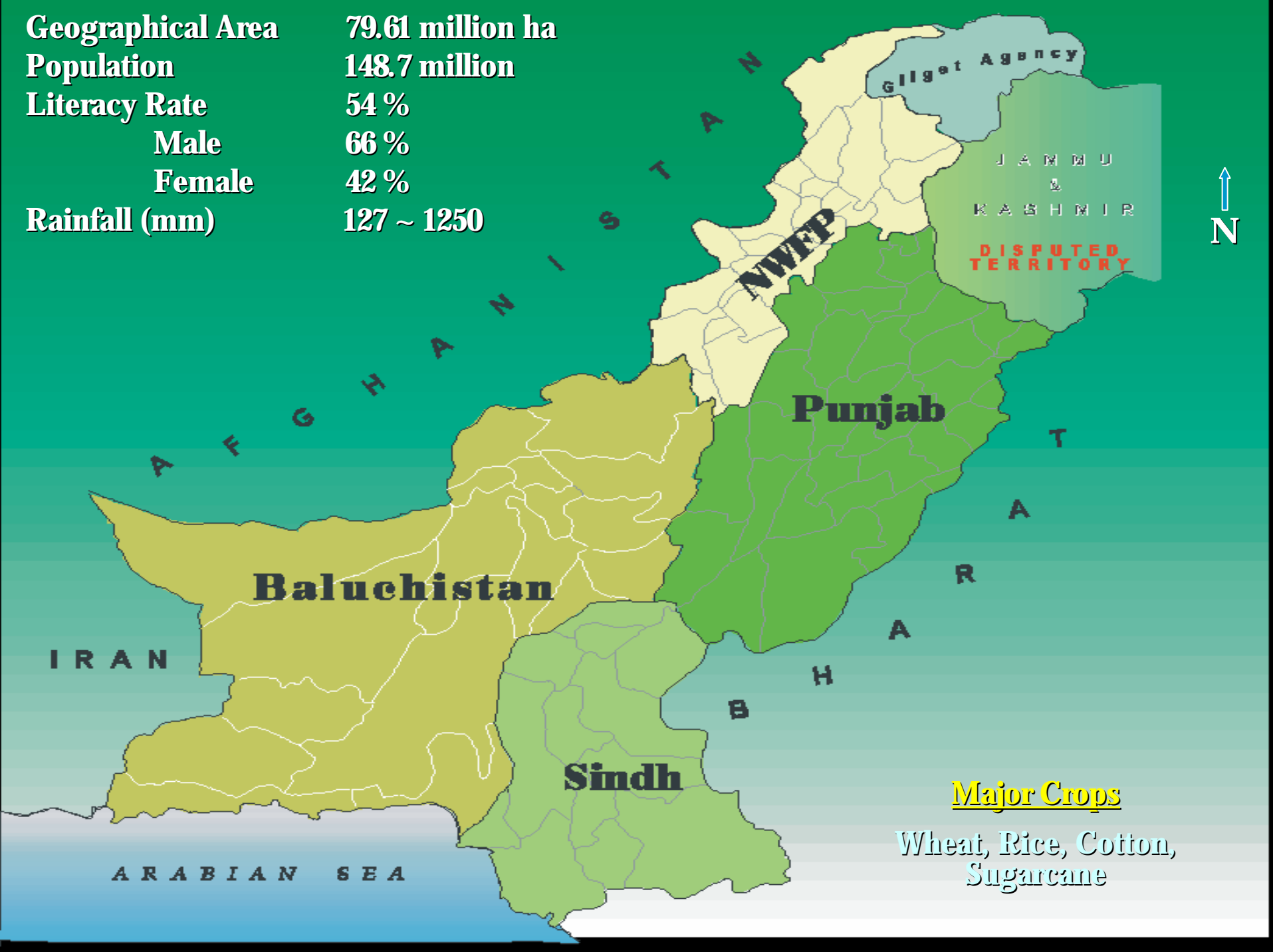


# **Country Report: Pakistan**

- **Overview**
- **National Perspective**
- **Development Focus**

<b>Geographical Area</b>	<b>79.61 million ha</b>
<b>Population</b>	<b>148.7 million</b>
<b>Literacy Rate</b>	<b>54 %</b>
<b>Male</b>	<b>66 %</b>
<b>Female</b>	<b>42 %</b>
<b>Rainfall (mm)</b>	<b>127 ~ 1250</b>



**Major Crops**

Wheat, Rice, Cotton,  
Sugarcane

# Agriculture in National Economy

- **Gross Domestic Product**      **23 %**
- **Employment**      **42 %**
- **Export Earnings of Raw  
& Processed Products**      **70 %**
- **Industrial Production**      **51 %**



# Agricultural Mechanization

## Aims at

- Increasing productivity of land and labor
- Bringing in more area under cultivation
- Conserving energy and resources
- Sustaining agricultural production
- Improving operators' comfort and safety
- Protecting environment
- Increasing farm profits



# Agricultural Mechanization

## National Perspective

- Practicing selective mechanization
- Mechanized operation for which there was shortage of labor, power or both
- Popular forms of mechanization are:
  - **Bulldozers**
  - **Power rigs**
  - **Tube wells**
  - **Tractors with cultivator, wheat thresher and trailer**



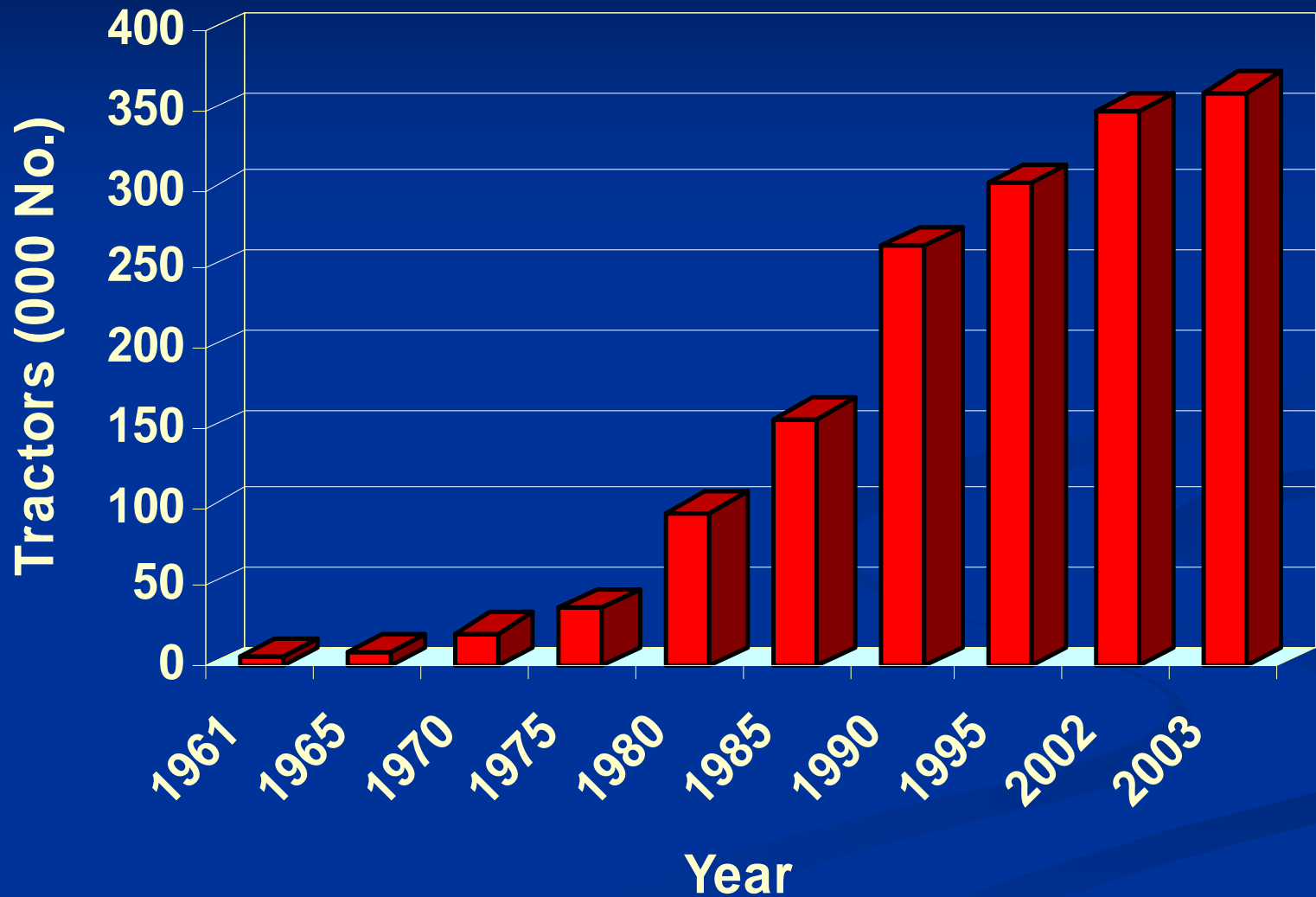
# Agricultural Machinery Used in Pakistan

Machinery	1968	1975	1984	1994	2010
Tractor	18,909	35,714	157,310	252,861	4,96,000
Cultivator	14,338	31,619	146,863	236,272 (93)	4,71,200 (95)
Mould Board Plough	2,335	2,734	7,319	28,413 (11)	99,200 (20)
Disc Plough	2,513	2,938	6,355	20,372 (8)	64,400 (15)
Blade	3,925	4,200	69,004	164,489 (65)	3,74,200 (70)
Chisel Plough	-	-	712	6,535 (3)	24,800 (5)
Rotavator	-	-	2,101	5,594 (2)	24,800 (5)
Bar/Disc Harrow	2,007	2,373	8,140	12,233 (5)	49,600 (10)
Ridger	-	120	4,711	10,984 (4)	49,600 (10)
Grain Drill	563	1,174	11,251	64,126(25)	2,48,000 (50)
Sprayer	-	-	-	20,778 (8)	49,600 (10)
Trailer	-	18,074	98,787	176,412(70)	2,48,000 (50)
Wheat Thresher	-	5,635	78,377	112,707(45)	1,24,000 (25)
Reaper	-	-	-	7,972 (3)	24,800 (5)
Combine Harvester (Wheat & Paddy)	-	-	-	859	6000

*Values in parentheses are the machine population as percent of tractor population*



# Tractor Population



# Agricultural Machinery Manufacturing

## TRACTORS

- Massey Ferguson MF-240 & MF-265/375
- Fiat Fiat-480,640 & TD95S
- Belarus MTZ-50 & UMZ-6AKM
- Ford 3600 & 4600
- IMT 540 & 560



# Agricultural Machinery Manufacturing

## TRACTORS – Deletion Achieved

### Massey Ferguson

50-60 hp tractors 87%

70-85 hp tractors 60%

### Fiat

50-65 hp tractors 85%

### Belarus

50 hp tractors 68%



# Farm Power Available

Power Source	Numbers	kW/Unit	Power Available (Million kW)	Share of Each Source (%)
Agriculture labor Force (million)	27.7	0.075	2.08	13.1
Work Animal (million)	4.45	0.40	1.78	11.2
Tractor Population				
• Medium size tractor (37 kW) - 80% of total population	240,000	37	8.88	56.2
• Large size tractor (51 kW) - 20% of total population	60,00	51	3.06	19.3
<b>Total Power (kW)</b>			<b>15.80</b>	
<b>Total cultivated area (million ha)</b>			<b>22.13</b>	
<b>Power available (kW/ha)</b>			<b>0.71</b>	



# Farm Power Projected (2010)

Power Source	Numbers	kW/Unit	Power Available (Million kW)	Share of Each Source (%)
Agriculture labor Force (million)	34.8	0.075	2.61	10.9
Work Animal (million)	3.78	0.40	1.51	6.3
Tractor Population				
• Medium size tractor (37 kW) - 80% of total population	396,800	37	14.60	61.5
• Large size tractor (51 kW) - 20% of total population	99,200	51	5.06	21.2
<b>Total Power (kW)</b>			<b>23.86</b>	
<b>Total cultivated area (million ha)</b>			<b>24.8</b>	
<b>Power available (kW/ha)</b>			<b>0.96</b>	



# Mechanization Organizations

## ➤ R & D Institutions

- Farm Machinery Institute (FMI)
- Agricultural Mechanization Research Institute (AMRI)
- Agricultural Mechanization Research Cell (AMRC)
- Centre For Agricultural Machinery Industry (CAMI)

## ➤ Universities

- University of Agriculture, Faisalabad
- University of Agriculture, Tandojam
- University of Engineering, Peshawer

## ➤ Others

- MINFAL, PDAE, ZTBL, APTMA, PAMIMA

# FARM MACHINERY INSTITUTE

**Farm Mechanization**  
*for*  
**Self-reliance & Quality Living**



# Mission

**Contribute to**

- food security
- poverty reduction
- environment protection

**by fostering** sustainable enhancement in productivity of agricultural production resources

**through farm machinery**

- Development/adaptation
- testing & standardization
  - commercialization



# Financial Impact of FMI Technologies

Rs. in Million

Year	Reaper	Groundnut Digger	Groundnut Thresher	Planter	Zero-Till Drill	Sunflower Thresher	Total	Budget
1985	12.86	0.92	-				13.87	3.382
1986	27.48	1.29	-				28.77	3.500
1987	62.00	2.48	-				64.68	2.810
1988	117.01	4.13	0.87				122.01	2.862
1989	146.26	4.88	1.53				152.67	3.050
1990	197.94	9.14	2.45				209.53	3.243
1991	212.47	11.86	3.14				227.47	2.850
1992	234.98	11.82	6.21				252.92	2.890
1993	281.38	18.48	15.29				315.15	3.300
1994	327.01	21.45	17.90				366.36	3.356
1995	542.51	25.74	24.32	1.84	6.88	3.15	604.43	3.490
1996	613.56	37.89	35.89	1.98	7.55	9.45	706.62	5.393
1997	708.38	49.23	64.29	2.38	16.00	9.20	849.48	4.809
1998	959.23	47.43	62.63	2.33	93.71	8.87	1174.20	5.292
1999	985.28	59.29	75.15	3.73	149.94	8.87	1282.26	5.452
2000	1196.2	71.02	87.68	4.40	196.60	8.87	1564.68	5.988
2001	1298.26	81.50	98.74	5.46	240.60	8.71	1733.28	5.713
2002	1431.71	80.45	110.41	6.50	287.01	8.62	1924.69	5.738
2003	1633.86	94.69	111.76	8.86	315.34	8.80	2178.41	8.682
Total	10988.81	633.72	718.25	37.48	1313.02	74.52	13770.90	81.800

# **Mechanization Research**

➤ **Development Focus**

# RICE THRESHING

(SINDH & BALOCHISTAN)

## ISSUES

- **Inefficient threshing practices**
- **Delayed threshing**
- **High grain losses**
- **Poor grain quality**



# RICE THRESHER



## TECHNOLOGY HIGHLIGHTS

- Output capacity : 1.5 t/h
- Operating cost : US\$ 3.2/t
- Economic benefit : US\$ 3.5/t
- Potential areas : Rice growing areas of Sindh & Balochistan

# FATE OF WHEAT STRAW



## ISSUES

- Environmental pollution
- Wheat straw collection
- Straw losses
- Fire hazards

# WHEAT STRAW CHOPPER



## TECHNOLOGY HIGHLIGHTS

- Field capacity : 0.3 ha/h
- Operating cost : US\$ 21.6/ha
- Economic benefit : US\$ 29.8/ha
- Potential areas : Wheat growing areas  
of the country



## ISSUES

- Delayed wheat sowing
- Irrigation water scarcity
- Escalating input cost
- Soil resources degradation
- Environmental pollution





## TECHNOLOGY HIGHLIGHT

- **Field capacity** : 0.40 ha/h
- **Operating cost** : U.S \$. 11.9/ha
- **Savings** : U.S \$. 69.9/ha
- **Potential areas** : Rice-Wheat & Cotton-Wheat areas

# FMI SEEDER



# FERTILIZER BAND-PLACEMENT WHEAT DRILL



## ISSUES

- In-efficient use of fertilizer (phosphorus)
- Improper placement of fertilizer
- WTO preparedness (reduced input cost)

# FMI FERTILIZER BAND-PLACEMENT WHEAT DRILL



## TECHNOLOGY HIGHLIGHTS

- **Field capacity : 0.5 ha/h**
- **Operating cost : U.S \$. 7.9/ha**
- **Savings : U.S \$. 54.2/ha**
- **Potential areas : Rain-fed & Cotton-Wheat areas**

# SEED PROCESSING PRACTICES



## ISSUES

- Low crops productivity
- Non-availability of quality seeds
- In-efficient traditional practices
- Non-availability of processing machinery



# FMI MOBILE SEED PROCESSING UNIT



## TECHNOLOGY HIGHLIGHTS

- Output capacity : 2 t/h (Wheat, Mung, Gram)  
: 1 t/h (Paddy)
- Operating cost : US\$ 3.3/t
- Savings : US\$ 30/t
- Potential areas : Seed producing areas of Pak



# TRADITIONAL DATES DRYING

## ISSUES

- In-efficient and un-hygienic practices
- High dates losses
- Poor quality dates

# FMI SOLAR-CUM-GAS FIRED DATES DRYER



## TECHNOLOGY HIGHLIGHTS

- Drying capacity : 4 t/season
- Operating cost : US\$ 66.7/t
- Savings : US\$ 33.3/t
- Potential Areas : KhairPur, Muzafargarh  
D.I. Khan, Turbat

# Vision

- **Mechanization strategy formulation**
- **National Network of Agricultural Mechanization**
- **Machinery Testing Lab Accreditation**
- **Grain Drying & Storage**
- **Agro-Processing Machinery**
- **Livestock Mechanization**
- **Energy efficient & environment friendly technologies**
- **Mechanization Informatics**

**THANK YOU**

# FMI CONTRIBUTIONS

## (Software)

### Testing & Evaluation - Machines Tested



### Standardization - Standards Developed



# FMI CONTRIBUTIONS

## (Software)

### Capacity Building:

- Engineers in testing & evaluation of farm machinery
- Extension Officers and farmers in operation, repair and maintenance of farm machinery

### Technical Assistance:

- Provided to manufacturers in manufacture of FMI developed technologies

### Policy Input:

- Input provided to Government in formulation of farm mechanization strategies for the country



# FMI CONTRIBUTIONS

## TECHNOLOGIES DEVELOPED

- REAPER-WINDROWER
- GROUNDNUT DIGGER
- GROUNDNUT THRESHER
- SUNFLOWER THRESHER
- ZERO-TILLAGE DRILL
- ROW-CROP PLANTER
- PADDY THRESHER

