MEF4CAP

Monitoring and Evaluations Framework for the Common Agriculture Framework

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NIVA stakeholders meeting
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Setting the Background

NIVA
NEW IACS VISION IN ACTION

Modernise IACS

- Make efficient use of digital solutions and e-tools,
- Create reliable methodologies and harmonised data sets,
- Reduce administrative burden for farmers, paying agencies and other stakeholders.

MEF4CAP

Monitoring and Evaluation of the CAP

- Establish an inventory of data needs to achieve a better targeting of policy measures,
- Identify the most promising data and technologies
- Minimize the associated cost and administrative burden,
- Harmonise Member States monitoring

Setting the Background

During CAP 2014-2020 cycle:

- Policy effectiveness has been assessed following the **C**ommon **M**onitoring and **E**valuation **F**ramework (***CMEF***).
- The *CMEF* establishes:
  - Sets of indicators -> metrics
  - Data sources to compute the metrics

New indicators => more y new data

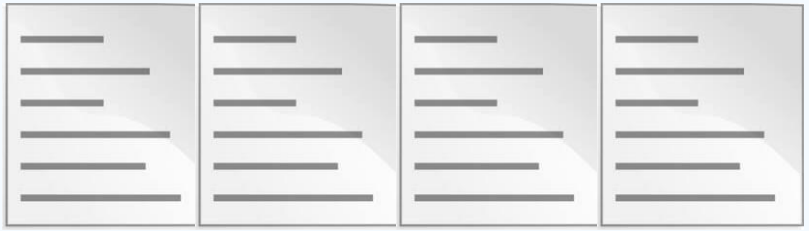
New CAP cycle (2023-2027) means:

- CAP objectives are enhancing to encompasses:
  - new emerging regulations and
  - societal demands
- A change in the paradigm for Monitoring and Evaluating the effects of the Policy
  - Shift from compliance to performance

New data sources => New technologies

MEF4CAP's General Framework

2 Identifiy TECHNOLOGICAL DEVELOPMENTS



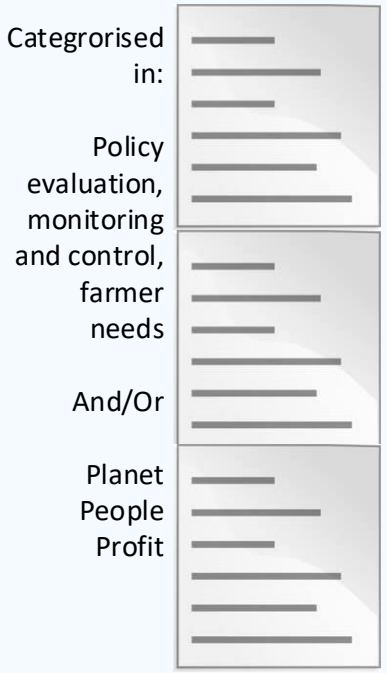
1 Identify FUTURE NEEDS

Categrorised in:

Policy evaluation, monitoring and control, farmer needs

And/Or

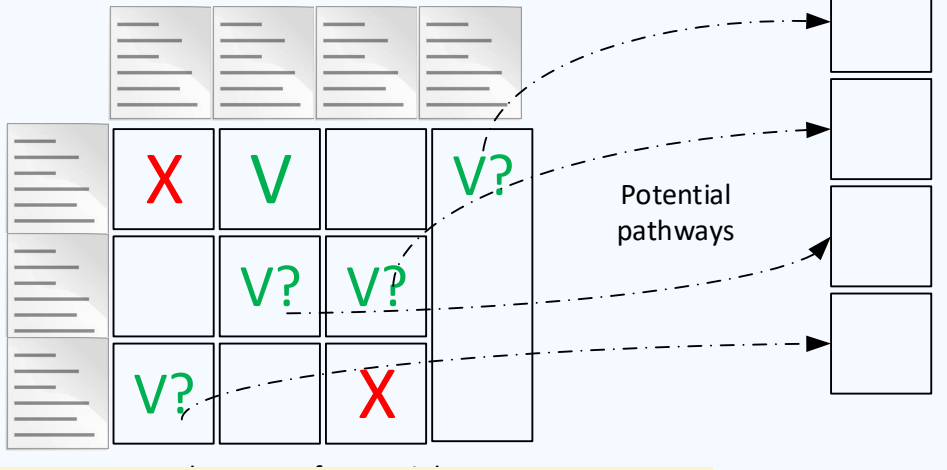
Planet People Profit



WP 3
Evaluating potential of ict development to meet needs

ICT developments

Needs



Potential pathways

4 DEMOSTRATION CASES

3 assess TECHNOLOGY POTENTIAL and define PATHWAYS.

Partnership

Consortium overview

Project structure

WP1: Policy Needs
- Assessment of needs for better monitoring and evaluation

WP2: ICT developments
- Review and evaluation of current technologies/ solutions
- Analysis of future technologies/ solutions

WP3: Current systems and future pathways
- Review of current monitoring systems
- First assessment of potential of ICT developments to address needs
- Specification of a monitoring and evaluation framework

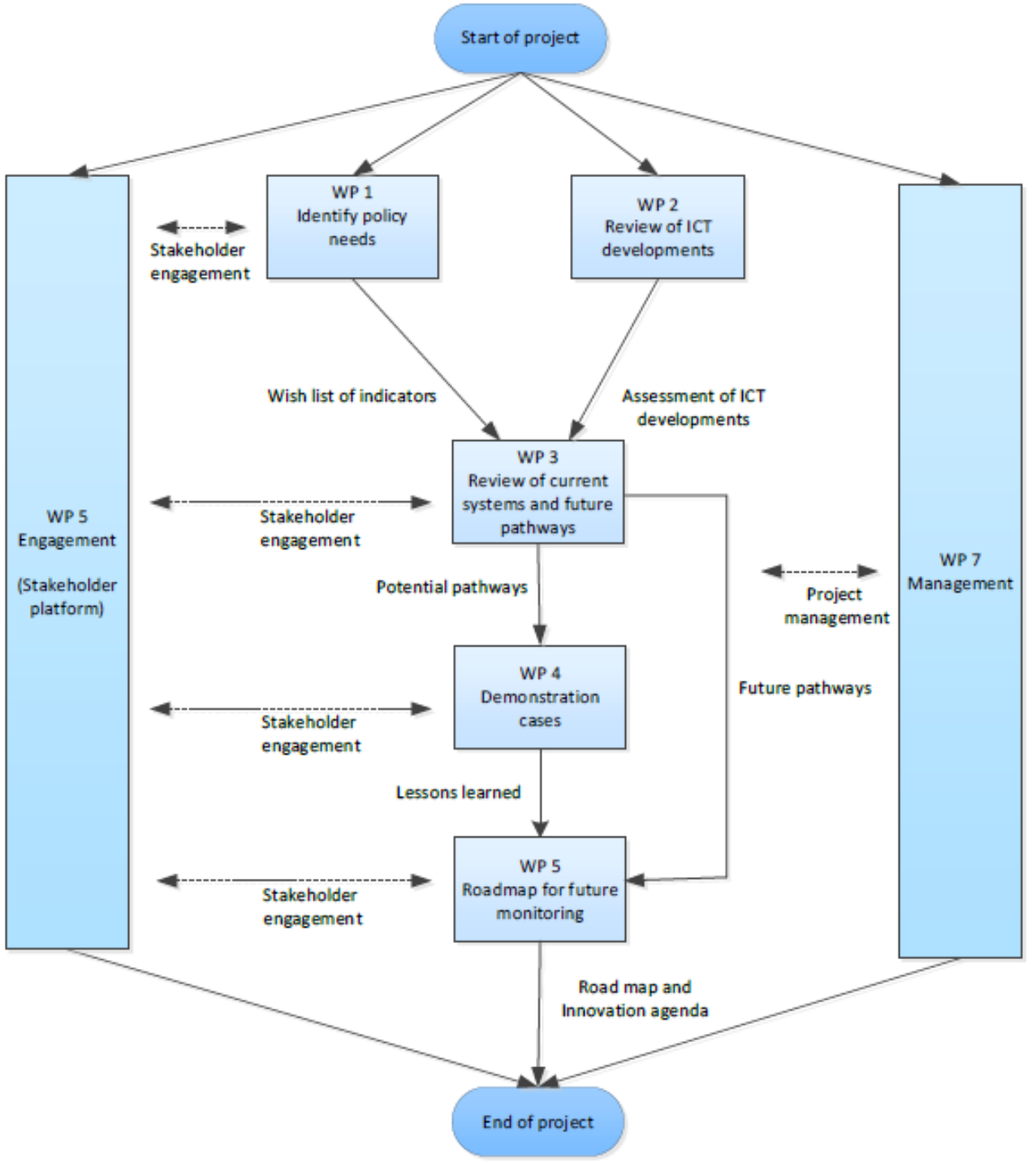
WP4: Demonstration cases and portal
- Implementation of an integrated EU monitoring and evaluation platform

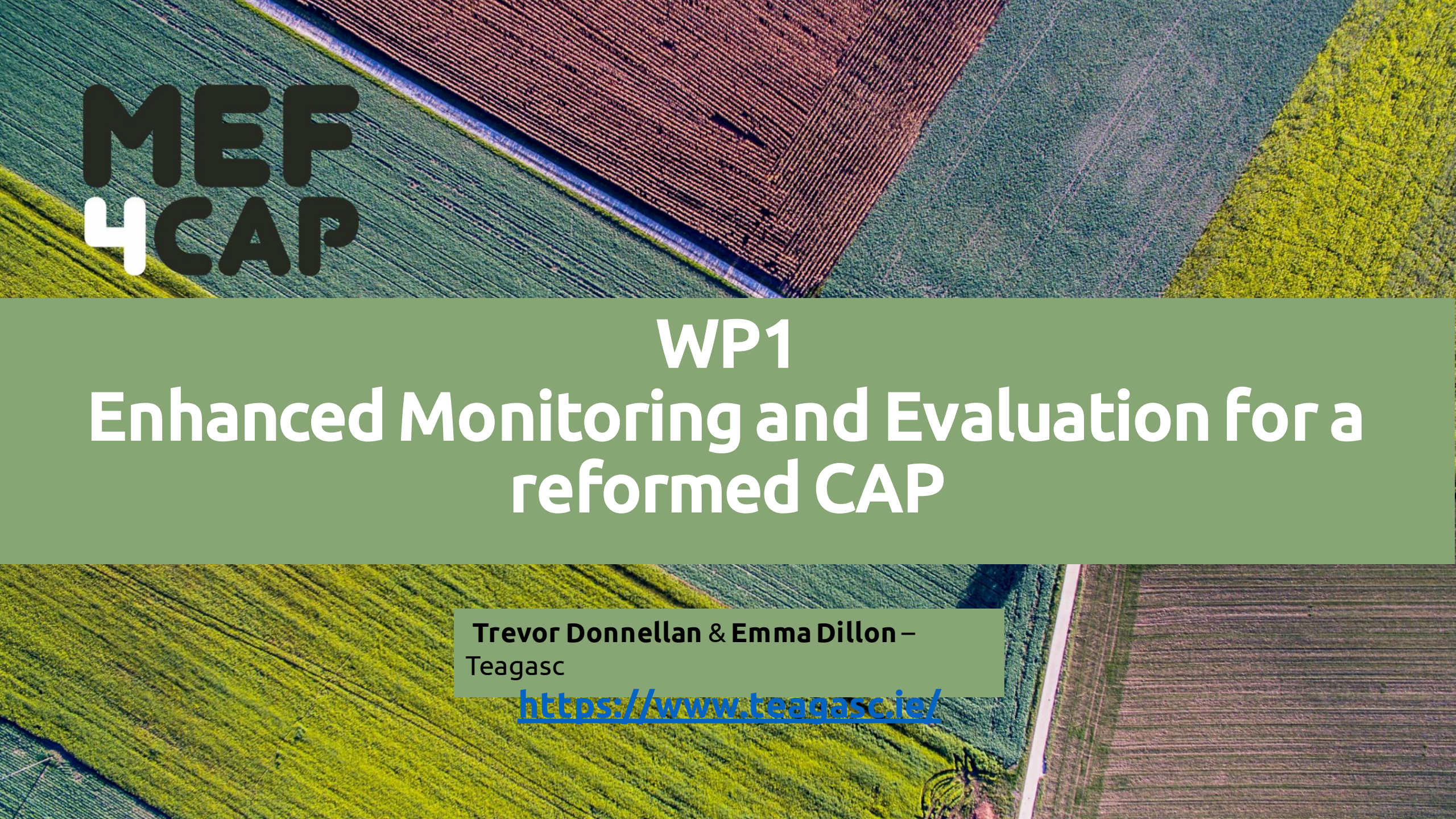
Demonstration cases:
- 1: Information transfer in agricultural sector to reduce administrative burden
- 2: Monitoring of eligibility criteria for paying agencies
- 3: Linking microlabs for policy evaluation
- 4: Integration of agri-environmental data

WP6: Synthesis and roadmap
- Lessons from pilots/cases
- Innovation / upscaling agenda

WP5: Engagement, communication and dissemination

WP7: Project coordination and quality management





WP1
Enhanced Monitoring and Evaluation for a reformed CAP

Trevor Donnellan & **Emma Dillon** –
Teagasc
https://www.teagasc.ie/

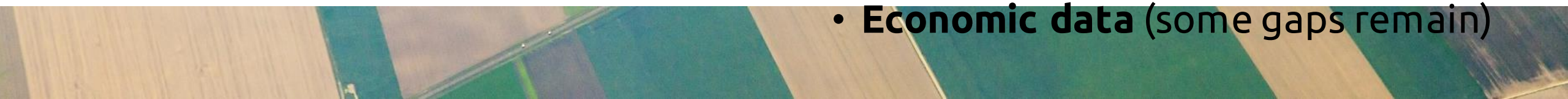
Evolution of the CAP and related policies (the emerging sustainability agenda)

Direction of the new CAP

- CAP influenced by **emerging sustainability agenda**
- **Transformative change required** – changing societal expectations
- These lead to a **the revision of CAP objectives**

Implications for Monitoring & Evaluation

- Shift from **compliance to performance** (new delivery model)
- MS CAP **Strategic Plans** (MS autonomy)
- **Indicators** need to be **updated**
- **Additional environmental and social data**
- **Economic data** (some gaps remain)



Enhanced Monitoring and Evaluation for a reformed CAP

Objectives:

- Develop a **wish list of metrics** for monitoring and evaluation purposes
  - given that **CAP** will have **widening objectives**
  - Identify CAP priorities in **next 14 years** (two CAP cycles)
- Monitoring and evaluation framework **(MEF) adapted** to reflect need
  - **for policy evaluation** (governmental policy evaluation)
  - **for monitoring and control** (implementation of control)
  - **to benefit data providers** (benchmarking tool for the development of agriculture)
- • Provide an overview of the **type of data** and **associated metrics** required

Developing an Indicator Wish List

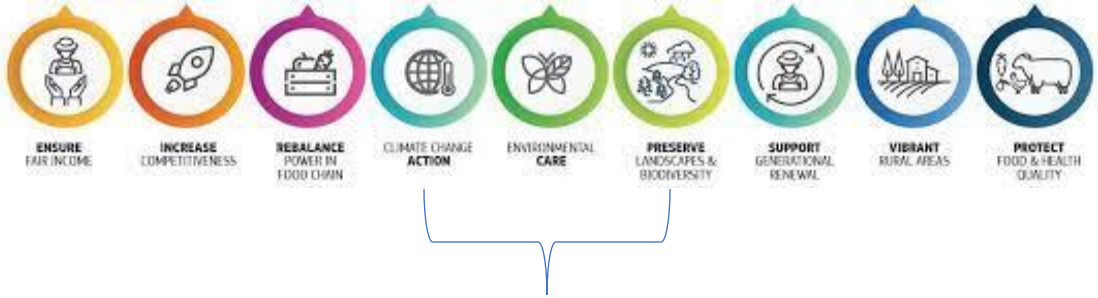
- A **Wish List** of indicators **reflecting priority data needs to fill current data gaps**
- Indicators are **associated with economic, social or environmental CAP objectives**
- **Some indicators** may be of relevance to more than one category (**multipurpose in nature**)
- **A long list** of indicators (88) further **reduced to a short list (41)**
- **Some topics have been excluded because:**
  - Either data already exists in some form e.g. FADN
  - A detailed dataset of granularity is thought unnecessary
  - The required data may be prohibitively difficult to collect
  - There is uncertainty over what is actually required
  - Where the requirement is not at an overall EU

WP3 Sistema actual y futuros pathways

EXAMPLES

Environmental

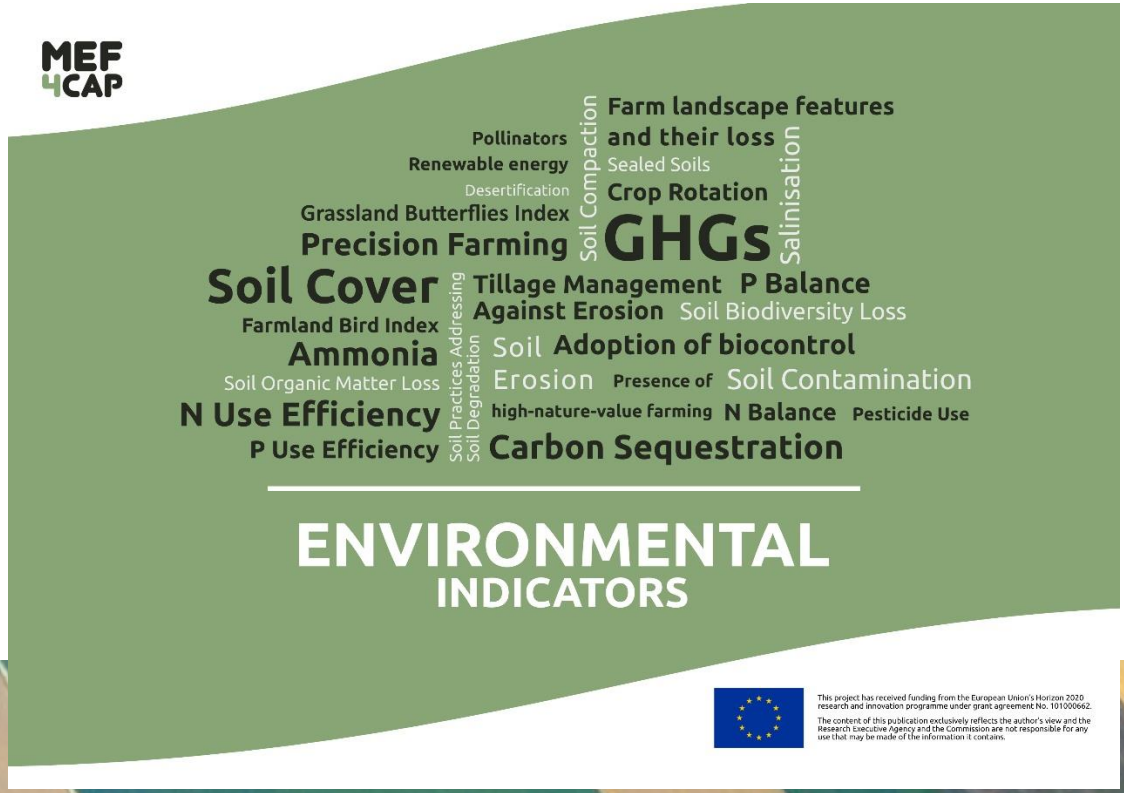
Sample indicator



- Environmental metrics a key priority area
- A number of important themes identified in Farm to Fork

Table 12: Greenhouse Gases per Farm

Indicator Name	Farm Level GHGs
Type of Indicator	Environmental
Definition	GHGs produced per farm
Unit of Measurement	Tonnes of CO_2 eq. per farm
Methodology/Formula	Total farm GHGs in tonnes / farm
Data Collection Level	Farm level
Data Reporting Level	National, regional, farm level
Frequency	Annual
CAP Objective	4. Agriculture & Climate Mitigation
Proposed Prioritisation	High



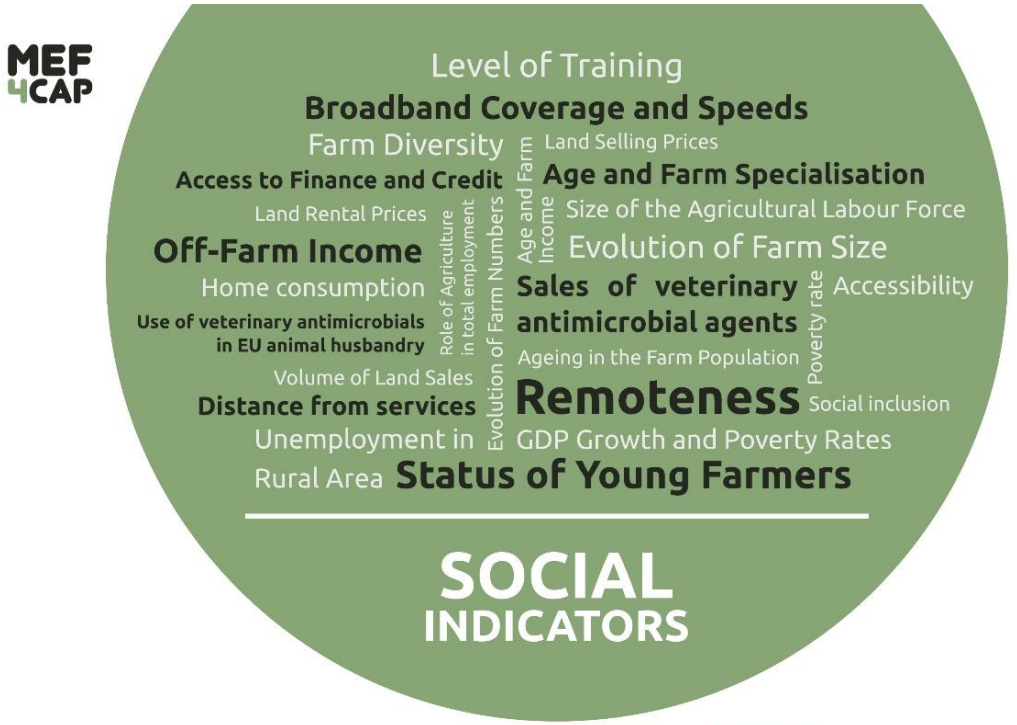
Social

Sample indicator

- A need for more holistic measures of sustainability around broad ranging societal concerns.
- Human, animal and (rural) community aspects.

Table 39: Use of Veterinary Antimicrobials in EU Animal Husbandry

Indicator Name	Use of Veterinary Antimicrobials in EU Animal Husbandry
Type of Indicator	Social
Definition	Frequency of use of medicines on farm
Unit of Measurement	Amount of medicines delivered by animal
Methodology/Formula	N/A
Data Collection Level	Farm level
Data Reporting Level	National, regional, farm level
Frequency	Annual
CAP Objective	9. Health, Food and Anti-microbial Resistance
Proposed Prioritisation	High



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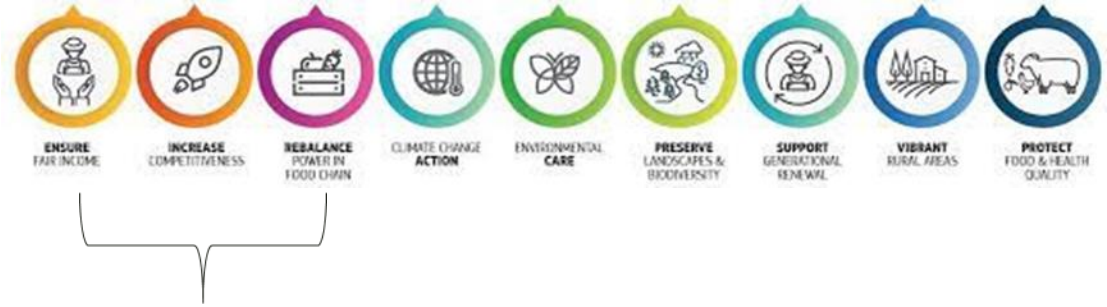
Economic

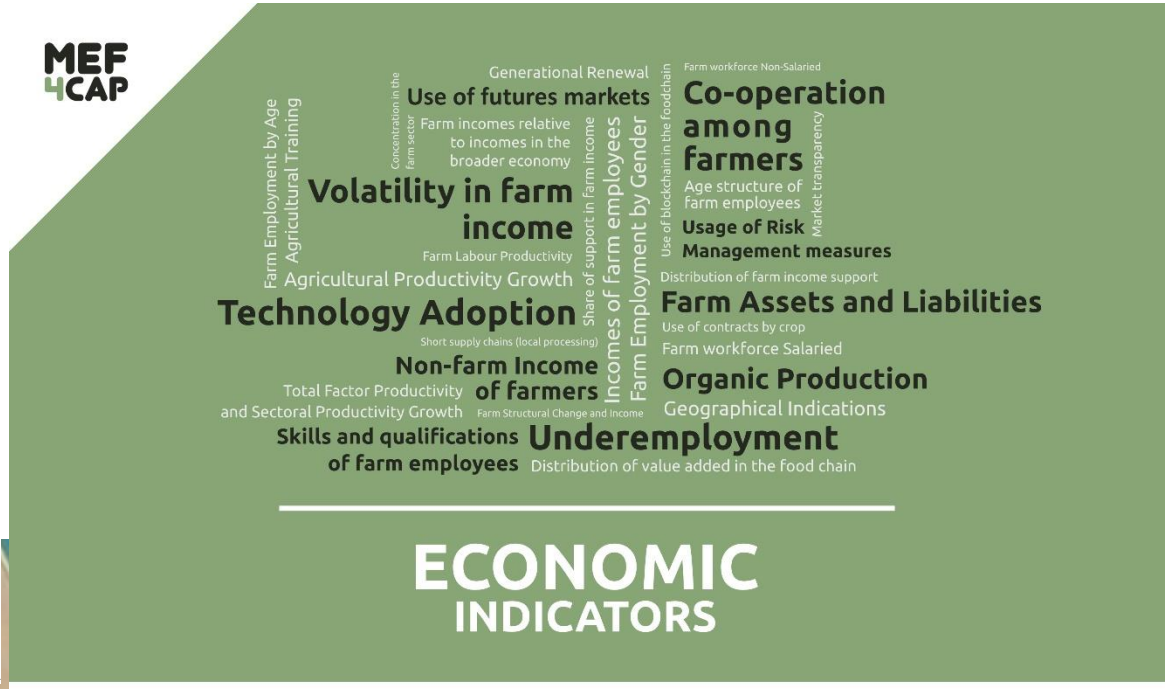
Sample indicator



- Economic dimension relatively well established, although:
  - Further detail required in some instances, and;
  - Newly emerging areas of interest need should be considered.

Table 6: Use of Forward Pricing

Indicator Name	Use of Forward Pricing of Farm Output
Type of Indicator	Economic
Definition	Share of farm output by volume that is forward sold
Unit of Measurement	Percentage of output
Methodology/Formula	Volume of farm output forward sold / total farm output
Data Collection Level	Farm level
Data Reporting Level	National, regional, farm level
Frequency	Annual
CAP Objective	3. Strengthening Farmers' Position in Value Chains
Proposed Prioritisation	High



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WP2
Exploring new data and technologies to measure sustainability in agriculture

Nikos Kalatzis & **Sokratis Kaprelis** –
NEUROPUBLIC
https://www.neuropublic.gr/

Promising technologies as new sources of data for monitoring and evaluation

Objective: To identify and assess digital agri technologies useful for CAP monitoring and evaluation

- State of the art review of technologies and assessment in the context of CAP monitoring (Legacy, Current, Future)
- Review of agri data models and agri data sharing approaches
- Continuous monitoring and collaboration with related EU initiatives and projects
- Analysis of selected cases of best practices on agri-tech utilisation serving also CAP Monitoring and Evaluation

Promising technologies as new sources of data for monitoring and evaluation

HOW TO ACQUIRE DATA

Information and Communication Technologies

- Field sensor
- Field machinery
- *Earth Observation & Remote Sensing*
- Livestock management technologies
- Pasture management technologies
- Financial Information Exchange

FARM
- On-farm data
- *Off-farm data*

Integrated in

HOW TO STORE DATA

Agriculture data models (Semantics & Ontologies)

- UN/CEFAT eCrop
- Agriculture Information Model (AIM)
- AgGateway's ADAPT
- ETSI-SAREF-Agri
- Agricultural data taxonomies

Following

FARM MANAGEMENT INFORMATION SYSTEMS

Shared with

HOW TO EXCHANGE DATA

Agriculture Data Sharing

- European Strategy for Data
- FAO-UN on farm data management and sharing
- GAIA X-Agri GAIA

STAKEHOLDERS

Third parties

- Policy makers
- Administrators
  - Control
  - Evaluation
- Researchers
  - Evaluation
- Cooperatives
- Farmers organizations
- Agri-food industry
- Advisory services

Promising technologies as new sources of data for monitoring and evaluation

Collaboration activities with selected EU projects

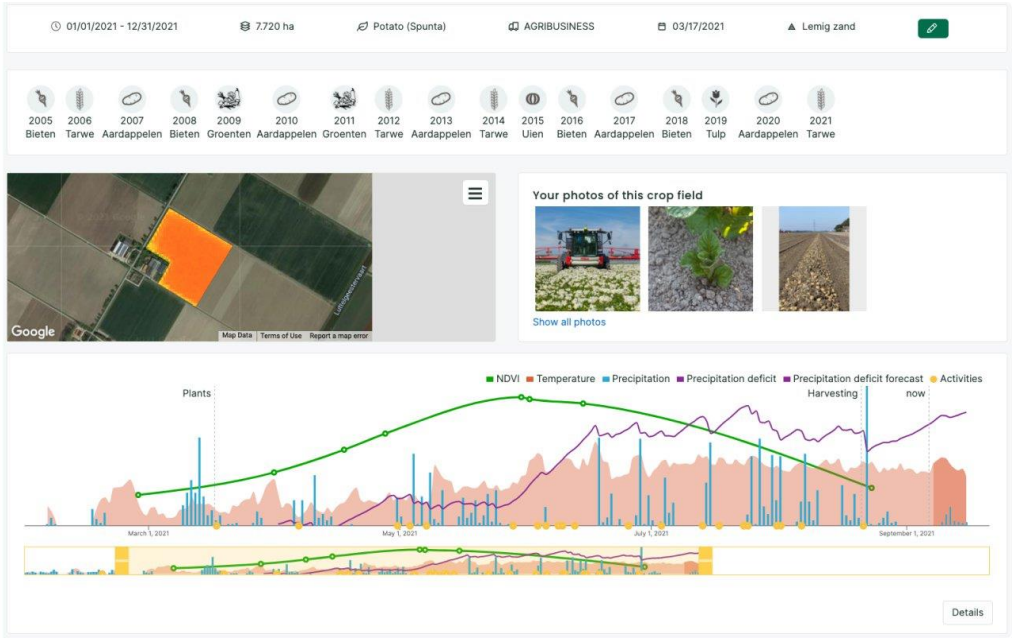
WP3 Sistema actual y futuros pathways

EXAMPLES

Promising technologies as new sources of data for monitoring and evaluation

Example: Farm level data monitoring through agricultural decision support systems

FMIS – IoT based data-driven advisory services



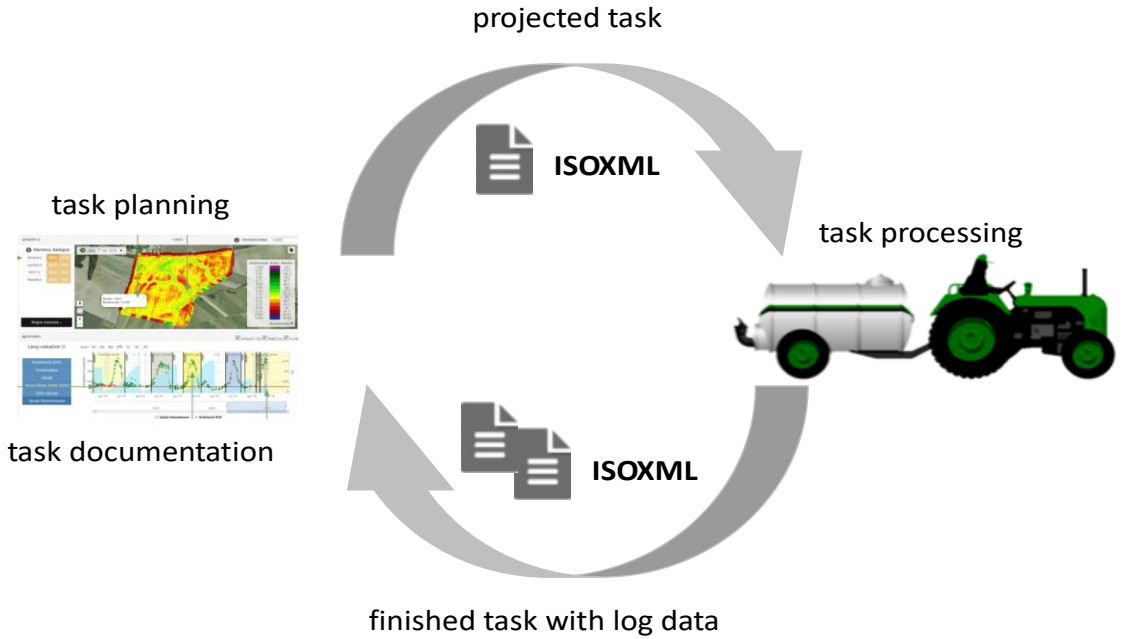
Combination of Technologies	Benefits for the farmers	Benefits for CAP Monitoring & Evaluation
Earth Observation data **IoT sensors** **Decision models** **Data analytics**	Optimised used of inputs (plant protection products, fertilisers, irrigation, fuel) Reduced environmental impact/better farm performance Automated documentation of activities	Applied inputs: irrigation/ pesticides /fertilisers on a field level. Crop type, parcel location, dates, yield

Open issues:

- Farm calendar with manually entries may also introduce **inaccurate** data (un)intentionally.
- Farmers' acceptance on **data sharing** is still an issue
- Sharing of FMIS generated logs already integrated in certification audits e.g. GlobalGAP

Promising technologies as new sources of data for monitoring and evaluation

Example: Variable Rate Application technologies and monitoring of applied phytochemicals



Technologies	Benefits for the farmers	Benefits for CAP Monitoring & Evaluation
Remote sensing for scanning the field/canopy of plants **Field zoning algorithms** **Variable Rate Application sprayers** **Satellite navigation systems**	Optimised use of inputs (agrochemicals, seed, fuel) Reduced environmental impact Reduced cost for farmers Automated documentation of activities	Farm level digital evidences of applied inputs (PPPs, seeds, fuel) Increased transparency of applied practices useful also for food retailers/processors

Open issues:

- **Interoperability** and **connectivity** issues. There is still no dominant approach for communicating generated ISOXML datasets with third parties.
- No mechanisms to **verify** the actual **composition of the inputs** (fertilisers, pesticides, seeds)
- Penetration and **utilisation** of VRA enabled farm machinery is **rather low** in EU countries where small and fragmented farms are the majority (e.g. South Europe).

Promising technologies as new sources of data for monitoring and evaluation

High Level Outcomes

- There is no one-fits-all technological approach to support CAP Monitoring & Evaluation
  - A combination of different technologies that are able to interact is necessary
  - Increased heterogeneity needs to be addressed
- CAP M&E and optimised farming practices can both be supported by agri-tech
- The way forward: Landscape monitoring
  - Aggregation of information on regional bases generates additional data products and knowledge
    - Area/region based sustainability performance monitoring
  - Support for policy makers and policy monitoring - Incentivize farmers to share data

WP3
Current system and future pathways

Alberto Gutiérrez García & **David A. Nafría García** – ITACyL

https://www.itacyl.es/

WP3 Current system and future pathways

Objectives

- Identify **potential solutions** to meet the data requirements for the Common Agriculture Policy Monitoring and Evaluation.
- Identify and define the most promising **pathways** to achieve the detected data needs for each indicator.

Pathway is a combination of several data sources and/or technologies that ease the computation of the indicator's metric

WP3 Current system and future pathways

Task 3.2: Potential of current systems and ICT developments for future data needs

WP2

Technologies:

EO, Sensors, FMIS, Pasture, herd...

Technology - Data

WP1

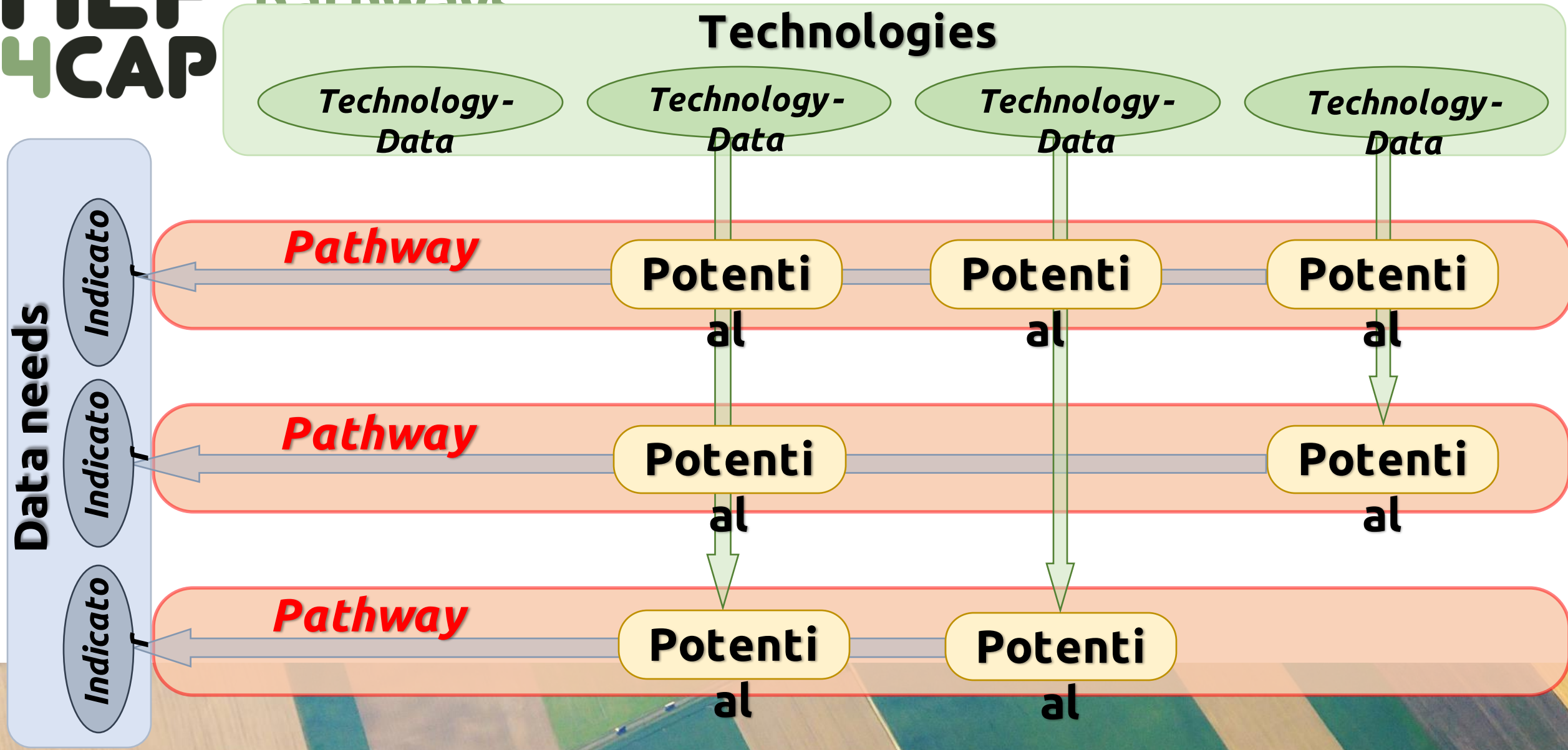
Data needs

Indicator (metrics)

Potential

- **Data** provided by the technology
- **Requirements** for the data to address the indicator's metrics.

WP3 Current system and future pathways



WP3 Sistema actual y futuros pathways

EXAMPLES

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WP3 Current system and future path

Data need

Indicator: **Carbon Seq.**

Metric: **CO_2 eq/ha**

Ec

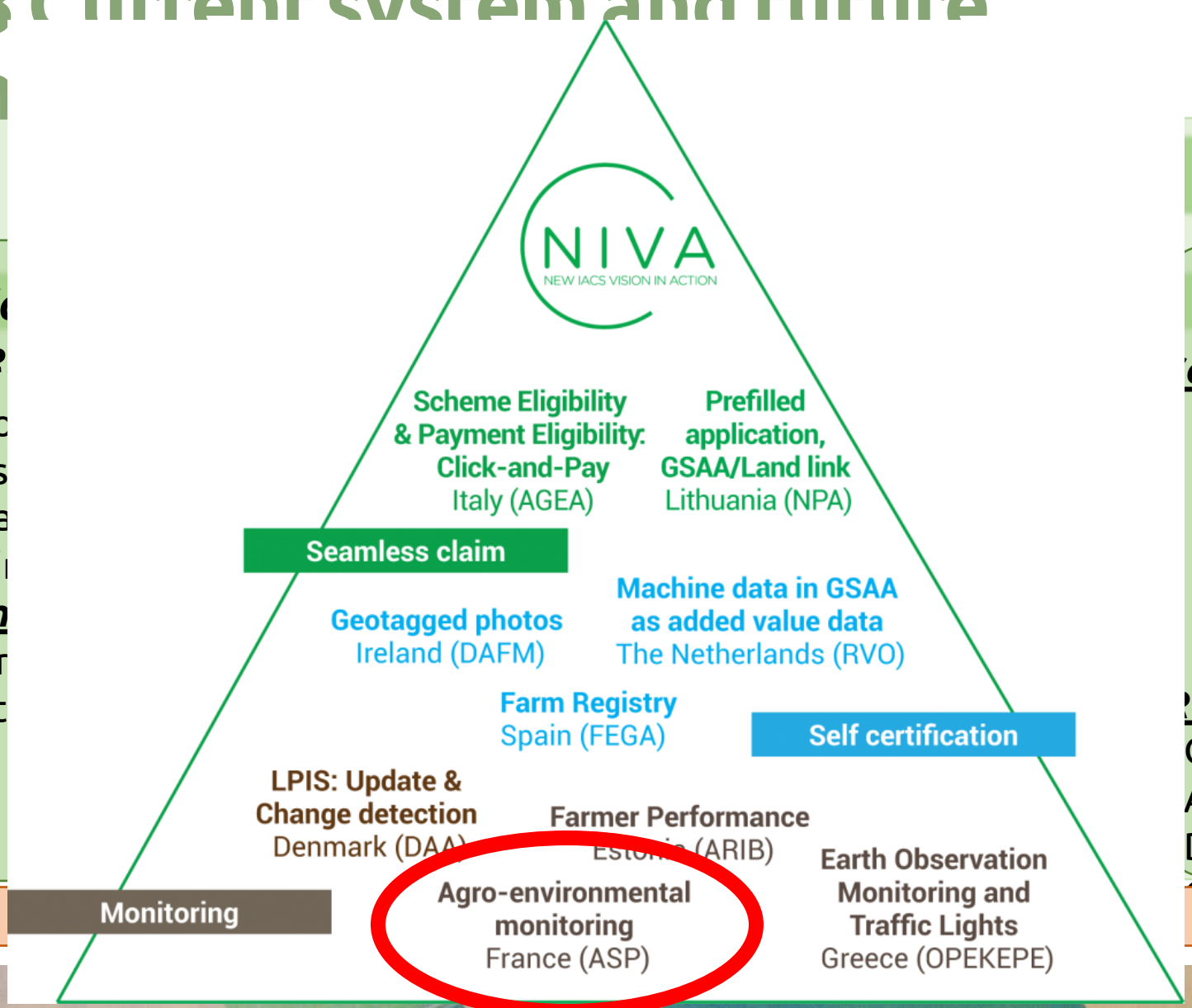
Obse

Source

- Land co
  biomas
- Spectra
  modeli

Requirem

- ML algor
- Agri. Dat
- CO_2 seq.



Crop monitoring

ource

FMIS Records of crop type, tillage practices, yield, residues and manure.
Environmental data

equirements

Crop models
Agri. Data Model
Data sharing

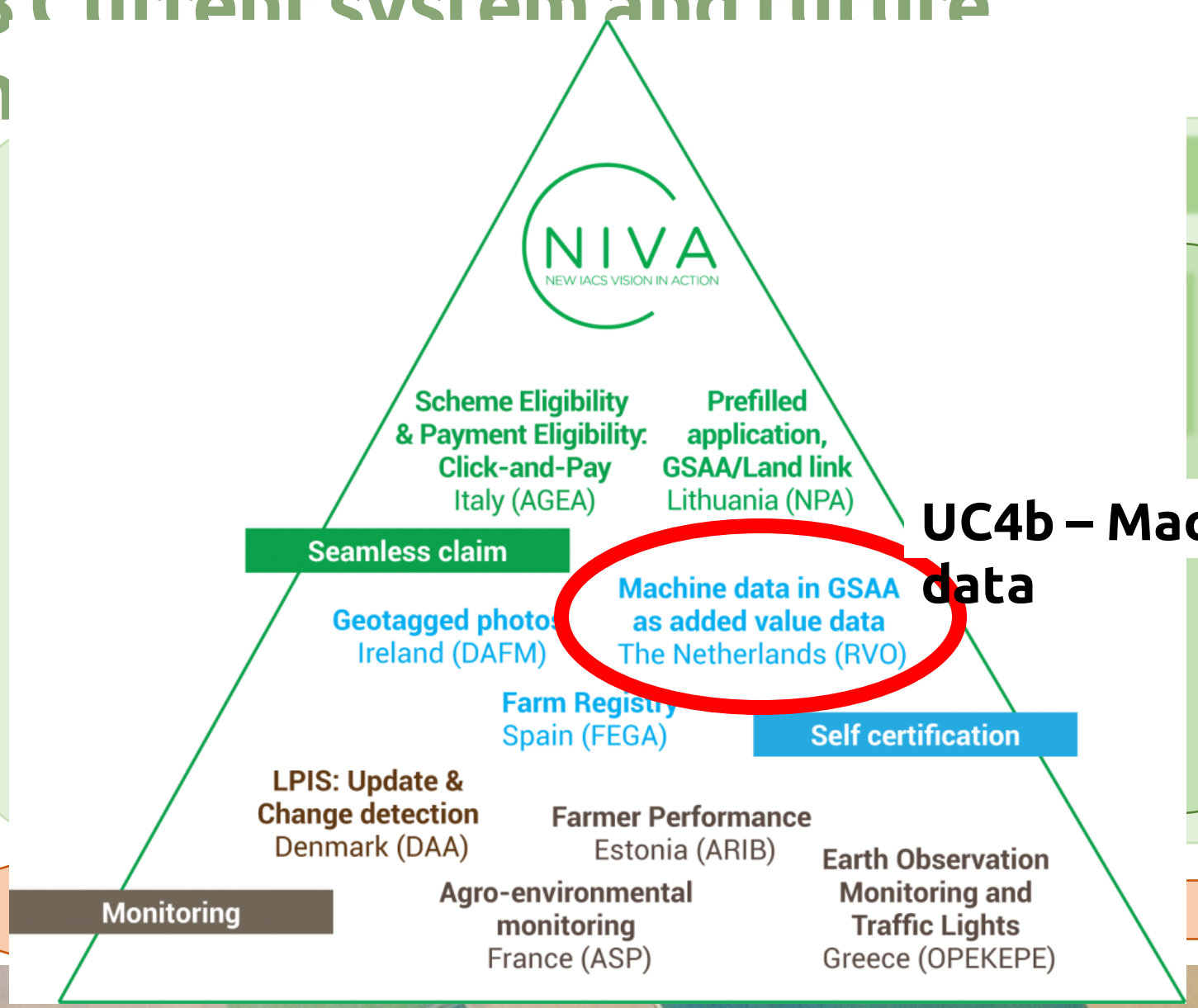
UC1b – Carbon budget

MEF 4CAP

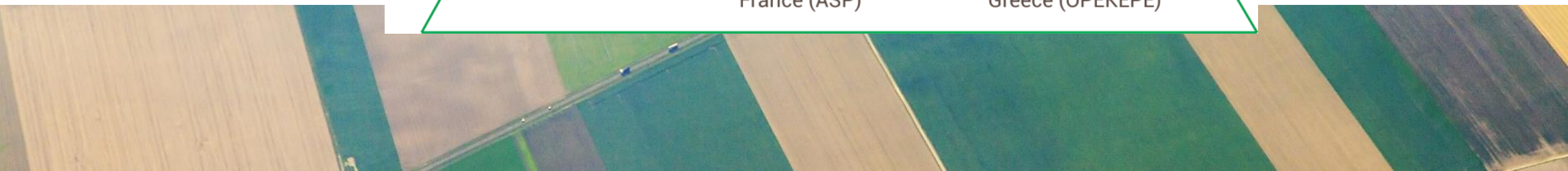
WP3 Current system and future path

Data need

Indicator:
Pesticide Use
Metric:
To be defined



UC4b – Machine data



MEF 4CAP

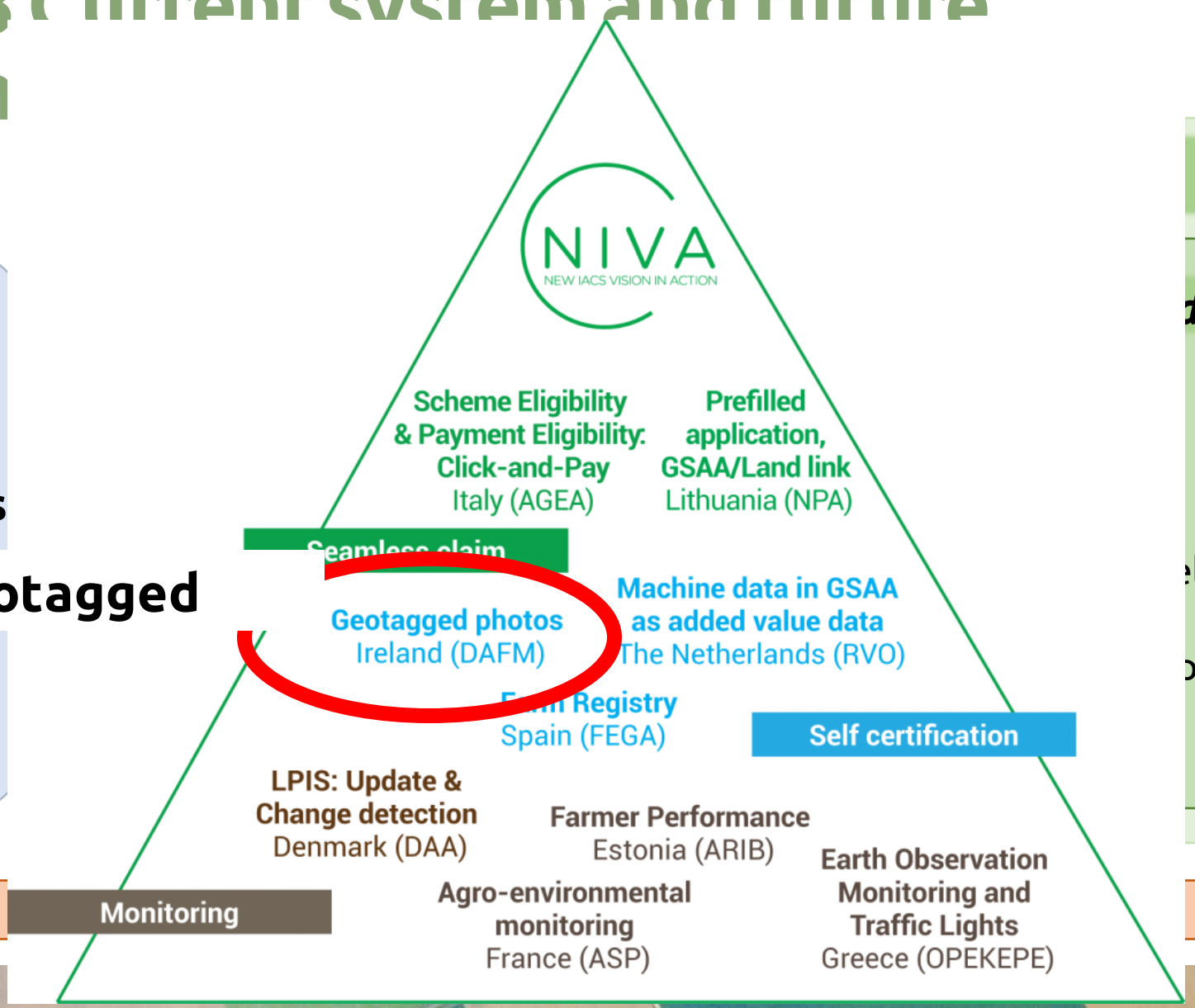
WP3 Current system and future path

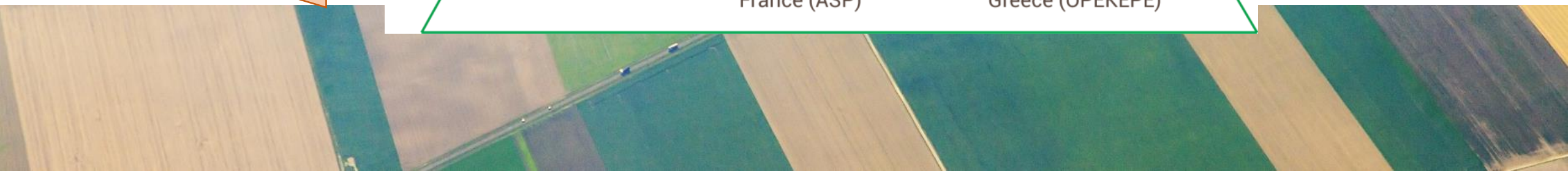
Data need

Indicator:
Farm landscape features and their loss

Metric:
Number of features relative to previous period

UC4a – Geotagged Photos

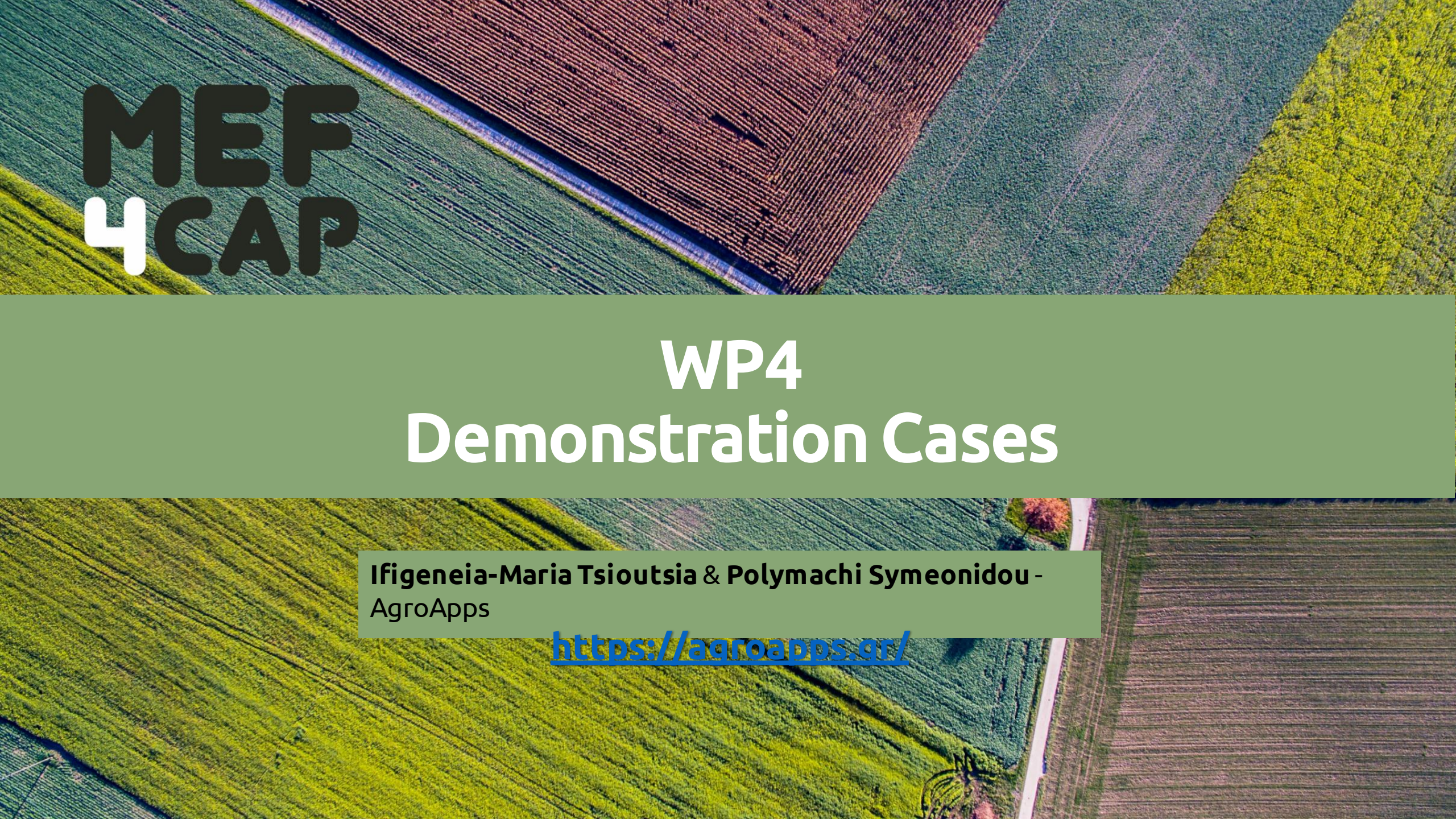




WP3 Sistema actual y futuros pathways

Conclussions

- Technologies addressing **economic indicators** are better **developed and established**.
- Few technologies to quantify some **social indicators**.
- **Environmental indicators**:
  - Requiere **combining** more **technologies** to compute their metrics.
  - **Scientific models** are needed to estimate either the metric or a proxy.
- **Interoperability between systems**:
  - Administrative databases ←→ statistical databases (evaluators access)
  - Machinery logs ←→ FMISs => data models and semantics (among others).
- **Willingness of data providers** to share their data:
  - Perception: evidence for penalties.
  - Accomplishment of GPDR regulation.
  - Technologies need to show advantages to data providers.
- Technology adoption:
  - Farm level: invesment in new technologies.
  - National/regional level: feasibility of using some technologies



WP4
Demonstration Cases

Ifigeneia-Maria Tsioutsia & **Polymachi Symeonidou** - AgroApps

https://agroapps.gr/

WP4 Demonstration Cases

DC1.1 Use of digital information flows in the agri-food sector

- **DC1.1** (Poland):
  - The DC will improve farm-level **management of environmentally sensitive inputs**.
  - It will **combine data** from Paying Agency of farm parcels with FADN system and collecting information on sustainability of fertiliser use.
- **DC1.2** (Netherlands):
  - This DC will provide and test means to **reduce the burden** (and costs) associated with the provision of data, help accelerate **digitalisation**, improve data **reliability** and establish **enhanced monitoring and evaluation** of farm and other data.
  - Focus on **organic dairy and arable farmers** and it will **combine and cross data** from existing sources (such as FADN) with alternative sources of information (i.e. economic data, environmental data, sustainability data, fertiliser use, antibiotics use, etc.).
- **DC1.3** (Ireland):
  - This DC will focus on the sector of conventional **dairy farms.**
  - The DC is aimed at the reduction of the amount of paper based on **data collection** from farms through the use of a dairy processor and **digital recording** document.

WP4 Demonstration Cases

DC2: Integrating open-source satellite data with farm level data

- **DC2.1** (Greece)
  - This DC will focus on developing a **digital farm book** that will support subsidies control and compliance checks based on "traffic light" scheme
  - The digital farm book will extract farm/ regional statistics on the use of **pesticides, fertilisers and irrigation**.
  - This DC will **integrate** several **technologies**: EO classification data, geo-tagged photos and digital farm calendars

- **DC2.2** (Spain)
  - This DC will develop a **digital farm book** that will support monitoring farmers' compliance with additional requirements linked with extra payments in the vinery sector
  - This digital farm book will collect and store statics on **fertilizers and pesticides use and water consumption**.
  - It will **combine** the **information** collected by this digital farm book with Remote sensing data.

WP4 Casos de demostración

- **DC3** (Netherlands): **Combining data from national level to improve policy making**
  - This DC will use a mock-up of how data in national or regional databases (FADN) could be combined in a virtual microlab (i.e. linking microlabs).
  - This DC will also include a discussion on accession rights and privacy issues.
- **DC4** (Spain)**: New ways for monitoring agri-environmental measures**.
  - This DC will be a proposal for an **eco-scheme** in the Spanish Strategic Plan with regards to **Low Carbon Agriculture** – (P1) Increasing the carbon sink capacity of pastures by promoting extensive grazing
  - the DC will define the workflow to **combine georeferenced information**: the herd position collected from GPS with remote sensing data and IACS/LPIS information within a GIS environment
  - It will also **integrate off-farm data** such as national meteorological information (AEMET network) and soil information (LUCAS).
  - The DC will include/provide indicators on organic fertilisation from livestock manure as a proxy indicator for organic matter content in the soil and carbon sequestration, as well as

Gracias por su atención

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