

Internship Presentation
On

**A COMPARATIVE STUDY ON EMERGING AGRICULTURAL
EQUIPMENT'S APPLICATIONS**

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KEY POINTS:

- ❑ **Early Innovations in Agricultural Equipment**
- ❑ **Challenges in the path of Mechanization**
- ❑ **Current Machinery in Indian Agriculture**
- ❑ **Essential Agricultural Tools**
- ❑ **Emerging Technologies in Agriculture**
- ❑ **Farm Power**
- ❑ **Field Visit**
- ❑ **Enhancing Farm Mechanization in India**

INTRODUCTION

- Farm mechanization is a key driver of progress in India's rural sector.
- The Green Revolution in the 1960s aimed to address food scarcity through improved crop varieties, chemical fertilizers, irrigation systems, and farmer education.
- Urbanization and alternative employment opportunities in factories and service sectors are reducing the agricultural workforce, necessitating increased farm mechanization.
- The Indian farm mechanization market is estimated at US\$16.73 billion in 2024 and projected to reach US\$25.15 billion by 2029. The Indian government has launched initiatives like the Sub-Mission on Agricultural Mechanization (SMAM) to promote farm mechanization adoption.
- Government initiatives include subsidies, credit facilities, and rental services for machinery.

EARLY INNOVATIONS IN AGRICULTURAL EQUIPMENT

Animal-Drawn Plows

The domestication of oxen in the Indus Valley around 4000 BC led to the use of animal-drawn plows, revolutionizing farming practices and improving efficiency.



Sickles

Simple yet effective, sickles with flint or stone blades on wooden handles were among the earliest tools used for harvesting grains, revolutionizing the process.

Steel Plows

John Deere's steel plow, introduced in 1837, was a significant advancement, allowing farmers to cultivate previously difficult land and boosting agricultural productivity.



CHALLENGES IN THE PATH OF MECHANIZATION

Knowledge Gap:

Traditional farmers may resist new technologies, requiring educational programs and demonstrations.

Land Fragmentation:

Small, divided landholdings make large-scale machinery impractical. Solutions include custom hiring services and promoting smaller, more maneuverable machines.

Financial Constraints:

High upfront cost and limited credit access pose significant barriers. Government subsidies and innovative financing schemes can incentivize investment.

Technological Inadequacies:

Existing machinery may not suit India's specific needs, necessitating increased R&D.

Infrastructure and Support Issues:

Limited spare parts availability and sparse service network pose challenges.

Geo-diversity:

Machinery designed to handle diverse soil types across India is needed.

CURRENT MACHINERY IN INDIAN AGRICULTURE

Tractors

India stands as the largest manufacturer and market for tractors globally, with companies like Mahindra, TAFE, and John Deere producing a wide range of tractors from 14 hp to 120 hp, offering advanced technology for various farm operations.



Sowing and Planting Equipment

Modern mechanized solutions like mechanically metered seed drills and seed-cum-fertilizer drills, operated by tractors, have replaced traditional methods, offering higher efficiency and precision in planting operations.



Harvesting and Threshing

Combine harvesters and tractor-mounted harvesters have become prevalent, replacing manual harvesting and threshing methods, allowing for efficient harvesting, threshing, and cleaning of grains in a single operation.



ESSENTIAL AGRICULTURAL TOOLS



Pruning Shears



Pruning shears, also known as secateurs, are strong enough to cut hard branches of trees and shrubs, making them essential tools for trimming and shaping plants in gardens and orchards.



Brush Cutters



Brush cutters are powerful gardening tools used to clear overgrown areas, trim small trees, and harvest crops, available in handheld, walk-behind, and tow-behind options with various blade attachments.



Gardening Forks



Gardening forks, also known as digging forks or spading forks, are essential tools for digging, aerating, mixing nutrients, and harvesting root vegetables, with sturdy tines and various designs for different tasks.



Thermal Foggers



Thermal foggers are machines that heat and release liquid solutions as fine fog, reaching nooks and crannies for effective pest control, disinfection, and mosquito control in agricultural and urban areas.

EMERGING TECHNOLOGIES IN AGRICULTURE



Vertical Farming

Vertical farming, a method of growing crops in vertically stacked layers using controlled-environment agriculture (CEA) and soilless techniques like hydroponics, aquaponics, and aeroponics, offers increased yield, reduced water usage, and year-round production in urban areas.



(HQV) Harvest Quality Vision

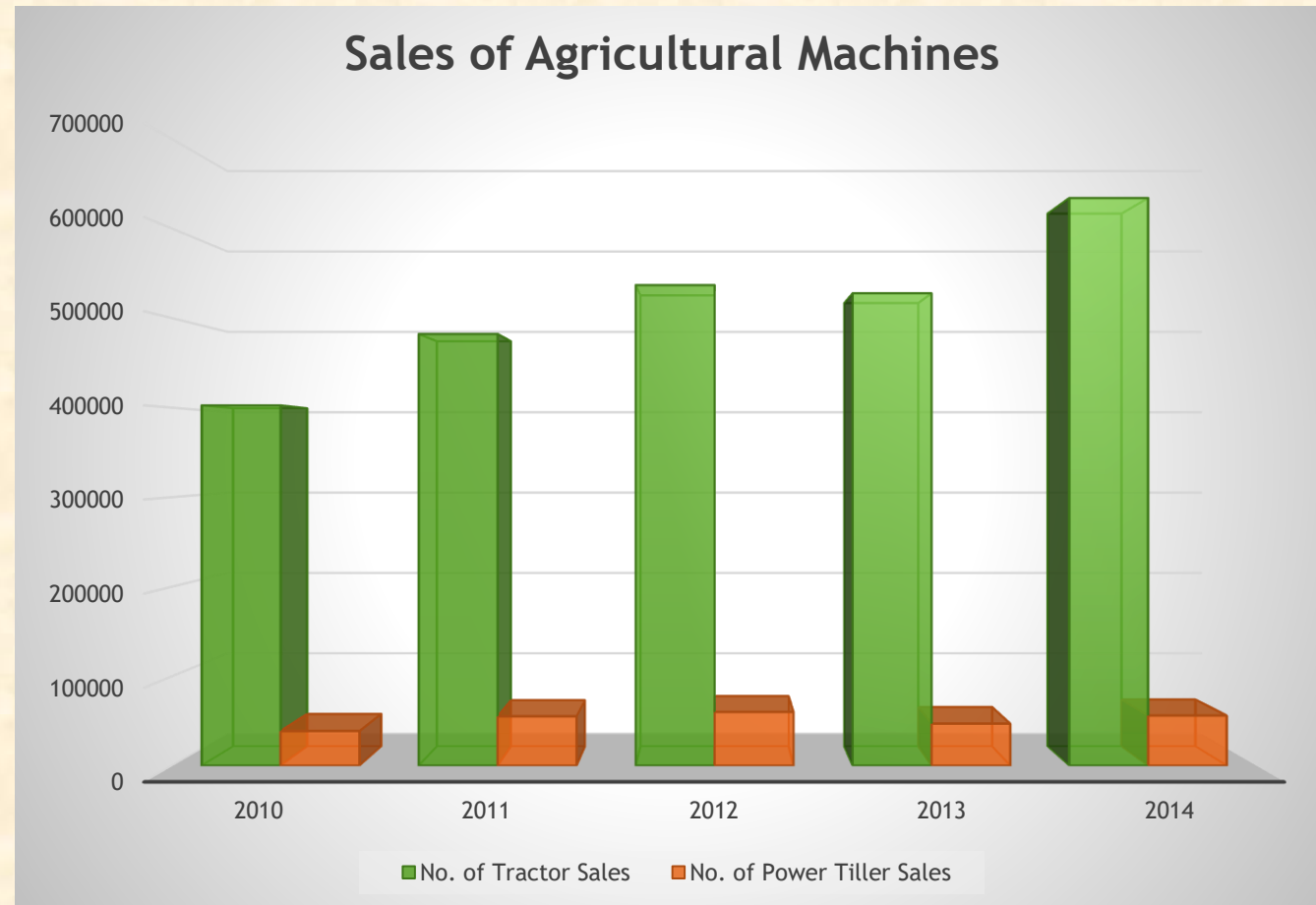
HQV technology uses computer vision, machine learning, and artificial intelligence to assess the quality and ripeness of vegetables during harvesting, providing farmers with real-time, non-destructive evaluation and precise information for optimal harvesting.

Nanotechnology in Agriculture

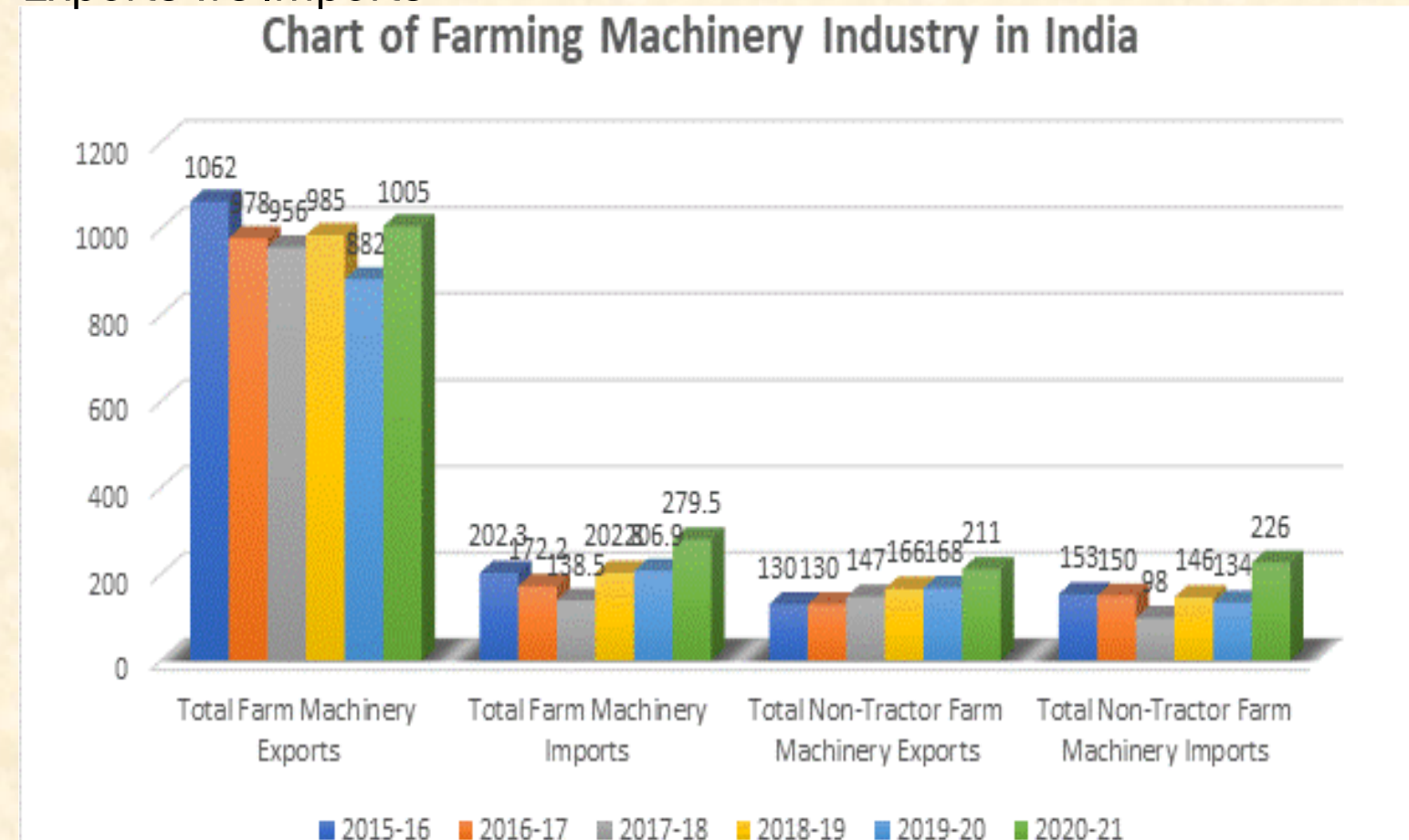
Nanotechnology offers innovative solutions for agriculture, including nano pesticides for targeted pest control, nano sensors for early detection of threats, and nano fertilizers for improved nutrient delivery, contributing to increased productivity and sustainability.

FARM POWER

No. of Tractor sales v/s No. of Power Tiller sales



Farm machinery Exports v/s Imports and Non-tractor machinery Exports v/s Imports



- ❑ Farm power in India has increased significantly since the Green Revolution, with tractor and electric motors contributing significantly.
- ❑ However, conventional sources like agricultural workers and draft animals are decreasing. To meet increasing food grain demand, farm power availability needs to increase from 2.02 kW per ha by 2030.

FIELD VISIT



Visit: Canara Complex, Karavali Junction Kochi, Panvel - Kochi - Kanyakumari Hwy, Adi-Udupi, Karnataka 576101

Me, Sales Person and Helper

Overview

- ❖ **Products:** Land mowers, chainsaws, wheelbarrows, mowers, trimmers, farming accessories (hand tools).
Power weeders, power tillers, advanced harvesting machines (seasonal).
- ❖ **Best Time to Buy:** Harvesting season.
- ❖ **Price Range:** Mostly above 60,000 rupees (no budget options mentioned).

ENHANCING FARM MECHANIZATION IN INDIA

Affordable equipment



Develop small, versatile machinery for small farms considering land size and crop variations.

Financing



Make loans and subsidies easier to access for farmers, with lower interest rates and longer repayment periods.

Farmer education



Educate farmers on using, maintaining, and understanding the economic benefits of machinery.

Shared machine services



Create centers where farmers can rent heavy machinery instead of buying it themselves.

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[Vertical Farming: Concept, Techniques & Advantages - Prakati India](#)



THANK YOU