Pakistan e-Agriculture – ICT Transformation

State of Agriculture in Pakistan

LAND AREA

770880

Sq.km

FAO estimate, 2014

COUNTRY AREA

796100

Sq.km

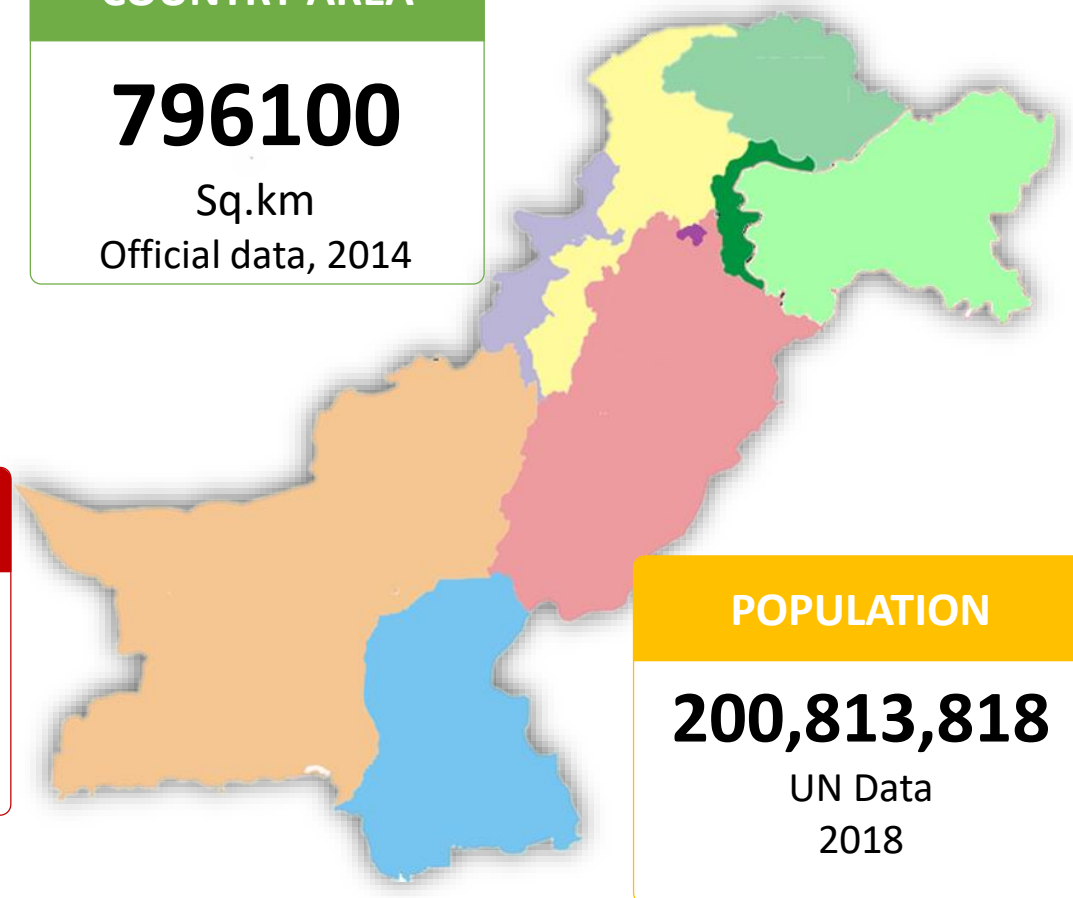
Official data, 2014

AGRICULTURAL AREA

362520

Sq.km (47% of land)

FAO estimate, 2014



G D P

1444

USD

Worldbank, 2016

POPULATION

200,813,818

UN Data

2018

FORESTS

1515

(1000 ha)

FAO estimate, 2014

Agriculture is the contributing 80% of foreign exchange

2nd Largest Sector

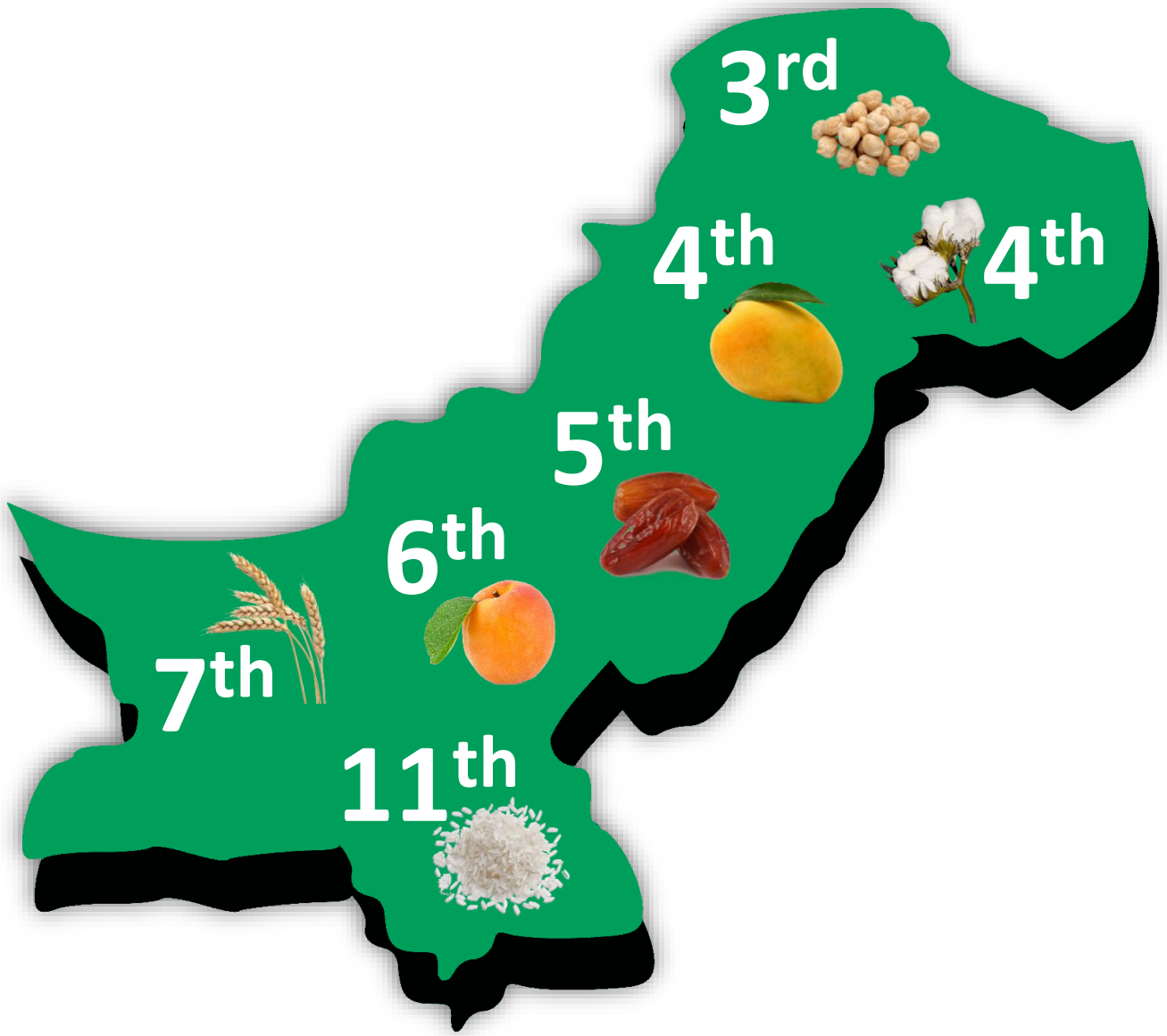
over **25%** of GDP

45% of the country's total labor force is in agriculture

Challenges:

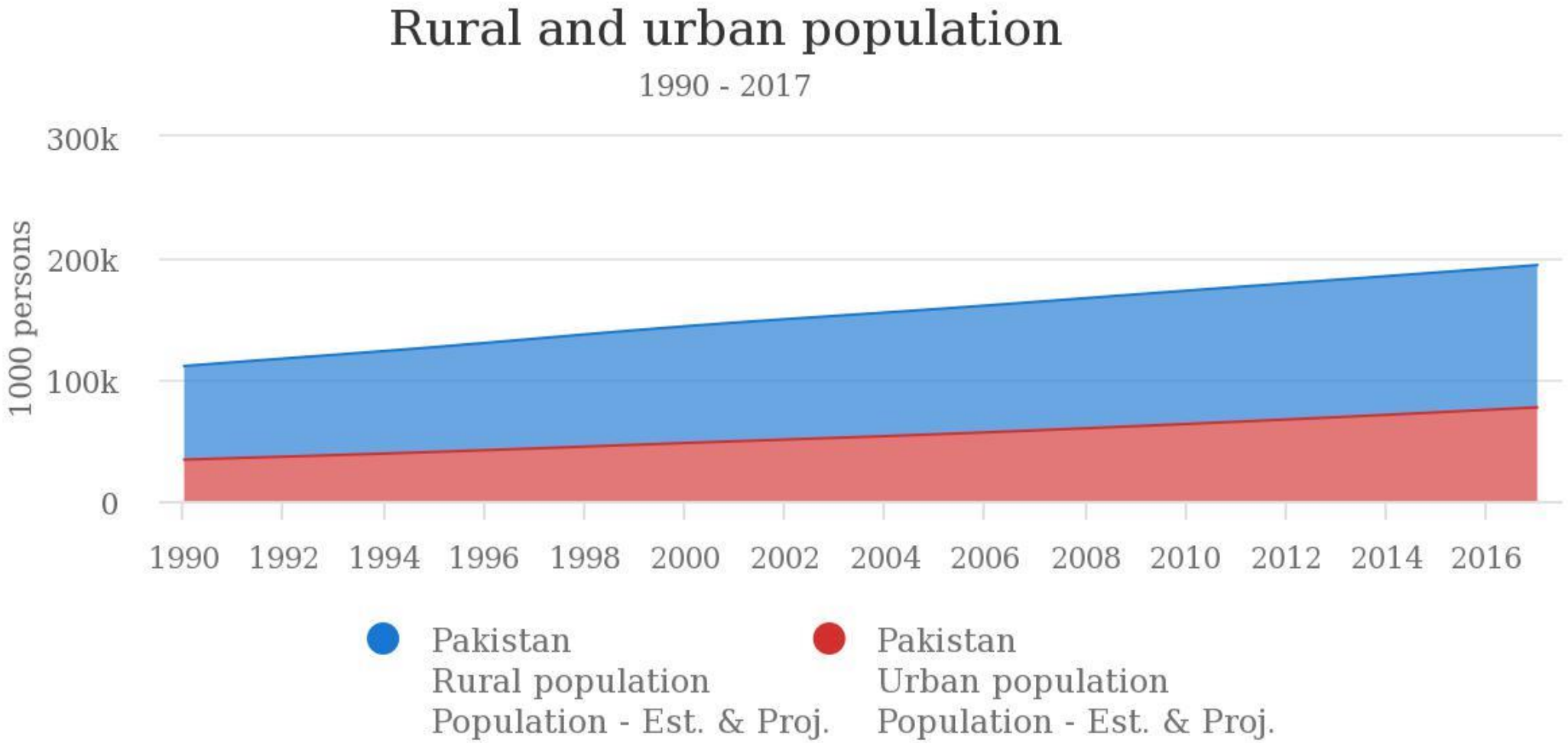
- Lack of optimal use of water resources
- Water logging and sanity
- 40% yield/acre gap with other countries
- Division of land

World Rankings of Pakistani crops



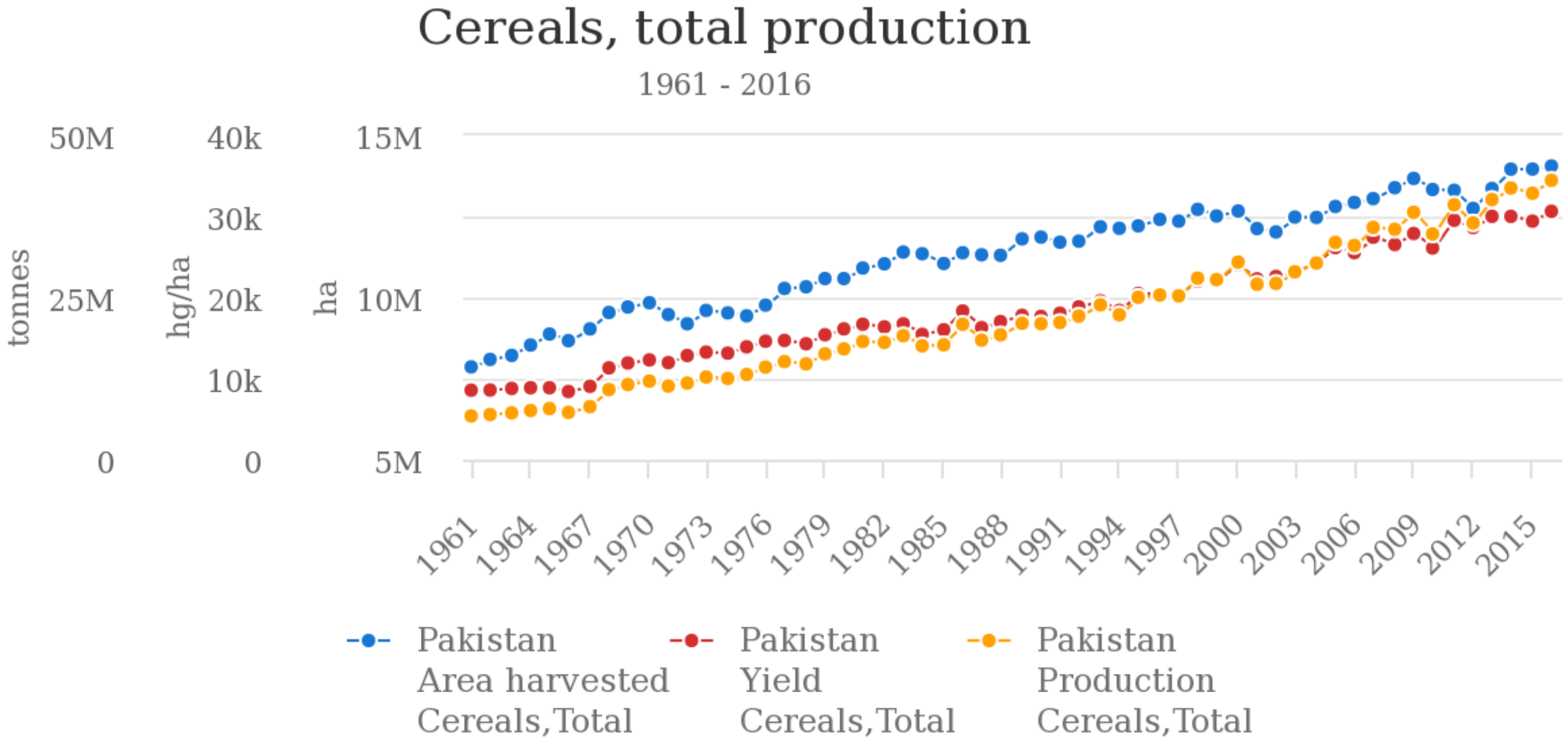
Source: Wikipedia 2015

Population is on the rise



Source: FAOSTAT (Jul 04, 2018)

Crop harvesting increases but yield is lagging



Source: FAOSTAT (Jul 04, 2018)

Traditional Agriculture

vs

Modern Agriculture

Traditional Agriculture	Modern Agriculture
Lesser Production & Productivity	Higher Production & Productivity
State of Hunger	State of Food Security
Poor Infrastructure	Highly Developed Infrastructures
Technologically Deprived	Technological Advancement
Low Per Capita Income	High Per Capita Income
Low Standard f Living	Higher Standard of Living

Technology can help solving problems in value chain

Productivity: Timely and context-specific data-driven insights aimed at improving the production of rice, other cereals, and vegetables.

Farming: Support a more sustainable way of farming by lowering the environmental impact of agriculture.

Markets: Develop the marketplace by providing inputs, extension services, and connections that support farmers in a sustainable way.

Agri Products: Improve the level of understanding and use of agricultural products such as fertilizers or quality seeds that can contribute to increased productivity among smallholder farmers.

Information: Generate timely information which can be acted upon to manage weather related risks to agricultural productivity such as drought or excessive rainfall.

“Data should no longer reside on computer servers at research institutes. We must make it open and accessible to farmers, agribusiness owners, and all stakeholders across the agriculture value chain. This is what we mean by

“data-driven farming.”

Amy Tohill-Stull, Mission Director at USAID

Need coordinated efforts to solve Agri sector Challenges

- Data to Actionable Outcome

- Actionable outcome:
  - Bridge between Service Providers and Service Consumers
  - Apps to provide link between government, banks, NGOs and universities.

- Big Data Analytics solutions
  - Algorithms as Service
  - Structured between Cloud and End-user delivery platform like mobile
  - Service on demand
  - Predictive Analytics
    - Example - Market Intelligence
  - Diagnostic Analytics
    - Example - Process Intelligence

Key stakeholders of Agriculture Industry

Academia


BARI CHAKWAL
Barani Agricultural Research Institute

NGOs

USAID

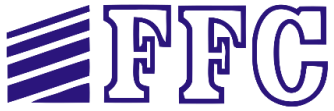
THE WORLD BANK
IBRD • IDA | WORLD BANK GROUP

Financial Institutions

NRSP
National Rural Support Programme

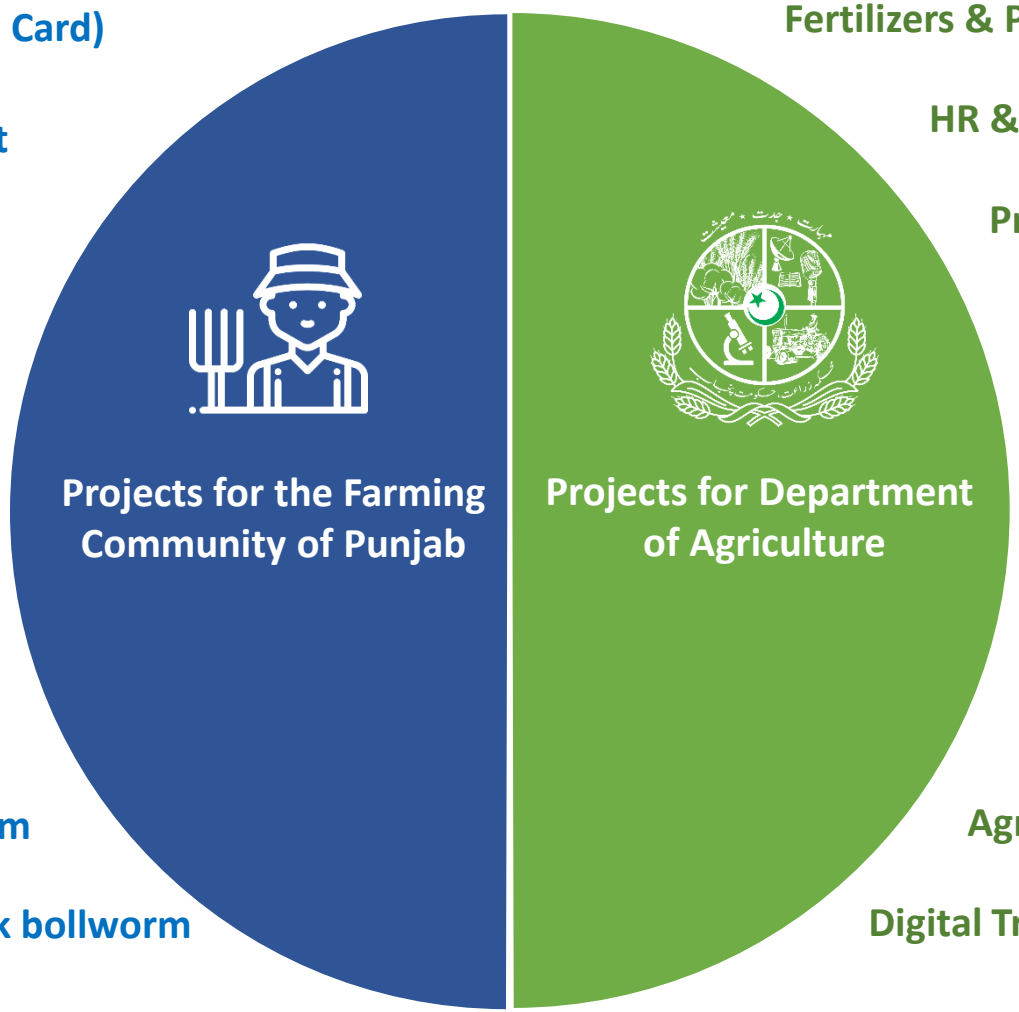
ZTBL
Zarai Taraqiati Bank Limited

Industries



Other Initiatives

Initiatives of Agriculture Department Punjab

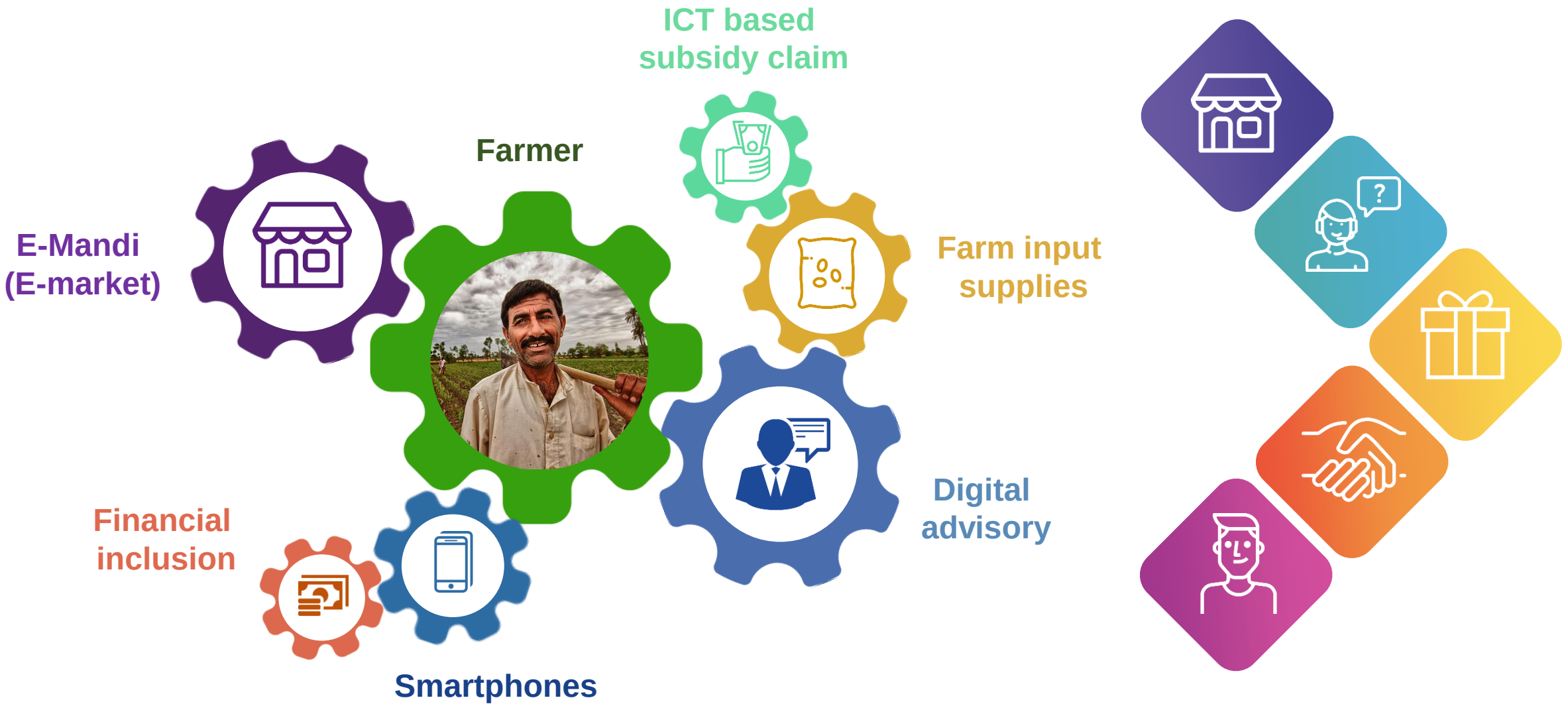


- Farmer Registration(Kissan Card)
- CAPP e-Credit
- Crop Insurance
- Extension Services 2.0
- Soil health Card
- Bulldozer Booking System
- Agri-Loan (e-Credit)
- On-ground Soil Nutrient Analysis
- Subsidy Management System
- Crop disease prediction model for Pink bollworm

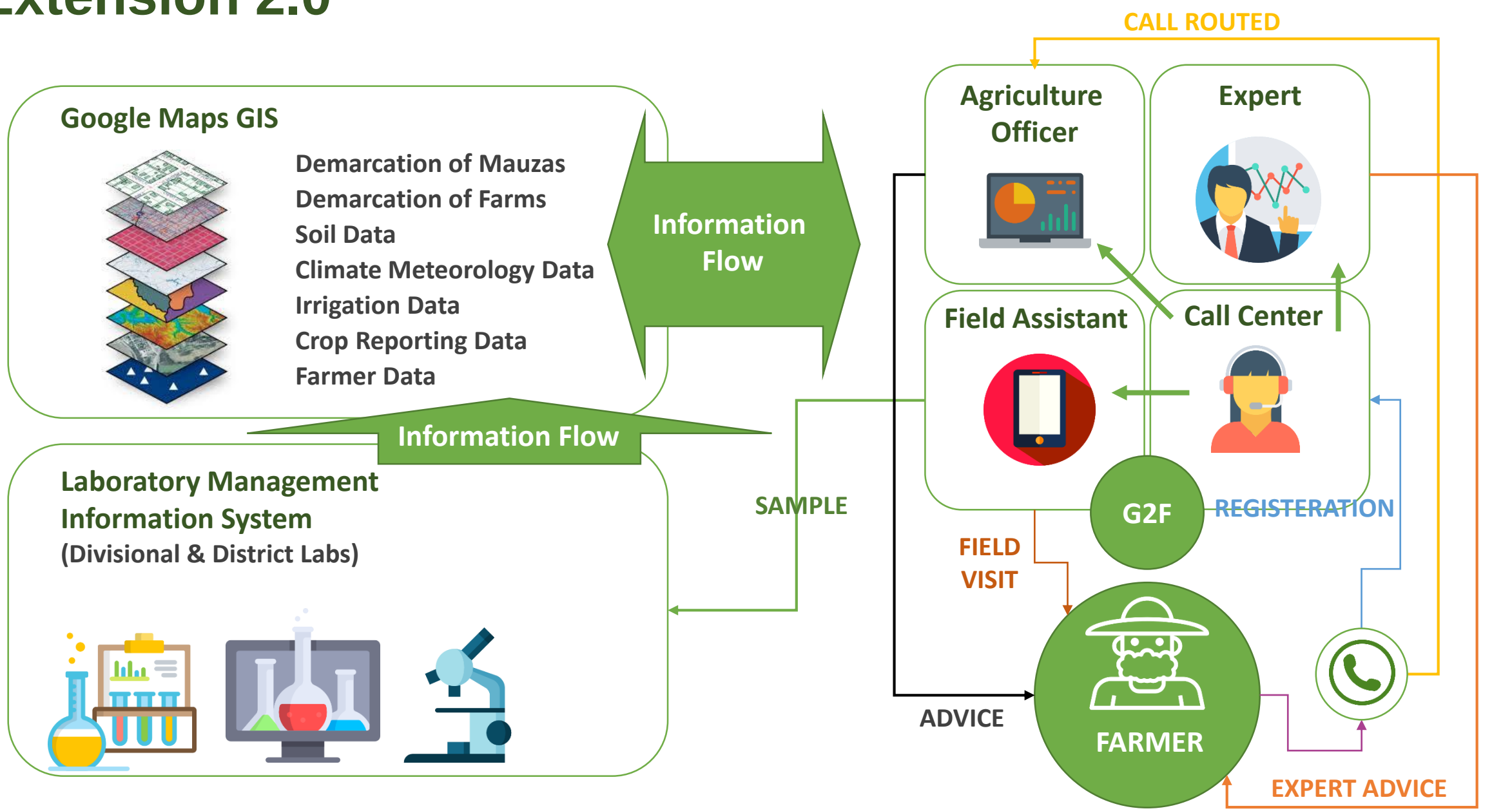
- Fertilizers & Pesticides Monitoring System
- HR & Biometric Attendance System
- Procurement Management System
- Software Quality Framework
- Bardana distribution
- Marketing Information System(Price)
- PSC – Inventory Management System
- Pest Scouting
- Agri-Smart: Performance Monitoring
- Digital Transformation of Punjab Seed Corporation

Foot @ Home

Connected Agriculture Platform Punjab (CAPP)



Extension 2.0



BaKhabar Kissan

Switch Communications
Islamabad

Artificial Intelligence, Machine Learning,
Big Data

Proposal brings a service solely dedicated to farmers which provides latest market rates, weather forecast, agricultural advisory, best practice tips, animal husbandry, section to buy products and all agriculture related news and government schemes.

Sustainable Systems for Real-Time Rural Irrigation

UAF, Faisalabad

Artificial Intelligence, Machine Learning, Big Data

Telecom networks use microwave signals between BTS towers and microwave signals are affected by the rain. PI has proposed to measure the amount of rain by the attenuation caused. This information will be used to manage the water resources in the cultivated area of land where water is required for irrigation.

Kissan Dost: Site Specific Economical Crop Production System

University of Agriculture Faisalabad

Artificial Intelligence, Machine Learning, Big Data

The crop production statistics for every farm of the province will be available on web and every farmer of the province will be able to use this information free of cost. The information regarding cost of inputs, prices of commodities and the expected income will also be made available on the web to make agriculture a profitable business.

Crop Estimation and Geographic Mapping System (CEGMaS)

KPUET,
Peshawar

Artificial Intelligence, Machine Learning,
Big Data

The CEGMaS uses state-of-the-art technology tools to acquire updated crop acreage estimates and quality pallets of the tobacco crop in the pilot regions of Shergarh (District Mardan) and Sawabi – two of the most tobacco producing regions of the Khyber-Pakhtunkhwa.

A mobile application/unit acquires location information from GPS satellites and send the location and field information in a pre-designed form to a secure web-server. This information is compared with the crop estimates obtained through the hyper-spectral remote sensing data for establishing and re-calibrating the accuracy of the estimation process.

Projects in Concept Phase

- Farm Operations Management System
- Research Management System
- Digital Transformation of Punjab Seed Corporation
- Human Resource Information System (HRMIS)
- Monitoring & Evaluation System (M&E Systems)
- Digital Diagnosis and Solutions of Crop Related Issues
- On-ground Soil Nutrient Analysis and Suggestive Models of Various Input Quantity
- Climate Smart Agriculture Solution (IoTs)
- Big Data, Data Sciences & Data Monetization

Thank You!