GEO Task AG-07-03 a
Developing a
Global Agricultural Monitoring System of Systems:
Yesterday, Today and Tomorrow

Chris Justice, Olivier Leo, Wu Bingfang, Jai Singh Parihar
and the
GEO Agricultural Monitoring (Ag0703)
Community of Practice
GEO Agricultural Monitoring System of Systems: Approach

1. Develop a common vision for the system amongst the Community of Practice (CoP)
2. Establish the conditions under which such a system can develop (with GEO partners)
3. Raise awareness to the importance of EO for agricultural monitoring and the level of national commitments for the Task Activities (CoP)
4. Identify near term practical steps (task activities and initiatives) that would contribute to achieving the vision (CoP)
GEO Agricultural Monitoring
Near Term Initiatives (3 years)

- **Initiative**: A Multi-source Production, Acreage and Yield (PAY) database

- **Initiative**: Coordinated Data Initiatives for Global Agricultural Monitoring (CDIGAM).

- **Initiative**: Joint Experiments on Crop Assessment and Monitoring (JECAM)

- **Initiative**: GLAMSS Thematic Workshop Series (GTWS).

- **Initiative**: Agricultural Land Use and Climate Change.
Initiative: PAY: a Production, Acreage, Yield multi-source online database

- A common centralized online database of Production, Area and Yield statistics generated by different agencies
- Enable identification of agreements and disagreements in national level crop statistics
- Four groups generate agricultural statistics on a regular basis for multiple countries: the USDA FAS, JRC MARS, IRSA Crop Watch and the UN FAO
- Initially the database will be populated with national level estimates from these 4 agencies and will later be expanded to include statistics from individual countries
The PAY web-interface

Interface allows for queries on Yield, Production and Area by:
- Agency
- Commodity (Corn, Soy, Wheat, Rice)
- Country
- Year (2005-present)
- Date of Forecast
- Data Type (Forecast, Reported)
Coordinated Data Initiatives for Global Agricultural Monitoring (CDIGAM)

- To ensure the on-going, frequent and timely acquisition, accessibility of satellite data during crop growing season and the continuity of those observations necessary for agricultural monitoring

- Compile the best available information on agricultural areas, crop calendars and cropping systems – define a global acquisition strategy

- To fill the gaps in the current in-situ observations.

- Near Term CoP Contributions:
  - Dynamic Global Croplands Likelihood Map (250m)
  - Near Real Time data from MODIS (NASA/USDA/UMD)
  - Compilation of Enhanced Global Crop Calendars (ISRO)
Crop calendars needed in the definition of satellite data acquisition strategies
JECAM
Joint Experiments on Crop Assessment and Monitoring

- A GEO Ag CoP Initiative, led by Canada GEO, that aims to facilitate the inter-comparison of monitoring and modeling methods, product accuracy assessments, data fusion and product integration, for agricultural monitoring
- This will be achieved by setting up a network of distributed regional experiments in cropland pilot sites around the world which represent a range of agricultural systems
- Time series datasets from a variety of earth observing satellites and in-situ data sources will be acquired for each of the sites
- Synthesis of the results from JECAM will enable:
  - Development of international standards for monitoring and reporting protocols
  - A convergence of the approaches to define best practices for different agricultural systems
  - Identify requirements for future EO systems for agricultural monitoring.
Compute the farmland weighted average yield of experimental plot, accuracy: 97.8%

Validation in crop yield prediction
Initial Countries participating in the JECAM Study

Initiative coordination by Canada GEO with Agriculture and Agri-Food Canada

Next step coordinated data acquisition working with CEOS
GLAMSS Thematic Workshop Series (GTWS)

- To improve communication among the Community of Practice,
- Develop best practices and standards,
- Increase international cooperation and coordination

Beijing 2009 – System of Systems Components
Ispra 2008 – Crop Area Estimation Best Practices
Ahmedabad 2009 Impact of Climate Change on Agriculture
Kananaskis 2009 - SAR to support AGMON
Initiative: Climate Change Impacts on Agriculture

ISPRS WG VIII/6 & GEO AG 07 03
Workshop on
Impact of Climate Change on Agriculture
Hosted by:
Space Applications Centre, ISRO, Ahmedabad India
&
Indian Society of Remote Sensing- Ahmedabad Chapter, Ahmedabad, India
Venue: SAC, Ahmedabad
Date: 17-18, December, 2009
Web site: www.commission8.isprs.org/wg6/
Global Agricultural Monitoring System of Systems (GLAMSS)
(GEO Task: AG-07-03a)

**Aims**

- Global monitoring of agricultural production, facilitating risk reduction and increase in productivity.
- Timely and accurate national and sub-national agricultural statistical reporting.
- Global mapping, monitoring, and modeling changes in agriculture.
- Effective early warning of famine, enabling a timely mobilization of international response.

**Multi-source Production, Acreage, Yield (PAY) Database**

Common centralized online database to enable objective assessment of food security and risk management planning.

Facilitate inter-comparison and convergence of estimation methods.

**Joint Experiments on Crop Assessment and Monitoring (JECAM)**

Cooperative field experiments using multi-source satellite and in-situ data, facilitate inter-comparison of monitoring and modeling methods & products.

Provide prototyping of GLAMSS.

**Coordinated Data Initiatives for Global Agricultural Monitoring (CDIGAM)**

Working with space agencies to establish coordinated, timely acquisition and improved accessibility of satellite data.

Evolve a free and open data policy to support agricultural monitoring.

**GLAMSS Thematic Workshop Series (GTWS)**

To improve communication among the Community of Practice on priority topics, developing best practices and standards.

Encourage international cooperation and coordination.

• Global monitoring of agricultural production, facilitating risk reduction and increase in productivity.
• Timely and accurate national and sub-national agricultural statistical reporting.
• Global mapping, monitoring, and modeling changes in agriculture.
• Effective early warning of famine, enabling a timely mobilization of international response.
The GEO Global Agricultural Monitoring Community of Practice

THANK YOU FOR ATTENTION