are predominant in the cluster. The levels of existing skills and those desired or required were common across these two firm categories. Specifically, with respect to formulations where additional process of packing was involved, the skill gaps were noticed separately and highlighted above.

- Automation of entire production processes remains a key challenge in the cluster. Most of the small and micro enterprises are using limited or no automation. Also, the extent of mechanical automation (lever based) is obsolete and no independent process control rooms, techniques of centralized manufacturing etc. are observed which leads to risks of contamination.
- Quality control norms are known and followed only by a few medium and micro firms. The small enterprises rely on the customers' requirements and hence, quality check is the responsibility of the buyer. Therefore, the small enterprises are less aware of the standard quality norms.
- Machine shop practices and standards of safety are adequately followed. However, with respect to standard operating procedures, c-GMP and GLP are less implemented, though a few medium enterprises have undergone GMP certification.
- With respect to marketing, the skills available can be easily classified as elementary even at the managerial level. The process is complex in the sense that for every order, multiple iterations of price negotiations are required even while dealing with the same buyer for the same product. Further, excessive reliance on sales force was observed amongst the enterprises. The employees involved in the sales jobs are less qualified with respect to pharmaceutical and chemicals knowledge.
- Knowledge of export regulations, international standards and packing is also limited with the medium firms. The micro and small enterprises are relatively less aware of these requirements.
- Training on soft skills, especially with respect to communication and employee motivation is highly important for most of the enterprises within the cluster.

The following Exhibit illustrates the tip sheet of Hyderabad cluster.

Exhibit 5.22: Tip Sheet Hyderabad Cluster										
Hyderabad	Shop Floor - Bulk Drugs Production						Shop floor - Formulation production			Middle Management
Processes in Value Chain	Chemical Processing	Filtering	Drying	Milling	Packing	Quality control	Tablets	Capsules	Liquid orals	Production
Sub Processes	Charging, Reactor operation	Filtration, Purification	Maintaining prescribed conditions, Handling	Operation of CNC milling machines or automated milling machines	Identifying packaging material, Packaging	In-process Quality checks	Dry mixing, Granulation, Drying, Milling, Blending, Compression, Packing	Mixing, Wet granulation, Drying, Dry granulation, Blending, Filling, Polishing, Packaging	Mixing, Filtration, Bottle washing, Filling, Sealing, Labeling, Packaging	Procurement, Production planning, GMP, GLP, Maintenance Management, Water management
Type of Skill Requirement (Semi-skilled / Skilled)	Skilled	Skilled	Skilled	Semi-skilled	Skilled	Skilled	Skilled	Skilled	Skilled	Skilled
Availability of Manpower (Low /Medium / High)	Medium	Medium	Medium	Medium	High	High	Medium	Medium	Medium	High
Skill Gap (Low/Medium/ High)	Medium	High	High	Medium	High	High	Medium	High	Medium	Medium
Training needs (Review /sustain /implement /Develop)	Review	Review	Implement	Develop	Sustain	Develop	Implement	Implement	Sustain	Implement

Available Training Courses	Diploma in pharmacy	No specific training programs available
Available Training Institutes	National Institute of Pharmaceutical Education and Research, Gokaraju Rangaraju college of pharmacy, Govt. Polytechnic, G. Pulla Reddy college of pharmacy, Kamla Nehru Polytechnic for Women, Sri Venkateswara college of Pharmacy	National Institute of Pharmaceutical Education and Research

Hyderabad Marketing

Exhibit 5.33: Marketing Tip Sheet

Marketing	Customer Development	Sales Force Effectiveness	Export compliance	Marketing Management	Demand Estimation
Sub-processes	New market identification	Effective monitoring of sales force, Developing channel mix	Knowledge of various export related procedures	Developing brands, Pricing strategies, patenting	Structured demand estimations
Type of skill requirement(semi-skilled/skilled)	Technical: Semi-skilled, Managerial: Skilled	Technical: Semi-skilled, Managerial: Skilled	Technical: Skilled, Managerial: Semi-skilled	Technical: Skilled, Managerial: Semi-Skilled	Technical: Skilled, Managerial : Skilled
Availability of manpower(Low/Medium/High)	Medium	Medium	Medium	Medium	Medium
Skill gap(Low/Medium/High)	Medium	High	High	High	Medium
Training needs(Review/Sustain/Implement/Develop)	Review	Develop	Sustain	Implement	Sustain
Available training courses	No training courses available				
Available training institutes	No institutional training available				

Annexures

Annexure 1: Skill Gap Analysis

Number of firms rated on complexity-availability matrix (select processes)

Chemical Processing - Complexity Vs. Skill Matrix					
Chemical Processing	Skill Availability Rating				
Complexity Rating	Nearly Insufficient	Moderately Sufficient	Sufficient	More than sufficient	Grand Total
Not Very Complex	3	-	-	1	4
Somewhat complex	-	7	-	-	7
Moderately Complex	-	-	17	1	18
Extremely Complex	-	-	-	9	9
Grand Total	3	7	17	11	38

Pulverization - Complexity Vs. Skill Matrix					
Pulverization	Skill Availability Rating				
Complexity Rating	Nearly Insufficient	Moderately Sufficient	Sufficient	More than sufficient	Grand Total
Not Very Complex	1	-	-	-	1
Somewhat complex	-	9	2	-	11
Moderately Complex	-	-	16	-	16
Extremely Complex	-	1	1	8	10
Grand Total	1	10	19	8	38

Blistering - Complexity Vs. Skill Matrix					
Blistering	Skill Availability Rating				
Complexity Rating	Nearly Insufficient	Moderately Sufficient	Sufficient	More than sufficient	Grand Total
Not Very Complex	2	-	-	-	2
Somewhat complex	-	5	-	-	5
Moderately Complex	-	-	12	-	12
Extremely Complex	-	-	-	7	7
Grand Total	2	5	12	7	26

Note: Rated only by enterprises which follow this operation

Quality Control - Complexity Vs. Skill Matrix					
Quality Control	Skill Availability Rating				
	Nearly Insufficient	Moderately Sufficient	Sufficient	More than sufficient	Grand Total
Complexity Rating					
Not Very Complex	2	-	-	-	2
Somewhat complex	-	8	-	-	8
Moderately Complex	-	-	13	-	13
Extremely Complex	-	-	1	9	10
Grand Total	2	8	14	9	33

Note: Rated only by enterprises which follow this operation

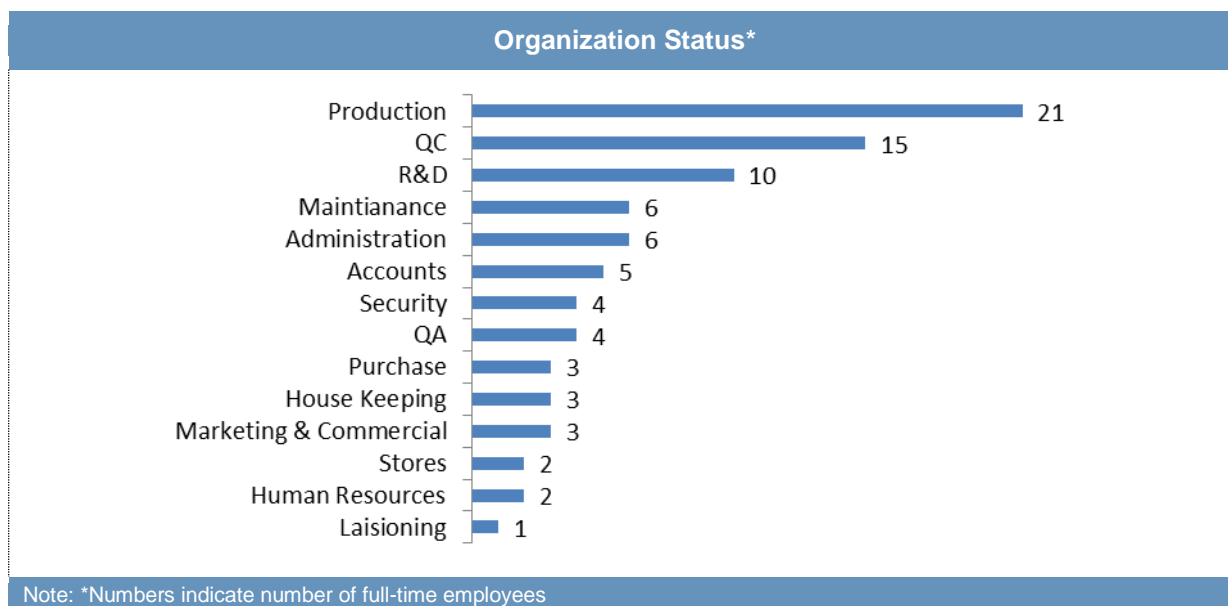
Annexure 2: Select Case Study

Organization Profile Information	
Name of Enterprise	Enal Drugs Pvt Ltd
Name of Respondent	Mr. Suresh Babu
Designation	MD
Year of Incorporation	1990
Type of MSME	Medium
Form of organization (Sole, Partnership, Company)	Sole Proprietorship
Products manufactured	API, Drug Intermediates

Enal Drugs is a medium enterprise involved in manufacture of Bulk Drugs and Drug intermediaries. With regards to production processes, the enterprise follows all European GMP, C GMP. Enal Drugs has taken a loan of INR 90 Lakhs from SIDBI for GMP up gradation. The organization is aware of latest techniques in manufacturing processes and plans to implement the same. The GMP certification at Enal Drugs is currently also supported by APITCO.

With a view to long term growth, technical qualification of most of the employees has been the thrust area while hiring new recruits.

The following is the organization status at Enal Drugs:



Out of the 15 employees involved in Quality Control, 12 are M.Sc. graduates while the remaining 3 are B.Sc. graduates currently pursuing their M.Sc. studies. All the 21 employees involved in production are SSC passed, while of these, 7 are B.Sc. graduates and 4 are M.Sc. graduates. All the six employees in the maintenance team are ITI graduates.

Some major issues noticed at this organization were:

- Procurement of raw materials was not done through certified vendors, though procurement of machinery was done through GMP certified vendors.
- No separate inventory warehouses for raw material and finished goods were observed. The major reason provided for this was lack of space. However, it appeared that separation of warehouses was thought to be inconvenient from logistics perspective
- Process controls and Standard Operating Conditions were not displayed at relevant places and hence, the labour was most of the times even unaware of what products were being manufactured and what process requirements would be necessary
- Research and Development activity has the maximum technically qualified staff and hence are able to research newer drugs and make suggestions to the management. Due to the efforts of R&D, the company has grown from 2 products to 10 products within 3 years of inception and currently produces 18 products and 35 intermediate products.
- No automation was observed at any stage and bulk of the activity is manual, though wet handling and drying operations are integrated.

Material handling is an issue since due to lack of automation, materials have to be moved manually to the next processes and the involved labour is not aware of in-transit conditions and storage at adequate temperature settings.

Annexure 3: List of Firms/ Meetings Conducted

Respondents		
Name	Organization	Designation
Mr Sri D. Chandra Sekar	MSME-DI Hyderabad	Director
Mr B Sarat Kumar	MSME	Assistant Director
Mr M. Sreenivasulu	MSME	Deputy Director
Mr Shujayat Khan	MSME Tool Room	Principal Director
Mr V. Krishnaswami	MSME Tool Room	Director
Mr H. Venkatesh	MSME Tool Room	Deputy Director-Training
Mr Capt D Pulla Reddy	APITCO	Project Manager
Mr Jagdish Reddy	APITCO	Network Expert
Mr Shri KVR Rao	BDMA	Executive Director
Mr. K.Y.D Prasad	Vasant Chemicals	Senior Manager- Production
Mr. Murali Krishna	Versatil Pharmaceuticals Pvt Ltd	Managing Director
Mr. Suresh Babu	Enal Drugs Pvt Ltd	Managing Director

Pune Fruits and Vegetable Cluster

Cluster Overview

Nature of Industrial Activity

The fruits and vegetables units cluster is located in the District of Pune and in and around Panchgani (District Satara). The Pune Fruits and Vegetables processing cluster comprises of three major categories:

- Spices, Papads & Pickles
- Fruits and Vegetables Processing
- Ready to Eat/ Ready to Cook

The structure of food processing industry in Pune is highly heterogeneous and does not reflect cohesiveness in terms of the range of products, technology used, and facilities. The cluster is highly unorganized and at the nascent stage.

In order to assess the nature of skill gaps in the cluster, D&B India conducted a quantitative survey amongst the enterprises in the various categories across the cluster. It was also ensured that the representation of micro, small and medium enterprises was adequate.

Skill gaps in the fruits and vegetables clusters have been observed at all levels across the value chain in the cluster. These skill gaps are predominantly related to the awareness levels of the owner and the seasonal nature of the products manufactured. Mentioned below is a summary of major findings of the study:

- The cluster is faced with severe shortage of skilled and unskilled labour.
- Very few training modules/ programs are available directly at the cluster level. Even if certain programs are available, these are largely at the entrepreneur level.
- Lack of technological awareness can be mentioned as another skill gap in the cluster.
- Quality control is an activity that is conducted only as a requirement measure. No standard norms or practices are followed while quality checks.
- Packaging and knowledge of packaging material is also limited with the medium scale enterprises. The small and micro firms largely cater to the regional and domestic markets and hence, awareness about innovative designs, attractive packing material etc is limited.
- Apart from technical skills, managers and supervisors also lack soft skills such as communication skills, team development and motivation skills for undertaking their activities.

Cluster Profile

The fruits and vegetables units cluster is located in the District of Pune and in and around Panchgani (District Satara). Proximity to urbanized markets such as Mumbai, Nasik, Nagpur, Aurangabad etc., changing food habits, cosmopolitan nature of the city, connectivity to JNPT and hence convenience of exports etc. are the factors that have given the required boost to make this segment a fast-growing one in Pune.

The products covered under various segments for the purpose of the project implementation are given below.

- **Spices and Pickles:** This segment covers basic raw spices, spice mixtures (powders and pastes), pickles as well as papads.
- **Fruit and Vegetable processing:** Products such as dehydrated vegetables, vegetable and fruit powders, jams, sauces, purees, etc. are included in this segment. All products covered in this segment require an FPO license.
- **Ready-to Eat (RTE) / Ready-to-Cook products (RTC):** Heat-and-eat products are classified as Ready-to-Eat or RTE products. These are in the form of cooked curries or frozen pulps, frozen foods on which no further processing is required. Ready-To-Cook or RTC products are those on which some final level of cooking is required before they can be consumed. Ready-to-cook spice mixes have been accounted for under the Spices category and not RTC because they are an ingredient rather than the final product.

Major products that account for a larger share in this cluster are spices and pickles. Therefore, larger representation of these products will be ensured while developing the sampling criterion.

The following table summarizes the information about the fruit and vegetables cluster:

Exhibit 6.1: Pune Cluster Summary				
Particular	Fruits and Vegetables Processing	Spices	RTE	Total*
Investment (Plant and Machinery) ` Cr	66	63	18	147
Turnover ` Cr	198	594	72	864
Employment (Nos)	2988	8665	1560	13213

Source: Pune BDS website – Cluster Diagnostic Study
Note: *Information pertains to only the F&V Segment and non-F&V items are not included above.

No statistical estimates of the number of units processing fruit and vegetable are known so far conducted through any of the published sources. The MCCIA study also provides only the break-up of “Total Food Processing” in Pune district. However, MCCIA estimates have revealed the following tentative guesstimates on number of units within the defined geographical locations of this cluster:

- Micro – about 400 units
- Small/Medium – About 150 units

Cluster Ecosystems and Inter-Linkages

The structure of food processing industry in Pune is highly heterogeneous and does not reflect cohesiveness in terms of the range of products, technology used, and facilities. The cluster is highly unorganized and at the nascent stage. Inter-linkages between the firms through material or process synergies are relatively lower.

Amongst the medium firms, large proportion of their output is through sub-contracting from smaller or micro units. These include the large spices and pickles manufacturers and some players in the RTC segment. However, process quality checks are conducted by these enterprises themselves before initiating the sub-contracting agreement. Most of the times, the basic raw material is provided like for e.g. in making the onion-garlic spice, the onion-garlic paste in ground format as required is provided to the smaller firm. Thus, risk of poor quality and contamination is eliminated at this stage itself.

There is minimal interaction at the firm level across the cluster. This is mainly due to every firm intends to preserve its unique identity through its well-crafted and developed recipes. This has led to traditional firms remaining traditional since access to modern technology and sources of knowledge are limited either through material suppliers or from buyers.

A few enterprises have also developed linkages with the farmer to get assured supply of the required standard of raw material. There is the need to not only develop linkages with the raw material supplier but also ensuring availability of the post harvesting infrastructure necessary to keep the produce in a standardized form which is cost efficient to the industry.

In terms of sourcing, identified market yards are used exhaustively by the incumbents. The following table highlights the various market yards that the cluster enterprises often tap for their raw material requirements.

The value chain in the cluster is also relatively simple with large focus on traditional and domestic methods. The technology though not obsolete, is however orthodox. The chart below depicts the various stages of production for various products. In each of these products, the availability of farm produce at the reasonable prices is important for all further processes.

Exhibit 6.2: Cluster – Production Value Chain

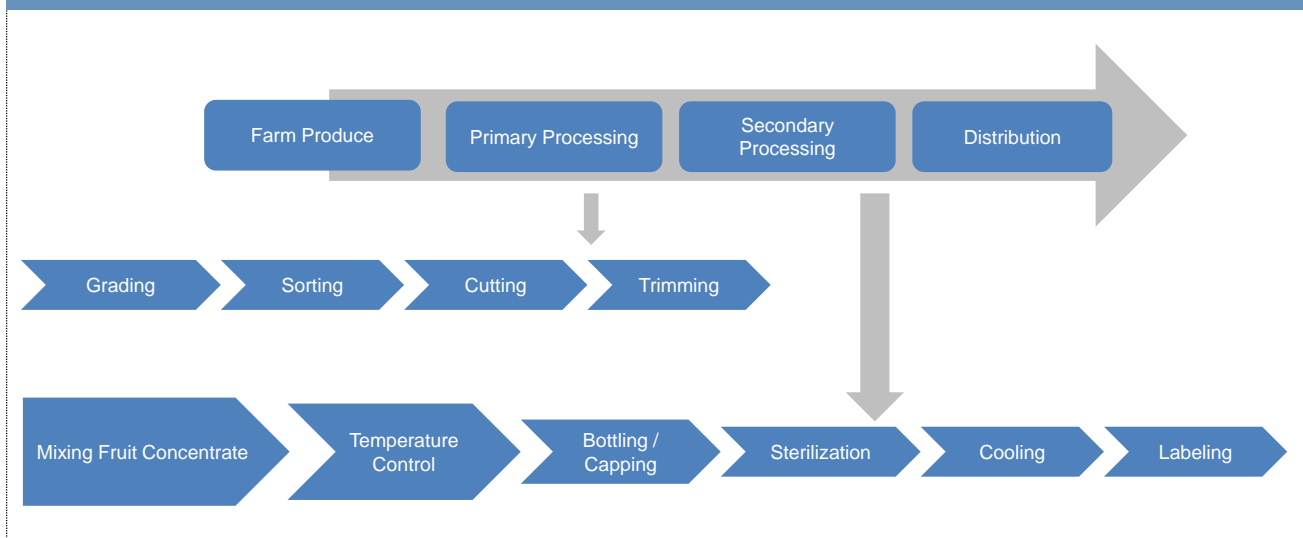


Exhibit 6.3: Cluster Products

Products	Geographical Areas
Grapes and Grapevine	Nasik, Sangli, Pune, Satara, Ahmednagar, and Sholapur
Alphonso Mango	Ratnagiri, Sindhudurg, Raigarh and Thane
Kesar Mango	Aurangabad, Jalna, beed, Latur, Ahmednagar and Nasik
Onions	Nasik, Ahmednagar, Pune, Satara and Sholapur
Pomegranate	Sholapur, Sangli, Ahmednagar, Pune, Nasik, Osmanabad, Latur
Banana	Jalgaon, Dhule, Nandurbar, Buldhana, Parbhani, Hindoli, Nanded and Wardha

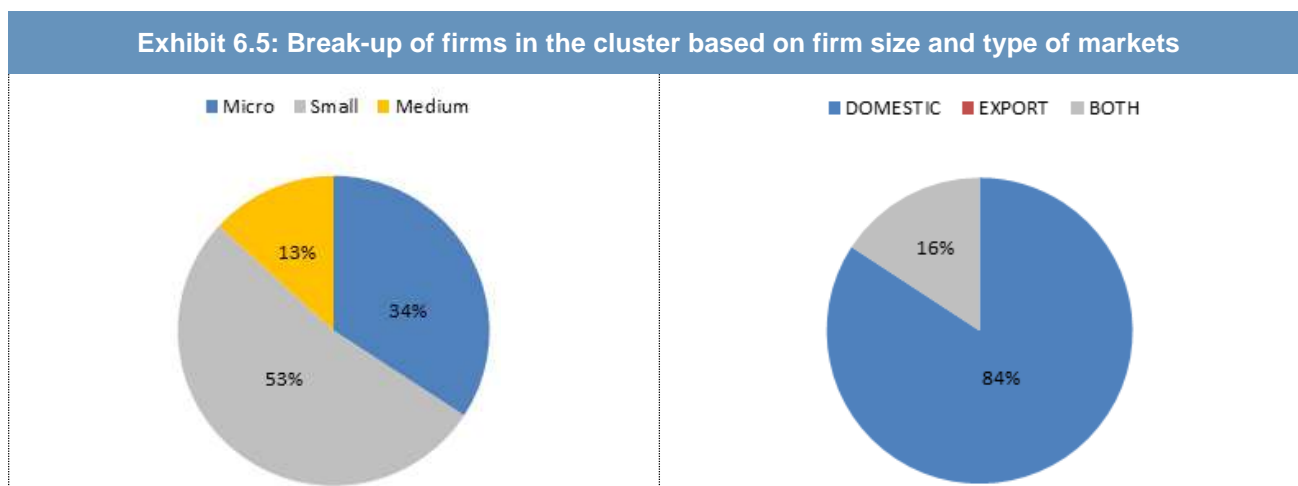
Skill Gap Assessment

Sampling

D&B India has conducted the initial round of qualitative interactions with various firms in the Pune F&V cluster. Primary assessments were conducted to understand key linkages and processes within the cluster, primary markets and specific marketing initiatives and knowledge about financing programs. MSME enterprises were selected on the basis of their position in the value chain. The qualitative samples were selected to include one firm from each segment within the F&V cluster. It was also ensured that the firms selected could be representative set of the Micro, Small and Medium Enterprises. The following table summarizes the sample coverage for the study.

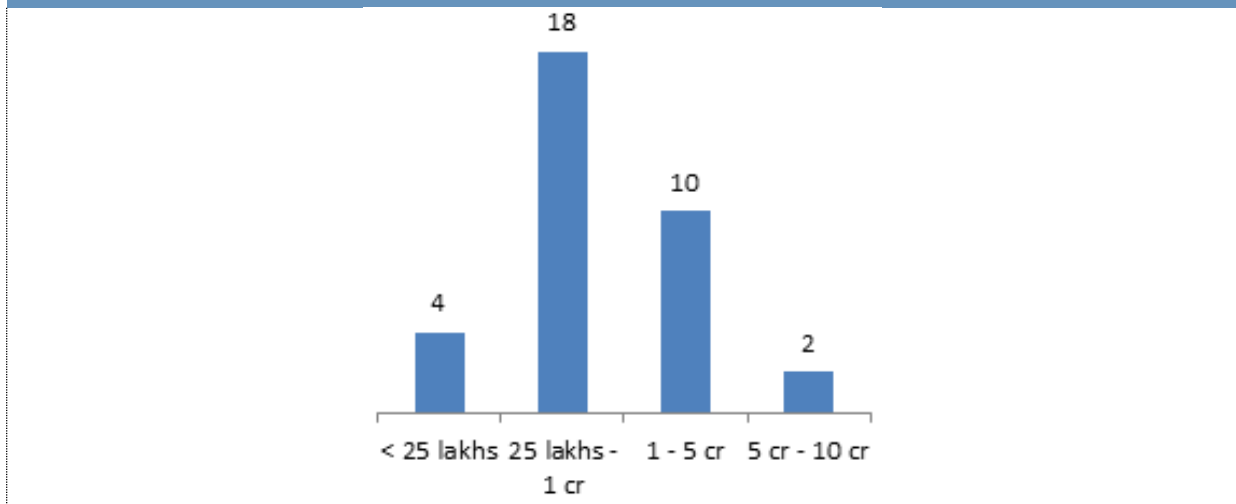
Exhibit 6.4: Sample Survey Coverage	
Products	Samples Covered
Fruits & Vegetables Processing	13
Spices, Pickles & Papads	13
RTE/ RTC	12

Appropriate mix of samples was covered across the cluster using sales, primary selling markets etc. The following charts represent the sample profiles. Around 84% of the sample firms covered were predominantly operating in domestic markets.



A few firms under the sample also have revenues to the tune of `5-10 crore and are largely export oriented firms.

Exhibit 6.6: Number of firms based on total sales



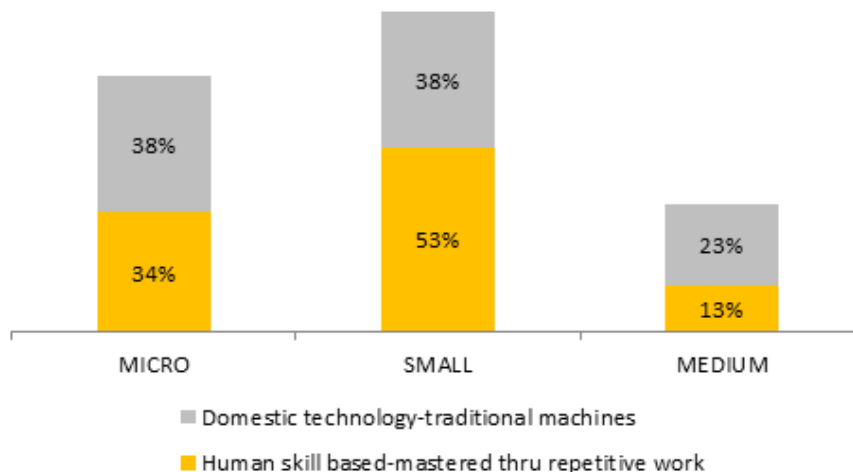
Process Based Observation

Production

The typical activities under production are highlighted in the process chart above. Various skill gaps were identified at each level in the production process. Most of these gaps related to the nature of labor employed in the enterprises. A large number of enterprises, irrespective of being micro, small or medium have to rely heavily on contractual labor. This is a major short-coming for the firms in the cluster.

- Procurement and Primary processing:** Procurement involves accessing the *mandis* to procure the required farm produce through networks or knowledge of the exact product requirements. The owners within micro and small enterprises do these themselves in order to have a larger control on the production costs in the firm. Post procurement, the production activity also includes smaller activities like cleaning, sorting, grading, processing, grinding/ homogenizing or temperature controlling. Whilst most of these are elementary processes, **inadequate knowledge of process efficiency are common leading to risks of contamination and hygiene etc.** Most of the enterprises are either using manual labor or traditional machines for the elementary processing activities. The following chart explains the type of technology available in the cluster firms.

Exhibit 6.7: Type of Technology Used across Various Firms



Note: The chart represents the current technology being used at the enterprises. For a particular technology, the numbers add up to 100% across enterprise categories.

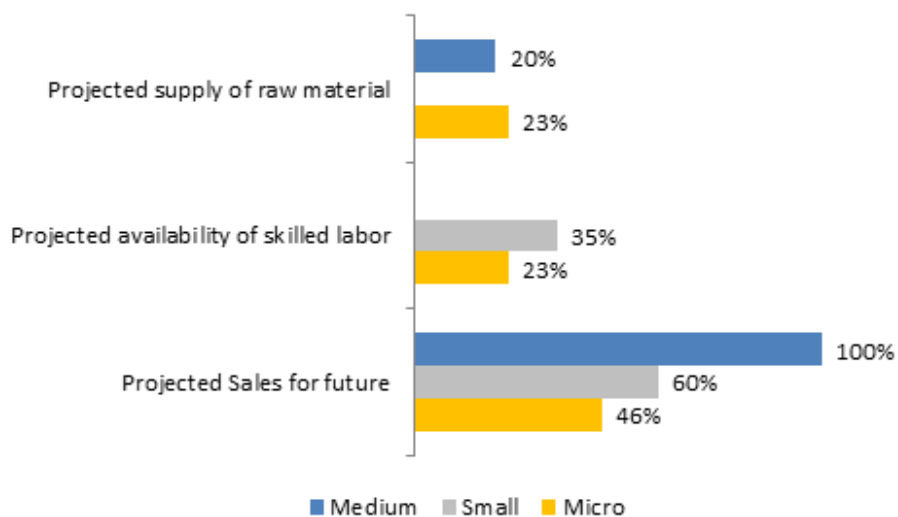
It can therefore be seen that around 53% of the small enterprises have indicated usage of human skills indicating no mechanization. These relate to specifically the fruits and vegetables enterprises where corn shelling, peas shelling etc. type of activities are involved.

- Secondary processing:** This activity involves using heat and temperature controls effectively for processes like sterilization, pasteurization etc. The level of knowledge of these techniques was found to be archaic. At certain organizations however, it was observed that expert food

technologists were controlling the unit. These enterprises have been successful in terms of cost control, productivity improvement and hence, remained competitive in the cluster. **Lack of expertise and proper information avenues on technology** have led to a major gap even at entrepreneurial level to ascertain the available technology. Information areas that were highlighted as necessary involved technology and knowledge of new plant and machinery. **Lack of innovation in products** was also commonly observed across small and micro enterprises. The medium enterprises have smaller teams that work across various cities and obtain tastes and preferences of these markets. Accordingly, secondary processing is altered to produce innovative products confirming to the market requirements.

- **Knowledge of production planning and scheduling** is also limited across the micro and small firms. These firms do not have access to techniques of demand forecasting and hence, production scheduling is conducted either on daily or weekly basis. Due to this, the availability of casual and temporary labour cannot be ascertained beforehand and these firms therefore face an issue of unavailability of labour.

Exhibit 6.8: Type of Technology Used across Various Firms

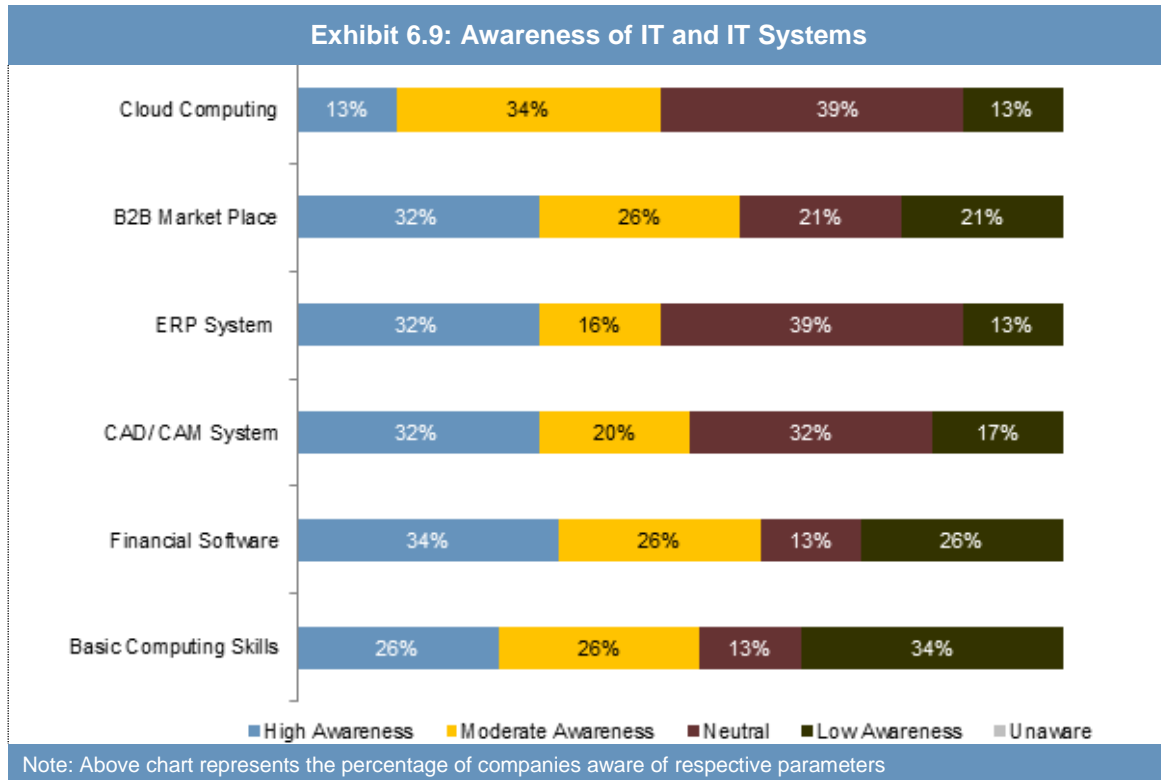


Note: Above chart represents the percentage of companies aware of respective parameters

Even in case of production planning, the inputs that are generally used are provided in the cart above. Most of the micro enterprises rely on sales projections, however, as compared to small and medium enterprises, the dependence on sales projections is much lower. The medium enterprises rarely face issues with skilled labour and hence, their production plans are independent of the availability of skilled labour. This practice of planning production based on labour availability is more commonly observed in micro and small enterprises.

- **Usage of IT:** Only a few key enterprises (industry leaders, so to say) were using sophisticated tools like ERP software for production scheduling. Automation aided computers and IT is fairly absent even with medium enterprises. Most of the production activities are carried out using

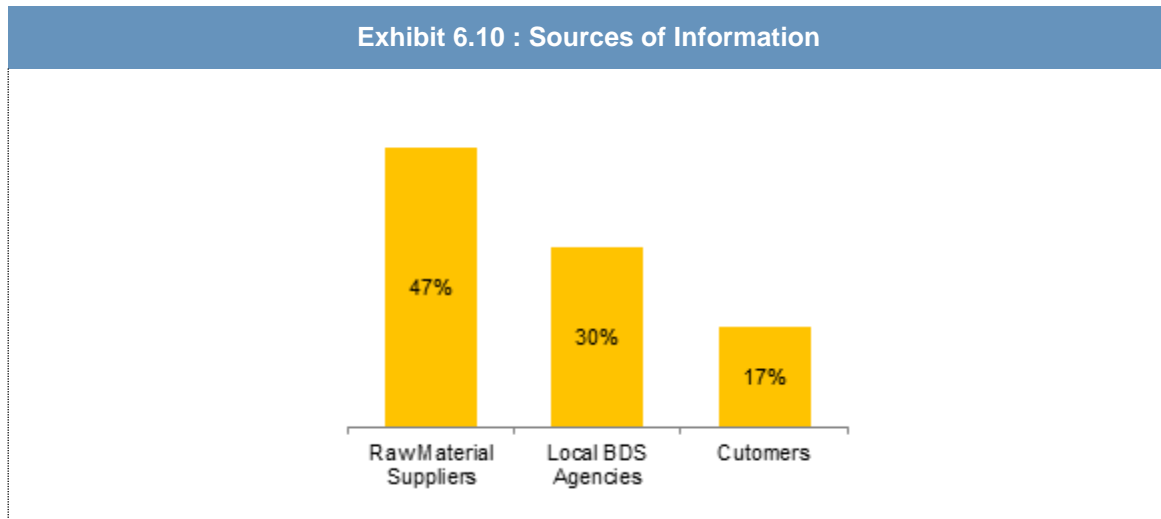
orthodox methods of production and absence of usage of IT is a major issue of the production process. Awareness levels on IT usage are also lower with respect to high-end applications like ERP, cloud computing and B2B Market place. The chart below summarizes the awareness related to IT.



As indicated in the above chart, around 52% of the enterprises have indicated low awareness about Cloud Computing, 42% have indicated low awareness on B2B Market places while 42% have indicated low awareness on Supply Chain Management Systems. With respect to computer aided manufacturing and design, around 40% and 47% firms respectively have indicated lower awareness levels. Maximum awareness was observed in CRM systems and ERP systems respectively. However, very few small and micro enterprises have implemented these systems at their enterprises. Even with respect to basic computing skills, around 47% of the firms are familiar but have not achieved enough awareness about the same.

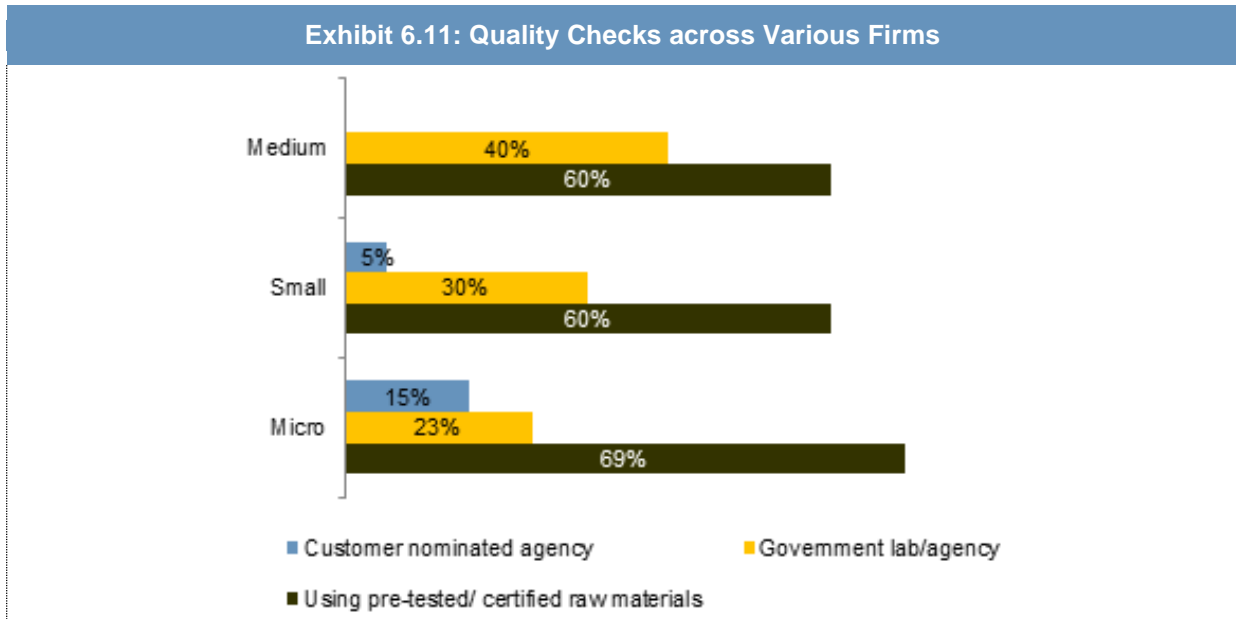
- Technology Advancements:** A major lacuna of the production processes in this cluster has been inadequate sharing of knowledge about technological advancements. Only a few large enterprises have gone ahead and installed imported technologies to achieve economies of scale. **Information on imported/ foreign technology, industry best practices** etc. is also absent posing a serious challenge to technology upgradation. Most of the enterprises rely on raw-material suppliers for knowledge of technology. These suppliers tend to sell their products by informing best possible means to use the raw materials. **Reliance on local BDS agencies** like design and process consultants, food technologists etc. is also observed. Only a few medium

enterprises like the industry leaders have collaborations with foreign technology vendors and access to information on innovative production techniques. The following chart explains the sources of technology as indicated by various firms.



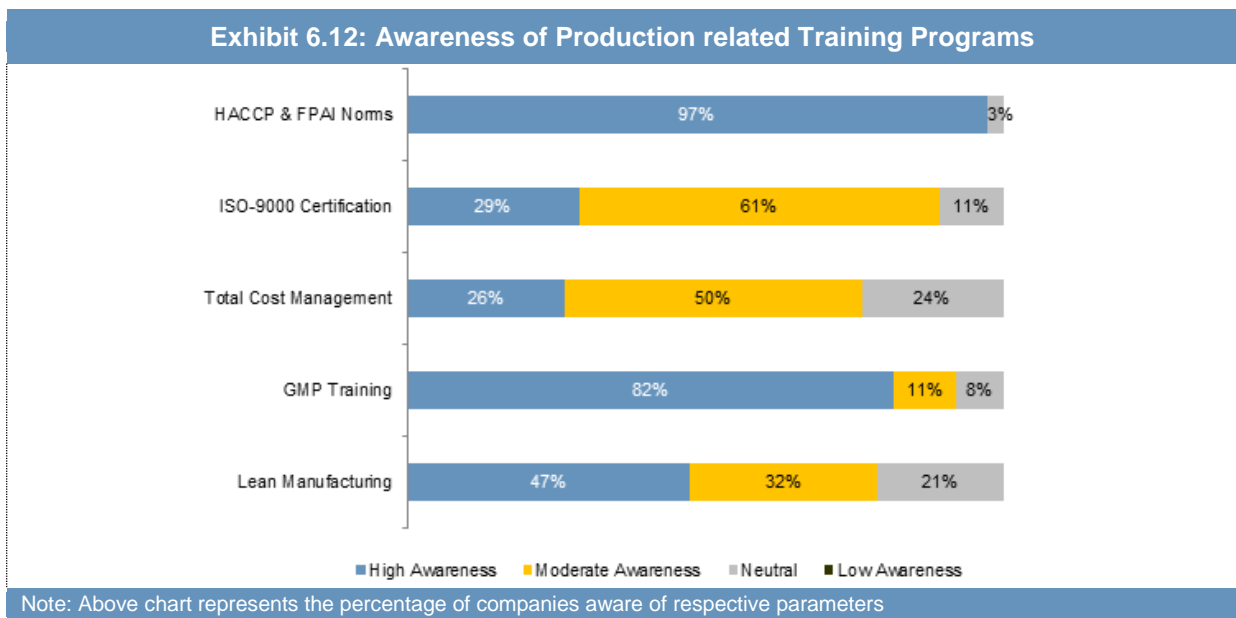
- Maintenance:** In most of the enterprises, maintenance function exhibited maximum gaps in terms of **inadequate knowledge of the machinery installed, sourcing of spares and parts** etc. Therefore, most of the enterprises rely on AMC (Annual Maintenance Contracts) with the Original Equipment Manufacturer (OEM). The OEMs tend to handle queries at their own speed and it was indicated that production losses due to unscheduled maintenance have been as high as 10-15% of the annual production. Such time-quantity-cost losses can be reduced through designed and structured programs for preventive and/ or predictive maintenance, on-site standard operating procedures etc. to increase awareness. Skill gap identified in this function therefore mainly relates to **technological knowledge of the machinery, lack of awareness about efficient maintenance programs and best knowledge of sourcing spares for the machinery.**
- Quality:** Skill sets desired for handling material and quality checks are most important when it comes to Food Processing. Most of the small enterprises rely on “**Sensory Quality Checks**” implying visual aids, taste, colour etc. of the end product. The workers engaged in quality checks are not aware of the standard norms, rules and regulations for the FPAI, AGMARK etc. Training on **quality control and checks** is an important requirement amongst the small and micro enterprises.
- Testing:** Availability of testing facilities at the clusters is a major challenge posing the quality checks. While NAFARI has set up a testing facility for the cluster, enterprises feel that it is **either expensive or does not provide timely results**. Examples were cited to indicate that the results of tests outsourced to NAFARI have taken week or even more, leading to a lost opportunity either in sourcing or finished goods sales. Common requirement from firms in the cluster has indicated training programs directed towards **improving awareness of acceptable norms and standards. In-house quality checks** and awareness programs for workers without resorting to huge

investment in labs etc. is a priority for most of the enterprises. Quality testing using designated labs is therefore only affordable for medium enterprises.

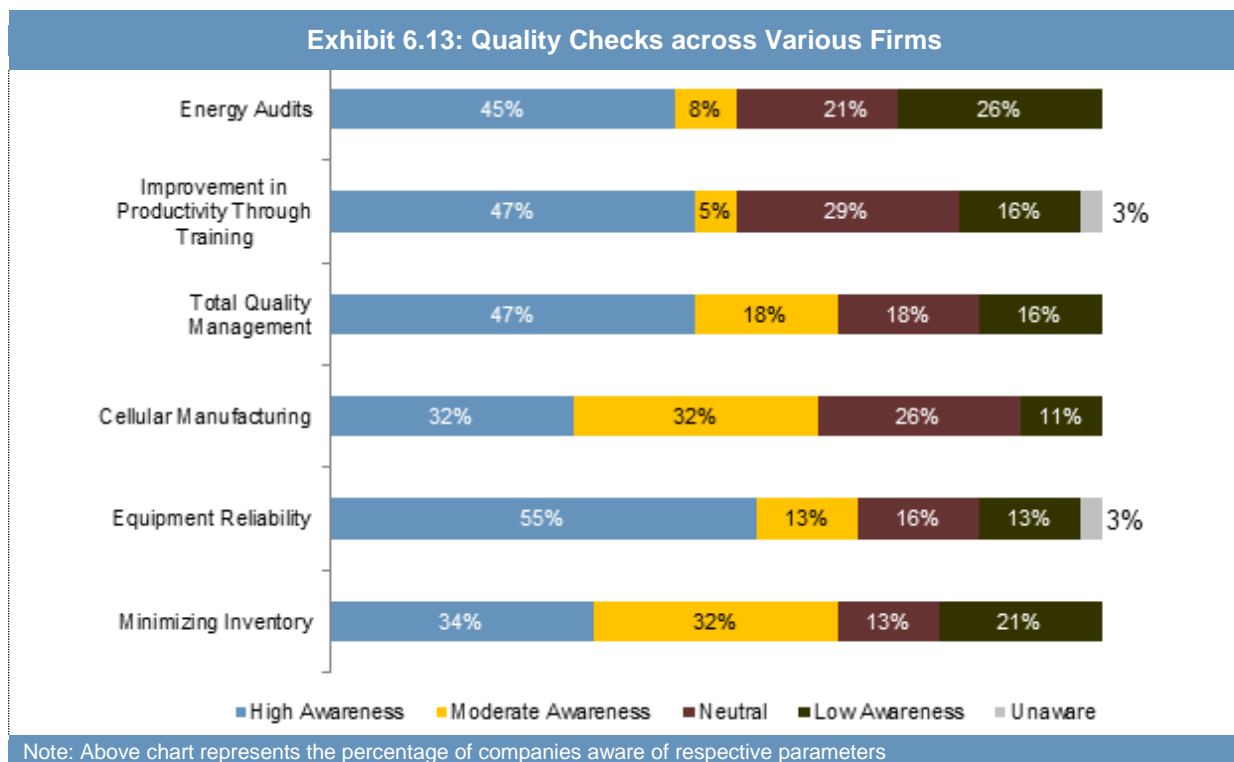


Using services of government lab is also observed only in Medium enterprises more commonly. The major reason for this is most of the medium enterprises are export oriented and hence, require testing and quality checks to be done at government labs. On the contrary, the micro enterprises tend to rely on pre-tested or certified raw materials as an integral quality control activity. However, the pre-tested or certified materials are self-declared by the material suppliers and hence, pose risks of quality. In case of small enterprises, the trend to use customer nominated testing centers is lower as compared to micro firms as their bargaining power vis-à-vis the micro enterprises is higher.

- **Awareness of training programs for production and quality** is also lower amongst the cluster firms. These relate specifically to the knowledge of Lean Manufacturing, GMP and other certification etc. The following chart summarizes the awareness levels across the cluster firms.

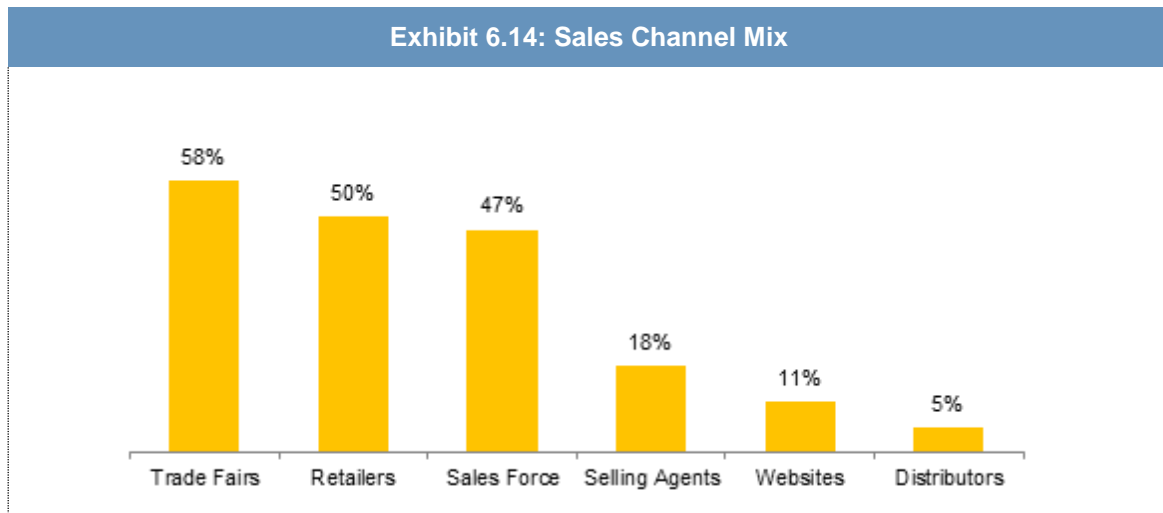


From the above chart, it is clear that the firms are aware of the HACCP and FPAI norms, however, this awareness is predominant across the medium firms. With respect to GMP training and lean manufacturing, high awareness levels were exhibited across the firms, however, very few firms have implemented GMP and Lean Manufacturing at the plant locations. As a consequence, GMP and Lean can be taken up as training requirements for the cluster, however, since adequate awareness is observed, these can be administered at intermediate to expert level and beginner level training may not be required. With specific requirements about lean manufacturing, the following chart represents maximum lack of awareness with respect to “Energy Audits” and “Improvement through Productivity Techniques”

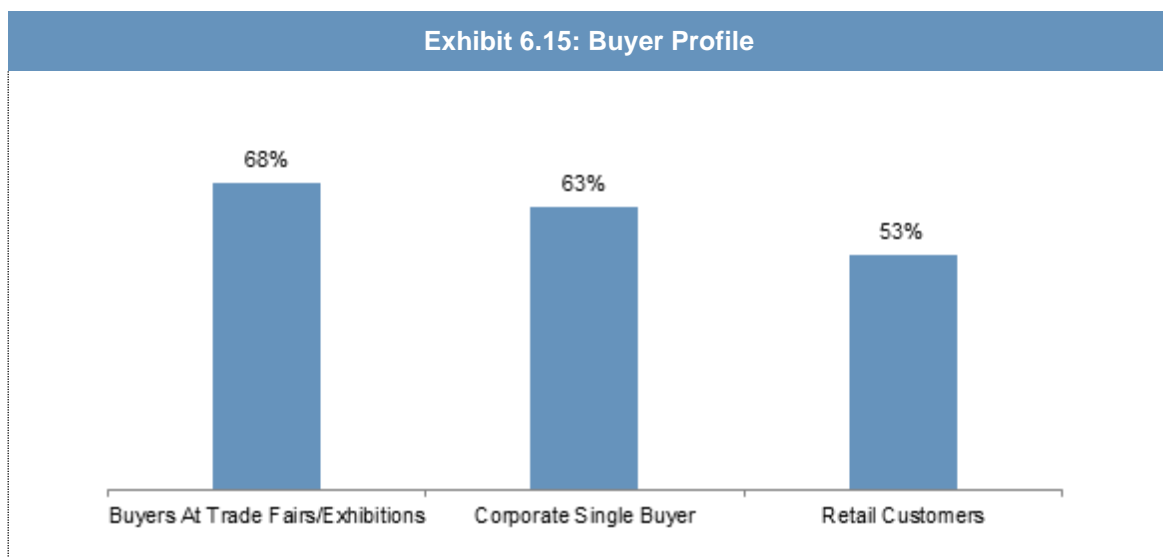


Sales and Marketing

Product marketing is largely done by the entrepreneur with a small sales team pushed in to the markets to collect information about potential demand and at times also, the Voice of the Customer. However in most of the organizations, it was observed that the sales and marketing staff were technically less qualified, but had adequate experience in the field of fruit and vegetable marketing due to continuous experience since years. A major lacuna of using this traditional technique is inefficiency and accuracy. Ascertaining the right demand from the right customers at the right time and place is a major skill gap in this cluster. This also has led to inefficiencies in production activities. Exhibit 6.11 indicates the percentage of firms which follow a particular channel to sell different products.



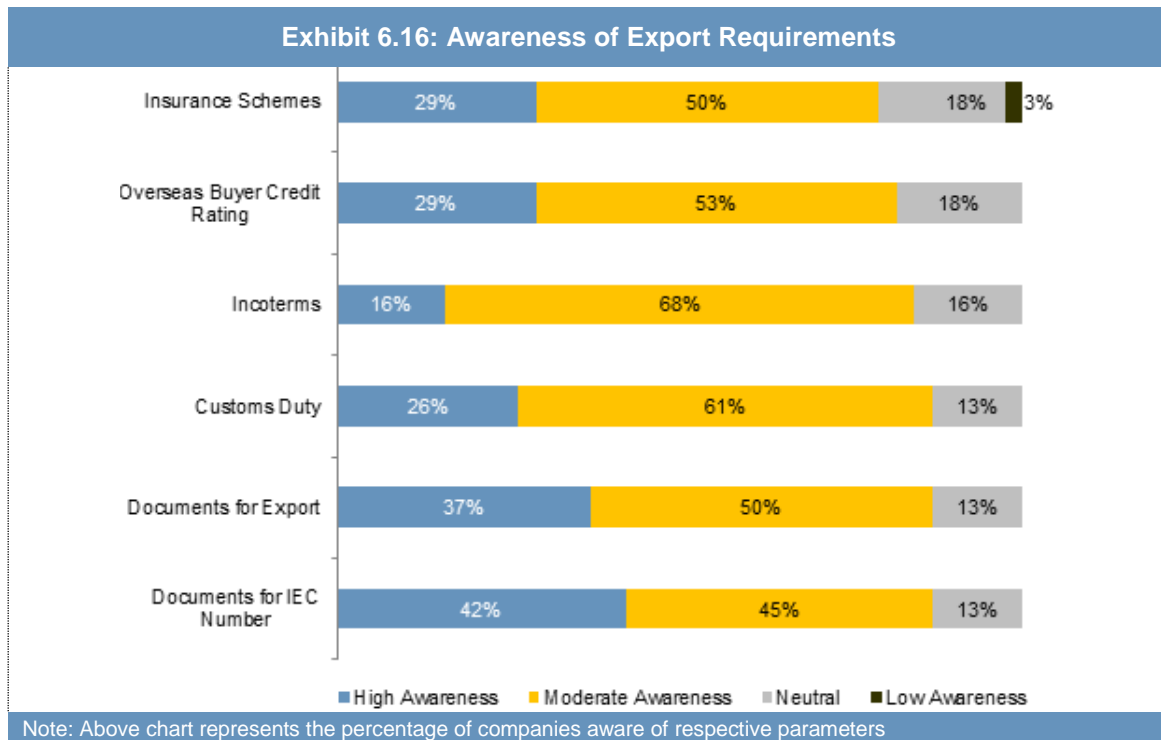
Buyer Profile



Most of the enterprises in the cluster are heavily dependent on trade fairs as highlighted in the above charts. During the qualitative discussions, it was highlighted that bulk of the orders are booked at the trade fairs by major buyers. However, the issue that was mentioned with this practice is the buyers get multiple options for bargaining with various exhibitors at the trade fair and hence, ultimately the orders are booked at buyer's prices.

As the Pune fruit and vegetable cluster is growing rapidly and expanding, exports form a significant market for the processed food categories. While the industry leaders have become efficient in identifying these export geographies, even their knowledge is obtained going through trial and error methods or liaising with international buyers.

With respect to the export markets, another skill gap identified in the cluster is the lack of adequate information on the regulations of various foreign markets, certification and packaging requirements. The following chart presents the awareness levels with respect to the export related documentation and processes.



There is low to moderate awareness amongst the cluster firms with respect to documents for export, customs duty and IEC number. Around 68% of the surveyed firms have indicated that knowledge of Incoterms is moderate. This need of providing the adequate information on export regulations is currently therefore serviced by the BDS providers in the cluster and are available within the reach of only the big enterprises. This is a major training requirement in the cluster.

As the Pune cluster has wide variety of companies competing with each other, every company has positioned itself differently with respect to different segments and has different branding strategies for different products. Most of the micro and small enterprises are not concerned about developing their own brands. These firms largely rely on sub-contracted orders received from medium enterprises. As a consequence, the products manufactured by these firms have a limited regional market restricting their revenue potential.

Promotional activities are conducted by only few firms who were the market leaders in the cluster. Very few enterprises have ventured into print media campaign for promoting their brand. Most of the enterprises promote their products either through adverts in Television media or by placing stalls in exhibitions where the sample of the product is distributed free of cost.

The knowledge of various techniques like demand forecasting, branding, promotion, distribution, product innovation that was observed was limited. Only a few numbers of enterprises were in to the planning for new markets/ territories/ products.

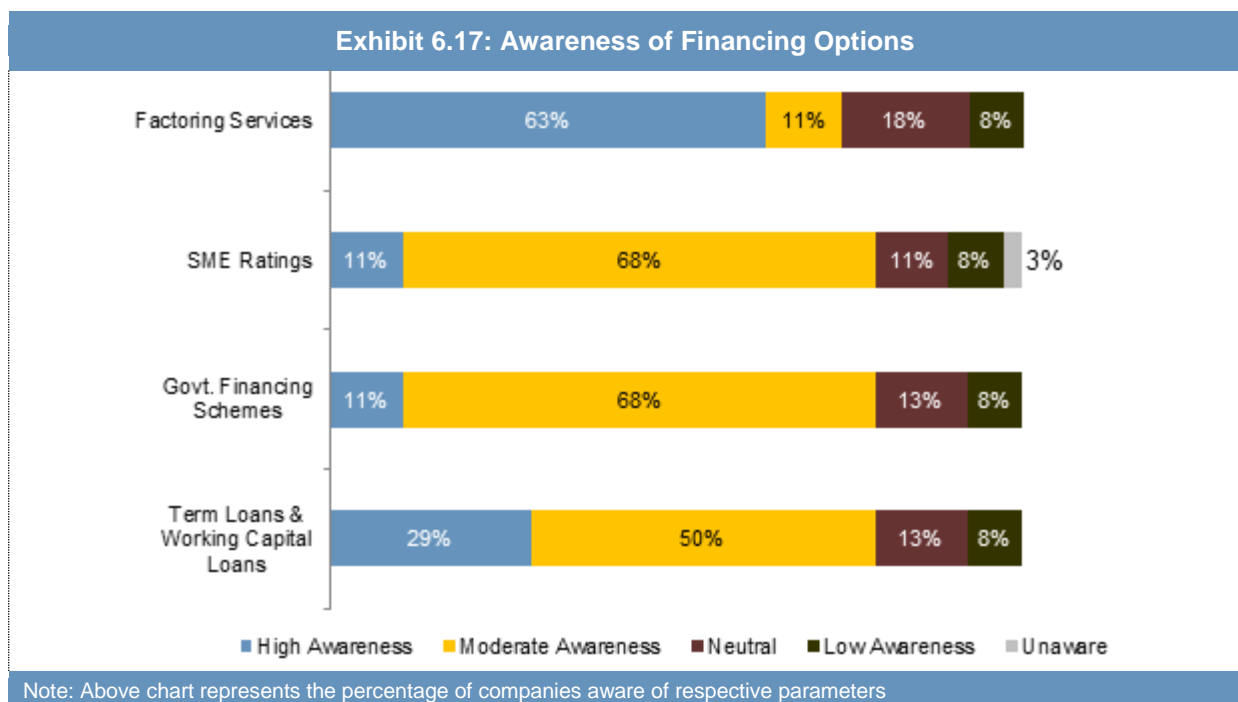
The major issue of the sales and marketing in this cluster has been inadequate ability to articulate views to understand changing customer preferences and analyze the demand for new products. It was also been observed that the person was lacking in inter-personal skills and Communication skills

so as to gauge the customer's requirement and redesign and innovative packaging for fulfillment of varied customer needs.

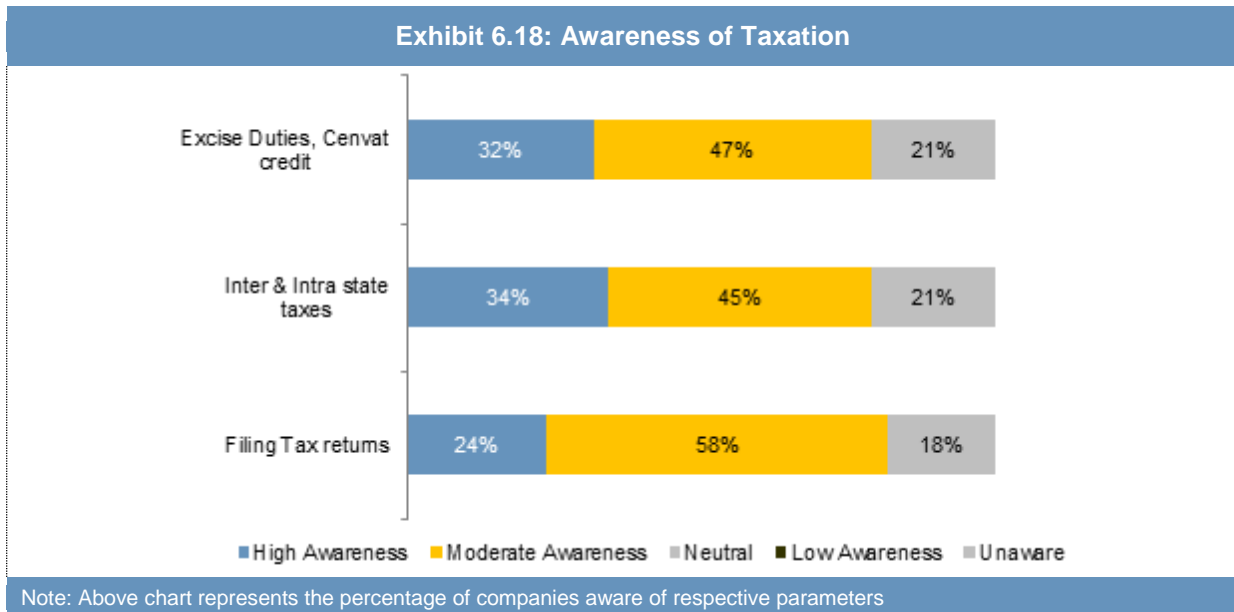
Finance

It is observed that most of the firms are using traditional techniques like monthly budgeting; planning sheets and scheduling on an ad-hoc basis to prepare the financial budget for the organization. The key linkages between procurement of raw material, production, and marketing, finance were not understood well even by owners of large enterprises.

To mitigate risks of financial compliance, firms rely more and more on the guidance of experienced and qualified financial managers in compilation of annual reports, understanding tax sops and incentives declared by continuous government announcements. Around 89% of the firms are moderately aware to unaware about the government financing schemes. As a result, they have to rely on private banks where the exploitations are high. Only a few enterprises (around 29%, largely medium firms) are aware of term loans and working capital loans.



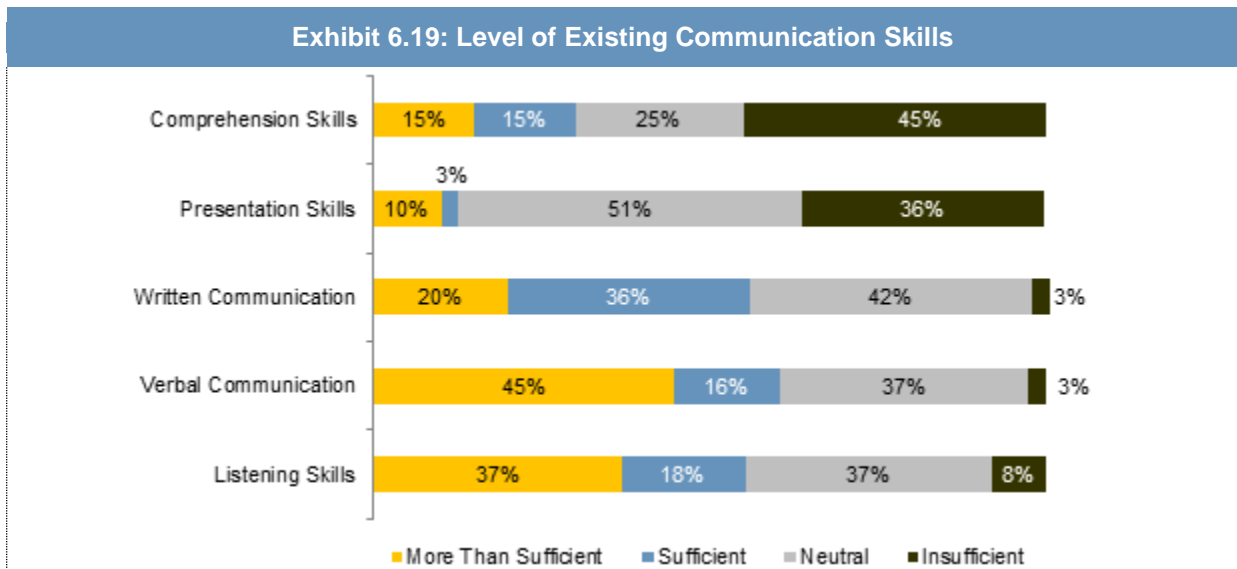
A major issue of the finance as a function has also been lack of proper skilled labor, for using and analyzing TDS, other tax related issues like CENVAT and Duty Drawback schemes. Only 32% of the firms and largely medium enterprises are aware of the excise duties, cenvat credit etc. Knowledge of basic tax filing/ returns is also moderate as indicated by around 58% of the enterprises. These firms rely on private Chartered Accountants or BDS providers.



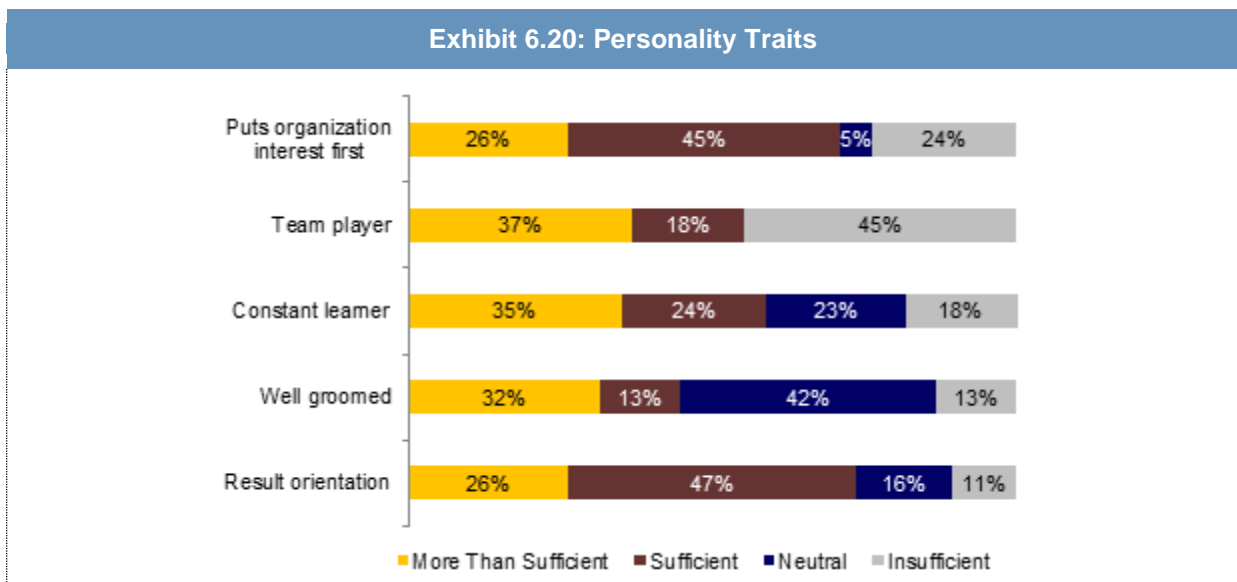
Another challenge is the usage of IT in the finance function as well. While most of the activities of the finance function involve usage of IT for filing returns, maintaining regular records, audit related documents etc. needs automation. **The knowledge of IT** in most of the firms is elementary and is now beginning to be focused upon.

Soft Skills

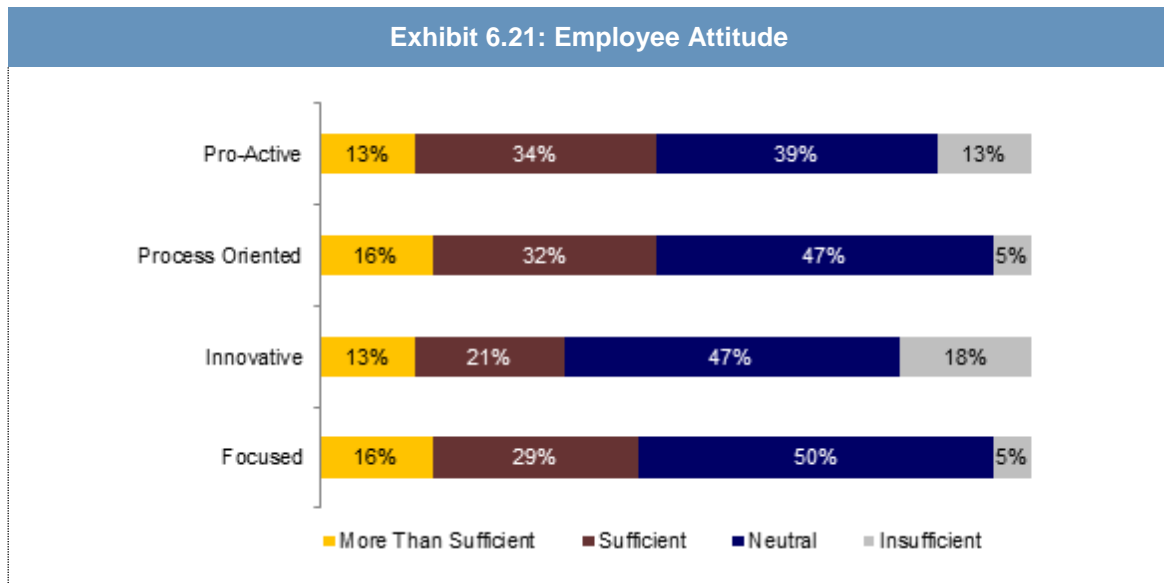
The soft skills of employees are important from organisation perspective as it helps in better coordination among employees, needs to deal with external world and to work in a collaborative environment. The level of observed soft skills with respect to communication, personality and attitude is lower as well. The environment on the shop floor is dominated largely by casual labourers and hence, handling these workers is an issue. Motivational techniques rarely work at such environments as compared to medium enterprises where the organization is largely driven by principles of human resource organization. The following charts exhibit the level of soft skills across the enterprises in the cluster.



With respect to the overall communication skills, more than sufficient levels were and verbal communication largely due to usage of local language (Marathi and Hindi) and hence, verbal communication is not a large issue with the firms in the cluster. Maximum problems are observed with respect to written skills especially within firms where documentation is higher.



With respect to the displayed personality traits, around 47% of the enterprises have indicated that the current levels are either neutral or relatively sufficient. Working with organization interest in mind is relatively less observed amongst the cluster firms (only around 26% have indicated more than sufficient in this case)



Existing levels of employee attitude is indicated as the largest problem amongst soft skills. Around 79% of the firms have indicated that their employees rank sufficient to neutral on being “Process Oriented”. Innovation is another issue amongst employees of the firms surveyed.

Enterprise-level initiatives

Medium enterprises are conducting regular training programs and workshops on quality, health and safety. These enterprises also afford to engage services of an external consultant. However, the small and micro enterprises have to rely on training modules available with the local BDS providers. These enterprises at times also attend the workshops conducted by MCCIA but these workshops are largely for the owners or the senior managers. Agricultural college of Pune offers short term programs on food technology, quality control and testing. A few firms have also sent their workers/ supervisors for such training programs.

Assessment of NSDC and other reports

National Skill Development Corporation (NSDC) has done a detailed study on mapping of human resource skills gaps in food processing sector in India till 2022. The report highlights the importance of technical skills required in the food processing sector and also the skill gaps at different stages of the value chain. The study reveals that India is the second largest producer of Fruits and Vegetables. The prominent processed items are fruit pulps and juices, fruit-based ready-to serve beverages, canned F&V, jams, squashes, pickles, chutneys, and dehydrated vegetables. The major products processed and exported are dried and preserved vegetables, mango pulp, pickle, and chutney. The study also reveals that Indians are becoming health conscious, but due to paucity of time, they prefer processed fruit and vegetables which will be fuelling the demand of these products in India in years to come.

As per the report current employment in the food processing industry for the organized sector is 1.5 million and in the unorganized sector is 7 million. The report reveals that significant proportion of the workforce is involved in Manufacturing Operations followed by functions such as Testing and Quality and other functions which include Sales and Distribution; support functions such as HR, administration, finance, etc.

However, the NSDC study does not capture skill gaps at enterprise level and hence, the skill sets of the industry leader and the laggards are not measurable. Also, the NSDC report focuses on skills through an education and experience route while D&B India has conducted the study through the process-function-domain requirements route. The advantage of the latter method is it enables to define and develop structured training modules for the identified gaps. These skill gaps are specific to the process and not generic. Lastly, the NSDC report applies to all fruits and vegetable processing centers while D&B India has concentrated only on the skill gaps in the Pune F&V cluster.

A comparative example in the production process from both the studies would highlight differences in approaches and the level of granularity that D&B India has conducted the study at the Pune cluster.

Exhibit 6.22: Assessment of NSDC Findings

Function	Skill gaps- NSDC Findings	Skill Gaps - D&B India Findings
Production	<p>Inadequate / restrictive motivational skills</p> <p>Inadequate documentation skills / not conversant with e-reporting / working on computers.</p>	<p>Lack of knowledge of advanced technology and excessive reliance on domestic and manual technology</p> <p>Lack of adequate maintenance related knowledge</p> <p>Lack of marketing skills and innovation</p> <p>Lack of regulatory aspects related to exports, taxation etc and documentation related issues.</p> <p>Inadequate ability to forecast demand and hence schedule production effectively</p>
Quality	<p>Inadequate awareness of quality norms</p> <p>No standard testing facilities</p>	<p>Lack of awareness of testing facilities</p> <p>Reliance on traditional quality control techniques</p> <p>Inappropriate quality checks at procurement and production</p>

Role of Industry Associations

Mahratta Chamber of Commerce, Industries and Agriculture (MCCIA) is a premier industry association with over 2500 members from different sectors like Automotive and Auto Ancillaries, Electronics, Agribusiness, Information Technology, Bio-Technology, Environmental Technologies, Chemicals, etc. It is one of the most active Chambers of Commerce in India catering to Pune and around region. It has been catalyst for economic development of Pune and has continuously strived to make Pune a global business destination.

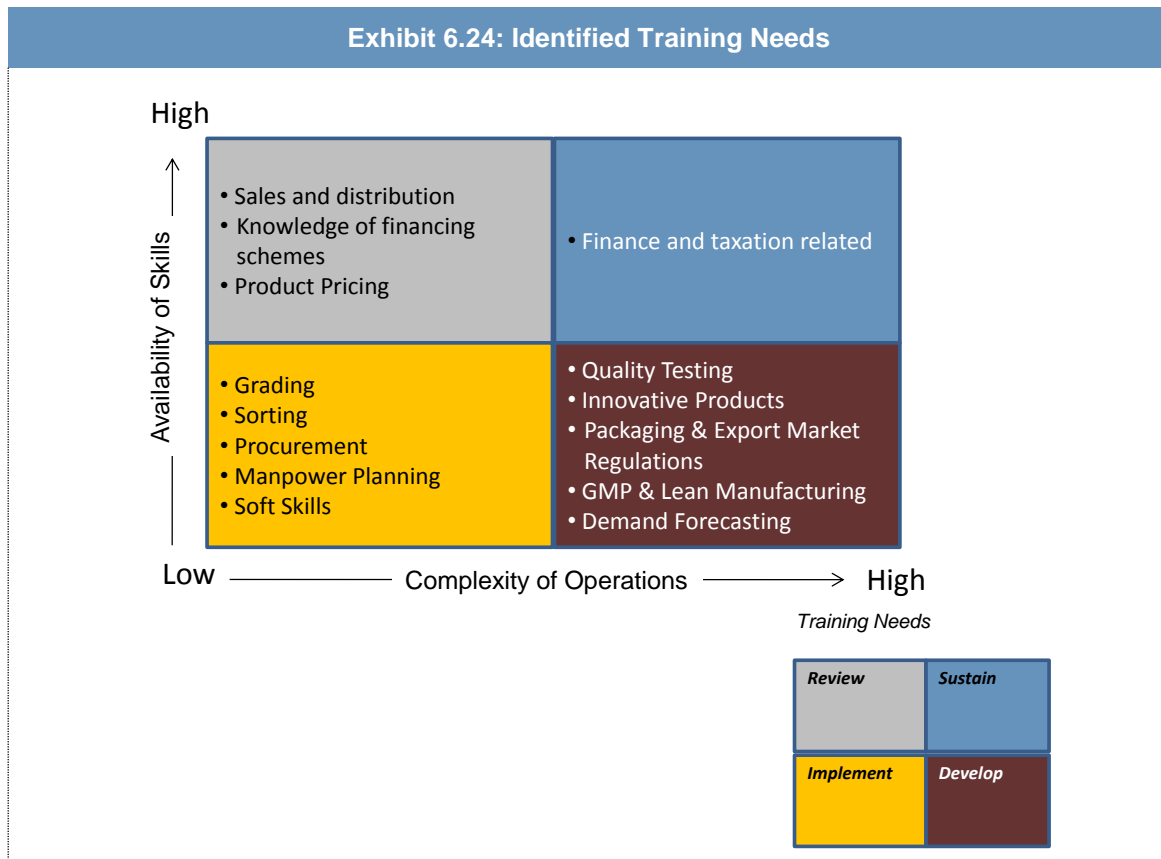
Exhibit 6.23 : Workshops Conducted by Industry Associations

Sr.No.	Workshops Conducted	Target Attendees
1	Workshop - Importance of Website in Marketing of Agri and Food Processing	Owners/ Senior Management
2	Seminar on New Trends in Packaging of Processed Foods	Supervisors and Workers
3	Workshop on Soybean Dal Analogue	
4	Training program On Market Identification and Effective Mktg. Tools	Marketing function related employees
5	Seminar on Govt. Schemes for MSMEs in Agribusiness and Agri Processing	Owners
6	B2B Meet between Processed Fruits and Vegetable Firms and Farmers	Owners and Farmers

Identified Training Needs in the Cluster

Production, quality and packaging are identified as important areas where training is required. In terms of marketing, export compliance and branding are important areas where training across forms of enterprises is required.

Assessment of skill set with respect to complexity of operations of the particular process was conducted to obtain insights on key areas where training is critical. Complexity of operations were assessed with the sample respondents to obtain an idea of the level of complications involved in the process for e.g. while procurement was indicated as a fairly simpler activity, quality and packaging were indicated as highly complex activities. The available skill sets were rated on the scale of sufficiency as perceived by the owner. The following matrix highlights the key areas where training requirements can be seen:



The following table further explains the training needs identified across key development areas and managerial levels:

Exhibit 6.25: Training Needs Identified		
Development Area	Worker/ Supervisory Training	Management Level Training
Production	Batch controls Process training Material grading, sorting etc.	Demand Planning and Forecasting Production scheduling and planning Manpower planning
Total Quality Management	Quality Testing Quality Assessment and Rejections	Quality Norms Importance of Product Certification
Equipment Maintenance	Machine knowledge Spares requirement planning	Preventive and predictive maintenance
GMP	Health and Hygiene Process sanitization	Standard Operating Procedures Effluent Treatment Techniques
Regulatory and Export compliance	Handling and Packaging	International regulations WHO standards International Taxation and Freight norms
Branding	Importance of labeling	Marketing Modules Market Development

Summary

Skill gaps in the fruits and vegetables clusters have been observed at all levels across the value chain in the cluster. These skill gaps are predominantly related to the awareness levels of the owner and the seasonal nature of the products manufactured. Mentioned below is a summary of major findings of the study:

- The cluster is faced with severe shortage of skilled and unskilled labour. Further, as mentioned, large part of the cluster output is seasonal and unskilled labour required for primary processing and handling cannot adjust themselves to the changing requirements as per the product of the season. For e.g. handling of mango during the pickles season is strikingly different than handling of spices or other fruits during some other season. The grading and primary processing techniques like cutting, salting, sun-drying etc. also differ from product to product.
- Very few training modules/ programs are available directly at the cluster level. Even if certain programs are available, these are largely at the entrepreneur level.
- Lack of technological awareness can be mentioned as another skill gap in the cluster. A large number of small and micro firms feel that since the product is traditional (e.g. pickles, spices, papads), no new advancements would be present on the technology front.
- Quality control is an activity that is conducted only as a requirement measure. No standard norms or practices are followed while quality checks. Government certified labs are used for quality certification; however, designated labs of NAFARI are not being used currently. It is easy to get the required certification from the smaller labs faster and at lower costs compared to NAFARI.
- Packaging and knowledge of packaging material is also limited with the medium scale enterprises. The small and micro firms largely cater to the regional and domestic markets and hence, awareness about innovative designs, attractive packing material etc is limited.
- Apart from technical skills, managers and supervisors also lack soft skills such as communication skills, team development and motivation skills for undertaking their activities.

The following Exhibit illustrates the tip sheet of Pune Cluster.

Exhibit 6.26: Tip Sheet Pune Cluster						
Pune	Shop Floor - Production					Middle Management
Processes in Value Chain	Farm produce	Primary processing	Secondary processing	Distribution	Quality control	Production
Sub Processes	Procurement, Price Negotiation, Cleaning	Grading, Sorting, Cutting, Trimming	Mixing fruit concentrate, Temperature control, Bottling/capping, Sterilisation, Cooling, Labeling	Packing and export market regulations	Quality checks at procurement, Quality control techniques	Procurement, Demand planning, Production scheduling, Quality norms, Product certification, Maintenance management
Type of Skill Requirement (Semi-skilled / Skilled)	Semi-skilled	Semi-skilled	Semi-skilled	Semi-skilled	Skilled	Skilled
Availability of Manpower (Low /Medium / High)	High	Low	Low	Medium	Medium	High
Skill Gap (Low/Medium/High)	Low	High	High	High	High	High
Training needs (Review /sustain /implement /Develop)	Implement	Implement	Implement	Review	Develop	Develop
Available Training Courses	Minimum Competency Vocational Course in Cookery, Diploma in Hotel Mangement and Catering technology, Certificate course in food production, Training programs for food sector under NAFARI's services, Bachelor's degree in food technology, Vocational course in Food Science and Quality control					Quality assurance and food safety management system, Training on GMP, Technology Management in Agri and Food sctor, Entrepreneurship Development programme, Business development programme
Available Training Institutes	Maharashtra State Institute of Hotel Management and catering technology, National Agriculture and Food Analysis and Research Institute (NAFARI), MIT college of food technology and management, SNDT college of Home Science					National Agriculture and Food Analysis and Research Institute (NAFARI)

Pune Marketing

Exhibit 6.27: Marketing Tip Sheet					
Marketing	Customer Development	Sales Force Effectiveness	Export compliance	Marketing Management	Demand Estimation
Sub-processes	New Market Identification, New customer identification, Relationship building with existing customers, Product Innovation	Effective monitoring of sales force, Developing right channel mix	Knowledge of various export related procedures	Brand awareness, Targeted pricing strategies, Product Marketing, Patenting	Quantitative tools, Structured Demand Estimations
Type of skill requirement(semi-skilled/skilled)	Technical: Semi-skilled, Managerial: Skilled	Technical: Semi-skilled, Managerial: Skilled	Technical: Skilled, Managerial: Semi-skilled	Technical: Semi-skilled, Managerial: Skilled	Technical: Skilled, Managerial: Skilled
Availability of manpower(Low/Medium/High)	Medium	High	High	Medium	Medium
Skill gap(Low/Medium/High)	High	Medium	High	High	High
Training needs(Review/Sustain/Implement/Develop)	Review	Develop	Implement	Implement	Develop
Available training courses	No training courses available				
Available training institutes	No institutional training available				

Annexures

Annexure 1: Skill Gap Analysis

Complexity of operations involved in the enterprise was evaluated vis-à-vis the available skill set to ascertain the gaps necessary for skill training. The following tables summarize the detailed analysis for the complexity-skill matrix contained in the report. The counts represent the number of firms that have provided the ratings in the sample selected. The highlighted cells are definite training needs where the complexity rating of the activity is higher whilst the available skill to perform the job is lower. Certain areas where complexity is lower but available skills are higher are also identified as training needs.

Procurement - Complexity Vs. Skill Matrix					
Procurement	Skill Availability Rating				
Complexity Rating	Nearly Insufficient(2)	Moderately Sufficient (3)	Sufficient (4)	More than sufficient (5)	Grand Total
Not Very Complex (2)	4	4	4	-	12
Somewhat complex (3)	2	14	7	3	26
Grand Total	6	18	11	3	38

Grading, Sorting - Complexity Vs. Skill Matrix					
Grading, Sorting etc.	Skill Availability Rating				
Complexity Rating	Nearly Insufficient(2)	Moderately Sufficient (3)	Sufficient (4)	More than sufficient (5)	Grand Total
Not Very Complex (2)	2	5	4	-	11
Somewhat complex (3)	2	1	2	-	5
Moderately complex (4)	3	13	5	1	22
Grand Total	7	19	11	1	38

Production - Complexity Vs. Skill Matrix					
Production	Skill Availability Rating				
Complexity Rating	Nearly Insufficient(2)	Moderately Sufficient (3)	Sufficient (4)	More than sufficient (5)	Grand Total
Not Very Complex (2)	5	6	5	3	19
Somewhat complex (3)	4	4	5	2	15
Moderately complex (4)	1	3	-	-	4
Grand Total	10	13	10	5	38

Quality - Complexity Vs. Skill Matrix					
Quality	Skill Availability Rating				
Complexity Rating	Nearly Insufficient(2)	Moderately Sufficient (3)	Sufficient (4)	More than sufficient (5)	Grand Total
Not Very Complex (2)	6	9	3	1	19
Somewhat complex (3)	6	4	5	2	15
Moderately complex (4)	-	1	1	-	4
Grand Total	12	14	9	3	38

Packaging - Complexity Vs. Skill Matrix					
Quality	Skill Availability Rating				
Complexity Rating	Nearly Insufficient(2)	Moderately Sufficient (3)	Sufficient (4)	More than sufficient (5)	Grand Total
Not Very Complex (2)	10	7	6	1	24
Somewhat complex (3)	6	1	2	3	12
Moderately complex (4)	-	2	-	-	2
Grand Total	16	10	8	4	38

Annexure 2: Select Case Study

Organisation Profile

Organization Profile Information	
Name of Enterprise	PKM Foods Limited
Name of Entrepreneur	Mr Rahul Jadhav
Type of MSME	Medium
Form of organization	Sole Proprietorship
Products	Spices, Ready to cook (sub-contracted)
Employees	150

About the Company

PKM foods was incorporated in the year 2005 from a small organization called Prakash Masale which was run from the household of Mr. Sanjay Jadhav. The annual production of spices (masala) is around 8000 Kgs. Of these, around 20% of the output is produced under a sub-contracting agreement with Mother's Recipe. The total number of full time employees in the organization is around 30 and about 50 workers are part-time/ casual labourers.

Interaction with the owner of PKM Foods Ltd

Following issues and key skill gaps were highlighted by Mr. Jadhav:

- In terms of procurement, raw materials required are purchased from Pune, Gujarat, and Maharashtra. They have also tie ups with various suppliers that provide raw materials to PKM Foods Pvt Ltd. However, the staff is not skilled to assess the quality of procured raw material nor do they have access to pricing from other markets. Therefore, PKM has to rely on the suppliers for price, quantity related information. Of late, due to food price inflation, even the regular suppliers are not providing adequate discounts to PKM and hence, identifying new suppliers is a challenge.
- Production is carried out without using any scientific methods of demand forecasting, production planning etc. The activity is purely led by marketing inputs and due to this, over-production is commonly observed at the plant. As an example, Mr. Jadhav cited that in the previous year, they overproduced pickles by 20% and hence, had to offload as institutional sales at lower prices leading to margin erosion.
- The workers are not aware of adequate product quality norms and hence, tend to rely on sensory tests. Though knowledge of HACCP (Hazard Analysis Critical Control Point) as an internationally accepted technique for preventing microbiological, chemical and physical contamination along the food supply chain is known to Mr. Jadhav, no other employees are aware of such norms.
- Maintenance is regularly carried out in the firm due to usage of obsolete and older machinery. An entire day, Thursday, is reserved for planned shutdown. The major reason is during the week the

plant faces above-average wear and tear and hence, a day is lost in maintaining the equipment, sourcing the spares etc. if required. There are only 2 mechanical engineers in the firm, however, these two have also not had formal engineering training but have mastered it through ITIs and other centers.

Annexure 3: List of Firms/ Meetings Conducted

Respondents		
Name	Organization	Designation
Mr. Anant Sardeshmukh	MCCIA	MCCIA
Mr. S. V Malpure	Mandar Food Products	Proprietor
Mr. Rahul Jadhav	PKM Foods Ltd	Managing Director
Mr. Jayant Pradhan	Lijjat Papad	Consultant
Mr. Sunil Gupta	Wiekfield Foods Pvt Ltd	Vice President
Mr. Govind Hardikar	Hardikar's Food Technologies Pvt Ltd	Managing Director
Mr Tejani	GITS	Managing Director

Chandigarh-Mohali-Panchkhula Cluster

Cluster Overview

Nature of Industrial Activity

Chandigarh is the common capital of two neighboring states—Punjab and Haryana. It has two satellite cities (both of which share a border with it): Panchkula on the east and Mohali on the west. These three cities together form a rough triangular area, known as the 'Chandigarh tri-city cluster'. The enterprises in the cluster can be classified into three major categories:

- Light engineering industries
- Steel fabrication
- Fasteners

In order to assess the nature of skill gaps in the cluster, D&B India conducted a quantitative survey amongst the enterprises in the various categories across the cluster. It was also ensured that the representation of micro, small and medium enterprises was adequate.

Skill gaps in the tri-city cluster were observed at all levels across the value chain in the cluster. Mentioned below is a summary of major findings of the study:

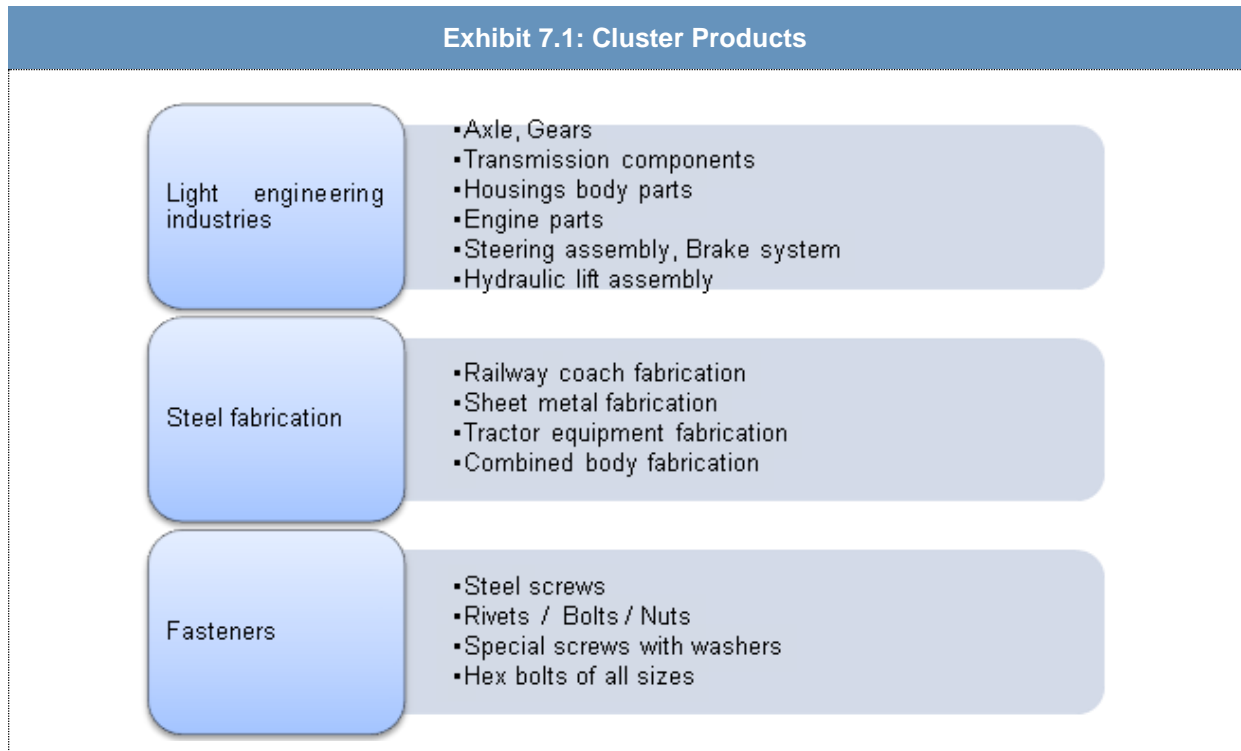
- The cluster is faced with severe shortage of skilled and unskilled labor.
- In order to combat the shortage of workers, a pilot project involving training women from rural areas of Punjab to work in the cluster did not meet with much success.
- The firms do not invest in research and development capabilities to develop and manufacture improved products.
- There is a lack of knowledge about quality control processes such as six sigma, kaizen, 5S etc. among the entrepreneurs in the cluster.
- There is a clear need for increased information exchange between the industry and the training institutes to improve the supply of trained resources as per the industry requirements.

Cluster Profile

The establishment of major manufacturing plants such as Swaraj Enterprises (Punjab Tractor Limited, Swaraj Majda, Swaraj Engines and Swaraj Combines) and Hindustan Machine Tools in the tri-city area during the 1970's led to the industrial development of this cluster. These Original Equipment Manufacturers (OEMs) created a huge demand for the supply of auto and tractor components which encouraged entrepreneurs to establish their ancillary manufacturing units in the nearby areas. In 1985 the setting up of the Rail Coach Factory at Kapurthala for the manufacture of passenger coaches and wagons gave a further boost to the enterprises in the cluster to expand their operations.

SME engineering units in the tri-city cluster manufacture a wide range of products such as machined parts for tractors, automobiles and railways; fasteners; scaffolding; steel fabrication; locks, mortises,

padlocks and door fittings; non-ferrous metal/ CI castings; sanitary fittings; and tool die makers for miscellaneous heavy industries. However, more than 60% of the engineering units in the tri-city cluster are ancillary units engaged in machining parts for railways, automobiles and tractors; sheet metal components; steel fabrication; and fasteners/wire drawings. The exhibit below provides the summary of major products manufactured by MSME's in the cluster:



The exhibit below captures information related to the micro, small and medium enterprises in the tricity cluster.

Exhibit 7.2: Chandigarh – Panchkula – Mohali Cluster Information						
Sub-Sectors	Locations	Micro Units	Small Units	Medium Units	Employment	Turnover (Rs. Crore)
Light engineering enterprises	Chandigarh	314	284	31	5661	295
	Mohali	361	325	36	6498	247
	Panchkhula	218	196	22	3915	198
Steel fabrication	Chandigarh	59	43	5	1820	122
	Mohali	48	35	4	342	18
	Panchkhula	41	30	4	507	24
Fasteners	Chandigarh	156	91	13	963	50
	Mohali	24	14	1	762	41
	Panchkhula	33	19	3	617	34
Total		1254	1037	119	21085	1029

Source: Chandigarh BDS website

Cluster Ecosystems and Inter-Linkages

Steel Authority of India Limited (SAIL) and Rashtriya Ispat Nigam Limited (RINL) have their sales depot in the cluster and supply directly to the bigger manufacturing units with annual requirement of 600 tons per annum. Chandigarh Industrial & Tourism Development Corporation Limited (CITCO) sources raw materials from SAIL or RINL and supplies to the smaller units. In addition there are local distributors in the cluster who supply to the smaller firms.

The cluster units mainly cater to the demands of tractor, auto or railway manufacturers located in the nearby areas. In terms of outsourcing, there are well established linkages between the units in the cluster. Some of the major functions for which the enterprises avail the services of external firms are heat treatment, forging, casting and cutting gear blanks. Majority of these units are involved in directly supplying the OEMs or to some other ancillary enterprises who in turn are supplying the OEMs.

The larger original equipment manufacturers (OEMs) which source their requirements from the cluster are listed below:

- Mahindra and Mahindra (Punjab Tractors Limited, Swaraj Combines)

- HMT tractors, Panchkhula
- Rail Coach Factory, Kapurthala
- Sonalika Tractors, Hoshiarpur
- Swaraj Mazda, Ropar

The OEMs generally maintain a pool of permanent vendors which supply to them. The OEMs follow a transparent tendering process without involvement of any intermediaries. The vendors submit their quotations to the OEM which are analyzed on the three parameters of quality, cost effectiveness and delivery time. There is intense competition among the vendors.

The OEMs are primarily responsible for initiating and driving any new product or process innovations. There is a sense of complacency among the entrepreneurs in this cluster. The growth in automobile and tractor segments presents a huge potential opportunity to the entrepreneurs in the cluster. However the enterprise owners are content to maintain the status quo and not looking to diversify into new product areas or markets. One of the key reasons for the lack of investment on the part of the entrepreneurs is that the funds have been diverted to real estate which has recorded a sharp rise in prices in the tri-city cluster area. Real estate investments have been providing a better return, thus entrepreneurs have been reluctant to invest in their manufacturing operations.

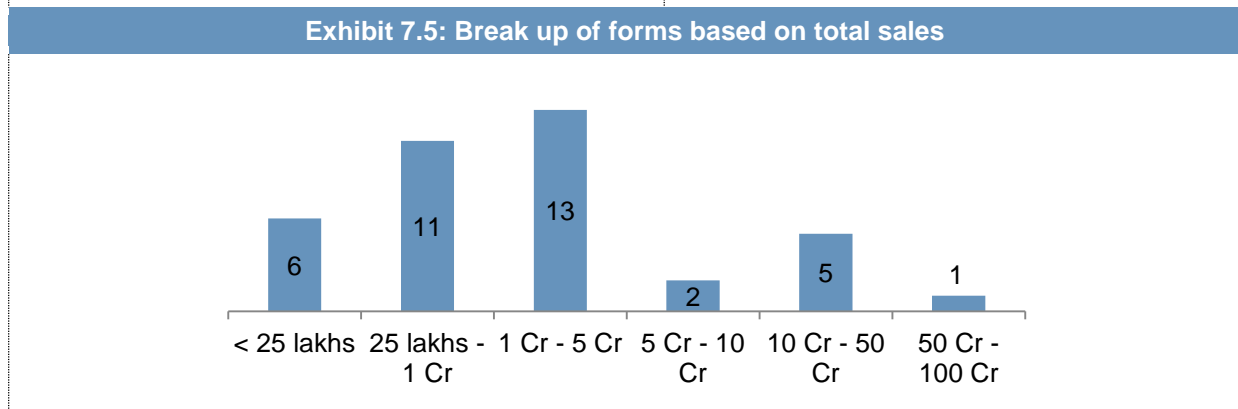
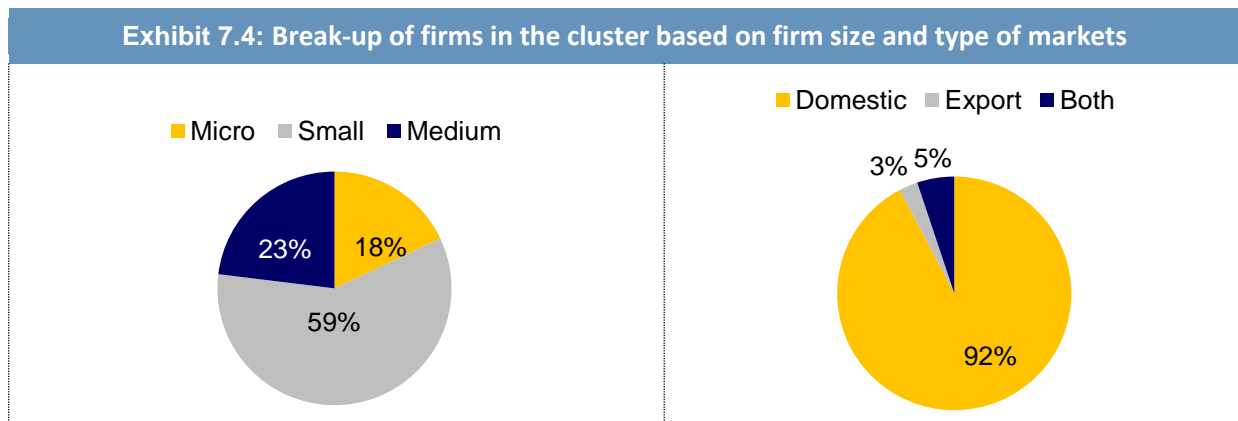
Skill Gap Assessment

Sampling

D&B India has conducted the initial round of qualitative interactions with various firms in the engineering cluster. Primary assessments were conducted to understand key linkages and processes within the cluster, primary markets and specific marketing initiatives and knowledge about financing programs. MSME enterprises were selected on the basis of their position in the value chain. The qualitative samples were selected to include one firm from each segment within the cluster. It was also ensured that the firms selected could be representative set of the Micro, Small and Medium Enterprises. The following table summarizes the sample coverage for the study.

Exhibit 7.3: Sample Survey Coverage	
Products	Samples Covered
Light engineering enterprises	15
Steel fabricating units	12
Fasteners	12

Appropriate mix of samples was covered across the cluster using sales, primary selling markets etc. The following charts represent the sample profiles. Around 92% of the sample firms covered was predominantly operating in domestic markets.



Process Based Observations

Production

The engineering enterprises in the cluster manufacturing different kinds of auto, tractor and machine components primarily uses conventional machines such as lathe, drilling, horizontal & vertical milling, shaping, broaching, welding, grinding etc. There appears to be a huge **shortage of skilled labor** for performing these operations. The National Rural Employment Guarantee Scheme (NREGS) initiated by the government has provided alternate employment avenues for workers in the cluster, thereby further aggravating the shortage of skilled workers. The numbers of migratory workers, majority of who come from Bihar and Orissa have reduced because NREGS.

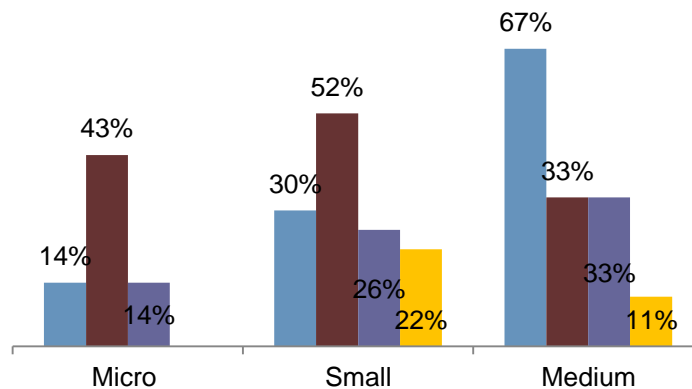
Both the migratory and locally available workers typically do not have any formal education or vocational skills. The entrepreneurs are forced to employ these unskilled workers and train them on the job. The absence of any formal training program means that both the productivity of workers and quality of their work suffer. Skill development training programs focusing on unemployed youth and women from the rural areas need to be carried out so as to increase the supply of skilled workers.

- Majority of the enterprises still continue to **use conventional machines in their manufacturing operations**. The medium category enterprises are the leaders in terms of technology adoption using modern CNC machines, CAD and CAM in their day to day operations. The latest CNC machines allow for better quality and higher productivity as compared to conventional machines.

As we move across the spectrum from medium towards the small and finally micro category enterprises the adoption rate of modern technology consistently reduces. The **bigger units have the financial muscle to invest in latest technology** such as expensive CNC machines.

However not all technological innovations involve a huge capital investment. There is a simple **low cast ratchet mechanism to automate** the arc welding process, which greatly increases the accuracy and productivity of the operation. Unfortunately, information about such low cost automation techniques is not easily available to the units in the cluster. Hence there is need for a structured approach to collect and share information about such low cost innovations both in terms of new machines and processes among the entrepreneurs in the cluster.

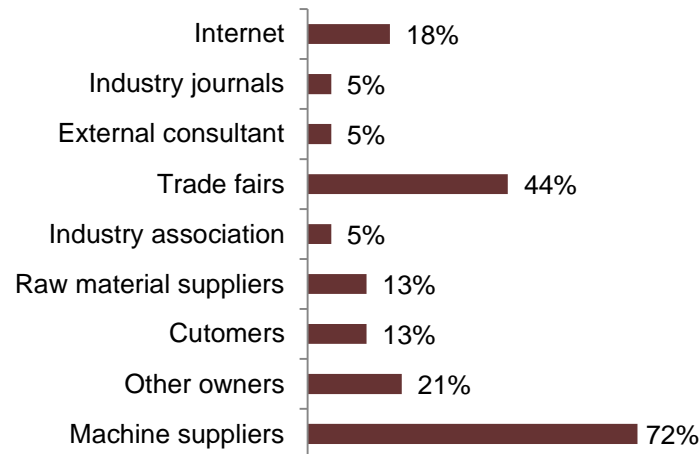
Exhibit 7.6: Type of Technology Used across Various Firms



Note: The chart represents the current technology being used at the enterprises. For a particular category of enterprise (micro, small or medium), the values indicate the % of enterprise in that category using a particular technology.

- The machine suppliers are most active in advising the entrepreneurs about the **latest equipment and technology** that is available in the market. In addition a significant proportion of the entrepreneurs also visit trade fairs in order to keep themselves updated about the latest technology innovations.

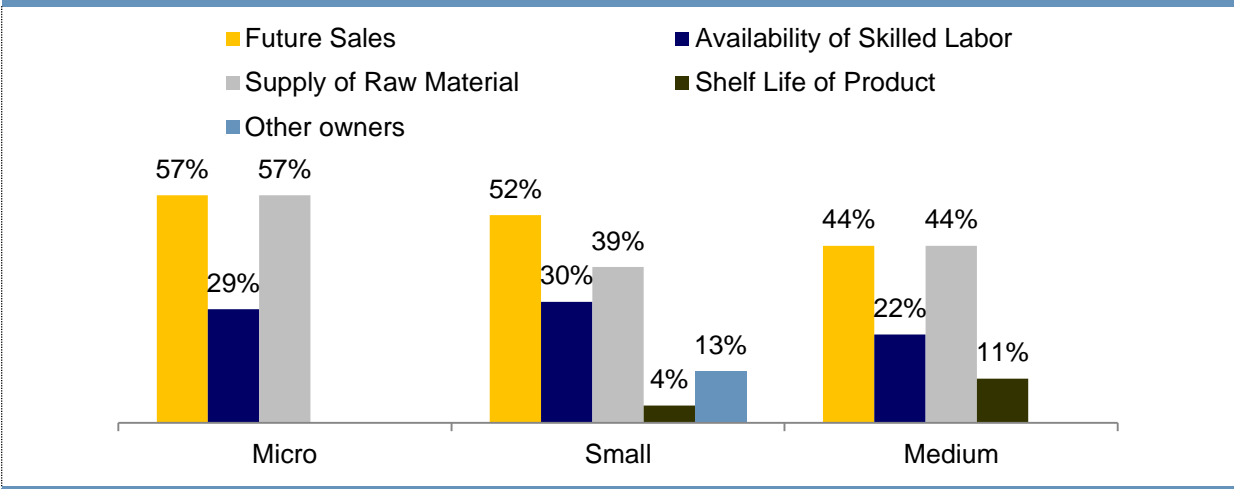
Exhibit 7.7: Source of information for technology used



Note: The chart indicates the % of firms who accessed each information source listed in the exhibit.

- Knowledge of **production planning and scheduling** is quite rudimentary across the micro and small firms. The enterprises in the cluster are involved in directly supplying the OEMs or to some other ancillary enterprises who in turn are supplying the OEMs. The OEMs generally source their supplies through a tendering process. Due to uncertainty associated with the tendering process, majority of the entrepreneurs in the cluster **cannot forecast with great accuracy their future sales**. The lack of clarity associated with sales projections has a cascading effect on the production planning process as the entrepreneurs are not able properly estimate their labor or raw material requirements.

Exhibit 7.8: Production planning inputs

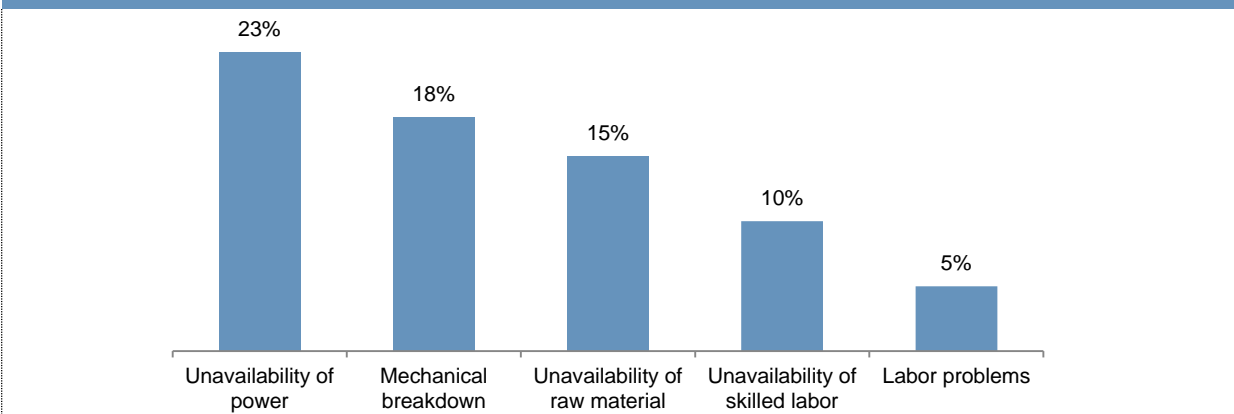


Note: For a particular category of enterprise (micro, small or medium), the values indicate the % of enterprise in that category aware of each listed parameter.

- A little more than half of the firms (54%) indicated that they did not experience any **production outage**. The second major cause for unscheduled production stoppage is due to **mechanical breakdown**, which indicates a problem with **maintenance expertise** among the units in the cluster. There is an acute shortage of qualified maintenance staff in the cluster. This problem is especially acute for CNC machines, where even the CNC machine suppliers are not always able to service the machines in time. Although there is a certain amount of awareness about preventive maintenance techniques but majority of the firms don't follow these rigorously in order to reduce the downtime of the equipment.

The timely delivery of orders is a key concern and hence the entrepreneurs are willing to pay higher salaries to **retain their experienced and highly skilled machines operators** to ensure continuity in production. In spite of this on certain occasions the entrepreneurs are forced to experience production stoppages due to lack of skilled workers as indicated by about 10% of the entrepreneurs.

Exhibit 7.9: Reasons for production outage



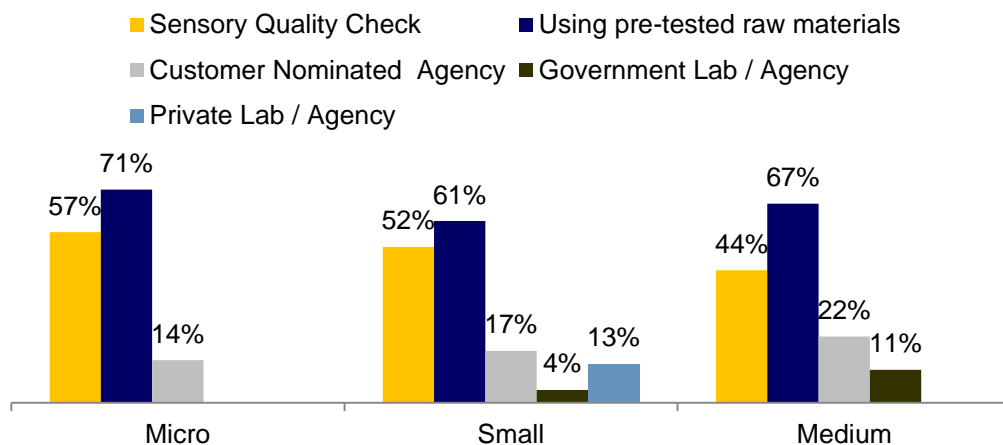
- As majority of the firms in the cluster directly or indirectly cater to the OEMs, ensuring **end product quality** is of critical significance for the firms. According to Mahindra & Mahindra officials, a large OEM, the firms in the cluster are aware of modern quality norms such as TQM, 5S etc., however there is a gap in the understanding of how to implement these processes within an enterprise. Majority of the units in the cluster lack adequate knowledge of identifying critical points in the production where defects can be introduced, etc. There is urgent need for quality experts who can prepare a clear implementation road map for modern quality processes customized to the needs of the enterprise.

The primary raw material used in the cluster is mild steel, which is either sourced directly from the manufacturers such as RINL, SAIL or from distributors who in turn source it from these companies. This steel which has already been tested by the manufacturers themselves ensures that the enterprises in the cluster are using **pre tested materials**.

A significant proportion of the units still continue to depend on **sensory quality testing**. This is due to an acute shortage of skilled labor having adequate knowledge to calibrate and operate basic quality checking tools such as vernier calipers, screw gauges etc.

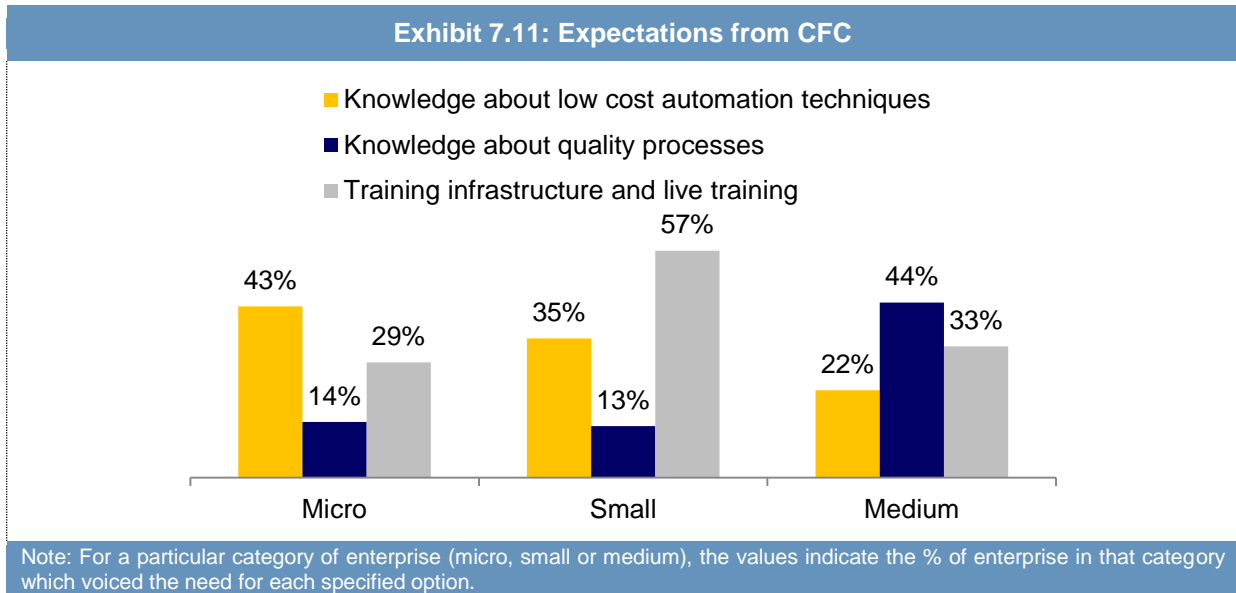
There are **three private and one government laboratory** in the cluster but none of them are National Accreditation Board for Testing and Calibration Laboratories (NABL) accredited. This explains why such a low proportion of firms get their products tested at a lab. The enterprises are required to send their products to NABL accredited labs in the NCR region. There is urgent need to ensure availability of NABL accredited testing facilities within the clusters.

Exhibit 7.10: Quality checks



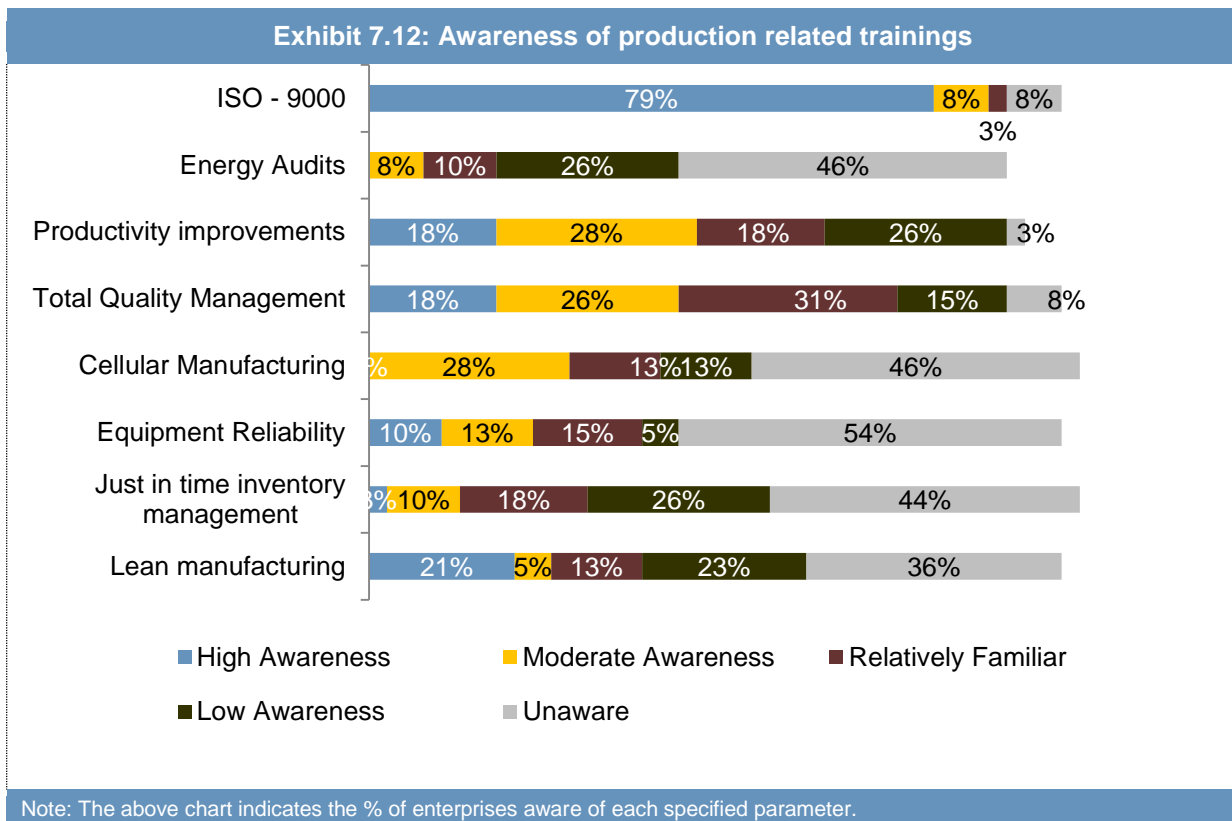
Note: For a particular category of enterprise (micro, small or medium), the values indicate the % of enterprise in that category doing each listed quality check.

- The exhibit below depicts the main services that the **Common Facility Center (CFC)** should provide to the firms in the cluster.



As evident from the exhibit above with decrease in investment capacity from medium to micro enterprises, the proportion of units wanting information about low cost automation techniques increases. A very low proportion of micro and small enterprises have voiced the need for information about quality processes. This is because the lack of awareness about the importance of quality processes is much higher in micro and small category of firms as compared to the medium category. The provision of training infrastructure and conducting training is a common need voiced by firms across MSME categories.

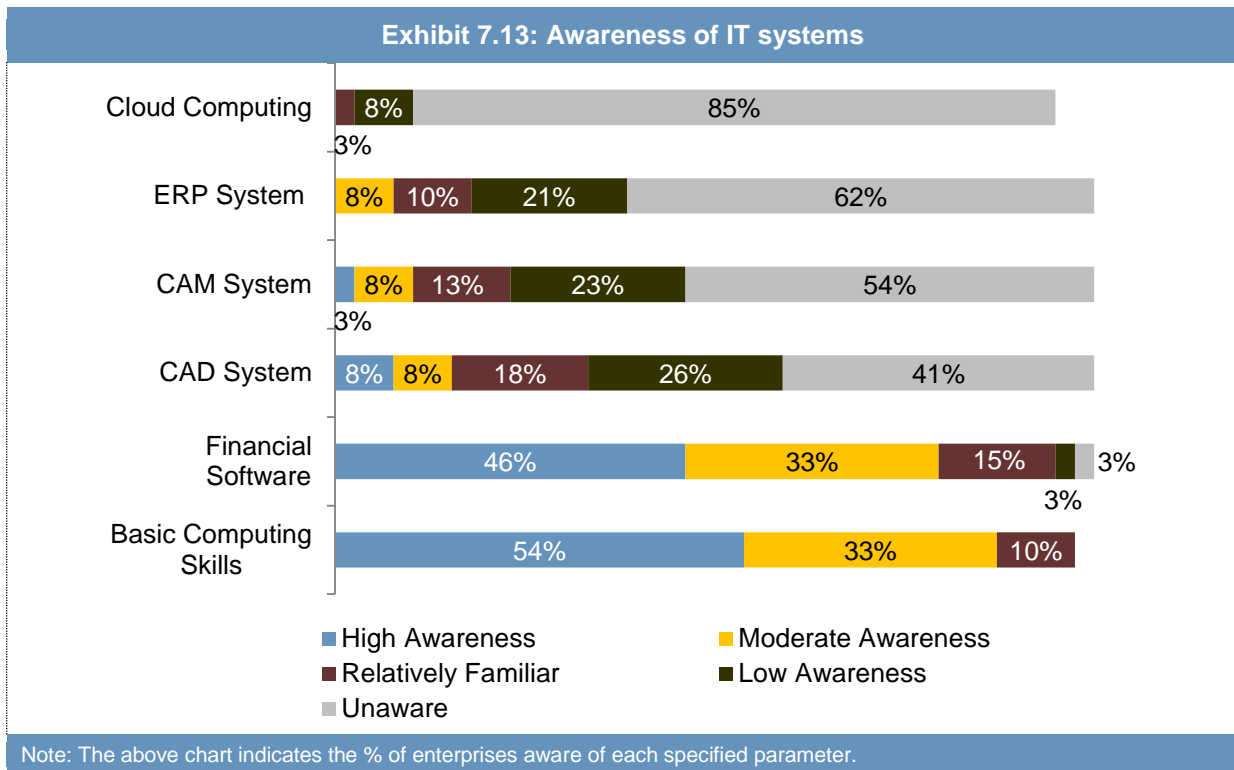
- The following exhibit summarizes the awareness level of firms in the cluster about training programs related to **production**.



The entrepreneurs in the cluster have a very low awareness level about **lean manufacturing**. As a result, they lack knowledge about specific facets of the lean manufacturing process such as just in time (JIT) inventory management, preventive maintenance, equipment reliability (preventive maintenance) and cellular manufacturing. There is a big lacuna in understanding of **TQM** principles among the firms in the cluster.

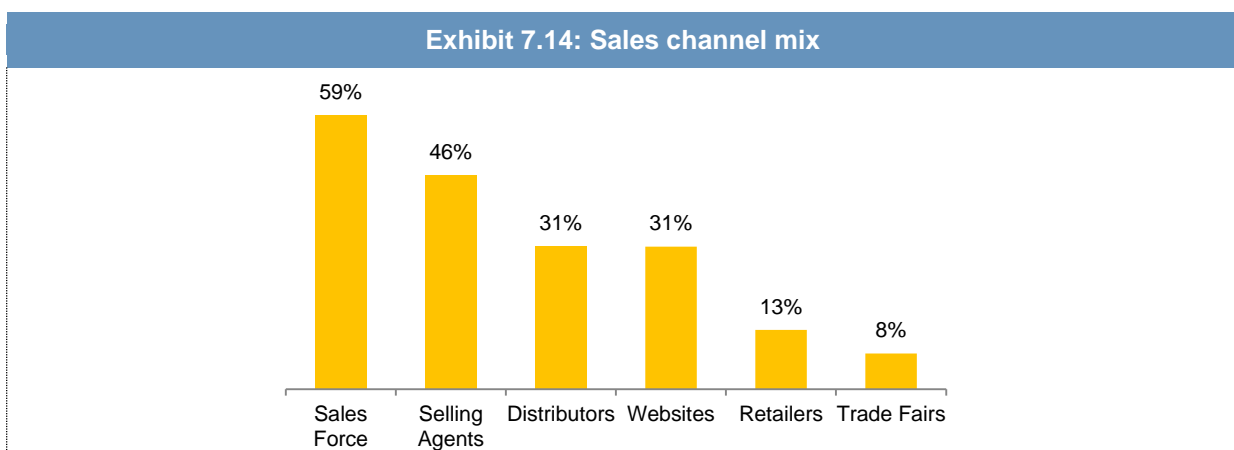
A key pain area for the entrepreneurs in the cluster is the lack of knowledge about energy audits. Majority of the enterprises in the cluster do not measure employee productivity. They need to be sensitized about productivity benchmarks and processes to improve productivity. There is a very high degree of awareness about the importance of ISO norms among the entrepreneurs. There are many external consultants available in the cluster to help the entrepreneurs to comply with ISO norms.

- In terms of **IT systems** such as ERP and cloud computing, the awareness is pretty low among the firms in the cluster. Only a few of the bigger players in the cluster are able to afford these systems for operations management, inventory control, customer management. The usage of CAD and CAM is also limited among the majority of the firms. The vendors mainly use the design as supplied by the OEM, hence there is not much need for computer aided designing. The tolerance and fit as required by the customers of the firms in the cluster can be achieved by conventional machines; hence the awareness about CAM is not very high. In terms of financial software and basic computing skills, the awareness level of the firms is pretty high.



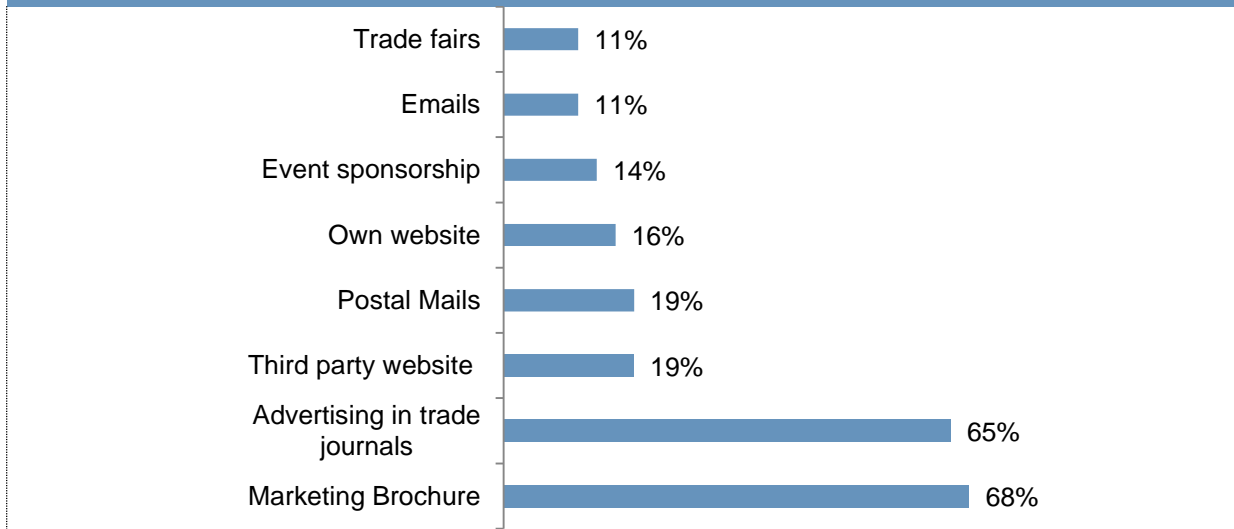
Sales & Marketing

- A high proportion of the enterprises are dependent on their **sales team to reach their customers**. The sales staff would be pushed into the market to collect information about potential demand. The sales staff had adequate knowledge of the industry but was not aware of modern marketing techniques. The other significant avenues for **generating sales** are through **sales agents, websites and distributors**. Some of the enterprises **primarily fastener manufacturers also use retailers** to sell their products.



- Primarily the entrepreneurs **promoted their products** by advertising in trade journals. The low proportion of firms having a website indicates the low awareness among entrepreneurs about internet as an effective marketing medium. The entrepreneurs need to be sensitized about how internet can be leveraged to provide a low cost solution to get in touch with potential buyers.

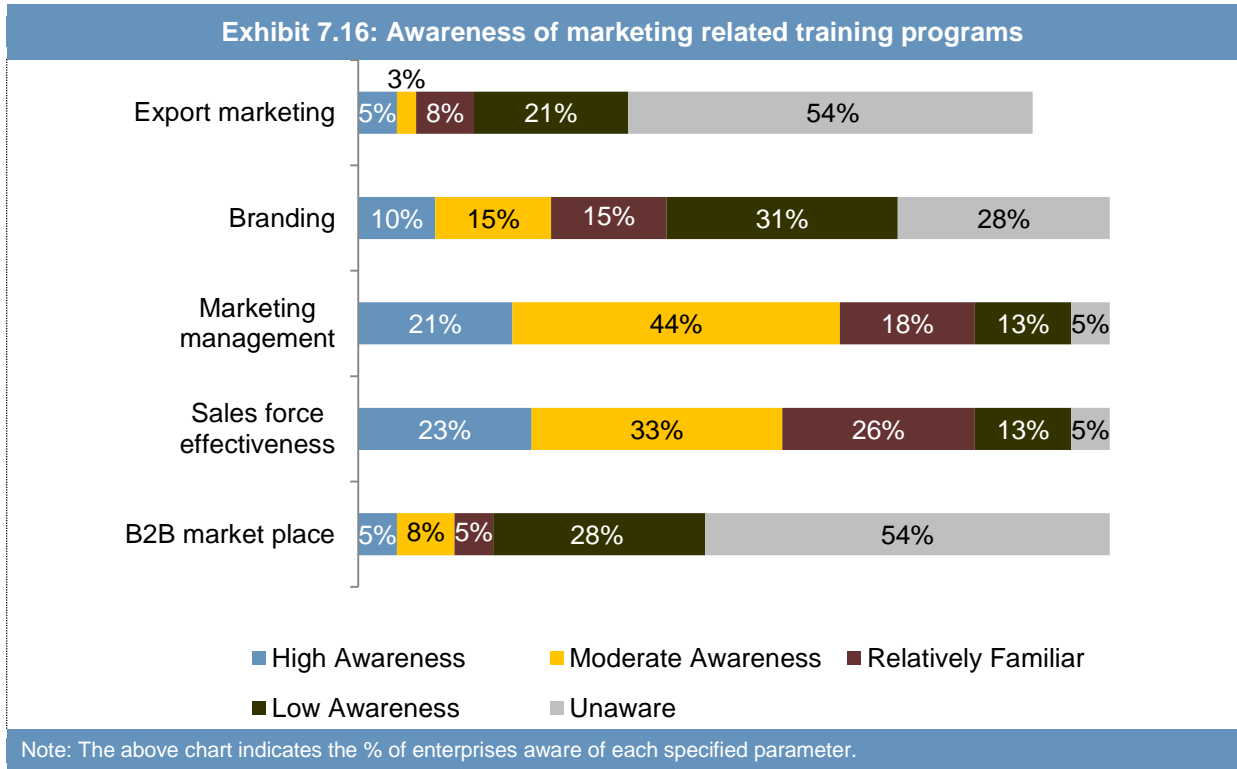
Exhibit 7.15: Promotional methods



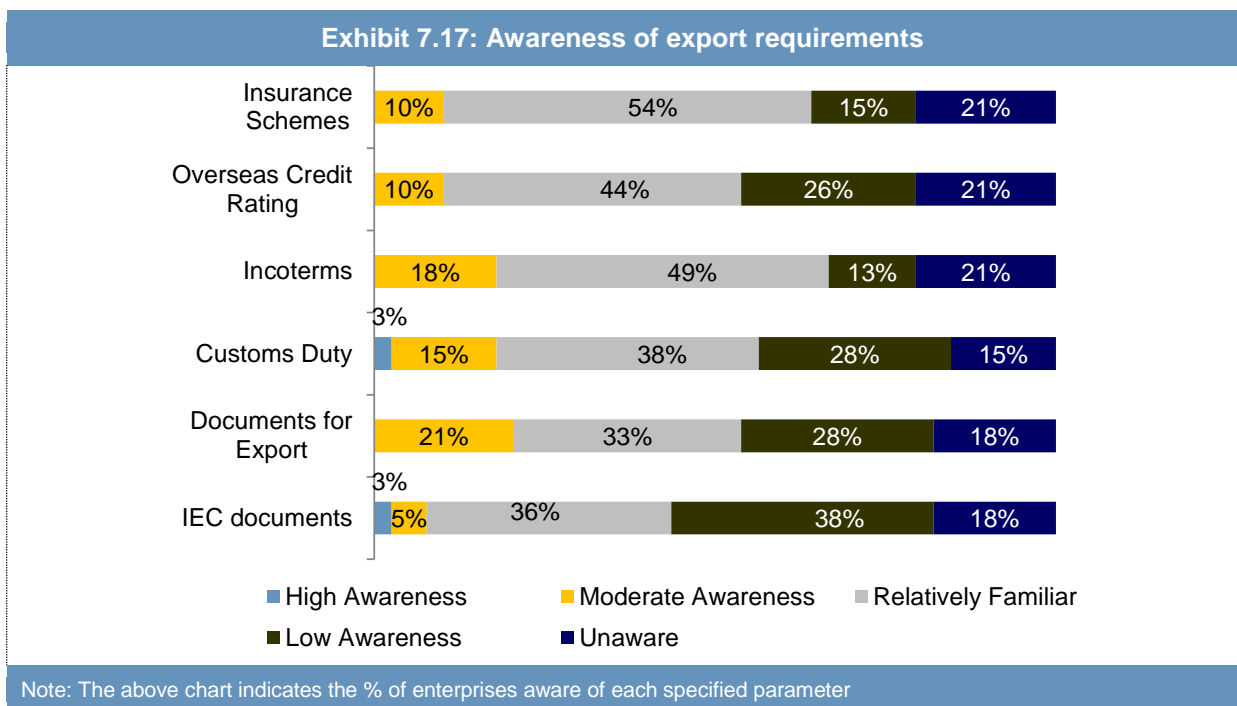
- The entrepreneurs in the cluster are reluctant to invest and build **marketing capabilities**. The units in the cluster primarily sell their products to large manufacturers (OEMs) located in the nearby areas. The OEMs maintain a pool of dedicated vendors and demand complete loyalty from them. The vendors are actively discouraged from entering into supply agreements with other competing OEMs. Hence the entrepreneurs do not make any major efforts to contact and build relationships with new buyers either domestic or foreign.

Even among the dedicated vendors maintained by the OEM, there is tremendous competitive pressure to offer the lowest prices without compromising on the quality or delivery schedule. It was observed that most of the enterprises set the price of the product according to their near competitor. The enterprise owners have not made any efforts to invest in **brand building** activities which would allow them to charge a premium price for their products.

The low proportion of firms having web sites, indicate a major lacuna with respect to knowledge of **ecommerce and other digital marketing tools**. There is not much awareness among firms about **export marketing** because primarily the firms in the cluster supply directly or indirectly to OEMs located in and around the cluster. The proportion of firms involved in exports is quite low.

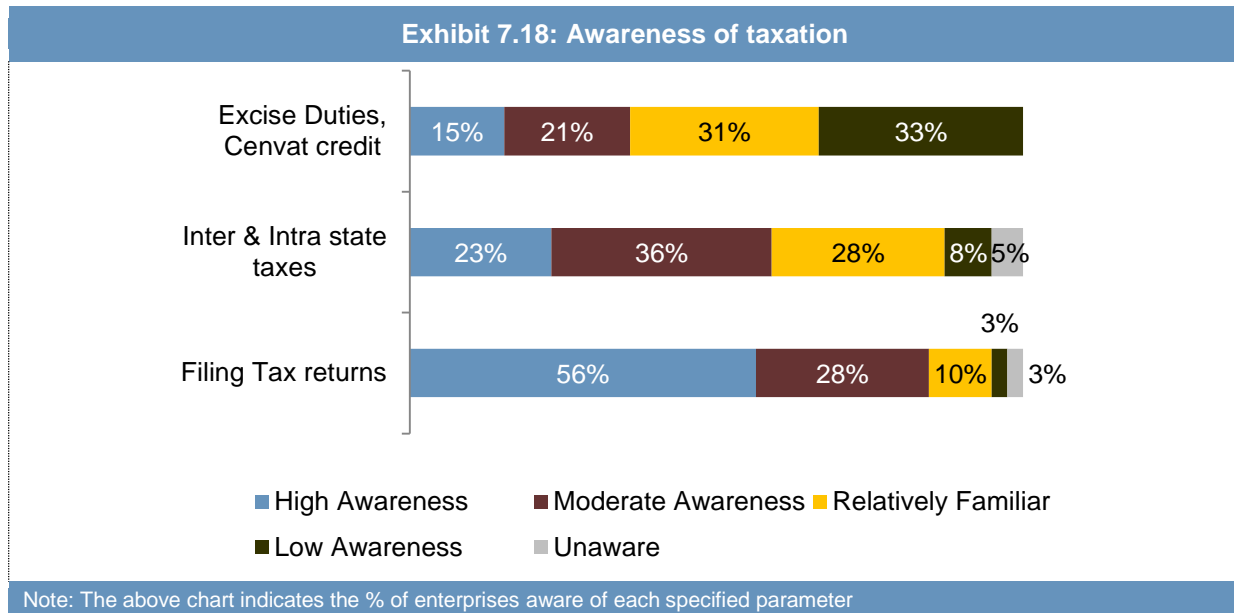


- The enterprises are not at all aware of the various **regulations, procedures and documents required for exports**. The firms in the cluster directly or indirectly supply to OEMs in the nearby areas and hence there is not much requirement for knowledge about export related finance matters. In addition there is a sense of complacency among the entrepreneurs who lack the required motivation to look for and break into new foreign markets. A specific training module covering export rules, documentation, importing country regulations and customs duty would be very helpful to the entrepreneurs in the cluster.

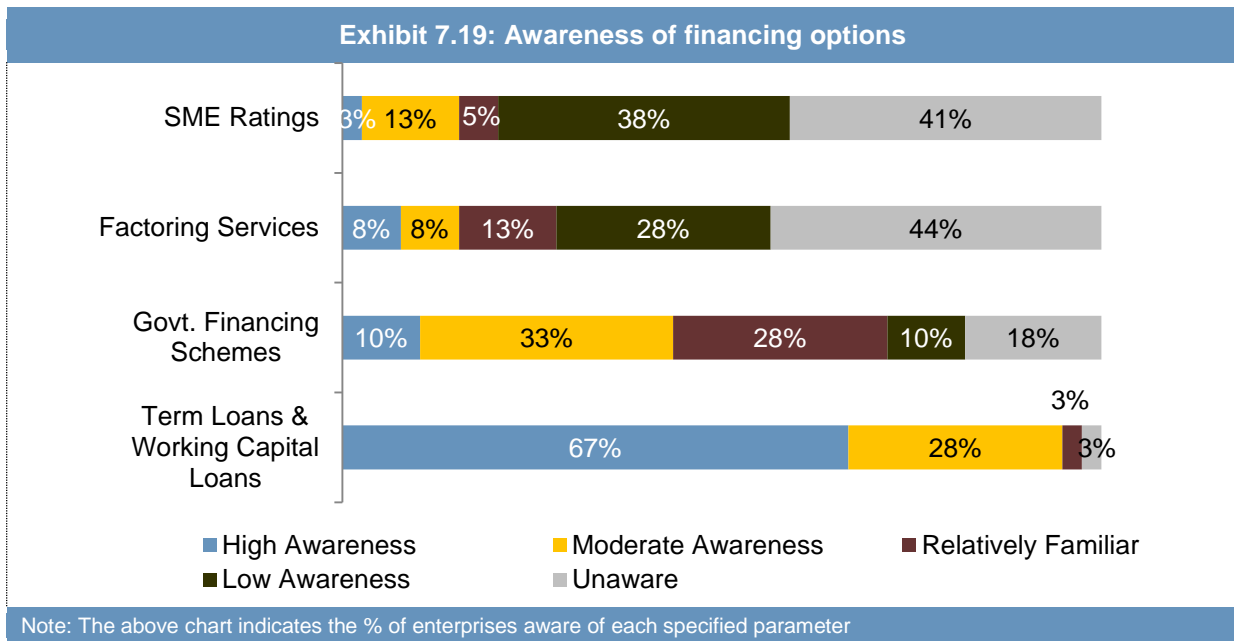


Finance

- A key concern in the finance function is the lack of knowledge about excise duties and cenvat credit. About 56% of the enterprises have indicated a high level of awareness about filing of tax returns. Majority of the firms in the cluster rely on the services of external CAs for preparing and filing tax returns. However many of the micro and smaller units are not able to afford the services of external consultants.

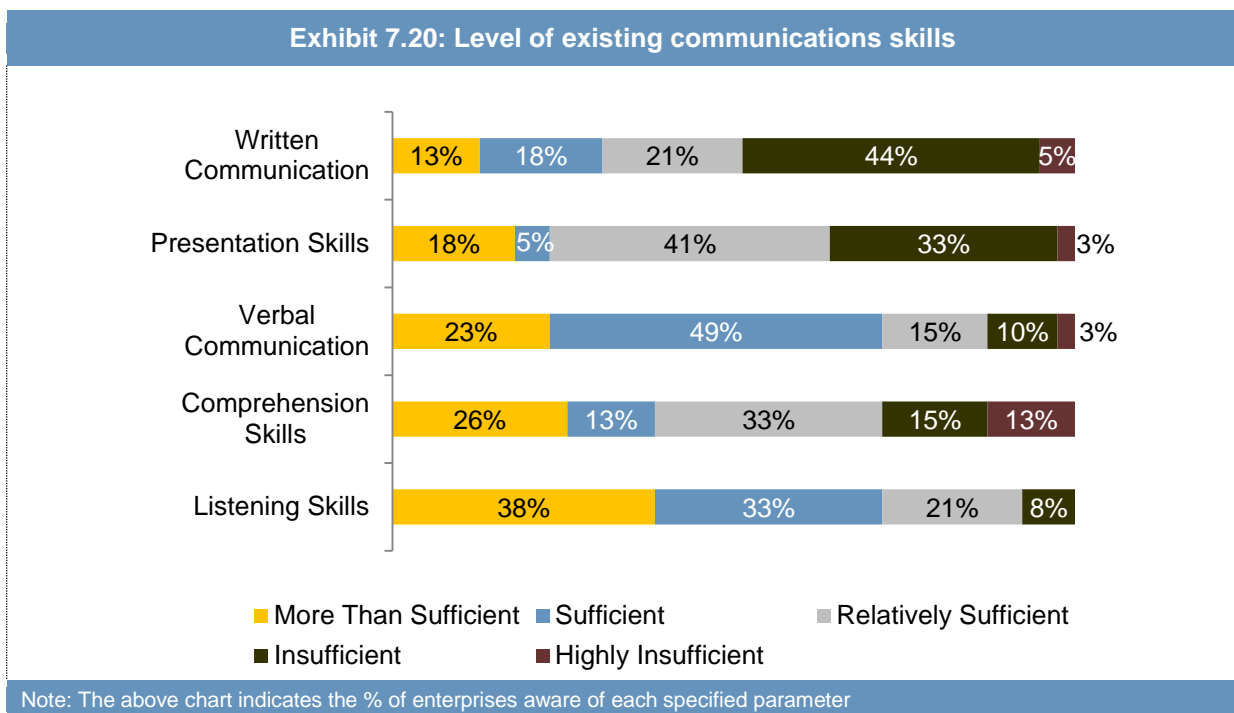


- The entrepreneurs in the cluster primarily tap the banking officials to obtain information about the **working capital and term loans** offered by the banks. In additions the OEMs also provide information about financing options to the enterprises. The entrepreneurs are quite highly aware of the interest rates, tenures and collateral requirement of the various banks and financial institutions. The **financial literacy level** among the entrepreneurs is quite low with respect to SME ratings and factoring services. There is also need to create aware ness about government financing schemes as 90% of the enterprise are moderately aware to unaware about these.

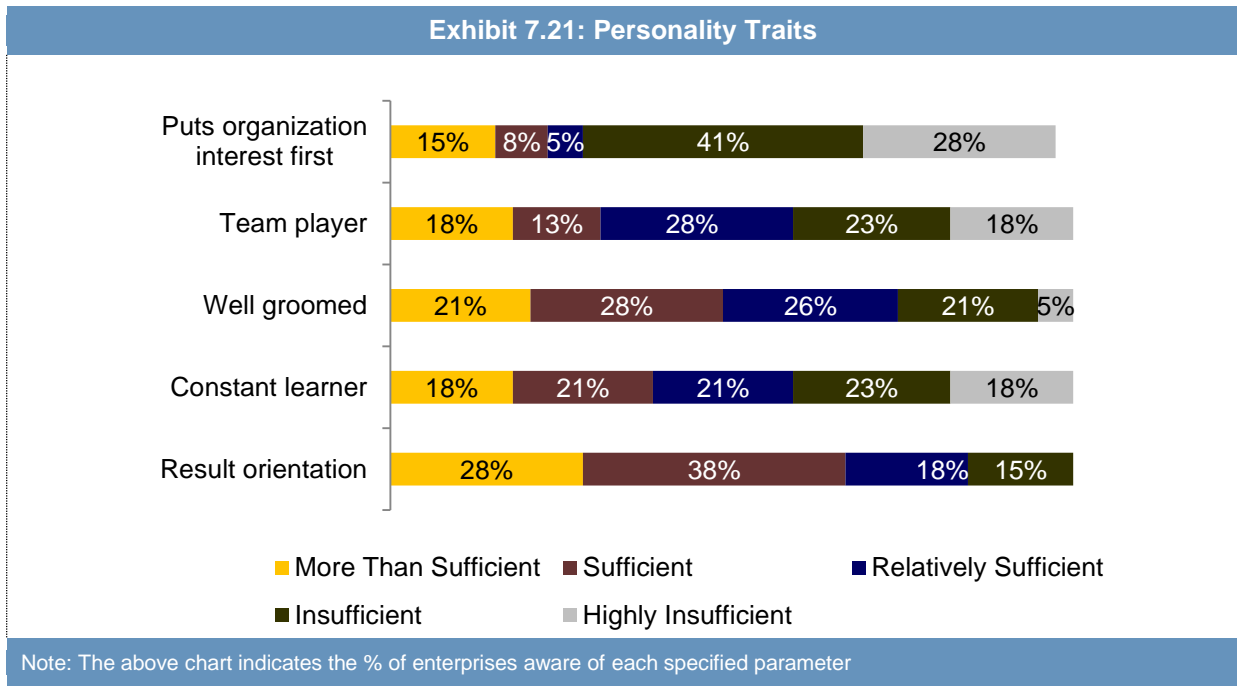


Soft Skills

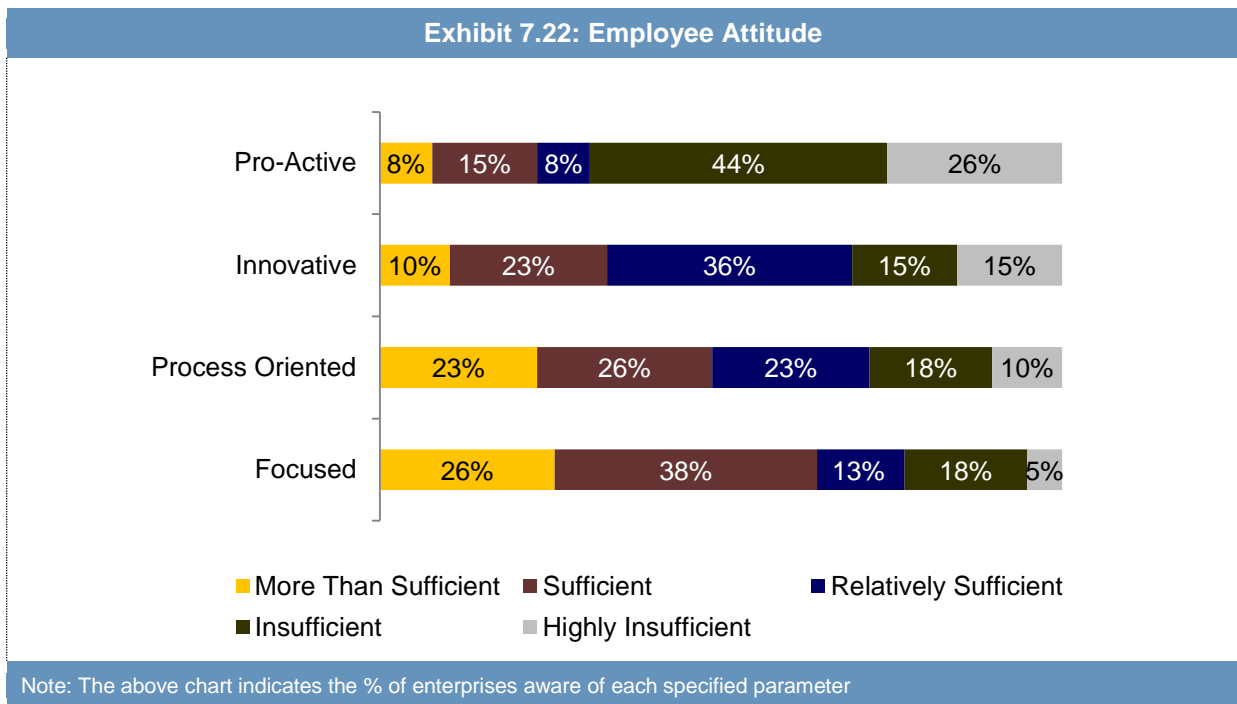
- As evident from the exhibit below, the major area of concern is the lack of **written communication** skills among the workers. A primary reason for this is that many of the workers in the cluster are school dropouts. In addition another pain area where the workers skills fall short is presentation skills.



- For all the **personality traits** except result orientation, more than half of the enterprises have indicated that the skill levels of the employees are highly insufficient or insufficient.



- As evident from the exhibit below the **lack of initiative** on the part of the workers is the major area of concern for the entrepreneurs in the cluster. Around 70% of the enterprises have indicated that pro-activeness levels of the employees are insufficient or highly insufficient.



Assessment of NSDC and other reports

National Skill Development Corporation (NSDC) has done a detailed study on mapping of Human Resource and Skill Requirements of the Auto and Auto Components Industry in India till 2022. The report highlights the importance of technical skills, managerial skills, soft skills required in the Auto and Auto Components Industry and also the skill gaps at different stages of the value chain.

However, the NSDC study does not capture skill gaps at enterprise level and hence the skill sets of the industry leader and the laggards are not measurable. Also, the NSDC report focuses on skills through an education and experience route while D&B India has conducted the study through the process-function-domain requirements route. The advantage of the latter method is it enables to define and develop structured training modules for the identified gaps. These skill gaps are specific to the process and not generic. Lastly, the NSDC report applies to the entire Auto and Auto Components Industry while D&B India has concentrated only on the skill gaps in the Chandigarh-Mohali-Panchkhula manufacturing cluster.

A comparative example in the production process from both the studies would highlight differences in approaches and the level of granularity that D&B India has conducted the study.

Exhibit 7.23: Assessment of NSDC Findings

Function	Level	Skill gaps- NSDC Findings	Skill Gaps- D&B India Findings
Production & Quality Control	Technicians /Supervisors /Quality staff	Personnel at smaller companies are unable to maintain quality of output and hence customer companies have to depute their own personnel to so as to ensure that the right quality of product is made available	Lack of knowledge of modern quality control techniques like six sigma, 5S, TQM etc.
		Inadequate understanding of advanced engineering drawings for critical gauges etc.	Lack of knowledge to calibrate and operate basic quality checking tools such as vernier calipers, screw gauges etc.
		Inadequate ability to understand the criticality of the role played by their component in the overall system design	Lack of knowledge of proper tools and fixtures to be used Lack of availability of knowledgeable CNC machine programmers and operators

			Lack of knowledge about modern welding techniques such as TIG, MIG.
	Design / Product Development	Inadequate ability to understand OEM design specifications	Lack of awareness of modern computer aided designing techniques
		Inadequate knowledge of materials used in auto components	Lack of knowledge about simulation software
Sales & Marketing	Sales Manager		Lack of awareness of creating a product label
		Inadequate ability to understand exact technical requirements of customers	Lack of ability to identify new potential buyers both domestic and foreign
		Inadequate ability to ensure timely delivery	Lack of knowledge of using website and digital marketing tools.
			Lack of communication and negotiation skills

Training Initiatives

The Energy Research Institute (TERI)

TERI has been appointed as the field agency for developing BDS in the cluster. It has been active in organising training programs across different levels in the organization. Some of the major training initiatives undertaken by TERI are listed below

- BIMTECH (Birla Institute of Management Technology), Greater Noida, conducted a training program for the industries associations of the Mohali–Panchkula–Chandigarh (MPC) engineering cluster—on the importance of their role in overall cluster development. The objective was to create awareness among participants on different facets of cluster development; sensitize them on their likely roles in development of the cluster; and apprise them of various facilities and promotional schemes for industries associations offered by the government at both state and central levels.
- Sam’s Techno School after taking into consideration the needs of the enterprises in the cluster has designed training modules on CNC programming and operating. These were 10 day short duration courses held in the evening with adequate stress on practical machine operations. This program has received quite good response from the units’ operating in the cluster.
- A workshop was carried to sensitize the entrepreneurs about the benefits of energy efficiency. The focus was on how energy saving can be achieved through two methods: ‘software’ (energy audit and training of workers) and ‘hardware’ (up gradation of existing equipment, installation of new equipment, and improvements in operating practices).
- A workshop on Export Promotion & Documentation was organized by Mohali Industries Association (MIA) in association with TERI for the entrepreneurs in the cluster. The workshop focused on various government schemes and incentives available for entrepreneurs interested in exports. The participants were shown various export documents and provided guidance on how these are to be prepared.
- Two workshops, one at Panchkhula and the other at Chandigarh were conducted on marketing by BIMTECH. The workshop focused on the benefits of collective marketing and creating a common branding platform for the enterprises in the cluster. BIMTECH also discussed case studies of successful common branding initiatives
- Two workshops were conducted to create awareness about the various government schemes available for the development of MSMEs. In addition participants were also informed about Credit Guarantee Trust for MSMEs (CGTMSE) schemes for collateral-free loans and energy efficiency promotion schemes.
- A workshop was organized on the basic principles of accounting and the importance of maintaining regular financial records for availing loans from banks or benefits under government schemes.

- A workshop focusing on competitive advantage was organized at Chandigarh. The participants were made aware of the need to formulate long term strategies aligned to the mission and vision of the company. The workshop stressed on the need to differentiate one's products from those of competitors.
- Faculty from Punjab Engineering College (PEC) University of Technology and ICFAI Business School, Chandigarh carried out a workshop which focused on modern techniques such as concurrent engineering and cellular production, to improve productivity as well as to reduce costs.

Mohali Industries Association (MIA)

MIA was established in 1972 and is a representative body of manufacturers operating in the Mohali area. MIA provides a platform for discussion issues of common interest related to public policy, labor problems, technology issues etc. MIA subscribes to various trade journals and circulates information of common interest to its members. In February, 2010 in collaboration with TERI, a group of association members had visited the Chennai manufacturing cluster in order to identify best practices that can be implemented over here in Mohali area. MIA had arranged the following training programs for its members:

- Basic computing skills
- Using Website and IT based Marketing Tools as a roadmap for business growth
- Communication and Marketing Skill
- Utilizing ICT tools to obtain export orders

Mahindra & Mahindra (OEM)

Mahindra & Mahindra (M&M) organizes training programs to augment the skill level and the capacity of its vendors. A key thrust of the training programs is to create awareness among the vendors about the importance of modern quality processes such as six sigma, 5S, Total Quality Management (TQM), Kaizen etc. The thrust is on formulating standard operating procedures, improved process layouts and following them. Mahindra & Mahindra tractors division have appointed an external training consultant TQMI International Private Limited to conduct a training program for its vendors. The vendors are initially charged a fee for attending these programs; however these fees are refunded if the vendor performs well in these programs. In addition the vendor is rewarded with larger orders from Mahindra. In addition M&M officials regularly visit the factory premises of its vendors and provide them with inputs on how to improve the productivity of the workers as well as the quality.

Current Training Infrastructure

Central Tool Room (CTR) Ludhiana

Central Tool Room (CTR), Ludhiana has been setup under bilateral agreement on technical cooperation between Govt. of India and Govt. of Federal Republic of Germany. The role of CTR is to support the small scale enterprises by rendering technical consultancy services, common service facilities like manufacture of various types of tools, heat treatment related services.. The institute offers training programs focusing on the following:

- Programming and performing various operations on CNC machines such as turning, milling, wire cutting
- Training on welding, grinding and sheet metal working
- Specialized CAD/CAM training programs
- Tool and die making training programs
- Designing of jigs and fixtures
- Skill enhancement courses focusing on Heat Treatment
- Soft skill courses focusing on labor management, communication, time management, basic computing skills etc.

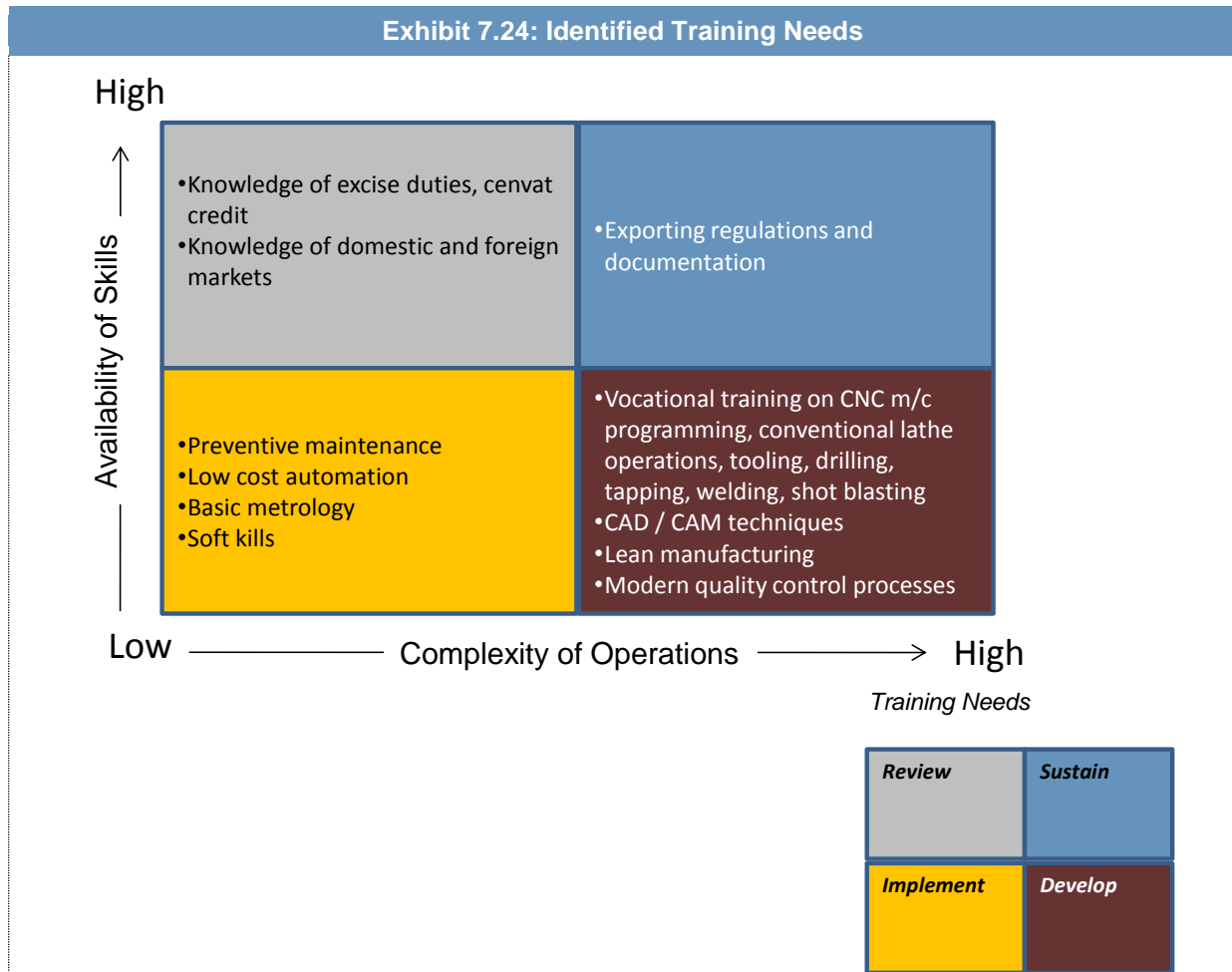
CTR offers consulting services advising on design and manufacture of Moulds, Tools, Dies, Jigs and Fixtures. CTR provides rapid prototyping facilities utilizing 3D computer-aided design (CAD) model data, CT and MRI scan data and data from 3D digitizing systems.

Industrial Training Institutes (ITIs)

There are two ITIs operating in the cluster, one in Chandigarh and the other in Mohali for women. ITI Chandigarh currently offers 21 trades targeted at 10th and 12th pass students. The trades offered under mechanical group are Fitter, Turner, Machinist, Welder, Plumber, Carpenter, Tool & Die Maker and Draughtsman (Civil and Mechanical). In addition ITI Chandigarh has an Automobile center of excellence. ITI Chandigarh has well equipped labs and workshops for training. ITI Chandigarh has signed Memorandum of Understanding (MOUs) with key industry players as part of which these companies donate equipment to the institute and also students are provided the opportunity to work as apprentices in these companies. ITI Chandigarh has invested in state of the art CNC machines. ITI Mohali for women offers training programs on stitching, knitting etc. ITI Mohali is recognized as a center of excellence in Information Technology. Both the ITIs offer part time vocational modular courses under the Skill Development Initiative Scheme (SDIS).

Identified training needs in the cluster

Assessment of skill set with respect to complexity of operations of the particular process was conducted to obtain insights on key areas where training is critical. The complexity of operations was assessed with the sample respondents to obtain an idea of the level of complications involved in the process. The available skill sets were rated on the scale of sufficiency as perceived by the owner. The following matrix highlights the key areas where training requirements can be seen:



The following table elaborates on the training needs identified across key development areas and managerial levels:

Exhibit 7.25: Training Needs		
Development Area	Worker/ Supervisory Training	Management Level Training
Production	Productivity improvement Understanding technical design specifications Usage of proper tools and fixtures	Low cost automation techniques Knowledge of CAD / CAM techniques Demand forecasting Lean manufacturing Energy audits
Total Quality Management	Calibration and operation of basic quality checking tools Defect tracking techniques	Implementation road map for quality control processes such as TQM, six sigma etc. Achieving OEM quality norms
Equipment Maintenance	Machine knowledge	Preventive and predictive maintenance
Sales & Marketing	Export documentation and regulations knowledge	Modern marketing and branding techniques Knowledge of domestic and foreign markets
Finance	Knowledge about excise duties, cenvat credit	Information about factoring services and SME ratings

Summary

- The cluster is faced with severe shortage of skilled and unskilled labor. The key areas where there is urgent need for qualified workers are conventional lathe machine operators and welders both for arc & advanced (Tungsten Inert Gas & Metal Inert Gas) welding. In addition there is a lack of expertise among the staff to identify the proper tools and fixtures required to machine the component.
- Apart from the high cost associated with CNC machines another reason for their low adoption rate is the lack of skilled CNC machine operators, CNC machine programmers and maintenance staff. The firms have been able to cope to some extent with the shortage of skilled CNC programmers by employing them as external consultants whose services are availed as and when required.
- In order to combat the shortage of workers, a pilot project involving training women from rural areas of Punjab on basic metrology was carried out. However, very few women enrolled for jobs after completing the training owing to social pressure against women working in male dominated engineering industry.
- The firms in the cluster primarily manufacture as per the design specification provided by the OEM. The firms do not invest in research and development capabilities to develop and manufacture improved products. There is significant scope for improvement in the area of research and development in this sector.
- There is a lack of knowledge about quality control processes such as six sigma, kaizen, 5S etc. among the entrepreneurs in the cluster. Defect tracking techniques in order to reduce the rejection rate is not widely followed.
- There is a clear need for increased co-operation and information exchange between the industry and the training institutes to improve the supply of trained resources as per the industry expectations in the cluster. The training institutes need to design vocational courses that have a component of field training in the industry or in the workshops of the institute as a part of the curriculum.

Exhibit 7.26: Production Function Tip Sheet

Chandigarh					
Production					
Production Processes	Conventional machine operations	CNC machine operations	Maintenance operations	Quality control processes	Modern manufacturing techniques
Sub Processes	Tooling, drilling, tapping, welding	CNC machine programming	Preventive maintenance techniques	Basic metrology, advanced techniques such as six sigma	Lean manufacturing, just in time inventory, equipment reliability, cellular manufacturing, total quality management
Type of Skill Requirement (Semi-skilled / Skilled)	Semi-Skilled	Skilled	Semi-Skilled	Semi-Skilled / Skilled	Skilled
Availability of Manpower (Low /Medium / High)	Low	Medium	Medium	Low	Low
Skill Gap (Low/ Medium/ High)	High	Medium	High	High	High
Training needs (Review /sustain /implement /Develop)	Implement / Develop	Implement / Develop	Implement / Develop	Review / Develop	Sustain / Develop
Available Training Courses	ITI Chandigarh offers training in various trades as well as short term modular courses. CTR, Ludhiana provides training on CAD/CAM, welding, grinding, die making, fixture design, etc.	CNC programming and operating courses offered by Sam's Techno School. In addition CTR, Ludhiana provides short duration training programs on CNC operations.	CNC machine maintenance courses offered by Sam's Techno School	Basic metrology course conducted by Sam's Techno School	Mahindra & Mahindra is planning to organize training on modern quality processes such as six sigma, 5S, etc. for its vendors.
Available Training Institutes	Industrial Training Institute (ITI), Chandigarh Central Tool Room (CTR) Ludhiana Sam's Techno School				

Exhibit 7.27: Marketing Function Tip Sheet

Chandigarh – Panchkula – Mohali		Marketing		
Processes in Value Chain	Customer Development	Sales Force Effectiveness	Export Compliance	Marketing Management
Sub Processes	New Market Identification, New customer identification, Relationship building with existing customers, Product Innovation	Effective monitoring of sales force, Developing right channel mix	Knowledge of various export related procedures	Brand awareness, Product marketing
Type of Skill Requirement (Semi-skilled / Skilled)	Technical: Semi-Skilled Managerial: Skilled	Technical: Skilled Managerial: Skilled	Technical: Skilled Managerial: Semi-skilled	Technical: Skilled Managerial: Skilled
Availability of Manpower (Low /Medium / High)	Medium	Medium	Medium	Low
Skill Gap (Low/Medium/High)	High	High	High	High
Training needs (Review /sustain /implement /Develop)	Review	Review / Implement	Sustain	Develop
Available Training Courses	Mohali Industries Association organized training programs on communication & marketing Skill and utilizing ICT tools to obtain export orders.			
Available Training Institutes	No Institutional Training Available			

Annexures

Annexure 1: Skill Gap Analysis

Complexity of operations involved in the enterprise was evaluated vis-à-vis the available skill set to ascertain the gaps necessary for skill training. The following tables summarize the detailed analysis for the complexity-skill matrix contained in the report. The counts represent the number of firms that have provided the ratings in the sample selected. The highlighted cells are definite training needs where the complexity rating of the activity is higher whilst the available skill to perform the job is lower. Certain areas where complexity is lower but available skills are higher are also identified as training needs.

CAD operations		Skill Availability Rating				
Complexity Rating	Insufficient (1)	Somewhat sufficient (2)	Neutral (3)	Sufficient (4)	More than sufficient (5)	Total
Not at all complex (1)	1	-	-	1	1	3
Not very complex (2)	-	1	1	-	-	2
Somewhat Complex (3)	-	-	2	-	-	2
Moderately Complex (4)	-	-	1	2	3	6
Total	1	1	4	3	4	13

CAM operations		Skill Availability Rating				
Complexity Rating	Insufficient (1)	Somewhat sufficient (2)	Neutral (3)	Sufficient (4)	More than sufficient (5)	Total
Not at all complex (1)	1	1	1	-	-	3
Somewhat Complex (3)	-	1	-	1	-	2
Moderately Complex (4)	-	1	1	1	-	3
Extremely Complex (5)	-	-	-	1	1	2
Total	1	3	2	3	1	10

CNC m/c programming		Skill Availability Rating			
Complexity Rating	Insufficient (1)	Neutral (3)	Sufficient (4)	More than sufficient (5)	Total
Not at all complex (1)	1	2	-	1	4
Somewhat Complex (3)	-	1	-	-	1
Moderately Complex (4)	-	-	1	-	1
Extremely Complex (5)	-	-	-	5	5
Total	1	3	1	6	11

Operating CNC m/c		Skill Availability Rating			
Complexity Rating	Insufficient (1)	Somewhat sufficient (2)	Neutral (3)	Sufficient (4)	Total
Not at all complex (1)	2	-	2	1	5
Moderately Complex (4)	-	-	1	4	5
Extremely Complex (5)	-	1	1	-	2
Total	2	1	4	5	12

Operating conventional lathe m/c		Skill Availability Rating		
Complexity Rating	Neutral (3)	Sufficient (4)	More than sufficient (5)	Total
Not at all complex (1)	-	3	-	3
Not very complex (2)	1	1	-	2
Somewhat Complex (3)	2	-	-	2
Moderately Complex (4)	-	2	1	3
Extremely Complex (5)	-	2	6	8
Total	3	8	7	18

Tooling		Skill Availability Rating			
Complexity Rating	Insufficient (1)	Neutral (3)	Sufficient (4)	More than sufficient (5)	Total
Not at all complex (1)	-	-	2	-	2
Not very complex (2)	-	-	2	-	2
Somewhat Complex (3)	1	1	3	-	5
Moderately Complex (4)	-	2	4	-	6
Extremely Complex (5)	-	-	2	7	9
Total	1	3	13	7	24

Cutting/ Profile cutting		Skill Availability Rating				
Complexity Rating	Insufficient (1)	Neutral (3)	Sufficient (4)	More than sufficient (5)	Total	
Not at all complex (1)	-	2	4	1	7	
Not very complex (2)	-	-	1	-	1	
Somewhat Complex (3)	-	2	-	-	2	
Moderately Complex (4)	1	2	2	2	7	
Extremely Complex (5)	-	-	4	6	10	
Total	1	6	11	9	27	

Facing		Skill Availability Rating				
Complexity Rating	Somewhat sufficient (2)	Neutral (3)	Sufficient (4)	More than sufficient (5)	Total	
Not very complex (2)	1	3	2	1	7	
Somewhat Complex (3)	-	4	1	-	5	
Moderately Complex (4)	-	1	3	3	7	
Extremely Complex (5)	1	-	-	2	3	
Total	2	8	6	6	22	

Drilling		Skill Availability Rating				
Complexity Rating	Somewhat sufficient (2)	Neutral (3)	Sufficient (4)	More than sufficient (5)	Total	
Not at all complex (1)	-	-	-	1	1	
Not very complex (2)	-	-	1	-	1	
Somewhat Complex (3)	-	3	6	3	12	
Moderately Complex (4)	-	-	3	3	6	
Extremely Complex (5)	1	3	2	2	8	
Total	1	6	12	9	28	

Tapping		Skill Availability Rating				
Complexity Rating	Insufficient (1)	Somewhat sufficient (2)	Neutral (3)	Sufficient (4)	More than sufficient (5)	Total
Not at all complex (1)	-	-	-	1	-	1
Not very complex (2)	-	1	-	-	1	2
Somewhat Complex (3)	1	-	1	-	3	5
Moderately Complex (4)	-	2	-	1	-	3
Extremely Complex (5)	-	-	4	-	2	6
Total	1	3	5	2	6	17

Reaming		Skill Availability Rating			
Complexity Rating	Insufficient (1)	Somewhat sufficient (2)	Neutral (3)	Sufficient (4)	Total
Not very complex (2)	1	-	-	-	1
Somewhat Complex (3)	-	1	1	-	2
Moderately Complex (4)	1	-	-	-	1
Extremely Complex (5)	-	-	1	1	2
Total	2	1	2	1	6

Grooving		Skill Availability Rating			
Complexity Rating	Somewhat sufficient (2)	Neutral (3)	Sufficient (4)	More than sufficient (5)	Total
Not at all complex (1)	-	1	1	-	2
Not very complex (2)	1	-	-	-	1
Somewhat Complex (3)	-	-	-	1	1
Moderately Complex (4)	1	1	1	-	3
Extremely Complex (5)	-	-	-	1	1
Total	2	2	2	2	8

Milling		Skill Availability Rating				
Complexity Rating	Insufficient (1)	Somewhat sufficient (2)	Neutral (3)	Sufficient (4)	More than sufficient (5)	Total
Not very complex (2)	1	-	-	-	-	1
Somewhat Complex (3)	-	1	-	1	-	2
Moderately Complex (4)	1	1	-	-	-	2
Extremely Complex (5)	-	-	-	1	1	3
Total	2	2	1	2	1	8

Straightening		Skill Availability Rating				
Complexity Rating	Insufficient (1)	Somewhat sufficient (2)	Neutral (3)	Sufficient (4)	More than sufficient (5)	Total
Not at all complex (1)	-	1	1	-	1	3
Not very complex (2)	1	-	-	-	1	2
Somewhat Complex (3)	-	-	1	-	-	1
Moderately Complex (4)	-	-	-	1	-	1
Extremely Complex (5)	1	-	-	-	-	1
Total	2	1	2	1	2	8

Forging		Skill Availability Rating				Total
Complexity Rating	Insufficient (1)	Somewhat sufficient (2)	Sufficient (4)	More than sufficient (5)		
Not at all complex (1)	-	1	-	-		1
Not very complex (2)	-	-	1	-		1
Somewhat Complex (3)	-	-	1	-		1
Extremely Complex (5)	1	1	-	1		3
Total	1	2	2	1		6

Threading		Skill Availability Rating				
Complexity Rating	Insufficient (1)	Somewhat sufficient (2)	Neutral (3)	Sufficient (4)	More than sufficient (5)	Total
Not at all complex (1)	1	-	-	1	1	3
Somewhat Complex (3)	-	-	2	1	1	4
Moderately Complex (4)	-	3	1	3	1	8
Extremely Complex (5)	1	-	1	-	5	7
Total	2	3	4	5	8	22

Pressing		Skill Availability Rating			
Complexity Rating	Somewhat sufficient (2)	Neutral (3)	Sufficient (4)	More than sufficient (5)	Total
Not at all complex (1)	-	1	2	-	3
Not very complex (2)	1	-	-	1	2
Somewhat Complex (3)	-	2	1	-	3
Moderately Complex (4)	-	2	4	1	7
Extremely Complex (5)	-	1	1	5	7
Total	1	6	8	7	22

Grinding		Skill Availability Rating			
Complexity Rating	Somewhat sufficient (2)	Neutral (3)	Sufficient (4)	More than sufficient (5)	Total
Not very complex (2)	-	3	1	-	4
Somewhat Complex (3)	1	3	-	1	5
Moderately Complex (4)	1	-	3	-	4
Extremely Complex (5)	1	1	-	5	7
Total	3	7	4	6	20

Bush fitting		Skill Availability Rating				
Complexity Rating	Insufficient (1)	Somewhat sufficient (2)	Neutral (3)	Sufficient (4)	More than sufficient (5)	Total
Not at all complex (1)	2	-	-	-	-	2
Not very complex (2)	1	-	-	1	-	2
Somewhat Complex (3)	-	-	3	-	-	3
Moderately Complex (4)	-	2	-	1	-	3
Extremely Complex (5)	-	-	-	-	1	1
Total	3	2	3	2	1	11

Chamfering		Skill Availability Rating			
Complexity Rating	Insufficient (1)	Somewhat sufficient (2)	Sufficient (4)	More than sufficient (5)	Total
Not very complex (2)	1	-	-	-	1
Somewhat Complex (3)	2	1	-	-	3
Moderately Complex (4)	1	1	2	-	4
Extremely Complex (5)	-	-	-	3	3
Total	4	2	2	3	11

Arc Welding		Skill Availability Rating			
Complexity Rating	Insufficient (1)	Somewhat sufficient (2)	Sufficient (4)	More than sufficient (5)	Total
Not at all complex (1)	3	-	1	-	4
Not very complex (2)	1	2	-	-	3
Moderately Complex (4)	1	-	-	-	1
Extremely Complex (5)	-	1	-	5	6
Total	5	3	1	5	14

Advanced welding (MIG,TIG)		Skill Availability Rating			
Complexity Rating	Insufficient (1)	Neutral (3)	Sufficient (4)	More than sufficient (5)	Total
Not at all complex (1)	2	-	-	1	3
Not very complex (2)	1	-	-	-	1
Moderately Complex (4)	-	2	2	-	4
Extremely Complex (5)	-	-	-	2	2
Total	3	2	2	3	10

Shot Blasting		Skill Availability Rating			
Complexity Rating	Insufficient (1)	Somewhat sufficient (2)	Sufficient (4)	More than sufficient (5)	Total
Not at all complex (1)	-	1	-	-	1
Not very complex (2)	-	1	-	-	1
Somewhat Complex (3)	-	2	-	-	2
Moderately Complex (4)	-	1	2	-	3
Extremely Complex (5)	1	-	-	1	2
Total	1	5	2	1	9

Primer Coating		Skill Availability Rating		
Complexity Rating	Somewhat sufficient (2)	Sufficient (4)	More than sufficient (5)	Total
Not very complex (2)	2	1	-	3
Somewhat Complex (3)	-	1	-	1
Moderately Complex (4)	-	3	-	3
Extremely Complex (5)	-	1	2	3
Total	2	6	2	10

Quality Checking		Skill Availability Rating			
Complexity Rating	Somewhat sufficient (2)	Neutral (3)	Sufficient (4)	More than sufficient (5)	Total
Not at all complex (1)	-	-	2	-	2
Not very complex (2)	1	1	2	1	5
Somewhat Complex (3)	-	1	1	-	2
Moderately Complex (4)	-	-	2	3	5
Extremely Complex (5)	-	-	6	18	24
Total	1	2	13	22	38

Packaging		Skill Availability Rating			
Complexity Rating	Somewhat sufficient (2)	Neutral (3)	Sufficient (4)	More than sufficient (5)	Total
Not at all complex (1)	-	-	1	1	2
Not very complex (2)	2	3	-	-	5
Somewhat Complex (3)	1	2	7	1	11
Moderately Complex (4)	-	-	5	3	8
Extremely Complex (5)	-	-	1	9	10
Total	3	5	14	14	36

Annexure 2: Case Studies

Case I

Organization Profile:

Organization Profile Information	
Name of Enterprise	Sam's Techno School
Name of Entrepreneur	Mr. N. S. Aulakh
Type of enterprise	Private Training Institute
Services	Offers training programs

Sam's Techno School is a private training institute in the engineering cluster. As part of the Implementing BDS initiative of SIDBI which is being managed by TERI, the institute offers training programs customized to the specific needs of the enterprises in the cluster. The promoters of the institute are also one of the major suppliers of CNC machines to the enterprises in the cluster. Hence the institute is able to obtain first-hand knowledge of the training needs of the cluster.

Training Initiatives:

- The institute as part of the Implementing BDS initiative of SIDBI offers training modules on CNC programming and operating. These are short duration courses ranging from 6 to 8 weeks with adequate stress on practical machine operations along with theoretical knowledge. The CNC operations training module mainly targets school drop outs at the class 5 and 8 level. The institute has 2 CNC machines at its Mohali center on which the students are trained.
- The promoters as part of their CNC machine supply business were finding it difficult to retain qualified maintenance staff. On many occasions customers were forced to stop production for extended periods as maintenance staff was not available. This led to the institute recently launching a course on CNC machine maintenance.
- The institute as part of an innovative approach to encourage women participation in the engineering cluster workforce has imparted basic metrology training to women. The training module concentrates on calibration and operation of basic quality checking tools such as vernier calipers, screw gauges etc. As the quality checking operations do not involve any heavy lifting work, it is quite suitable for women.

Case II

Organization Profile:

Organization Profile Information	
Name of Enterprise	Axles India
Name of Entrepreneur	Mr. Munish Kanotra
Type of MSME	Small
Products	Front axle assembly for tractors

Axles India is a Panchkhula based enterprise manufacturing front axle assembly component for tractors. The enterprise supplies to HMT (OEM). The enterprise is ISO 9001 certified.

Skill gaps:

- The enterprise bought its first CNC machine in 2002. Currently it has 2 CNC machines. According to the entrepreneur not much skill is required in operating a CNC machine. However there is lack of skilled workers for initial setting and subsequent adjusting of the tool in CNC machines and CNC programming.
- The enterprise still operates a significant number of conventional machines and is facing a severe shortage of skilled operators for these machines. The new workers are trained on CNC machines and lack the skill required to operate conventional machines.
- Another area where skilled workers are in short supply is welding. There is urgent need to train workers both on arc welding and advanced welding techniques such as TIG, MIG.
- As the enterprise supplies to a single customer HMT, not much time and effort is devoted to marketing initiatives.
- Although the entrepreneur is aware of modern techniques such as 5S, six sigma, lean manufacturing etc., he requires guidance on how to actually implement these techniques in the enterprise.
- The entrepreneur is aware of the benefits of using an ERP system. However the high cost associated with such a system has prevented him from investing in one.

Annexure 3: Workshop conducted

A workshop was organized with active participation of enterprise owners, TERI officials, training institutes and quality consultants. In order to increase the supply of workers to the cluster it was proposed to target school dropouts even at class 5 level and above and train them on basic machine operations. The target students coming from the weaker sections of the society would not be able to pay any fees for attending these training programs. Hence it was suggested that the entrepreneurs in the cluster be tapped to provide funds to meet the expenses of running this training program. The prospective students hailing from the remote areas would be provided residential facilities along with a minimum stipend during the training period so that the student is able to meet his food and other expenses. In order to increase the appeal of the training program, it was suggested that the OEMs in the cluster could also be roped in.

The training program would be designed with active participation from industry representatives so that the students after successfully completing the course can be employed by the firms in the cluster. The training program would focus on practical machine operations in addition to theoretical knowledge. In addition the training program would also provide some basic communication and writing skills training to the participants. A suggestion was made that the existing infrastructure of the both government private training institutes in terms of hostel facilities, machinery and teaching staff could be utilized for carrying out this training program.

In order to surmount the social bias against women working on the shop floor, it was proposed that the services of NGOs can be enlisted to convince the families of prospective female employees about the safety and security of their daughter. These NGOs would be visiting remote rural areas and conduct a door to door to awareness campaign among the villagers sensitizing them about the prospect of women getting gainful employment in the engineering cluster.

Group Discussion with Stakeholders in Progress in Chandigarh



Annexure 4: List of Firms / Meetings Conducted

Respondents		
Name	Organization	Designation
Mr. Anurag Aggarwal	Mohali Industry Association	Sr. Vice President
Mr. S. M. Devgan	Sam's Techno School	Advisor
Mr. A Malhotra	Sam's Techno School	Marketing
Mr. N. S. Aulakh	Param Metal Tech	Director
Mr. M. Kanotra	Axles India	Proprietor
Dr. Gunmala Suri	University Business School (Punjab University)	Reader
Prof. P. Thareja	Punjab Engineering College	Professor

Bhadohi Floor Covering Cluster

Cluster Overview

Nature of Industrial Activity

The floor covering cluster in Varanasi is spread across 50 Kms in the districts of Bhadohi and Mirzapur. Bhadohi & Mirzapur has over years of history in carpet Industry. During mid 20th century the cluster diversified from knotted to tufted, shaggy and durries. The floor coverings manufactured in India are mainly exported. Domestic market for carpet is small in India. Presently, India exports floor coverings worth over Rs. 2700 crores.

The type of firms in the cluster can be divided in to four categories viz. Merchant Export Firms (MEFs), Manufacturing Export Firms (MAFs) Tiny Manufacturing Firms (TMFs) and weavers. The following are the major products manufactured in the cluster – Knotted Carpets, Tufted Carpets, Shaggy Carpets and Durries.

Detailed study was done by visiting APITCO, Marketing Consortia, Purvanchal Designers Association, AICMA (All India Carpet manufacturers Association), CEPC (Carpet Export Promotion Council), IICT (Indian Institute of Carpet Technology), MSME DI by understanding the level of skill gaps that these institutes have assessed. Focused group discussion was also carried out between these institutes' directors.

Enterprise level surveys were also conducted across 38 firms to assess the skill gaps and training needs. The following were identified as prominent skills gaps in the Bhadohi Cluster.

- The primary requirement of the cluster is availability of skilled designers. Shortage of designers was observed across all the cluster enterprises. No formal training within the firms is available for the workers to be able to take up the jobs of designers, the primary reason for this being secrecy of designs. Another issue with the availability of labour is the implementation of NREGA which has attracted more labour from within the cluster and the payment is lucrative compared to the tedious work and low payment at the cluster enterprises.
- Production process complexities are observed at most of the cluster enterprises and these largely relate to dyeing, knotting and weaving. Dyeing is explained as a complicated process due to variety of chemical process, physical testing and colour combination based changes in design. Carpet Yarn Dyeing is an integral process of the production activity. Indian knot is the most complicated knotting system in carpet manufacturing as it involves looping and double-looping of fibre yarn. The existing skills in this respect amongst the cluster firms are traditionally gathered and no formal qualification is available with the workers in this regard.
- Lack of technological awareness can be mentioned as another skill gap in the cluster. IICT has been making constant efforts in terms of promoting advanced technology however, cost of investment is a major issue within the firms.

- Availability of testing facilities related to chemical, physical and carpet labs are limited. The knowledge about quality standards is relatively inadequate across all enterprises in the value chain.
- Knowledge of export regulations is also lacking amongst most of the micro enterprises. The consequence of this is loss of bargaining power with the buyers due to unfavourable pressures created by them, for e.g. issues with using child labour.
- Awareness about computer aided designing has now started to be seen amongst the cluster firms. However, most of the international competition has already switched to CAD and computer aided manufacturing enabling economies of scale (e.g. China carpets are largely machine made carpets)
- The knowledge of GMP and Lean Manufacturing is also limited across the cluster firms.

Cluster Profile

The floor covering cluster in Varanasi is spread across 50 Kms in the districts of Bhadohi and Mirzapur. Bhadohi & Mirzapur has over years of history in carpet Industry. During mid 20th century the cluster diversified from knotted to tufted, shaggy and durries. The floor coverings manufactured in India are mainly exported. Domestic market for carpet is small in India. Presently, India exports floor coverings worth over Rs. 2700 crores. The type of firms in the cluster can be divided in to four categories viz. Merchant Export Firms (MEFs), Manufacturing Export Firms (MAFs) Tiny Manufacturing Firms (TMFs) and weavers. Majority of the TMFs and weavers are operating on job work basis supplying to the MEFs. The All India Carpet Manufacturers Association (AICMA) was formed by manufacturing and export firms for promotion of exports and handling of buyers who play with price by quoting lower price of competition. The Merchant Export Firms are the main drivers of cluster; these firms will collect the orders from buyers/buying agents and give job work to the Manufacturing Export Firms (MAFs) Tiny Manufacturing Firms (TMFs) and weavers. The snapshot of the Bhadohi cluster is given as below:

Exhibit 8.1: Cluster Overview	
Parameter	Key Metrics
Spread of the Cluster (r)	50 km (Bhadohi, Mirzapur Districts)
Total Units (Nos.)	
Manufacturing Export Firms (MAFs)	20
Merchant Export Firms (MEFs)	800
Tiny Manufacturing Firms(TMFs)	1000
Weavers	290000
Aggregate Employment (Nos.)	
Direct	55000
Indirect	30000
Aggregate Investments (Rs. Crores)	760

Estimated Production (Rs. Crores)	1000
Estimated Turnover (Rs. Crores)	1250
Product Mix	Knotted (60%), Shaggy (10%), Tufted (25%) and Durries (5%)
Major Stakeholders	Merchant Export Firms Manufacturing Export Firms Tiny Manufacturing Firms Weavers/ Job Workers Government & support Institutions Raw material suppliers, M/C suppliers, Support Firms & Financial Institutions and bankers
Major BDS Providers	IICT, Designers, Dye Houses, Shipping Agents, CAs, Testing Labs, Educational Institutions etc.

The major products manufactured in the Bhadoi cluster can be classified as:

Exhibit 8.2: Major Products of the Cluster

Knotted Carpets



Tufted Carpets



Shaggy Carpets



Durries



Cluster Ecosystem and Inter-Linkages

The types of firms in this cluster are varied in terms of the key activities that they perform. Some of the enterprises are classified as tiny manufacturing firms; some are merchant export firms while some are merchant manufacturing firms.

As the name suggests, the merchant export firms involve themselves in the exports of the products of the cluster. They bring in the orders and are in constant touch with the markets in terms of demand and changing tastes. These firms are also capable of manufacturing the requirements internally. However, since their key focus is on exports, the job work is passed on to the Tiny Manufacturing Firms or Merchant Manufacturing Firms. These firms are also now trying to get in direct contact of the buyer to achieve higher realization.

The industry is seasonal in terms of demand and monsoon is the month when most of the production activity is reduced. As a result, labour availability is a critical issue faced by all categories of firms in the cluster.

Sourcing of raw material, mainly wool, is done from New Zealand and the cluster faces enormous problems like fluctuations in raw material prices from imports, lack of adequate government support in enabling furnishing of bank guarantees, material hoarding and artificial scarcity by local material importers etc.

Another issue with the linkages amongst firms in the cluster is related to the payment mechanisms and credit period. There have been numerous cases of payment defaults and payment not received from carpet importers in foreign countries. As per a trusted source from All India Carpet Manufacturers Association (AICMA), the Bhadoi cluster export volume is to the tune of around Rs 2500-3000 Crores, of this value, around 25% is either lost in defaults or delayed payments making the enterprises lose a lot of revenues.

Skill Gap Assessment

Sampling

A total sample of 38 enterprises was selected for quantitative survey at the cluster. MSME enterprises were selected on the basis of their position in the value chain. The qualitative samples were selected to include one firm from each segment within the floor covering cluster. It was also ensured that the firms selected could be representative set of the Micro, Small and Medium Enterprises. The observations on the current levels of skills within these enterprises and of the industry leaders are captured at a high level.

The composition of the sample was chosen based on the firm size, type of firm (domestic, export and both). The following exhibits indicate the demographics of the sample used for quantitative surveys and the sample profile largely represents the overall profile of the cluster. The sample includes only micro and small enterprises of the cluster because the carpet industry is small in terms of investment in plant and machinery; medium enterprises are very few and could not be covered.

The following charts depict the sample coverage of the firms from the quantitative survey

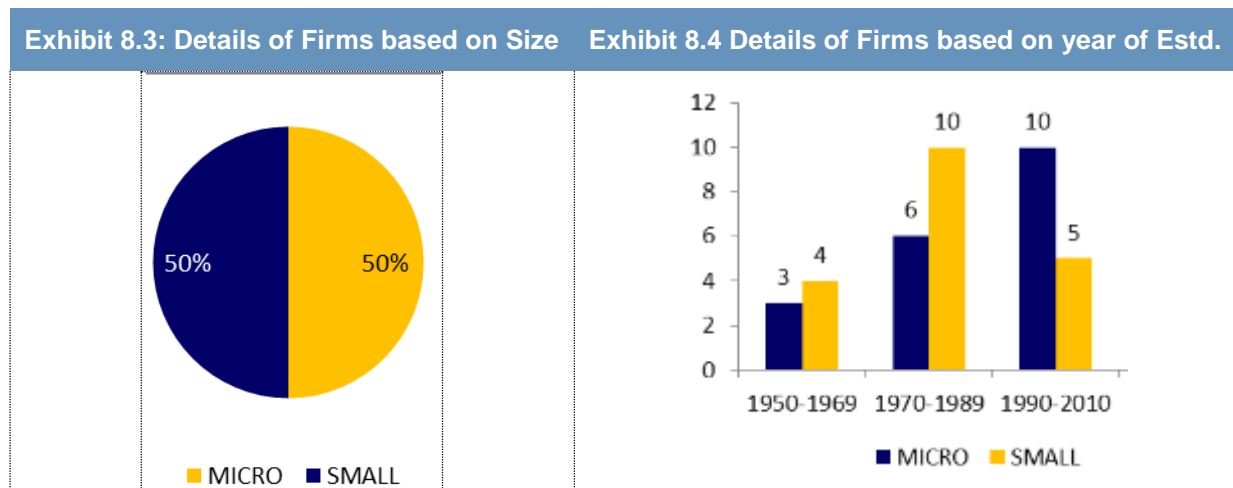


Exhibit 8.5: Break up of firms based on markets

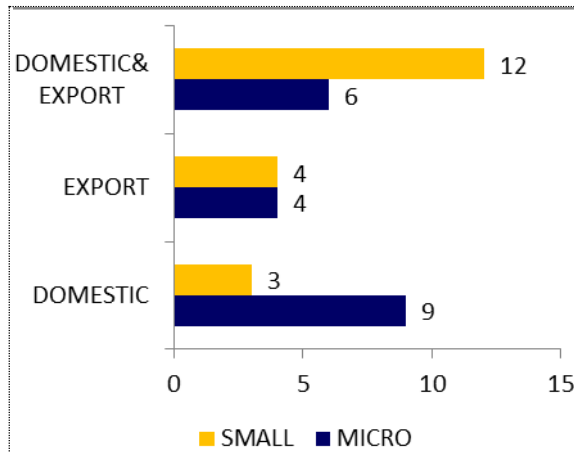
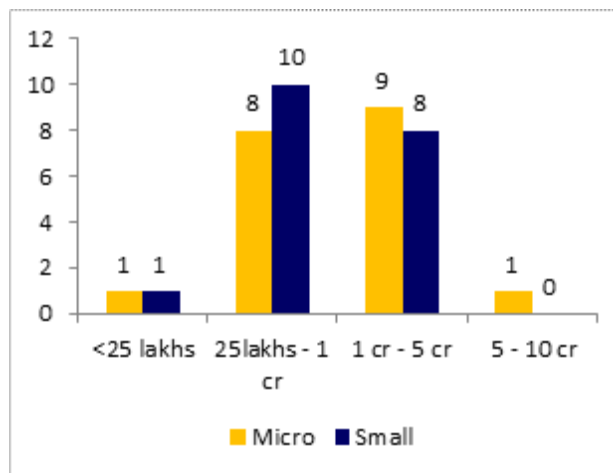


Exhibit 8.6: Break up of firms based on total assets



Group Discussions and qualitative interactions:

Detailed study was done by visiting APITCO, Marketing Consortia, Purvanchal Designers Association, AICMA (All India Carpet manufacturers Association), CEPC (Carpet Export Promotion Council), IICT (Indian Institute of Carpet Technology), MSME DI by understanding the level of skill gaps that these institutes have assessed. Focused group discussion was also carried out between these institutes' directors.

The local SIDBI office at Varanasi was also tapped to gather inputs and insights on the cluster. Focus group discussions were conducted with training center, APITCO and Marketing consortia.

Exhibit 8.7: Visit to MSME DI Varanasi

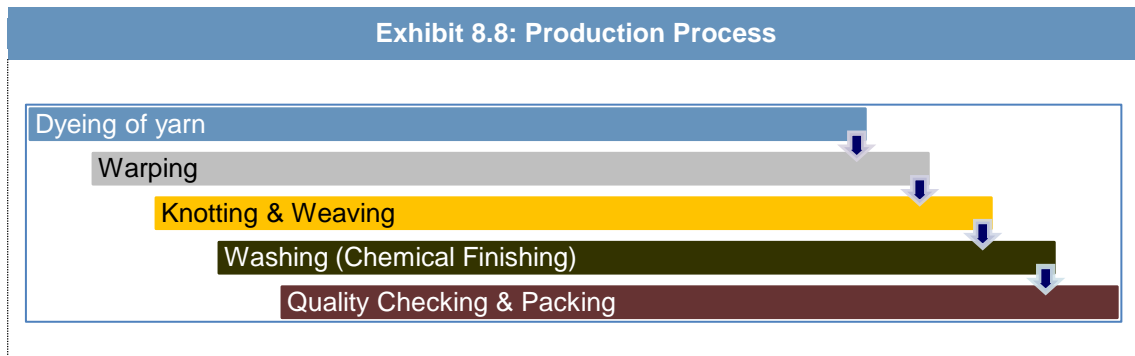


At the MSME DI at Varanasi, group discussion was held with the director, cluster in-charge and training officer to understand the specificities of the cluster. It was also discovered that while the main MSME DI is located at Allahabad, the MSME DI in the Bhadoi area was not responsible for Bhadoi cluster until February 2011. This situation has now changed and MSME DI at Varanasi is responsible for Bhadoi cluster development as well.

Process Based Observations

Production

Production Process



- **Dyeing of yarn**

Different dyes and chemicals are used in yarn dyeing process. Dyes are used as per the requirement of the buyer. Reactive, mordant and vat dyes, sulphuric acid, Soda Ash etc., are the major dyes and chemicals used in the process. The process requires following of standards like IS: 2006, IS: 11870 etc. Knowledge about such standards is limited in the cluster firms.

- **Warping**

It is a process where warp is brought from one rod to other. At the end of this operation all the warps will be on the rod. The warps which are laid on the thick iron rod are transferred to a thin steel rod. After transferring the warp into thin steel rod it is folded and carried to the Loom for mounting which is followed by Shedding of warp.

- **Knotting & Weaving**

It is a process of introducing the pile yarn into the carpet by means of tying the knot. There are two types of knots viz. Ghiordes or Turkish knot and Sehna or Persian knot. The nature of a knot and its insertion ensures that the tuft lies at a very acute angle to the back. Because each tuft is quite separate from the next, the weaver has an unlimited field, both in the choice of pattern that may be produced, and in the number of colour that can be used.

- **Washing (Chemical Finishing)**

The main objective of washing is removal of dust particles, swelling of fibres and removal of soft fibre and finally achieving the required softness and lustre.

- **Quality Checking & Packing:**

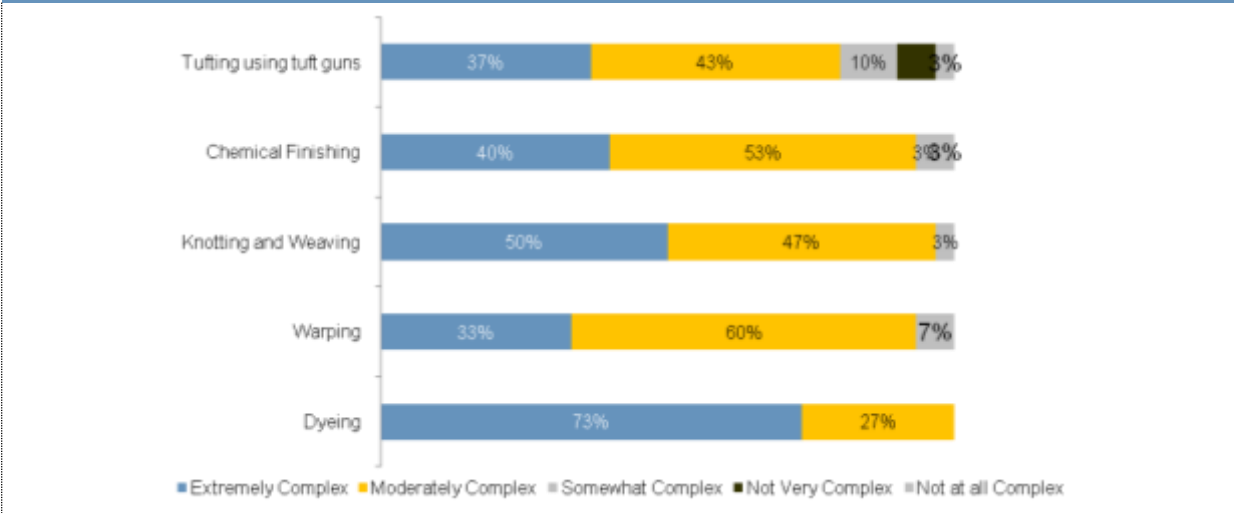
Each carpet is carefully inspected for colour uniformity, type and quality of material used, piles per inch, height and strength of the pile, dimensional changes etc. After quality checking the carpet is then rolled and wrapped separately in polythene sheets and finally wrapped with jute fabric before shipping.

Exhibit 8.9: Production Floor



While most of these processes are routine and are carried out mechanically, the process complexities are clearly understood by the cluster enterprises. Exhibit 8.9 indicates the level of complexity of the various operations at various firm levels. From the chart, it can be seen that Dyeing process is indicated as extremely complex process, mainly due to variety of processes, chemical treatments and testing norms applicable for the process. Followed by dyeing, knotting and weaving is indicated by around 50% of the firms as an extremely complex process, the main reason being variety of knots leading to changes in product design itself.

Exhibit 8.10: Level of complexity of operations



Education and Experience: In most of the organizations, it was observed that the owner was less qualified educationally but had adequate experience in the field of floor coverings. One of the reasons for using orthodox technology could be the **lack of technical education at the entrepreneurial level**. Even at the entrepreneurial level, management knowledge through MBA courses is not observed.

Exhibit 8.11: Educational qualification of full time employees, average employees per firm

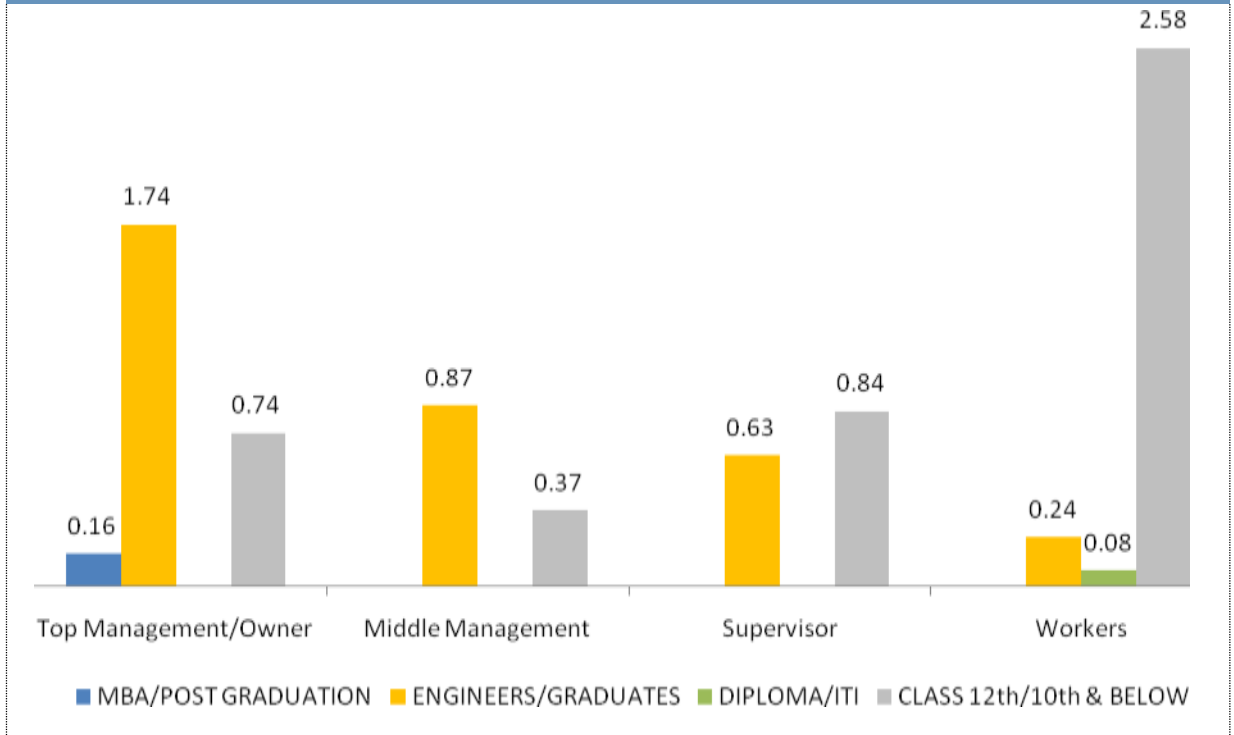
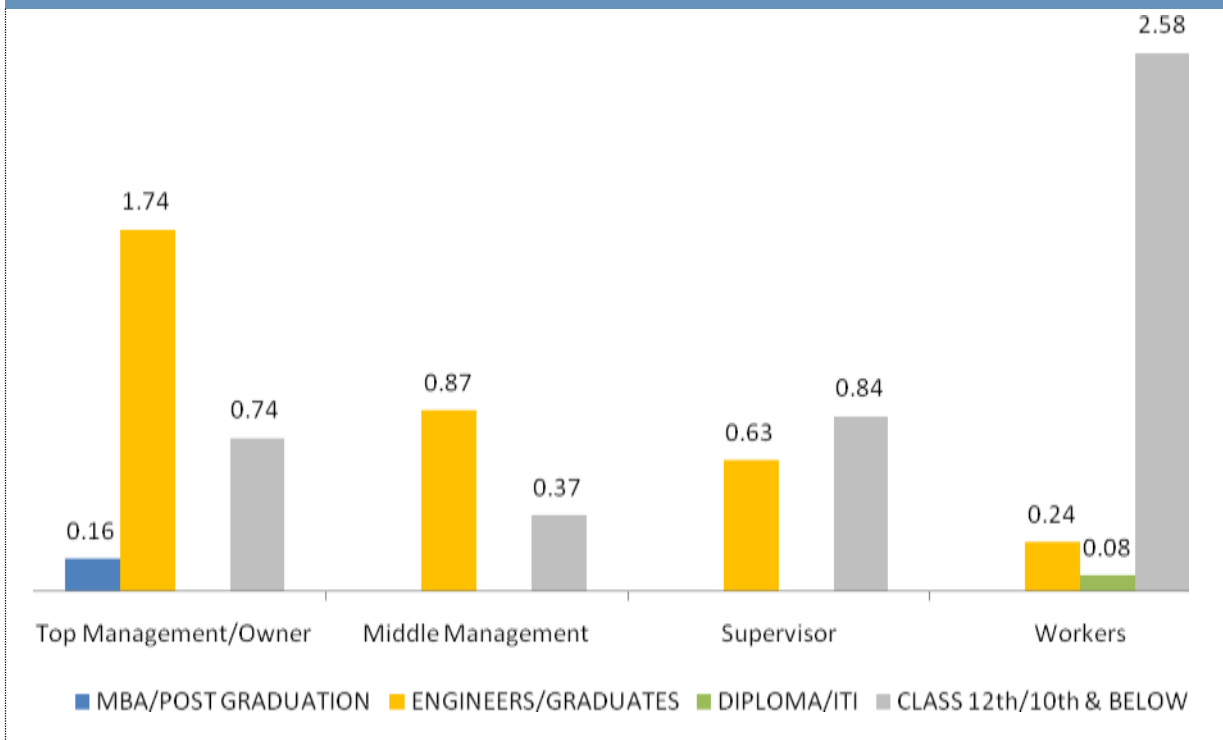


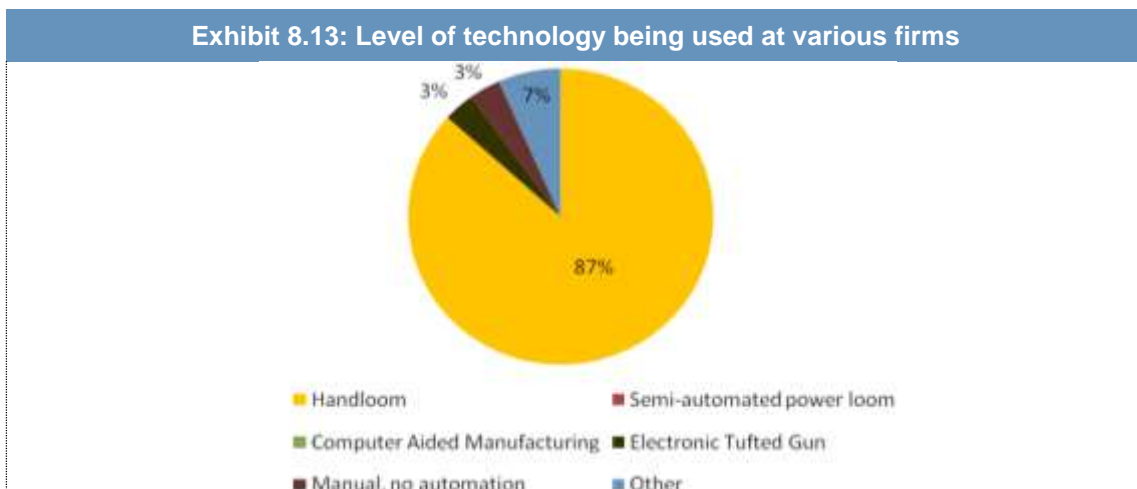
Exhibit 8.12: Experience of employees at various levels, average no. of employees per firm



It is therefore clear from the above charts that though the educational level of most of the workers is class 10/12 or below, their experience in terms of number of years is around 6-10 years for most of the workers. Therefore, lack of technical education is a major gap in the cluster and workers are forced to continue as workers. Even at the supervisory level, very few graduates and ITI engineers are observed.

Technology and automation: The level of technology being used at various firms is only based on handloom and not even a single firm in the observed sample is using either semi-automated power loom or computer aided manufacturing technologies. Around 87% of the firms are still using handloom for production technology. The usage of electronic tufting is observed at around 3% of the enterprises surveyed. Exhibit 8.13 shows the break-up of technology being used at various firms

Exhibit 8.13: Level of technology being used at various firms

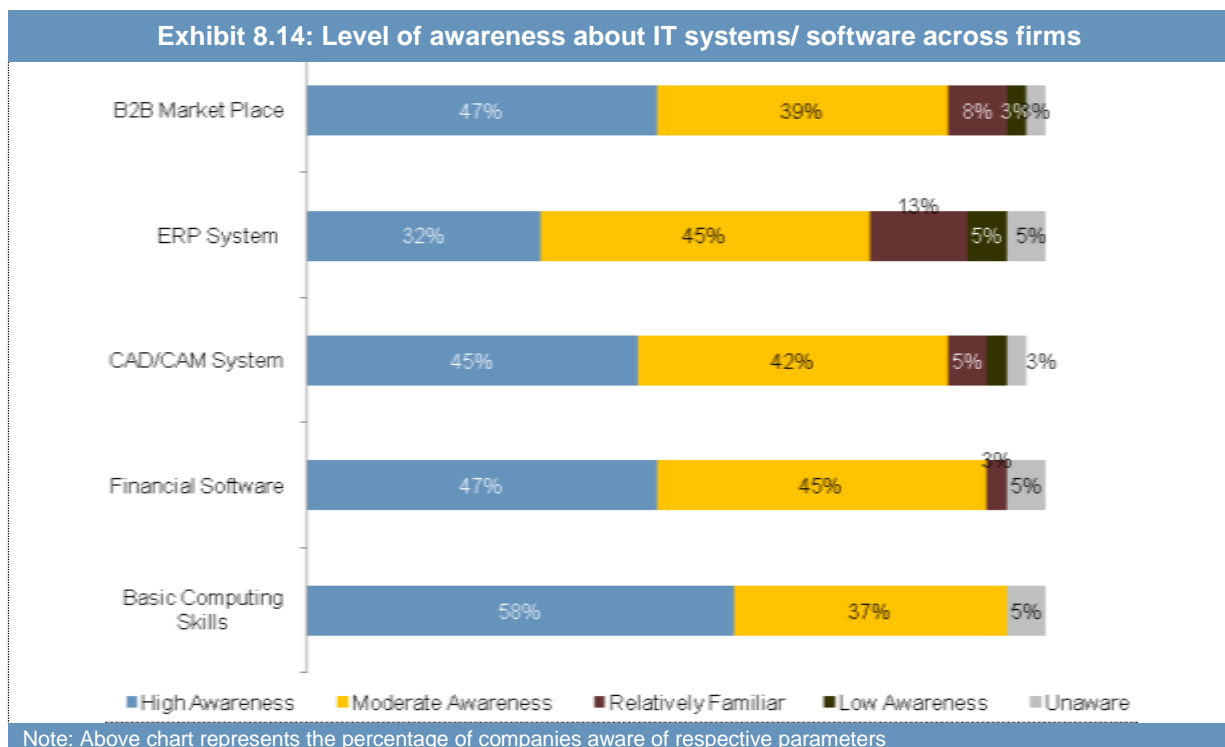


More than 95% of the yarn is purchased from New Zealand, dyed and supplied to weavers/ tiny manufacturers by Merchant Export Firms and Manufacturing Export Firms. Price fluctuation of yarn is high due to seasonality and fluctuations in demand. The cotton yarn is purchased by manufacturing firms from the local yarn supplier. No **collective purchase mechanism** is observed in the cluster. Also, knowledge about managing price and quantity fluctuations is not observed

Limited access to advanced technologies in Chemical & Mechanical finishing are the major constraint observed in the cluster.

Dyeing, knotting and weaving being the relatively more complex operations the skill gaps are high in these processes. It is evident that lack of skilled workers to carry out these processes in an efficient manner has been a constraint for most of the firms to maximise output. At small firms level dyeing, knotting and weaving, chemical weaving are considered to be relatively complex and available skill levels are lower than required skills of the cluster. Also between micro and small firms dyeing, knotting and weaving are the processes where the skill gaps are highly prevalent.

Material wastages due to poor quality, production run-times and overall productivity losses due to power shortage, lack of infrastructure facilities were commonly observed. Orthodox methods of production and **absence of usage of Information Technology** is a major issue of the production process. Institutes like IICT are offering long-term courses in **CAD/ CAM** however, due to higher resource commitment in terms of investment and labour, enterprises are shying away from the same. Exhibit 8.14 shows that firms are aware about the different IT software and information systems but the cluster is not active in the usage of the IT systems for various reasons.

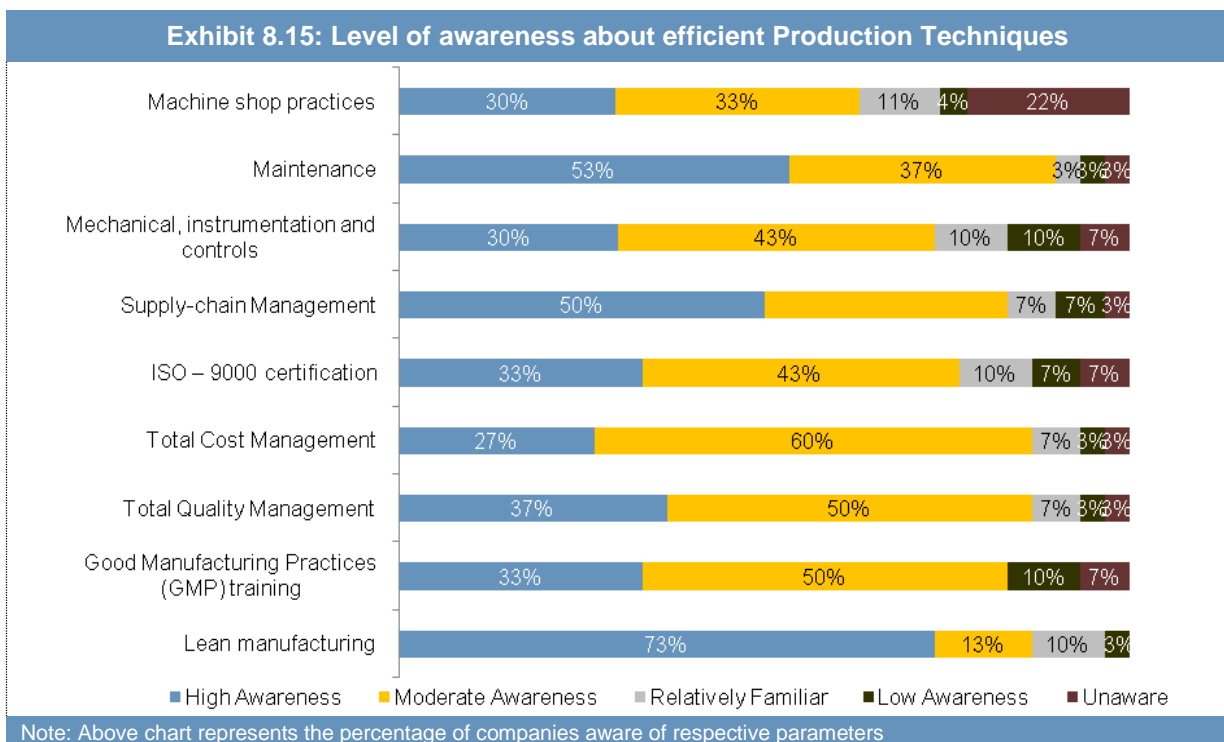


Around 68% of the enterprises are only moderately aware of the ERP systems and hence, most of these have not even implemented the same at their plant locations. With respect to basic computing skills, though 58% of the enterprises have demonstrated high awareness levels, these are not observed across functions or hierarchies and the knowledge is restricted to a few process owners.

There has been inadequate sharing of knowledge about technological advancements. Only a few large enterprises e.g. OBT have gone ahead and installed high technologies to reduce duplication of time and effort. Information on **imported/ foreign technology, industry best practices, Lean Manufacturing and GMP** etc is limited posing a serious challenge to technology up gradation. Buyers are at a commanding position and knowledge about **social norms like child labour** etc is absent in the enterprises. As a result, they are exploited by buyers by dictating terms.

Awareness about Lean manufacturing techniques is relatively moderate and around 40-50% of the enterprises have indicated the same across various lean manufacturing modules.

Other than lean manufacturing, awareness levels about other industry best practices and production techniques is also low with respect to critical modules related to the enterprises. Around 67% of the firms are moderately aware of GMP. The following chart summarizes the modules related to production and quality standards.

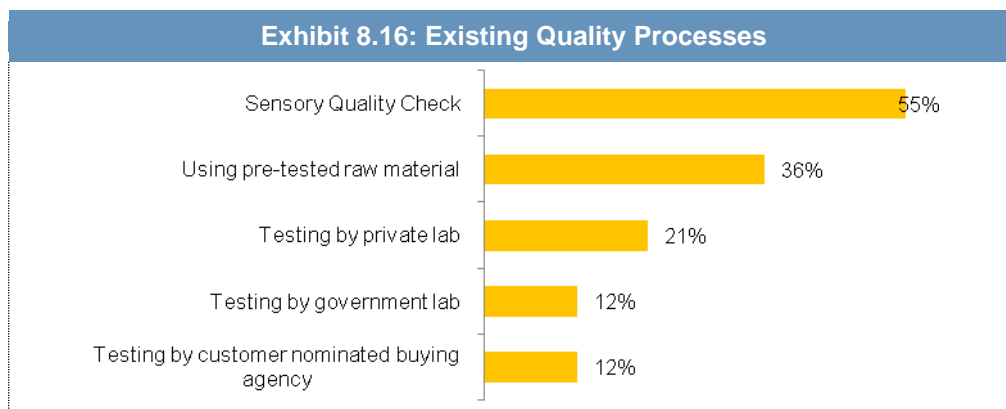


Carpet Designing is also an important activity for the carpet industry. Most of the small firms tend to have the designing facilities in-house to preserve secrecy of the designs. However, IICT offers module-wise designing facilities and a few micro firms use these services from IICT. The cost of design varies with the nature of design required i.e. an exclusive design will be most expensive followed by Persian, Tibettan, Killim, Kashmiri etc. The cost is determined on basis of per square inch

of design. The micro firms have to rely on the services of IICT due to non-availability of designers at affordable prices.

Availability of Designers: The **affordability of qualified designers/ design firms, technical training institutions** is beyond the reach of tiny manufacturing firms. The availability of trained craftsmen in weaving, finishing process is very limited leading to **low productivity and high wastage**. Though there are institutions/ organizations who are providing training/ courses in designing and dyeing are on long term basis, however **no institutions are offering short term courses in weaving, designing and Finishing**.

Quality process is a major skill gap at small enterprises as these are relying on **sensory testing** as a tool for judging the samples that they produce. **No quality control measures/ checks** were identified in weavers and tiny manufacturing firms leading to poor quality and higher rejection rate with cutting in job work charges and delay in payments as it affects the entire value chain. Merchant Export firms are not aware of quality certifications or quality specifications of international buyers leading to limited direct marketing. Usage of government labs is restricted either due to prohibitive pricing of the tests or the delay in obtaining reports.



It is important to note that out of the sample respondents, around 55% of the enterprises have indicated “Sensory Quality Check” as an activity for quality processes. Enterprises use these techniques for physical tests and other chemical processes are rarely followed.

Availability of testing facilities & common facility centers in the clusters is a major challenge posing the quality checks. In-house quality checks and awareness programs for workers without resorting to huge investment in labs etc is a priority for most of the enterprises. Indian Institute of Carpet Technology offers testing services to the cluster firms through its various labs like chemical testing, physical testing and carpet labs. The following modules are readily available at the IICT:

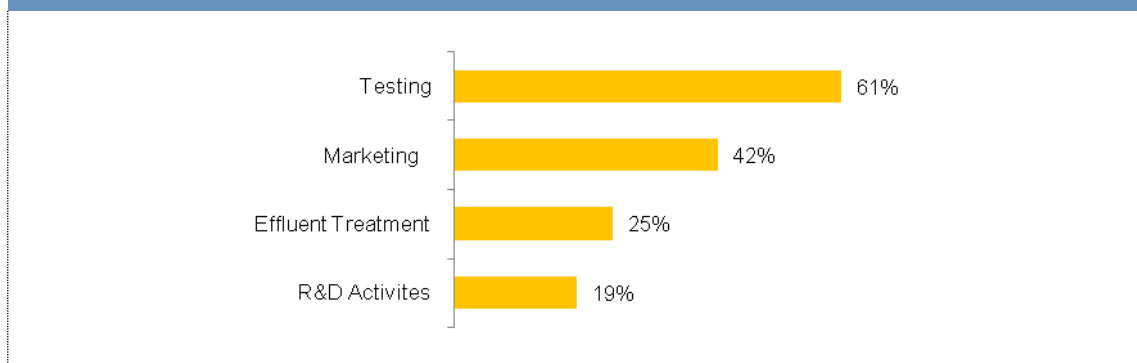
Exhibit 8.17: Available testing facilities at IICT

Test Type	Test Parameter	Proposed Charges per sample
Chemical Testing	Dyeing and color related	Rs 350- Rs 3500
	Raw Material testing for fiber content, moisture etc	Rs 350
Physical Testing	Determination of twist, length of fiber etc	Rs 400
Carpet Lab	Thickness, recovery, withdrawal force	Rs 400
	Knots per square inch, wear and abrasion loss	Rs 500

All the above three testing facilities are available under NABL (National Accreditation Board for Testing and Calibrating Laboratories) and non-NABL certifications.

The cluster has indicated its requirements from a common facility centre as testing, marketing and training purposes. The most preferred choice of the firms in the survey was a common facility centre for testing purposes which signifies the lack of quality testing facilities inside the cluster.

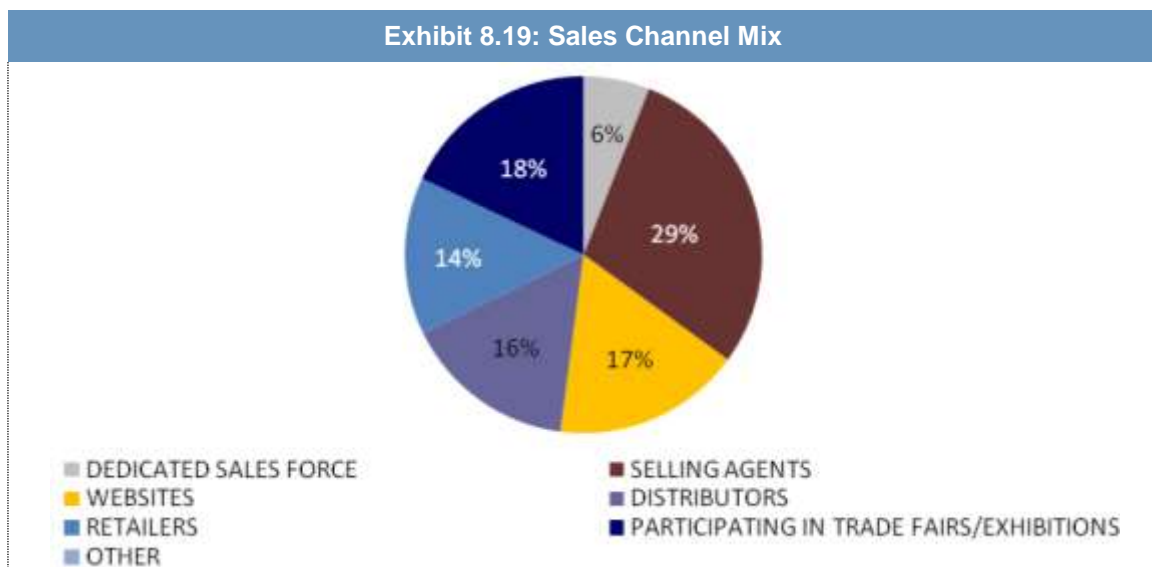
Exhibit 8.18: Awareness of Manufacturing Practices



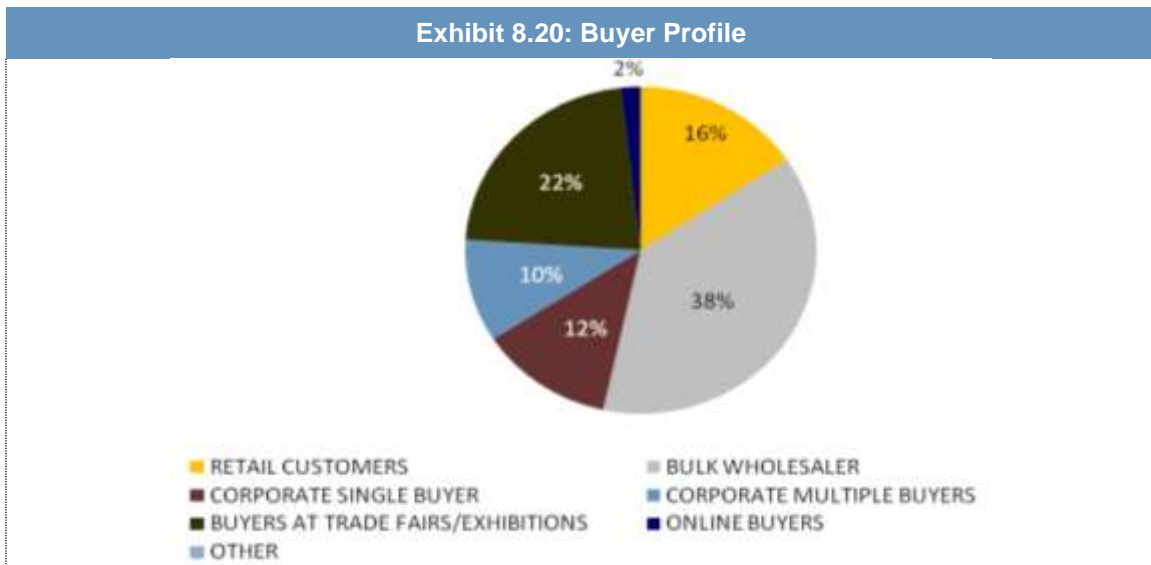
Effluent treatment is also seen as a major issue in the cluster with respect to knowledge of the treatment. Under such circumstance, the enterprises face issues with the pollution control boards etc and hence, having a common effluent treatment plant is indicated as a major requirement from facility centers. Training programs can be used as an interim measure to bridge the current requirements of the enterprises from facility centers.

Sales and Marketing

Marketing is more often done by the entrepreneur with a small sales team pushed in to the markets to collect information about potential demand and at times also, the Voice of the buyer. A major lacuna of using this **traditional technique** is inefficiency and accuracy. Ascertaining the right demand from the right buyers at the right time and at right place is a major skill gap in this cluster. Exhibit 8.19 shows the channel mix of cluster and majority of the sales happen through selling agents, trade fairs/exhibitions. This high dependency on selling agents poses a serious problem to the enterprises in terms on inability to market innovative products. The selling agents bring orders only for traditional designs and are not aware of new designs, products etc. The following chart explains the sales channels available and used by the enterprises within the cluster. Around 71% of the order booking is seen through own channels and dependence on external agencies is relatively lower. The role of selling agents is more prominent in the micro enterprises.

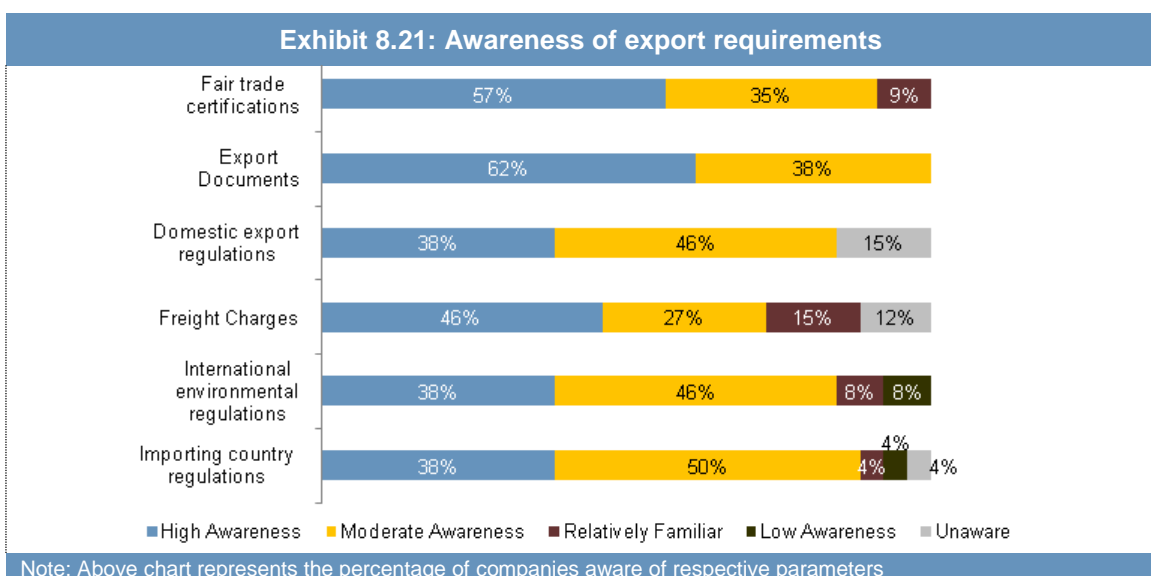


Bhadohi floor covering cluster is growing rapidly and expanding, exports form a significant market for the carpet industry. While the industry leaders have become efficient in identifying these export geographies, even their knowledge is obtained through the learning curve. There is no scientific criterion or method to identify potential markets etc. Evaluation and selection of specific foreign markets to enter is done with the help of export consultants or else buyers are in search of the new designs & tap the market as per their choice. This is a **buyers' market** and around 38% of the buyers are bulk wholesalers that dictate their own terms to the cluster firms.



The MEFs and MAFs are supplying the raw material and designs to the tiny manufacturers/ weavers through sub contractors on job work basis. The payment mechanism for tiny manufacturers is 1 month credit period while for weavers either cash or on weekly basis. During the field survey it was observed that only MEFs and MAFs are doing **direct marketing through buying agents** while tiny manufacturers and weavers are **exclusively depending on export houses**. The buying agents will be appointed by the buyers to check the quality of the finished goods with parameters as given by the buyer and timely execution of the order. Poor emphasis on **domestic market and its requirements, exploitation by buying agents, late delivery of the goods affecting the repeated orders** is the major constraint observed in marketing.

With respect to the export markets, another skill gap identified in the cluster is the lack of adequate information on the **rules & regulations of various foreign markets, certification and packaging requirements** amongst small firms. This is currently therefore serviced by the buying agents in the cluster and are available within the reach of only the big enterprises.

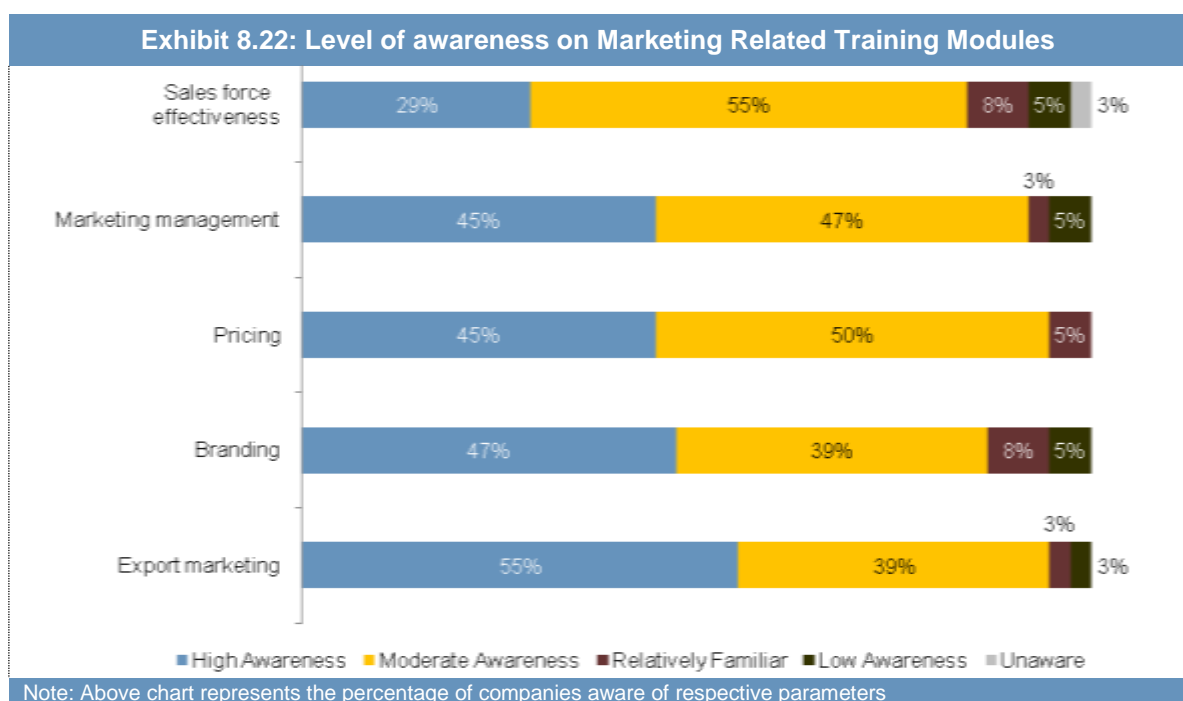


The above chart represents the awareness level of employees about different aspects of exports. Most of the firms (around 50%) have indicated that knowledge of importing country regulations is moderate. This is a major issue in the cluster since for such cases, the enterprises have to rely on external experts and BDS providers.

As the Bhadohi floor covering cluster has wide variety of firms competing with each other, creating importance of **brand awareness** through digital marketing or getting orders through email needs to be stressed, given the fact that a large volume is export volume. However, as indicated above, the knowledge of basic computing skills is relatively concentrated amongst a few firms and employees.

Pricing strategies of most of the enterprises depended upon the overall view of the competing firms. It was observed that most of the enterprises set the price of the product according to their near competitor or the industry leader producing the same product. However no proper pricing strategies or techniques were followed and lack of innovative marketing programs and price strategies is an issue.

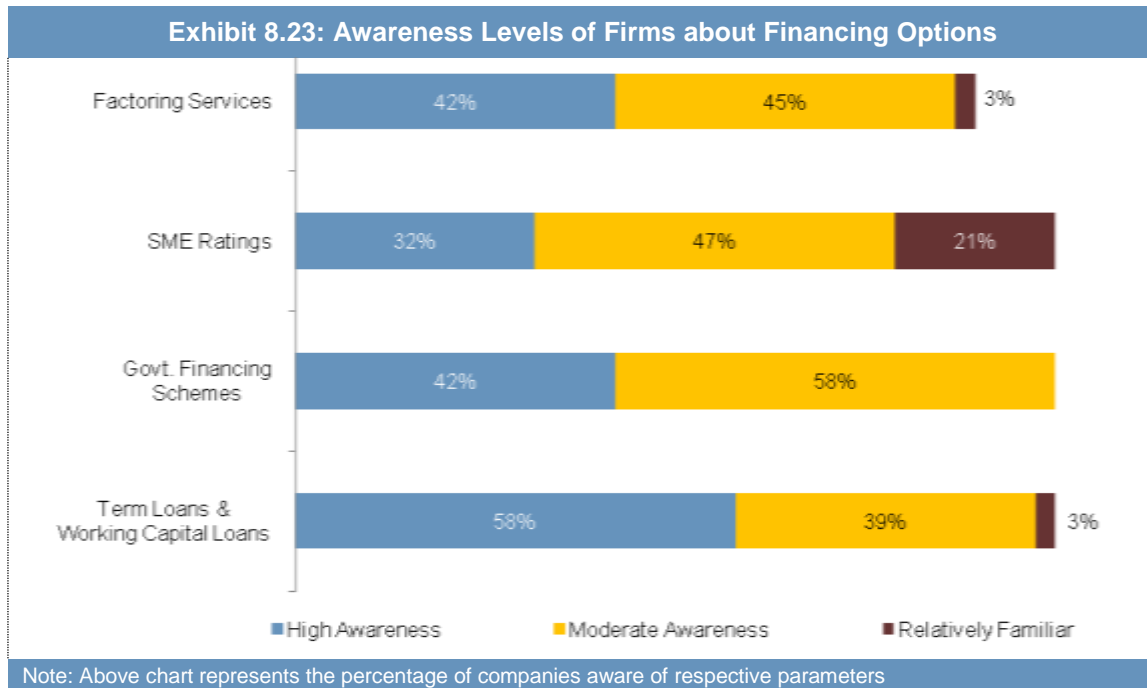
Marketing related training modules and their awareness is also relatively lower in the cluster enterprises. The firms are not aware of effectively utilizing sales force and hence have to rely on selling agents or other internal sources, though they have dedicated sales force. The following chart indicates awareness levels of the enterprises with respect to marketing related training modules.



The major issue of the sales & marketing in this cluster has been inadequate ability to articulate views to understand changing buyer's preferences & analyze the demand for new products. It was also been observed that the person at helm of the function was lacking in inter-personal skills & communication skills so as to gauge the buyer's requirement & redesign and innovative packaging for fulfillment of varied buyer needs. The level of soft skills is assessed in the section below at an overall organization-wide level.

Finance

MEFS and MAFs are having good linkage with the banks. The tiny manufacturers and weavers are mainly depending on money lenders or own sources of funds for purchase of equipment and working capital including labour payments. The money lenders are charging anywhere between 15 to 20% based on the entrepreneurs credibility and net worth. The MEFs and MAFs have their own accountants/ Auditing firms to maintain the financial transactions, where as the Tiny Manufacturing Firms are not **following any systematic accounting procedures.**



It is clear from the above chart that around 58% of the firms are only moderately aware about government financing schemes (here, government financing schemes specifically includes SIDBI).

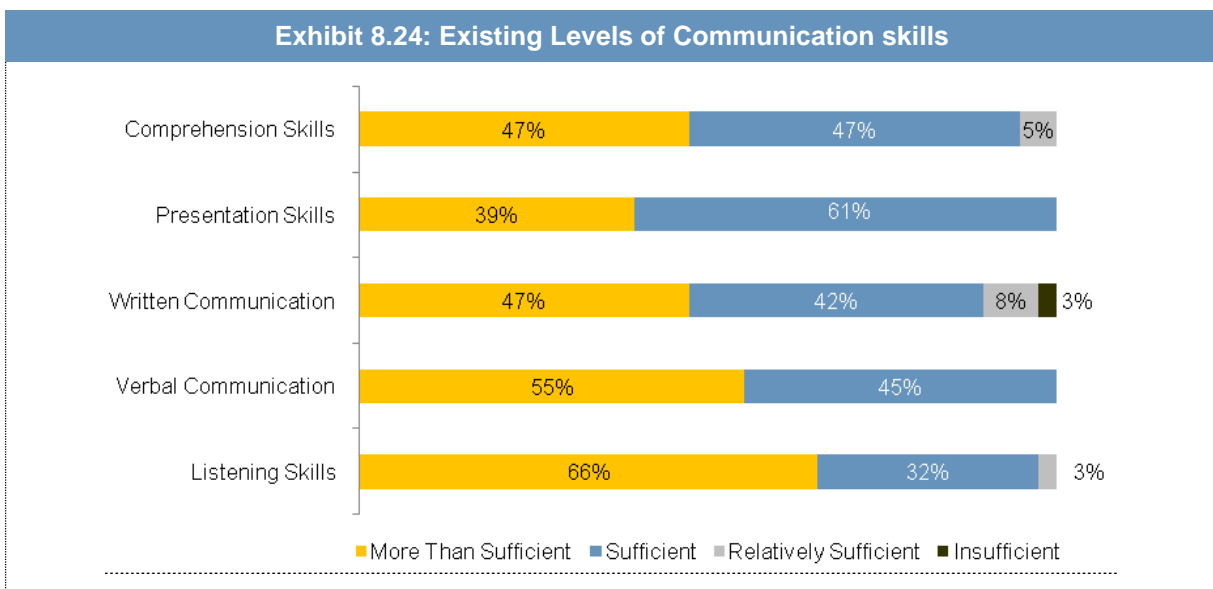
It is observed that most of the firms are using traditional techniques like monthly budgeting; planning sheets and scheduling on an ad-hoc basis to prepare the financial budget for the organization. **The key linkages between procurement of raw material, production, and marketing, finance were missing in most of the enterprises.**

To mitigate risks of financial compliance, firms rely more and more on the guidance of experienced and qualified financial managers & their owners in compilation of annual reports, understanding tax sops and incentives declared by continuous government announcements.

Another challenge is the usage of IT in the finance function. While most of the activities of the finance function involve usage of IT for filing returns, maintaining regular records, audit related documents etc. The knowledge of IT in most of the firms is elementary and is now beginning to be focused upon.

Soft skills

The soft skills of employees are important from organisation perspective as it helps in better coordination among employees, needs to deal with external world and to work in a collaborative environment. It is highly required for employees working in Bhadohi cluster because the cluster is export driven, it needs to deal with foreign markets and also internally marketing personnel need to deal with export oriented firms and production personnel should be able to manage workers working in different processes. Soft skills of the employees are assessed based on communication skills, attitude, personality traits and leadership skills of managerial staff.

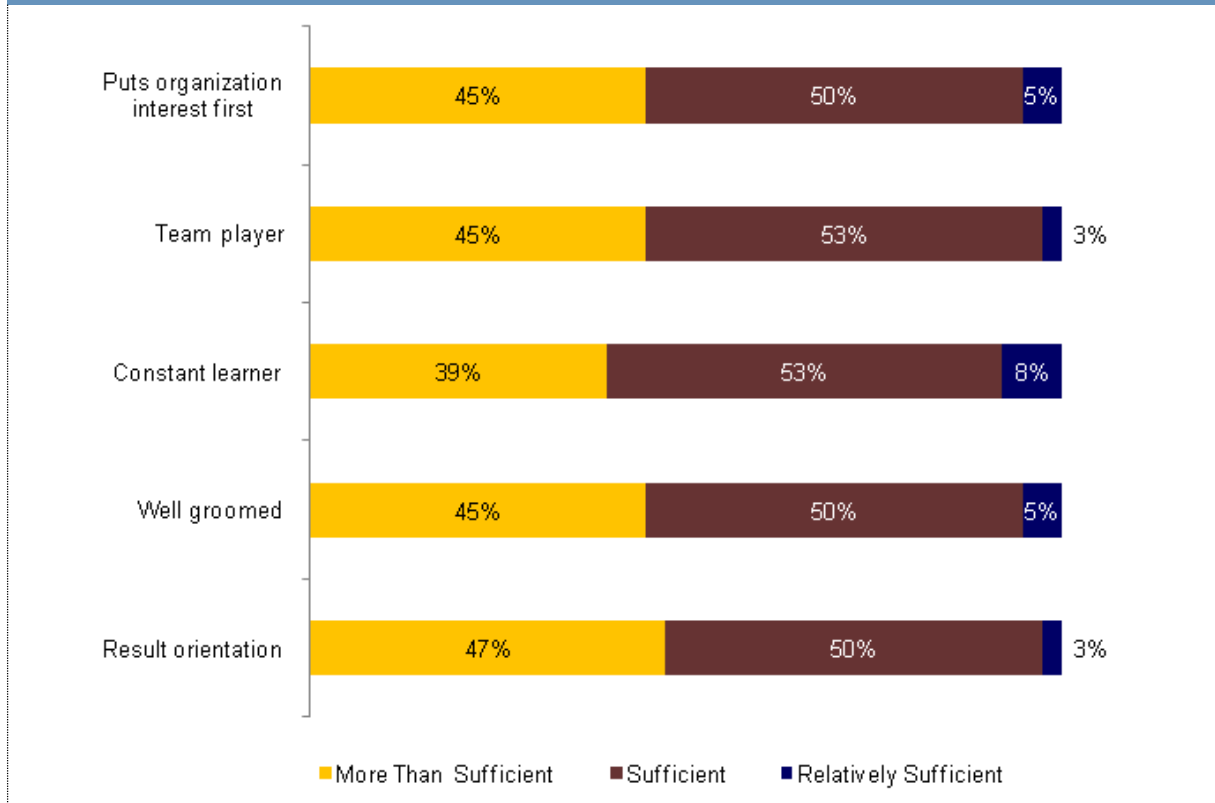


It can be seen from the above chart that around 45% of the enterprises have indicated issues with verbal skills and these mostly relate to familiarity of local language only. There are cases where not even the national language is known and hence, interaction with international vendors (for materials, mainly New Zealand) and international buyers (mainly Iran, Persia etc) is an issue.

In terms of attitude, no major issues were identified within the firms in the cluster. Innovation, however, still remains an issue with most of the enterprises.

Personality traits exhibited have indicated some issues with the cluster firms. Since most of the labour is non-sticky and migrates very often, the tendency to be less motivated and result oriented is more common amongst the firms. The following chart depicts the existing levels of personality traits indicated by the sample respondents.

Exhibit 8.25: Personality Traits



Enterprise Level Initiatives

It was observed that most of the firms provide on the job training i.e. training on GMP, GLP, Quality Assurance, IPR, Regulatory Affairs, Maintenance and New Product Development to the weavers with help of trainers who are called from various training institutes. Regular training sessions on various automation procedures, technology up gradation and usage of various software's, skills & managerial ability polishing, handling of various machineries were provided to the weavers of the firms. However, the levels of awareness of training programs were relatively lower across the firms in the cluster.

Assessment of NSDC and other reports

National Skill Development Corporation (NSDC) has done a detailed study on mapping of Human Resource and Skill Requirements of the Furniture & Furnishings Industry in India till 2022. The report highlights the importance of technical skills, managerial skills, soft skills required in the Furniture & Furnishings Industry and also the skill gaps at different stages of the value chain.

However, the NSDC study does not capture skill gaps at enterprise level and hence, the skill sets of the industry leader and the laggards are not measurable. Also, the NSDC report focuses on skills through an education and experience route while D&B India has conducted the study through the process-function-domain requirements route. The advantage of the latter method is it enables to define and develop structured training modules for the identified gaps. These skill gaps are specific to the process and not generic. Lastly, the NSDC report applies to all Furniture & Furnishings Industry while D&B India has concentrated only on the skill gaps in the Bhadohi floor covering cluster.

A comparative example in the production process from both the studies would highlight differences in approaches and the level of granularity that D&B India has conducted the study

Exhibit 8.26: Assessment of NSDC Report

Function	Level	Skill gaps- NSDC Findings	Skill Gaps- D&B India Findings
Production & Quality Control	Managers	<p>In-depth knowledge of the various types of fabric and quality parameters.</p> <p>Negotiation and communication skills.</p> <p>Knowledge of international quality standards is a significant gap.</p> <p>Inadequate knowledge of speciality fabrics</p> <p>Insufficient knowledge of various types of fabric defects and other quality parameters.</p>	<p>Lack of knowledge of advanced technology</p> <p>Lack of adequate maintenance related knowledge</p> <p>Lack of marketing skills and innovation</p> <p>Lack of regulatory aspects related to exports, taxation etc and documentation related issues.</p>
	Supervisors	<p>Inadequate understanding of quality management practices</p> <p>Inadequate practical exposure to high quality lab settings</p> <p>Inadequate communication skills for communicating with weavers</p> <p>Inadequate understanding of</p>	<p>Lack of understanding various processes</p> <p>Lack of knowledge of Various machineries etc.</p> <p>Lack of orientation of shop-floor culture</p> <p>Lack of specific</p>

		<p>intellectual property management</p> <p>Inadequate task orientation</p> <p>Inadequate leadership skills</p>	<p>Floor coverings knowledge</p> <p>Lack of Training and assisting various weavers on the job</p> <p>Unable to polish Poor people management and planning skills</p>
Sales & Marketing		<p>Convincing skills and objection handling</p> <p>Relationship management</p> <p>Basic knowledge of logistics, commercial aspects, legal aspects etc</p>	<p>Lack of selling and negotiation skills</p> <p>Effective pricing tools</p> <p>Lack of synchronization between costing and finance with entrepreneurs</p>

Role of Industry Associations

Andhra Pradesh industrial & technical consultancy organization limited

APITCO (Andhra Pradesh industrial & technical consultancy organization limited) provides a complete range of solutions that help establish MSME & is promoted jointly by all-India financial institutions (IDBI, IFCI, ICICI), industry development corporations in Andhra Pradesh (APIDC, APSFC) and Commercial Banks (Andhra Bank, Indian Bank, SBI). APITCO, offer a wide range of consulting services, especially to SMEs in project identification, project counseling, pre-feasibility reports, detailed project feasibility studies, infrastructure planning, market assessment, expansion, diversification and turnaround strategies, energy audits, waste minimization, environment impact assessment, valuation of fixed assets, skill development etc.

Micro Enterprise Development: Identification of potential entrepreneurs among different target groups such as rural poor, women, minorities & upon that basis it identifies area specific viable manufacturing and service activities, extending candidate specific 'escort services' to entrepreneurs right from project identification, availing financial assistance and accessing markets & then monitoring during project implementation through commercial operation & capacity building of other support providers.

APITCO has a strong base of Accredited Trainer Motivators who regularly conduct training to diverse target groups on wide ranging subjects. Organizing Skill Development Programs and capacity building for candidates selected under different government schemes, Conducting Management Appreciation Programs for SSIs & upgrading skills of middle and senior level executives through management development programs.

MSME DI

The local MSME – DI is located at Varanasi. The services offered by MSME-DI are conducting Market Surveys, financial support for infrastructure development and Common Facilities Centres. The quantum of grant varies from 40 to 60% based on size of the firms and nature of facilities required. The Tiny Manufacturing Firms and weavers have no linkage with MSME-DI. There is good scope for availing grant for any Common Facilities Centre proposed to be established under MSECDP Scheme.

IICT (Indian Institute of Carpet Technology)

The Indian Institute of Carpet Technology Bhadohi, was set up to provide support to the carpet industry in the area of human resource development, research and development and common facility services.

Human Resource Development: HRD is done through academic courses, which the institute undertakes. These include :- 1) Short term certificate courses of 4 Months in CAD Designing,

Dyeing and Computer Accountancy 2) Distance learning diploma programme of 3 years (IDLDP) in weaving, carpet manufacturing, chemical processing, carpet designing and maintenance of carpet 3) B.Tech. in carpet technology of four years duration. These courses will cover training in computer

aided designing colour matching, physical and chemical testing of various parameters of various types of yarn used in manufacture of carpets and floor covering, standardization of dyeing techniques including vegetable dyes. Standardization of washing and finishing technique and weaving on improved looms.

Research and Development:

The institute conducts research work in the areas of blending of fibres for different quality yarns, colour matching and standard recipes for different colours/shades, dyestuff and eco friendly dyes, types and systems of weaving and different knots included improvement in looms, modern systems of carpet finishing/ washing/ standardization of technology and development work on designs.

Common Facility Services: The institute provides common facility services to the industry in the following fields:-

- Testing of various parameters of fibres and yarns
- Testing of various parameters of carpets and floor covering
- Colour matching and recipes of dyes, sale of designs, colour shade cards,
- Testing of eco friendly dyes
- Provide documentation and library facilities including creation of museum of carpet and floor coverings
- Arrange exhibitions, seminars, conferences to provide facilities of photo studio, business centres etc.
- Arrange lectures of national and international specialties.
- Inviting foreign designers, experts, professionals for continuous flow of exchange of knowledge and expertise.

At present the services rendered by IICT for Bhadohi cluster is limited to testing and HRD for Merchant Export firms and few Manufacturing Export firms. The cost of the services rendered by IICT is borne by the users and there are no grants/ subsidies involved. There is a good demand for testing, short term courses of in CAD/ CAM designing of 3 months duration, dyeing and finishing and R&D services, offered by IICT in the cluster.

CEPC

The CEPC provides necessary information about the buyers, market trends and support to participate in exhibitions and trade fairs. There is a good demand for the support scheme to participate in exhibitions and trade fairs. 50% of the cost of the service is provided in the form of grant from Govt. of India. All the cluster Merchant Export Firms and Manufacturing Export firms around 12000 are the members of the CEPC. The linkage of CEPC with these firms is found to be strong.

Bhadohi Industrial Development Authority (BIDA)

BIDA has developed 50 plots for relocation of dyeing units in Carpet City at Bhadohi. However due to poor infrastructure development only 3 dye houses are in operation in the relocated area. Other dye houses are also willing to relocate if necessary facilities were provided. Recently BIDA has undertaken Cluster Development Programme under MSEC DP Scheme of DC-MSME. They are also proposing to establish a common dyeing plant in the cluster for which in principal sanction was given by DC-MSME.

Industry Associations

There are four associations dealing with carpet industry in the cluster, as detailed below:

All India Carpet Manufacturers Association (AICMA), Bhadohi.

All India Carpet Yarn Spinners & Dealers Associations(AICYSDA), Bhadohi

All India Carpet Exporters Association (AICEA), Mirzapur

Mirzapur Carpet and Durries Export Associations (MCDEA) , Mussaffarganj, Mirzapur

The major activities undertaken by the important associations are given as below:

All India Carpet Manufacturers Association (AICMA), Bhadohi:

The All India Carpet Manufacturing Association caters to the MEFs and MAFs and established in 1985. The association is having own office at Kaleen Bhavan, Maryadapatti, Bhadohi. The association has employed 2 persons for looking after association activities. The association helps to increase job work charges for workers/ weavers by 10%. All the cluster Merchant Export Firms and Manufacturing Export firms around 250 are the members of the AICMA. The linkage of AICMA with these firms is found to be strong.

All India Carpet Yarn Spinners and Dealers Association (AICYSDA), Bhadohi:

The All Carpet Yarn Spinners and Dealers Association (AICYSDA) are the associations of the yarn spinners and dealers. The association is having own office at Hotel Shiraz, Station Road, Bhadohi. The association has employed 1 person for looking after association activities. The major activities of the association are price fixation of the raw materials, conducting annual meetings to address common issues.

All India Carpet Exporters Association (AICEA), Mirzapur:

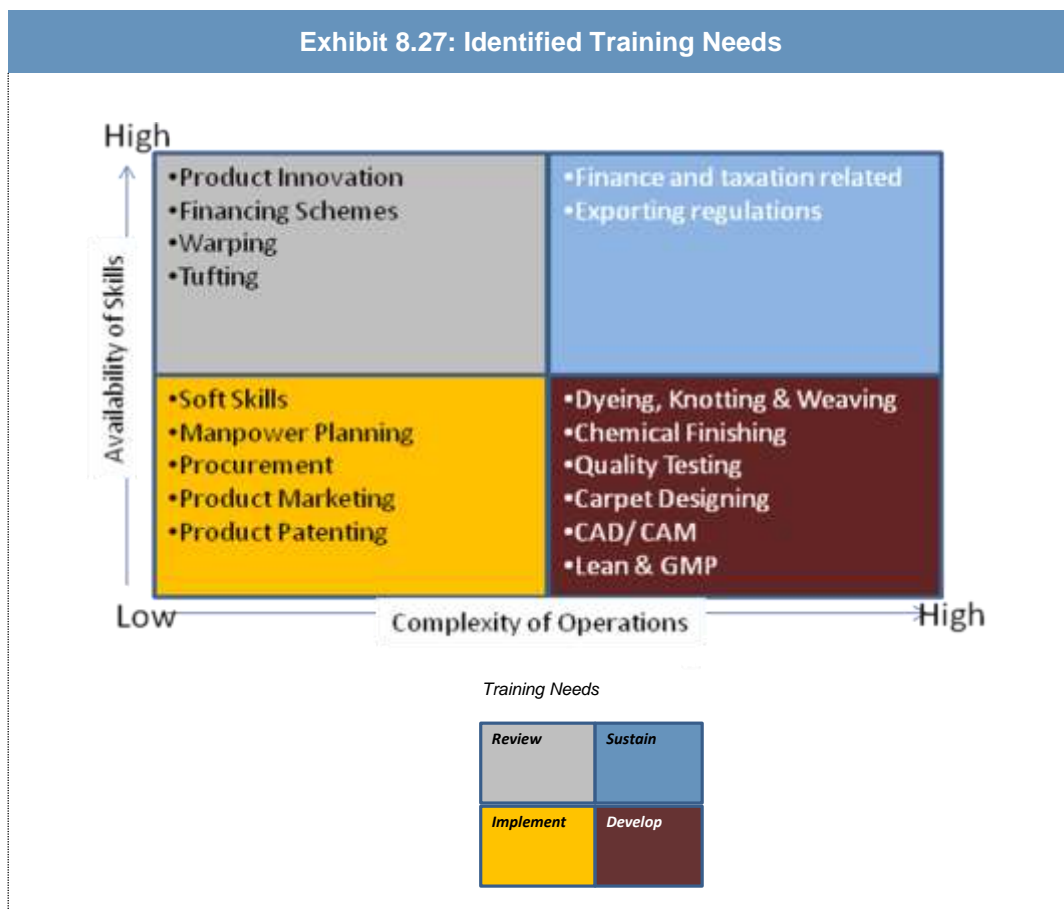
AICEA was established in 1990, to cater the needs of Mirzapur MEFs. Most of the association members are also members of AICMA and CEPC. The major activities of the association are to provide market related information, working of the problems of the MEFs in the areas of production, timely realization of money from buyers etc. However since last four years the operations of the association became limited due to lack of cohesiveness among members and economic recession.

Mirzapur Carpet and Durries Export Associations, Mussaffarganj, Mirzapur:

This is the association based in Mussaffarganj, Mirzapur district and related to the durries manufacturers and exporters. At present the association is inactive due to differences among the members.

Identified Training Needs in the Cluster

Production, quality and packaging are identified as important areas where training is required. In terms of marketing, export compliance and branding are important areas where training across forms of enterprises is required. Assessment of training needs and skill gaps was conducted using the complexity-skill available matrix where process complexities were rated against the skills available currently to perform the said activities. The following matrix represents the set of training needs for the carpet cluster.



The following table further explains the training needs identified across key development areas and managerial levels:

Exhibit 8.28: Training Needs Identified		
Development Area	Worker/ Supervisory Training	Management Level Training
Production	Productivity Improvement Mechanized Production Dyeing, Weaving & Knotting	Chemical Testing Importance of ISO standards
Equipment Maintenance	Machine knowledge Spares requirement planning	Preventive and predictive maintenance
GMP & Lean Manufacturing	Health and Hygiene Process sanitization	Standard Operating Procedures Effluent Treatment Techniques Certification
Intellectual Property (IP)	Awareness modules on IP	Documentation Registration of Designs and IP Certification Arbitration for infringement
Computer Designing	Manual Designing Innovative designing, colour combination	CAD, CAM
Export Marketing	Designing per international standards	New Market & Product Development Incoterms & Global Practices
Soft Skills	Verbal communication skills Attitude & Motivation	Managerial & Leadership Skills Verbal communication, foreign languages

Summary

Availability of skilled labour and designers is an important issue at the Bhadohi Carpet cluster. While most of the enterprises are export oriented units, the labour that these firms have to rely on is highly migratory in nature. Also, the seasonality element in the cluster is responsible for the shortage of labour in the enterprises.

- The primary requirement of the cluster is availability of skilled designers. Shortage of designers was observed across all the cluster enterprises. No formal training within the firms is available for the workers to be able to take up the jobs of designers, the primary reason for this being secrecy of designs. Another issue with the availability of labour is the implementation of NREGA which has attracted more labour from within the cluster and the payment is lucrative compared to the tedious work and low payment at the cluster enterprises.
- Production process complexities are observed at most of the cluster enterprises and these largely relate to dyeing, knotting and weaving. Dyeing is explained as a complicated process due to variety of chemical process, physical testing and colour combination based changes in design. Carpet Yarn Dyeing is an integral process of the production activity. Indian knot is the most complicated knotting system in carpet manufacturing as it involves looping and double-looping of fibre yarn. The existing skills in this respect amongst the cluster firms are traditionally gathered and no formal qualification is available with the workers in this regard.
- Lack of technological awareness can be mentioned as another skill gap in the cluster. IICT has been making constant efforts in terms of promoting advanced technology however, cost of investment is a major issue within the firms.
- Availability of testing facilities related to chemical, physical and carpet labs are limited. The knowledge about quality standards is relatively inadequate across all enterprises in the value chain.
- Knowledge of export regulations is also lacking amongst most of the micro enterprises. The consequence of this is loss of bargaining power with the buyers due to unfavourable pressures created by them, for e.g. issues with using child labour.
- Awareness about computer aided designing has now started to be seen amongst the cluster firms. However, most of the international competition has already switched to CAD and computer aided manufacturing enabling economies of scale (e.g. China carpets are largely machine made carpets)
- The knowledge of GMP and Lean Manufacturing is also limited across the cluster firms.

Exhibit 8.29: Production Function Tip Sheet

Exhibit 8.29: Production Function Tip Sheet					
Bhadohi	Production				
Processes in Value Chain	Dyeing	Warping	Knotting & Weaving	Washing (Chemical Finishing)	Quality Checking
Sub Processes	Colour Selection, Designing, Chemical Processing	Rod Replacements, Shedding, Spinning, Yarn Making	Knot Selection, Knot Designing, Pattern Selection, Colour Selection	Washing, Chemical Processing, Standard Maintaining	Physical Testing, Chemical Testing
Type of Skill Requirement (Semi-skilled / Skilled)	Semi-Skilled	Semi-Skilled	Skilled	Skilled	Skilled
Availability of Manpower (Low /Medium / High)	Low	High	Low	Medium	Low
Skill Gap (Low/Medium/High)	High	Low	High	High	Medium
Training needs (Review /sustain /implement /Develop)	Develop	Review	Develop	Develop	Develop/ Implement
Available Training Courses	Certificate course in carpet yarn dyeing	Level I Course in Yarn Making Spinning of woolen/ cotton yarn	Certificate Course in Hand knotted Carpets Level II Course in Carpet Design- CAD	IICT Washing and testing labs Physical Testing Courses	Certificate course in Physical Testing, Texture and withdrawal force
Available Training Institutes	Indian Institute of Carpet Technology, MSME Development Institute				

Exhibit 8.30: Marketing Function

Exhibit 8.30: Marketing Function					
Bhadohi	Marketing				
Processes in Value Chain	Customer Development	Sales Force Effectiveness	Export Compliance	Marketing Management	Demand Estimation
Sub Processes	New Market Identification, New customer identification, Relationship building with existing customers, Product Innovation	Effective monitoring of sales force, Developing right channel mix	Knowledge of various export related procedures	Brand awareness, Targeted pricing strategies, Product Marketing, Patenting	Quantitative tools, structured demand estimations
Type of Skill Requirement (Semi-skilled / Skilled)	Technical: Semi Skilled Managerial: Skilled	Technical: Skilled Managerial: Skilled	Technical: Skilled Managerial: Semi-skilled	Technical: Semi-skilled Managerial: Skilled	Technical: Skilled Managerial: Skilled
Availability of Manpower (Low /Medium / High)	High	Medium	Low	Medium	Low
Skill Gap (Low/Medium /High)	High	High	High	High	Medium
Training needs (Review /sustain /implement /Develop)	Review	Implement	Sustain	Develop	Implement
Available Training Courses	Certificate course in Marketing Management at IICT				
Available Training Institutes	No Institutional Training Available				

Annexures

Annexure 1: Skill Gap Analysis

Number of firms rated on complexity-availability matrix (select processes)

Dyeing - Complexity Vs. Skill Matrix						
Dyeing	Skill Availability Rating					
Complexity Rating	Insufficient	Nearly Insufficient	Moderately Sufficient	Sufficient	More than sufficient	Grand Total
Moderately Complex	1	1	1	3	2	8
Extremely Complex			1	9	12	22
Grand Total	1	1	2	12	14	30

Warping - Complexity Vs. Skill Matrix					
Warping	Skill Availability Rating				
Complexity Rating	Nearly Insufficient	Moderately Sufficient	Sufficient	More than sufficient	Grand Total
Not At All Complex			2		2
Moderately Complex	1	2	8	7	18
Extremely Complex		1	3	6	10
Grand Total	1	3	13	13	30

Knotting & Weaving - Complexity Vs. Skill Matrix					
Knotting & Weaving	Skill Availability Rating				
Complexity Rating	Nearly Insufficient	Moderately Sufficient	Sufficient	More than sufficient	Grand Total
Somewhat complex				1	1
Moderately Complex	1		6	7	14
Extremely Complex	1	2	7	5	15
Grand Total	2	2	13	13	30

Chemical Finishing- Complexity Vs. Skill Matrix					
Quality Control	Skill Availability Rating				
Complexity Rating	Insufficient	Moderately Sufficient	Sufficient	More than sufficient	Grand Total
Not At All Complex	-	-	1	-	1
Somewhat complex	-	-	1	-	1
Moderately Complex	1	2	6	7	16
Extremely Complex	1	2	4	5	12
Grand Total	2	4	12	12	30

Tufting- Complexity Vs. Skill Matrix						
Tufting	Skill Availability Rating					
Complexity Rating	Insufficient	Nearly Insufficient	Moderately Sufficient	Sufficient	More than sufficient	Grand Total
Not At All Complex	-		-	1	-	1
Not Very Complex	-	1	-	1	-	2
Somewhat complex	1		-	2	-	3
Moderately Complex	1	1	1	6	4	13
Extremely Complex	-	-	-	1	10	11
Grand Total	2	2	1	11	14	30

Annexure 2: List of Firms/ Meetings Conducted

Respondents		
Name	Organization	Designation
Mr. Abdul Mujeeb	APITCO	Cluster Manager
Mr. Dinesh Mishra	Marketing Consortia	President
Mr. Ramesh Chandra Yadav	Purvanchal Designers Association	President
Mr. Abdul Hadi	AICMA	Secretary
Dr. K.K. Goswami	IICT	Director
Mr. D.K. Shrivastava	Branch MSME DI- Varanasi	MSME DI
Mr. Amit Rai	SIDBI- Varanasi	Deputy General Manager

APPENDIX – QUANTITATIVE SURVEY QUESTIONNAIRE

SECTION 1 – GENERAL PROFILE

RESPONDENT DETAILS

1. Name of Enterprise	
2. Name of Respondent	
3. Designation	

4. Investment in Plant & Machinery.	
a) <input type="checkbox"/> less than Rs. 25 lakhs	d) <input type="checkbox"/> Rs. 3 Cr to Rs. 5 Cr
b) <input type="checkbox"/> Rs. 25 lakhs to Rs. 1 Cr	e) <input type="checkbox"/> Rs. 5 Cr to Rs. 10 Cr
c) <input type="checkbox"/> Rs. 1 Cr to Rs. 3 Cr	f) <input type="checkbox"/> Above Rs. 10 Cr

To FRA – Please terminate the interview if the respondent selects option (f) for question no. 4.

5. Year of establishment / registration	
---	--

6. Form of organization (To FRA – Use show card no. 1 to explain the options to the respondent)	
a) <input type="checkbox"/> Sole Proprietorship	e) <input type="checkbox"/> Public limited company
b) <input type="checkbox"/> Family owned business	f) <input type="checkbox"/> Private limited company
c) <input type="checkbox"/> Partnership	g) <input type="checkbox"/> Other, please specify _____
d) <input type="checkbox"/> Limited liability partnership	

7. Please tell me the products manufactured by you and the annual (FY 2010) production volume for each product. Please also list the months when production is at its peak for each product.	Product Name	Production Volume		Months when production is at its peak
		Numbers	%	
	Total		100%	(To FRA - No data to be filled)

8. Total sales	
a) <input type="checkbox"/> less than Rs. 25 lakhs	e) <input type="checkbox"/> Rs. 10 Cr – Rs. 50 Cr
b) <input type="checkbox"/> Rs. 25 lakhs – Rs. 1 Cr	f) <input type="checkbox"/> Rs. 50 Cr – Rs. 100 Cr
c) <input type="checkbox"/> Rs. 1 Cr – Rs. 5 Cr	g) <input type="checkbox"/> more than Rs. 100 Cr
d) <input type="checkbox"/> Rs. 5 Cr – Rs. 10 Cr	

9. Breakup of total sales			%
	Domestic Sales		
	Export Sales		
	Total		100%

10. What is the breakup of full time and contract employees? Please also provide the split between skilled and unskilled employees for part time and full time employees. (To FRA – Use show card no. 2 to explain the terms unskilled / manual and skilled to the respondent)		Number of employees	Skilled (%)	Unskilled / Manual (%)
	Full time			
	Contract Employees			
	Total			100%
11. What is the breakup of full time employees, division wise?		Number of employees	%	
	Top Management			
	Production			
	Finance			
	Marketing/Merchandising			
	HR / Admin / Support/Others			
	Total			100%
12. Educational qualification of full time employees. (To FRA – Please ask the respondent to provide broad estimates)				
	Top Management / Owner	Middle Management	In Charge/ Supervisors	Workers
MBA				
Specialized degrees (Fashion Designing, Knitwear Designing, Fashion Forecasting, Production, Merchandising)				
Engineers				
Other graduates				
Diploma or equiv. certification				
ITI and other vocational courses				
Class 12 th & below				
Class 10 th & below				
Total (Number of employees)				
13. Please specify the count of full time employees from different levels based on their tenure of work experience				

	Top Management / Owner	Middle Management	Supervisor	Worker
Less than 1 year				
1 – 3 years				
3 – 6 years				
6 – 10 years				
Above 10 years				

14. Skill level break up of full time employees

(To FRA – Use show card no. 3 to explain the terms basic, aware, knowledgeable and expert to the respondent)

	Top Management / Owner	Middle Management	Supervisor	Worker
Basic				
Aware				
Knowledgeable				
Expert				
Total	100%	100%	100%	100%

SECTION 2 – Production Function (To be answered by the person in charge of production or the owner)

	Rating Value
<p>15. Please rate the listed operations on the basis of level of complexity of operations, where 5 = Extremely complex & 1 = Not at all complex</p> <p>(To FRA – Use show card no. 4. Please ignore any operation if not applicable. However, in such case, please indicate NA)</p>	Fibre cleaning
	Spinning
	Winding
	Knitting
	Mending
	Finishing
	Dyeing
	Printing
	Compacting
	Stitching
	Overlock
	Linking

	Cutting Button holing Labeling Quality checking Ironing Packaging		
		Rating Value	
	Fibre cleaning Spinning Winding Knitting Mending Finishing Dyeing Printing Compacting Stitching Overlock Linking Cutting Button holing Labeling Quality checking Ironing Packaging		
16. Please rate the available skill level of your employees for the listed operations on a 5 point scale; where 5 = More than sufficient & 1 = Insufficient (To FRA – Use show card no. 5. Please ignore any operation if not applicable. However, in such case, please indicate NA)			
17. What are the main reasons for your employees lacking skills?	a) <input type="checkbox"/> Lack of suitable training b) <input type="checkbox"/> Lack of formal qualification c) <input type="checkbox"/> No initiative from employee to learn d) <input type="checkbox"/> Other, please specify _____		
18. Please indicate the type of technology being used at your plant/manufacturing unit. (To FRA – Options a,b and c are for knitting process and other options are for remaining processes mentioned in Q15. Last option is applicable for all processes)	a) <input type="checkbox"/> Circular Knitting Machines b) <input type="checkbox"/> Computerized Flat Bed Knitting Machines c) <input type="checkbox"/> Manual Flat Bed Knitting Machines d) <input type="checkbox"/> Domestic Machinery - Traditional e) <input type="checkbox"/> Domestic Machinery - Modern f) <input type="checkbox"/> Imported Machinery - Traditional g) <input type="checkbox"/> Imported Machinery - Modern h) <input type="checkbox"/> Other, please specify _____		

19. Please indicate the source from where you obtained information about the technology being used at your plant.	
a) <input type="checkbox"/> Machine suppliers	h) <input type="checkbox"/> Local BDS agencies
b) <input type="checkbox"/> Other enterprise owners	i) <input type="checkbox"/> MSME DI or Toolroom
c) <input type="checkbox"/> Customers	j) <input type="checkbox"/> Textiles Committee
d) <input type="checkbox"/> Raw material suppliers	k) <input type="checkbox"/> Government agencies / Financial institutions
e) <input type="checkbox"/> Local industry associations	l) <input type="checkbox"/> Published industry journals
f) <input type="checkbox"/> Trade fairs / exhibitions	m) <input type="checkbox"/> Internet / Blogs
g) <input type="checkbox"/> External / design consultants	n) <input type="checkbox"/> Other, please specify _____
20. How far into the future do you estimate your production schedule?	
a) <input type="checkbox"/> 1 week	e) <input type="checkbox"/> 6 months
b) <input type="checkbox"/> 2 weeks	f) <input type="checkbox"/> Other, please specify _____
c) <input type="checkbox"/> 1 month	
d) <input type="checkbox"/> 3 months	
21. Please indicate the inputs you consider for estimating the production schedule.	
a) <input type="checkbox"/> Projected sales for the future	d) <input type="checkbox"/> Delivery Commitments to Buyers
b) <input type="checkbox"/> Projected availability of skilled labor	e) <input type="checkbox"/> Labour Productivity
c) <input type="checkbox"/> Projected supply of raw material	f) <input type="checkbox"/> Other, please specify _____
22. Please indicate the reasons for production outage at your plant.	
a) <input type="checkbox"/> No production outage	e) <input type="checkbox"/> Unavailability of skilled labour
b) <input type="checkbox"/> Mechanical breakdown	f) <input type="checkbox"/> Industrial strikes / labour problems
c) <input type="checkbox"/> Unavailability of raw material	g) <input type="checkbox"/> Industrial accidents
d) <input type="checkbox"/> Unavailability of power	h) <input type="checkbox"/> Other, please specify _____
To FRA – If the respondent selects option (b) for question no. 22, then ask question no. 23,24 and 25.	
23. Please indicate the main reasons for mechanical breakdown	
a) <input type="checkbox"/> Lack of knowledge of machine operations	c) <input type="checkbox"/> Overutilization
b) <input type="checkbox"/> Mishandling during operations	d) <input type="checkbox"/> Lack of maintenance
	e) <input type="checkbox"/> Other, please specify _____
24. Please indicate the measures taken to handle the problem.	
a) <input type="checkbox"/> In house maintenance staff	d) <input type="checkbox"/> Consulting with MSME Tool Room
b) <input type="checkbox"/> Owner himself handles the problem	e) <input type="checkbox"/> Consult local BDS agencies
c) <input type="checkbox"/> Annual Maintenance Contract (AMC) with the machine supplier	f) <input type="checkbox"/> Preventive Maintenance
	g) <input type="checkbox"/> Other, please specify _____
25. Please indicate the time required to solve the problem.	
a) <input type="checkbox"/> less than 1 day	c) <input type="checkbox"/> 2 – 4 days
b) <input type="checkbox"/> 1 – 2 days	d) <input type="checkbox"/> More than 4 days
26. Please indicate the steps followed to ensure quality of products manufactured by your organization	
a) <input type="checkbox"/> Sensory quality check done (testing done by seeing and/or touching the product)	c) <input type="checkbox"/> Testing done by customer nominated buying agency
b) <input type="checkbox"/> Using pre-tested / certified raw materials	d) <input type="checkbox"/> Testing done by government lab / agency
	e) <input type="checkbox"/> Testing done by private lab / agency
	f) <input type="checkbox"/> Other, please specify _____
27. Please elaborate on the regulatory quality standards you follow.	
28. Please indicate the Good Manufacturing Practices you follow.	
a) <input type="checkbox"/> Ensuring that pollutants are not released in the environment	g) <input type="checkbox"/> Buying machines from GMP certified manufacturers
b) <input type="checkbox"/> Ensuring hygiene of workers	h) <input type="checkbox"/> Adequate lighting and ventilation
c) <input type="checkbox"/> Ensuring health of workers	i) <input type="checkbox"/> Std. operations procedures displayed on each machine
d) <input type="checkbox"/> Adequate sanitation facilities	j) <input type="checkbox"/> Safety training for workers
e) <input type="checkbox"/> Adequate sewage disposal facilities	k) <input type="checkbox"/> Not required to follow GMP practices
f) <input type="checkbox"/> Adequate safety signs	l) <input type="checkbox"/> Other, please specify _____
29. Please rate your awareness of the listed training programs on a 5 point	Rating Value

scale; where 5 = Highly aware & 1 = Not at all aware. (To FRA – Use show card no. 6)	Lean manufacturing		
	Total quality management		
	ISO – 9000 certification		
	Merchandising		
	Industrial Engineering		
	Maintenance		
	Production Planning		

SECTION 3 – Marketing Function (To be answered by the person in charge of marketing or the owner)

30. Please indicate how you reach your markets. Please also provide the breakup of sales among the options you select.		Tick	% of Sales
	Dedicated sales force		
	Selling Agents		
	Web sites (Alibaba.com., Trademart.com, Indiamart.com)		
	Distributors		
	Retailers		
	Participating in trade fairs / exhibitions		
	Other, please specify _____		
Total		100%	
31. Please indicate your buyer profile. Please also provide the breakup of sales among the options you select.		Tick	% of Sales
	Retail customers		
	Bulk wholesaler		
	Corporate single buyer		
	Corporate multiple buyers		
	Buyers at trade fair / exhibitions		
	Online buyers		
	Other, please specify _____		
Total		100%	

32. Please indicate how you promote your product.	a) <input type="checkbox"/> Product catalogue / Marketing Brochures b) <input type="checkbox"/> Own website c) <input type="checkbox"/> Third party website (Alibaba.com, Indiamart.com, Trademart.com) d) <input type="checkbox"/> Sending postal mails to potential customers e) <input type="checkbox"/> Sending emails / SMS to potential customers f) <input type="checkbox"/> Participating in trade fairs / exhibitions g) <input type="checkbox"/> Advertising in trade journals / yellow pages h) <input type="checkbox"/> Event sponsorship i) <input type="checkbox"/> Other, please specify _____														
33. How do you determine the price for your product?	a) <input type="checkbox"/> Add a profit margin to cost of the products b) <input type="checkbox"/> Match the price of my competitors c) <input type="checkbox"/> Charge a markup on competitor prices d) <input type="checkbox"/> Follow the industry leader in setting the price e) <input type="checkbox"/> Customer determines the price f) <input type="checkbox"/> Agent determines the price g) <input type="checkbox"/> Charge different prices to different customers h) <input type="checkbox"/> Other, please specify _____														
To FRA – If the respondent does not sell his products outside India, then skip question no. 34, 35 and 36.															
34. Please rate your awareness of the listed options on a 5 point scale; where 5 = Highly aware & 1 = Not at all aware (To FRA – Use show card no. 6)	<table border="1"> <thead> <tr> <th></th> <th>Rating Value</th> </tr> </thead> <tbody> <tr> <td>Importing country specific regulations</td> <td></td> </tr> <tr> <td>International environmental regulations</td> <td></td> </tr> <tr> <td>Freight rates and charges</td> <td></td> </tr> <tr> <td>Domestic export regulations</td> <td></td> </tr> <tr> <td>Documents required in export process</td> <td></td> </tr> <tr> <td>Fair trade certifications (Social accountability standard – SA8000 etc.)</td> <td></td> </tr> </tbody> </table>		Rating Value	Importing country specific regulations		International environmental regulations		Freight rates and charges		Domestic export regulations		Documents required in export process		Fair trade certifications (Social accountability standard – SA8000 etc.)	
	Rating Value														
Importing country specific regulations															
International environmental regulations															
Freight rates and charges															
Domestic export regulations															
Documents required in export process															
Fair trade certifications (Social accountability standard – SA8000 etc.)															
35. Please indicate the source from where you obtain information about the options listed in above question.															
a) <input type="checkbox"/> Customer b) <input type="checkbox"/> Other enterprise owners c) <input type="checkbox"/> Local associations d) <input type="checkbox"/> Trade fairs / exhibitions e) <input type="checkbox"/> External consultants / Export agents f) <input type="checkbox"/> Local BDS agencies g) <input type="checkbox"/> Government agencies h) <input type="checkbox"/> Published industry journals i) <input type="checkbox"/> Internet / blogs j) <input type="checkbox"/> Other, please specify _____															
To FRA – If the respondent selects option (f) or (g) for question above question, then ask the next question.															
36. Please indicate the reason for employing the service of external agencies.															
a) <input type="checkbox"/> Cost savings b) <input type="checkbox"/> Expert advice c) <input type="checkbox"/> Savings in time d) <input type="checkbox"/> Quality of service e) <input type="checkbox"/> Lack of skilled resources f) <input type="checkbox"/> Other, please specify _____															

SECTION 4 – Finance Function (To be answered by the person in charge of finance or the owner)

37. Please rate your awareness of the tax and duty related options on a 5 point scale; where 5 = Highly aware & 1 = Not at all aware. (To FRA – Use show card no. 6)	<table border="1"> <thead> <tr> <th></th> <th>Rating Value</th> </tr> </thead> <tbody> <tr> <td>Preparing & filing the tax return and associated compliance procedures</td> <td></td> </tr> <tr> <td>Intra state and inter state sales taxes</td> <td></td> </tr> <tr> <td>Excise duties, Cenvat credit and duty drawback schemes</td> <td></td> </tr> </tbody> </table>		Rating Value	Preparing & filing the tax return and associated compliance procedures		Intra state and inter state sales taxes		Excise duties, Cenvat credit and duty drawback schemes	
	Rating Value								
Preparing & filing the tax return and associated compliance procedures									
Intra state and inter state sales taxes									
Excise duties, Cenvat credit and duty drawback schemes									

		Rating Value
38. Please rate your awareness of the export related options on a 5 point scale; where 5 = Highly aware & 1 = Not at all aware. (To FRA – Use show card no. 6)	Documents required for Importer-Exporter Code (IEC) Number	
	Documents required for export (Bill of lading, Export packing list etc.)	
	Customs duty	
	International commercial terms (Incoterms)	
	Overseas buyers credit rating	
	Insurance schemes to protect against payment risk	
	Procedures for recovering bad debts	
39. Please rate your awareness of the financing options on a 5 point scale; where 5 = Highly aware & 1 = Not at all aware. (To FRA – Use show card no. 6)	Term loans and working capital loans - interest rates, tenures etc. offered by public banks, private banks, non-banking financial companies (NBFCs), private money lenders, etc.	
	Government financing schemes such as CGTMSE, Technology Upgradation Fund (TUF) for textiles	
	SME ratings	
	Factoring services	
40. Please indicate the source from where you obtain information about the financing options listed above.		
a) <input type="checkbox"/> External consultants (CA etc.) b) <input type="checkbox"/> Other enterprise owners c) <input type="checkbox"/> From bank / financial institution officials d) <input type="checkbox"/> Customer e) <input type="checkbox"/> Local associations f) <input type="checkbox"/> Trade fairs / exhibitions g) <input type="checkbox"/> Local BDS agencies h) <input type="checkbox"/> Cluster development agency i) <input type="checkbox"/> Government agencies j) <input type="checkbox"/> In house resources k) <input type="checkbox"/> Internet / Blogs l) <input type="checkbox"/> Other, please specify _____		
To FRA – If the respondent selects option (a) or (g) for above question no. 37, then ask the next question.		
41. Please indicate the reason for employing the service of external agencies.		
a) <input type="checkbox"/> Cost savings b) <input type="checkbox"/> Expert advice c) <input type="checkbox"/> Savings in time d) <input type="checkbox"/> Quality of service e) <input type="checkbox"/> Lack of skilled resources f) <input type="checkbox"/> Other, please specify _____		
42. How far into the future do you estimate your financials/conduct budgeting?		
a) <input type="checkbox"/> 1 month b) <input type="checkbox"/> 3 months c) <input type="checkbox"/> 6 months d) <input type="checkbox"/> 1 year e) <input type="checkbox"/> Other, please specify _____		

SECTION 5 – PRODUCTIVITY AND INFORMATION MANAGEMENT (To be answered by the owner)

		Rating Value
<p>43. Please rate your awareness of the listed lean manufacturing techniques on a 5 point scale; where 5 = Highly aware & 1 = Not at all aware. (To FRA – Use show card no. 6)</p>	Minimizing inventory (Just in time technique)	
	Equipment reliability (Total productive maintenance)	
	Eliminating waste through process and workplace redesigning (Cellular manufacturing)	
	Continuous improvement in quality (Total quality management)	
	Improvement in productivity through training etc.	
	Energy audits to improve energy efficiency	
<p>44. Please rate your awareness of the listed information and communication systems on a 5 point scale; where 5 = Highly aware & 1 = Not at all aware. (To FRA – Use show card no. 6)</p>		Rating Value
	Basic computing skills – email, Windows operations	
	Financial software – Tally, Excel	
	Computer aided designing (CAD) system	
	Computer aided manufacturing (CAM) system	
	Enterprise resource planning (ERP) system such as SAP	
	Supply chain management (SCM) system	
	Customer relationship management (CRM) system	
	Using business to business (B2B) market place	
Cloud computing		

SECTION 6 – Soft skills (To be answered by the person in charge of human resources or the owner)

		Rating Value
<p>45. Communication skill level of employees - Please rate on a 5 point scale; where 5 = More than sufficient & 1 = Insufficient (To FRA – Use show card no. 5)</p>	Ability to listen	
	Ability to talk	
	Ability to write	
	Ability to present information	
	Visual contact	
	Clarity of thought	

46. Attitude of employees - Please rate on a 5 point scale; where 5 = More than sufficient & 1 = Insufficient (To FRA – Use show card no. 5)		Rating Value
	Focused	
	Innovative	
	Process oriented	
	Pro active	
47. Personality traits of employees - Please rate on a 5 point scale; where 5 = More than sufficient & 1 = Insufficient (To FRA – Use show card no. 5)		Rating Value
	Result orientation	
	Well groomed	
	Constant learner	
	Team player	
48. Leadership skills of managerial staff - Please rate on a 5 point scale; where 5 = More than sufficient & 1 = Insufficient (To FRA – Use show card no. 5)		Rating Value
	Ability to motivate and influence	
	Ability to resolve conflict	
	Ability to plan for the future	
	Ability to handle stressful situations	

SECTION 7 – Training Needs (To be answered by the person in charge of human resources or the owner)

49. Please elaborate on the training programs required by your middle management for the areas listed.		Rating Value
	Ability to communicate effectively	
	Ability to motivate and influence	
	Ability to resolve conflict	
	Ability to plan for the future	
	Ability to handle stressful situations	

<p>50.</p> <p>A. Please specify the specific trainings required by your workers/employees on production floor?</p> <p>B. Please specify the processes which are faced by shortage of resources currently?</p>	<p>a) <input type="checkbox"/> Stitching Operators</p> <p>b) <input type="checkbox"/> Linking Operators</p> <p>c) <input type="checkbox"/> Computerized Knitting Machine Operators</p> <p>d) <input type="checkbox"/> Stoll/Sulzer Machine Operators</p> <p>e) <input type="checkbox"/> Checking</p> <p>f) <input type="checkbox"/> Machine Mechanics</p> <p>g) <input type="checkbox"/> Dyeing Operators</p> <p>h) <input type="checkbox"/> Printing Operators</p> <p>i) <input type="checkbox"/> Production Supervisors</p> <p>j) <input type="checkbox"/> Garmenting</p> <p>k) <input type="checkbox"/> Other, please specify</p>	<p>a) <input type="checkbox"/> Stitching Operators</p> <p>b) <input type="checkbox"/> Linking Operators</p> <p>c) <input type="checkbox"/> Computerized Knitting Machine Operators</p> <p>d) <input type="checkbox"/> Stoll/Sulzer Machine Operators</p> <p>e) <input type="checkbox"/> Checking</p> <p>f) <input type="checkbox"/> Machine Mechanics</p> <p>g) <input type="checkbox"/> Dyeing Operators</p> <p>h) <input type="checkbox"/> Printing Operators</p> <p>i) <input type="checkbox"/> Production Supervisors</p> <p>j) <input type="checkbox"/> Garmenting</p> <p>k) <input type="checkbox"/> Other, please specify</p>
<p>51.</p> <p>A. Please specify specific trainings required by your office staff/middle management staff?</p> <p>B. Please specify the processes which are faced by shortage of resources currently?</p>	<p>a) <input type="checkbox"/> Production Planning</p> <p>b) <input type="checkbox"/> Inventory Management</p> <p>c) <input type="checkbox"/> Logistics Management</p> <p>d) <input type="checkbox"/> Merchandising</p> <p>e) <input type="checkbox"/> Fashion Designing</p> <p>f) <input type="checkbox"/> Fashion Forecasting</p> <p>g) <input type="checkbox"/> Lean Manufacturing</p> <p>h) <input type="checkbox"/> Industrial Engineering</p> <p>i) <input type="checkbox"/> Maintenance</p> <p>j) <input type="checkbox"/> Industrial Relations</p> <p>k) <input type="checkbox"/> Marketing Management</p> <p>l) <input type="checkbox"/> Export Documentation and Logistics</p> <p>m) <input type="checkbox"/> Others</p>	<p>a) <input type="checkbox"/> Production Planning</p> <p>b) <input type="checkbox"/> Inventory Management</p> <p>c) <input type="checkbox"/> Logistics Management</p> <p>d) <input type="checkbox"/> Merchandising</p> <p>e) <input type="checkbox"/> Fashion Designing</p> <p>f) <input type="checkbox"/> Fashion Forecasting</p> <p>g) <input type="checkbox"/> Lean Manufacturing</p> <p>h) <input type="checkbox"/> Industrial Engineering</p> <p>i) <input type="checkbox"/> Maintenance</p> <p>j) <input type="checkbox"/> Industrial Relations</p> <p>k) <input type="checkbox"/> Marketing Management</p> <p>l) <input type="checkbox"/> Export Documentation and Logistics</p> <p>m) <input type="checkbox"/> Others</p>

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