

Agricultural Equipment

MARKET & OPPORTUNITIES



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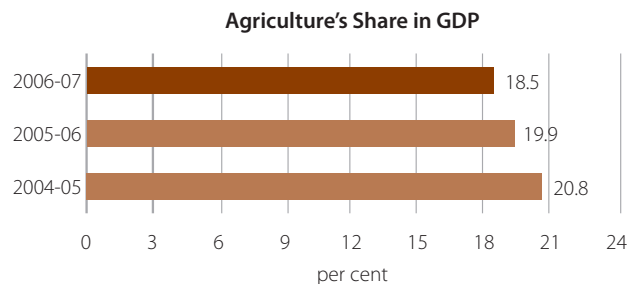
Introduction

India's agricultural sector is one of the most significant components of the country's economy, though its share in the GDP has been decreasing over the years. Nearly 60 per cent of India's population is dependent on agriculture for its livelihood. Performance of the agricultural sector continues to have a crucial impact on the prices of essential goods and market demand for various consumer products.

Agricultural Equipment industry plays a key role in supporting the performance of the agricultural sector

in India. Farming activities are increasingly getting mechanised, and the availability, quality and performance of agricultural equipment has an increasing impact on improving the output and productivity of the agricultural sector.

While India manufactures and deploys a range of agricultural equipment across the industry value chain, tractors and tillers are the two that constitute the bulk of the industry.



Indian Agricultural Equipment Industry

The Indian agricultural equipment industry covers the gamut of equipment used for different activities across the agriculture value chain. The key activities along the value chain and the equipment used in each stage are depicted below.

This report focuses on the tractors and tiller segment as they constitute the majority of the Indian agricultural equipment industry.

The industry structure spans both tiny rural units and MNCs

The manufacture of basic agricultural implements is largely by village artisans and tiny units, small scale industries and the State Agro-Industrial Development Corporations. The traditional artisans and small scale industries rely upon their own experience, user’s feedback and government owned research and development institutions for technological support. They typically operate out of their own homes or basic establishments that are often without regular utility services.

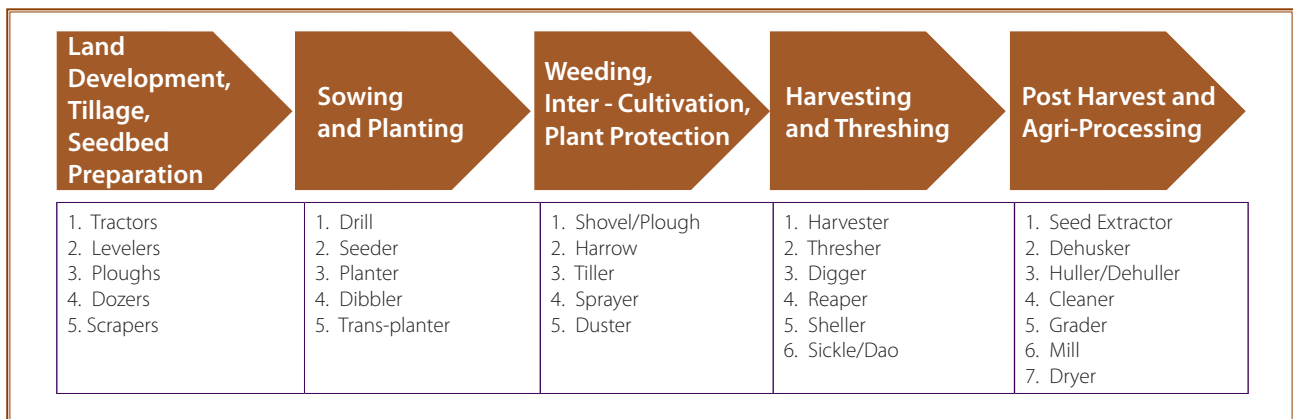
Medium scale industries operate in their own premises with adequate infrastructure, sometimes forming a part of an industrial estate. They also have manufacturing and

marketing facilities and employ skilled manpower. Products such as diesel engines, electric motors, irrigation pumps, sprayers and dusters are produced in this sector.

Complex products such as land development machinery, tractors, power tillers, post harvest and processing machinery and dairy equipment are manufactured by large players in the organised sector. These firms typically have large manufacturing facilities, professional marketing network of dealers and provide effective after sales service. They also have in-house research and development facilities or have joint ventures with advanced countries for technology upgradation. Mahindra & Mahindra’s Farm Equipment Sector (FES), which designs, develops, manufactures and markets tractors for Indian and overseas markets, is the largest manufacturer of tractors in India. Other major players include TAFE, New Holland, John Deere and Punjab Tractors.

Mechanisation of agriculture has been growing

Over the years, the share of human and animal power in agriculture has reduced drastically, paving the way for a variety of equipment to emerge. Many of these are driven by tractors, diesel engines or tillers. Several of the traditional

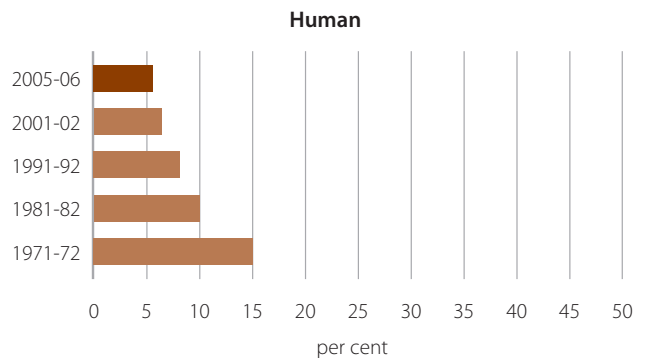
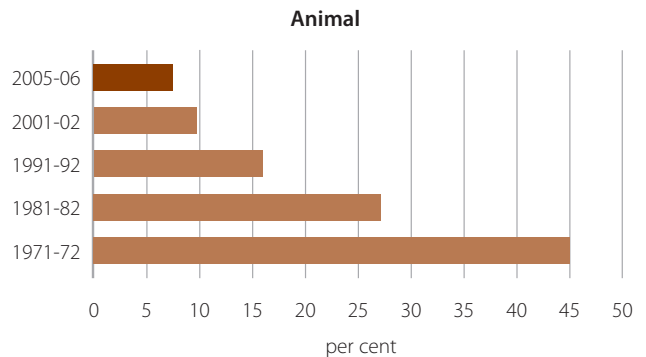
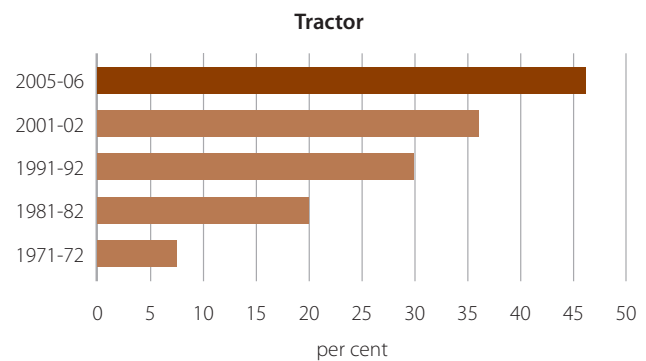
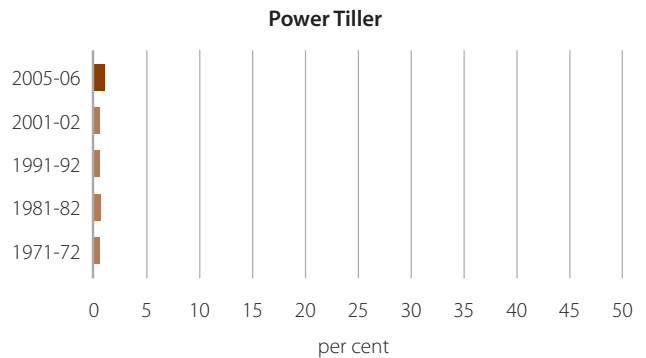
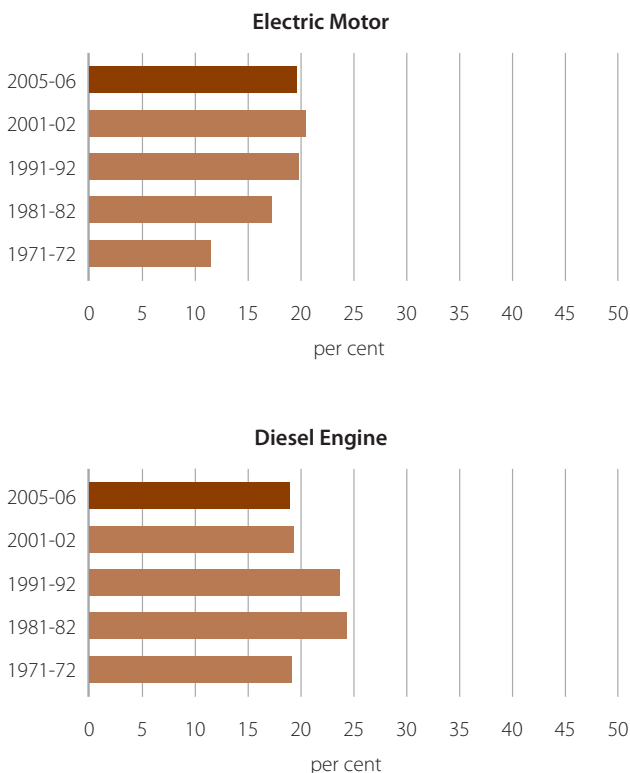


processes agriculture have been transformed with the advent of mechanisation. For example:

- Land development, tillage and seedbed preparation, together account for a major share of power utilisation in the crop cycle. From animal driven plough and blade harrow, the process is now being transformed by utilisation of tractor driven devices
- Sowing and planting as a process, though not power intensive, has traditionally been sub-optimal due to the complexity of drilling of land and then uniformly sowing the seeds. This process is now being transformed by modern seed drills and planters
- Irrigation of farmland has been largely automated and the use of diesel and electric motors and pumps is now well established
- Similarly, the activities pertaining to plant protection, harvesting and threshing are being automated, largely with the help of sprayers and tractor mounted equipment, respectively

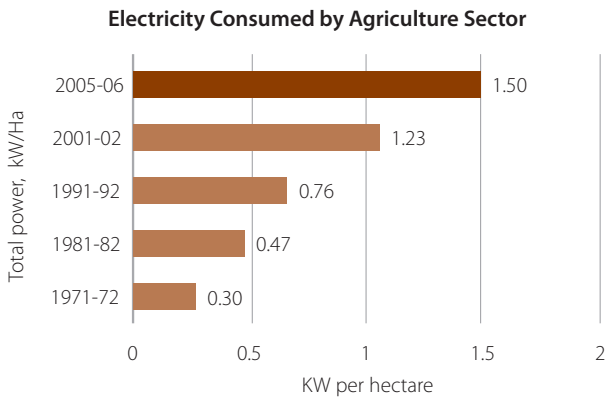
As a result of these developments, the use of animals to power farming activities has been continuously declining. This decline is matched by an almost equal increase in the share of tractors, indicating that the former is being replaced by the latter (refer figure).

Share of Different Sources of Power for Agriculture



The consumption of electric power for farming has also been increasing steadily – another indication of the increasing mechanisation in the sector. The chart below

indicates the increasing trend of energy consumption per hectare.



The need for improving productivity is the key driver for adoption of mechanisation. Some of the key trends impacting demand for agriculture equipment are as follows:

Falling interest rates and availability of credit

Easy availability of financing has been a key driver of consumption across different sectors in India, and agriculture is no exception. More than 90 per cent of tractor purchases in India are on credit.

Emergence of contract farming and dedicated sourcing with corporate partnership

Contract farming is an agreement between the food processor (contractor), who is typically a large organised player, and the farmer, whereby the farmer is contracted to plant the contractor’s crop on his land. He also agrees to harvest and deliver to the contractor a quantum of produce, based upon anticipated yield and contracted acreage at a pre-agreed price. The food processor provides inputs in terms of technology and training to the farmer, to improve the yield and quality of the produce.

There have been several examples of successful contract farming ventures in India – companies like Pepsi Foods, Rallis and Appachi Cotton have been involved in successful ventures.

Contract farming enables the farmer to get the benefit of technology, training and financing with the contractor’s support. This facilitates adoption of mechanised farming practices.

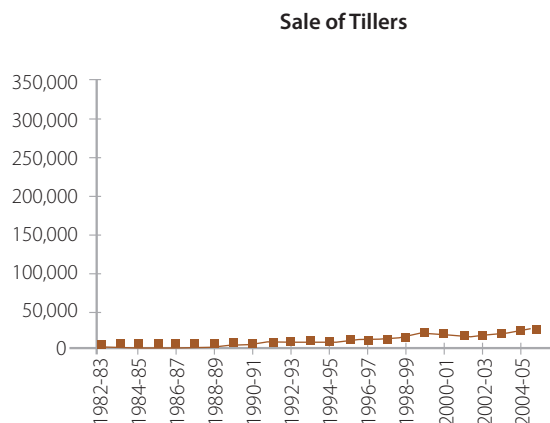
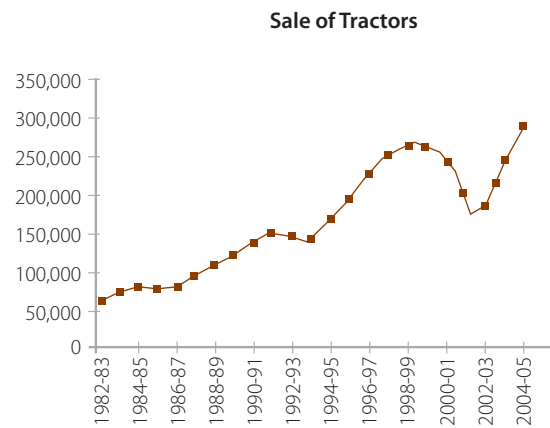
Migration of agricultural labour to urban areas

There has been an increasing trend of migration of rural population to urban areas, to seek better job opportunities and lifestyles. This is primarily due to improvement in income levels and quality of life in cities, enabled by the boom in services and manufacturing sectors. As a result, the number of agricultural workers has been declining, and it is expected that the percentage of population involved in agriculture will come down from the present 60 per cent to close to 40 per cent by 2020. The decrease in number of manual workers has necessitated the move towards increased mechanisation.

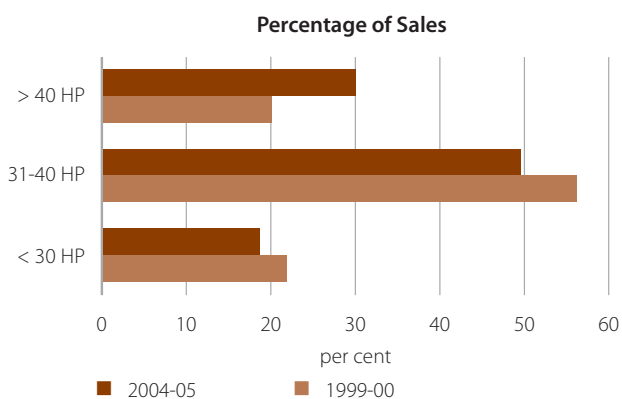
As a result of these trends, the domestic market for agricultural equipment in India has been growing steadily. This is discussed in the following section.

BOTH DOMESTIC AND EXPORTS MARKETS HAVE BEEN GROWING

The tractor market in India is cyclic and has been growing steadily over the years. There has been a continuous growth



of about 20 per cent Y-o-Y for the industry since 2003. There was a recession between 2000 and 2002 owing to poor monsoons; however the industry has recovered and the performance of the last three years show a steady growth. There was a production of 296,080 tractors in 2005-06 as against 249077 tractors in 2004-05.



The market is segmented in terms of horsepower into the 30 HP and less (lower) segment, the 30 HP – 40 HP segment and the higher segment beyond 40 HP. All major players cater to all the three segments. There has been a trend to move towards higher HP tractors, in recent years. This has been prompted by the need for newer applications and increasing awareness among farmers about new mechanisation options.

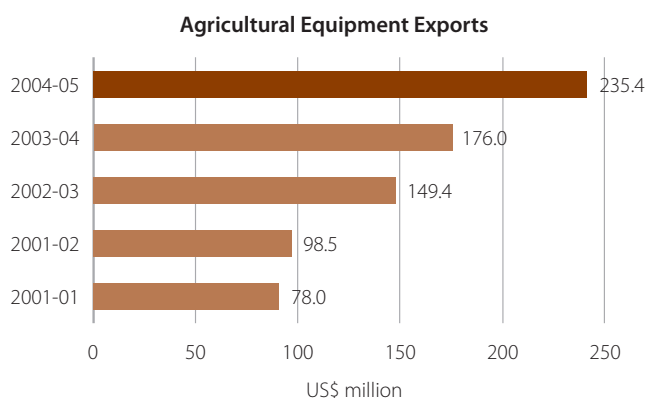
Punjab, Uttar Pradesh and Haryana are the largest markets for tractors, together accounting for more than 50 per cent of sales.

State-wise Sale of Tractors in India

State	Sale of Tractors
Punjab	36.13%
Uttar Pradesh	9.93%
Haryana	6.96%
Rajasthan	6.94%
Madhya pradesh	6.89%
Gujarat	6.62%
Maharashtra	5.31%
Bihar	3.80%
West Bengal	3.16%
Karnataka	3.08%
Andhra Pradesh	2.00%
Others	9.18%

Exports of tractors have been growing at a healthy rate

Indian agricultural equipment is increasingly finding acceptance in global markets. Tractor exports from India have been registering continuous growth over the past five years. From US\$ 78 million in FY01, tractor exports rose to US\$ 235 million in FY05, a CAGR of 31 per cent. Sizeable quantities are exported to Africa, the Middle East, Asia, South America and other nations.



LOW PENETRATION OF EQUIPMENT INDICATES SIGNIFICANT GROWTH POTENTIAL

Agricultural mechanisation in India, while growing rapidly, is still at a nascent stage. The penetration of almost all

Penetration of Agricultural Equipment

Equipment	Nos. per 1000 Hectare
Animal Drawn Seed Cum Fertiliser Drill	36.1
Tractor Drawn Seed Cum Fertiliser Drill	7.0
Animal Drawn Leveller	8408.0
Tractor Operated Levellers	6.2
Manually Operated Plant Protection Equipment	28.5
Power Operated Plant Protection Equipment	4.3
Drip & Sprinkler Equipment	8.3
Horticultural Tools (Power Operated)	8.9
Tractors	16.7
Power Tillers	2.0
Tractor Operated Disc Harrow	6.6
Tractor Operated Cultivator	12.5
Tractor Operated Rotavator	0.9
Potato Digge	2.1
Straw Reaper	18.8
Forage Harvester	18.2

categories of agricultural equipment, as measured by the number of equipments per hectare, is quite low in India. This indicates significant growth potential for the industry in the future. India's experience in consumer durables and automobiles over the past decade has been that when there is a low market penetration, coupled with availability of high quality, high technology products and ease of financing, the market booms. All these factors are present in the agricultural equipment sector today and hence the confidence in future growth appears sound.

As evident, tractors, as well as most other equipment that are operated using tractors, have very low penetration levels in India. This factor, coupled with the growth in the tractors segment, indicates that these could be quite attractive growth options for investors.

THE GOVERNMENT IS ACTIVELY SUPPORTING THE AGRICULTURAL SECTOR

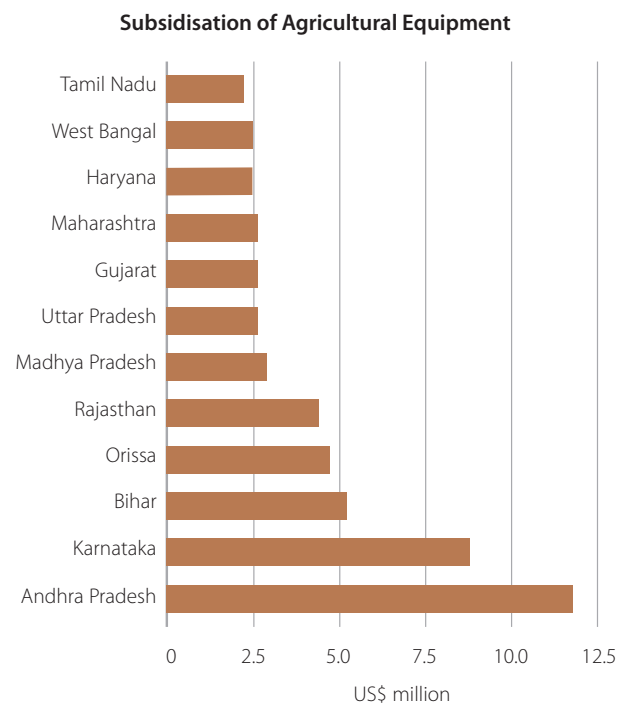
The Government of India has initiated several steps to improve mechanisation and boost farm productivity.

Assistance in the form of subsidy at the rate of 25 per cent of the cost with permissible ceiling limits is made available to the farmers for the purchase of agricultural equipment including hand tools, bullock-drawn/power-driven implements, planting, reaping, harvesting and threshing equipment, tractors, power-tillers and other specialised agricultural machines under the centrally sponsored scheme of Macro Management of Agriculture.

According to the Economic Survey 2006-2007, 7,292 tractors, 16,500 power tillers, 64,610 hand tools, 41,854 bullock-drawn implements, 15,236 tractor-driven implements, 6,080 self-propelled/power-driven equipment, 81,496 plant protection equipment, 6,587 irrigation equipment and 66,464 gender-friendly equipments were supplied to the farmers under the Scheme during 2005-06.

ATTRACTIVE STATES FOR INVESTMENT

Attractiveness of states for investment in agricultural equipment manufacturing can be determined by a combination of the following factors:



Policy support for manufacturing sector

Several state governments also support the sector through subsidies in different forms. Andhra Pradesh, Karnataka and Bihar had the highest outlays for farm subsidies in the period 2003-07.

Consolidation of farmlands in the state

This could either be through single ownership or formation of self-help groups or co-operative farming institutions which are formed with the objective of leveraging resultant scale benefits. Consolidation of farmlands is an indication of the maturity of the market to efficiently use the equipment and thus generate better return on investment in agriculture.

Predictability of rainfall/availability of alternate irrigation infrastructure

This is a key determinant influencing the sales of high cost equipment like tractors. Without a reliable source of risk

mitigation, it does not make economic sense to invest in capital goods that would aid the process of agriculture.

Market competitiveness of goods produced in the region as compared to national and global commodities markets

This is another factor that determines the purchase of agricultural machinery. The investment in productivity enhancing goods is proportional to the predictable returns the farm produce would fetch, which in turn is influenced by the demand for the commodity in the global market.

Punjab and Haryana meet the above criteria largely due to the presence of consolidated wheat farms and due to the emergence of corporate participation in the process of agriculture through promotion of contract farming and sourcing.

As per the Livestock Census 2003, Andhra Pradesh, Karnataka, Madhya Pradesh and Tamil Nadu were the fastest in adopting automation solutions; however, the market in some of these states is yet to evolve in terms of scale.

Conclusion

The farm equipment sector in India is nascent, but a fast growing one, that is set to experience sustained growth due to increased mechanisation of farming, easy availability of credit and emerging practices, such as contract farming.

Tractors and related equipment form the major part of the industry and given their low penetration levels in India, look set to continue having a significant share in the market. These appear the most attractive segments for investment and have been attracting multinational players such as John Deere.

Punjab and Maharashtra appear attractive locations for investment given the favourable demand, supply and regulatory scenario in these states. Andhra Pradesh and Tamil Nadu could be other options.

PROFILES OF SELECT MNC'S

John Deere

To expand its global presence in the agricultural equipment sector, John Deere established a green field project in 1999 under a 50:50 joint venture with Larsen & Toubro Limited (L&T) - an engineering company of repute from India. A state-of-the-art tractor manufacturing plant for 5000 series John Deere tractors was set up at Sanaswadi, near Pune, in the state of Maharashtra. These tractors were introduced in India in early 2000.

In 2005, Deere & Company acquired nearly all the remaining shares in this joint venture. The new enterprise, John Deere Equipment Private Limited, operates through a network of 15 area offices, 4 zonal offices and 270 authorised dealers spread across the country.

The factory currently produces modern tractors of 35, 40, 42, 47, 50, 55 and 70 HP capacities for domestic markets. Tractors manufactured in Sanaswadi are also exported to

the USA, Mexico, Turkey, North and South Africa, and South East Asia. The company has received awards for export excellence in 2005 and 2006 from the Engineering Export Promotion Council.

New Holland

New Holland AG's entry into India was facilitated by FIAT's acquisition of Ford-New Holland in 1991. By 1998 New Holland AG (India) completed the construction of a new plant in Noida, near Delhi, with a capacity of 5,000 tractors in the 35 - 75 HP range.

In 1999, New Holland AG's parent company FIAT bought 70 per cent of holdings of Case Corporation and created Case New Holland Global.

In 2000, the capacity of the Noida plant rose to 12,000 tractors per year and in 2007 the company can manufacture close to 24,000 tractors for the domestic and export markets.

New Holland India exports fully-built tractors to 51 countries in Africa, Australia, South-East Asia, West Asia, North America and Latin America. It also exports sub-assemblies and other tractor parts to the facilities of CNH Global, around the world.

PROFILES OF KEY INDIAN PLAYERS

Mahindra & Mahindra Limited (M&M)

Mahindra & Mahindra, headquartered in Mumbai, India, is principally involved in the manufacture, distribution and sale of farm equipment and utility vehicles. The company's operations are divided into four business segments: automotive, farm equipment, financial services and IT services.

M&M's farm equipment sector has had market leadership in the domestic tractor market for the last 24 years. The farm equipment segment has significant presence across six continents and manufactures agricultural tractors and implements that are used in conjunction with tractors and industrial engines at its Kandivli and Nagpur plants in Maharashtra. One of the top five tractor brands in the world, the company has its own state-of-the-art plants in India, USA, China and Australia and a capacity to produce 150,000 tractors a year.

Tractors and Farm Equipment Limited (TAFE)

Tractors and Farm Equipment Limited (TAFE), is a unit company of the Amalgamations Group, one of India's largest light engineering groups with diverse interests in diesel engines, automobile components, tractors and related farm machinery, lubricants, panel instruments, hydraulic pumps, engineering tools and several other engineering and automotive products. The group's leadership in technology, built on foreign know-how has been nurtured through indigenous efforts.

TAFE has a collaboration with AGCO Corporation, headquartered in Duluth, Georgia, which is one of the largest manufacturers, designers and distributors of agricultural equipment in the world. TAFE has a network of more than 500 dealers, branches, service outlets, as well as its own sales offices and depots covering the entire width and breadth of India.

TAFE is also involved in the following areas, apart from its core business of manufacturing and marketing tractors.

- Matching trailers, implements and accessories
- Packaged power industry
- Hydraulic pumps and gears for tractors
- Engineering plastics and tools and dyes for this industry

Punjab Agro Sales (India)

Punjab Agro Sales (India) manufactures and supplies a wide range of agricultural implements including discs, rotary tillers, disc ploughs, cultivators, offset disc harrows, tractor trailers and tractor blades.

Escorts Agri Machinery Group

Escorts Ltd. set up the strategic Agri Machinery Group (AMG) in 1960 to venture into tractors. The company rolled

out Escort, its first brand of tractors in 1965. In 1969 a separate company, Escorts Tractors Ltd., was established with equity participation of Ford Motor Co., Basildon, UK for the manufacture of Ford agricultural tractors in India. In the year 1996, Escorts Tractors Ltd. formally merged with the parent company, Escorts Ltd. Since its inception, the company has manufactured over 1 million tractors.

HMT Limited

HMT Ltd., incorporated in 1953 by the Government of India as a machine tool manufacturing company, diversified over the years into watches, tractors, printing machinery, metal forming presses, dye casting and plastic processing machinery, CNC systems and bearings. Today, HMT comprises of six subsidiaries under the ambit of a holding company, which also manages the tractor business directly. HMT commenced manufacturing agricultural tractors in 1972 with technology acquired from ZETOR, Czech Republic and continues to upgrade the products. The tractor plants in Pinjore, Mohali and Hyderabad with a capacity of 20,000 per annum, produce a wide range of tractors from 25 HP to 75 HP to suit various farming requirements. The company also manufactures primary and secondary tillage implements, land shaping, planting and harvesting equipment.

Address of the Apex Contact Agency for the Sector

Apex Contact Agency	Address
Engineering Export Promotion Council (EEPC)	Vanijya Bhavan (1st Floor), International Trade Facilitation Centre, 1/1 Wood Street Kolkata 700016 Ph: 91-33-22890651/52 Email : eepcho@eth.net Website: http://www.eepc.gov.in
Tractors Manufacturing Association	B-30 Sagar Apartment, 6, Tilak Marg, New Delhi- 110001 Ph: 91-11-2381895 / 2388665
Indian Machine Tools Manufacturer Association (IMTMA)	Plot 249 F, Phase IV, Udyog Vihar, Sector 18 Gurgaon 122 015 Haryana Ph: 91-124-5014101/02/03/04 Email: imtma@del2.vsnl.net.in Website: http://www.imtma.org

Exchange Rate Used

Year	Exchange Rate (INR/US\$)
2000-01	45.75
2001-02	47.73
2002-03	48.42
2003-04	45.95
2004-05	44.87
2005-06	44.09
2006-07	45.11

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