European Space Agency - ESA

ESA is an intergovernmental organisation with 22 Member States

ESA purpose: "...provide for and to promote, for exclusively peaceful purposes, cooperation among European States in space research and technology and their space applications ....”

Article II of the ESA convention

ESA achieves this through:
- Space activities and programmes
- Implementing a long term space policy
- A specific industrial policy
- Coordinating European with national space programmes
Sentinels watching over Agriculture

Winter-Spring Rice 2015/16
- March 2016: 1.4 Million ha rice
- March 2015: 1.7 Million ha rice
- 16.5% loss in rice area due
drought and salt water intrusion
due to El Nino
- 976,000 people affected, 67 Mil. $
estimated damage (UN estimates)

Based on unprecedented S1 time
series

The Mekong Delta, Vietnam
300 km x 300 km, 20 m resolution

Contains Copernicus data (2016)
**Sentinel-1 time series**
Rice mapping & Phenological stages

![Graph showing Sentinel-1 time series with labels: Vegetative, Reproductive, Ripening stages.](image)

**Sen2Agri: National Crop Monitoring at Field Scale**

- GEOGLAM – international R&D cooperation
- Open Source system for up-scaling and transfer

![Map showing Sen2Agri application in multiple countries.](image)
**Sentinel-2: Crop status monitoring**
Ukraine 2016

- 18 Feb. 16
- 18 Apr. 16
- 28 Apr. 16
- 17 Jun. 16
- 17 Jul. 16
- 8 Sept. 16

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**G20 Action Plan on Food Price Volatility**
Paris 2011

The G20 Ministerial Declaration (2011) states that GEOGLAM "will strengthen global agricultural monitoring by improving the use of remote sensing tools for crop production projections and weather forecasting".
### Sentinels and Agriculture: GEOGLAM

Primary missions for all Targets Products

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Spatial Resolution</th>
<th>Spectral Range</th>
<th>Effective observe frequency (cloud free)*</th>
<th>Sample Type</th>
<th>Field Size</th>
<th>Crop Mask</th>
<th>Crop Type Area and Growing Calendar</th>
<th>Crop Condition Indicators</th>
<th>Crop Yield</th>
<th>Crop Biophysical Variables</th>
<th>Environment Variables</th>
<th>Ag Practices / Cropping Systems</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>500 - 2000 m</td>
<td>Thermal IR + optical</td>
<td>Daily</td>
<td>Wall-to-Wall</td>
<td>All</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

**Sentinel-3**

**Sentinel-2**

**Sentinel-2**

**Sentinel-1**

**RAPP Products**

Source: CEOS ACQUISITION STRATEGY FOR GEOGLAM PHASE 1

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**Welcome to ESRIN**

![Image of ESRIN area from space]
# Seed Questions: Sentinels supporting RAPP products

<p>| | |</p>
<table>
<thead>
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</thead>
</table>
| 1. | Key technical characteristics and data requirements for an operational RAPP global monitoring system?  
   |   |  
   |   | - National to global?  
   |   | - Products or tools?  
| 2. | Additional layers to the RAPP Map?  
   |   | - Global rangeland biomass  
   |   | - Vegetation cover at 30 meter resolution  
   |   | - Conservation areas  
   |   | - Tree density and cover  
| 3. | Data Cube opportunities?  
   |   | - Analyze ready data  
   |   | - DIAS  

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