



GCP/PAK/125/USA



Pakistan Crop Portal

Overview Initiative

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FAO



FAO and the Project

- Trainings
 1. Training on Satellite based Area Frame technique
 2. Training on design and test sampling strategies
 3. Workshops on survey and methodology review
- Technical support
 1. Development, training and QA/QC (on going) of national land cover database
 2. QC on equipment procurement (acquisition is ongoing)
- Development (or support in the) of communication products
 1. Publications, manuals, flyers, brochures, posters,
 2. Printed land cover atlas (ongoing)
 3. Website and e-newsletter
- Data and Information Dissemination
 1. **Development of Crop Information Portal**



Test installation: <http://84.33.2.75/MapStore/>

NATURAL RESOURCES DEPARTMENT (NR)

PAKISTAN AGRICULTURE INFORMATION SYSTEM
CROP Information Portal

Logos: FAO, Government of Pakistan, SUPARCO, USDA

Navigation: Crop Data, Agrimet Variables, Crop Status, Crop Report, View, Full Screen, Select an area, Log in

Output Type: Data Chart Map

Season: Rabi (Nov-Apr) Kharif (May-Oct)

Area of interest Type: Province District Pakistan

Commodity: Wheat

Reference Year: 2012

Range: 2000 - 2012

Variable: Area Production Yield

Unit: Production: 000 tons, Area: 000 hectares, Yield: kg/ha

Map: Pakistan map showing provinces (Balochistan, Punjab, Sindh, FATA, Gilgit-Baltistan), major cities, and rivers. Includes a legend on the right with layers like Admin, Topography, Flooding, and Background.

Scale: 1 : 8735665



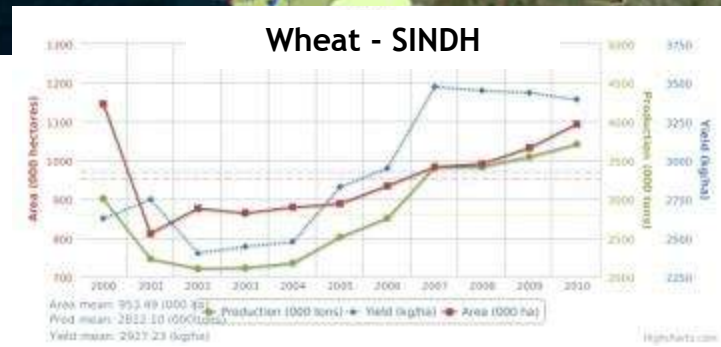
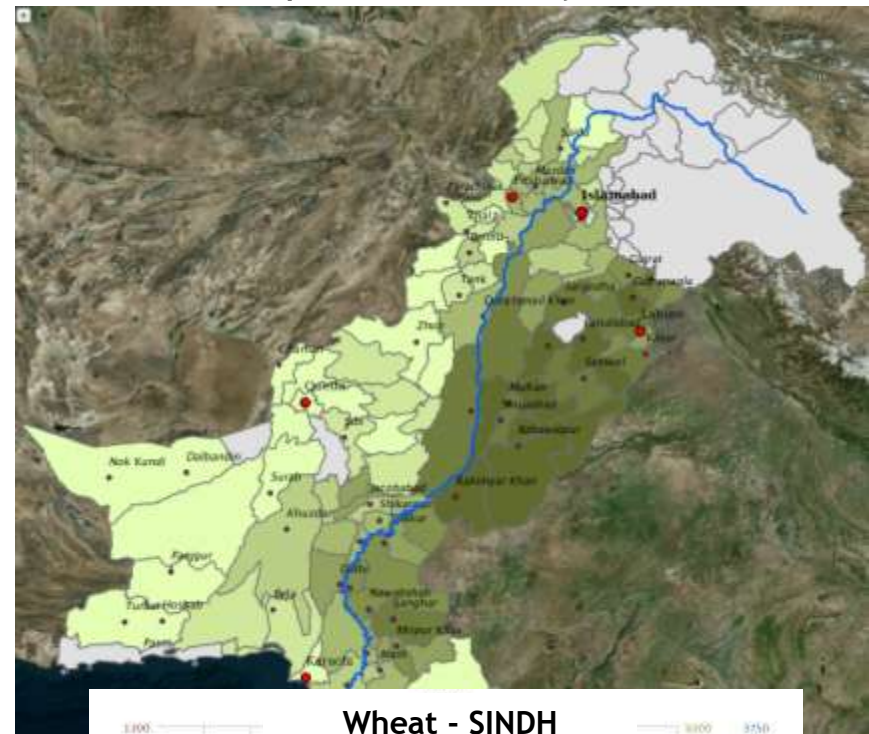
What is the Crop Portal?

- The Pakistan's Crop Portal is a component of the *Pakistan Agriculture Information System*;
- It is being developed to support data and information dissemination on major crops (area, yield and production) and agro-meteorological conditions affecting crop growth;
- FAO and SUPARCO have collaborated in defining user requirements, technical specifications, and activities to implement the system.
- FAO is supervising the development with regular consultation and support by SUPARCO, which also provides source data and admin boundaries.

What is the Crop Portal?

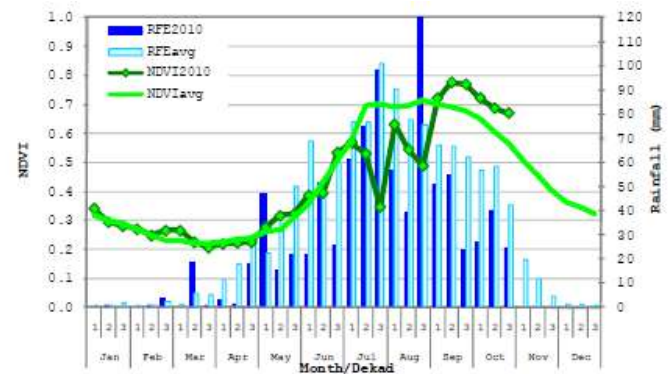
- The Crop Portal aims to make available to WEB users the historical archive and the latest produced crop and agro-meteorological data, integrated with satellite based information into a GIS like environment;
- The system will allow timely access to all the available data, perform statistical analysis, and generate outputs in various formats: tables, charts, maps and reports.

Wheat production 2010 by District



Summary Crop Portal Objectives

- Share historical data on crop production, harvested area and yield
- Share historical and latest data on agronomic, meteorological and hydrological conditions
- Cross check growing conditions against crop characteristics to highlight potential stresses affecting crop results
- Integrate crop information with geospatial data from various sources (including remote sensing) in a GIS like web interface





Data content

- The Crop Portal uses **District** based crop data (production, area and yield)
 - Major crops currently included are:
 - wheat (RABI)
 - maize, sugarcane, rice and cotton (KHARIF)
 - Currently, covered time period is **1999-2012**, but more years will be added as they become available
- SPOT **NDVI** and climate variables (max and min temp, precipitations, daylight len) are also included in the system DB to evaluate crop growth conditions.
 - Currently, covered time period is **1999/04-2013** by district and a **dekadal frequency (3/mo)**

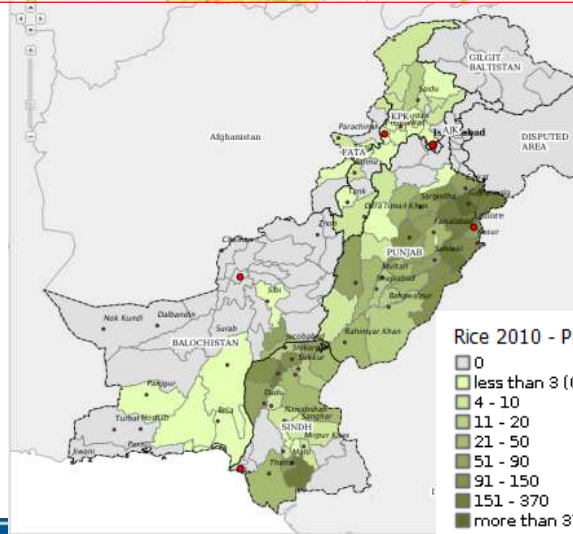
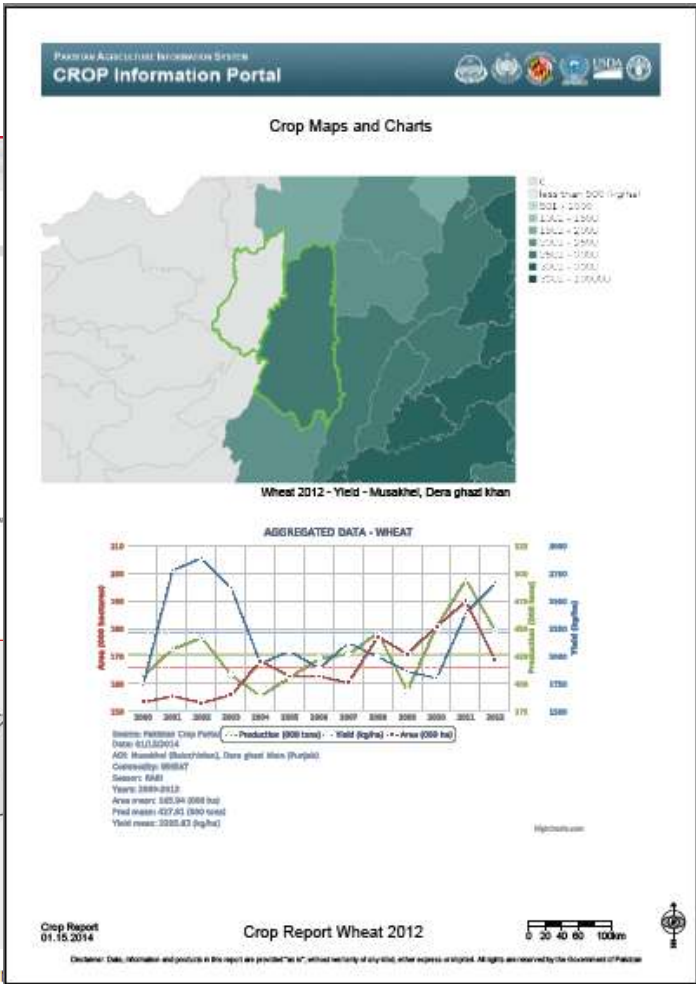
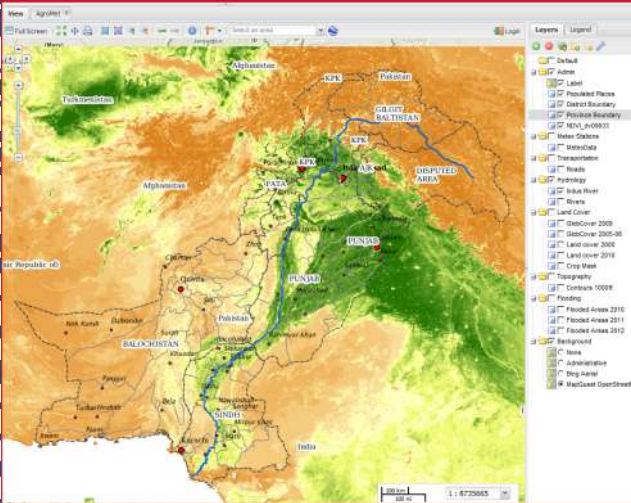


Outputs

(NR)

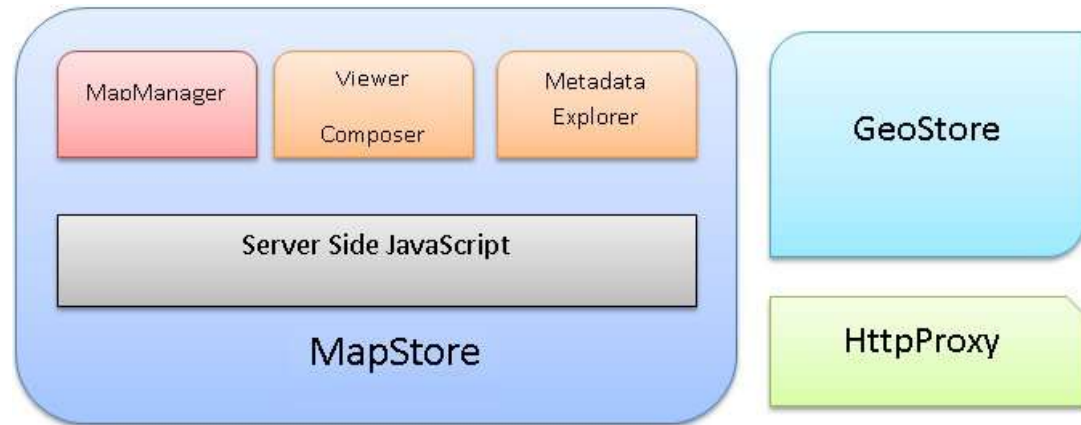
NATURAL RESOU

Region	Year	Production (000 tons)	Area (000 hectares)	Yield (kg/ha)
Pakistan	1999	25.26	27.88	1281.23
Pakistan	2000	41.70	28.70	1452.98
Pakistan	2001	23.60	23.60	1254.49
Pakistan	2002	32.70	21.49	1520.04
Pakistan	2003	32.40	25.16	1286.89
Pakistan	2004	38.39	28.23	1361.39
Pakistan	2005	41.80	27.16	1532.52
Pakistan	2006	37.20	29.60	1426.23
Pakistan	2007	42.80	28.70	1493.00
Pakistan	2008	51.80	38.90	1331.36
Pakistan	2009	53.80	32.70	1644.69
Pakistan	2010	46.92	29.94	1567.59
Jiangsu	1999	190.39	79.32	2340.49
Jiangsu	2000	128.80	88.23	1447.19
Jiangsu	2001	194.50	72.80	1451.39
Jiangsu	2002	117.80	79.20	1486.70
Jiangsu	2003	152.70	97.80	1561.03
Jiangsu	2004	170.40	107.60	1584.61
Jiangsu	2005	170.20	106.60	1600.20
Jiangsu	2006	170.80	102.80	1661.49
Jiangsu	2007	158.70	88.23	1793.32
Jiangsu	2008	192.30	102.80	1776.40
Jiangsu	2009	119.21	80.80	1475.41



System Architecture

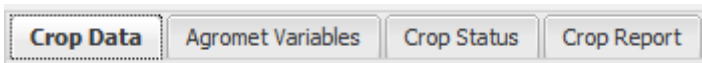
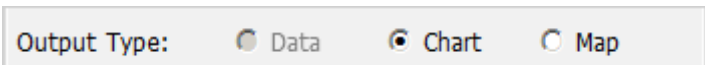
- Based on open source technologies and international standards
- Web interface for user interaction
- Server applications to manage data and perform processing





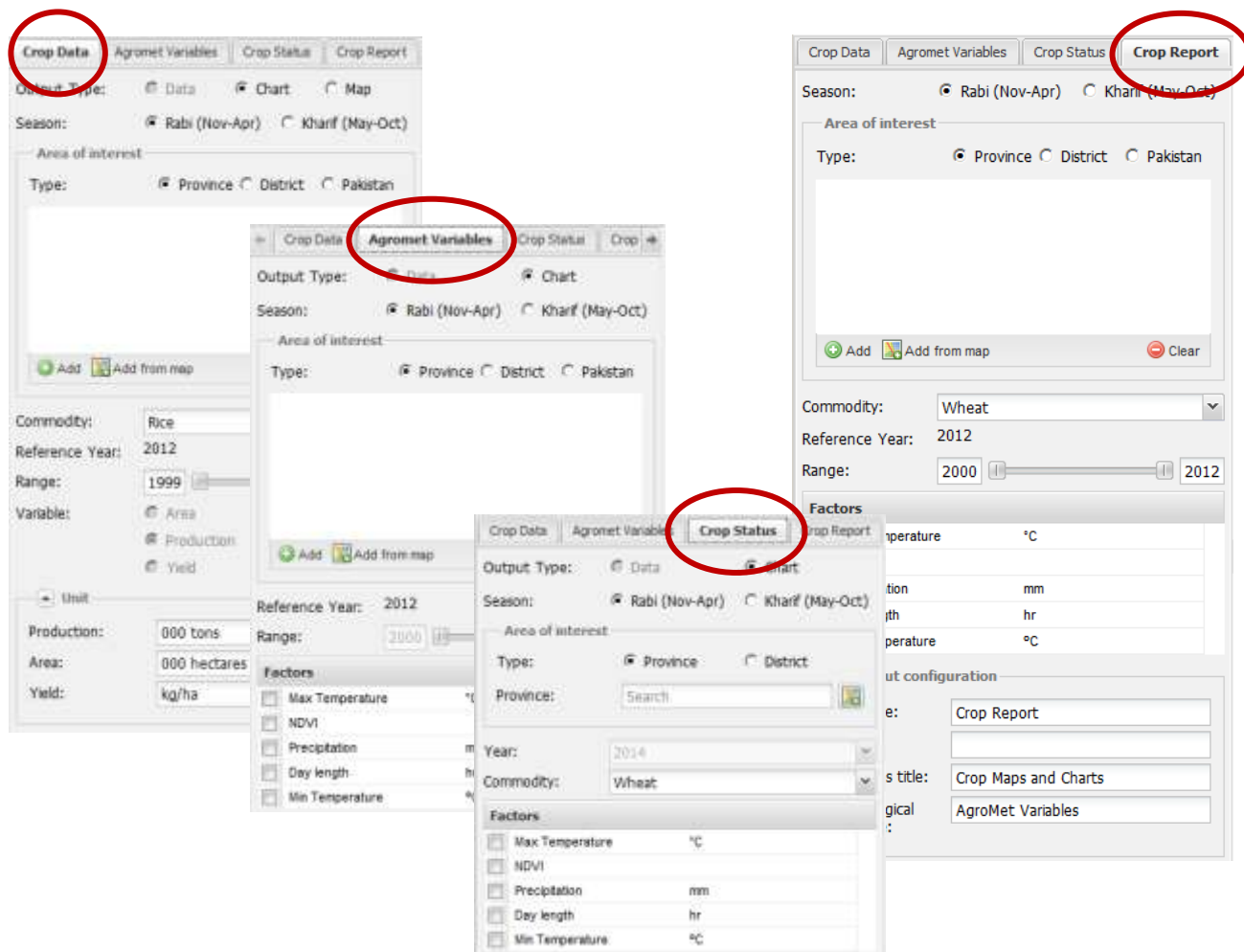
Modules

- Crop Data
 - a. Tables
 - b. Charts
 - c. Choropleth Maps
- Agromet Conditions
 - a. Charting
- Crop Status
 - a. Charting
- Crop Report
 - a. Report
- Geospatial
 - a. Mapping
 - b. NDVI

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Provide table, chart and map outputs from historical crop data

View Crop Data Tables (x)

Pakistan - Crop Data - Commodity: RICE - Season: KHARIF - Years: 1999-2010

Region	Crop	Year	Production(000 tons)	Area(000 hectares)	Yield(kg/ha)
Faisala...	rice	1999	35.30	27.90	1265.23
Faisala...	rice	2000	41.10	28.70	1432.06
Faisala...	rice	2001	29.60	23.90	1238.49
Faisala...	rice	2002	32.70	21.40	1528.04
Faisala...	rice	2003	32.60	25.10	1298.80
Faisala...	rice	2004	38.30	28.30	1353.36
Faisala...	rice	2005	41.00	27.10	1512.92
Faisala...	rice	2006	37.20	25.90	1436.29
Faisala...	rice	2007	42.80	26.70	1603.00
Faisala...	rice	2008	61.80	38.90	1588.69
Faisala...	rice	2009	53.88	32.78	1643.69
Faisala...	rice	2010	46.92	25.90	1811.58
Jhang	rice	1999	106.30	79.30	1340.48
Jhang	rice	2000	126.90	86.20	1472.16
Jhang	rice	2001	104.50	72.00	1451.39
Jhang	rice	2002	117.90	79.30	1486.76
Jhang	rice	2003	150.70	97.90	1539.33
Jhang	rice	2004	176.40	107.60	1639.41
Jhang	rice	2005	178.20	108.00	1650.00
Jhang	rice	2006	170.80	102.80	1661.48
Jhang	rice	2007	158.70	88.20	1799.32
Jhang	rice	2008	182.00	102.80	1770.43
Jhang	rice	2009	110.51	65.96	1675.41
Jhang	rice	2010	102.75	59.08	1739.17

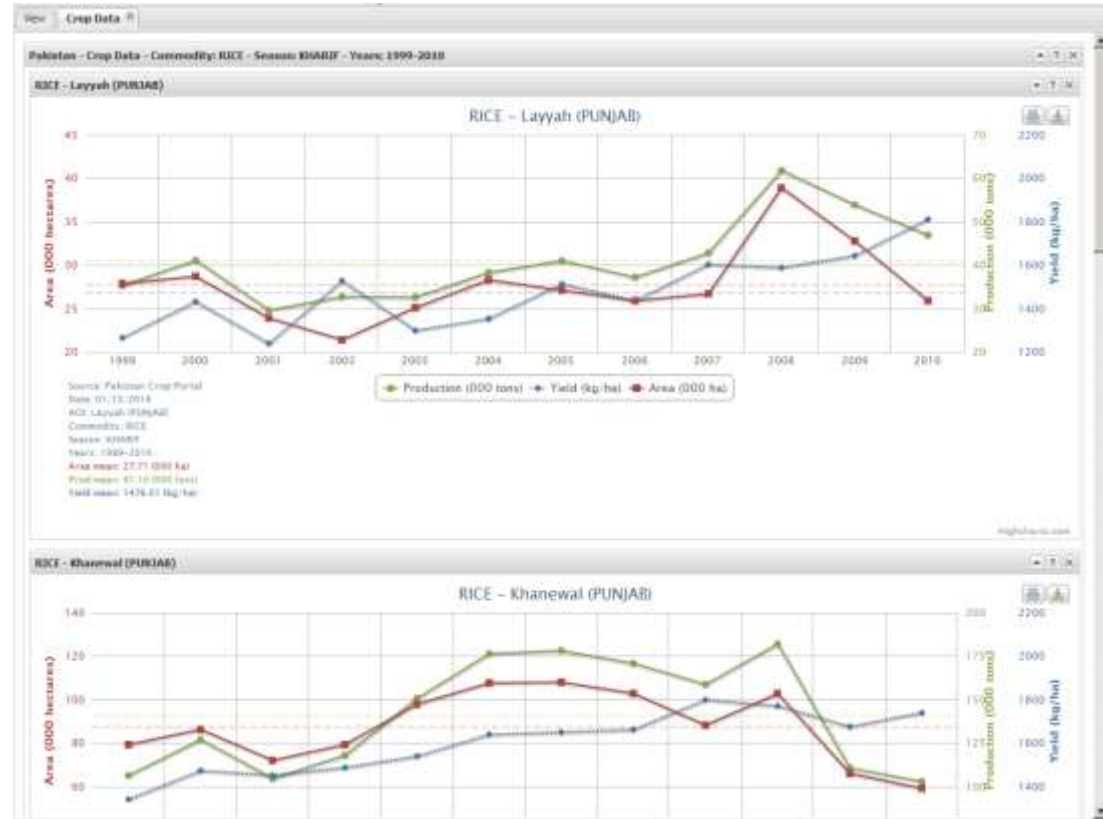
Export



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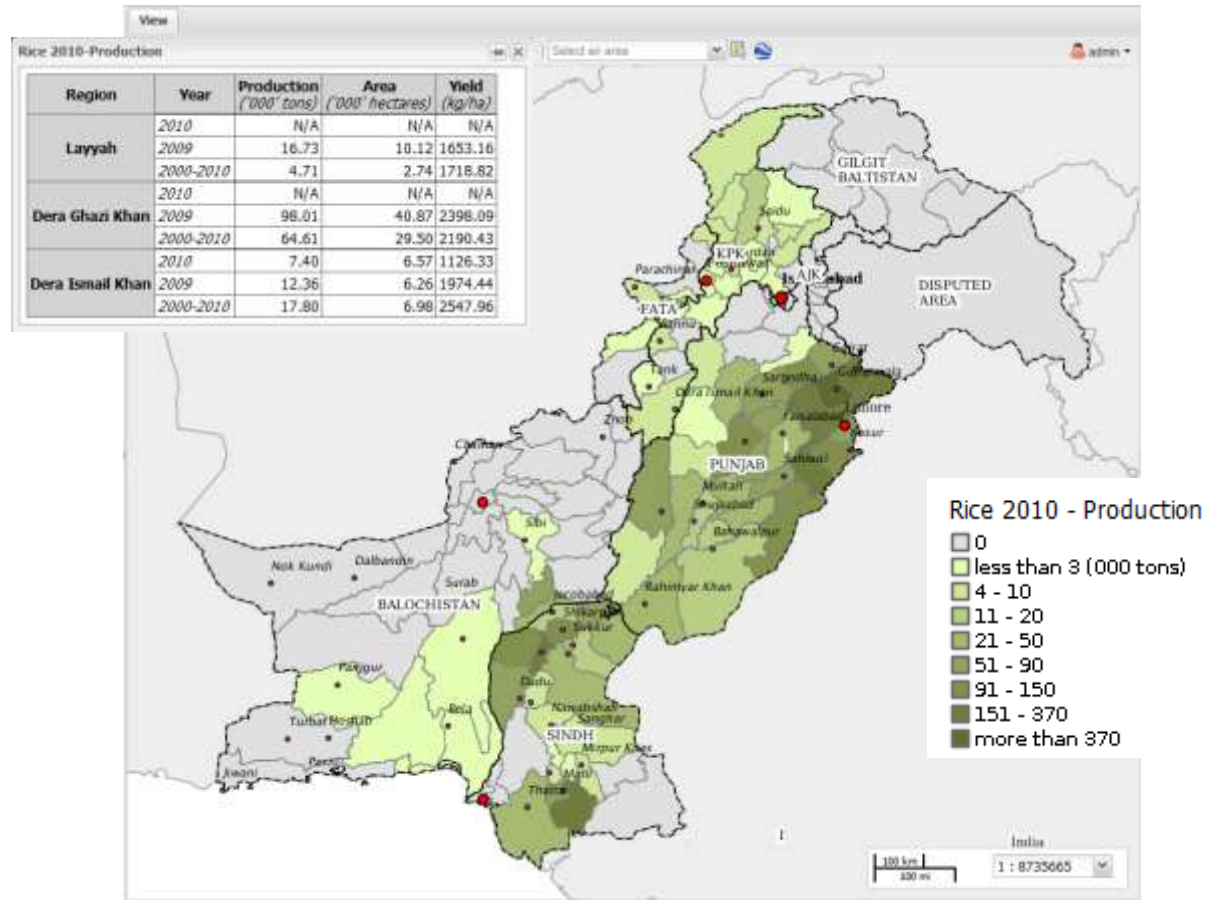
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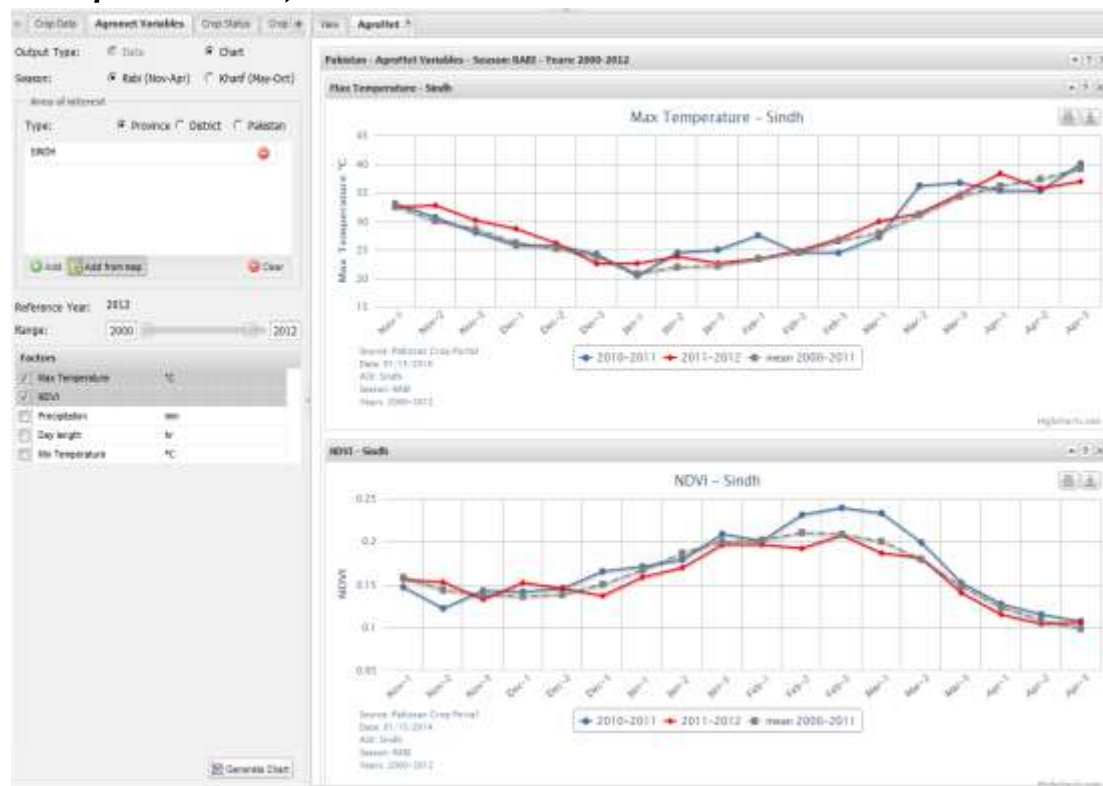
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Provide information about current or historical agro-meteorological data (currently, max/min temperature)



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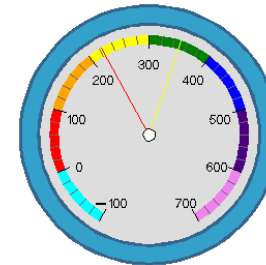
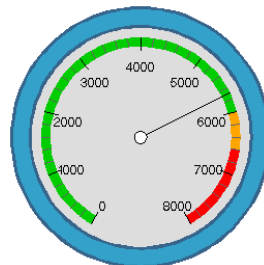
Factors

NDVI

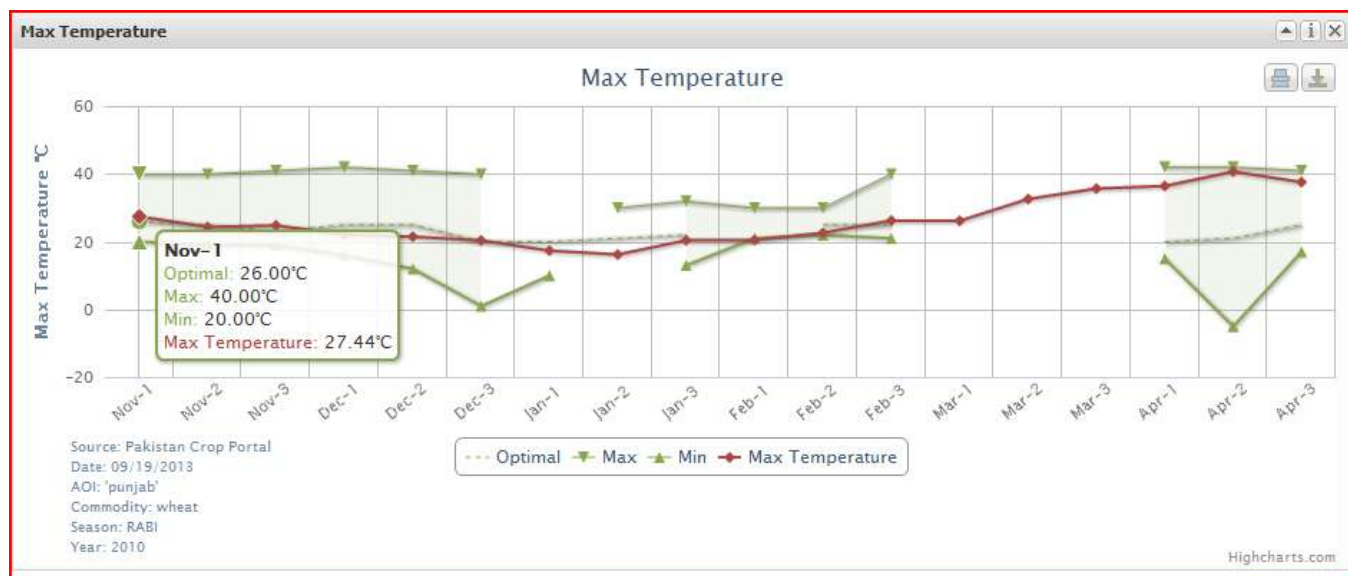
Max Temperature

Min Temperature

Precipitation



Provide information about crop condition and stress throughout the growing season. Parameters such as NDVI or climate based can be compared to the same crop growth stage in past years.



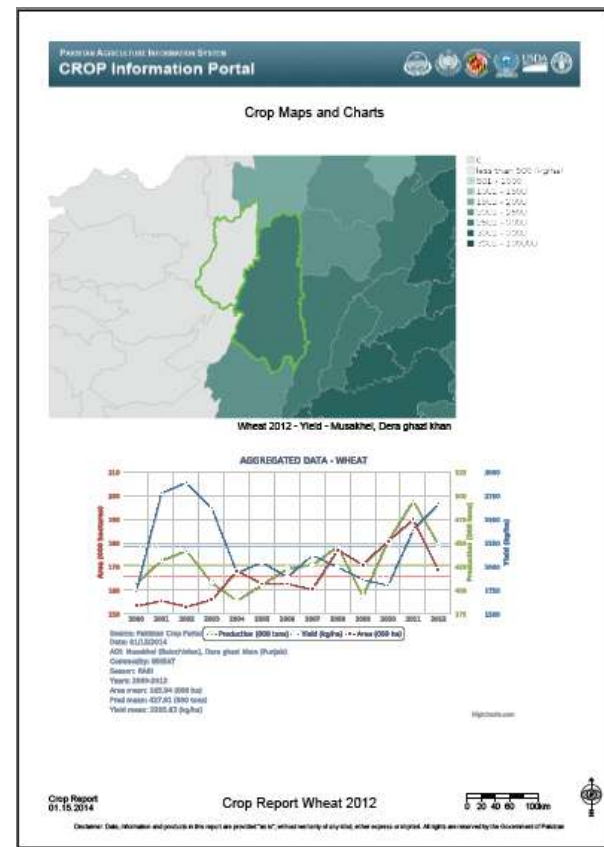
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Provide on the fly reports in PDF format ready for printing

The screenshot shows the 'Crop Report' tab of the Crop Information Portal. It includes the following configuration options:

- Season:** Rabi (Nov-Apr) selected, Kharif (May-Oct) unselected.
- Area of interest:** Type set to District. Selected areas: Musakhel, Dera Ghazi Khan.
- Commodity:** Wheat.
- Reference Year:** 2012.
- Range:** 2000 to 2012.
- Factors:** Max Temperature (°C) and NDVI are checked. Precipitation (mm), Day length (hr), and Min Temperature (°C) are unchecked.
- Layout configuration:**
 - Report title: Crop Report Wheat 2012
 - Subtitle: Districts
 - Crop pages title: Crop Maps and Charts
 - Meteorological pages title: AgroMet Variables

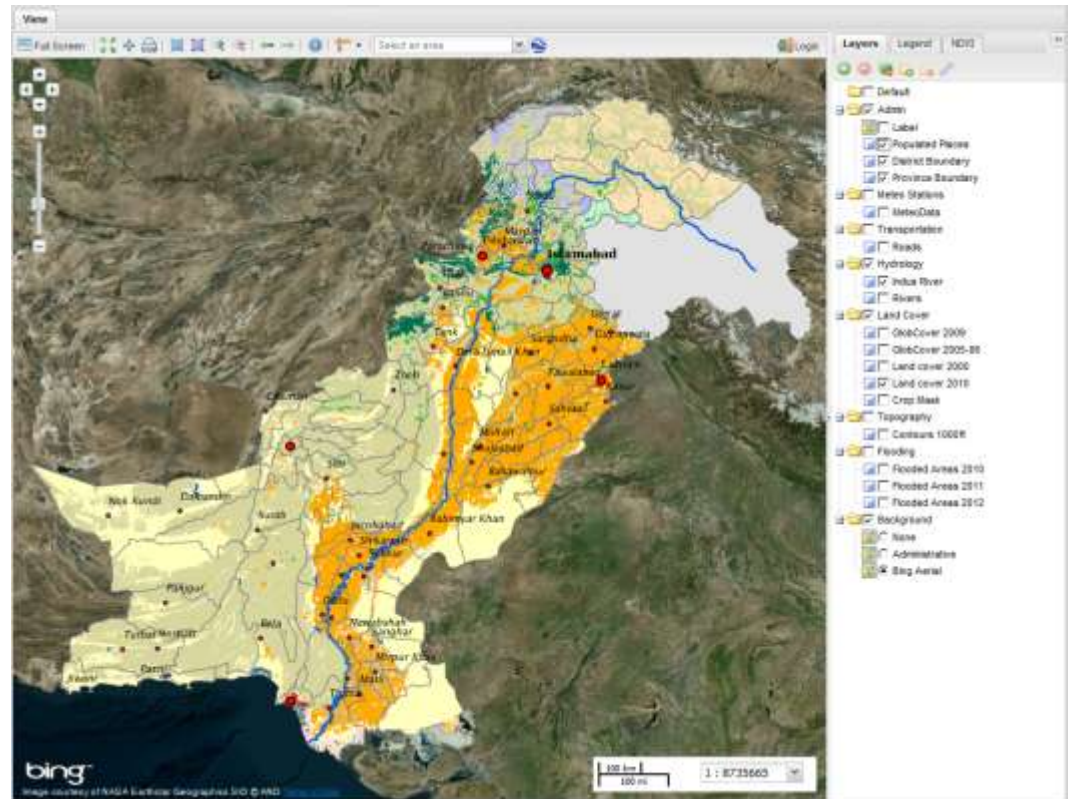




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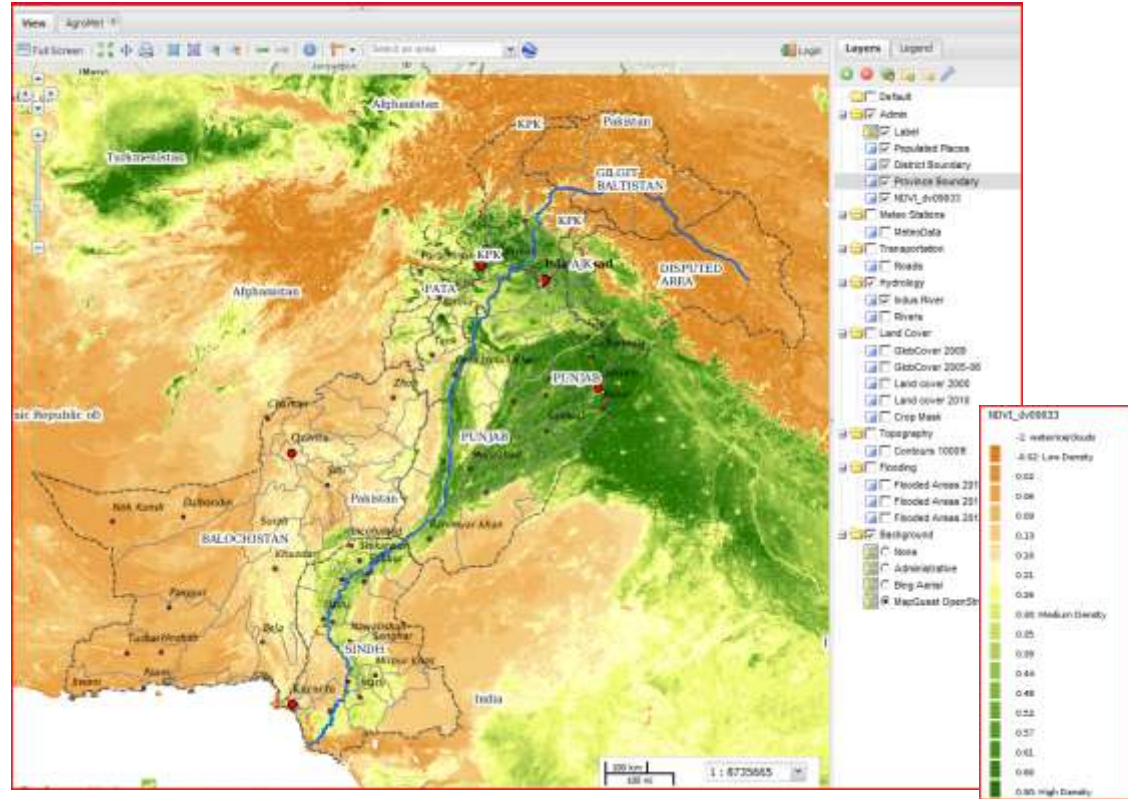
Provide standard mapping capabilities and integrating db derived layers (choropleth maps and NDVI) with local or remote satellite images and thematic datasets



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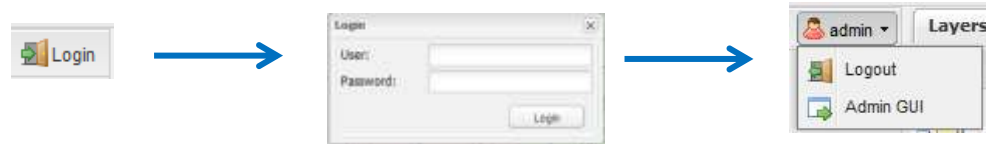


Administration Module

Included is

- Administration of registered user accounts (for data download)
- Creation of a new crop or agromet factor in the system
- **Ingestion of new data or update of existing values**
- Insertion of new NDVI images, and
- Extraction of mean NDVI values per district using a crop mask
- Display log from applied tasks

It allows administrators to perform few common tasks for the maintenance of the Crop Portal.



Name	Actions	Size	LastModified	Delete	Download	Last execution	Status
sugarcane_00_12.tif	GDV	11450 Bytes	22/11/2013	Delete	Download	--	
wheat_00_12.tif	GDV	101113 Bytes	22/11/2013	Delete	Download	--	
wheat_2011.tif	GDV	7895 Bytes	14/01/2014	Delete	Download	14/01/2014	SUCCESS

Select files to upload. Please Add buttons to add more file inputs.

Field installation

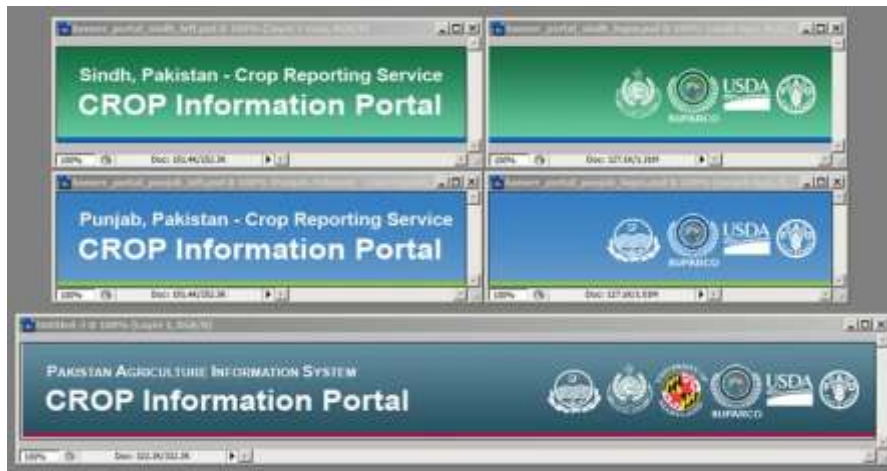
- 3 servers LINUX based have been acquired and set up with the Crop Portal. They will be installed at:
 1. SUPARCO (national version)
 2. CRS of Punjab (provincial version)
 3. CRS of Sindh (provincial version)



Dell PowerEdge T620

- TWO INTEL EIGHT-CORE E5-2690 2.90GHZ/8 GT/S-20MB PROCESSORS (or better)
- 64GB (8 X 8GB)PC3L-10600 DDR3 RDIMMS (or better)
- 24 MEMORY SLOTS
- 8 X 2TB 3.5" SATA (or SAS) HARD DRIVES configured as RAID5
- RAID CONTROLLER WITH CACHE and support for RAID5
- OPTICAL DRIVE DVD-RW
- BIOS MANAGEMENT ENGINE
- TWO 750W (or higher as needed) COMMON SLOT PLATINUM HOT PLUG POWER SUPPLIES
- INPUT VOLTAGE 220V
- HIGH VOLTAGE POWER CORDS
- STANDARD WARRANTY

Linux Server





Notes about the data

- Area, production and yield data stored in the Crop Information Portal derive from official Pakistan's Government publications.
- Current Districts (latest review in October 2013) have changed during the period covered by the Portal's database; for example:
 - Nankana Sahib (Punjab) was created in 2005 from Sheikhpura district.
 - Jamshoro (Sindh) was created in 2006 from Dadu district
 - Kashmore (Sindh) was created in 2006 from Jacobabad district.
 - Qambar Shahdadkot (Sindh) was created in 2006 from Larkana district.
 - Matiari, Tando Allahyar, and Tando Muhammad Khan (Sindh) were created in 2006 from Hyderabad district.
 - Harnai (Balochistan) was part of Gilgit.
 - Sheerani (Balochistan) was part of Zhob.
 - Hunza-Nagar (Gilgit-Baltistan) was part of Ziarat.
 - Washuk (Gilgit-Baltistan) was part of Kharan.
 - Tor Ghar was part of Meinsehra (KPK).
 - Skardu is the new name of Baltistan (Gilgit-Baltistan).



Notes about the data

- AgroMet variables included in the Portal are district based average values generated from different sources and processed by SUPARCO.
- Day length data changes per admin unit (latitude) and during the year (from Jan to Dec), but it does not change year by year. Thus, charts show one only line (current year is equal to previous and for the whole period).
- Aggregations of Districts/Provinces are calculated
 - a) for crop values, by summing areas and production, and averaging yields
 - b) for AgroMet variables, by averaging district values. Spatial aggregations of district values need to be considered with caution in regard of AgroMet data because of the nature of this information and their quite complex spatial variability.



Notes about the data

Units of measure

- **Crops (all):**
 - o Area (thousand hectares, 000 ha)
 - o Production (except Cotton: thousand metric tons, 000 t)
 - o Production (Cotton: thousand bales, 000 b; 1 bale = 170kg)
 - o Yield (metric kilograms per hectare, kg/ha)
- **AgroMet variables:**
 - o Temperature (degree Celsius, ° C)
 - o Precipitation (millimeter, mm)
 - o NDVI (index, +1.0 ... -1.0)
 - o Daylight length (hours, h)