

# Farm Mechanization in India



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# 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

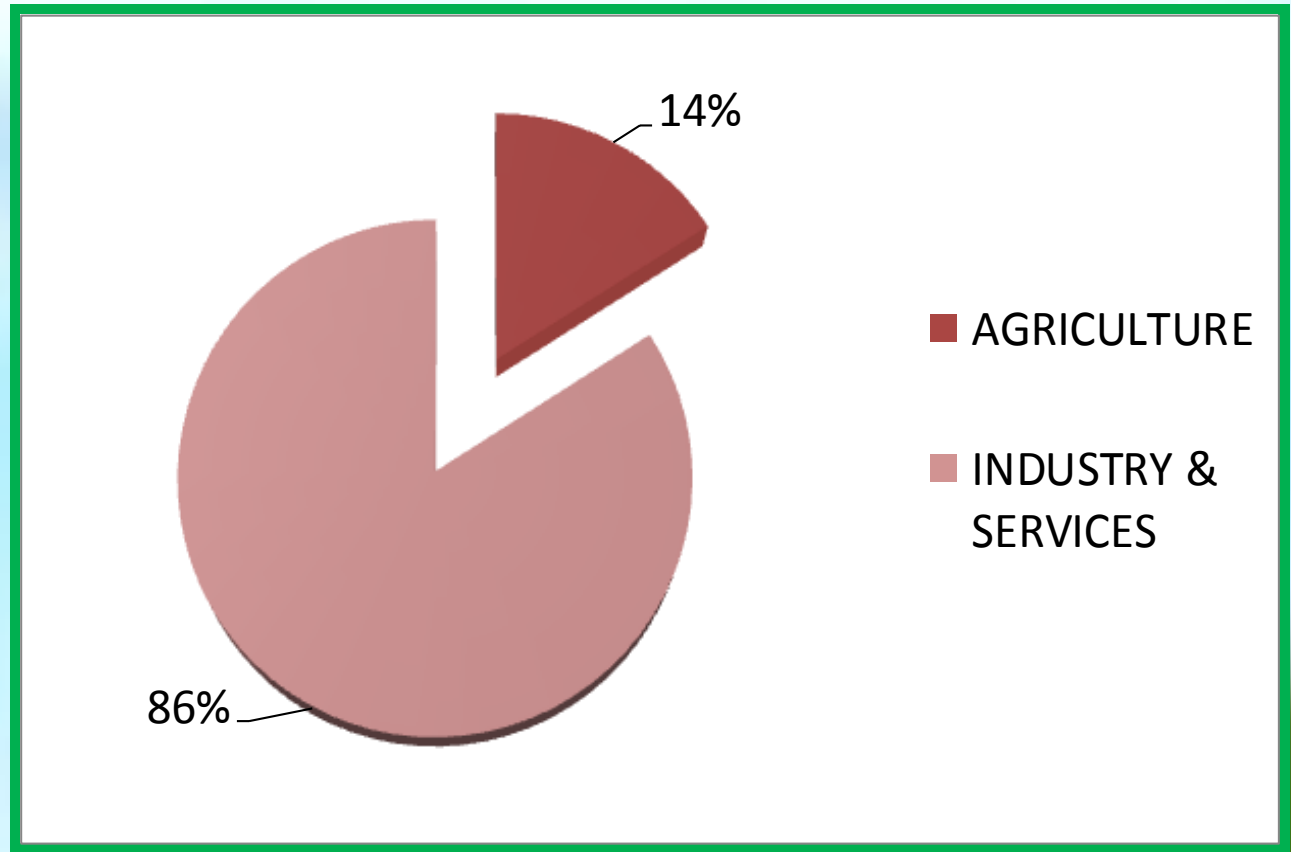
Agriculture accounts for 80% of water needs;  
60% from ground water.

52% workers in Agriculture: 14% of GDP;

# INDIAN AGRICULTURE



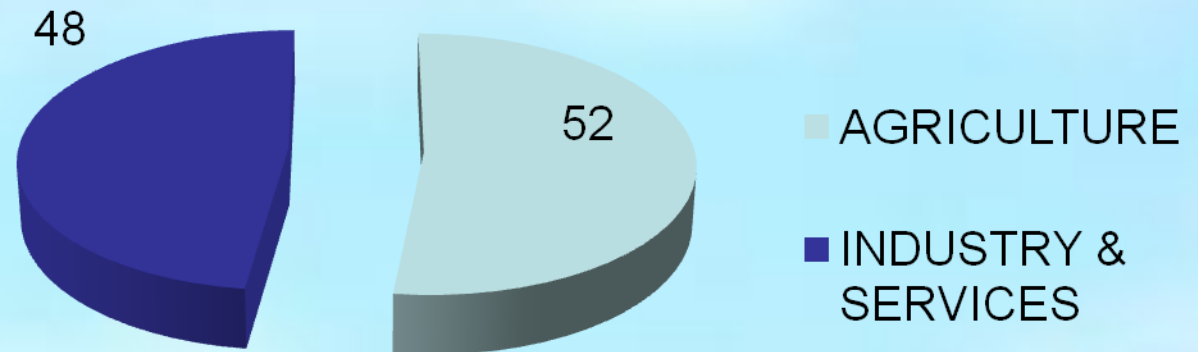
## CONTRIBUTION TO GDP



# INDIAN AGRICULTURE



## LABOUR FORCE BY OCCUPATION ( 478.3 MILLION)

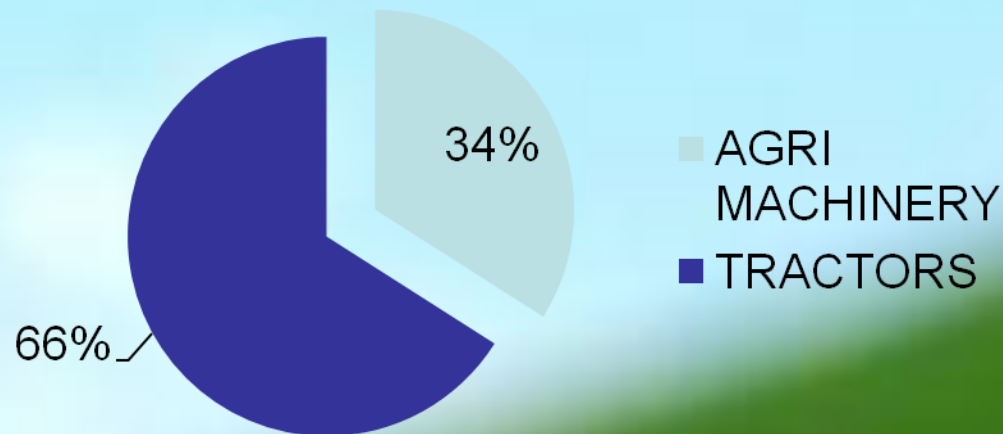


# INDIAN AGRICULTURAL MACHINERY INDUSTRY



250 Medium to Large Scale Units  
2,500 Small Scale Industries  
15,000 Tiny Industries  
1,00,000 Village level Artisans

32,000 Crore Industry, CAGR growth 5%



# INDIAN AGRICULTURE MACHINERY INDUSTRY OPPORTUNITIES

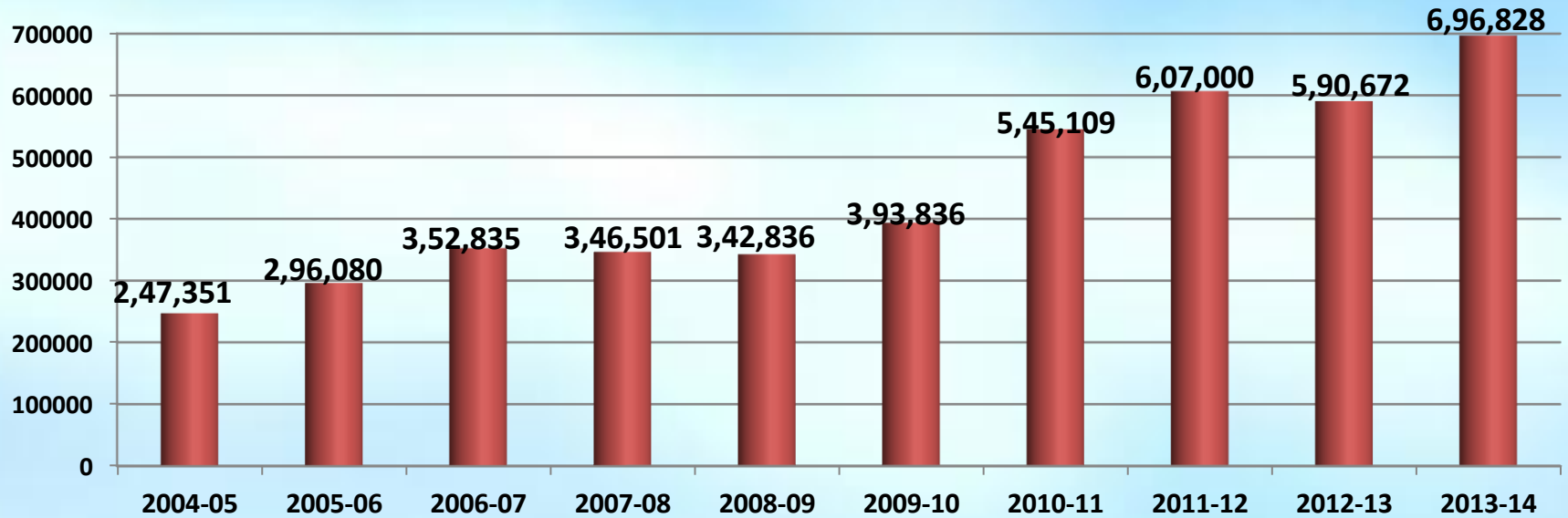


1. FAVOURABLE GOVERNMENT INCENTIVE POLICIES.
2. INCREASED PRODUCTION AND SALES OF TRACTORS.

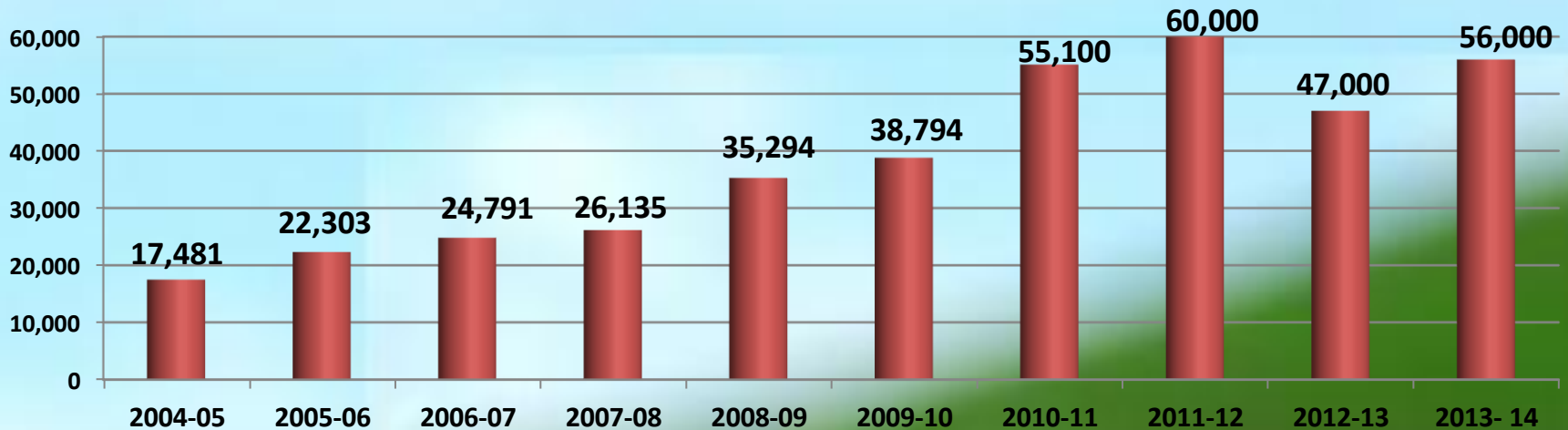
# Sales of Tractors and Power Tillers in India



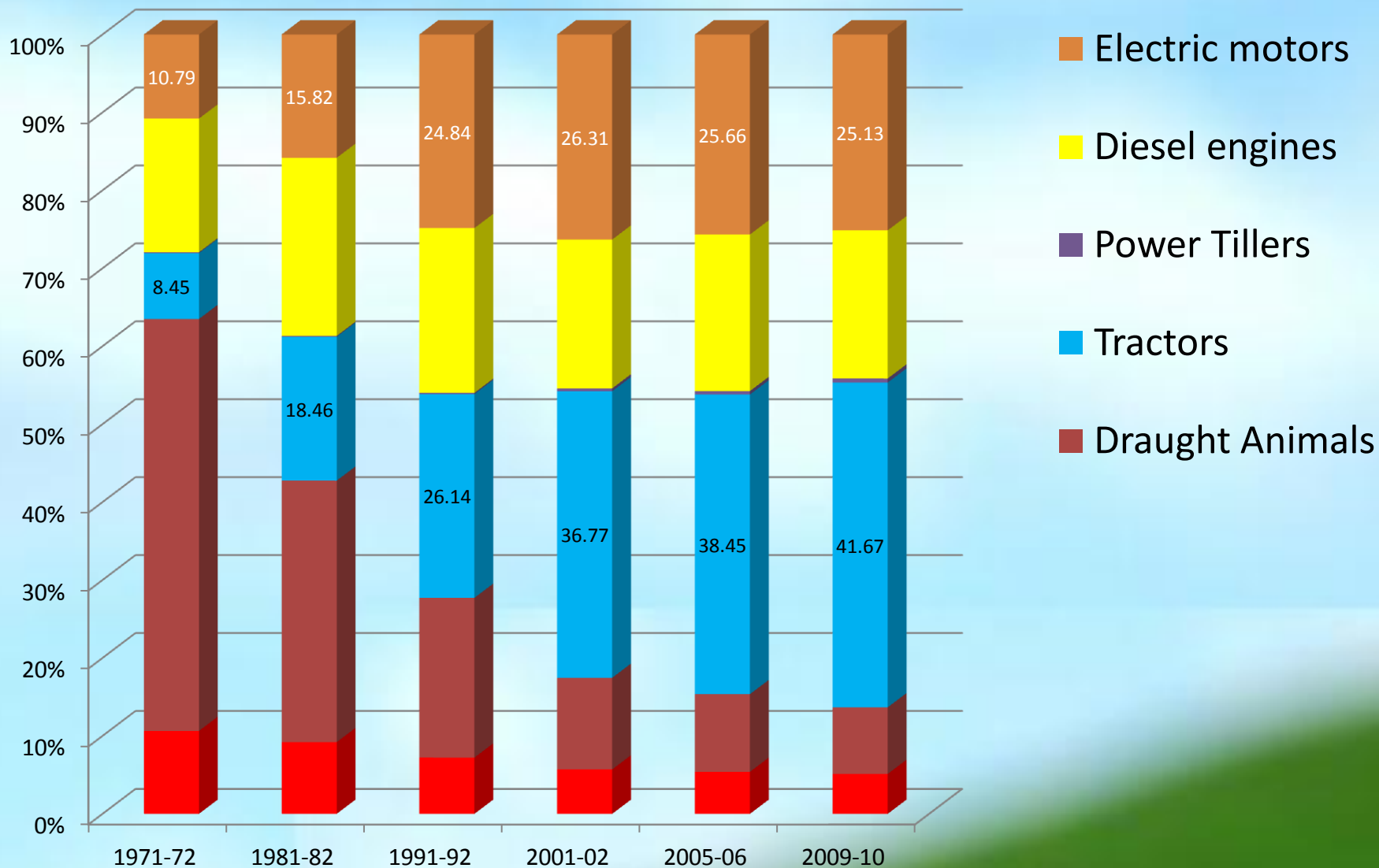
## Sale of Tractors



## Sale of Power Tillers



# Trend of power availability from different sources





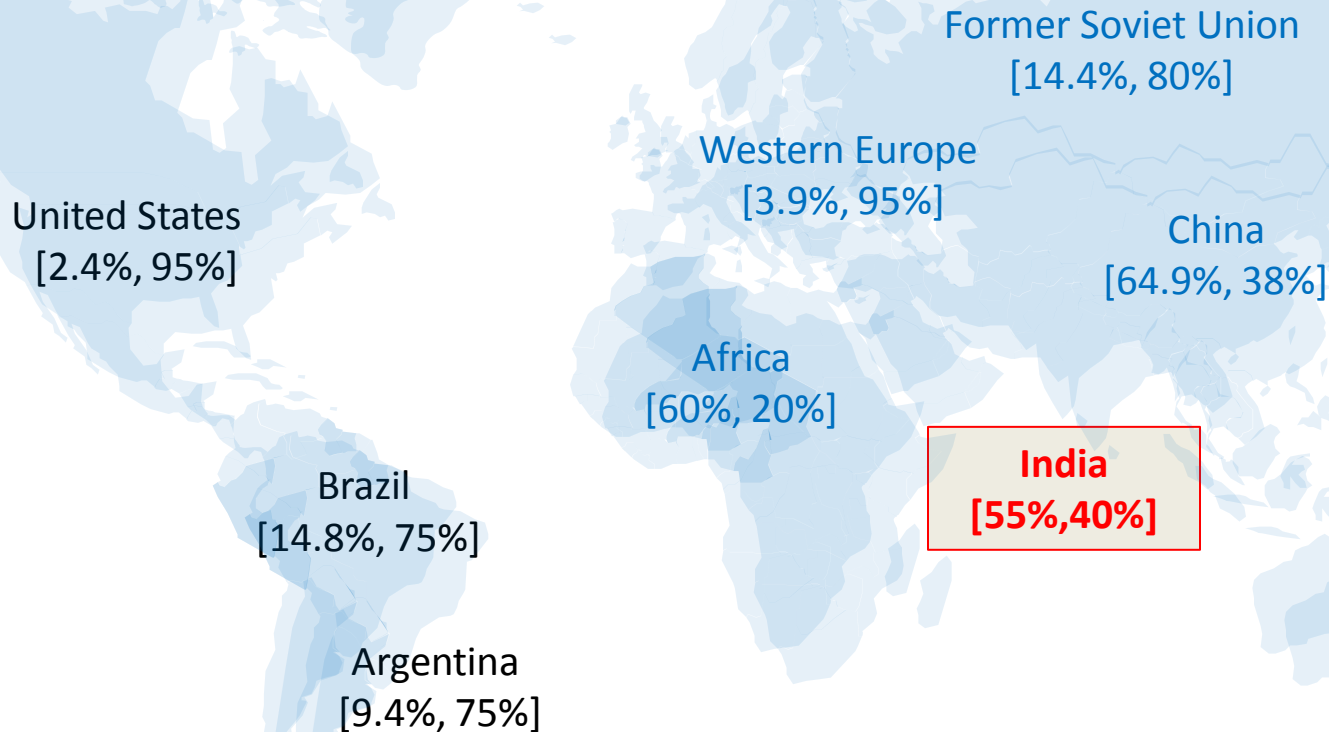


## Comparison of Mechanization with Other Countries

Sl. No.	Country	Farm Power (kW/Ha)	No. of Tractors per 1000 Ha.	No. of Combine Harvesters per 1000 Ha.
1	India*	2.02	37	0.026
2	Japan	8.75	461.22	236.98
3	U.K.	2.50	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

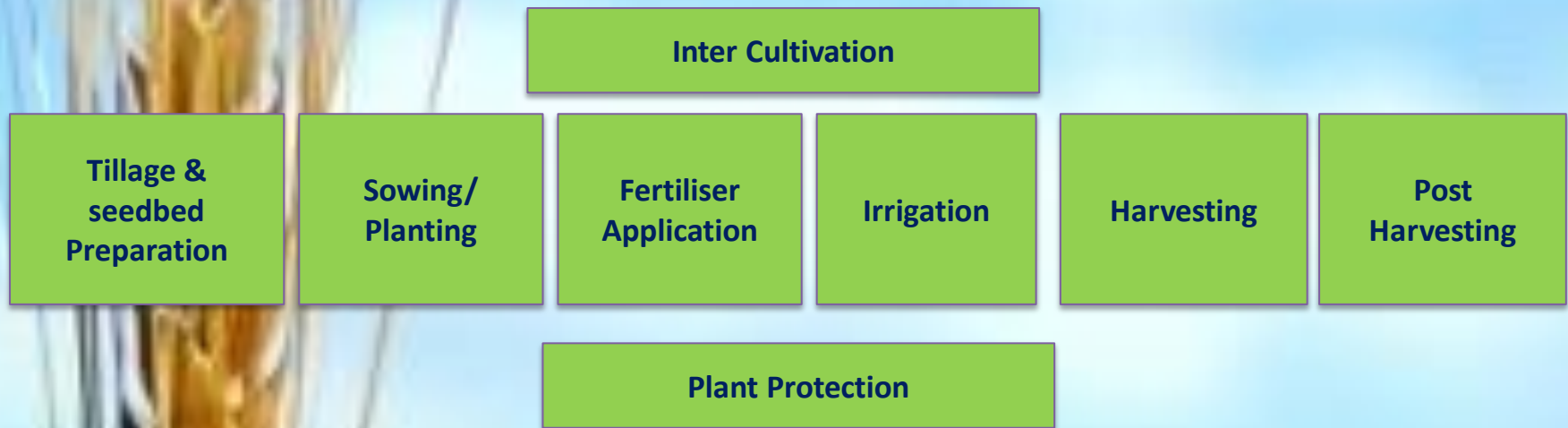
**Source: FAO Yearbook 2003**

# 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

# 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

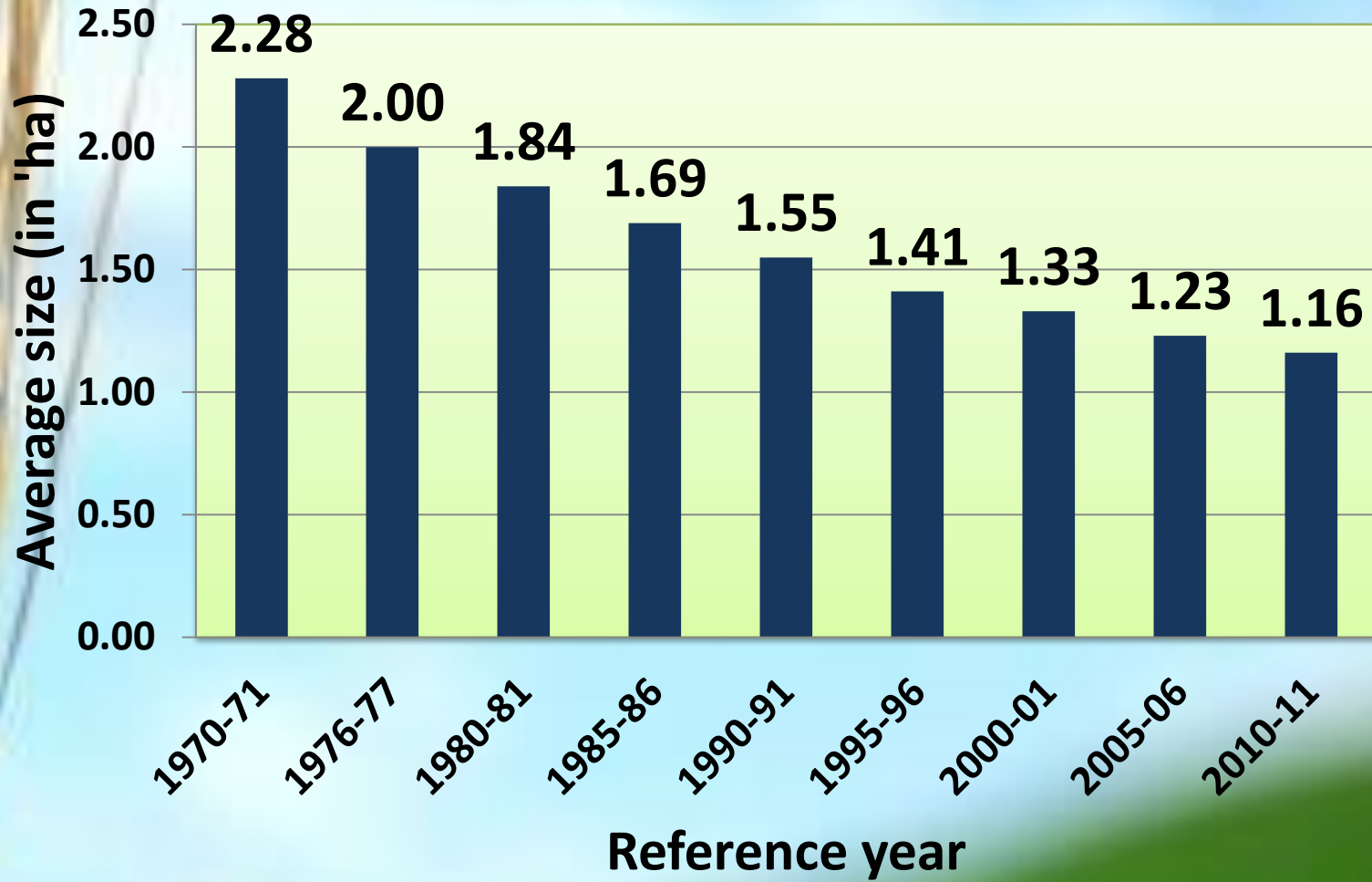
- **Manufacturing Units**

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

- **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.





# Policy Framework : Addressing Issues

- Addressing adverse 'Economies of Scale'
- Access to Credit
- Promotion of appropriate Farm Equipment: Low cost, region and crop specific, indigenous
- **Unbundling Agriculture Services from Farmers;**
- **Facilitate Entrepreneurs** to establish Custom Hiring Centre;
  - Facilitating rural entrepreneurs
- **Special incentives to Small and Marginal farmers**
- Focusing on **village level mechanization : low cost, region –crop specific, indigenous technology**

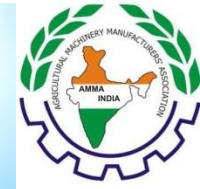
## Other Key Focus Area : Gender-friendly tools and equipment

### ROLE OF WOMEN IN INCREASING AGRICULTURAL OUTPUT (KG/HA)

According to a study, had the women enjoyed the same access to productive resources as men, women could boost yield by 20-30 per cent; raising the overall agricultural output in developing countries by two and a half to four per cent.

This gain in production could lessen the number of hungry people in the world by 12-17 per cent, besides increasing women's income (FAO, 2011).

# POLICY SUPPORT FOR INCREASING PARTICIPATION OF WOMEN IN INDIAN AGRICULTURE



Policy	Steps to increase participation of women in Agriculture
National Horticulture Mission	Women are being organized into Self Help Groups and input, technological and extension support etc. is being provided to make them self reliant.
National Bamboo Mission	30% of the budget allocations are earmarked for Women beneficiaries/farmers.
Macro Management for Agriculture' (MMA)	33% of the allocation has to be made for small, marginal and women farmers.
National Programme for Organic Farming' (NPOF)	25 % seats have been reserved for training of women farmers in organic farming.
Strengthening and Modernization of Pest Management Approach in India	subsidy on total cost of equipment to the tune of 50% is being provided to women organizations for opening mass production units of bio-control agents



# Female labour-use per ha by crop and operation in major crops

## Indian Agriculture



	Land preparation		Sowing		Interculture		Harvesting		All operations	
	F	TL	F	TL	F	TL	F	TL	F	TL
<b>Paddy</b>	0	16	24	33	22	29	27	50	74	137
<b>Cotton</b>	1	19	4	9	32	43	45	48	83	138
<b>Chillies</b>	1	21	17	21	24	31	34	47	77	136
<b>Groundnut</b>	0	14	5	8	16	25	26	44	48	95
<b>Sugarcane</b>	0	18	15	34	13	51	11	86	38	205

Source: Sharma and Prakash: Causes and Consequences of supply-demand gap for labour in Sugarcane

# INNOVATIONS IN FARM MACHINERY FOR INDIAN WOMEN



S no	Crop	Women friendly farm machinery
1	Maize	Hand operated maize dehusker-cum-sheller Gender-friendly on-farm model capable of dehusking and shelling maize cobs
2	Flowers	Finger guard for plucking flowers Fruit harvester
3	Paddy	Direct paddy seeder, Paddle operated paddy thresher, Two row and four row Rice planter
4	Sugarcane	Sugarcane stripper
5	Groundnut	Groundnut stripper
6	Cotton	Cotton stalk puller

# Contribution of women farm workers in Agriculture: World and India



	Women workers in agriculture
<b>World</b>	42%
<b>Latin America</b>	40%
<b>Thailand</b>	44%
<b>Vietnam</b>	61%
<b>India</b>	60%
<b>Sub Saharan Africa</b>	80%



# WORLD AGRICULTURE

## Employment of women in selected high-value agro-industries

Country	Commodity	Number of employees in this agro industry	Share of Female employees
Kenya	Flower	40,000-70,000	75%
Uganda	Flower	3300	75%
Zambia	Vegetables	7500	65%
South Africa	Deciduous fruits	283,000	53%
Mexico	Vegetables	950,000	90%
Chile	Fruits	300,000	46%

*Source. For Africa: Maertens and Swinnen (2009: Table 1), based on several sources. For South America: Deere (2005: Appendix II), based on several sources.*



# Way Forward

1. Development of drudgery reducing options for decreasing the workload and increasing the efficiency of women
2. Assess application of gender related technologies.
3. Dissemination(extension) of women friendly technologies



# **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 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 beneficiary

# Agricultural Machinery Manufacturers' Association (AMMA – India)



Association is ready to offer all kinds of co-operation to promote the agricultural mechanization all over India.

## Other Associations in the India

- **Tractor Manufacturers' Associations (TMA)**
- **Power Tiller Manufacturer's Associations (PTMA)**
- **All India Combine Manufacturers' Associations (AICMA)**
- **Pump Manufacturer's Association (PMA)**

# **Agricultural Machinery Manufacturers' Association (AMMA – India)**



***Our association is committed to the growth of Indian Agricultural Machinery Industry in such a way that it is able to assist the farmers in achieving sustainability and profitability through appropriate farm mechanization '***



**THANK YOU**