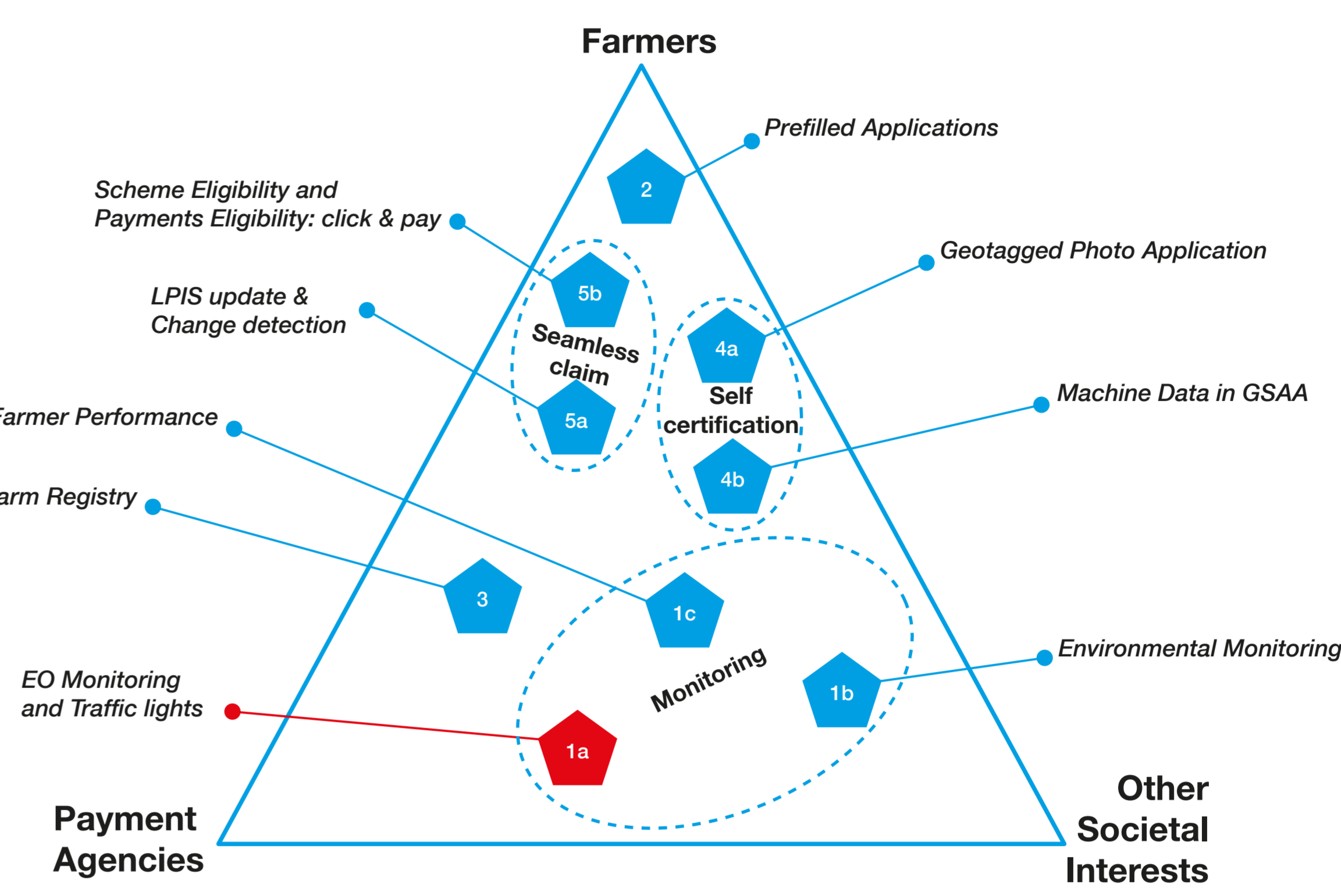


# New IACS Vision in Action - NIVA

## UC1a: Earth Observation Monitoring and Traffic Lights

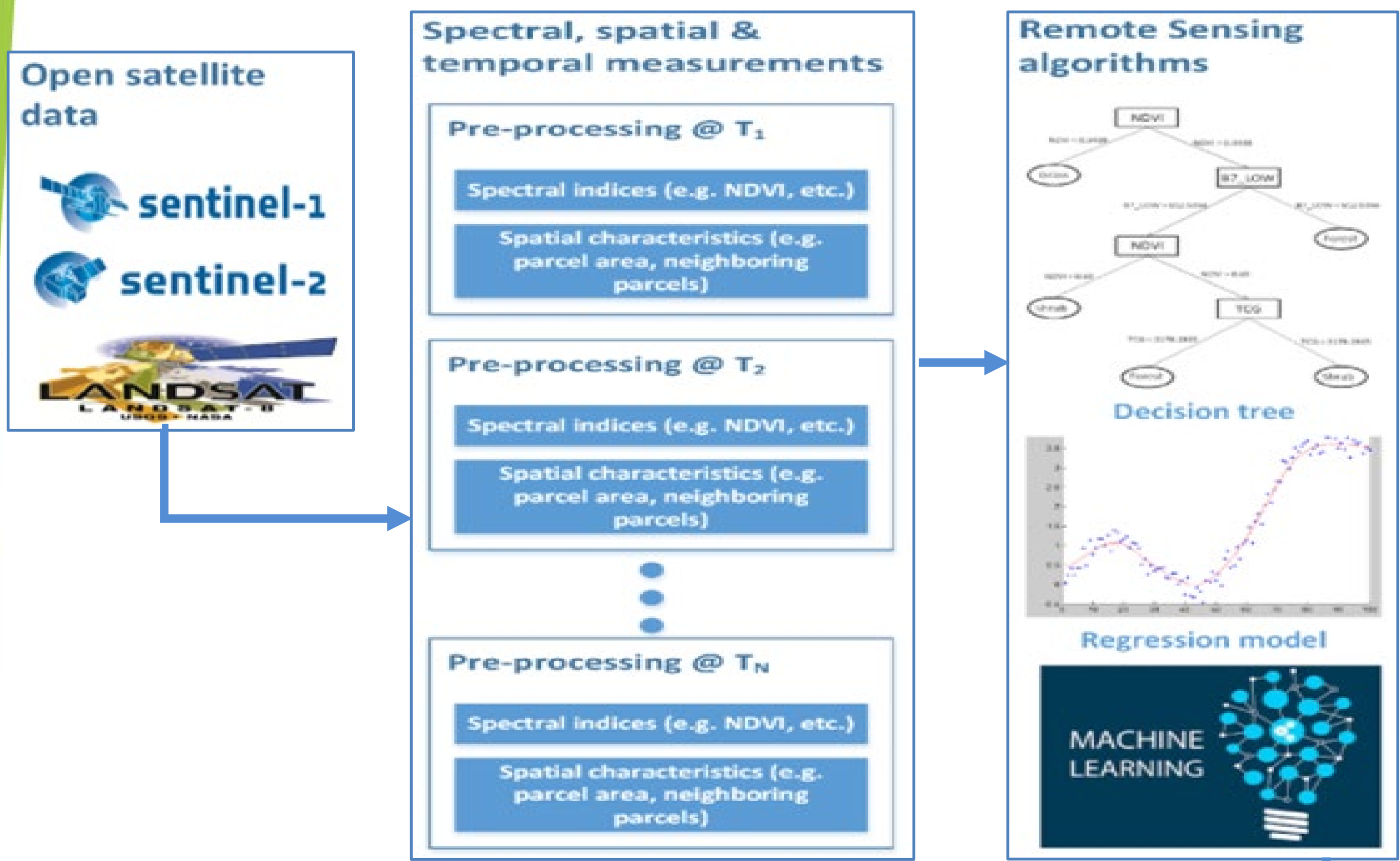
Lead: Greece (OPEKEPE)



### NEW IACS VISION in ACTION – NIVA

#### UC1a: Earth Observation Monitoring and Traffic Lights

Den Haag, NL  
Kick-off Meeting, June 2019



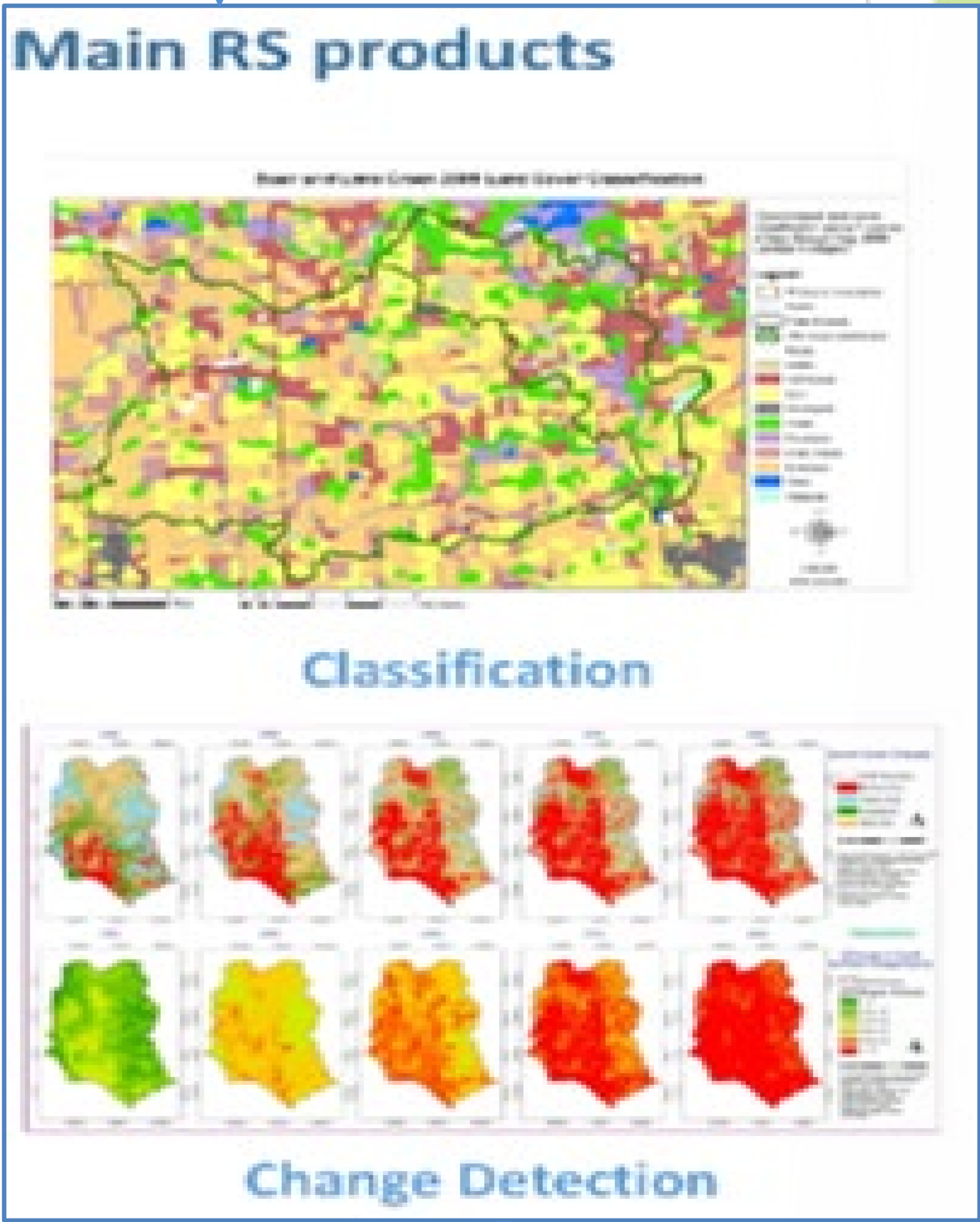
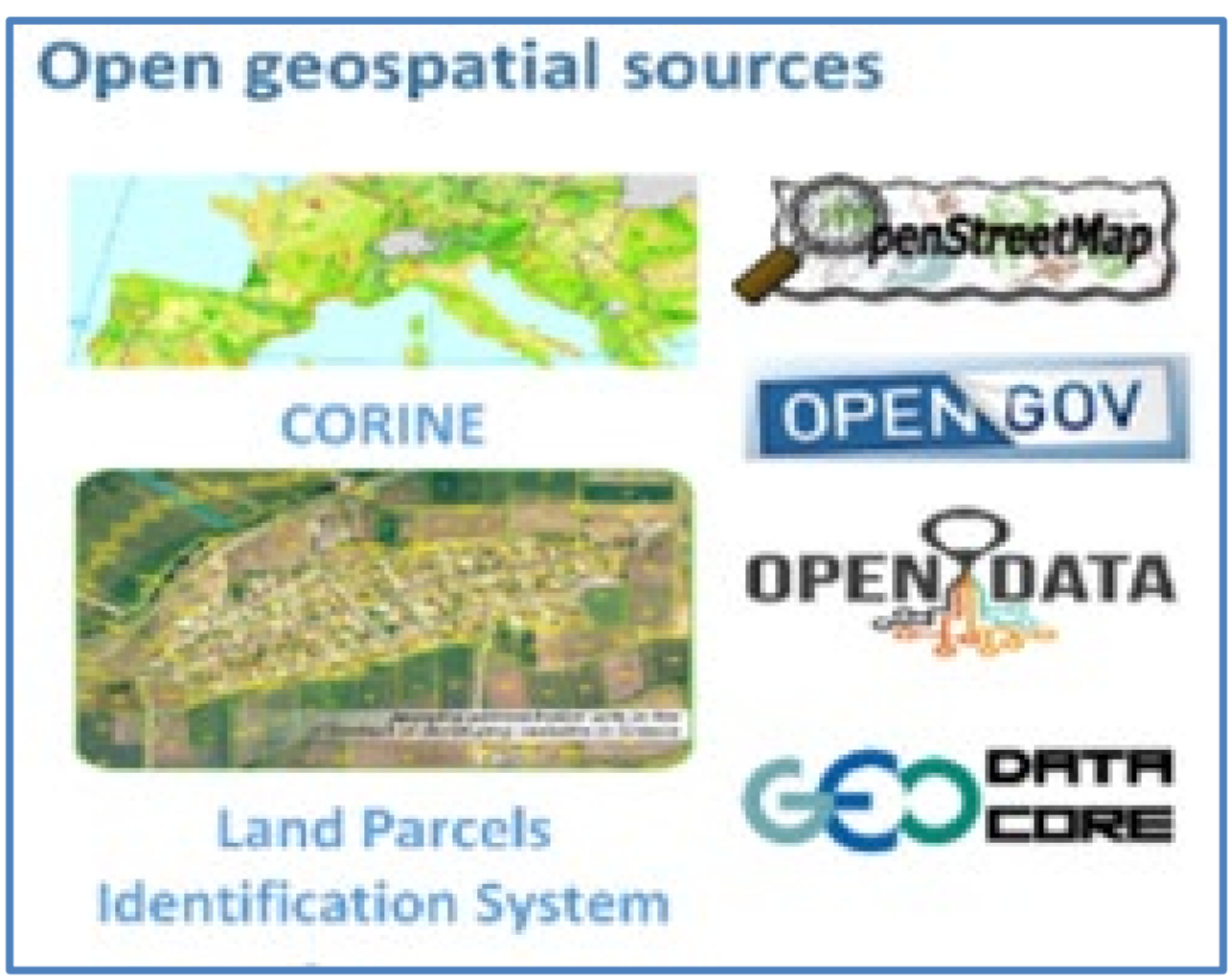
#### Objectives: “monitoring” at Parcel level

- Review EO processing algorithms
- Improve suitable algorithm (Open Call)
- Review - Define monitorable eligibility criteria (markers)
- Model observed conditions in relation with traffic light codes and eligibility scenarios

Substitute sample approach & OTSC by “monitoring” using Sentinel and farmers data

#### Sub-Components:

- Search & download (DIAS compatible)
  - Extract information
  - Assign extracted info (features) to agriparcels
  - Data analysis to conclude valuable info
  - Classification algorithm resulting in EO traffic light
  - Normalization of farmers data sources
  - Final eligibility decision
- ASSISTED EO MONITORING**



#### Involvement of stakeholders:

Stakeholders: Farmers, Agri-Cooperatives, PA's, Smart Farming providers, Consult., EC admin.  
Participation: Throughout UC1a

#### Links with other UCs:

INPUTS (potential use if budget available)  
UC1b / UC1c / UC2 / UC3 / UC4a / UC4b

OUTPUTS  
Mainly to UC5a / UC5b but also in other UCs'

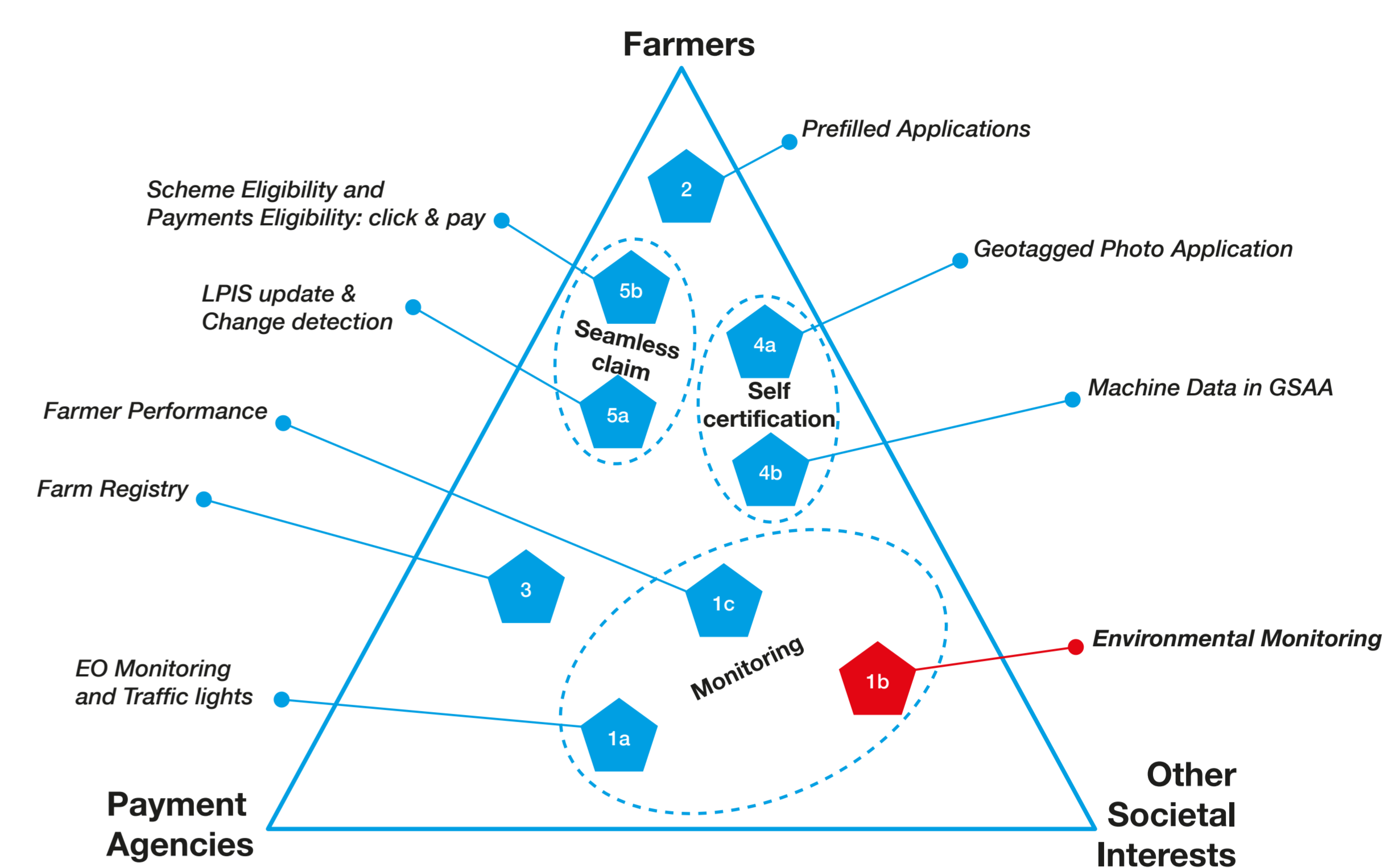


# New IACS Vision in Action - NIVA

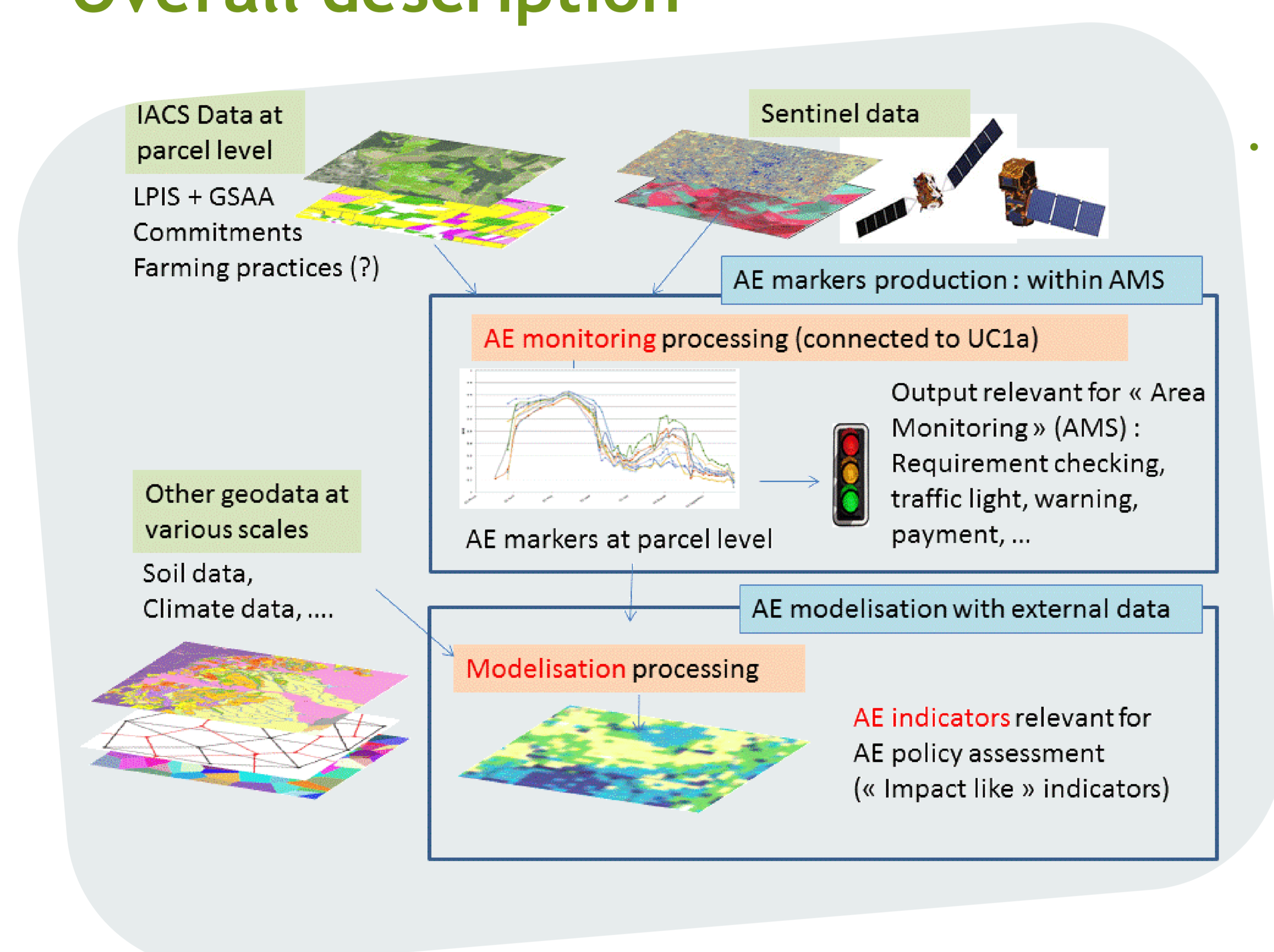
## UC1b: Environmental Monitoring

NIVA Kick-off meeting - The Hague - 17/19 of June 2019

Lead: France (ASP)



### Overall description



### Proposed partners

- ASP (FR) as Leader
- INRA (FR) as main partner and WUR (NL) will bring their scientific knowledge and expertise
- IGN (FR) and Neupublic (GR) will bring their expertise and know-how on Earth Observation (EO) and Geographic Information System (GIS) sciences
- ASP (FR), RVO (NL), DAA (DK), OPEKEPE (GR) and FEAGA (SP) as paying agencies will bring their business expertise and operate the large scale pilots.

### Goals and results expected

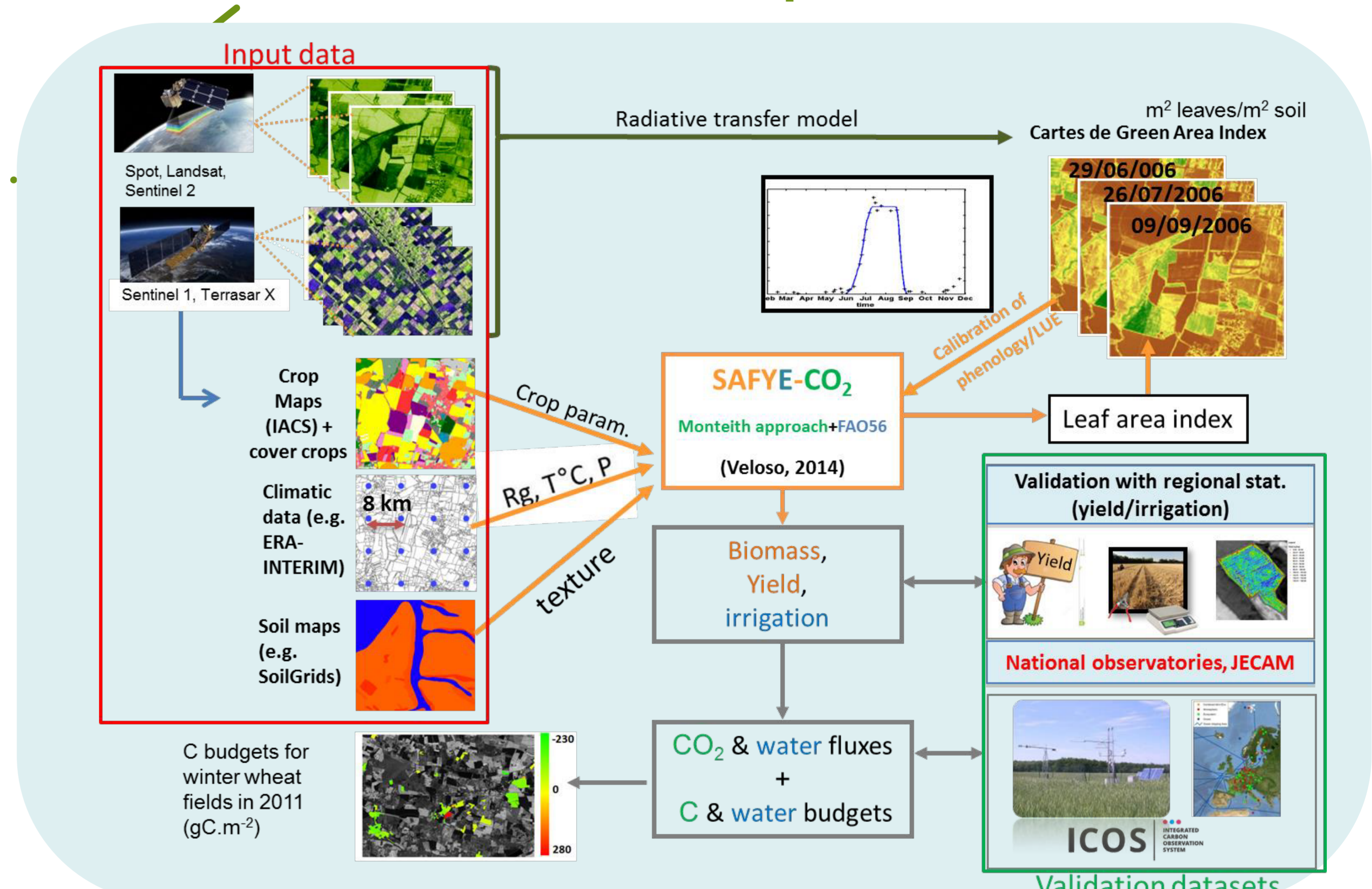
#### Goal of UC1b

- Identifying and publishing relevant common environmental indicators and models based on monitoring methodology at the level of farm holding MS and EU level.
- Processing IACS with non IACS data at EU level for the purpose of environmental issues.

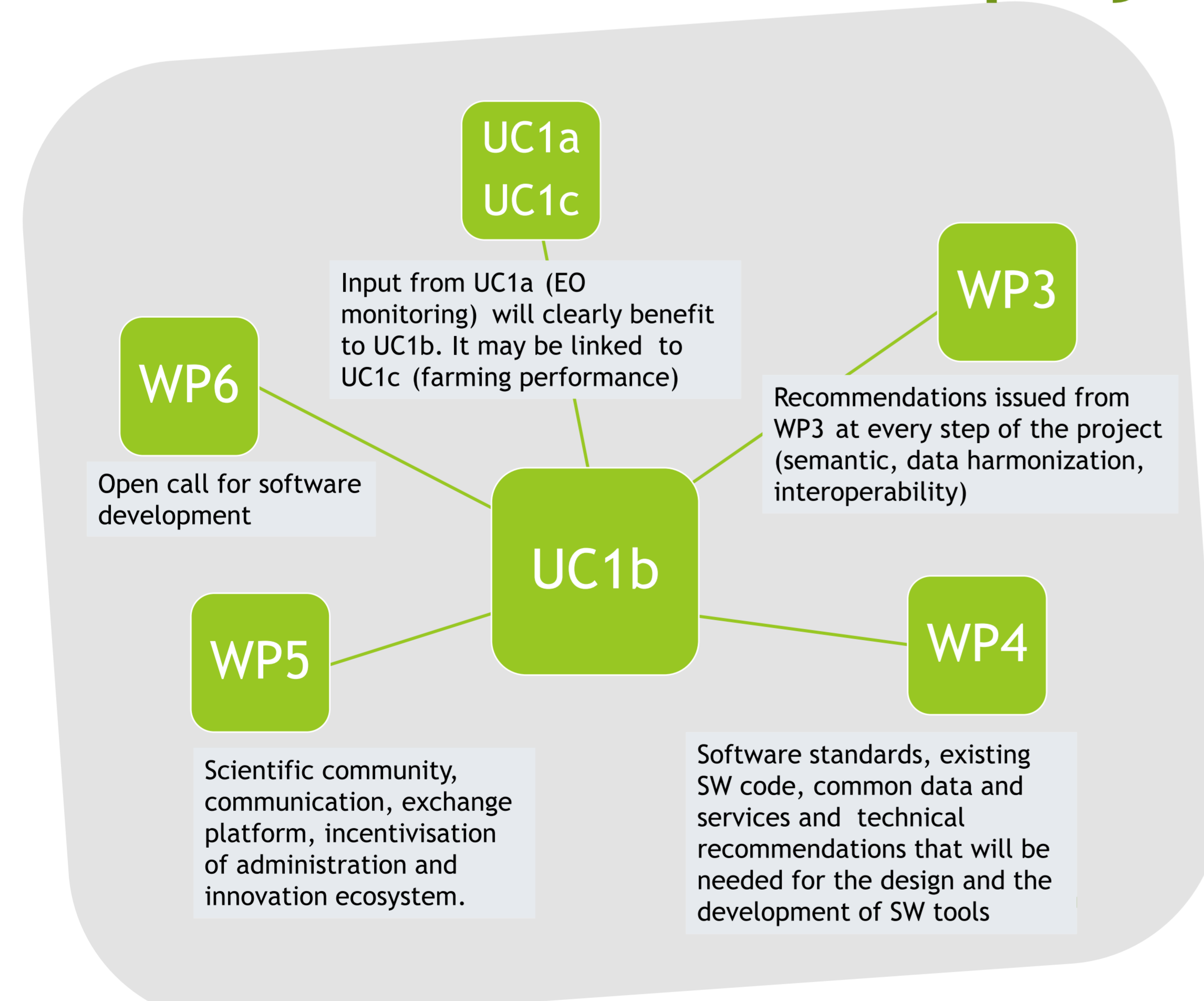
#### Result expected :

- A large scale pilot will be implemented in several Member states and will be potentially extendable to all EU MS.
- It will rely on common algorithms and open source software tools aiming at output relevant agro-environmental indicators elaborated from EU harmonised IACS data and other relevant geolocated data.

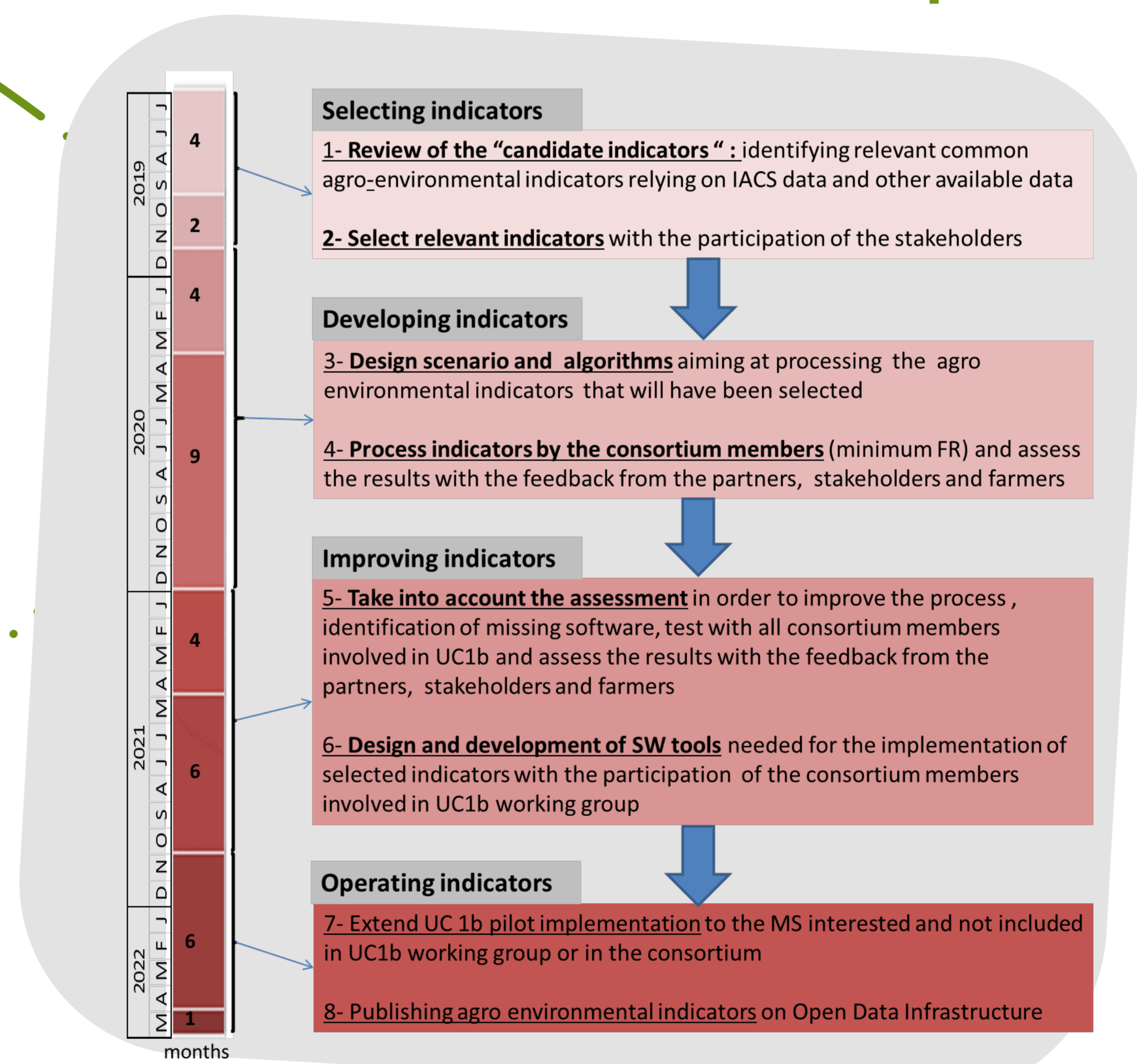
### Example of indicator



### Relations with the overall project



### Provisional work plan



# New IACS Vision in Action - NIVA

## UC1c: Farmer Performance

**Lead:** Estonia (ARIB)

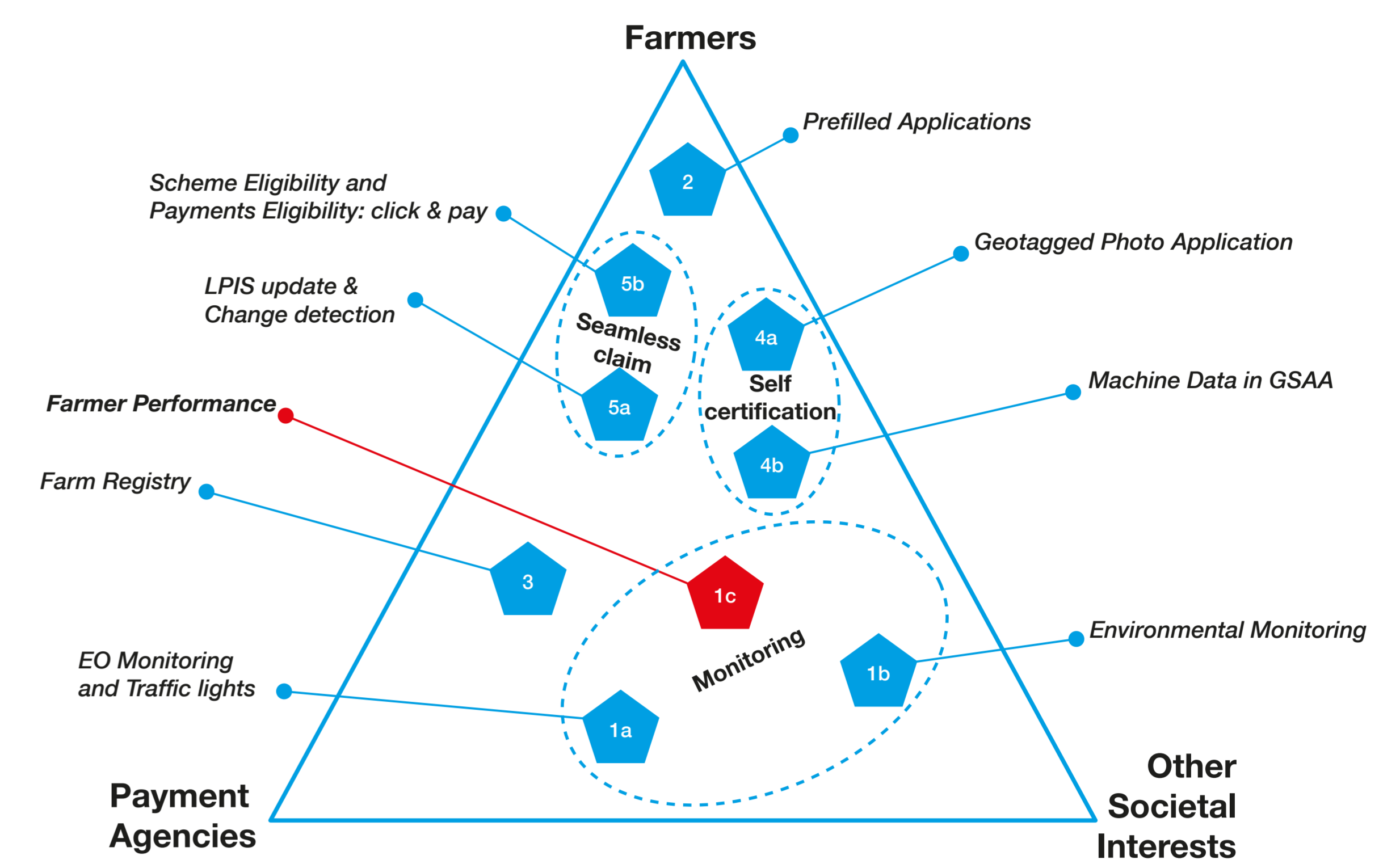
**Testing:** Italy (AGEA)

### Activities

- Gathering information/requirements (questionnaires)
- indicators assessing performance at farm level (needs from EC/MSs/other stakeholders);
- existing APIs (application programming interface);
- available data and software used by different stakeholders;
- Analysing the usability of existing APIs and software + data;
- Standardization of API for pan-EU use;

### Expected products

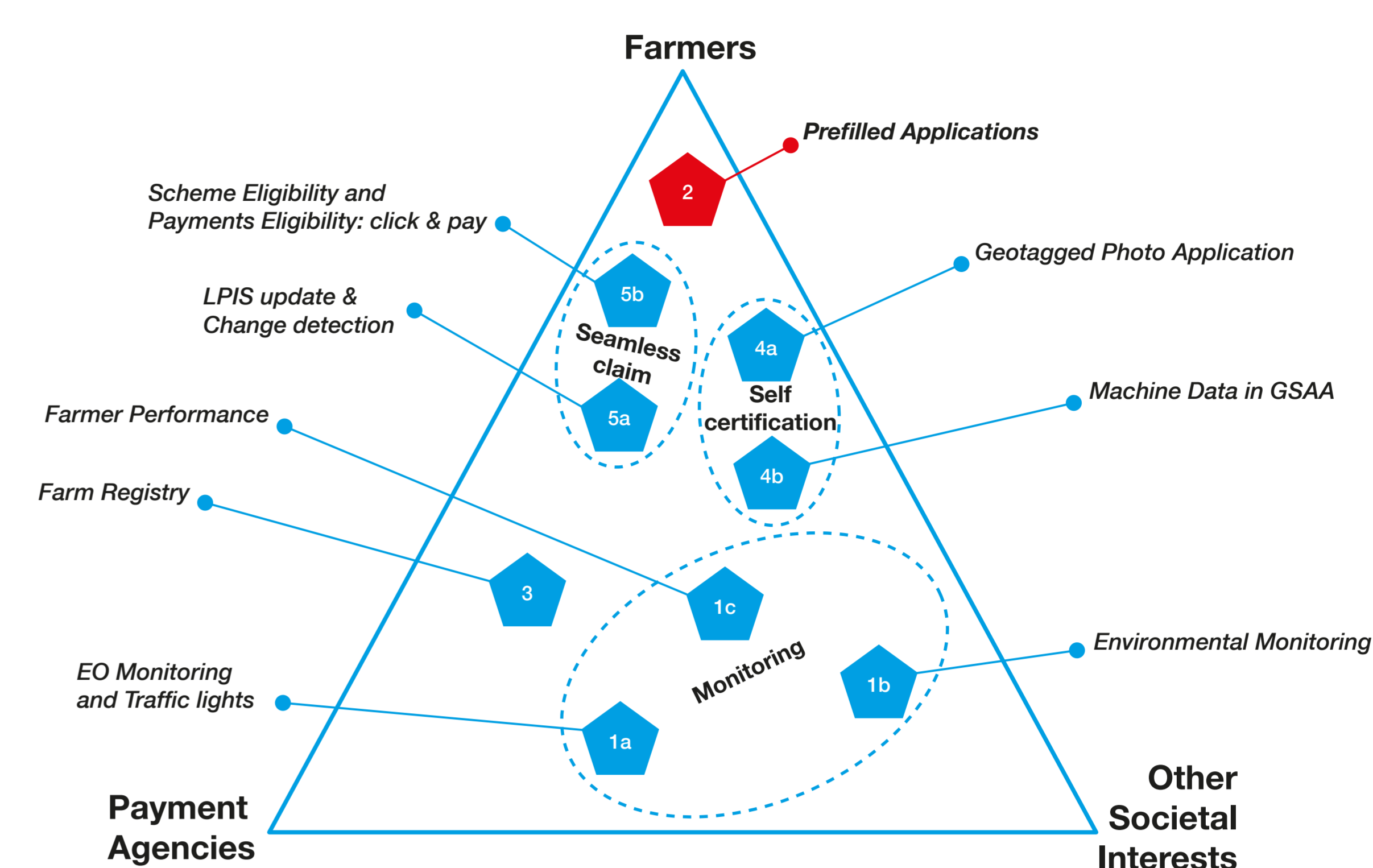
- API prototype for exchanging data between stakeholders and IACS – tested and documented, including description of suitable standards, at least in 3 real cases;
- Create methodology of indicators and evaluate it with users.



# New IACS Vision in Action - NIVA

## UC2: Prefilled Applications

**Lead:** Lithuania (MPA)  
**co-lead:** Spain (FEAGA)



UC2 aims to develop a model how and when to collect large part of application data in automative way and integrate those into the application in the harmonized way:

- from updates of LPIS data sets
- from previous years' aid applications
- from the official internal and external registers and databases
- from smart farming applications
- from farm sustainability tool for nutrients (FaST)
- from continuous monitoring of the fields with Sentinel data
- from geo-tagged photos
- from drones and etc.

### This will ensure:

- reduced administrative burden
- faster application process
- increased reliability and accuracy
- lower error rate and less sanctions
- transparency of the decisions
- other open data possibilities
- a road to automatic claim system
- effective implementation of a new 2021-2027 CAP

### MAIN GOALS AND RESULTS OF UC2

- To test the capabilities and limits of the new available technologies
- To develop an architecture, that can be integrated with and benefit from other systems
- To design the automation tools, test and validate them
- To prepare a new application preparation, submission and administration workflow
- To integrate and harmonize the results of other UCs
- To apply the multi-actor approach by actively engaging with different stakeholders

### HOW DOES THE USE CASE GOAL RELATE TO THE OVERALL PROJECT GOAL?

By making the efficient use of digital solutions and e-tools by reducing administrative burden for farmers, paying agencies and other stakeholders.

### LINKS TO OTHER USE CASES

The UC2 will integrate the results of other UCs though common interfaces:

- Monitoring (UC1a, UC1b)
- Farm Registry (UC3)
- Geotagged photos (UC4a)
- Machine data (UC4b)
- LPIS update (UC5a)

and will eventually lead to:

- Click and pay (UC5b)



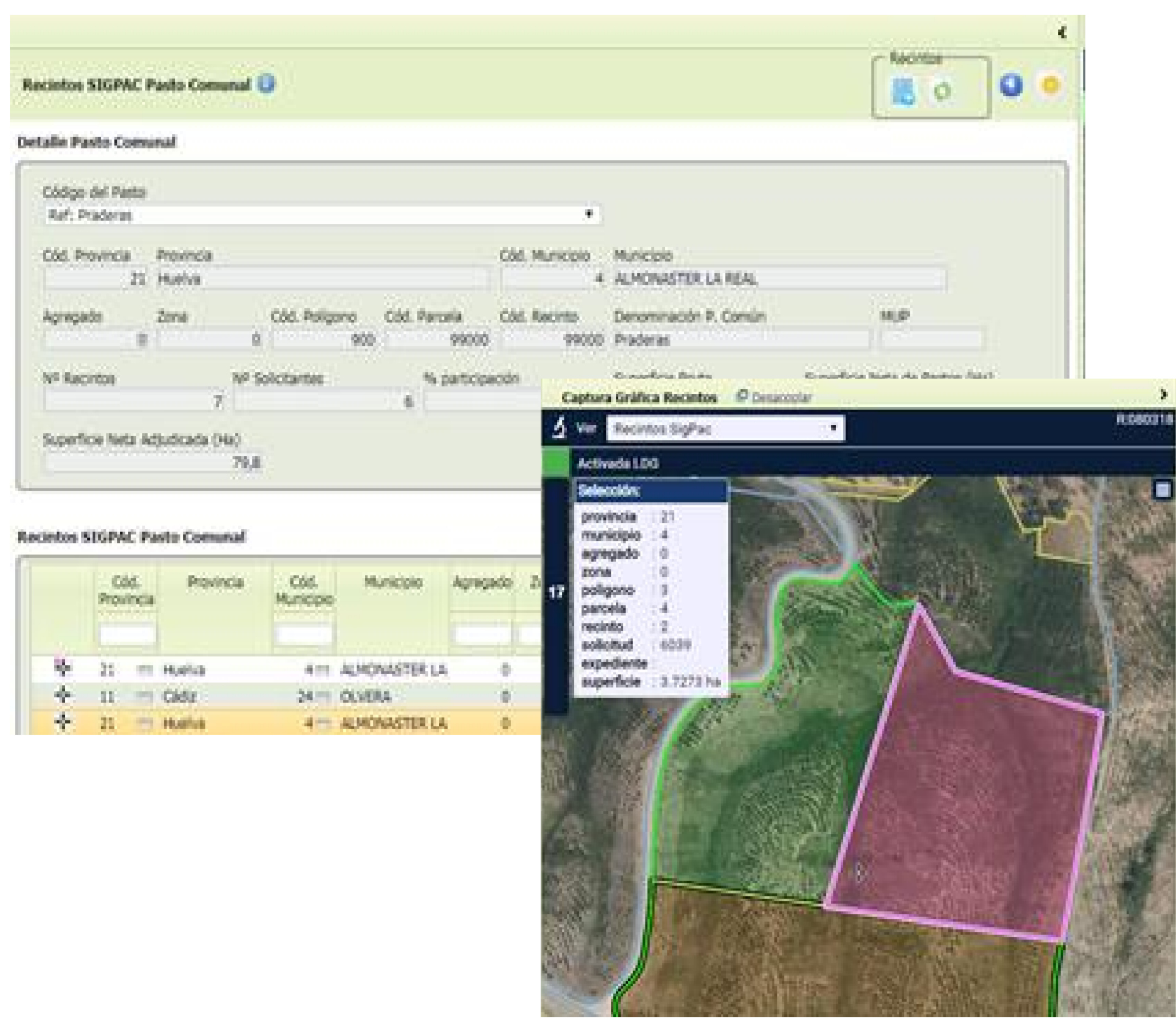
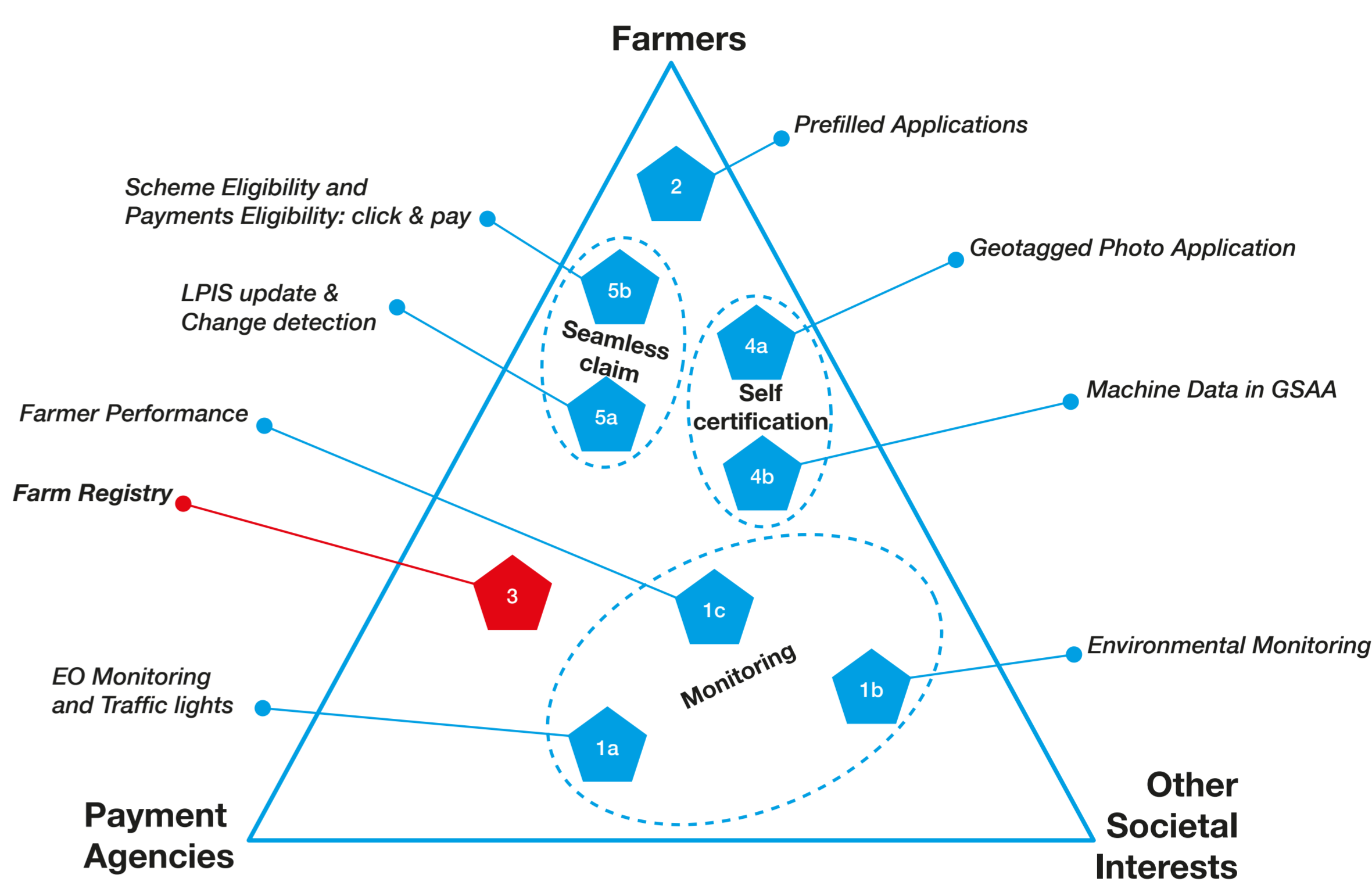
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# New IACS Vision in Action - NIVA

## UC3: Farm Registry

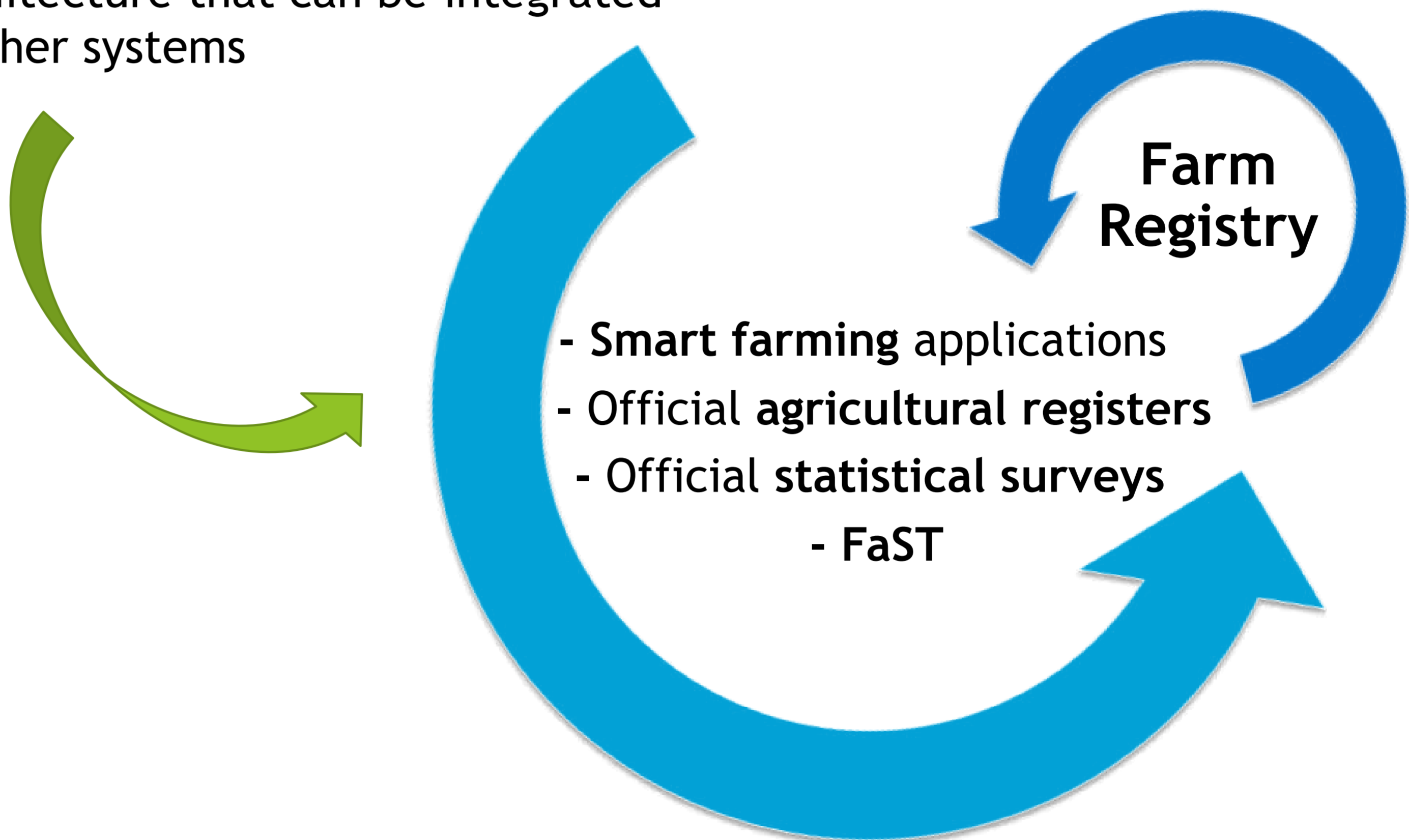
Lead: Spain (FEGA)



! A Farm Registry for an extensive use of information and access to various data sources to:

- Support a wider monitoring
- Verify the IACS claims
- Make the control and information crossover to Public Administrations easier
- Guide the application processes
- Support a seamless experience for the farmers

! An architecture that can be integrated with other systems



### Main goals of UC3

#### Short term goals:

- ! Analysis of the existing datasets related to IACS
- ! Develop an architecture that can be integrated with other systems
- ! Multi-actor approach to take into account the different stakeholders involved
- ! Agreed Farm Registry proposal for agricultural areas

How does the use case goal relate to the overall project goal?

The UC3 goals are aligned with NIVA's goals: a future CAP easier to manage with new tools in a digital environment

#### Long term goals:

- ! Get ready for the new CAP:
- Extensive use of information
- Access to different datasets
- Make the control of the claims easier
- Support a future seamless claim system

### End Results of UC3

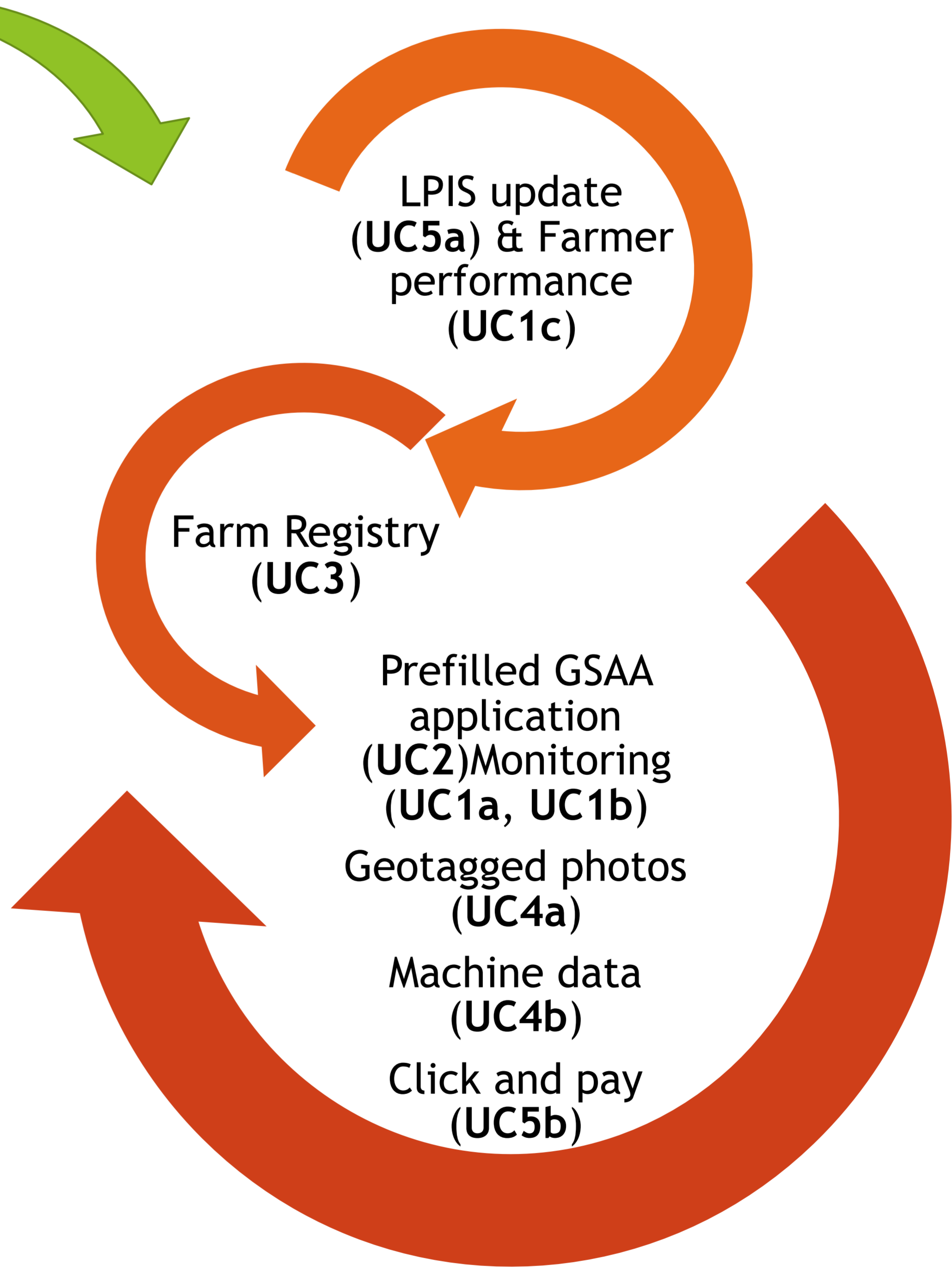
- ! Farm Registry vocabulary
- ! Integration & harmonization of datasets
- ! Links with Farm Sustainable Tool for Nutrients
- ! Open Data Publication
- ! E-Tools promotion and test
- ! Simplified interface for end users

### Specific Interfaces required with other UC's

! The Farm Registry will provide the access to datasets needed by the rest of UC's of the project and will receive feedback from other UC's.

! Interfaces will have to be designed to exchange data between the UC's:

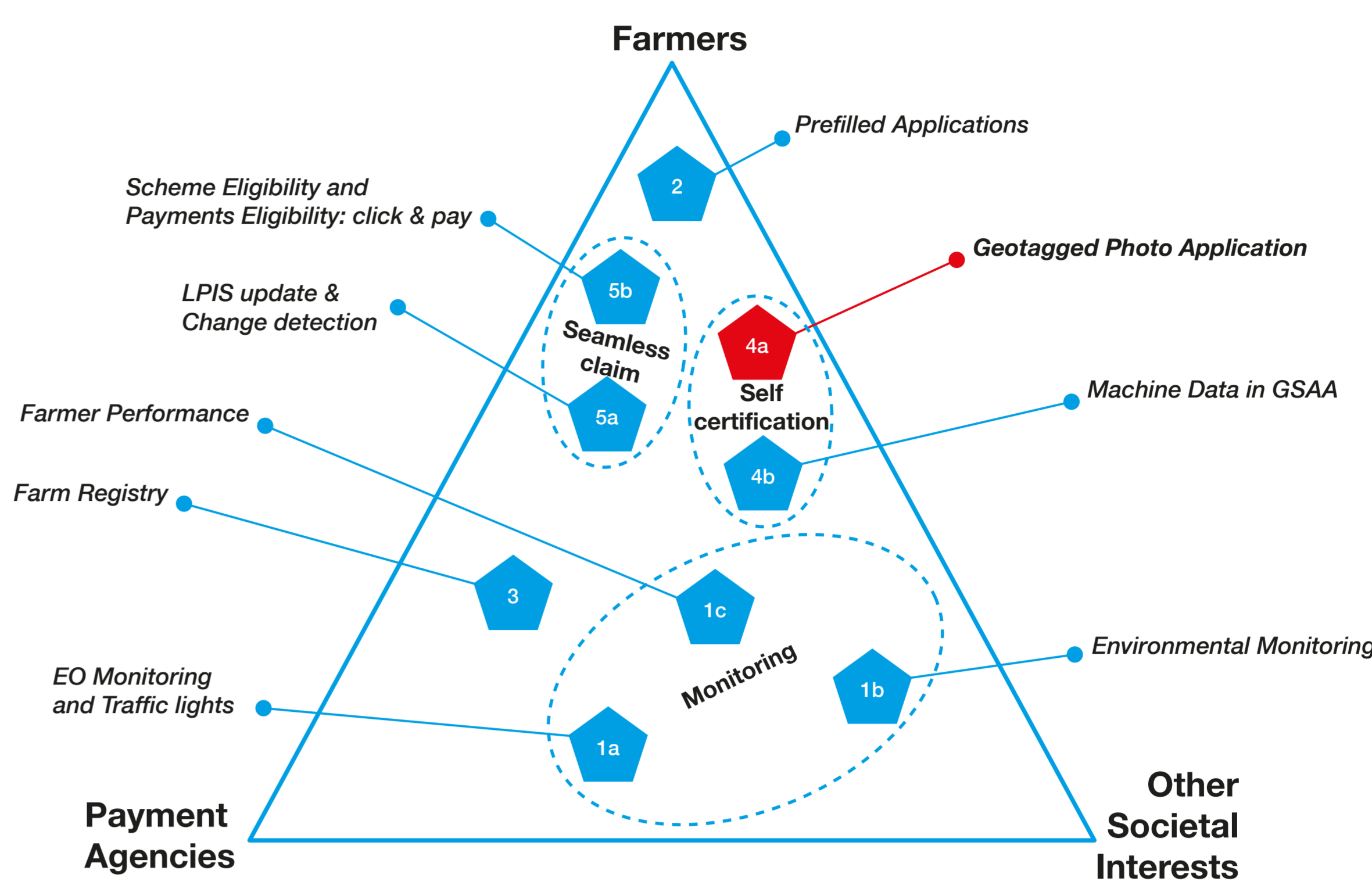
- From Farm Registry (UC3) to:
  - Prefilled GSAA application (UC2)
  - Monitoring (UC1a, UC1b)
  - Geotagged photos (UC4a)
  - Machine data (UC4b)
  - Click and pay (UC5b)
- From LPIS update (UC5a) to Farm Registry
- From Farmer performance (UC1c) to Farm Registry



# New IACS Vision in Action - NIVA

## UC4a: Geotagged Photo Application

Lead: Ireland (DAFM)

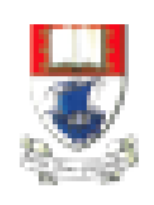


### NIVA Use Case 4a – Geotagged Photo Application



An Roinn Talmhaíochta,  
Bia agus Mara  
Department of Agriculture,  
Food and the Marine

TSSG



Waterford Institute of Technology  
INSTITIÚD TEICNEOLAÍOCHTA INDRE LAIRGE



Teagasc  
AGRICULTURE AND FOOD DEVELOPMENT AUTHORITY

#### Introduction

An application for mobile devices to facilitate a farmer/advisor to upload a geotagged photograph as supporting evidence to a claim

- A secure & verifiable technique
- A usable, responsive, functional and reliable application
- Understand 'User Experience'

The pilot will address precise, timely and accurate in-situ verifications, allowing a multi-actor approach to real agronomic land monitoring performed by both administrative surveyors and farmers, or associations

#### Challenges

- Influencing farmer acceptance
- Addressing concerns
- Adoption of new technology
- Appropriate design
- Meaningful pilots
- Overcome barriers

#### Goals

Adopt 'a *user-centered approach*' to technology development so as to identify and address potential barriers preventing uptake of the technology amongst farmers

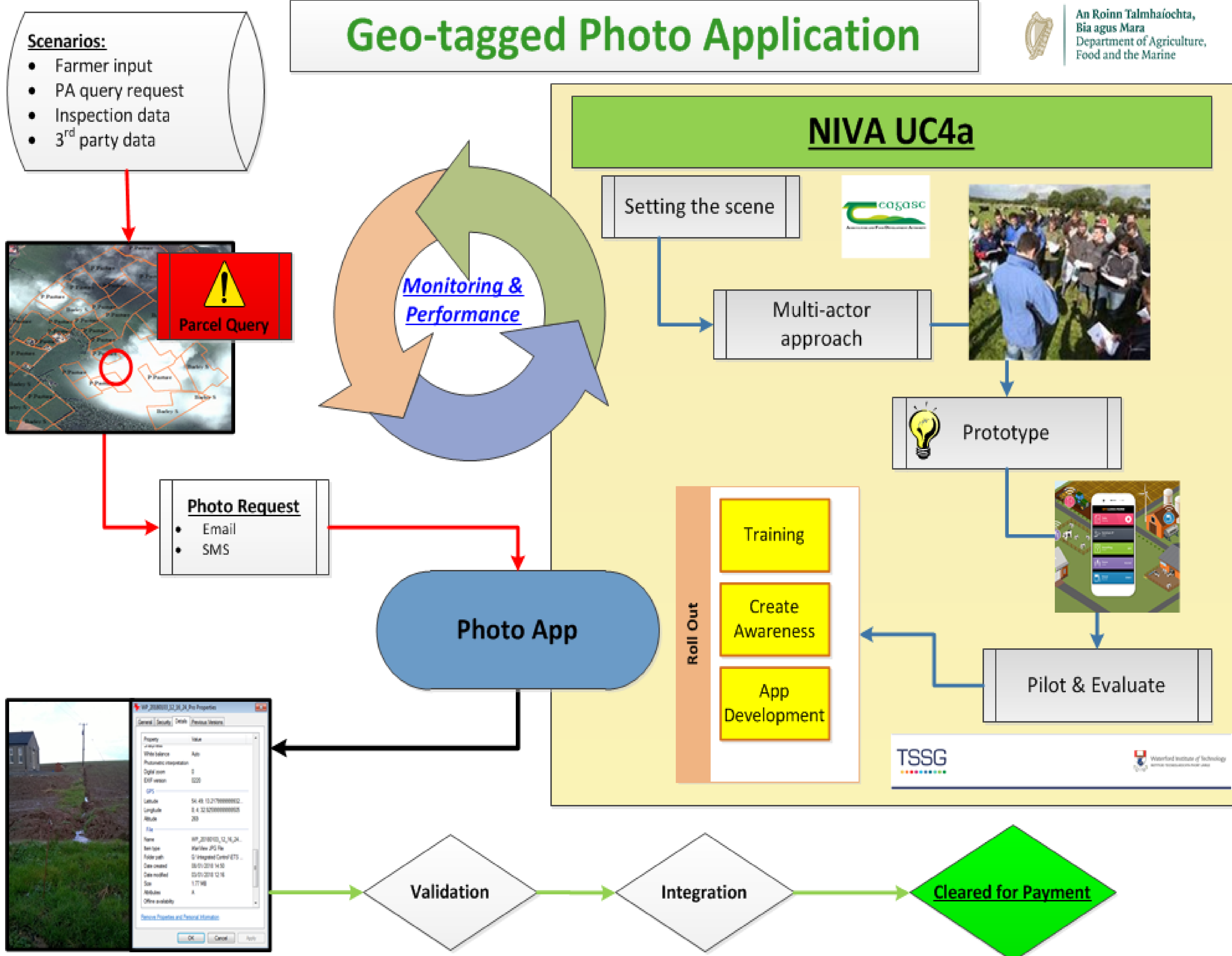
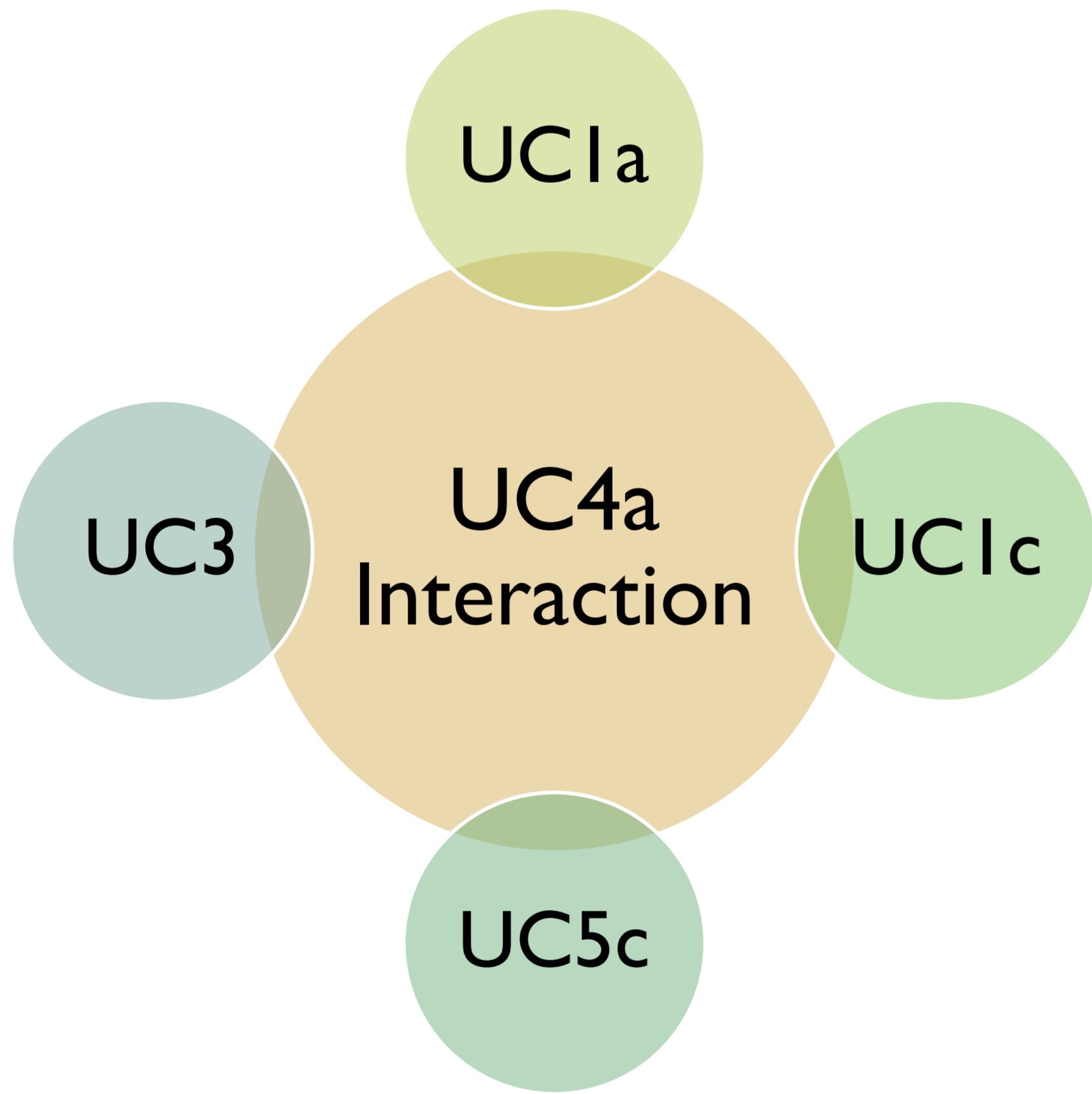
Understand user experience & appropriate design

Development of a geotagged photo application system

- Supporting a digital environment

#### Opportunities

- Stakeholder engagement
- User developed design
- Quicker resolution
- Increase IACS efficiency
- Increase technology uptake



#### Expected Results

- Development of an app for smart devices for use by farmers and others
- Identification of additional supports required to ensure maximum uptake amongst farmers
- Precise, timely and accurate in-situ verifications
- 'Multi actor approach' to land monitoring

#### Next Steps

- Initial app development Phase:
- User centred workshops
  - Identify user design constraints, concerns & uptake impacting factors
- App design
- Prototype & pilot
  - Testing in real conditions
- Analysis & Evaluation



#### Partners

- Lead – DAFM
- Teagasc will explore the socio-economic factors and barriers involved in implementation of the geo-tagged system through stakeholder engagement
  - Telecommunications Software & Systems Group (TSSG) of Waterford Institute of Technology is committed to developing the geo-tagging platform
- PA Partners – NPA, ARIB, AGEA, OPEKEPE

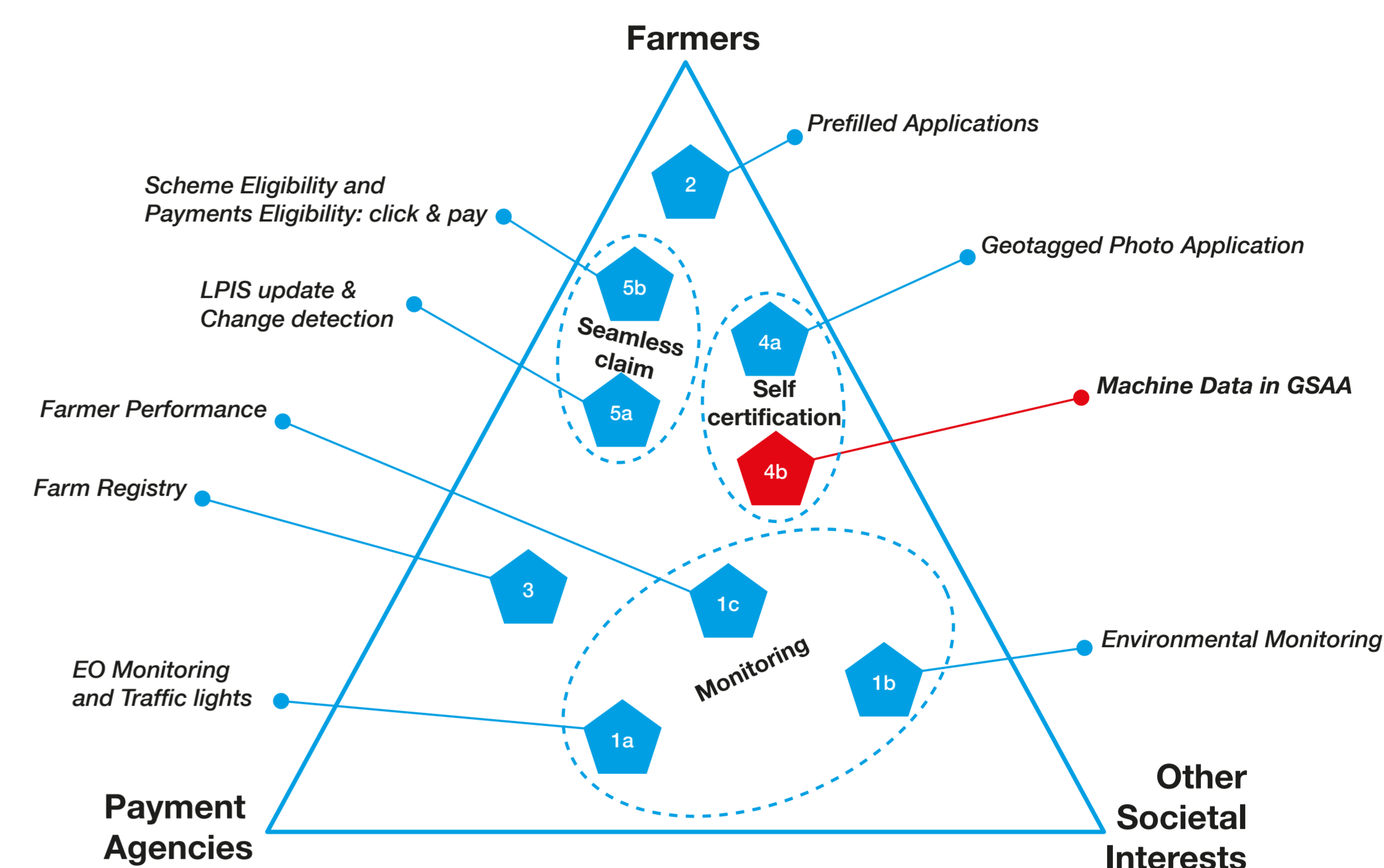
#### Contact

Department of Agriculture, Food and the Marine,  
Old Abbeyleix Road,  
Portlaoise, Co. Laois  
Email: eoin.dooley@agriculture.gov.ie

# New IACS Vision in Action - NIVA

## UC4b: Machine Data in GSAA

Lead: Netherlands (RVO)



Harvest and process location based farm machine data to:

- Directly update registers (FMIS and/or GSAA)
- Reduce administrative burden and increase data quality



### Initial design & development

- RVO – User involvement through customer panels
- ZLTO, Seges (Farmers Union, NL, DK) - Testing
- Wageningen University & Research - Design
- European AgroConnect – Standards

### Testing of results

- Denmark (DAA)
- Spain (FEGA / ITACYL)
- Greece (OPEKEPE)

### Expected products

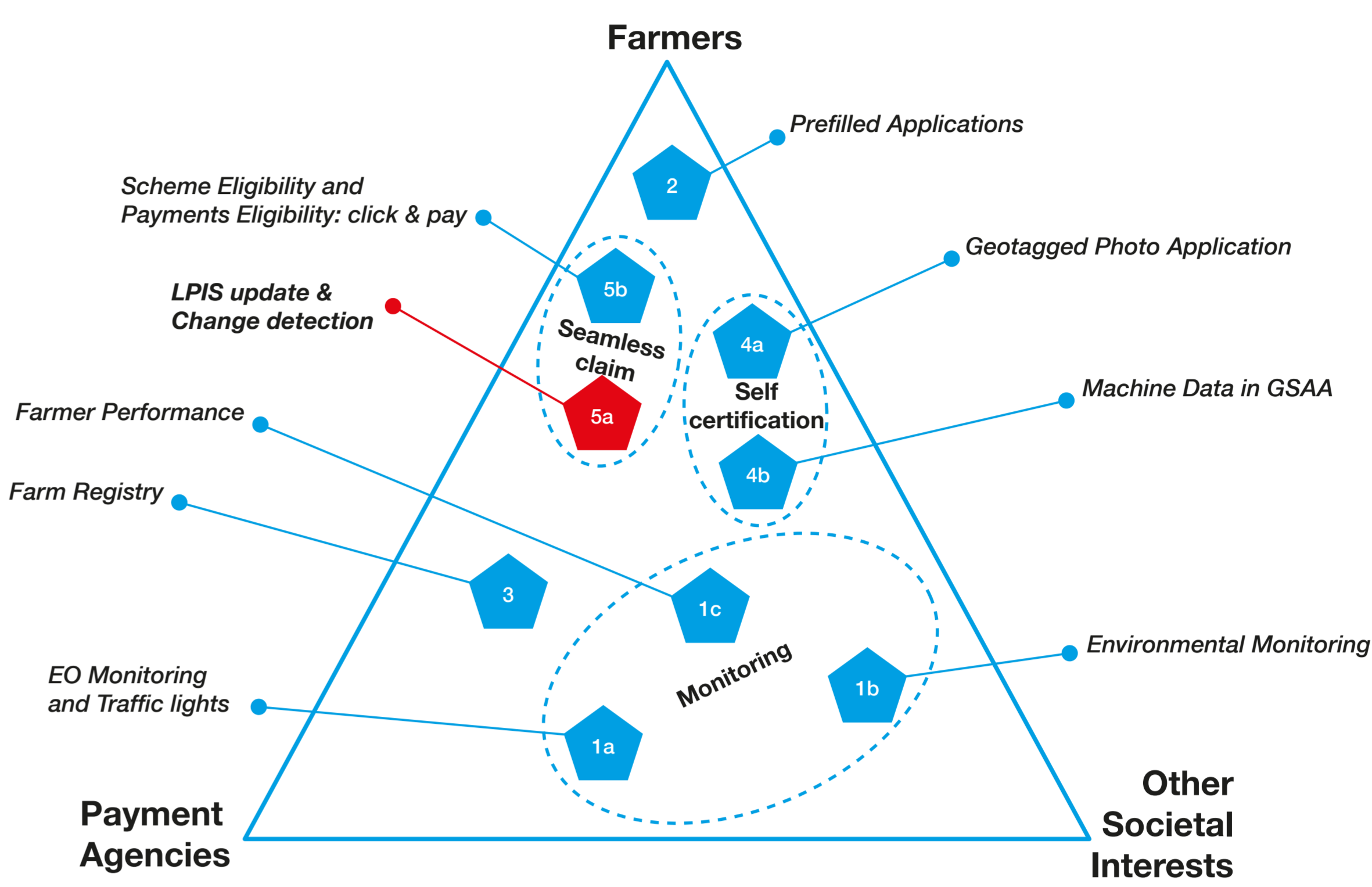
- App: automated update of parcel info in IACS based on farm machine data (location based, time stamped, trusted quality)
- Standards on data exchange
- Services to send and receive machine data
- Application Programming Interface (API's)



# New IACS Vision in Action - NIVA

## UC5a: LPIS update & Change detection

Lead: Denmark (DAA)



### Use case 5a: LPIS update & Change detection

**Goal:** To produce 3 algorithms for change detection based on orthophotos



Hedges automatically detected



New buildings automatically digitised

Source: Institut National de l'Information Géographique et Forestière

### Are there topographical or ecological elements?

We have a digital surface model that captures the natural and built features on the Earth's surface and a digital terrain model that is a 3D representation of a terrain's surface, excluding natural and built-up features. By comparing the two models, it is possible to find high vegetation, such as hedges and groves, and artificial elements, such as buildings. We use that data to generate a layer of points and surfaces on the orthophoto. The elements are shown with green and red points, as well as orange and blue polygons.



Source: Alexandra Institute

### Is the boundary correct?

We use a segmentation-network to identify orthophoto boundaries, which are shown in the black and white images. The clearer the line, the more certain it is that there is a boundary. We are still in the process of determining which network is best for boundary identification.



Source: Ministry of Environment and Food Denmark - The Danish Agricultural Agency

### Is the entire reference parcel correct - eligibility and boundaries?

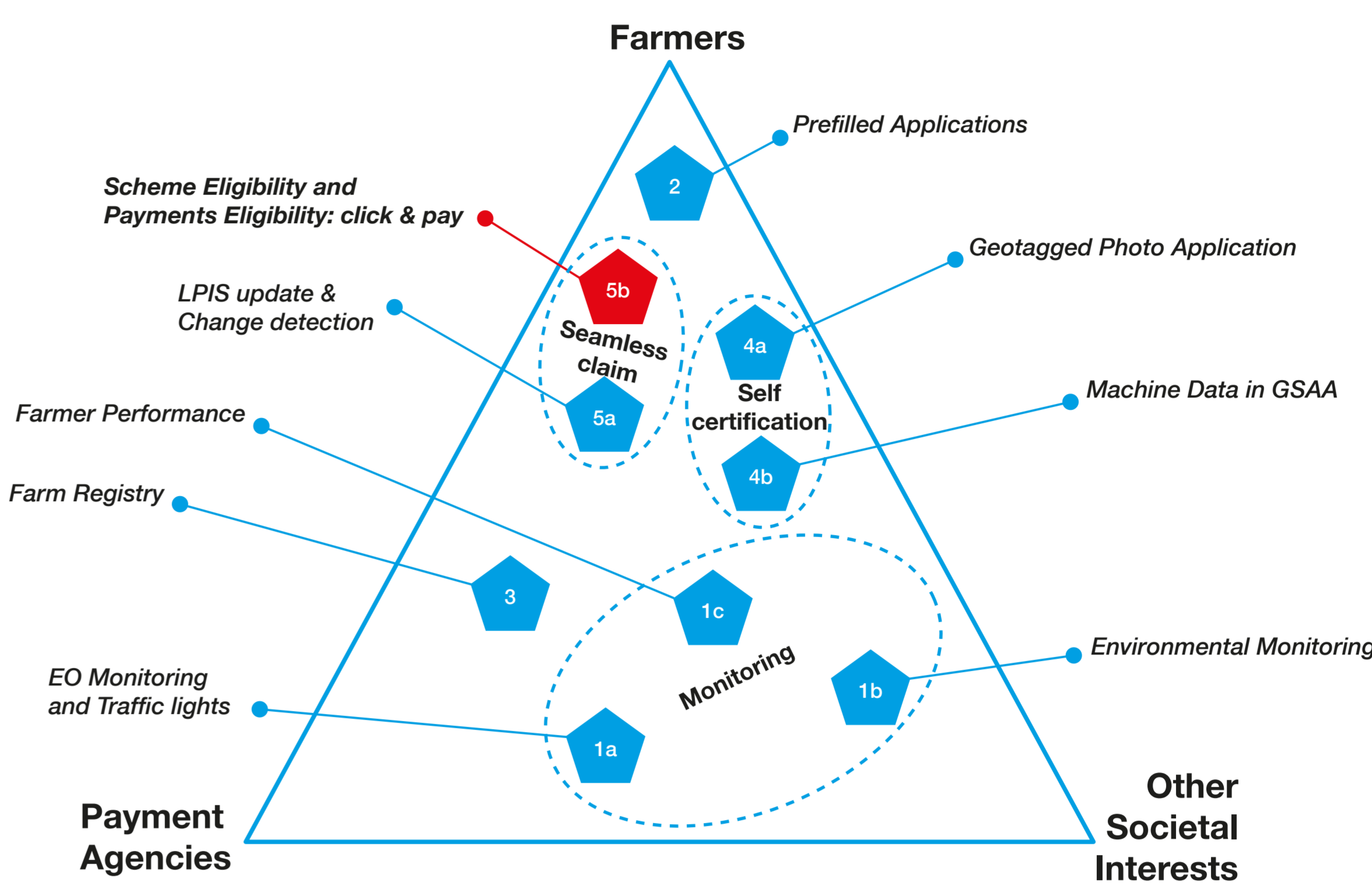
We use machine- and deep learning to determine if the reference parcel is correct. The algorithm uses orthophotos and existing data such as type of reference parcel (arable land, permanent grassland, etc.), as well as historical data regarding whether the reference parcel needs correction or not.



# New IACS Vision in Action - NIVA

## UC5b: Scheme Eligibility and Payments Eligibility: click & pay

Lead: Italy (AGEA)



### Purpose:

1. Combine almost all other use cases' results to implement an automated payment system approach going beyond the GeoSpatial Aid Application and the Pre-filled Application.
2. Review the claim handling methodology, fast track the majority of claims, hence reduce the handling cost of applications.
3. Reduce the administrative burden for the beneficiaries by re-routing of the traditional application journey and gradually fade out sanctions.
4. (plus) create an EU-wide simulation tool to quantify the value of payment rights
5. (plus) develop, for national Farm Registers (UC3), the methodology to categorise the Farm Type (n. 1217/2009) then used for a rating purpose

We aim to define the governance and to design, prototype and test the end-to-end process to achieve a seamless claim (e.g. claimless system), by piloting the Smart Contract concept on the existing IACS ledgers to ensure that the ‘correct amount’ is paid. Instead of submitting applications, farmers could indicate early in the year their interest in receiving CAP aid and the information necessary to establish the eligibility for aid could then be collected from various sources throughout the year - systematic checks carried out using the area monitoring system, data provided by farmers (e.g. precision farming data), relevant third party data (e.g. certification bodies for organic farming), etc.

