

# Farm Mechanization in India:

**V.N.KALE**  
**Additional Commissioner**  
**Mechanization and Technology Division**  
**Dept. of Agriculture and Cooperation**  
**Ministry of Agriculture**  
**Government of India**

# India

Total population: 1.21 billion (2011)

Population growth rate: 1.5% annually

Majority (69%) of people live in rural areas.

Land area: 297.3 million ha (2.4% of world)

17% of population;

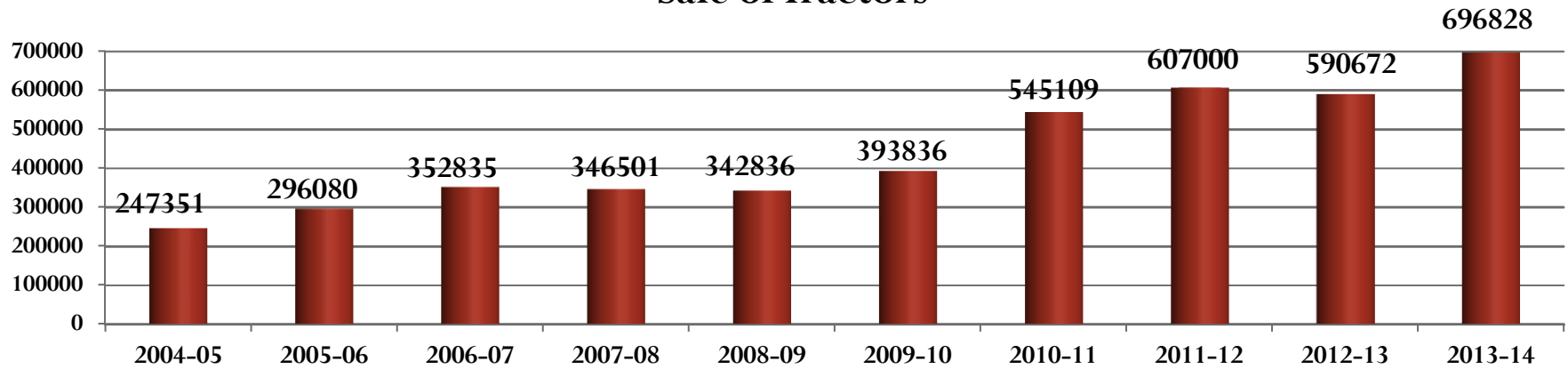
Only 4.2% of world water; 1200 mm annual rainfall

Agriculture accounts for 80% of water needs; 60% from ground water.

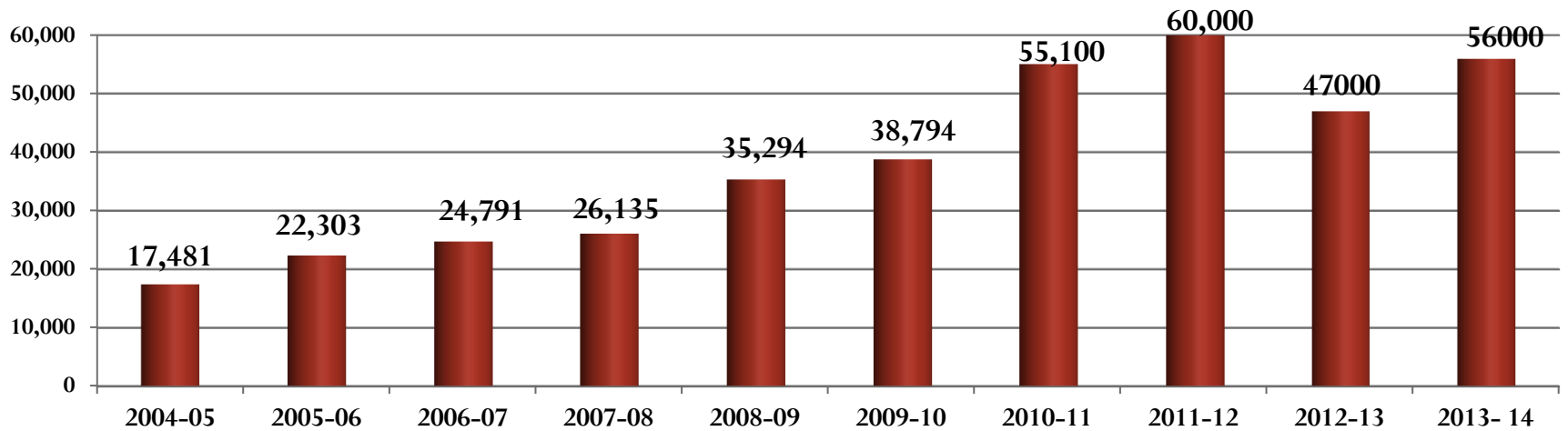
52% workers in Agriculture: 14% of GDP;

# Sales of Tractors and Power Tillers in India

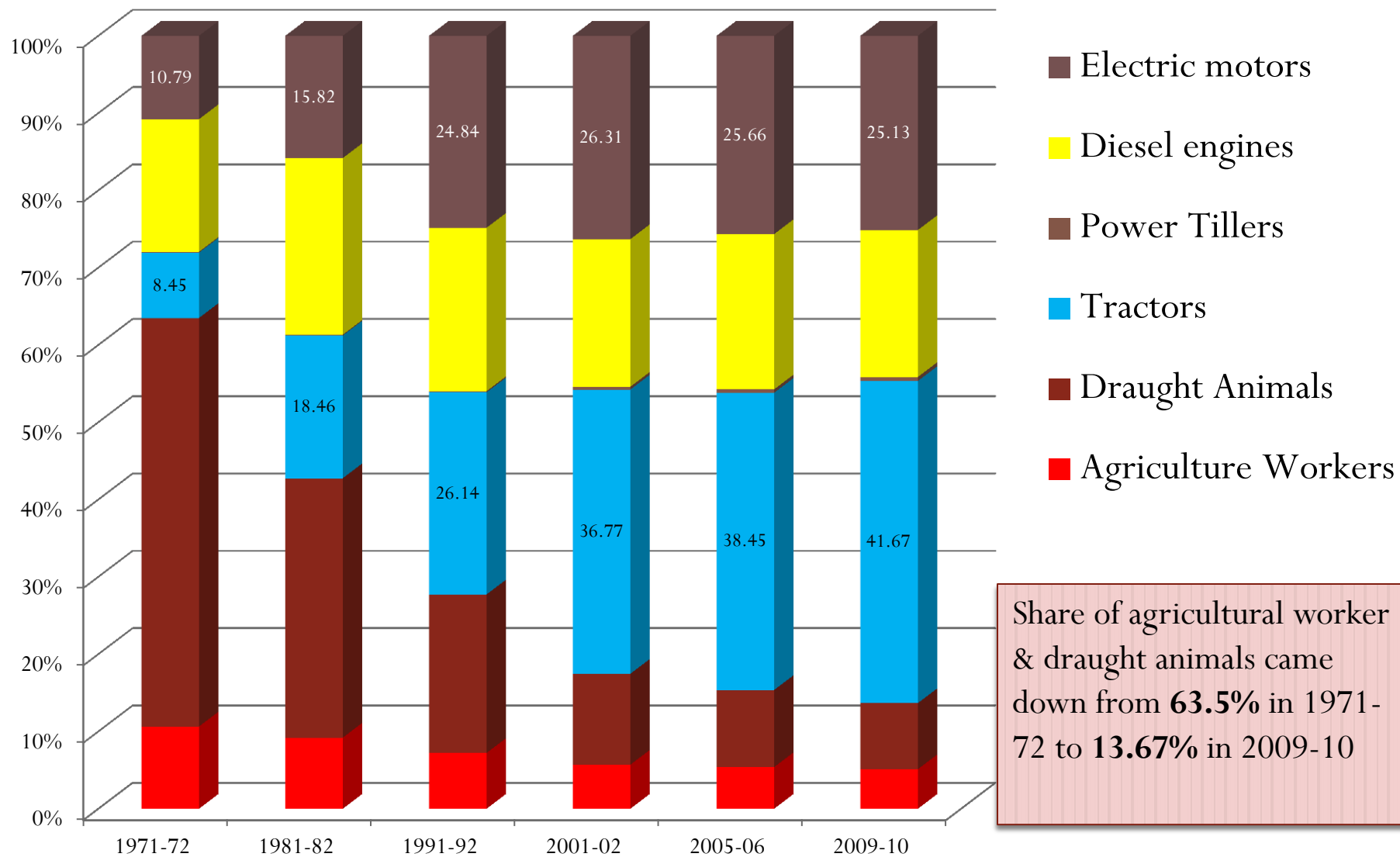
## Sale of Tractors



## Sale of Power Tillers



# Trend of power availability from different sources

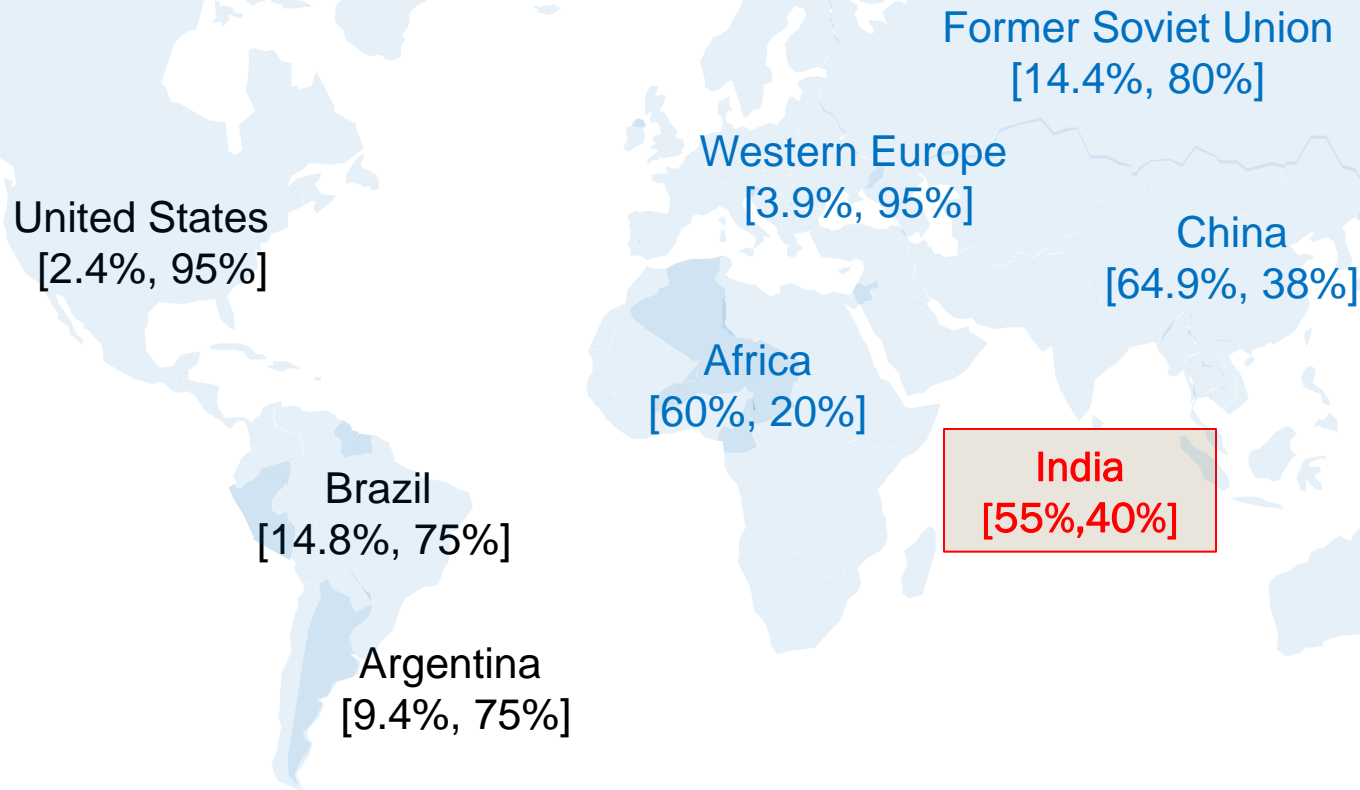


# Comparison of Mechanization with Other Countries

Sl. No.	Country	Farm Power (kW/Ha)	No. of Tractors per 1000 Ha.	No. of Combine Harvesters per 1000 Ha.
1	India	1.36	15.75	0.026
2	Japan	8.75	461.22	236.98
3	U.K.	2.5	88.34	8.3
4	France	2.65	68.5	4.93
5	Italy	3.01	211.08	4.71
6	Germany	2.35	79.817	11.41
7	Argentina	--	10.74	1.79
8	Brazil	--	13.66	0.915
9	China	--	6.98	2.53
10	Pakistan	--	16.47	0.08
11	Egypt	--	30.7	0.79

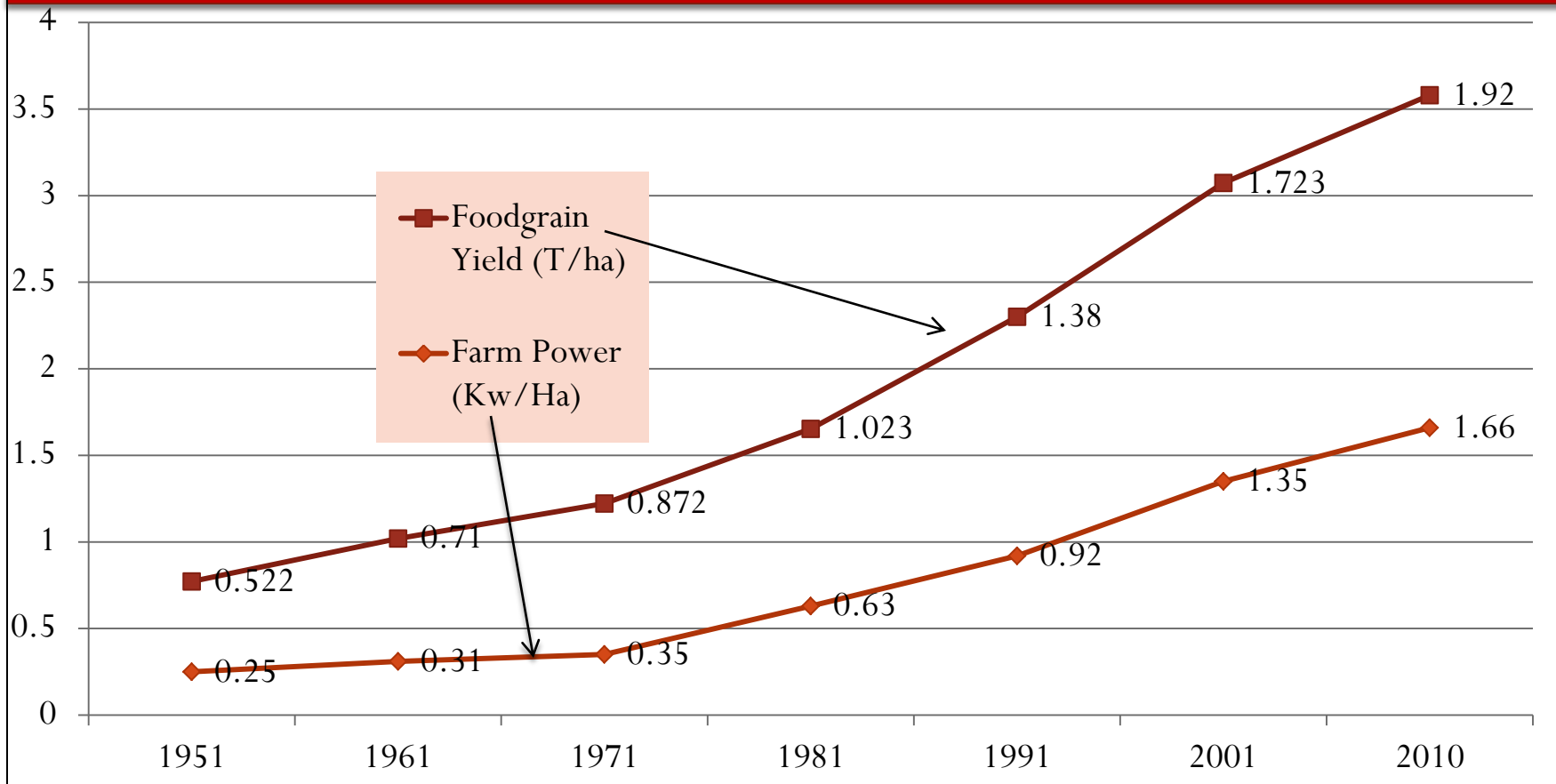
**Source: FAO Yearbook 2003**

# Population engaged in Agriculture vis-a-vis level of farm mechanization



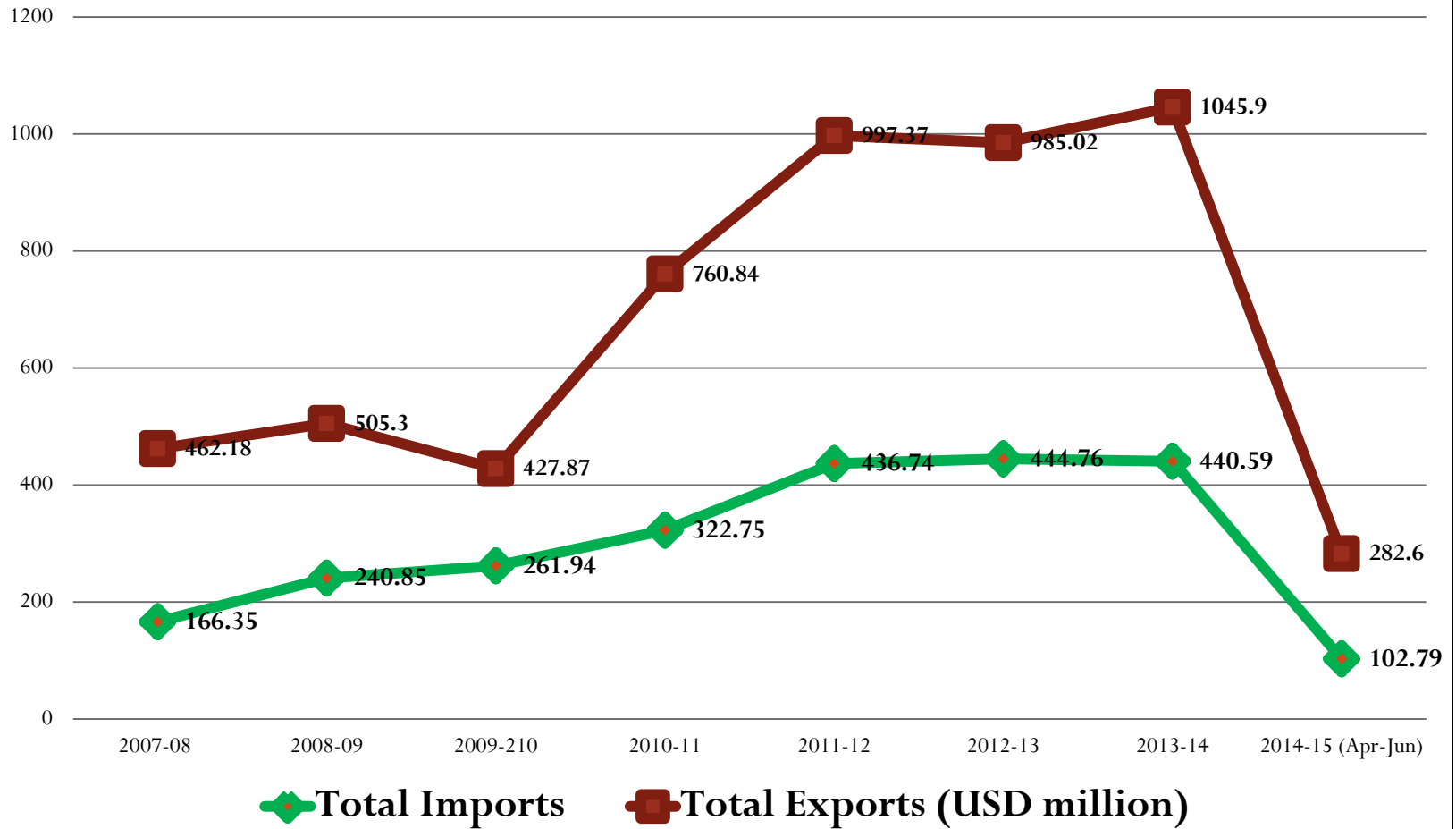
Higher share of labour (55%) with lesser contribution to GDP (14%) makes farming in India less remunerative and incidence of farmers' poverty

# Farm Mechanization: Key driver of productivity



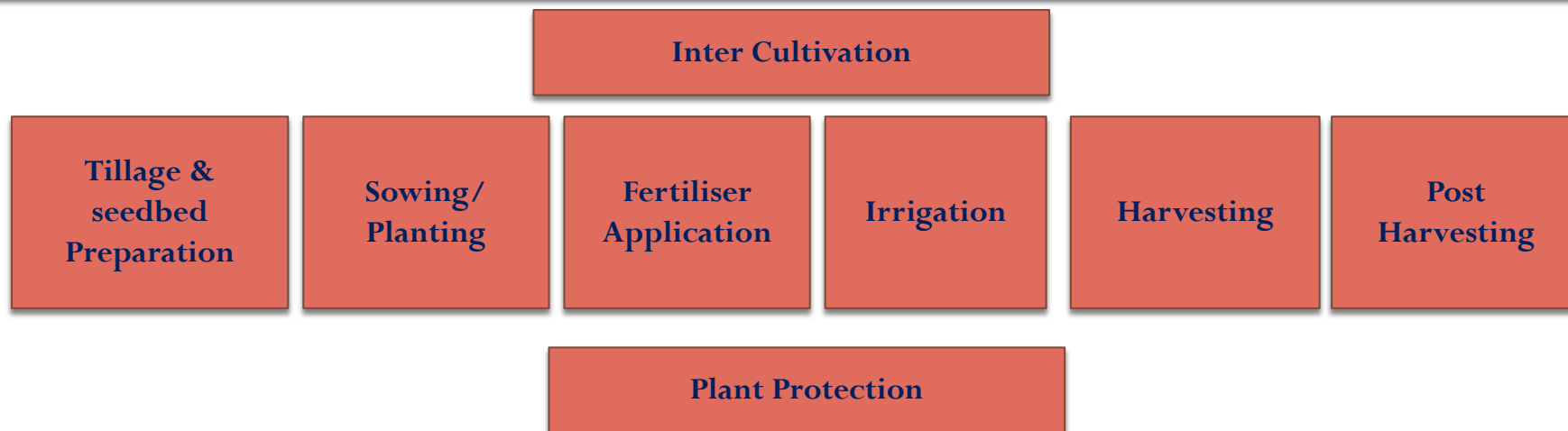
*Agricultural productivity has positive correlation with level of farm mechanization*

**Fig. : Exports - Imports of selected agriculture equipments (USD million)**





# Level of Farm Mechanization in India



Operation	Percentage
Soil working and seed bed preparation	40
Seeding and planting	29
Plant protection	34
Irrigation	37
Harvesting and threshing	60-70 percent for wheat and rice and <5percent for others

**Overall about 40-45%**

# Farm Mechanization: SWOT Analysis

## Strengths

- Large No. of manufacturers

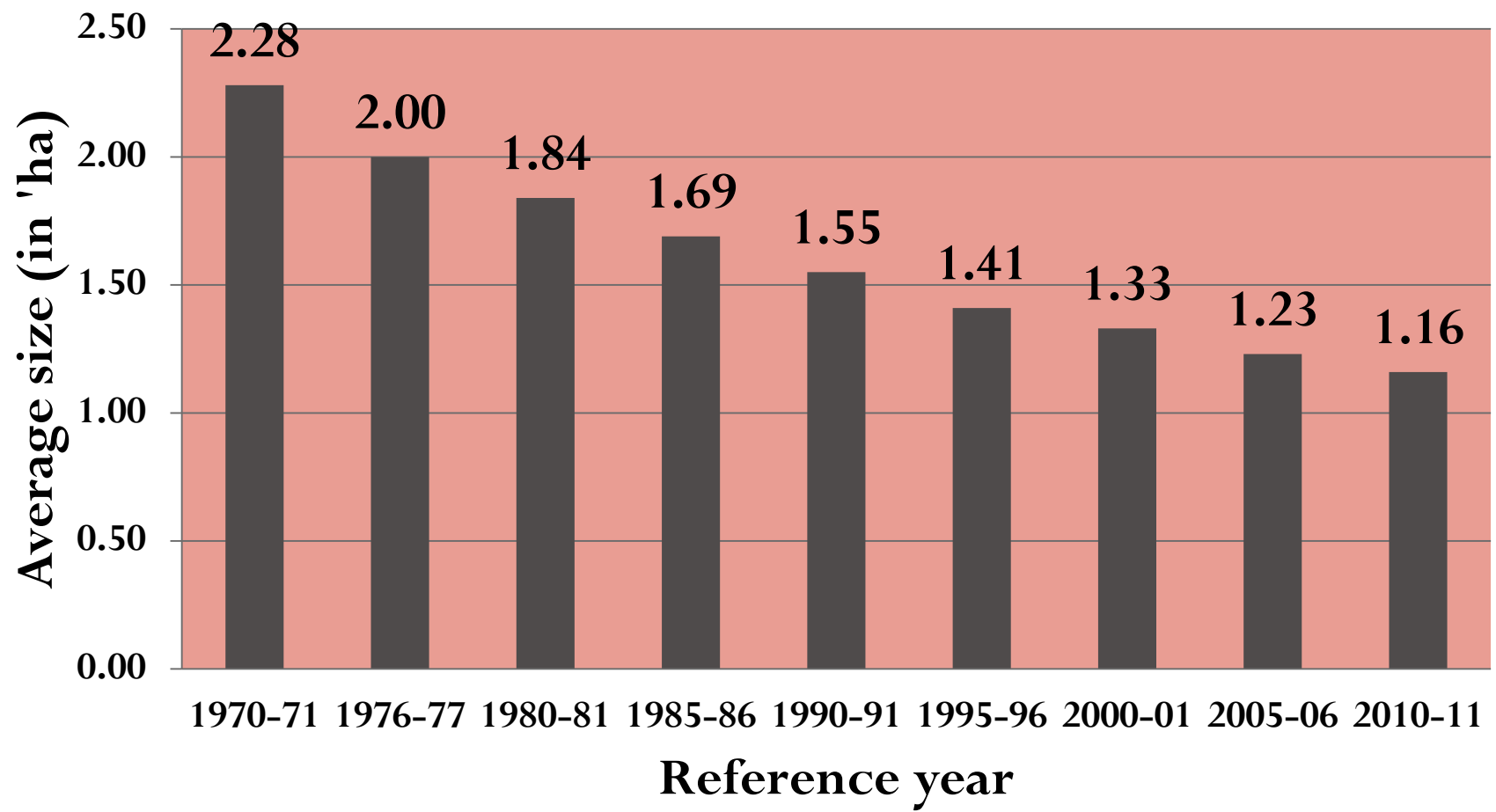
Equipment manufacturers	No. of units
• Agricultural tractors	13
• Power tillers	2
• Irrigation pumps	600
• Plant protection equipment	300
• Combine Harvester	48
• Reapers	60
• Threshers	6000
• Seed Drills and planters	2500
• Diesel oil engines	200
• Plough, cultivators, harrows	5000
• Chaff cutter	50
• Rural artisans (hand tools)	>1 million

Source: ICAR  
2011

- Testing Facility at : 4 FMTTIs , 30 designated centers and BIS labs
- Vast network of academic and R&D institutions including 100 centers for research, technology transfer and extension

# Average size of operational holdings

Source: Agriculture Census 2012.



# The Core Issues

- **Small/Medium Farmers** : Low credit worthiness
- Adverse '**Economies of Scale**';
- **Weak financial strength** of majority of farmers (SMF);
- **Lack of access to credit** to Rural Entrepreneurs for setting Custom Hiring Centre;
- **Need for promoting appropriate Farm Equipment**: Low cost, region and crop specific, indigenous technology

# Policy Framework : Addressing Issues

- Addressing adverse 'Economies of Scale'

- **Unbundling Agriculture** Services from Farmers;
- **Facilitate Entrepreneurs** to establish Custom Hiring Centre;

- Access to Credit

- Facilitating rural entrepreneurs

- Promotion of appropriate Farm Equipment: Low cost, region and crop specific, indigenous

- **Special incentives to Small and Marginal farmers**
- Focusing on **village level mechanization** : low cost, region –crop specific, **indigenous** technology

# Other Key Focus Area : Gender-friendly tools and equipment

- High women workforce in agriculture – both in production and processing
- Ergonomically designed tools and equipment for
- Reduced drudgery
- Enhanced safety & comfort



**SUB-MISSION**

**ON**

**AGRICULTURAL MECHANIZATION**

# Mission Objectives

- Increasing the reach of farm mechanization to small and marginal farmers and to the regions where availability of farm power is low;
- Promoting 'Custom Hiring Centres' to offset the adverse economies of scale arising due to small landholding and high cost of individual ownership;
- Creating hubs for hi-tech & high value farm equipments;
- Creating awareness among stakeholders through demonstration and capacity building activities;
- Ensuring performance testing and certification at designated testing centers located all over the country.



# Sub Mission on Agricultural Mechanization (SMAM) : Key Interventions

- 1. Promotion and Strengthening of Agricultural Mechanization through Training, Testing and Demonstration**
- 2. Demonstration, Training and Distribution of Post Harvest Technology and Management (PHTM)**
- 3. Financial Assistance for Procurement of Agriculture Machinery and Equipment**
- 4. Establish Farm Machinery Banks for Custom Hiring**
- 5. Establish Hi-Tech, High Productive Equipment Hub for Custom Hiring**
- 6. Promotion of Farm Mechanization in Selected Villages**
- 7. Financial Assistance for Promotion of Mechanized Operations/hectare Carried out Through Custom Hiring Centres**
- 8. Promotion of Farm Machinery and Equipment in North-Eastern Region:**

# Financial Assistance: Training

- Trainees sponsored by the state nodal agencies to the User Level Courses at the FMTTIs will be paid stipend @Rs. 500/- per week per trainee. Travel expenses to the trainees admitted in these courses will be paid on actual basis by ordinary mode of transport from their place of residence to the training institute and back.
- The training institutions will claim Rs 4000/- per person per week for the conduct of these courses. This includes:
  - stipend of Rs. 500/- per trainee per week
  - Actual to and fro travel expenses by ordinary mode of transport in ordinary class, upto maximum of Rs. 500/- per trainee
  - boarding and Lodging Charges @ Rs. 1500/- per trainee per week
  - Institutional charges (including stationary, training material, honorarium) @ Rs. 1500/-per trainee per week

# Capacity Building

# Location of FMTTI'S



**Northern Region Farm Machinery Training and Testing Institute Hissar,**

**1963**

**North-Eastern Region Farm Machinery Training and Testing Institute, Biswanath-Chariali 1990**

**Central Farm Machinery Training and Testing Institute Budni 1956**

**Southern Region Farm Machinery Training and Testing Institute, Garladinne, Anantpur 1983**

# Demonstration

- Field demonstrations of package of machines/equipments will be conducted on cropping systems based approach in the districts identified for AAP.

**Financial Assistance:** Demonstrations will be organized by ICAR, PSUs of GOI and State Government's organizations. Government of India will provide 100% assistance for contingency expenditure per demonstration, as per following norms:

<b>Power operated/self-propelled equipment</b>	<b>Rs. 4000/- per hectare</b>	<b>For hilly areas, cost per demonstration will be 1.5 times of said cost.</b>
Animal drawn equipment	Rs. 2000/-per hectare	
Manually operated equipment	Rs. 1500/-per hectare	

# Establishment of post harvest technology

- The units utilizing the available post harvest technologies and management, value addition, scientific storage, packaging technologies and technologies for bi-product management .

Technical guidance on the available post harvest technologies will be provided by CIPHET Ludhiana and also by other ICAR/CSIR/SAU centers.

**Financial assistance:** PHT units shall be established in the production catchments with 50% assistance from the Government of India limited to Rs. 1.25 lakhs per machine/technology. (Additional 10 % assistance limited to Rs. 1.50 lakhs will be available for SC, ST, small & marginal farmers, women, and NE States beneficiary). Remaining cost will be borne by beneficiary.

# Financial Assistance for Procurement of Agriculture Machinery and Equipment

- Ranges 25% to 50% subsidy per machine
- 10% more subsidy to SC/ST/Women/Small & Marginal farmers/ NER states beneficiery

# Farm Machinery Banks for Custom Hiring

S.N	ITEM	MAXIMUM PERMISSIBLE PROJECT COST	PATTERN OF ASSISTANCE
<b>A</b>	Procurement subsidy for establishment of Custom Hiring Centre upto 10 lakh	<b>Project based</b> Rs. 4.0 lakh	40%
<b>B</b>	Procurement subsidy for establishment of Custom Hiring Centre upto 25 lakh	<b>Project based</b> Rs. 10.0 lakh	40%
<b>C</b>	Procurement subsidy for establishment of Custom Hiring Centre upto 40 lakh	<b>Project based</b> Rs. 16.0 lakh	40%
<b>D</b>	Procurement subsidy for establishment of Custom Hiring Centre upto 60 lakh	<b>Project based</b> Rs. 24.0 lakh	40%

# Hi-Tech, High Productive Equipment Hub for Custom Hiring: Financial Assistance

S.N	ITEM	MAXIMUM PERMISSIBLE PROJECT COST	PATTERN OF ASSISTANCE
<b>A</b>	Procurement subsidy for establishment of Custom Hiring Centre upto 100 lakh	<b>Project based</b> Rs. 40.0 lakh	40%
<b>B</b>	Procurement subsidy for establishment of Custom Hiring Centre upto 150 lakh	<b>Project based</b> Rs. 60.0 lakh	40%
<b>C</b>	Procurement subsidy for establishment of Custom Hiring Centre upto 200 lakh	<b>Project based</b> Rs. 80.0 lakh	40%
<b>D</b>	Procurement subsidy for establishment of Custom Hiring Centre upto 250 lakh	<b>Project based</b> Rs. 100.0 lakh	40%



# Promotion of farm mechanisation in selected villages

- **Objectives:**

To establish farm machinery banks by the Cooperative Societies of farmers, Self Help Group of Farmers etc. in the selected villages of low mechanized states so as to encourage members to take up appropriate mechanized operations

To conduct demonstrations through Custom Hiring Centres in large areas with the assistance of Custom Hiring Centres set up under component (4).

- **Financial Assistance:** Each village will be eligible for setting up of farm machinery banks upto a maximum project cost of Rs. 10 lakhs. Financial assistance @ 80% of the project cost will be provided for such machinery banks.

## Assistance for Mechanized operations.

**Financial Assistance:** Financial assistance will be available to the beneficiaries upto a maximum of 1 ha area as per following norms:

For tractor/power operated operations – 50% of the cost of operation /ha limited to Rs. 2000/ha per farmer per year

For animal drawn mechanized operations- 50% of the cost of operation /ha limited to Rs. 1000/ha per farmer per year

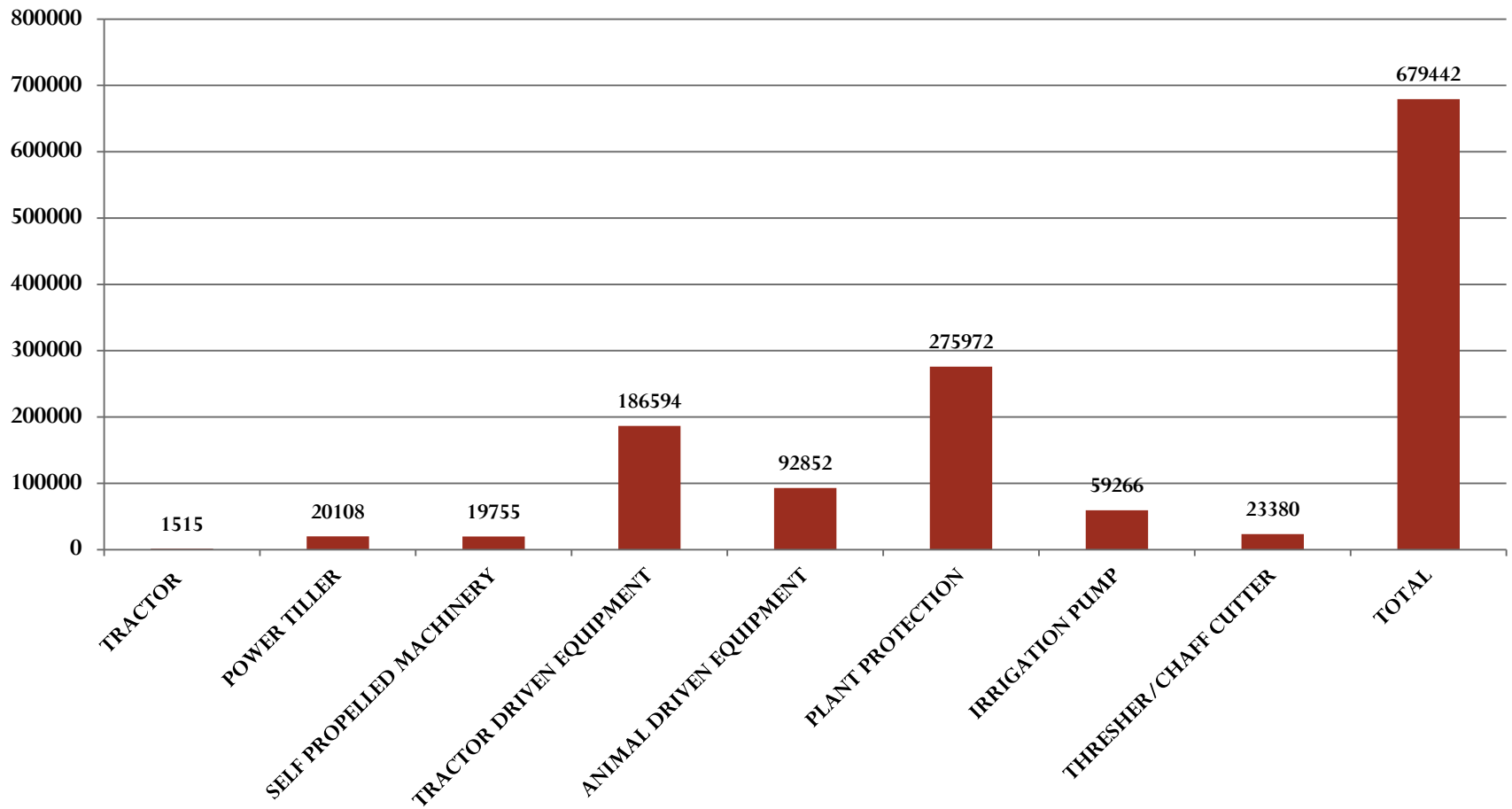
For manual operations –50% of the cost of operation /ha limited to Rs. 750/ha per farmer per year

# Promotion of farm machinery and equipment in North-Eastern States

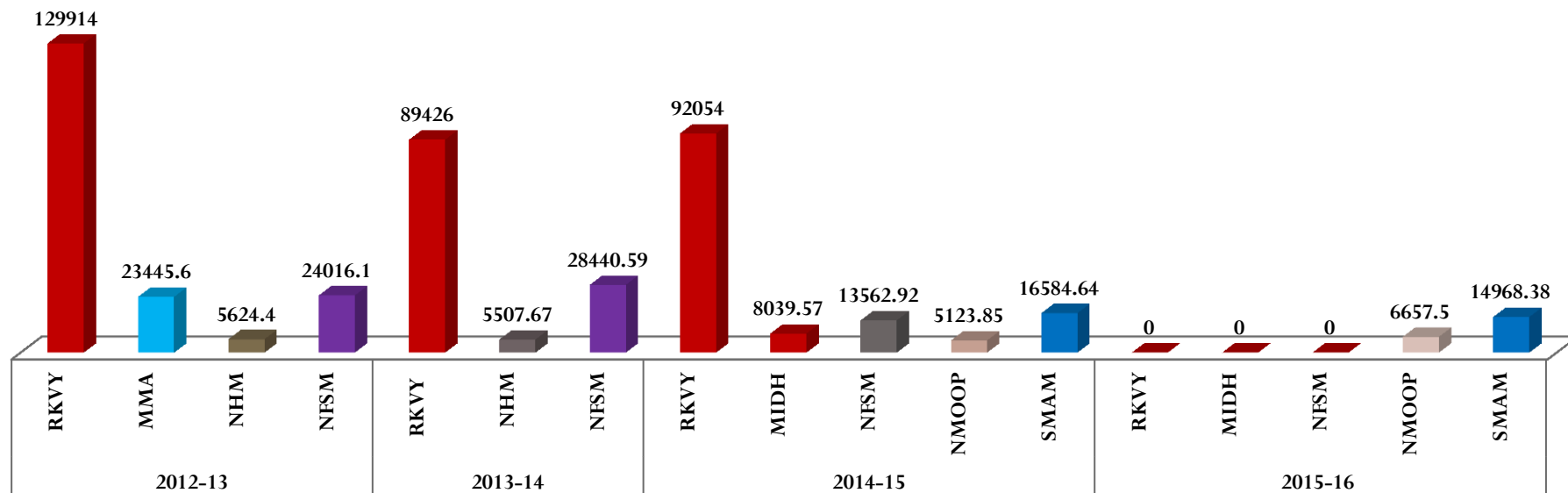
## Financial Assistance

<b>ITEM</b>	<b>MAXIMUM PERMISSIBLE PROJECT COST</b>	<b>PATTERN OF ASSISTANCE</b>
(a) Financial assistance for procurement of machinery/ implements	Upto Rs.1.25 lakhs per beneficiary	100% of cost of machinery/implement /equipment
(b) Financial assistance for Farm Machinery Banks for group of farmers	Upto Rs.10 lakhs per Farm Machinery Bank	95% of cost of Farm Machinery Banks

# Distribution of Agricultural Machinery and Tools-(2014-15)



**Fig : Details of fund released to the state Government during the last three years and the current years for Farm Mechanisation (Rs in Lakhs)**



**RKVY**- Rastriya krishi Vikas yojna

**MMA**-Micro management in Agriculture

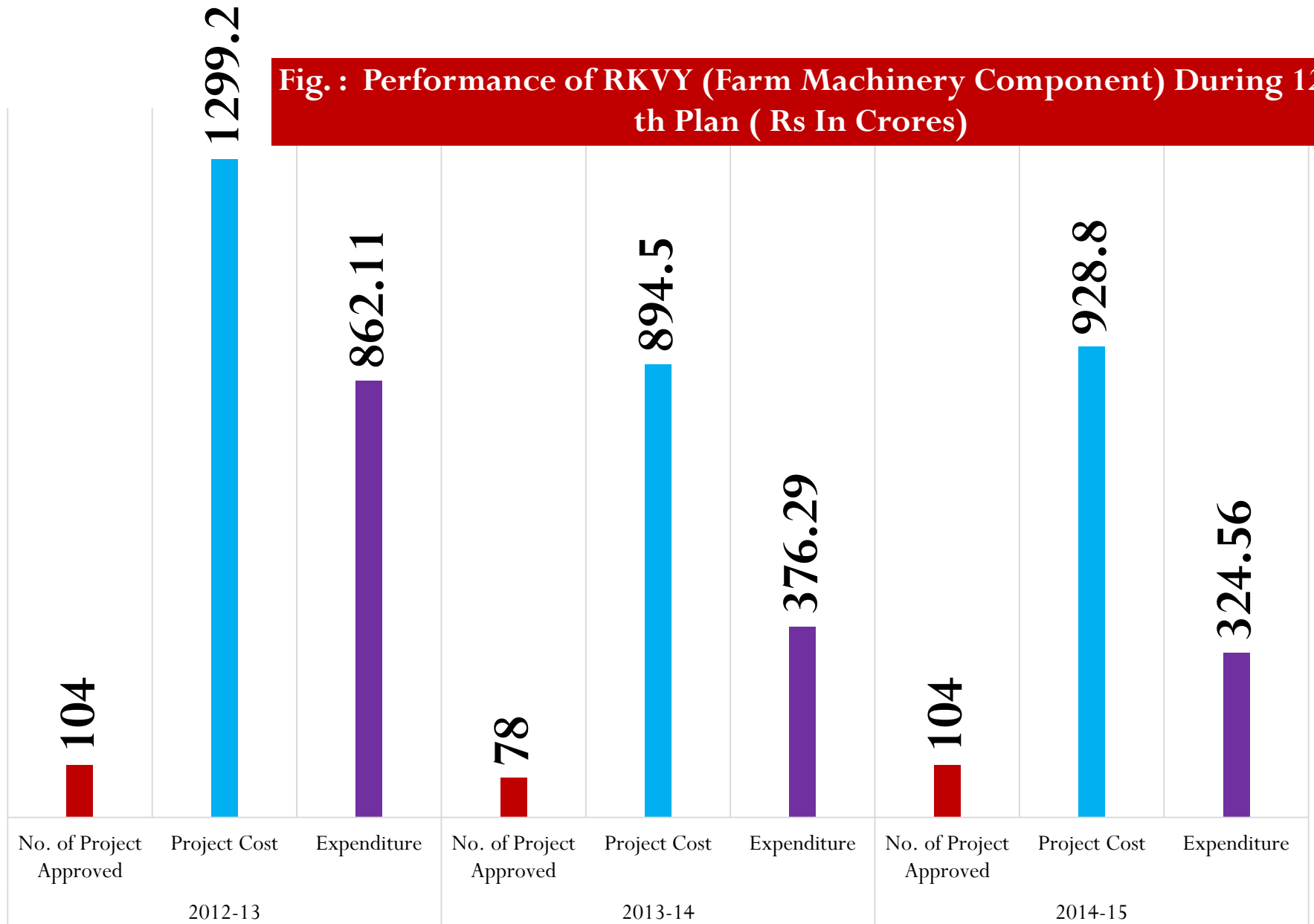
**NHM** National horticulture Mission

**NMOOP**- National Mission on oil seed and oil palm

**NFSM**- National food security Mission

**SMAM**- Sub mission on Agricultural mechanisation

**Fig. : Performance of RKVY (Farm Machinery Component) During 12<sup>th</sup> Plan ( Rs In Crores)**



- The total investment in Farm Mechanization sector through the various Schemes of Government of India is about Rs. 1354 crores during 2014-15 which needs to be enhanced to Rs. 13000 crores per annum by supplementing through State plan or other sources like Rural Infrastructure Development Fund (RIDF) etc. to achieve the target of farm power availability of 2kW/ha by 2017 which is presently about 1.73kW/ha.

Thanks

