Application of satellite remote sensing for monitoring of crops and environment
Monitoring of crops

The project is being carried out in collaboration with M/o Food & Agriculture
Objectives

• Crop area and yield estimation
• Capacity building of crops reporting services in the provinces and federal institutions
### Coverage 2005-06

<table>
<thead>
<tr>
<th>Province</th>
<th>Districts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Punjab</td>
<td>02</td>
</tr>
<tr>
<td>Sindh</td>
<td>01</td>
</tr>
<tr>
<td>Total</td>
<td>03</td>
</tr>
</tbody>
</table>

* Wheat, Cotton and Rice
## Coverage 2006-07

<table>
<thead>
<tr>
<th>Province</th>
<th>Districts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Punjab</td>
<td>26</td>
</tr>
<tr>
<td>Sindh</td>
<td>11</td>
</tr>
<tr>
<td>NWFP</td>
<td>06</td>
</tr>
<tr>
<td>Balochistan</td>
<td>01</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>44</strong></td>
</tr>
</tbody>
</table>

* Wheat, Cotton, Rice, Sugarcane and Maize
Project Coverage 2006-07

Crops
- Sugar cane
- Cotton
- Wheat
- Rice
- Maize

Districts
- Punjab: 26
- Sindh: 11
- NWFP: 06
- Balochistan: 01
## Coverage 2007-08

<table>
<thead>
<tr>
<th>YEAR</th>
<th>Provinces</th>
<th>Districts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kharif</td>
<td>Punjab</td>
<td>35</td>
</tr>
<tr>
<td>(Cotton, rice, sugarcane, maize)</td>
<td>Sindh</td>
<td>17</td>
</tr>
<tr>
<td></td>
<td>NWFP</td>
<td>06</td>
</tr>
<tr>
<td></td>
<td>Balochistan</td>
<td>03</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>61</td>
</tr>
</tbody>
</table>

Rabi  
(Wheat)  
Covered the entire country in toto
Crop area estimation

- Area frame development
- Image classification techniques
Area Frame

Legend
- Pakistan
- Punjab_Potohar_Zone
- Punjab_North_East_Zone
- Punjab_Central_Zone
- Punjab_Southern_Zone
- Sindh_Left_Zone
- Sindh_Right_Zone
- NWFP_North_Zone
- NWFP_South_Zone
- Balochistan_Zone
Methodology

- Wall to wall imagery of the area of interest (AOI) two times during growing period of a crop
- Development of satellite image mosaics
- Development of spectral signatures
- Maximum likelihood technique
Classified Images
2005-06
Classified Images
2006-07
Sugarcane : Aug, 06

RAJANPUR

Legend
- Non-Agricultural
- Sugarcane
- Cotton
Classified Images
2007-08
Cotton
Bahawalpur-2007
Wheat: Peshawar – April 2008
Crop yield estimation

- NDVI imagery
- Agromet data
- Crop cut data
- Fertilizer data
### Wheat estimate 2007-08, 20th Apr 2008

<table>
<thead>
<tr>
<th>Provinces</th>
<th>SUPARCO (000 tons)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Punjab</td>
<td>15,890</td>
</tr>
<tr>
<td>Sindh</td>
<td>2,720</td>
</tr>
<tr>
<td>NWFP</td>
<td>990</td>
</tr>
<tr>
<td>Balochistan</td>
<td>750</td>
</tr>
<tr>
<td>Pakistan</td>
<td>20,350</td>
</tr>
</tbody>
</table>

*3% difference with the final estimates released in October 2008*
# Wheat Crop 2008-09
(13th Apr 2009)

<table>
<thead>
<tr>
<th>Province</th>
<th>Area (000 ha)</th>
<th>Production (000 tons)</th>
<th>Yield (kg/ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Punjab</td>
<td>6624.4</td>
<td>17183.3</td>
<td>2594</td>
</tr>
<tr>
<td>Sindh</td>
<td>1074.0</td>
<td>3361.1</td>
<td>3129</td>
</tr>
<tr>
<td>NWFP</td>
<td>762.0</td>
<td>1038.9</td>
<td>1363</td>
</tr>
<tr>
<td>Bal</td>
<td>392.0</td>
<td>806.1</td>
<td>2056</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>8852.4</strong></td>
<td><strong>22389.4</strong></td>
<td><strong>2529</strong></td>
</tr>
</tbody>
</table>

*4% difference between SUPARCO est. and FCA forecast*
Transfer of technology
Transfer of technology Program

SUPARCO

3 x 13 trainings executed as planned for stakeholders

SPOT IMAGE FRANCE

1 x 35 training program executed for SUPARCO 18 & stakeholder 17 persons

FAO/ULG

2 x 15 planned; one program executed May 2007 (SUPARCO 9, stakeholders 6 persons); second in May 2008
Participation

- Economic Wing of MINFA
- Agricultural policy institute, MINFA
- Crop Reporting Services, Punjab, Sindh, NWFP and Balochistan
- Pak-Met Department
- SUPARCO
- FBS
- Agricultural Department, AJK
ENVIRONMENT
Muhammadpur Ghotki: Frost damage
Surface drainage system
Cholistan

Shallow water
Deep water
Indus in flood: RYK-Rajan pur section

June 07, 2005

July 09, 2005
Executive Summary
Dandbeh, Hattian
Muzaffarabaad

Post EarthQuake 21-10-2005

Pre EarthQuake 22-10-2004

A landslide at 34° 42' E and 34° 08' 20" N caused by severe Earthquakes on October 8, 2005 south of Hattian blocked the streams near Dandbeh village in Muzaffarabaad District.

Land Slide Area = 181.3440 Ha
Thank you