

# **COUNTRY REPORT**

## **(Islamic Republic of Pakistan)**

by

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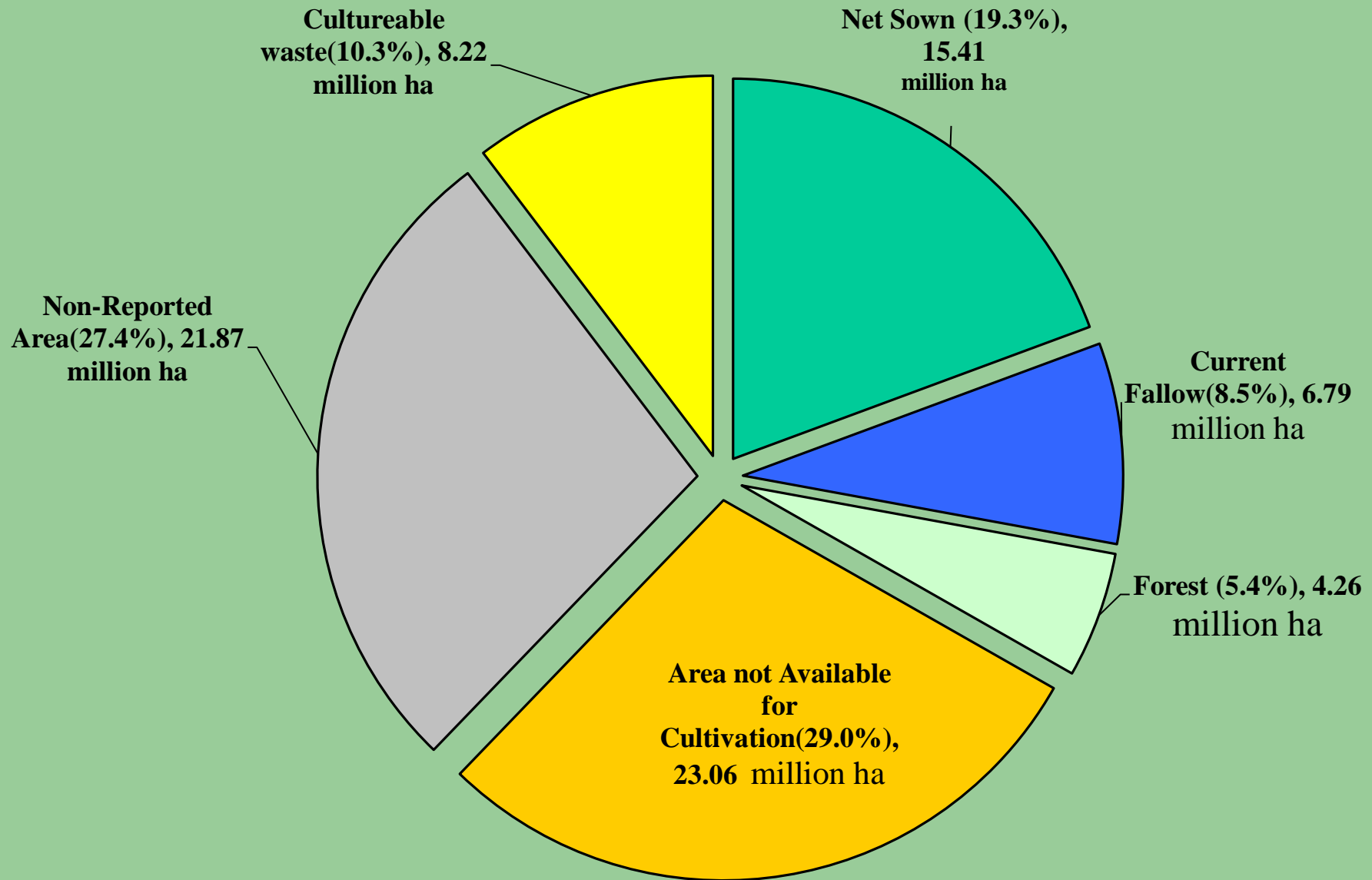
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# INTRODUCTION

## Agriculture

- Pakistan is predominantly an agricultural country and it's almost 70% of the economy is based on agriculture.
  - ❖ Contributes 21% to the GDP
  - ❖ Employs 43.7% of the total work force
  - ❖ Serves as a major supplier of raw materials to the industry
  - ❖ Contributes substantially to Pakistan's export earnings
  - ❖ Major crops (wheat, rice, cotton & sugarcane) contribute 31.1% to the value added in overall agriculture and 7.1% to GDP
  - ❖ Minor crops account for 11.1% of value added in overall agriculture
  - ❖ Total Population (2011): 184.35 million
  - ❖ Rural population: 68%

# LAND UTILIZATION



# Area and Production and Yield of Important Crops

(Area '000' hectares)

(Production '000' tones)

Crops	Area	Production	Yield (Kg/ha)
Wheat	8660.2	24211.4	2796
Maize	1059.5	4220.1	3981
Rice	2308.8	5535.9	2399
Sugarcane	1128.8	63749.9	56466
Cotton *	2878.8	13030.7	769

\*Cotton production is in thousand bales of 375 lbs. each

# FARM MECHANIZATION

- Farm Mechanization is key to modern agriculture system. Farm power is recognized throughout the world as a crucial factor influencing farm productivity both directly and indirectly and had tremendous effect on people way of life
- Intensive use of agricultural machinery is required to improve average yield
- Transition from subsistence farming to commercial farming can only be achieved through transfer of the latest, most efficient and cost effective technology to the farming system
- Efficient use of scarce agriculture resources and accelerated agriculture mechanization is vital and demands strategic planning for the future.

## FARM MACHINERY AND TRACTOR MANUFACTURING

1. Mechanization in Pakistan is growing rapidly with the introduction of farm machinery in last three decades
2. There are five makes of tractors, which are manufactured in the country
3. Most of the farm implements and machines are manufactured in the country
4. Tillage implements, reaper-windrower, threshers, combine harvesters, seeders, band placement drill, zero tillage drill, wheat straw chopper, dryers, etc. are the major technologies which have brought positive change in the field of agricultural mechanization

S.No	Deletion achieved in tractor manufacturing (%)	85
1.	Working number of tractors (Million)	0.57
2.	Tractor annual production capacity (Million)	0.065
3.	Total farm power in the country (Million kW)	30.5
4.	Available farm power (kW/ha)	1.1
5.	Hectares of cultivated area for which, a 50 hp tractor is available	37

# Ownership of Selected Tractor Drawn Machinery in Pakistan

Year	Tractor	Machinery							
		Cultivator	Mold Board Plough	Bar / Disc Harrow	Disc Plough	Drill / Planter	Ridger	Trailer	Thresher
2004	401663	369866	40050	23764	29218	70810	71338	242655	137270
1994	252861	236272	28413	13233	20372	64126	10987	176412	112707
1984	157310	146863	7319	8140	6355	11251	4711	98787	78377
1975	35714	31619	2734	2373	2938	1174	1174	18074	5635

# Number of Privately Owned Tractors by Make

Administrative unit	Massey Ferguson	Ford	Fiat	Ursus	Belarus	IMT	Others	Total
Punjab	151285	21224	139920	3541	11752	1831	1720	331273
Sindh	5817	3043	10806	104	16129	110	73	36082
KPK	7799	554	13373	118	1757	61	305	23967
Baluchistan	6557	66	386	25	2066	20	4	9124
Pakistan	171458	24887	164485	3788	31704	2022	2102	400446



# Number of Private Tractors by Horse Power

Administrative unit	Tractors by Horse Power							
	Total Tractors	Below - 26	26-35	36-45	46-55	56-65	66 & above	Not Reported
Punjab	331273	85	405	16442	255158	40215	18434	534
Sindh	36082	4	19	255	28325	6428	1047	4
KPK	23967	282	13	388	18780	3980	472	52
Baluchistan	9124	-	11	300	8261	348	196	8
<b>Pakistan</b>	<b>400446</b>	<b>371</b>	<b>448</b>	<b>17385</b>	<b>310524</b>	<b>50971</b>	<b>20149</b>	<b>598</b>

# Number of Tractors by Type of Ownership Horse Power

Administrative unit	Number of Tractors		
	Privately Owned	Government Owned	Total
Punjab	331273	632	331905
Sindh	36082	163	36245
KPK	23967	302	24269
Balochistan	9124	120	9244
<b>Pakistan</b>	<b>400446</b>	<b>1217</b>	<b>401663</b>

# Tractors Deletion Achieved

S.No.	Make	Model	Deletion %
1	Massey Ferguson	MF-240, MF-260	87
2	Massey Ferguson	MF-265/375, MF-385	60
3	Fiat	Fiat-480 & Fiat-640	85
4	Belarus	MTZ-50 & UMZ-6AKM	60 (no more in business)
5	Ford	3600 & 4600	no more in business
6	IMT	540 & 560	After pause of many years, they have started business again

# Number of Tractors Manufactured and Imported in Pakistan (1994-2012)

Year	Manufactured	Imported	Total
1994-95	17063	10084	27147
1995-96	16218	6805	23023
1996-97	10121	2020	12141
1997-98	14242	1086	15328
1998-99	26885	3281	30166
1999-00	35038	2469	37507
2000-01	32553	55	32608
2001-02	24311	220	24531
2002-03	27101	14000	41101
2003-04	36059	11420	47479
2004-05	44095	6543	50638
2005-06	49642	7346	56988
2006-07	54431	10051	64482
2007-08	53598	8941	62512
2008-09	60561	2636	63197
2009-10	71607	12052	83659
2010-11	71550	905	72455
2011-12	48120	3676	51796
Total(1994-2012)	693195	103590	796758

# NUMBER OF TRACTORS

Administrative Unit	Total	Below 26 HP	26-35 HP	36-45 HP	46-55 HP	56-65 HP	66 & above HP
Punjab	477000	143	572	23659	367433	57908	26521
		0.03%	0.12%	4.96%	77.03%	12.14%	5.56%
Sindh	50658	5	25	360	39767	9022	1469
		0.01%	0.05%	0.71%	78.50%	17.81%	2.90%
Khyber Pakhtunkhwa	33772	399	17	547	26461	5610	665
		1.18%	0.05%	1.62%	78.36%	16.61%	1.97%
Balochistan	11257	0	14	370	10192	429	242
		0.00%	0.12%	3.29%	90.54%	3.81%	2.15%
Pakistan	<b>572688</b>	<b>547</b>	<b>628</b>	<b>24936</b>	<b>443853</b>	<b>72968</b>	<b>28898</b>
		<b>0.09%</b>	<b>0.11%</b>	<b>4.34%</b>	<b>77.54%</b>	<b>12.73%</b>	<b>5.03%</b>

# FARM POWER AVAILABLE

Power Source	Numbers	kW/ Unit	Power Available (million kW)	Share of Each Source (%)
Agriculture Labor Force (million)	24.51	0.075	1.83825	5.46
Work Animal (million)	2.59	0.4	1.036	3.10
Tractor Population Medium size Tractor (37 kW) – 80% of total population	0.4582	37	16.952	50.60
Large size tractor(51 kW) – 20% of total population	0.11414	51	5.84	17.43
Diesel engines and electrical motors prime movers for tubewells	1.05	7.46	7.83	23.37
Total Power (million kW)	33.5			
Power available for cultivation(90% assumed)	30.15			
Total cultivated area (million ha)	22.75			
Power available (kW/ha)	1.11			

# MECHANIZATION EXTENT OF CROP PRODUCTION OPERATIONS

Crop	land Preparation	Sowing	Irrigation	Spraying	Inter-culture	Harvesting	Threshing
Wheat	Semi Mech.	Low Mech.	Partial Mech.	Low Mech.	Nil	Semi Mech.	Full Mech.
Cotton	Semi Mech.	Full Mech.	Partial Mech.	Full Mech.	Full Mech.	Nil	-
Rice	Full Mech.	Nil	Partial Mech.	Nil	-	Semi Mech.	Partial Mech.
Sugarcane	Partial Mech.	Partial Mech.	Partial Mech.	Nil	Semi Mech.	Nil	-
Maize	Full Mech.	Semi Mech.	Partial Mech.	Nil	Semi Mech.	Low Mech.	Full Mech.
Potato	Full Mech.	Semi Mech.	Partial Mech.	Full Mech.	Full Mech.	Partial Mech.	-
Pulses (Grams)	Low Mech.	Full Mech.	Low Mech.	Nil	Low Mech.	Nil	Full Mech.

## Issues

- Under-utilization of tractor power
- Shortage of irrigation water
- Lack of machinery for value addition of farm produce and equipment for precision farming
- Use of old combine harvesters for wheat and rice, causing grain and quality losses
- Lack of machinery for livestock and dairy farming
- Increasing cost of inputs
- Limited availability of capital for machinery purchase
- Lack of standard and quality products
- Small land holdings and poor economic condition of farmers
- Inadequate custom hiring services
- Lack of coordination among researchers, machinery manufactures, extension workers and farmers
- Lack of awareness of farmers



# STRATEGY

Incentives to farming communities in terms of credit on low interest rates, decreasing GST on agricultural machinery and provision of subsidy on tubewells, implements, tractors and machinery like combine harvesters and dryers by provincial Governments (Punjab and Sindh):

- To increase horse power per hectare to 1.4 kW in Pakistan
- To increase Nos. of machines and implements for full utilization of tractor horse power and work hours
- To decrease harvesting losses and to mechanize various crop production operations through provision of implements to the small farmers/service providers
- To optimize the use of inputs like fuel, water, seed, fertilizer, chemical etc. by adopting mechanized farming.
- To enhance use of machinery custom hiring services

# GOVERNMENT POLICY AND INCENTIVE FOR PROMOTION OF MECHANIZATION

- Provision of machinery on cost sharing basis
- Training and awareness to the farmers and end users
- Banking loan facility
- Tax rebates on agricultural machinery
- Higher per acre yield incentive in terms of machinery
- Contribution of NGOs for promotion of machinery
- Demonstration, exhibition of agricultural machinery to the farmers and manufacturers

# Salient Achievement of R&D Institutions

Description	Agricultural & Biological Engineering Institute (ABEI), NARC, Islamabad	Agricultural Mechanization Research Institute (AMRI), Multan
Mechanization technologies developed and commercialized	Tractor front mounted reaper-windrower, groundnut digger, groundnut thresher, sunflower thresher, paddy thresher, pneumatic row crop planter, zero-till drill, fertilizer band placement wheat drill, canola thresher, wheat straw chopper-cum-blower, hand operated groundnut shellers, ABEI olive oil extractor, wood shredder, and Mobile seed processing unit.	Seed drills, planters, ridger, bed shaper, weeders, wheat thresher, rotary slasher, potato planter, groundnut digger, maize sheller, rotary tiller, boom sprayer, fertilizer spreader, axial flow pump, seed cleaner grader, hand dibbler, furrow bed/shaper planter, soil hard pan tester, bullock drawn implements, and mobile bhoosa chopper and baler.
Mechanization technologies being developed	Rocket seeder, PTO disk plough, paddy transplanted, vegetable planter, turmeric dryer, solar-cum- gas fired dryer, mini seed cleaner cum grader, flat bed dryer for canola, sunflower & maize, date dryer, mango picking & pre-cooling technology harvester and nursery raising plant, hot-water treatment plant for eradicating mango fruit fly infestation.	Power tiller, chain trencher, fodder cutter bar, sugarcane base cutter, pneumatic drill, rotary ditcher, ejector pump, maize cob harvester, cheaper biogas planter, vegetable nursery transplanter, groundnut sheller, rice thresher, seed- bed finisher, stubble shaver, and orchard sprayer.

# Machines Tested and Standards Developed

## Testing & Evaluation – Machines Tested



## Standardization – Standards Developed

# CROP RESIDUE MANAGEMENT



Wheat Straw Chopper Blower



Wheat Straw Chopper Blower



Mobile Bhoosa Baler

# Technologies Commercialized

1985: Reaper-windrower: 35,000 units    1995: Zero-till Drill: 7,000 units



2002: Wheat Straw Chopper: 5,000 units    2002: Paddy Thresher: 6,000 units



# Technologies Commercialized

**Fertilizer Band Placement Drill 2009 onward: 8,000 (Punjab Govt.)**



# Technologies Commercialized

**Mobile Flat-bed Dryer (0.7m)**



**Olive Oil Extraction Unit (0.6m)**



**Milking Machine for Buffaloes (0.15m)**



**Mango Picking Machine (0.7m)**





# Technologies in Progress

**Solar-cum-Gas Fired Dates Dryer**



**Solar House Dates Dryer**



**Mobile Seed Processing Unit**



**Seeder For Combined Harvested Paddy Fields**



THANKS