LandSense

A Citizen Observatory and Innovation Marketplace for Land Use and Land Cover Monitoring

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Earth Observations Group
Ecosystems Service and Management (ESM)
LandSense Consortium

17 partners
9 countries

5 research institutes/universities
5 SMEs
3 NGOs
3 Public Bodies
1 Professional Network

1. International Institute for Applied Systems Analysis
2. Birdlife International
3. Sinergise
4. University of Nottingham
5. InoSens doo
6. GeoVille Information Systems GmbH
7. Environment Agency Austria
8. Institut National de l’Information Géographique et Forestière
9. European Citizen Science Association
10. StZ Felis
11. University of Heidelberg
12. Wageningen University
13. VU University Amsterdam
14. Joint Research Centre
15. Secure Dimensions
16. Friends of the Earth/Global 2000
17. European Crowdfunding Network
LandSense Aim

... to build an innovative citizen observatory in the field of LULC, which collects data both actively (through citizens) and passively (from authoritative, open access, and other citizen-based initiatives) and integrates them into an open platform that provides valuable quality-assured in-situ data for SMEs, larger businesses, government agencies, NGOs and researchers.
Earth Observation (EO) plays a critical role in land monitoring, e.g. through **Copernicus and the new Sentinel satellites**, but lacks sufficient ground-level (*in-situ*) data for developing accurate and validated land monitoring products.

- The Land Use/Cover Area Frame Survey (LUCAS) costs € 10M
- France estimates annual surveying costs on the order of € 20M per year
LandSense Objectives

Assess current practices, user requirements and barriers of present LULC technologies and illustrate the potential of *in-situ* citizen observatories

Build the LandSense engagement platform (*i.e.* extending existing technology) for the collection, integration, management, and contextualized presentation of LULC information by key stakeholders

Deliver four LULC services - LandSense Campaigner, Farmland Support, Change Detector, and Quality Assurance & Control - and implement a strategy detailing the sustainable exploitation of these technologies post-project

Demonstrate the quality, confidence and added value of *in-situ* citizen-driven observations and citizen engagement for improved LULC monitoring via three demonstration cases

Promote the uptake of the LandSense technologies, solutions, and products for large-scale LULC monitoring across the EU and beyond through the LandSense Services Incubator
LandSense Engagement Platform
LandSense Campaigner

– a comprehensive visualization and mapping service that builds upon existing technologies, i.e. Geopedia (web-based GIS and crowdsourcing tool) and Geo-Wiki (visualization, crowdsourcing and validation tool to improve land cover)

geo-wiki.org

geopedia.world
Farmland Support

This service will scale-up the existing CleverFarm and AgroSense services.

http://www.sinergise.com/en
Change Detector

will provide near real-time high quality LULC change detection, using the power of the crowd to help validate these changes in-situ.

It will extend and couple services, i.e. LACO-Wiki (i.e. LULC validation tool) and Sentinel 2 image processing chain
Quality Assurance and Control

A fourth service for quality assurance will build on the existing open source technology developed in the FP7-funded citizen observatory COBWEB13.
LandSense Demonstration Cases

<table>
<thead>
<tr>
<th>LANDSENSE DEMONSTRATION CASES</th>
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<tbody>
<tr>
<td><strong>MONITORING URBAN &amp; RURAL LANDSCAPE CHANGES</strong></td>
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<tr>
<td><img src="image1.png" alt="Image" /></td>
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<tr>
<td>Complementing authoritative data sources</td>
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<tr>
<td>→ Reducing costs in professional surveying</td>
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<tr>
<td>→ Optimizing workflows of mapping agencies</td>
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<tr>
<td>→ Opening up access to land take information</td>
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| **MONITORING AGRICULTURAL LAND USE** |
| ![Image](image3.png) |
| EO-driven services for farm management |
| → Lowering barriers to technology for farmers |
| → Creating an ecosystem of EO-based services |
| → Improving agriculture policy compliance |
| ![Image](image4.png) |

| **HABITAT & FOREST MONITORING** |
| ![Image](image5.png) |
| High-res EO data for biodiversity preservation |
| → Adding LULC data into biodiversity databases |
| → Reducing habitat degradation and deforestation |
| → Opening up EO-data for forest monitoring |
| ![Image](image6.png) |
LandSense - Impacts

**Reduce** the costs of *in-situ* data collection for LULC calibration/validation activities and offer a significant spatial-temporal extension to the *in-situ* component of the GEOSS and Copernicus initiatives.

**Empower** citizens via a range of activities from data collection to knowledge exchange with stakeholders, using LandSense tools for collaborative mapping, opinion surveys and informed decision-making.

**Enhance** the implementation of local and global policy objectives while engaging citizens to contribute to environmental multi-level governance in terms of increased transparency, accountability and responsiveness.

**Foster** an innovation community in the area of *in-situ* monitoring for LULC by coordinating with ongoing and forthcoming citizen observatories to align activities, interests and networks.

**Increase** Europe’s role in the business of *in-situ* monitoring and create an innovation marketplace for sustainable market uptake.
LandSense Data Mgt. Plan

- **Types of data to be collected and generated**: (1) georeferenced data at point locations... raster, vector, images
- **The standards that will be used**: standard web service interfaces (OGC’s Web Services (WFS, WMS, WCS, etc.)). Metadata using ISO19115. **Compliance with INSPIRE will also be considered.**
- **Data sharing and exploitation**: the data available and shared under an Open Data Commons Open Database License (ODbL)
- **Curation and preservation of the data**: the data will be curated and preserved via a spinoff company responsible for maintaining the LandSense federation.
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