

Sub-task Number: AG-07-03a

Sub-task Title: Global Agricultural Monitoring System of Systems (GLAMSS)

Overarching Task: Global Agricultural Monitoring

Area: AGRICULTURE

Related Community of Practice: Global Agricultural Monitoring

Relevant Committee: TBD

Related Targets: (to be included in 2009)

Sub-task Definition (as given in the 2009-2011 Work Plan):

Develop and improve a global operational agricultural monitoring system – enhancing current capabilities in the areas of monitoring, famine early warning and food security. Related activities will include: (i) Global mapping and monitoring of changes in distribution of cropland area and associated cropping systems; (ii) Global monitoring of agricultural production leading to accurate and timely reporting of national agricultural statistics, accurate forecasting of shortfalls in crop production, and reduction of risk & increased productivity at a range of scales; (iii) Development of early warning systems for famine, enabling timely mobilization of international response in food aid.

Leads (GEO Member or PO, Entity carrying out the work, Contact: e-mail):

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NB. The activity (i) identified in the task definition above will be designed and implemented in close cooperation with GOFK/GOLD (POC – Michael Brady (Natural Resources, Canada))

Motivation/Background (Why should this Task or sub-task be implemented? What relevance to society? What is the state of the art? 3-5 lines)

Ensuring world food security in part requires timely and accurate agricultural monitoring and assessment, with transparent reporting. A number of agricultural monitoring systems exist around the world, often providing different results, which could benefit from increased cooperation, shared standards and shared data. These systems often do not take advantage of the earth observations for providing timely results, though, there is benefit in integrating remote sensing with traditional ground-based methods. There are also a number of shortcomings in the current and planned earth observation systems for agricultural monitoring, which could be remedied through i) a better definition of sensor system requirements, some of which are well understood now and some which are emerging through a series of joint experiments, ii) increased coordination and cooperation between the space agencies, meteorological agencies and data providers. A focussed global effort is needed to ensure timely generation and flow of earth observation data and information for agricultural monitoring and to inform policy and decision-makers. This can be achieved through an international program of cooperation among the earth observation agencies and the agricultural monitoring community.

Outputs (e.g. products and services which result from the activities of the Task/sub-task; outlined in the form of deliverables with timelines)

Planned Initiatives:

In this period, outputs are being developed around four major initiatives and a number of sub tasks, the latter will be updated periodically:

Initiative 1 A multi-source Production, Acreage and Yield (PAY) database on common platform. This will enable intercomparison of crop statistics forecasts reported by the different reporting agencies as the growing season progresses as well as intercomparison of historic statistics.

Initiative 2. A Joint Experiment on Crop Assessment and Monitoring (JECAM) undertaking modelling and monitoring method intercomparisons, accuracy assessments, data fusion, and product integration, for agricultural monitoring based on multi-source satellite and in-situ data. The objective of JECAM is to compare data from disparate sources, methods, and results over a variety of cropping systems; to reach a convergence of the approaches; and to develop monitoring and reporting protocols and best practices for different agricultural systems.

Initiative 3. A Coordinated Data Initiative for Global Agricultural Monitoring (CDIGAM). i) 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, ii) compile the best available information on agricultural areas, crop calendars and cropping systems, iii) to fill the gaps in the current in-situ observations.

Initiative 4. A GLAMSS Thematic Workshop Series (GTWS). Community workshops will be held on thematic methodological issues and topics to improve communication amongst the CoP, develop best practices and standards as well as encourage cooperation, coordination and data sharing.

Produced (Milestones Accomplished):

The GEO Global Agricultural Monitoring System of Systems (GLAMSS) Community of Practice (CoP) was formed, a common vision for the Task developed and priority initiatives and sub tasks identified. A Task Secretariat was established at ISRO/SAC India and a Web Site for the CoP developed by the UMD (www.earthobservations.org/cop_ag_gams.shtml).

Three community planning workshops were held (FAO Rome 2006, FAO Rome, July 2007, IRSA Beijing, February, 2009). A GAMS Thematic Workshop on Crop Acreage Best Practice was held at the EC JRC Ispra, Italy June, 2008. A GAMS Thematic Workshop on Satellite Rainfall Estimation was held at the EC JRC Ispra, Italy, October 2008.

Activities (operations or work processes through which resources are mobilized to produce specific outputs; outlined in the form of milestones including timelines)

Ag 0703a Sub Tasks for 09-11

- Sub Task 1. PAY Initial Data Base Development (ISRO, FAS, JRC, IRSA, UMD, Nov 2009)
- Sub Task 2. GLAMSS Best Practices Document to be completed (ISRO Nov 09)
- Sub Task 3. JECAM – Joint Experiments on Crop Assessment and Monitoring
 - 3a. JECAM China – Database to be put on-line, initial experiment design, (IRSA Dec 09) implementation 2010
 - 3b. JECAM Europe – initial planning 2009 (UCL)
 - 3c. JECAM Canada – initial planning 2009, preliminary implementation 2010
 - 3d JECAM Ukraine – initial planning 2010
 - 3b. JECAM Argentina – initial planning 2010, preliminary implementation 2011 (CONAE, SDSU, UMD)
- Sub Task 4. CDIGAM - Coordinated Data Initiative for Global Agricultural Monitoring
 - 4a. CDIGAM Croplands data set at c. 250m (SDSU Nov 09).
 - 4b. CDIGAM Croplands data set input data set GLS 2005 (20-60m) (NASA/USGS Dec 2009)
 - 4c. CDIGAM Croplands data set input data set GLS 2010 data collection to be initiated (20-60m, multi source) with GEOSS Task DA-07-02 (GOFC/GOLD/NASA/USGS).
 - 4d. CDIGAM Initial Observation Adequacy Assessment (USGS/CEOS, UIC GOFC/GOLD 2009)
 - 4e. CDIGAM Compilation of Merged Global Data Base for Early Warning (FAO/FEWS/UMD/FAS Dec 09)
 - 4f. CDIGAM Africa Rainfall Observation Network Needs Assessment (FEWS)

- Sub Task 5. GTWS - GLAMSS Thematic Workshop Series
 - 5a. GTWS Workshop on combining SAR and Optical Data for Agricultural Monitoring (Agriculture Canada, Nov 09)
 - 5b. GTWS Workshop on Climate Change and Agriculture jointly with ISPRS (Dec 09 SAC/ISRO, India)
 - 5c. GTWS Workshop to review methods for integration of in-situ and EO estimates of rainfall in Africa (EC-JRC, early 2010)
 - 5d. GTWS Workshop Belgium (UCL, VITO 2010)
 - 5e. GTWS Regional Workshop on Latin America Agricultural Monitoring (Brazil, 2010)
- Sub Task 6. Development of a GLAMSS Brochure and outreach materials (GEO Secretariat, SAC/ISRO July 09)
- Sub Task 7. Global Field Size Data base (Lead TBD)

[Note: Updates on outputs and activities will be formally provided twice a year, according to the GEO schedule for 2009]

Resources (indication of resources – e.g. financial, human – contributed by GEO Members or Participating Organizations to produce outputs)

- i) A Space Agency Sponsorship for JECAM coordination support is currently being sought. Space Agencies will also be requested to acquire and provide data over the JECAM Test Sites during agricultural growing season from Sept 2009-2011.
- ii) CEOS cooperation in CDIGAM (i) and (iii) is needed. Specific requests will be made during the next 12 months.
- iii) WMO assistance is needed for CDIGAM(iii) to increase coverage of African the rainguage stations in GTS

Architecture and Data Component

1) Please briefly describe any task-related Earth observation resources (data set, system, website/portal) and any related Web Service interfaces that are contributed to GEOSS. State whether these items are or will be registered with the GEOSS Component and Service Registry for access via the GEO Web Portals, and whether any associated standards or other interoperability arrangements will be registered in the Standards and Interoperability Registry.

The Community of Practice Web Site has been developed and is being maintained. Links are provided through the GEO Web Site. An easier system of site update by the COP is needed. The PAY data base is currently in development for internet sharing. Following its initial design and pilot implementation, the suitability for inclusion in the GEO Web Portal will be evaluated.

2) Please also describe what data and information your activity/system needs that you would request to be accessible through the GEOSS Common Infrastructure.

Capacity Building Component

(capacity building is defined to include the development of capacity related to: (i) Infrastructure and technology transfer (Hardware, Software and other technology required to develop, access and use EO); (ii) Individuals (education and training of individuals to be aware of, access, use and develop EO) and (iii) Institutions – building policies, programs & organizational structures to enhance the value of EO data and products).

1) In accordance with the above definition does this Task have a capacity-building component? If so, please provide a short description of this component including a description of end users.

Capacity building is a key area of development in order to achieve the task of global agricultural monitoring system of systems. This will be undertaken primarily by partner Task Ag 0703c in close cooperation with this task.

2) *Have any additional CB needs for this Task been identified? Please provide a short description.*

A number of CB needs were identified at the Beijing Workshop 09 and are being addressed by Partner Task Ag 0703c. These include training, a visiting scientist program and travel support for developing country scientists to attend the GTWS Workshops. Training support for CB has been offered by ISRO, India and IRSA, China. Proposals have been submitted to the GEO CB call for proposals.

User Engagement Component

(please briefly describe to what extent end users are engaged in this Task and influence the nature of the outputs produced)

The Community of Practice consists of data providers, data producers and data users. Increased user participation is being developed and fostered through the GTWS and JECAM Initiatives. The COP is open for individuals and organizations to join and participate.

Science and Technology (S&T) Component

1) *Please briefly describe the elements of scientific research or technological development contained in this Task.*

2) *In relation to the S&T component(s) of this task, please describe gaps, priorities, continuity needs, barriers, scientific expertise and additional resource needs (this information will be used for developing a gaps and needs assessment in Task ST-09-01)*

A number of S and T components are critical to the success of this task. These include:

- 1) A system of coordinated data acquisition and increased availability amongst the Landsat class sensors is needed to ensure 2-3 day coverage during critical periods of the crop calendar.
- 2) The implementation of the CEOS GLI Constellation is needed by this task
- 3) Improved data interoperability of the coarse and moderate resolution sensors is needed.
- 4) Data continuity is needed for the primary coarse and moderate resolution sensing systems used for agricultural monitoring.
- 5) An increase in the number of meteorological stations contributing to the WMO database is needed.

Members and POs' Contributions to Outputs and Activities above:

(Input is optional. This section gives the chance to Members and POs to provide more details (3-5 lines) on their individual activities, making a clear connection with the Outputs and Activities outlined above).

A large number of individuals and institutions are involved in the program and are included in the list of the Community of Practice identified below. A summary of the selected participating national programs can be found on the COP Web Site - http://www.earthobservations.org/documents/cop/ag_gams/

Participation To Date:

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Community of Practice Participation (Table to be filled in 2009):

The following list includes members of the Community of Practice that have attended our Strategic Planning Workshops and the GLAMSS Thematic Workshop Series or have shown an interest in contributing to the task.

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