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# I. INTRODUCTION

Agricultural Implements & Farm Machinery industry has been instrumental to the success of “The Green Revolution” in India. It is an important backward linkage required for improvement of the agriculture. This industry has its roots in the age-old black smithy shops situated in the villages and small towns. These shops used to cater the equipments and implements needs of the farmers of the area. Before the dawn of money economy, these black smiths were getting their remuneration in kind as a small share in the crop at the time of harvest. With the advent of mechanization of agriculture, the traditional black smithy has grown into present day industry.

Prof. Mason Vaugh, an Agricultural Engineer, founded the Department of Agricultural Engineering at Allahabad Agriculture Institute, Naini, Allahabad. He became the father of Agriculture Engineering in India in the early forties. Several implements such as Mould Board Ploughs (Wah Wah Plough, U.P. No.1, U.P. No.2, Shabash Plough) hoes, cultivators and wheat thresher were, for the first time introduced in India, by Prof. Vaugh.

## **International Scenario**

USSR, USA, Australia, Italy, Israel and Germany are the important manufacturing bases of Farm Machinery.

## **National Scenario**

Wide range of agricultural implements and machinery being manufactured in the country. Not only India is self-sufficient in this field but also sizable exports are taking place. Indian machinery is finding markets not only in developing countries but in developed countries as well. Agricultural Implements & Farm Machinery is being manufactured at Bhopal, Ratlam, Bina, Muksi and Indore in Madhya Pradesh; Saharanpur, Sambhal & Barabanki in Uttar Pradesh; Rudarpur in Uttranchal, Kota & Jaipur in Rajasthan and Unjha & Ahemdabad in Gujrat. Moga, Ludhiana, Hoshiarpur, Jalandhar, Malout, Mansa, Ropar & Sangrur are the major industrial clusters manufacturing Agricultural Implements & Farm Machinery in Punjab.

## **Scenario in Moga Cluster**

This cluster is spread over 20 to 35 kms radius of Moga city in small towns situated nearby such as Talwandi Bhai, Bhagata and Pakhoke. Entrepreneurs from all these places visit Moga frequently and are in close contact with each other. They also have a lot of social interaction between themselves. Moga is also a good market for spares parts and sub assemblies required for the manufacture of farm machinery.

Many types of Threshers and other Agricultural Implements & Farm Machinery are developed at Moga. It is rightly called the “Thresher City”. The cluster consists of more than 100 units manufacturing agricultural machinery and it’s parts. There are about 25 units manufacturing Farm Machinery, 20 units Manufacturing spare parts and about 10 foundries catering the needs of the Agricultural Implements & Farm Machinery industry. About 45 units manufacturing Agricultural Implements & Farm Machinery are working at Talwandi Bhai, Bhagata and Pakhoke. There are about 200 unregistered units doing job work for parts manufacturers.

Apart from Farm machinery, many other types of industries are also set up at Moga. Engineering Industries such as hydraulic jacks and pumps, truck body building, rice-shelling plants have developed at Moga.

## **Genesis of the Cluster**

Moga is a part of folklore of Punjab. No Bhangra & Gidda performance is complete without mentioning the name of Moga. Traditional Entrepreneurial culture is observed in the people of Moga. A large grain market is established at Moga. One of the pioneer brands of mustard oil “P Mark” was introduced at Moga. Swiss MNC Nestle has also set up large manufacturing facility at Moga.

A Cluster manufacturing horizontal diesel engines was already in existence at Moga. This cluster gradually gave way to agriculture machinery cluster. The entrepreneurs having experience in the manufacture of diesel engine started producing agricultural machinery. First unit manufacturing wheat Thresher came up at Moga in 1955. M/s Vishwakarma Industries and M/s Bharat Engineering Works (Bharat Thresher) were the pioneers to the manufacture of agriculture machinery.

Subsequently an industrial cluster manufacturing Agricultural Implements was established at Moga.

The commercial production of Wheat Thresher for the first time in India took place at Moga. It was based on a prototype developed by Prof. Mason Vaugh at Naini. This thresher is called conch or “*Ghughu*” Thresher in common lingo as its shape resembles with a conch. It was a great commercial success. Many subsequent developments resulted into Cutter Thresher or Haramba Thresher, which is more complicated in design and have better threshing capabilities. A paddy Threshers is a later development. Multi-crop Thresher for other crops like mustard, pulses & chick piece and sunflower is also developed. Potato seed planter and digger machines were introduced with the assistance of Punjab Agriculture University (PAU). Earlier potato seed planters were manual, but later, semi-automatic and automatic potato seed planters were developed. A small wheat harvester combine was replicated at Moga. Straw Reapers are manufactured to use with harvester combine to produce hay for fodder. Fairly large quantity of cultivators, Disc harrows and Karahas are also manufactured in the cluster during the lean periods.

The cluster has grown vis-à-vis the mechanization of agriculture in India. With the advent of green revolution in Punjab, this cluster has shown remarkable growth during late 60s and early 70s,

The cluster was on its zenith during the years 1975-80. There were about 100 units manufacturing more than 35000 pieces of threshers per annum.

Cluster has been showing decline trend since, 1986. Many reasons are put forward for this decline. There is saturation of markets in Punjab, Haryana, Western U.P. and Northern Rajasthan. A number of competitors came up in the States of Madhya Pradesh, U P and Rajasthan etc. High cost of transportation on raw material as well as finished products had adverse effect on the cost of production. Law and order disturbance in Punjab during 1985 to 1992 also took its toll. Customers from other States were hesitant to come to Punjab similarly the manufacturers from Moga didn't prefer to go to other States.

The process of emergence of agricultural machinery cluster at an around Moga was spontaneous Following are the facilitating factors for growth of the cluster.

### **Entrepreneurship**

People of Punjab are well known for their entrepreneurship. They try to avail every opportunity of doing business. Many Entrepreneurs from Moga join the pioneering people when they saw a good business opportunity in the industry. Thus demonstration effect, the enterprising and risk taking attitude of the local people paved the way for the growth of the cluster.

### **Low Barriers To Entry**

A very little capital investment is required to establish a unit. Only a workshop having lathe, welding set, drilling machine and shearing apparatus are required to setup a unit initially

### **Skilled Manpower**

Skilled manpower was available as a developed cluster manufacturing horizontal diesel engines was already in existence at Moga. Most of the entrepreneurs as well as workers are from an artisan community called Ramgarias. They are skilled technicians. British gave them the metaphor “The Born Engineers”. They are masters of reverse engineering. You give them a machine or a part they will replicate it easily.

### **Nearness To Market**

Moga is situated in Malwa belt of Punjab. Areas having highly advance agriculture of the States like Punjab, Haryana, Uttar Pradesh and Rajasthan are very near to it. Proximity to market is a very strong reason for development of cluster at Moga.

### **Demand Based Growth**

Mechanization of agriculture was an important factor leading to the green revolution. For mechanization there was a great demand for latest agricultural implements. Therefore this cluster was demand induced

### **Sources of Raw Materials**

Moga is located far away from the sources of raw materials. But due to rapid industrialization took place in near by areas a good market for raw material was developed at Ludhiana & Jalandhar. Similarly re-rolling industry was established at Mandi Gobindgarh. Disadvantage of Location i.e. being away from the sources of raw material was mitigated considerably by the development of these markets.

### **Govt. Policies**

To encourage mechanization of Agriculture, Central Govt. provided subsidy to the farmers on the purchase of farm implements. This subsidy gave an impetus to the agriculture machinery industry. Govt. also made available raw material at less than market price through its policy of allotting quotas of raw material to the industrial units and the policy of freight equalization.

### **Infrastructure**

#### Transport

Moga is situated about 65 km westward from Ludhiana, on Ludhiana - Ferozpur National Highway and Railway Line. It has good roadway linkages with Amritsar, Jalandhar, Bathinda and Abohar etc. Adequate road and railway links with major markets also played their role in the development of the cluster.

#### Power

Power Grid Corporation of India has established a distribution center at Moga. Therefore power is abundantly available.

#### Communication

Moga has a good network of telecommunication facilities like telephone, Internet, postal and courier services,

#### Industrial Accommodation

Punjab State Industrial Development & Export Corporation established an industrial focal point at Moga in 1977. This focal point fulfils the industrial land requirement of the industry.

## Current Output

### Output for the year 2003-04 in the Cluster

Name of the product	Numbers	Turnover (Rs. Crores)
Threshers all types	5000	20.00
Seed drills all types	1500	4.50
Potato Planters	700	2.00
Potato Diggers	300	0.50
Tractor Driven Harvester Combine	10	1.00
Straw Reaper	200	2.00
Reaper all kinds	N.A.	1.00
Cultivators and Disc Harrows all types.	N.A.	3.00
Spares Parts	N.A.	16.00
	<b>Total</b>	<b>50.00</b>

## Exports

### Export of Tractors & Agriculture Equipment (Value in MLN. \$) (All India)

1998-99	1999-2000	2000-01	2001-02	2002-03	2003-04
					(Estimated)
49.64	48.92	78.01	98.57	149.37	146.83

Source: (EEPC Data)

## Employment

The cluster directly employs 3000 persons approximately and about 2000 persons receive indirect employment in the cluster. Most of the employees are semi skilled and unskilled labour.

## Policy

Many Agricultural implements such as Chaff Cutters and their blades, animal driven implements, ploughs and cultivators, Disc Harrows, Forks & Hoes and manual sprayers & dusters are reserved for production in small scale industry sector. A few items for Agricultural Implements & Farm Machinery having motive power up to 5 horse power ( viz. Wheat and Rice Threshers, Seed Cleaners, Grain Dryers, Shell Huskers, Cotton De-linting machines and certain types of Earth Moving Blades used in agriculture machines) are also reserved for production in SSI sector.

Basic custom duties on import of main raw material required for manufacturing farm machinery (flats, bars & angles etc.) and on intermediaries (rivets, bolts & nuts etc.) are 40 % and 30% respectively, whereas custom duty on import of finished products and spares is 25%. This policy implies dearer import of raw material and comparatively cheaper import of finished products.

Duty draw back on export of farm machinery is Rs. 3356/- per M.T. and is available for excise portion only. Therefore no drawback is available in case where CENVAT credit is availed. DEPB rates for some products vary from 16% to 18% of FOB value with a value cap of Rs. 40/- per Kg

Under new VAT regime agricultural implements & components are classified under schedule 'A' (i.e. 0% tax rate). However tax is imposed on raw material.

## II. DEFINING THE PRODUCT

Agricultural Implements & Farm Machinery industry is instrumental to manufacturer equipment to facilitate the cultivation of a variety of crops. (e.g. various type of seed drills, planters, sprayers, cultivators, disc harrows, potato planters & diggers, Threshers, reapers, harvester combines, chaff cutters and implements etc.). Barring a few, most of the units in the industry are small workshops having the machinery like lathes, cutters, welding sets and small tools etc. Main processes involved in this industry are cutting & sizing, machining and fabrication etc. Outdated technology is being used. Jigs, fixtures & dies are rarely used. Department of Farm Power & Machinery Punjab Agriculture University is providing useful Research & Development Inputs.

Before going through the study, I will like to clarify the nomenclature of group of the products being manufactured at Moga. In common parlance the term Agricultural Implements is used for the Farm Machinery. Even the 8<sup>th</sup> Steering Committee of SICDP mentioned the name of the cluster as “Agricultural Implements Cluster at Moga”. But on close observation it is found that technically speaking the term “agricultural implements” stand for the hand tools and animal driven appliances used in agriculture. Power driven implements are denoted by the term “farm machinery”. Even for statistical purposes the agricultural implements and farm machinery are classified under different codes. Therefore it is evident that products being manufactured at Moga are farm machinery (power Driven) rather than agricultural implements.

Some of the types of Agricultural Implements & Farm Machinery being manufactured at Moga Cluster are: -

### **Ghughu Threshers**

Ghughu Threshers are compact and less power consuming. It comes in many variations and capacities.

### **Multi Crop Threshers**

Multi crop threshers are suitable for threshing different types of crops, like wheat, gram, green gram, mustard and soybean.

### **Harambha (High Capacity) Thresher**

Harambha thresher is suitable for threshing wheat crop and is highly popular. It is basically a chaff-cutter type thresher and has high capacity. It is also suitable for high moisture crops. A tractor of 35 hp and above operates Harambha thresher. Time required for threshing one-hectare crop is 4 to 4.5 hours.

### **Axial Flow Paddy Thresher**

It is used for threshing harvested paddy crop and is operated by a tractor of 25 hp or above. The machine uses axial flow threshing system and can thresh about 13.0 q/h of clean paddy grain. The grain losses are less than 2.5 percent. The machine can save about 50 percent of labour and 15 percent cost in comparison to manual threshing.

### **Sunflower Thresher**

The machine is operated by 7.5 hp motor and has a capacity of 8.0 q/h clean grains. The threshing efficiency of the thresher is more than 99 percent.

### **Tractor Mounted Till Planter**

The equipment can simultaneously prepare a seedbed after harvesting paddy and sow wheat crop effectively in one operation. It consists of a 9-row seed-cum-fertilizer drill mounted over a rotavator of 1.6-m width and is operated by 45 hp tractor.

### **No till drill with notched double disk furrow openers**

The machine consists of nine independent notched double disc furrow openers along with nine press wheels following each furrow opener. Independent discs help in maintaining uniform depth on uneven surfaces also. The draft requirement is 50% less and field capacity is almost double (due to its higher speed of operation) as compared to no till drill with inverted T-type furrow openers.

### **Tractor-drawn-Strip-Till Drill**

Strip-till drill helps to sow wheat crop after paddy without any prior seed bed preparation. It consists of a rotary blade attachment in front of a commercially available seed-drill. The blades open about 6-8 cm wide furrows in front of each row for the seeds to be placed. Thus in this machine only 40 percent of the area is tilled and the whole area is sown in one operation. It saves about 60 per cent time and 40 per cent fuel. The machine can cover about 0.3 ha/h and is highly efficient.

### **Seed-cum-Fertilizer Drill with Planter attachment**

A planting mechanism for sowing maize, cotton, groundnut etc. has been developed as an attachment to the existing seed drill. The planting attachment consists of 6 planting units for tractor drawn drills. Each unit has an inclined plate with notched cells. The plates can be changed according to the crops and the seed spacing requirement.

### **Tractor-operated No till Drill**

*This machine is modified version of seed-cum-fertilizer drill. In this machine the inverted T-type furrow openers were provided in place of shovel type furrow openers.*

### **Potato Planters**

Three types of Potato seed Planter viz. manual, automatic and semi-automatic are manufactured. Generally, semi-automatic potato planters are of revolving magazine or belt-conveyor type with cups. The machine is mounted on a 3- point linkage of a tractor and two persons sitting on the machine feed the tubers. Automatic Potato Planter is used for planting of potato crop automatically and no labour is used for feeding the tubers. Also capacity of automatic planter is about double than the semi-automatic. Automatic machine can plant potato seeds into 8-10 acres per day.

### **Tractor Operated Potato Elevator Digger**

It helps in digging the potato tubers and separating them from the soil. The machine is operated by a 35-45 hp tractor and has a capacity of about 0.25 ha/h.

Labour requirement for tuber collection is 140 man-h/ha and exposure of tubers is more than 95 percent.

### **Small Harvester Combines**

Combines are suitable for harvesting wheat and paddy and are of two types namely: self-propelled combine harvesters and tractor operated combines. Tractor operated combines can harvest 3-4 ha/day whereas self-propelled combines cover 5-6 ha/day.

### **Self Propelled Vertical Conveyer Reaper**

This machine is suitable for small fields and hilly areas. A small diesel engine is fitted on it to provide motive power.

### **Tractor Front Mounted Vertical Conveyer Reaper**

The machine is mounted in the front of a tractor and is used for harvesting cereal crops like wheat and paddy. It cuts the crop, conveys it vertically to one side and drops in a windrow for easy collection. The field capacity of the machine is 0.4 ha/h when operated at forward speed of 2.5-3.5 km/h

### **Straw Reaper**

Straw combine is used to recover wheat straw after combine operation and is operated by a tractor. Straw collected by straw combine is cut into pieces and collected in the trolley. Some grains are also collected along with straw. The capacity of machine on an average is 0.5 ha/h and straw recovery is about 55-60%.

### **Cultivators**

Units at Moga also produce cultivators, karahas and disc harrows during the lean season to have sustainability.

### **Motor Operated Grain Cleaning Blower**

Motor Operated Grain Cleaning Blower is used to separate husk from the grains. These are operated by electric motors normally these blowers are in use at Grain Markets.

### **Fodder Reaper**

Fodder Reapers are used to reap fodder for dairy animals. This device saves time and labour.

### **Post Hole Digger & Pit Digger for Sugar Cane Planting and Horticulture**

Post Hole Digger & Pit Diggers are used to dig pits. These diggers are powered by PTO shaft of Tractor. These are very useful for planting in Horticulture and for sugarcane farming

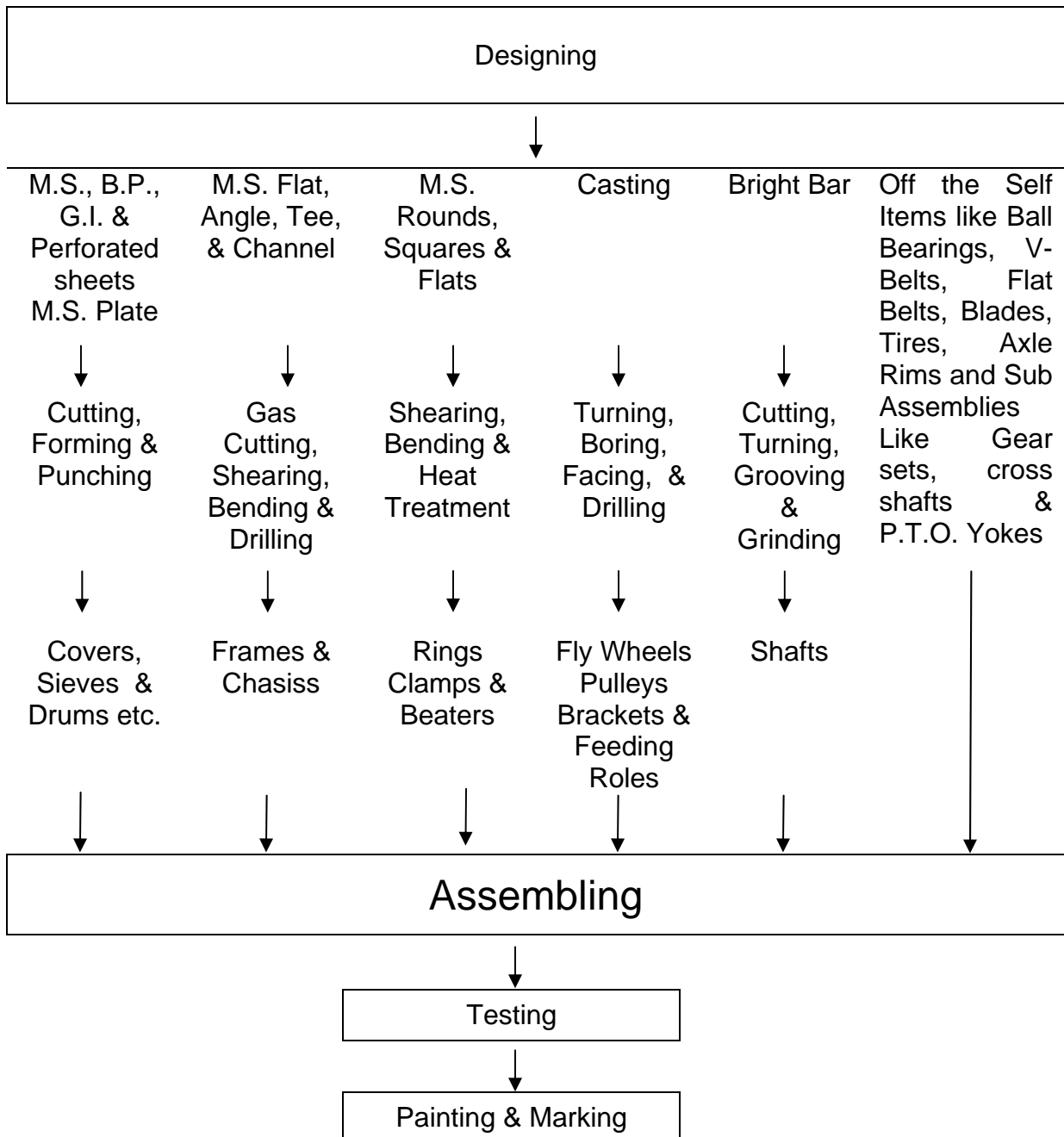
### **Rotavator or Rotary Ploughs**

It is a Europe origin plough. It consists of a power driven shaft on which knives or tynes of different shapes and sizes are mounted. The speed of this plough is 200 to 300 rpm. The width ranges from 61 to 180 cm and depth ranges from 5 to 20 cm. It is suitable for shallow cultivation and weed control. It cuts the soil, pulverizes the soil to powder and spreads uniformly to level the field. It has many advantages over the traditional cultivators. It gives better output in lesser cost.

### **Spares**

Spares of farm machinery mentioned above and many other types of farm machinery are also produced at Moga having value of more than 15 crores per annum.

## Manufacturing Process



Above-mentioned chart refers to the broad overview of the manufacture process. To some extent there is existence of inter firm and intra firm linkages. Each firm does not carry out all the processes mentioned above. Normally SME's undertake many jobs themselves and for the rest of the processes they hire the services of a job worker, or buy ready components from market. Bigger SME's show the higher level of vertical integration.

### III. CLUSTER ACTORS

To make a comprehensive study of Agricultural Implements Industry at Moga, it is utmost important to learn in-depth about various stakeholders and actors working in the cluster and the linkages among them. In the coming pages we will study the role-played by actors that exists in the cluster.

#### Core Cluster Actors

##### Raw Material Suppliers

Raw materials are procured from many places. Iron sections like flats, angles and bars are procured from Mandi-Gobindgarh. Sheets and plates are available at Ludhiana and Jalandhar. Some components and casting blanks are procured locally as well as from Batala and Jalandhar. Few disposal parts are being bought from Delhi. Local manufacturers also produced many spares and sub assemblies. There are a few local traders who purchase raw material in bulk from above mention places and supply it to small manufacturers in the cluster.

Normally suppliers provide raw material in cash terms. They offer ½ % cash discount. Sometimes they also provide credit for duration of one to two weeks. On late payments beyond this period they charged interest varying from 1% to 3% per month.

##### Casting Units

There are 10 casting units working in the cluster. They produce cast iron blanks for parts like pulleys and gears. All of the units have coal fired couple furnaces. Some units create more value addition by machining the cast iron products. Two short blasting units are also providing their service to the cluster.

##### Spare Parts & Components Manufacturers & Traders

There are about 20 units specialized in the production of spare parts required for the agriculture machinery. They produce gear sets, pulleys, sieves, clamps and spare parts for harvester combines. A big market for spare parts and sub-assemblies has been developed at Moga. Agricultural Implements & Farm

Machinery manufacturers from all over the India access Moga for their requirements of spare parts and sub assemblies of agriculture machinery. Suppliers at Moga source their products not only from Moga, but also from the places like Ludhiana and Delhi. There are about 200 small ancillary units doing sub-contracting work for the spare parts manufacturers.

Many consumables like welding rods, nuts, bolts & rivets and paint etc. are made available locally by few traders. Few units purchase these consumables in bulk from market like Ludhiana and Delhi.

### **Manufacturers of Agricultural Machinery**

The cluster comprises of about 60 units manufacturing Agricultural Machinery. All of them are in small-scale industrial sector. Most of units are sole proprietorships. Some of units are partnership firms. There is no large and medium unit and/or joint stock company manufacturing Agricultural Implements & Farm Machinery in the cluster. Generally they are family owned business. They produce undifferentiated products with insignificant notional variations. Most of the units don't use jigs & fixtures; therefore every unit has own specifications. This phenomenon makes after sale service very difficult. Customers from distant places prefer to purchase a product manufactured at a nearer place to get better after sale service. Barring a few, all units produce a large range of products. A strong demonstration effect is prevalent in the cluster.

### **Customers and Intermediaries for Agricultural Machinery**

We may classify customer and intermediaries into following broad categories.

#### **Dealers**

Some units have appointed dealers in various markets. They receive orders and market information from these dealers. Normally dealers market the products on profit basis.

#### **Traders**

There are traders/agents who collect orders from the market and forward these orders to the manufacturers. They work on commission/profit basis. Traders/agents are price sensitive and do not bother about the quality.

## Manufacturers

During the peak season some manufacturers themselves set up their transitory sales points called “*addas*” at a number of places. They could not provide after sales service. Occasionally hard sell tactics used by the manufacturers at these sale points received bad name for the Moga Cluster.

## Big Buyers

There are few big buyers who give bulk orders to the manufacturers. These buyers give their own specifications and they market the product under their own brands.

## Actual users

Many actual users prefer to buy directly from the manufacturers at Moga. Every year farmers from far-flung places visit Moga in groups to make their purchases. By doing so they could save on transportation cost & dealers’ margins and wield better bargaining power. Some actual users are service providers. Farmers hire their services to get the threshing or reaping of their crops done. These service providers buy “make to order” heavy-duty machines.

## Government and Institutions

Many Govt. departments, Universities and Agriculture Research & Development Institutions procure the modern types of Agricultural Implements & Farm Machinery from Moga.

## Spare Part Market

Moga has been developed into a big market for spare parts and components. Manufacturers from all over India access Moga for their requirements of spares parts and sub-assemblies.

## ***Machinery Suppliers***

Main sources of Machine tools are Batala & Ludhiana. Welding sets and spray-painting machines are being procured from Ludhiana. Some small pieces of equipment are being manufactured locally. Actual number of machinery suppliers is not known.

## Other Cluster Actors (Direct Stake)

These are the organizations have direct stake in the Cluster. These are the associations formed directly by the cluster actors.

### *The Moga Agro Industries Association, Moga*

The present Moga Agro Industries Association was established in the year 1994. 100 SME's are the members of this association. Earlier an association was formed in 1968 under the name of the Moga Oil Engine and Agro Industries Association. After the closers of oil engine cluster the members established the Moga Agro Industries Association. This association is an active body. Its members played active role in the formation of the Punjab State Agriculture Implements Manufacturers Association. In late eighties strict safety norms were imposed on thresher. The association played an active role in getting the norms of Bureau of Indian Standards (ISI) framed.

Under Govt.'s Policy of allotting raw material to the industry through associations, this association took a lot of initiatives to get the raw material allotted to its members.

Activities of transport union present at Moga fade away the most of cost advantage of the industry. The association is making all out efforts to get the union dissolved. The association has many meetings with higher authorities as well as with the members of the union. But as the transport union is politically Strong body, it will take time and efforts to get it dissolve or receive a favour from the union.

As the VAT was imposed on power driven Agri. Implements. The Association tried hard to get the Agri. Implements exempted from the VAT. They have meetings with Finance Minister and Higher Tax Authorities. Their effort bore fruit and cabinet decided to exempt Power Driven Agri. Implements from VAT.

This association also approached DC (SSI) to get the Moga Agri. Implements cluster approved under the Small Industries Cluster Development Programme (SICDP).

### **The Punjab State Agricultural Implements Manufacturers Association**

The Punjab State Agricultural Implements Manufacturers Association was established in a very unassuming way during the winter of 1989. About 15 manufacturers gathered in a vendor meeting. They felt a strong need to join together and the association was formed.

Since then this association has come a long way. Presently the association has more than 125 members. It is an active & dynamic association. The association has regular meetings. Generally they meet on last Saturday of every month at department of Farm Power and Machinery, Punjab Agricultural University, Ludhiana. Elections for office bearers of this society are being held regularly.

The association carries out a plenty of activities. Normally in every meeting experts from different fields are invited to impart the latest knowledge to the members regarding their respective fields. Association has also arranged for the members to visit many Institutes like CTR, MERADO etc.

The Punjab Agricultural Implements Manufacturers Association has a very close liaison with Department of Agriculture, Government of Punjab, Punjab Agricultural University, Ludhiana, SIDBI, Banks and other Financial Institutions, Tax Departments, Technical Institutes out side the State of Punjab and especially with Indian Society of Agriculture Engineers.

This Association played a very active role to get the agricultural implements exempted from the imposition of VAT. In the past also this association has been able to receive favourable Government response on many issues.

### **Ramgarhia Sewa Society, Talwandi Bhai**

At Talwandi Bhai society named Ramgarhia Sewa Society is formed. This society has about 50 members. They hold regular monthly meeting of general body and fortnightly meeting of executives. The society is primarily concerned with the activities aimed at the welfare of their members and public in general. Such as they provide financial assistance to the needy members and provision of drinking water for school children. The services of this society can be utilized for networking at Talwandi Bhai.

## **Other Cluster Actors (Indirect Stake)**

These organizations and institutes are independent entities and have indirect relationship with the cluster. They could play an important role in the development and day-to-day working of the cluster.

### **Department of Farm Power and Engineering, Punjab Agriculture University, Ludhiana**

The Department was established in 1974 after trifurcation of the erstwhile department of agriculture engineering (established in 1965). It imparts knowledge and skills in the discipline of farm power and machinery especially related to design, management and ergonomic aspects of farm power and machinery. The major research mandate of the department is to design and develop farm equipment suitable for this region and to help in promoting their use through active liaison with the small - scale industry. The department has developed potato diggers, sunflower and paddy threshers, reapers for wheat and paddy, planters for sowing bold grains (maize, cotton, sunflower etc.), rapeseed / mustard drill, straw combine, etc. Also, the department has research programmes in the area of human engineering; energy in agriculture, management of farm power and machinery and prototype manufacturing. Besides, academic research is also being conducted in the area of soil dynamics in tillage and traction. The department has also a testing center, which helps the local small-scale manufacturers in upgrading the quality of their equipment through testing. The Centre also does testing for BIS certification. The department has already developed a number of useful equipments, which have been commercialized and are being used by the farmers on a large scale. These include the use of the improved farm equipment has made Punjab a leading mechanized state in India. At present, the research is being conducted to develop suitable farm equipment / technologies to tackle problems of this region, like residue management, paddy transplanting, forage harvesting, vegetable transplanting, cotton picking etc.

The Resident Instruction Programme in farm power and machinery comprises of undergraduate instructions for the students of College of Agricultural Engineering and College of Agriculture and postgraduate instructions leading to M. Tech. and Ph. D. degrees in Farm Power and Machinery.

### **Small Industries Service Institute, Industrial Area-B, Ludhiana**

The Small Industries Service Institute was set up at Ludhiana in 1956 to serve the erstwhile combined Punjab. At present, this Institute caters to the needs of small-scale sector in the State of Punjab and U.T. Chandigarh. It is one of the 28 Institutes functioning all over the country under Ministry of Small Scale Industries. Its Headquarters situated at Nirman Bhawan, New Delhi under the Additional Secretary & Development Commissioner, Small Scale Industries. The main services provided by this institute are as below:

- Technical Counselling
- Managerial Counselling
- Economic Counselling
- Management Development Programme
- Product/Process Oriented Entrepreneurship Development Programme
- Skill Development Programme
- Modernisation
- Ancillary Development Programme
- Export Marketing
- Marketing assistance including Sub-contract Exchange
- Technology Upgradation
- Energy Conservation
- Pollution Control
- Quality Management
- Testing facilities by Chemical Laboratory
- Vendor Development
- Workshop Facilities (Engineering)

SENET and Technology Resource Centre provide technical, managerial, economic and marketing services. Common facility services of workshop are upgraded with the installation of CNC Horizontal and vertical machining centres and CNC lathes in the Hi-Tech cell. Centre of Excellence in CAD & CAM provides training in I-DEAS software.

**Central Institute of Agricultural Engineering, Nabhi Bhagh, Berasia  
Road, Bhopal**

Central Institute of Agricultural Engineering was established on Feb. 15, 1976 during the Fifth Five Year Plan to address research issues related to agricultural engineering. Initially, research and development work related to farm machinery, post harvest technology and energy in agriculture, were taken up. Keeping with functional utility, the Divisions at the Institute were reorganized and two additional divisions namely Agro Industrial Extension and Instrumentation were created during VII plan. The Divisions were further reorganized and an additional division of Irrigation and Drainage Engineering was created.

To conduct research and development to facilitate agricultural mechanisation, conserve soil and water through land development and efficient irrigation and drainage equipment, post-harvest and value addition of agro waste produce and efficient utilization of renewable and non-renewable sources of energy in agriculture, information dissemination in technology transfer through training, demonstration and prototype production and supply. Main objectives of the Institute are summarized below:

- Undertake basic, applied and adaptive research leading to a development, improvement of equipment, technology, process for crop production, irrigation and drainage, post-harvest technology and processing, and energy-use in agriculture and rural industries
- Develop hardware and technology in cooperation with other ICAR Institutes in the area of crops, horticulture, aquaculture and animal husbandry for production and processing
- Provide leadership and co-ordinate network of research with state agricultural universities for generating location-specific technologies
- Provide input to ICAR on policy intervention with respect to agricultural mechanization, energy management in agriculture, irrigation and drainage and post harvest technology
- Provide consultancy and undertake sponsored research from industry and other organization

- Act as a repository of information on agricultural engineering
- Act as a Center for training in research methodologies and technology and conduct post graduate education programme leading to Master's and Doctoral degrees in Agricultural Engineering
- Collaborate with relevant national and international agencies in achieving the above objectives.

**Central Farm Machinery Training and Testing Institute, Budni, Madhya Pradesh.**

Central Farm Machinery Training and Testing Institute, Budni was established in 1955. it works under the Ministry of agriculture, Department of Agriculture & Cooperation. This institute is the forerunner of other Farm Machinery Training & Testing Institutes viz. NRFMTTI (1963) at Hissar (Haryana), SRFMTTI (1983) at Garladinne (AP), and NERFMTTI (1990) at Biswanath Chariali (Assam).

Major activities performed by CFMTTI, Budni are training, testing, trails and Research & Development. Some of objectives of the Institute are summarized below:

- To train trainers in the selection, operation, maintenance/ repairs, energy conservation, scheduling and management of various agricultural implements and machinery.
- To offer training programmes to the state Governments/ organisations/ institutions to meet their need on various aspects of agricultural mechanization.
- To implement refresher training o technicians, rural youth, farmers and others in the repair, maintenance and energy conservation of agricultural machines.
- To offer on the job training to technicians who want to establish their own workshops for repairs of agricultural implements, electrical motors, engines, tractors, etc.
- To arrange on-site training programs (village camps) on energy conservation, preventive maintenance etc., for the benefits of farmers, technicians and extension personnel.

- To test agricultural machinery, engines, pumps, etc., manufactured in the country with a view to assess their functional suitability and performance characteristics under different agro climatic conditions.
- To carryout field trials on machinery and implements with a view explore the possibility of their introduction in the country.
- To provide feedback to the manufacturers through user's survey aiming at the farmers response and the standard of 'after sales service' provided by them.
- To assist Bureau of Indian Standards in the formulation of various standards on agricultural implements and machines.
- To carry out allied research & development on agricultural machines and implements.

### **Northern Region Farm Machinery Training & Testing Institute, Hissar**

The Northern Region Farm Machinery Training and Testing Institute, Hissar, started functioning as training institute in the year 1963. The testing wing was added to the center in the year 1973. Apart from meeting the training needs of the northern region, the Institute has established test laboratories recognized by BIS for certification marks scheme on small diesel, petrol/kerosene engines, irrigation pumps, plant protection equipment. This Institute has also been fully equipped and approved by the Ministry of Agriculture for testing of self propelled combine harvester in addition to existing testing facilities for all types of farm equipment. In addition to above the institute conducts training courses in operation, maintenance and repair of farm machinery and equipment, and in the improved mechanized farming techniques for the benefits of progressive farmers, tractor owners, technicians, in-service personnel and foreign nationals sponsored under international co-operation programmes. Institute also conducts energy conservation and management camps and arranges training programmes for the women working in the field of agriculture.

### **Central Tool Room, A-5, Phase V, Focal Point, Ludhiana-141010**

The Government of India established the Central Tool Room at Ludhiana in the year 1980-81 with financial and technical collaboration from the government of

Federal Republic of Germany and the active support of the government of Punjab.

Main objectives of Central Tool Room are as follows

- To increase the efficiency of Small Scale Units in the Northern Region in light engineering and allied fields by providing support in the areas of design & production of Tools, Jigs & Fixtures, advisory/consultancy services.
- To manufacture small & medium sized tools such as Press Tools, Jigs & Fixtures, Moulds & Dies and Special Purpose Tools.
- To provide common service facilities for the manufacture of Tools, Jigs & Fixtures, Moulds & Dies and in various Heat Treatment operations for Small Scale and other operations.
- To impart technical training to tool makers for Press Tools, Dies, Jigs & Fixtures and Moulds etc. and on Heat Treatment processes.
- To conduct Short Term and Part Time courses for the representatives of Small Scale Industries of the region.

The Centre has been providing services to the industry in general and small-scale units' in particular viz. technical consultancy, Designing and manufacturing of tooling, heat treatment and training.

**Mechanical Engineering Research & Development Organisation, Gill Road, Ludhiana**

The Central Mechanical Engineering Research Institute (CMERI) Durgapur under the aegis of the Council of Scientific & Industrial Research (CSIR) established a Centre in Ludhiana in 1965 known as MERADO to boost the Mechanical Engineering Research & Development in Punjab State. The Centre helps the industry in the following fields:

- Design, development and standardisation of industrial machinery and equipment, farm machinery and equipment and jigs, fixtures, tools and gauges.
- Testing of materials, components and products for hardness, tensile, compression, bending and impact strength, internal flaws by ultra sonic, radiographic, magnetic and penetrate methods, measurement of coat thickness and crack depth, precision measurements of linear and angular dimensions, profiles and surface finish, calibration of instruments and gauges, performance

testing of I. C. engines, pumps, sprayers etc. chemical analysis of materials, microstructure analysis and foundry sand testing.

- Preparation of feasibility reports for light and medium industry, Industrial consultancy, expert guidance to foundry industry and precision jig boring etc.

### **Punjab Small Industry & Export Corporation**

PSIEC has developed an Industrial Focal Point at Moga having area of 108.28 acres. More than two hundred plots of the sizes ranging from 250 Sq. Mtrs to 4000 Sq. Mtrs. are developed for the benefit of the Industry at Moga. To encourage the industrialization more such Focal Point with proper infrastructure are required in the cluster.

### **National Institute of Secondary Steel Technology, Mandi Gobindgarh**

National Institute Of Secondary Steel Technology is providing technical services to secondary steel sector by arranging seminars and workshops in the State and undertakes consultative projects and pollution studies in the industry. This institute has been established by Ministry Of Steel, Government Of India to render the services to secondary steel industry sector, which includes Steel Re-rolling mills, Induction furnaces/Arc Furnaces, Foundries etc. The Institute provides HRD, Technical support to the industry in various fields of Engineering In Steel sector.

### **State Directorate of Industries and District Industries Centre (DI & DIC)**

It is the State Government office for the promotion of small-scale industries sector. The Director of Industries and Commerce heads the department at Chandigarh and General Manager heads the District Industries Centre at district level. Main functions of State Directorate of Industries & District Industries Centre are: -

- Issue of provisional SSI and permanent SSI registration certificates.
- Motivate industries by giving them awards in various areas.
- Providing loan for educated unemployed through the PMRY scheme.
- Capital subsidy scheme
- Freight subsidy scheme for exporter
- Seed margin money scheme.

### **Bureau of Indian Standards (BIS)**

In 1947, an organization by name Indian Standards Institution was set up which was later made a statutory body and christened as Bureau of Indian Standards (BIS) in 1986. The important activities of BIS include formulation of standards, product and quality system certification, training, information service etc.

The Bureau of Indian Standards has also set up an office at SCO 335-336, Sec 34-A, Chandigarh Ph. 0172-601640, to provide services to the industry of the state.

### **National Small Industries Corporation (NSIC)**

The NSIC was established in 1955 by the Government of India with a view to promote, aid and foster the growth of small industries in the country. NSIC provides diversified support through its wide spectrum of programme of SME's to cater to their different needs related to multi products and multi-location markets. NSIC is implementing the following schemes, namely :

- Machinery and equipment
- Hire purchase scheme
- Equipment leasing
- Working capital finance
- Composite loan scheme (tiny units)
- Indo-Italian programme for development of Indian SME's through co-operation with Italian enterprises.
- Raw Material Assistance
- Schemes for import of scarce material.
- Raw material godowns in different parts of the country.
- Marketing
- Marketing consortium formation.
- Tender marketing support
- Integrated marketing support
- Registration for Government stores purchase programme.
- Technological Upgradation

- Prototype centre at Rajpura and consultancy through technical service centres.
- Technological transfer facilitation.
- Exports
- Conducting of exhibitions/trade fairs and buyer seller meets.
- Absorption of marketing overheads and export promotion.
- Assistance under leasing for technology up-gradation. Pre-shipment advances.
- Assistance for project export.

### **Small Industries Development Bank of India,**

SIDBI was established on April 2, 1990. The Charter establishing it, The Small Industries Development Bank of India Act, 1989 envisaged SIDBI to be "the principal financial institution for the promotion, financing and development of industry in the small scale sector and to co-ordinate the functions of the institutions engaged in the promotion and financing or developing industry in the small scale sector and for matters connected therewith or incidental thereto. SIDBI Offers following Services

- Term loan to all tiny and SSI units through SFC and commercial banks by the way of refinance
- Extending seed capital/soft loan assistance under NEF and Mahila Udyam Nidhi scheme for SSI through specified agencies
- National equity fund scheme for SSI units
- Refinance scheme for acquisition of ISO – 9000 services certificate by SSI units
- Schemes for financing activities relating to marketing of SSI products
- Scheme of direct assistance for development of industrial infrastructure for SSI sector
- Scheme for export bill financing
- Vendor Development Scheme
- Working capital term loan scheme for SSIs
- Credit guarantee fund scheme for small Industries

## Engineering Export Promotion Council (EEPC)

The Engineering Export Promotion Council (EEPC) was set up in 1955 as a no-profit body under the sponsorship of Ministry of Commerce, Government of India, for promotion of international trade in engineering goods and projects. For most of the activities regarding export of engineering products have to be contacted at their sub-regional office at Comm Plot # 1, Industrial Focal Point, Jalandhar.

### Current Institutional Metrics

Abbreviations	EEPC	SIDBI	NSIC	DI&DIC	BIS	MERADO	CTR	CFMTTI	NRFMTTI	CIAE	SISI	DFPE	PSAIMA	MAIA
MAIA	1	1	2	4	2	1	1	3	3	3	2	4	4	
PSAIMA	3	3	3	3	2	3	3	3	3	3	3	4	↗	
DFPE	1	1	1	1	2	1	2	4	4	4	2	↗	↗	
SISI	4	4	4	4	2	3	4	1	1	1	↗	↗	↗	
CIAE	1	1	1	1	2	1	1	4	4	↗	↗	↗	↗	
NRFMTTI	1	2	1	1	3	1	1	4	↗	↗	↗	↗	↗	
CFMTTI,	1	2	1	1	3	1	1	↗	↗	↗	↗	↗	↗	
CTR	2	2	3	1	3	3	↗	↗	↗	↗	↗	↗	↗	
MERADO	1	1	2	1	2	↗	↗	↗	↗	↗	↗	↗	↗	
BIS	2	2	3	1	↗	↗	↗	↗	↗	↗	↗	↗	↗	
DI&DIC	2	3	3	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	
NSIC	3	4	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	
SIDBI	3	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	
EEPC														

Name of the Institution	Abbreviations
The Moga Agro Industries Association	MAIA
The Punjab State Agri. Imp. Manufacturers Association	PSAIMA
Dept of Farm Power and Engineering, PAU	DFPE
Small Industries Service Institute,	SISI
Central Institute of Agri. Engineering, Bhopal	CIAE
Indian Society of Agricultural Engineers,	ISAE
N. R. Farm Machinery Trg & Testing Institute, Hissar	NRFMTTI
Central Farm Machinery Trg and Testing Instt. Budni,	CFMTTI,
Central Tool Room, Ludhiana-141010	CTR
Mechanical Engg. R&D Organisation	MERADO
Bureau of Indian Standards	BIS

<b>Name of the Institution</b>	<b>Abbreviations</b>
Directorate of Industries & District Industries Centre	DI&DIC
National Small Industries Corporation	NSIC
Small Industries Dev. Bank of India,	SIDBI
Engineering Export Promotion Council	EEPC

The current institutional matrix depicts the relationship among the various stakeholders in the Moga Agricultural Implements & Farm Machinery Cluster. The nature of relationship between these cluster actors is not always very clear and direct. Some of them have very remote relationship and it is limited to the extent of providing certain marginal services, and sometimes-conducting informal meetings or some seminars and conferences.

Based on the role of these institutions and associations and strength of inter linkages and cooperation among them, they are given scores on a 4 point scale. The scale one indicates that there is a negligible cooperation among the cluster actors. Scale two illustrates though some objectives of the cluster actors are common but there is a little interaction between them. Scale three shows that cluster actors have close interaction & better awareness of each other and conduct common programmes using each other facilities. Scale four depicts common management, sharing of finance, regular meetings, indispensability and common problem solving among the cluster actors. The current institutional matrix delineating the scores is shown in the above table.

The matrix shows that the Punjab State Agriculture Implements Manufacturers Association (PSAIMA) is an active association and has good linkages with most of the institutions. MAIA has good linkages with the institutes directly related with agricultural engineering, but it does not have linkages with institutes related to finance and exports.

The institutes related to agricultural research & development and testing have strong linkages among themselves. Relationship is quit strong. They under take together lot of projects and programme. But these institutions do not have much interaction with other institutes like CTR, MERADO, DIC, SISI, SIDBI, NSIC, EEPC . Most of the institutions have fairly good interaction with BIS. The current institutions

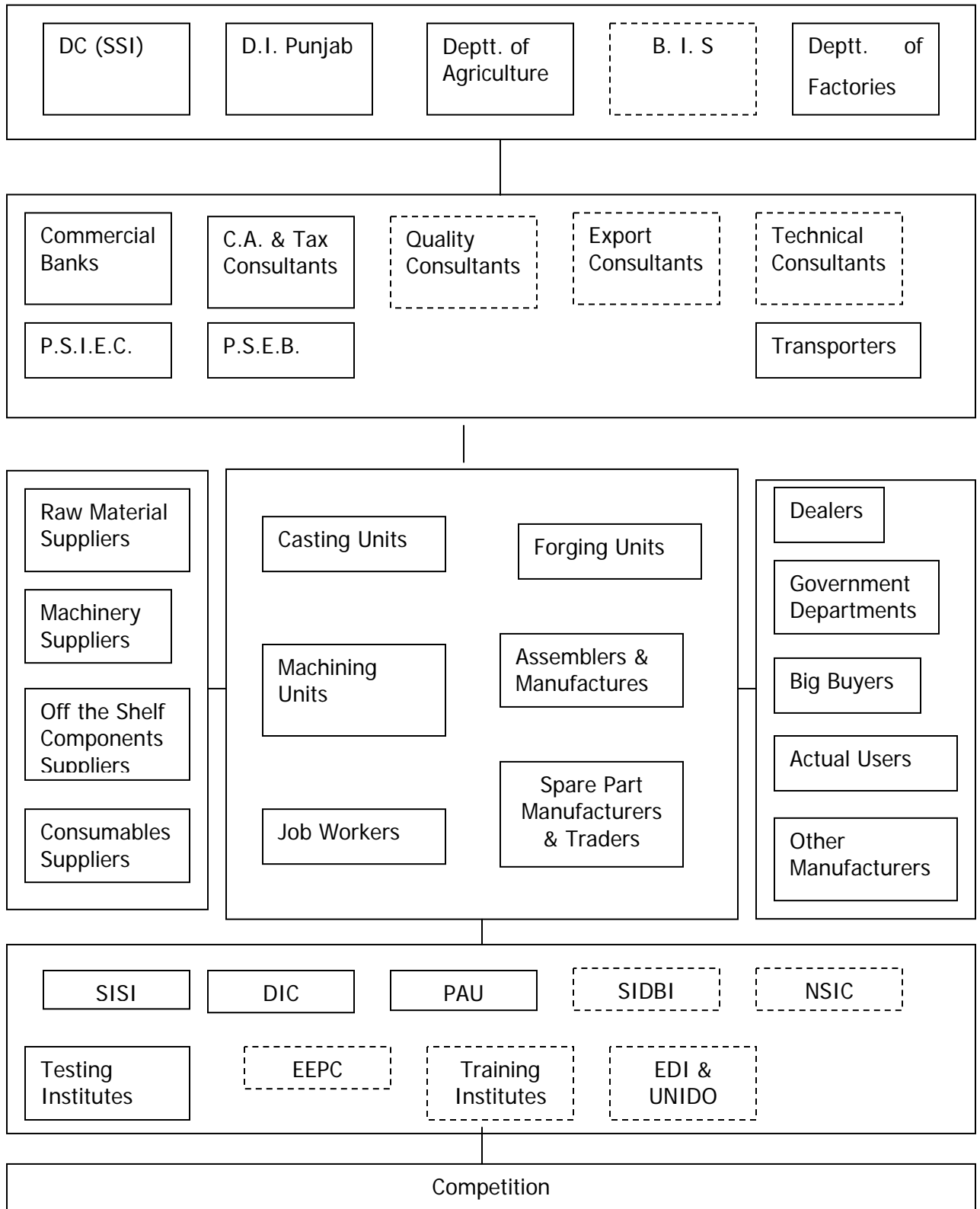
matrix clearly shows that strong linkages exist among the technical institutions. But linkages between other stakeholders are weak or moderate.

The current institutional matrix clearly shows that generally the relationship between these stakeholders is either minimal or moderate. This is one of the drawbacks of the Moga Agricultural Implementscluster. The entire leading clusters world wide, which is widely quoted in various articles, journals and books and which also provides a model for the developing and emerging clusters, exhibit a very strong relationship among the stakeholders and the cluster actors. A strong relationship and inter linkages among stakeholders can not only solve the problem of the cluster but also could source technology, finance, marketing etc. for the overall growth and development of the cluster. It is therefore important that the inter-linkages among these stakeholders need to be strengthened by organizing meetings and motivating each other. This can be taken up as a capacity building exercise for the cluster.

One of the main lacunae of the current institutional matrix is that it does not reflect the nature of relationship between stakeholders and its associated members.

It became clear from the diagnostic study that, not only inter-linkages among stake holding institutions need to be strengthened but also the relationship between individual enterprises and associations needs to be improved. A win-win situation has to be created where all the cluster actors and stakeholders work in unison.

# Present Cluster Map



The above cluster map of Agricultural Implements cluster at Moga indicates the cluster actors and linkages among them. Bold lines indicate the preponderance of organization, whereas dotted lines show the organisation is to be developed. Development Commissioner, Small Scale Industries & Bureau of Indian Standards at national level and Department of Agriculture, Department of Factories and Directorate of Industries, Punjab at state level decide the policies, which have direct repercussions on the activities of the industries.

There are commercial service providers like c banks, chartered accountant & tax consultant, Quality, Technical and export consultants. They provide valuable services on commercial basis. At Moga availability of these services is deficient. Efforts should be made to strengthen these business development services. PSIEC, PSEB and Transporters provide necessary infrastructure, power and logistic respectively.

The nucleus of the cluster map is the SME's involved in manufacturing of Agricultural Implements & Farm Machinery and spare parts. There are casting, forging and machining units, job workers, manufacturers and assemblers of farm machinery and spare parts. Then there are backward and forward Linkages. Linkage among them is job specific and commercial oriented. All these cluster actors and their significances discussed under the heading "core cluster actors".

The organizations, which are providing support services are DIC, SISI, Department of Farm Power and Machinery, PAU, Ludhiana etc. The role of these Institutions and their inter linkages are described in the current institutional matrix.

Agricultural Implements cluster at Moga faces three levels of competition. First of all there is competition within the cluster. All clustering efforts aim at to mitigate this competition through networking. Secondly there is competition with the farm machinery manufacturers operating in Punjab State. Third level of competition is with the firms operating out side the State and the international competitors.

## IV. VALUE CHAIN ANALYSIS

Agricultural Implements industry is basically a fabrication Industry. Level of Technology involved into this industry is not only low but also very traditional. Therefore, value addition is negligible. The number of products of varying sizes and weights make it difficult to work out value chain analysis. The unit of quantity of the product is numbers, but to facilitate the value chain analysis, we may convert the market price per unit into the market price per Kg. It means that if a thresher has market price of Rs. 25,000/- per unit weighing about 500 Kg, then the market price by weight would be Rs. 50/- per Kg (i.e. 25000 / 500). Similarly per Kg cost could be computed.

The cost per Kg of different types of raw material varies between Rs. 30 to Rs. 40. The market price per Kg of finished product varies between Rs. 45 to Rs. 60 This variation in the selling price may be due to the quality level, customer's loyalty, and cost of inputs used etc. The products, which have high sheet metal contents and entails more labour cost, fetch more revenue by weight than the products, which comprise more of cast iron and heavy sections.

It is observed that products like seed drills, reapers and threshers are more high-priced weight wise than the cultivators, disc harrows and Karahas etc. Therefore profit margins are also higher on the former types of products.

The comparative Cost analysis of products is given below

<b>Reaper</b>		<b>Cultivator</b>	
Raw material	70 %	Raw material	80 %
Labour	20 %	Labour	10 %
Others	10 %	Others	10 %
Cost price	100 %	Cost price	100 %

## V. ANALYSIS OF BUSINESS OPERATIONS (Problems Identified)

### Raw Material

Following types of raw materials are required for production of farm machinery.

- M.S., G.I., B.P. Sheets & M.S. Plates
- M.S Flats, Angles, Channels & Squares
- Cast Iron Components
- Bright Bars
- Other off the shelf parts like bearings; gear sets, welding rods Beaters, Blades & paints etc.

Prices of imported raw materials are high due to high custom duties levied on it. Therefore Indian raw material manufactures face less competition from imports. So that the prices of raw material manufactured domestically tends to be higher than the price prevailing in international market.

Sources of raw material are far away. Therefore SME's and raw material suppliers have to incur high cost of transportation. SME's can ensure economics of scale by adopting interventions like raw material bank and common buying.

Some fabricated components can easily be replaced by prefabricated tubular structures or special sections of steel. It needs high initial investment to get ready the dies and to purchase minimum order quantity of such components. The scale of production is low and there is little networking. Therefore initial investment on these components could not be made.

Prime quality raw materials are expensive. To reduce costs SME's have to use commercial quality raw material from Mandi-Gobindgarh therefore quality of final products suffers.

The major raw material used is mild steel. Many other materials like plastics fibers, other alloys and metals may be used to replace steel.

## **Machinery & Production**

Agricultural implements and farm machinery Industry is basically a fabrication Industry. Very simple technology is used to manufacture the products. only few types of machines are required to establish a farm machinery Industry, i.e. Lathe machine, Cutting & shearing equipment, drilling machine & welding sets etc. Few bigger units have Radial Drilling Machine, Milling & Slotting Machines. In last 50 years no significant customization of plant & machinery took place. Only few units are using customized shearing presses or machines.

Production is seasonal; therefore, only one production cycle takes place. So that optimum utilization of plant & machinery and consequential economies of scale are not available. However during the lean season SME's cater small orders of other types of agricultural machinery. They also keep on producing and maintaining inventory of spare parts & components, which, they assemble during peak season to fulfill orders quickly.

Less capital investment in plant & machinery was a good reason for fast growth of the cluster, ironically same phenomena is responsible for the decline of the cluster as competing industrial units came up fast into other states.

The process of manufacturing is a traditional. Normally jigs and fixtures are not in use. Therefore inter changeability of parts is difficult. Part and sub-assemblies are not standardized. Quality standards are neither established nor maintained. After studying the manufacturing process, following technological gaps are identified.

### **Forging**

- The manufacturers do not understand the concept of close tolerance forging. The majority is making use of technique of Open Die Forging that is prone to various types of wastage in the form of burning losses, thicker fins, excess fuel oil consumption etc.
- Raw materials for forgings are not properly tested and selected for chemical and mechanical properties. Even the forged component is seldom subjected to any sort of testing.

- Forging dies and other press tools, required for forging purposes, are not being manufactured out of specified/proper die steels. Most of the units are not using machinery like die sinking, spark erosion, saw-cut, CNC machining centres, precision grinding, lapping etc. for proper development of dies.
- Barring a few progressive units, others do not put their forged components to normalising/annealing processes before machining.

### **Casting**

- Cast components are not produced to the required grade (As per BIS Specifications No. IS: 210- latest year).
- Working in the foundry unit is found to be unsystematic and no proper care being taken for the selection of various inputs.
- Most of the units are not equipped with chemical & metallurgical testing facilities.
- Functioning of the casting units fully depends on skill of the workers, since no machines like moulding, muller, sand mixer, sieves etc. are installed.
- The units have not adopted fuel-efficient versions of Cupola and other melting furnaces.
- For malleability of cast components, proper process and furnace are not pressed into service.

### **Sheet Metal Components**

- Sheet metal components are produced on conventional type of power presses, which are unable to generate close tolerances in the products. Newer versions of power presses like pneumatic/hydraulic, crank less, knuckle joint presses are not much in use in the industry.
- Press tools are generally got manufactured from die makers who lack knowledge of proper designing and development. The facilities provided by modern and sophisticated tool rooms like CTR, Bicycle and Sewing Machine R & D Centre and other such tool rooms in the private sector are not being utilised effectively by the industry.

- The raw- material required for sheet metal components is not properly selected and the variation in thickness creates problems in achieving quality products. No provisions are there in units to maintain the required thickness of the sheet stock.
- There is no systematic procedure to inspect and recondition press tools.
- Conventional types of press tools like single stage open die type are much in use. Progressive/compound types of press tools are not being given preference.
- During drawing processes, lubricants are not being properly selected and used.

### **Machined Parts.**

- Machined parts are generally produced on local made 'addas' and other production machines, which are unable to produce quality products as far as close geometrical, and dimensional accuracy is concerned.
- The industry is fully dependent upon the skill of the machine operators since no provisions are there on the machines to check the sizes in operation.
- The imperfections generated by the pre-operation machines are removed on the final operation machines after heat treatment, generally on grinding machines, which proves to be most un-economical and inefficient.
- Production of components in mass quantity with zero defect is found to be extremely difficult on the present set up of machinery and equipment.
- Stage inspections are not carried out in an earnest way and are also not documented.
- No proper care is given to preventive maintenance of the machinery and equipment.
- Various machining processes are not carried out in sequence based on scientific lines.
- Standard quality cutting tools are also not used; instead the second quality or local made ones are in use. Newer machining techniques including CNC's supported by modern cutting tools are almost absent in the industry.

- In the heat treatment units no proper arrangements are there to keep the temperature as well as the viscosity of the quenching media within desired specifications.
- Heating furnaces being used by these units belong to old generation.

### **Fabrication**

- Various types of contours and profiles are normally cut manually creating problems in the overall fitting in at the required place when components are assembled.
- Modern welding techniques are not still adopted, old generation welding equipments are in use.
- Welding procedures as per IS Specifications are not in use.
- To relieve thermal stresses in the welded components, there is no provision for normalizing.
- Welding electrodes are picked up at random for any type of job giving no proper attention to select the required grade and size thereof to obtain efficient welded joints.

Following are the a few observations made during the diagnostic study regarding threshers. One of the most critical parts of thresher is shaft. It needs lots of improvements. Every thresher has a unique shaft. It is utmost important to standardize the shaft. Blowers do not have aerodynamic design. Aerodynamically designed blower will improve the working and also reduce the load.

### **Products & Marketing**

Cluster comprises of about 100 units manufacturing approximately 40 types of farm machinery and there are 200 ancillary units doing the job work. Main markets of the products are out side Punjab. Customers from far off places like Nepal & Bihar visit Moga along with demand drafts to make their purchases. A Few units enjoy good customer loyalty. It depicts that products have good marketability.

Agricultural machinery manufactured at Moga already has brand equity. Customers from far off places prefer Moga products to the products manufactured at

places near to them. Therefore a collective brand building initiative can successfully be under taken.

The major rationale applied for comparing the quality of the machine is weight. Heavier is the machine better it is considered. It results in unnecessarily heavy designing of the products and notional innovation leading to higher cost of production.

There is little flexibility in operating system. Except a few, every SME tries to manufacture whole range of products. This practice hampers specialization and results in unhealthy competition among the SME's.

Domestic market for agricultural implements is highly fragmented. Agriculture development has been stagnating for last one decade, therefore demand for Agricultural Implements & Farm Machinery and its replacement is depressed. Nearer market are saturating fast. The firms outside the cluster give stiff competition. Firms are small in size and their orientation is production or product based. They assume that customer is primarily interested in product availability and low prices or the product that offer the most quality, performance and innovative features. They do not realize what the market needs. Most of their resources are spent in production planning and dealing with day-to-day issues. They could not devote much time into marketing activities. Most of the SME's could not afford to use marketing tools.

Export market could not be tapped effectively due to many reasons viz. dearth of market knowledge, products are heavy and bulky therefore design of the products is not suitable for exports. Products are not standardized, resulting poor interchangeability, ineffective after sales service and lot of customization is required e.g. there are different fitments to fit a tractor-mounted reaper to each model of tractor. Generally the products are not marketed abroad except Nepal.

It is almost certain, that networking is a need of hour. By forming marketing consortia, many activities can be undertaken together, for instance; common brand building, joint participation in National & International trade fairs, Hiring a marketing consultant, opening shared sales offices, appointing common dealers across the country, united negotiation with buyers, compete in national & international markets on quality & price and last but not the least common websites, brochures and advertisements.

Agricultural machinery industry is a seasonal industry, because major demand for the harvester combines, threshers & Reapers arises in the months of February, March & April. Entrepreneurs make their business plans accordingly. This lean period is a boon in disguise, as SME's undertake research & development work during this period.

## **Competition**

The cluster is facing competition at all levels. At local level, SMEs compete on price and notional innovation. It is utmost important to mitigate local competition by networking, real innovation, brand building and standardization, etc. it will improve their competitiveness.

Competition at state/region level is again price and quality based. This competition could be tackled with improvement of quality, enhancing marketing efforts, adopting best practices, common branding and adding more features to the products. In short, competition at state level could be handled with better product image.

Competition at national and international level, could only be handled by rigorous marketing efforts, capturing the economy of the scale, cohesive efforts by all clusters actors, through technological & marketing research and optimizing the cost of production, apart from the endeavors mentioned above to handle local and state level completion.

## **Entrepreneurs and the Enterprises**

A majority of SME's is one-man show and generally they are family owned. The owner and his family members play the roles of from peon to president. They try to undertake all the business functions themselves and tend to produce every thing inside the enterprises. Qualified people from outside are seldom recruited. It is beyond doubt that at present techno economic and managerial levels, there are several functional areas in enterprises where, qualified and experienced personnel are required.

Most of the entrepreneurs belong to Ramgarhias community. As mentioned earlier they are highly skilled technicians. Their formal education level is poor, but in

the field of practical knowledge they can do better than well-qualified engineers. They are predominantly production oriented. You give them a viable idea and they will implement it. They are innovative, but sometimes their innovations are notional only. Poor managerial skills are their major weakness. Generally they could not carry out better in the fields of finance and marketing.

Demonstration effect is prevalent between the SME's in the cluster. New innovations and development made by one spread very fast, because others will copy it immediately.

## **Finance & Working Capital**

Many units have access to institutional finance for their working capital needs. Extra working capital is required only during the peak season. Raw material suppliers also provide credit of one to two weeks according to the creditworthiness of the SME's. They sometimes charge high rate of interest on late payments. Sometimes Buyers also make advance payments to SME's.

Normally SME's do not resort to term loans because cost of plant and machinery required is not much, so it could be met through their own resources. Generally SME's do not source finance from un-organised moneylenders.

Because of the industry's seasonal nature, some amount of finance remains unutilised during lean season.

## **Manpower**

Skilled manpower is locally available in abundance. It is learnt during the field survey that one can find skilled workers from Moga, at every threshers manufacturing center in India. There is dearth of experienced and qualified engineers, marketing personnel and financial experts. SME's are family owned and are not willing to hire experts from outside. A strong need is felt for hiring qualified and experienced personal for each functional area.

There is not technical training facility/Institution available to train labour force in the cluster. Workers learn on the Job.

## **Infrastructure**

Earlier industry was developed around majestic road, locality of Moga City. In the year 1977 PSIEC developed an industrial focal point at G.T. Road, Moga. Number of plots developed is more than 200. No planned industrial accommodation is available at Pakhoke Bhagta and Talwandi Bhai. Power supply, water, telecommunication facilities are available adequately. The cluster is well linked with major markets of States and country through railway and roads. Transport Companies at Moga have formed a union, which does not allow non-member truck owners to load their trucks from Moga. They also charge excessive freight charges from the industry

## **Business Development Services**

Business Development Service providers in Moga cluster are in low demand low supply stage. There is no technical training Institute, Management Institute, testing facility & marketing expertise. Trivial Research & Development is being done by the SME's themselves. Research and Development support is available at department of Farm Power and Machinery, Punjab Agricultural University (PAU), Ludhiana and many other similar institutes. Testing facilities are available at PAU Ludhiana, Northern Region Farm Machinery Training & Testing Institute (NRFMTTI), Hissar and Centre of Farm Machinery Training & Testing Institute (CFMTTI), Budni provide the testing facilities. SME's do not avail these facilities frequently.

## VI. CURRENT REALITY TREE

## VII. INDUSTRY STRUCTURE ANALYSIS

Michel Porter has devised certain tools for industry structure analysis to determine firm level profitability, competition, SME viability and prospect of growth. Analysis of Agricultural Implements cluster at Moga using these tools depicts the following state of affairs.

### **Entry Barriers (Low)**

Entry barrier in above cluster is low because very small investment is required for entry. Only a workshop having lathe, welding set, drilling machine and shearing apparatus is required to setup a unit initially and other inputs are available in plenty. Requirement of proprietary technology and skill is less for new entrants. There are no licensing or patent requirements. Industry does not need any special type of location. Agricultural Implements & Farm Machinery industry is not characterized by high economies of scale. Low fixed costs bring about low break-even point. Most of the distribution channels are easily available to new entrants. But a few units have developed their own distribution channels. There is hardly any product differentiation and brand identification. However, some enterprises hold higher customer loyalty.

### **Power Of Competition (Low)**

Products are not highly differentiated from one firm to another. But there are many insignificant variations in the products manufactured by each SME. Number of firms in the industry is only about 100, which is a modest number. Growth of industry is relatively slow. Many products are on maturity or decline stage of product life cycle. Units are small and non-aggressive. Plant capacity additions are not to be done in large increments. Competitors do not have very high stakes in staying in the industry. They may use same workshop to manufacture other fabricated products like truck bodies. Fixed costs involved in the industry are low therefore exit barriers are also low.

## **Strength Of Customer (Moderate To High)**

Earlier, buying in large quantities was more prevalent. Even now there are, some big buyers who buy in bulk quantities, but generally buyers are actual users and spread over the large area. Products are largely standard and un-differentiated of course with small variations. Customers do not have to incur significant cost to switch from one seller to another. They are also price sensitive.

## **Strength Of Supplier (Low To Moderate)**

There is no viable substitute to the products provided by the supplier because basic raw material for Agricultural Implements & Farm Machinery is steel, which is available abundantly. There are large numbers of supplier and hardly any cost is involved into switching from one supplier to other supplier. Agricultural Implements & Farm Machinery Industry is not an important customer of the supplier. In comparison of large concentration of different types of industry in nearby districts like Ludhiana the industry at Moga is very small. There is hardly any evidence of forward integration taken place by the supplier.

## **Strategy**

In the light of above analysis of Agricultural Implements cluster at Moga, it is construed that the firms can easily enter and leave the industry because entry as well as exit barriers are low. This situation also portray that returns are low and stable. To increase profit potential the firms should make efforts to raise the entry barriers so that fewer new firms could enter the industry. Technology upgradation, batter control of distribution channels & collective initiatives to reap the economies of scale are few suggestions to elevate the barriers of entry.

Buyers exert more bargaining power. To protect themselves SME's may go for buyers who have less power to negotiate or switch suppliers. A better option is to give superior offer so that buyer cannot refuse.

Supplies are available at prevailing prices. Still it is essential to explore new sources of supply. Common buying is another viable option to wield more bargaining power against suppliers.

## VIII. SWOT ANALYSIS

<b><i>MOGA (Location)</i></b>	
<b>Strengths</b>	<b>Weaknesses</b>
<ul style="list-style-type: none"> <li>• Moga is located on National Highway connecting Ludhiana with Ferozepur</li> <li>• Good climate &amp; water</li> <li>• Adequate power and infrastructure is available</li> </ul>	<ul style="list-style-type: none"> <li>• Hinterland location restricts the Export potential</li> <li>• High transportation cost at input as well as output stage.</li> </ul>
<b>Opportunities</b>	<b>Threats</b>
<ul style="list-style-type: none"> <li>• Proximity to International border may prove to be an opportunity, as hostility with Pakistan is subsiding.</li> <li>• The opening of land trade routes to central Asia, Iran and Afghanistan will be beneficial to Moga</li> </ul>	<ul style="list-style-type: none"> <li>• Transport Companies at Moga have formed a union, which does not allow non-member truck owners to load their trucks from Moga. They also charge excessive freight charges from the industry</li> </ul>
<b><i>MAN (Work Force)</i></b>	
<b>Strengths</b>	<b>Weaknesses</b>
<ul style="list-style-type: none"> <li>• Skilled labour is available abundantly.</li> <li>• Amicable industrial relations</li> <li>• Learning by doing is in practice</li> </ul>	<ul style="list-style-type: none"> <li>• Highly skilled manpower is not available</li> <li>• BDS providers are not employed.</li> <li>• No formal skill upgradation training for worker.</li> </ul>
<b>Opportunities</b>	<b>Threats</b>
<ul style="list-style-type: none"> <li>• Training facilities available with PAU and other technical institutes can be utilised for skill upgradation of workers.</li> </ul>	<ul style="list-style-type: none"> <li>• It is difficult to adopt latest technology without upgrading the skill base of workers</li> </ul>

<b><i>MACHINE (Technology)</i></b>	
<b>Strengths</b>	<b>Weaknesses</b>
<ul style="list-style-type: none"> <li>• Skilled labour and machinery manufacturers are available</li> <li>• Many products are invented, designed and developed at Moga with negligible outside help.</li> </ul>	<ul style="list-style-type: none"> <li>• Technological level is low leading to low productivity &amp; value addition and poor quality standards.</li> <li>• Absence of technical analysis and professional design with regard to many products.</li> <li>• Many innovations are notional</li> </ul>
<b>Opportunities</b>	<b>Threats</b>
<ul style="list-style-type: none"> <li>• Scope for economical production of improved quality products by adopting little better production techniques and practices</li> <li>• Technical support is available at institutes like PAU, Ludhiana.</li> </ul>	<ul style="list-style-type: none"> <li>• Technology is changing fast &amp; level of technology in the cluster is a major threat unless it adapts accordingly.</li> <li>• At present technological level International competition may not effectively be met with</li> <li>• Absence of private public partnership to promote R&amp;D for value added production &amp; new markets</li> </ul>
<b><i>MANAGEMENT (Entrepreneurship)</i></b>	
<b>Strengths</b>	<b>Weaknesses</b>
<ul style="list-style-type: none"> <li>• Traditional Entrepreneurial culture in the people.</li> <li>• Entrepreneurs are innovative. They are able to develop, replicate &amp; customise the products &amp; Machinery</li> <li>• Demonstration Effect</li> </ul>	<ul style="list-style-type: none"> <li>• Informal and unorganised industrial sector</li> <li>• Entrepreneurs are averse of new and upgraded technology</li> <li>• Modest modern managerial skills</li> </ul>
<b>Opportunities</b>	<b>Threats</b>
<ul style="list-style-type: none"> <li>• Visits to national &amp; international exhibitions, trade fairs and institutes can give exposure to the entrepreneurs on latest products &amp; technology.</li> </ul>	<ul style="list-style-type: none"> <li>• Migration of Entrepreneurship to other parts of the country</li> </ul>

<b><u>MARKETING</u></b>	
<b>Strengths</b>	<b>Weaknesses</b>
<ul style="list-style-type: none"> <li>Established strong linkages with customers during long run.</li> <li>The products have good image in the minds of the customers.</li> <li>To some extent innovation based competitions prevails</li> <li>Agricultural Implements is exempted from tax.</li> </ul>	<ul style="list-style-type: none"> <li>Poor exploration of domestic market as well as Export market.</li> <li>Inadequate information on markets.</li> <li>Price based competition.</li> <li>Poor brand building efforts.</li> <li>Dearth of organised marketing channels.</li> </ul>
<b>Opportunities</b>	<b>Threats</b>
<ul style="list-style-type: none"> <li>Competition from foreign countries is yet to be experienced in India particularly in Agricultural Implements segment</li> <li>Market potential is high, can be achieved through product diversification and innovation.</li> <li>New marketing avenues are made available by globalisation and more mechanisation of agriculture.</li> <li>Govt. supports agriculture and allied activities</li> </ul>	<ul style="list-style-type: none"> <li>Competition from National and International industry</li> <li>Competitiveness suffers due to high transportation cost and transport union</li> <li>Market for agriculture machinery is saturated in Punjab &amp; nearby states</li> <li>Low initial capital investment always poses a threat of entry of new competitors</li> </ul>
<b><u>MONEY (Finance)</u></b>	
<b>Strengths</b>	<b>Weaknesses</b>
<ul style="list-style-type: none"> <li>Good banking facilities are available</li> <li>Some SME's receive advance payment from customers</li> <li>Normally suppliers give one to two weeks' interest free credit to SME's.</li> <li>Due to seasonal nature of the business extra credit is required only for a limited period.</li> </ul>	<ul style="list-style-type: none"> <li>Access to institutional finance is deficient for some SME's.</li> <li>Suppliers charge high rate of interest on late payments.</li> <li>SME's do not come together for bulk purchase of inputs as to benefit from quantity discounts.</li> <li>Some amount of financial assets remains unutilised for a large part of the year.</li> </ul>

<b>Opportunities</b>	<b>Threats</b>
<ul style="list-style-type: none"> <li>• Common financing to facilitate cheaper institutional finance (e.g. MCGF)</li> <li>• Common finance to facilitate common Facility Centre &amp; Common raw material purchase.</li> </ul>	<ul style="list-style-type: none"> <li>• Lack of fresh investment and migration of capital other parts of the country.</li> <li>• Non-proactive banker may not support development plan of SME's.</li> <li>• Dwindling margins of SME's would pose threats to their very sustainability.</li> </ul>

## Four alternative Strategies

There are four alternative strategies based on the analysis of the external environment (threats and opportunities) and internal environment (weaknesses & strengths) as given in following matrix:

**SWOT Matrix**

<b>FACTORS</b>	<b>STRENGTHS (S)</b>	<b>WEAKNESSES (W)</b>
<b>OPPORTUNITIES (O)</b>	SO Strategy Maxi-Maxi	WO Strategy: Mini-Maxi
<b>THREATS (T)</b>	ST Strategy Maxi-Mini	WT Strategy Mini-Mini

### *The WT strategy*

The WT strategy (please see the lower right hand quadrant of above mentioned table) is to minimize both weaknesses and threats. Under this strategy, following interventions are suggested, which could help to mitigate the weaknesses and threats:

#### Location

- Production of high value added products would compensate the effects of disadvantageous location.
- Manufacturing of new products to cater markets nearer to Moga is another solution.

#### Men

- Training programmes could be organised for work force's skill upgradation
- Development of BDS will provide necessary impetus to remove the knowledge gaps.

## Machine

- Collective R & D, Standardization of farm machinery, Market savvy redesigning of a few products
- For cost reduction real innovations should be encouraged instead of notional innovations.

## Money

- SME's should go for institutional finance to avail low rates of interest and tax leverage.

## Marketing

- Exploration of export market to Pakistan & other SAARC countries, Africa, Middle East and South East Asia will widen market access.
- Through market studies of domestic as well as export market SME's could gain more marketing awareness.
- Competition should be innovation based rather than price based.
- Efforts should be made for brand building,
- Common showroom/ warehouse in far away markets would increase the market reach and enable SME's to ensure timely deliveries and offer better after sale service.
- Diversification or Identification of new products for new markets will enhance the competitiveness.

## Management

- Management Development Programmes on marketing, inventory control, production management, and latest manufacturing techniques could help the SME's to overcome the deficiencies in managerial and technological skills.
- Endeavours should be made to convert the unorganised cluster in organized sector.

## **The WO strategy**

The WO is a developmental strategy attempts to overcome weaknesses in order to take advantage of opportunities. Following interventions are suggested.

## Machine

- By studying the present manufacturing processes and identifying the scope of improvements and aim of economical and quality production could be achieved.
- SME's should be encouraged to avail training, testing and R & D facilities available at the institutes such as PAU, NRFMTTI etc.
- Quality standards should be established.

## Money

- Consortium could be evolved to avail common finance facilities.

## Marketing

- Following opportunities if tapped judiciously may help in the development of market. Visit to other clusters, markets, exhibitions will give exposure to the entrepreneurs.

## **ST Strategy**

ST Strategy is based on the use of industry strengths to deal with the threats in the environment.

## Location

- More industrial infrastructure could be created under IID scheme.
- Services of Railways might be availed if viable.

## Men

- Work force has practical knowledge. Imparting them with more theoretical knowledge will broaden their vision.

## Machine

- Upgradation of tech by adopting laser profile cutting machine and MIG welding technique will improve the quality of products.

## Marketing

- Collective development of new products and markets will increase SME's bargaining power and reduce the cost.

### **The SO Strategy**

The SO strategy is most desirable position. It is potentially the most successful strategy utilizing the industry's strengths to take advantage of opportunities. Indeed, it is the aim of industry to move from other position in the matrix to this situation. If it has weaknesses it will strive overcome them, making them strengths. If it faces threats it will cope with them so that it can focus on opportunities.

## IX. STRATEGY

Agricultural Implements Cluster at Moga is a spontaneous growth. During last five decades it has come through many ups & downs and has shown a lot of resilience. But while conducting the diagnostic study and analyzing the cluster by doing analysis of business operations, making current reality tree, analyzing industry structure with the help of Michel Porter's tools and SWOT analysis, following key areas have been identified in which strategic interventions are required.

### Market Development

#### *Strengthening existing markets and exploring new markets*

All SME's in the cluster desire to expand their markets and enhance profits. A comprehensive strategy has to be adopted to achieve this goal. A product market expansion grid is a useful framework for detecting new intensive growth opportunities. By adopting this grid we can analyze the product-market situation and accordingly plan the growth strategy. The product market expansion shows three states of the product vis-à-vis three market situations (e.g. we will study the strategy to be adopted to gain market share for our current product into three market situations i.e. current modified and new markets).

**Product Market Expansion Grid**

	<b>Current Product</b>	<b>Modified Product</b>	<b>New Product</b>
<b>Current Market</b>	CP/CM	MP/CM	NP/CM
<b>Modified Market</b>	CP/MM	MP/MM	NP/MM
<b>New Market</b>	CP/NM	MP/NM	NP/NM

As per abovementioned table there are nine Product-Market situations. We shall discuss all of them and suggest strategies for development & growth under each situation.

#### Current Product /Current Market (CP/CM)

First of all we have to consider that whether we could gain more market share into current markets with our current products. For example making buy back offers or buying back old farm machinery and selling new machinery to replace old one.

#### Current Product /Modified Market (CP/MM)

To promote Current Products into modified markets non-users in existing markets might be identified and encouraged to use the products. New distribution channel could be engaged in to market current products.

#### Current Product /New Market (CP/NM)

To introduce the current product in new market, a market study could be conducted and untapped markets might be identified. Exploration of export market for current products is another strategy.

#### Modified Product /Current Market (MP/CM)

Products could be modified for current markets by improving the existing product or by identifying the weakness of competitor's product and offering own product after improving upon that weakness or by adding new features like better automation, enhanced safety etc.

#### Modified Product /Modified Market (MP/MM)

Modified products could be introduced in modified market by altering the product features to suit the changed requirement of customers. Such as Blades are introduced in threshers for high moisture crops.

#### Modified Product /New Market (MP/NM)

Existing products could be modified to suit new markets. Cultivators and disc harrows could be modified to the requirements of hilly areas/ export market. Modifying the present farm machinery according to the requirements of dry land farming could be a good strategy under MP/NM.

#### New Product /Current Market (NP/CM)

New products or multiuse products can be developed for current markets.

#### New Product /Modified Market (NP/MM)

New machinery could be introduced to fulfill a changed requirement. Automatic potato planter is introduced to reduce the requirement of labour.

## New Product /New Market (NP/NM)

New type of threshers could be introduced for a newer crop, cotton crop machinery or horticulture machinery could be developed. Small self-propelled Agricultural Implements & Farm Machinery could be designed for use in the small land holdings or hilly areas. Diversification could also be done.

### **Brand Building**

Brand identifies the product or maker. It can be a name, trademark, logo or other symbol. A brand is a seller's promise to deliver a specific set of features, benefits and services consistently to the buyers. The most enduring meaning of a brand is its values, culture and personality. Today branding is such a force that hardly anything can go unbranded. Brands provide competitive advantages. An SME can reduce marketing costs, have more trade leverage with customers, charge higher prices, easily launch new products. We should make efforts to build a common brand for cluster's products.

### **Creating export potential**

Presently SME's in the cluster do not export except some meager exports to Nepal. It is evident that the domestic market is getting saturated. Export is one of the strategies to expand the market. To make the cluster export worthy, following interventions are suggested: quality improvement; standardization; common brand; networking to fulfill large export orders; participation in National and International trade fairs and exhibitions; and training in Export Procedures, Documentation & International Marketing.

## **Technology Upgradation**

Agricultural Implements industry is a fabrication industry. Technology involved in the cluster is low. Many customers such as government departments, service providers and big buyers ask for better quality products. Moreover buyers & users are scattered all over India. They face difficulties in receiving parts for repair & maintenance and after sales service. The market is also expanding fast and lucrative international markets are yet to be explored. Therefore a strong need for

technological upgradation is felt. Following interventions are suggested for technology upgradation:

- Collective research & development for standardization & interchange-ability of Agricultural Implements & Farm Machinery and market savvy redesigning of products
- For cost reduction real innovations should be encouraged instead of notional innovations.
- By studying the present manufacturing processes and identifying the scope of improvements and aim of economical and quality production could be achieved.
- SME's should be encouraged to avail training, testing and R & D facilities available at the institutes such as PAU, NRFMTTI etc.
- Upgradation of tech by adopting laser-cutting machine, use of jigs & fixtures and MIG welding technique will improve the quality of products.

## **Development of Networking Among the Cluster Actors**

Networking among the cluster actors is inadequate. Moreover, association comes into action only at the time of crisis. Cluster actors hesitate to Interact with each other this may be due to the fear that technology may be replicated and market related information might be passed out.

A strong network has to be created among the cluster actor so that they can jointly solve each other's problems, pressurize Govt. in liberalizing the rule & regulations. They even can jointly market their products in the global market in order to compete with "the economies-of-scale" approach of Chinese manufacturers. The industry associations need to be made proactive and networking has to be strengthened. This can be taken up as a part of capacity building exercise. The benefits of networking have to be explained to them.

## **Implementation of Modern Management Practices**

Majority of the industrial unites in the cluster are under unorganized sector. Entrepreneurs are self-taught fellows. They are unaware of modern management tools, such as Inventory Management, Production Management, Process control,

Methods of costing & pricing etc. Certainly they are using abovementioned tools in somewhat crude way. Nevertheless, there is a necessity to impart training to the entrepreneurs on the use of modern Management Tools.

## **Rationalization of Government Rules & Regulations**

The entrepreneurs are finding it difficult to comply with the rules and regulations of several Govt. departments. They have to jostle with tens of offices and fill hundreds of forms. Most of their time is spent in filling up forms and submitting papers as per their requirements. Therefore Govt. rules and regulations have to be liberalized. The rule of the Govt. department should be a facilitator rather than regulator. An awareness workshop for the Govt. Officials in the form of “department-enterprise interface” can be organized.

Agricultural implements industry is an important backward linkage to the agriculture. It is certain that extensive use of agricultural implements and farm machinery is crucial for faster development of agriculture. Unlike the use of pesticides and chemical fertilizers, there is little controversy over the use of agricultural implements. Therefore it is utmost important for the Government to confer agricultural implements industry with the status of Agro Industry.

The import duty on raw material is 67%. This itself makes the final product costlier. Some action needs to be initiated in reducing import duty. Moreover cost of capital has to be reduced and made as per international standard. (The normal rate of interest in India is 12% compared to 5% in China, Japan).

## **Developing BDS to Assist the Cluster**

Growth of Business Development Services especially in technical and marketing areas are very limited. There is none technical training institute, no R & D & testing laboratory, within the cluster. As a result, the technology and the process of manufacturing have remained unchanged. Moreover, there is no consultant/experts who can guide them in international marketing, export procedures and documentation, etc. whatever the entrepreneurs learnt; they learnt it by doing it or from other entrepreneurs. Therefore, Business Development services have to be developed in the cluster.

## X. ACTION PLAN

Based on the whole analysis the following activities can be organized at Moga during the Cluster Development Programme.

- Diagnostic study of the cluster is completed and its finding will be disseminated in the proposed seminar. Accordingly cluster vision and action plan would be prepared.
- Meeting of cluster actor will be convened regularly and required funds are asked for in the action plan.
- Visits for large & Medium sector fabrication units and other successful dynamic clusters are proposed.
- Study in understanding the present manufacturing process and identifying the scope for improvement is proposed
- Workshops are proposed to identify the needed technology and to disseminate the available technologies.
- A BDS provider's database will be compiled
- Three to five day training programme on marketing shall be organised.
- Experts will be hired to conduct seminars on International marketing.
- Funds are provided for participation in National & International trade fairs.
- A buyer seller meet is proposed.
- A few training programme in export procedures & documentation are planned.
- Delegations to Pakistan, Germany and African countries are proposed.
- Seminars on ISO-9000 are proposed.
- A BDA will be engaged to undertake detailed value chain analysis and to identify the gaps in it.
- Apart from part time tech BDS, a few experienced engineers will be appointed on full time basis to provide personal counselling.
- Standardization of products will be a thrust activity. This intervention will continue for the whole period of cluster activity.

- Training programme for the workers, supervisors and managers will be designed according to the needs of the industry.
- Training programme on entrepreneurship will be conducted regularly.
- Department (Govt.) – enterprise interface will be one of the major activities.

## **XI. CLUSTER VISION**

**“By the Year 2008 the Agricultural Implements Cluster in and around Moga will have evolved into a Dynamic Cluster and develop its Domestic as well as Export Market by Quality Improvement, Cost Reduction, Innovation, Improved Customer Experience and Niche Marketing”.**

## **XII. PROPOSED ACTIVITIES IN THE YEAR 2005-06**

### **Market Development**

- Launch of Website
- Market Studies
- Training programme on Export Procedure and Documentation
- Seminars and workshop on marketing
- Exposure visits to relevant cluster
- Participation in International & National trade fairs and industrial exhibitions
- Common Brochure
- Buyer seller Meet

### **Technology Upgradation**

- Feasibility study for Process Improvement
- Awareness programme on ISO-9000, HACCP
- Standardisation of Farm Machinery
- Workshop on Welding Technology
- Workshop on Metal Cutting Technology
- Workshop on Foundry Technology
- Training on CAD/CAM

### **Capacity Building**

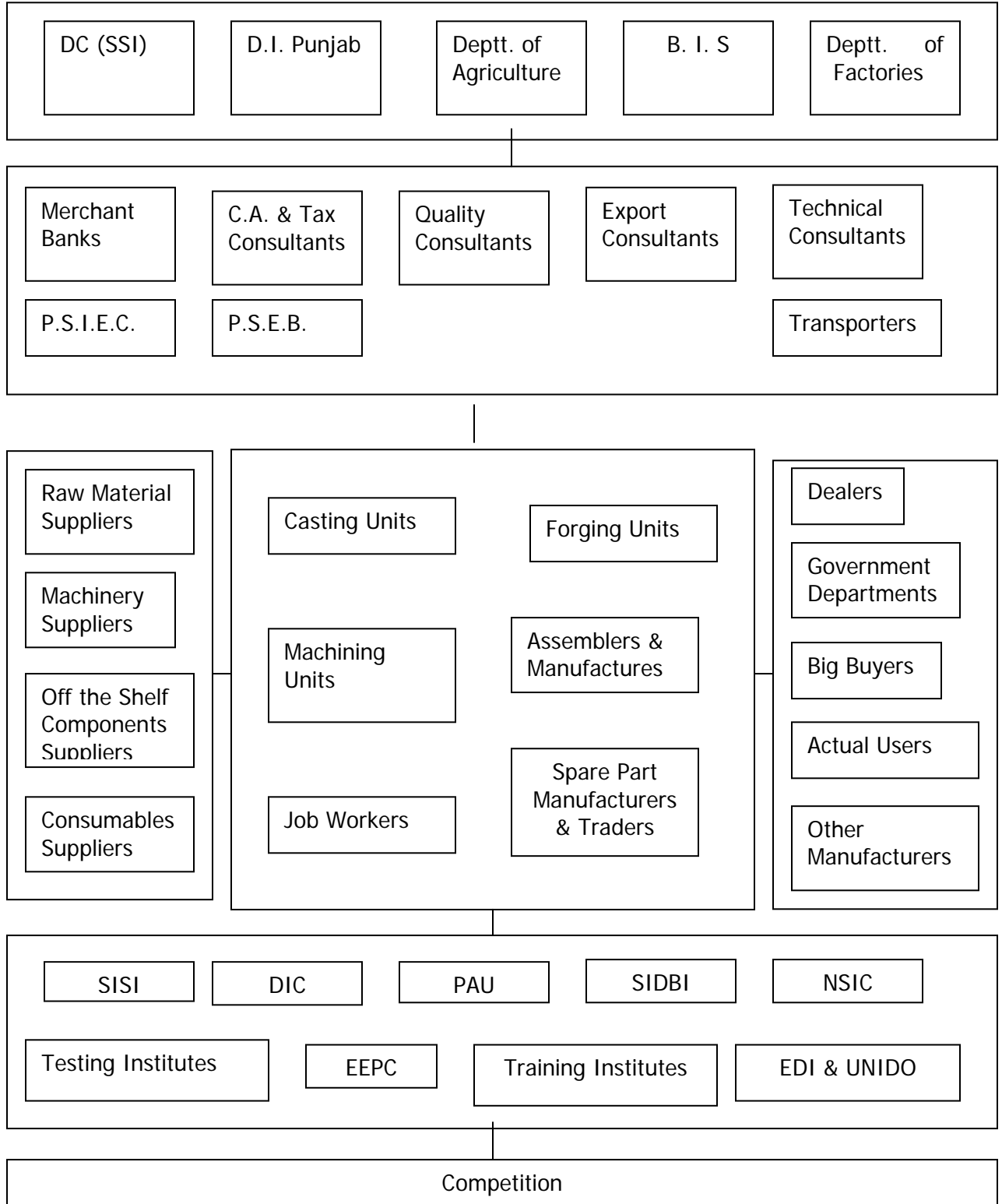
- Strengthening of Association & Their Secretariat at Moga
- Seminars on Cluster Development Programme
- Data Bank of Business Development Service Providers (BDS)

### **Misc./ Other Activities**

- Organising Periodic meeting with cluster actors
- Establishing a technical library at Moga

# ANNEXURE -- I

## Post Intervention Cluster Map



## ANNEXURE -- II

### Post Intervention Reality Tree

# ANNEXURE -- III

## Post Intervention Institutional Matrix

Abbreviations	EPC	SIDBI	NSIC	DI&DIC	BIS	MERADO	CTR	CFMTTI	NRFMTTI	CIAE	SISI	DFPE	PSAIMA	MAIA
MAIA	3	4	4	4	3	3	3	4	4	3	2	4	4	
PSAIMA	3	4	3	3	2	3	3	3	4	3	3	4	4	
DFPE	2	3	2	2	2	2	2	4	4	4	4	4	4	
SISI	4	4	4	4	2	3	4	2	3	2	4	4	4	
CIAE	2	2	2	2	2	1	1	4	4	4	4	4	4	
NRFMTTI	2	2	2	2	3	2	2	4	4	4	4	4	4	
CFMTTI,	1	2	1	1	3	1	1	4	4	4	4	4	4	
CTR	2	2	3	2	3	3	3	4	4	4	4	4	4	
MERADO	2	2	2	2	2	2	2	4	4	4	4	4	4	
BIS	2	2	3	2	2	2	2	4	4	4	4	4	4	
DI&DIC	2	3	3	2	2	2	2	4	4	4	4	4	4	
NSIC	3	4	4	2	2	2	2	4	4	4	4	4	4	
SIDBI	3	4	4	2	2	2	2	4	4	4	4	4	4	
EPC	3	4	4	2	2	2	2	4	4	4	4	4	4	

## **ANNEXURE -- IV**

### **List of Units Contacted During the Field Survey**

- M/s Ajit Industries, Majestic Road, Moga.
- M/s Ashoka Agro Industries, Majestic Road, Moga.
- M/s Bant Mechanical Works (Regd.), Talwandi Bhai.
- M/s Bharat Industrial Corporation, Akalsar Road, Moga.
- M/s Bhari Mechanical Works, Baja Khana Road, Bhagta Bhai Ka,
- M/s Droli Industries (Regd.), Majestic Road, Moga.
- M/s Droli Mechanical Works, Majestic Road, Moga.
- M/s Jandu Engg. Works, Majestic Road, Moga.
- M/s Jhandeana Industries, C-69-70, Focal Point, Moga.
- M/s Madho Agro Industry (Regd.), B-3, Focal Point, G.T.Road, Moga.
- M/s Madho Mechanical Works (Regd.) B-49, Focal Point, G.T.Road, Moga.
- M/s Malwa Agro Industries, Talwandi Bhai.
- M/s Marshal Industrial Company, 103, Court Road, Moga.
- M/s Master Malwa Product, C-48, Focal Point, G.T.Road, Moga.
- M/s National Agro Industries, Link Road, Industrial Area-A, Ludhiana.
- M/s Neelam Industries, C-27, focal Point, Moga.
- M/s New Punjab Mechanical Works, Talwandi Bhai.
- M/s Onkar Industries, Talwandi Bhai
- M/s Paramveer Engineers & Manufacturers, C-71-72, Indl. Focal Point, Moga.
- M/s Punjab Mechanical Works, Talwandi Bhai.
- M/s Super New Punjab Mechanical Works, Talwandi Bhai.
- M/s The Sigma Steel Industries (Regd.) A-2, Industrial Estate, Ludhiana.