



International Institute for  
Applied Systems Analysis  
www.iiasa.ac.at

# LandSense



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

**Ian McCallum**

**Steffen Fritz (PI)**

[fritz@iiasa.ac.at](mailto:fritz@iiasa.ac.at)

**Earth Observations Group**

**Ecosystems Service and Management (ESM)**



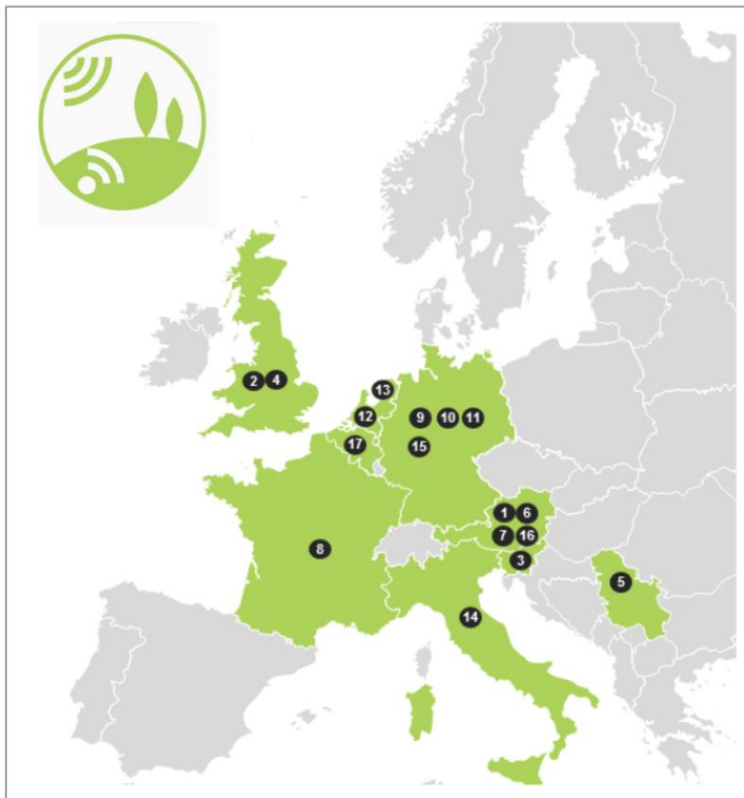
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# LandSense Consortium

**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

# Need for LandSense

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 2012 Land Use/Cover Area Frame Survey (LUCAS) cost € 10M for data collection (or roughly €36 per point collected)
- IGN-FRANCE estimates their annual surveying costs are on the order of € 20M per year
- Costs related to the image acquisition and interpretation campaign for CAP (Common Agricultural Policy) with remote sensing were € 8M in 2012.

# LandSense Objectives

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

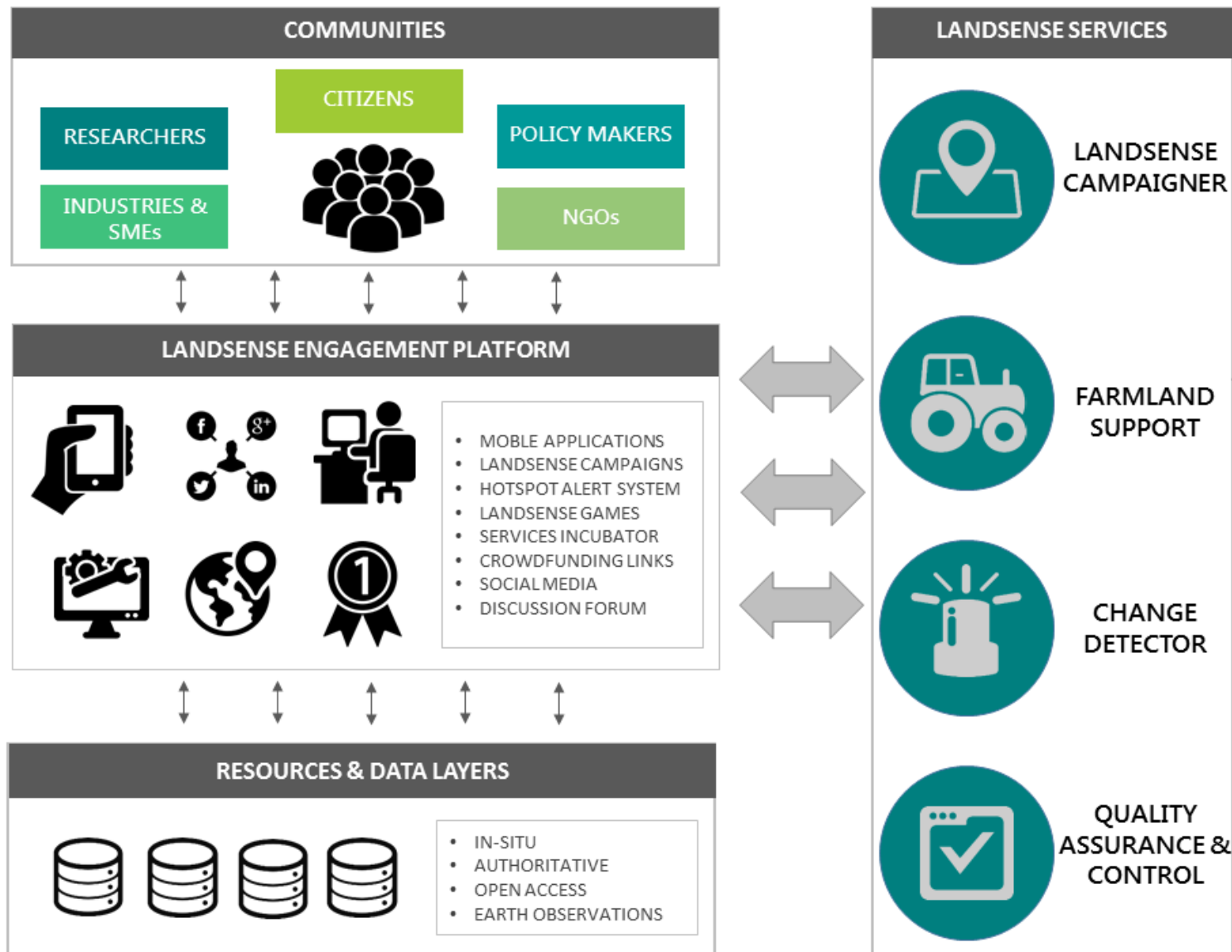
**Build** the LandSense engagement platform (*i.e. extending existing technology*) for the collection, integration, management, and contextualized presentation of LULC information by key stakeholders

**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 Demonstration Cases

## LANDSENSE DEMONSTRATION CASES



MONITORING URBAN &  
RURAL LANDSCAPE  
CHANGES

### Complementing authoritative data sources

- Reducing costs in professional surveying
- Optimizing workflows of mapping agencies
- Opening up access to land take information



MONITORING  
AGRICULTURAL LAND USE

### EO-driven services for farm management

- Lowering barriers to technology for farmers
- Creating an ecosystem of EO-based services
- Improving agriculture policy compliance



HABITAT & FOREST  
MONITORING

### High-res EO data for biodiversity preservation

- Adding LULC data into biodiversity databases
- Reducing habit degradation and deforestation
- Opening up EO-data for forest monitoring



# 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.



# LandSense Needs

- Community agreed upon standards – i.e. OGC Sensor Web Enablement (SWE), others?
- Quality Assurance – built upon COBWEB technology, others?
- Ensure secure and efficient integration of internal and 3rd party data via a flexible Spatial Data Infrastructure (SDI)
- Establish licensing policies for the use and re-use of LandSense services and data, COBWEB?
- Integrate and upgrade existing technologies to support citizen-contributed data to deliver four innovative services
- What worked, what didn't, from pioneering observatories
- General recommendations



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science for global insight