Climate-Smart Agriculture and Mechanization in Pakistan

Presentation by

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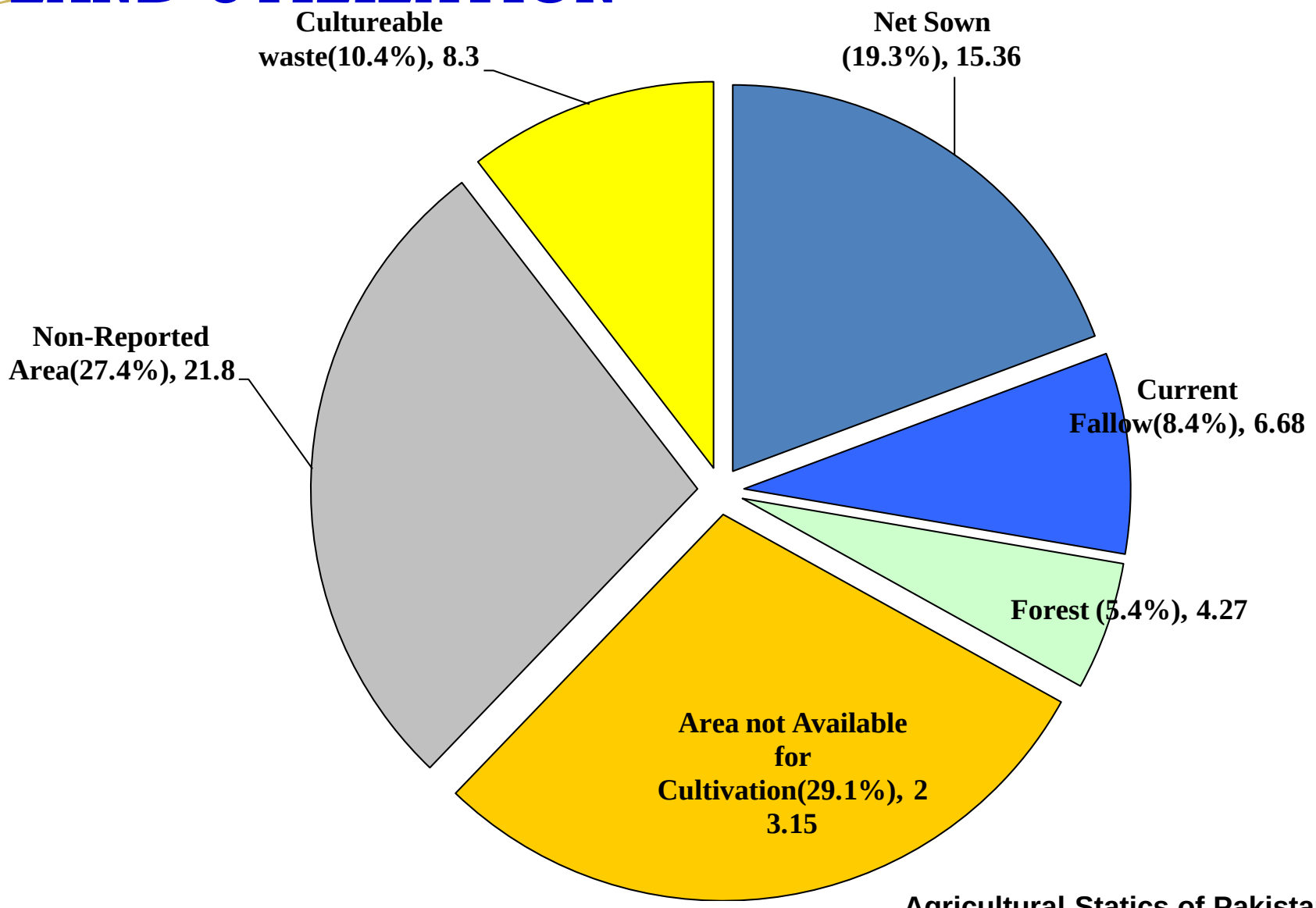
INTRODUCTION

Agriculture

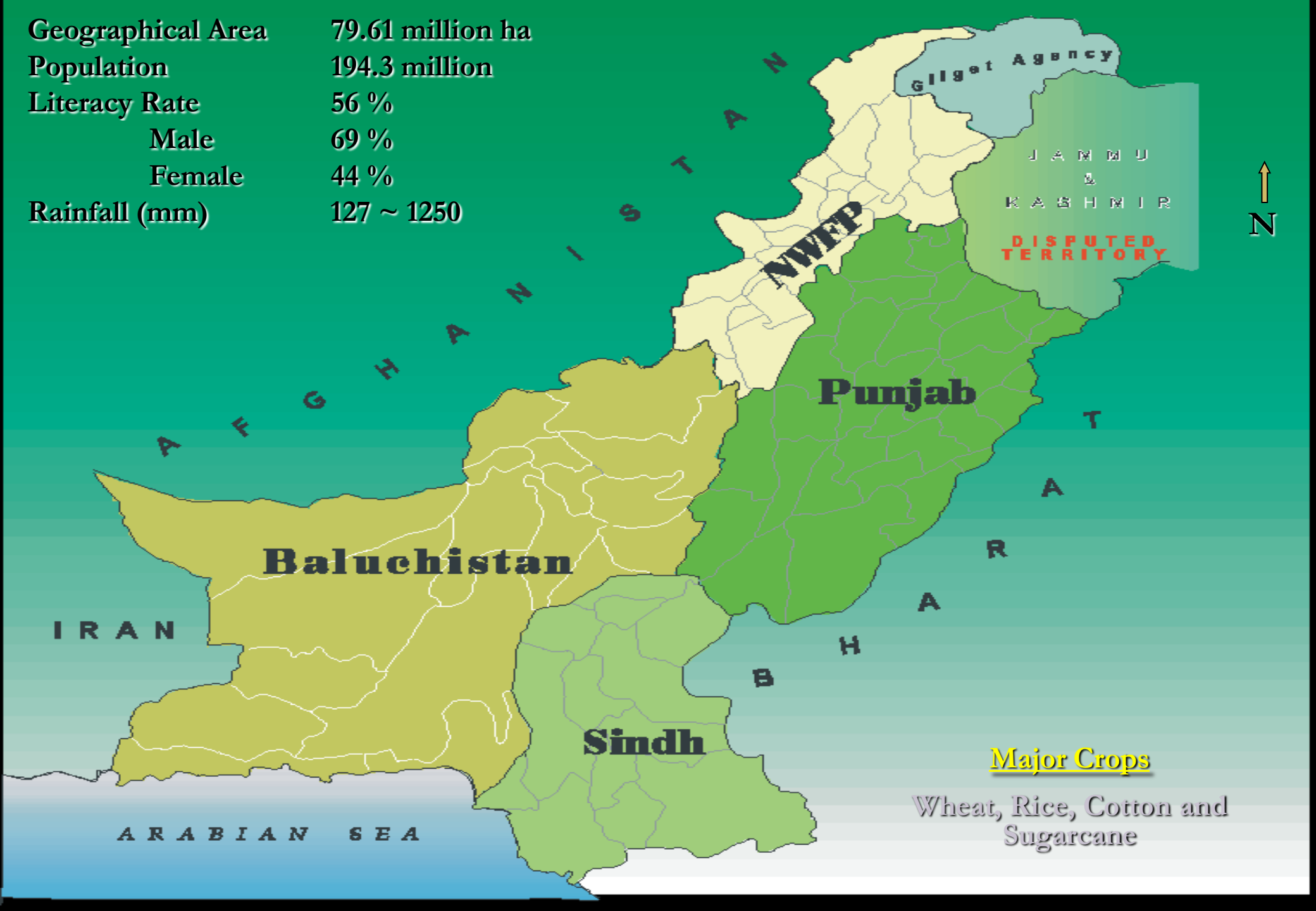
Pakistan is basically an agricultural country and it's almost 70% of the economy is based on agriculture. Most importantly, 68 % of country's population living in rural areas is directly or indirectly depend upon agriculture for their livelihood

- Agriculture sector is a dominant sector of Pakistan Economy
  - Contributes 21% of GDP
  - Employees 43.7% of the total work force
  - Serves as a major supplier of raw materials to industry as well as a market for industrial products
  - Contributes substantially to Pakistan's export earnings
  - The four major crops (wheat, rice, cotton & sugarcane) on average contribute 31.1 percent to the value added in overall agriculture and 7.1 percent to GDP
  - The minor crops account for 11.1 percent of the value added in overall agriculture

LAND UTILIZATION



Agricultural Statics of Pakistan-2012-2013


Geographical Area 79.61 million ha
Population 194.3 million
Literacy Rate 56 %
Male 69 %
Female 44 %
Rainfall (mm) 127 ~ 1250
AFGHANISTAN
Gilgit Agency
JAMMU & KASHMIR
DISPUTED TERRITORY
N
NWFP
Punjab
Baluchistan
IRAN
Sindh
ARABIAN SEA
BHARAT
Major Crops
Wheat, Rice, Cotton and Sugarcane

Reaper
Units: 51000
Benefit: 103 billion

Zero tillage drill
Units: 7000
Benefit: 43 billion

Wheat straw chopper
Units: 5000
Benefit: 15 billion

Rice thresher
Units: 7000
Benefit: 33 billion

Seed processor
Units: 50
Benefit: 1.3 billion

Groundnut digger
Units: 2200
Benefit: 6 billion

Ground nut thresher
Units: 2200
Benefit: 7 billion

Planter
Units: 300
Benefit: 1 billion

Seed drill
Units: 8000
Benefit: 30 billion

Balochistan

Sindh

Punjab

Khyber Pakhtunkhwa

Gilget Agency

JAMMU & KASHMIR

DISPUTED TERRITORY

قومی زرعی تحقیقاتی مرکزکی تیارکردہ
زرعی مشینری

Zero Tillage (ZT) Technology

- Time window between rice harvesting and wheat sowing is less than two weeks, especially in Basmati growing areas.
- Therefore, about 70% of wheat sowing in rice-wheat based cropping system gets late.
- Delayed planting of wheat in rice based farming system was resulting in 15% reduction of wheat yield.
- Challenge was to develop a technology for timely sowing of wheat, thus reducing its yield losses.

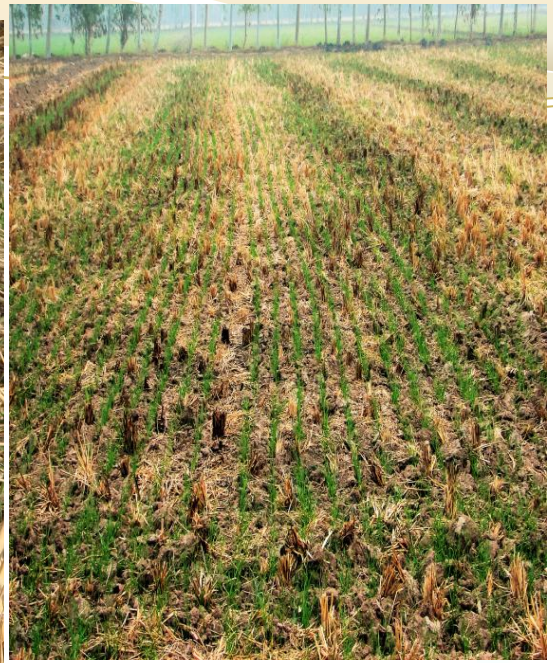
About 7,000 drills are being used by the farmers. Estimated 43 billion rupees saving due to timely sowing of wheat, yield increase and savings in production cost.

PAK SEEDER


PAK SEEDER
پاک سیڈر
Design & Developed By: Agricultural
& Biological Engineering Institute
051-9255044-45
(ABEI)
PARC

ISSUE

FARMERS CURRENT PRACTICES OF LAND PREPARATION




Farmer
practice


Farmer
practice

PAK SEEDER PERFORMANCE

FERTILIZER BAND PLACEMENT DRILL

FERTILIZER BAND PLACEMENT DRILL

- Fertilizer broadcast method is a wasteful method of fertilizer application
- Fertilizer use efficiency is less and high rate of ammoniated phosphate fertilizer (like DAP) affects the seed germination and crop yield.
- ABEI NARC designed and developed a fertilizer band placement drill. This drill places fertilizer 5cm away and 5cm deeper than the seed.
- Currently 8000 units in operation

BENEFITS

- This drill saves 50% phosphate fertilizer compared with broadcast method.
- It saves One DAP bag(Rs 4300) per acre.
- About 10% more grain yield by using this drill for wheat sowing.
- By up scaling this technology, country will benefit Rs. 15000 million/annum

WHEAT STRAW CHOPPER

Wheat Straw Chopper-cum-Blower

Wheat Straw Chopper

ISSUES

- Straw collection
- Wastage of wheat straw in combine harvested field
- Straw burning & related field hazards
- Environmental pollution

TECHNOLOGY HIGHLIGHTS

Field Capacity : 0.0.4 ha/h
Economic Benefit : $ 190/ha (2400 kg straw not burned and saved for cattle feeding)
Operating units : 5000

Future Focus

- Precision Agriculture
- To optimize the use of inputs like fuel, water, seed, fertilizer, chemical etc. by the use of energy efficient and environment friendly mechanical technologies.

- Computer controllers
- Variable rate technology
- Field shape affects farming efficiencies
- Farm GIS and data management
- Zone management
- Telemetric machinery operating information available on internet
- Crop sensors

Thank you.

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UNITED NATIONS ESCAP Economic and Social Commission for Asia and the Pacific CSAM VIAEP

Table-1 Pak Seeder vs Farmer's Practice: Grain yield of wheat crop during 2015-16 Sowing Season

Farmers Detail	1. Haji Mahmood Silver Star Factory, Daska Sialkot road			2. Sultan Mahmood Qureshi Village: Chicher Wali Pasroor		3. Mian Irfan Bhatti, Village:Baka Bhattian Khanka Dogran Hafizabad.		4. Malik Shakir Awan, Village: Alipur Noon Near Bhalwal, Sargogha		5. Ch. Mubarak, Village: Glotian, Daska-Wazirabad Road, Daska		6. Ch. M. Afzal, Village: Jajay Sahian, Sialkot		
*DOS.	29-11-2015			26-11-2015		22-11-2015		20-11-2015		18-11-2015		26-11-2015		15-11-15
Practices	Pak Seeder + Full residue	Pak Seeder + Partial residue	Farmer Practice	Pak Seeder + Full Residue	Farmer Practice	Pak Seeder + Full Residue	Farmer Practice	Pak Seeder + Partial Residue	Farmer Practice	Pak Seeder + Full Residue	Farmer Practice	Pak Seeder + Full Residue	Farmer Practice	Zero Tillage + No Residue
Crop yield/ac (Kg)	1883	1670	1239	1767	1389	1738	1612	1728	1583	1718	1408	1776	1360	1757
Crop Yield/ha (Kg)	4653	4127	3062	4366	3432	4295	3983	4270	3912	4245	3479	4388	3360	4341

(* Date of Sowing)