Concept Note
Towards Future Copernicus Services
Components in support to Agriculture?

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Serving society
Stimulating innovation
Supporting legislation

Context

Prepared by DG JRC at the request of DG GROW

Projecting Copernicus capacity on information requirements of the Agriculture and Food Security user domains

Review the relevance of Sentinel 1, 2 and 3 and associated technology trends

Describe the relevant use cases, focused on European and Global scale

Suggest elements for implementation, both within the scope of Copernicus (Land) Services and beyond.
Rationale

The Sentinels radically improve the technical feasibility for wide-area consistent crop mapping and monitoring:

- Superior radiometric and geometric data quality
- Revisit frequencies matching the dynamics of the crop cycle
- Complimentarity of consistent SAR series with intermittent optical imagery
- Full, free and open access

Leading to expansion of applications in:

- National and regional crop area and yield statistics
- Capacities to follow crop specific phenology at parcel level
- Derived information products for public and private use

Use of satellite imagery in agriculture

<table>
<thead>
<tr>
<th>Resolution</th>
<th>Revisit</th>
<th>Application</th>
<th>Limits</th>
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<tbody>
<tr>
<td>300 m – 1 km</td>
<td>Daily</td>
<td>Global crop production trends</td>
<td>Not crop specific, difficult to separate area and phenology</td>
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<tr>
<td>10-30 m</td>
<td>Weekly</td>
<td>Crop area, crop type, phenology, crop diversity/rotation</td>
<td>Requires massive data processing, globally consistent methodology</td>
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<tr>
<td>0.5-5 m</td>
<td>On demand</td>
<td>Area measurement, detailed measures, precision farming</td>
<td>Costly, on sample basis only</td>
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Free & Open
Commercial but free access
Environment

Communities of practice:
- Global monitoring programs “agriculture and food security”
- E.g. FAO GIEWS, AMIS, US FEWSNET, EU MARS
- Essential component in Sustainable Development Goals (SDGs)
- EU Common Agricultural Policy monitoring and control (IACS)
- Wide range of private actors in farm services, food chain applications

Uptake favored by:
- Trends to open access to reference data (e.g. EU Land Parcels Information Systems (LPIS))
- “Big Data” processing solutions, capacities of open source software
- Novel technology in mobile data collection and sharing (crowd sourcing)
Ideas for implementation

A number of exploratory activities already underway.

Important to shorten time-to-operations to maximize benefit of Sentinels

Copernicus focus on products that benefit both public and private users, with specialization and tailoring in down-stream activities

EU CAP has own operational set-up to evaluate Sentinel benefits in IACS

Further stimulate discussion on open access to LPIS

Anchor in Copernicus European and Global Land Services
Next steps

Feedback received from Member States (Copernicus User Forum, April 2016)

JRC to launch expert group to benchmark concept note against European practice (phase 1), expand the global focus (phase 2)

Present and discuss in relevant fora

Initiate discussions with other Copernicus services to understand mutual interests (e.g. Climate, Atmosphere, Emergency)

Expose service elements in related innovation programs (e.g. EIP-AGRI, H2020, Big Data initiatives)

Consider promotion and capacity building efforts to stimulate take up
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<th>Month</th>
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<tr>
<td>March</td>
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