“Open Session on “Space for Agriculture and Food Security”
Rome, 09 March 2012
World Food Program Auditorium

Crop Monitoring and Food Security: the JRC action and prospect

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MARS (Monitoring Agricultural ResourceS) Unit:
60 staff in 4 actions:

- **GEOCAP**: Geomatics for the CAPcontrol
- **CID**: Community Image Data portal
- **AGRI4CAST**: crop production forecast in Europe; extension under development
- **FOODSEC (Food Security Assessment)**: crop monitoring & food security information mainly in sub-Saharan Africa
2 types of methods (choice of MS) based on Computer-Aided Photo Interp.

[1] “standard” scenario: VHR+HR: 1 VHR image + n current year HR images
[2] “VHR only” scenario: 1 VHR + rapid field visits
Control of Good Agri-Environmental Conditions

Example of GAEC control: maintenance of landscape element (hedge, pond, isolated trees, trees in line or group of trees)

Images VHR (1m)
Reference year vs Current year
Control by CAPI
General frame of the MARS crop monitoring system

Crop monitoring
Yield forecast
Crop area estimation
Climate change impact
Early warning

AGRI4CAST
FOOD SEC

MARS Crop monitoring system
30 staff Global data infrastructure

1.5 M € / an

10-15 staff MARS OP (1-2-3)
ALterra, VITO, MeteoConsult, GISat
Near real time Acquisition & processing

Earth observation
Meteo (observations & forecast)
Crop simulation
Visualization tools / DB

Partners:
- FAO, WFP
- USAID, FEWSNET

Collaboration agreements:
- USA, Brasil, Argentina, China, Kazakhstan, African Union, Agrhyemet, RCMRD…
The MARS system for crop monitoring

MARS Crop Growth Monitoring and Yield forecasting System

- Data collection
- Earth Observ.
- Climate data
- Ground stations + Global Circulation Models
- Auxiliary information
- LAND COVER
- SOIL
- Analysis
- Stat. analysis
- Crop models
- QUALITATIVE INFO
  - Crop status report, early warning
- QUANTITATIVE INFO
  - Yield forecasts

Global low and medium resolution
0.3 - 1.0 - 5.0 Km

The MARS system for crop monitoring
Monitoring of the 2011 drought in Europe

MARS reports weekly to DG AGRI on the development of the situation over Europe and neighbouring countries

Meteo data interpolated or model outputs (CGMS)
Spot VGT data at 1km -> NDVI, fAPAR 1st dekad of June

NDVI anomaly (%) = (NDVI 2011 – NDVI mean 99-2010) / NDVI mean 99-2010

Monitoring of the 2011 drought in Europe
Crop monitoring / food security bulletins on specific countries according to need and demand

Number of seasons since October 2010 that have failed or are delayed. "Failed" means that a poor season was observed compared to the short-term average (1999-2009). These conditions are derived from the interpretation of SPOT NDVI profiles.
Qualitative monitoring and early warning

Ex: Somalia 2009 vs 2008 & mean 99-08

Need to focus on the right area and time (crop season)
2011 drought in Ethiopia

NDVI

RFE
Table  Correlation Matrix of maize yield and the independent variables

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<th>WDEFt</th>
<th>ETAi</th>
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- Similarity analysis
- Regression analysis
  - simple CNDVI yield regression
  - multiple regression with bio-climatic indicators

Plus recherche qu’application opérationnelle

R² = 0.81
RMSE = 0.359 t/ha
CV = 23%
MARS system provides efficient user (analyst) interfaces

MARS Viewer provides online access and query to databases and models outputs
Capacity building

JRC training 28-30 September 2011

Wednesday 28 September

Training Module 1: MARS Viewer
14:30 – 17:30 Use of remote sensing and agro-meteorological data for crop monitoring.
  Production of Anomaly maps and seasonal profiles
TBC Introduction to FAO E-learning (in general and/or “Crop monitoring and EO components”)

Thursday 29 September

Training Module 2: SPIRITS (Software for Processing and Interpreting Raster Image Times Series)
9:00 presentation of the tool
10:00 access to input data: E-station, Devcovacl, FEWSNET data portal...
  - Practical session 1
11:00 importing input data from different sources
12:00 computing the historical average and anomaly maps
12:30 Lunch
  - Practical session 2
14:00 – 17:00 exercises

- Customized methods, tools
- IPC
- National and regional bodies
The recent declaration of famine in Somalia followed an IPC process.

The Famine IPC class is based on 3 main outcome indicators:
Global Acute Malnutrition >30%,
Crude Death Rate >2/10,000/day, and
at least 20% of households facing extreme food shortages with limited ability to cope.

IPC maps the present situation, characterizes its likely evolution and is regularly updated.

Evidence and Standards for Better Food Security Decisions
Feasibility study to cover the globe

- Monitor the impact of weather in the main grain producing areas
- Produce short-term forecasts

4 zones of the world main crops of interest: wheat, barley, rice, maize, rape seed, soybean, sugar cane

GLOBCAST is a feasibility study currently conducted for DG AGRICULTURE
G20 initiative on agriculture and price volatility

Summit of G 20 Ministers of Agriculture - Paris, 22-23 June 2011

Ministerial Declaration
ACTION PLAN ON FOOD PRICE VOLATILITY AND AGRICULTURE

Meeting of G20 Agriculture Ministers
Paris, 22 and 23 June 2011

1. We, the G20 Agriculture Ministers, meet today to address the issue of food price volatility with the ultimate objective to ensure food security and agree on an "Action Plan on food price volatility and agriculture" that will be submitted to our Leaders at their Summit in November 2011.

2. Food security will remain a critical issue for the international community. In order to tackle the food security challenge, important commitments and actions have been taken, in particular at the L'Aquila Summit, the 2009 World Food Summit in Rome and the G20 Summits. All countries have stressed the need for improved and more effective agricultural policies at the global and national levels, better international coordination and concrete implementation of political commitments to promote food security and sustainable agricultural production. They have achieved a wide consensus and made progress in reforming the Committee on World Food Security (CFS), implementing the Global Partnership for Agriculture, Food Security and Nutrition and, for those involved, carrying out the L'Aquila Food Security Initiative.

3. The situation is still worrying, especially in developing countries, and many challenges remain. World population is projected to reach more than 9 billion by the middle of this century. Much of this increase is projected to occur in developing countries which currently face the greatest level of food insecurity. In this regard, we recall our commitments to support the Rome Principles for Sustainable Global Food Security presented at the World Summit on Food Security in November 2009.

4. We reaffirm the right of everyone to have access to safe, sufficient and nutritious food, consistent with the progressive realization of the right to adequate food in the context of national food security. To strengthen global food security, steps must be taken to improve access and availability of safe and nutritious food for the most vulnerable, particularly women and children in developing countries, through, for instance national food security programs.

- A detailed action plan, incl. 2 initiatives to increase market transparency:
  - Agricultural Market Information System
  - Global Agricultural Geo-Monitoring Initiative
1. The GEO-GLAM Initiative: objectives

To reinforce the international community’s capacity to produce and disseminate relevant, timely and accurate forecasts of agricultural production at national, regional and global scales.
2. The GEO-GLAM Initiative: actions

**Action 1. Strengthening national capacities for agric. monitoring capacity development for the use of EO, experience sharing, research**

**Action 2. Global and regional agricultural monitoring Systems**
Harmonizing, connecting, strengthening inter-comparing existing systems, disseminating information.

**Action 3. At risk regions and countries agricultural monitoring** Improving monitoring methods, tools and systems for vulnerable agricultural systems

**Action 4. Global Earth observation system of systems for agricult.**
Developing an operational system: coordinated satellite and in-situ Earth Observation and weather forecasting;

*Long term commitment. Full and open data policy.*
International effort to increase information availability, quality and transparency
4. The GEO-GLAM Initiative: Status and agenda

Jan.- May 2011: Initial design in the framework of G20 priorities
June 2011: Adoption by G20 Agriculture Action Plan
Sept. 2011: International GEO-GLAM meeting at GEO Geneva
Nov. 2011: G20 Final Declaration (GEO-GLAM art. 44)
Nov. 2011: Presentation at GEO VIII Plenary (90 countries, 60 inst.)

Nov. 11 – Feb. 2012: Detailed action plan and budget + Governance scheme + Linkage with AMIS

March – June 2012: Governance definition and approval
Linkage with G20 Mexican presidency
Securing funds for implementation
Informing national and international actors

July 2012 on …: Implementation

Intercomparison of global products; JECAM; EO data access; Capacity building modules
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Thanks for your attention!

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