

# WHEN SPACE MEETS AGRICULTURE

14-15 November 2016 | Matera, Italy

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#WSMA16

## Space2ID : an action to support internationalisation of space based SMEs

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WHEN SPACE MEETS AGRICULTURE | 14-15 NOVEMBER, MATERA





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### THE EUROPEAN STRATEGIC CLUSTER PARTNERSHIP FOR SMEs USING SPACE DATA



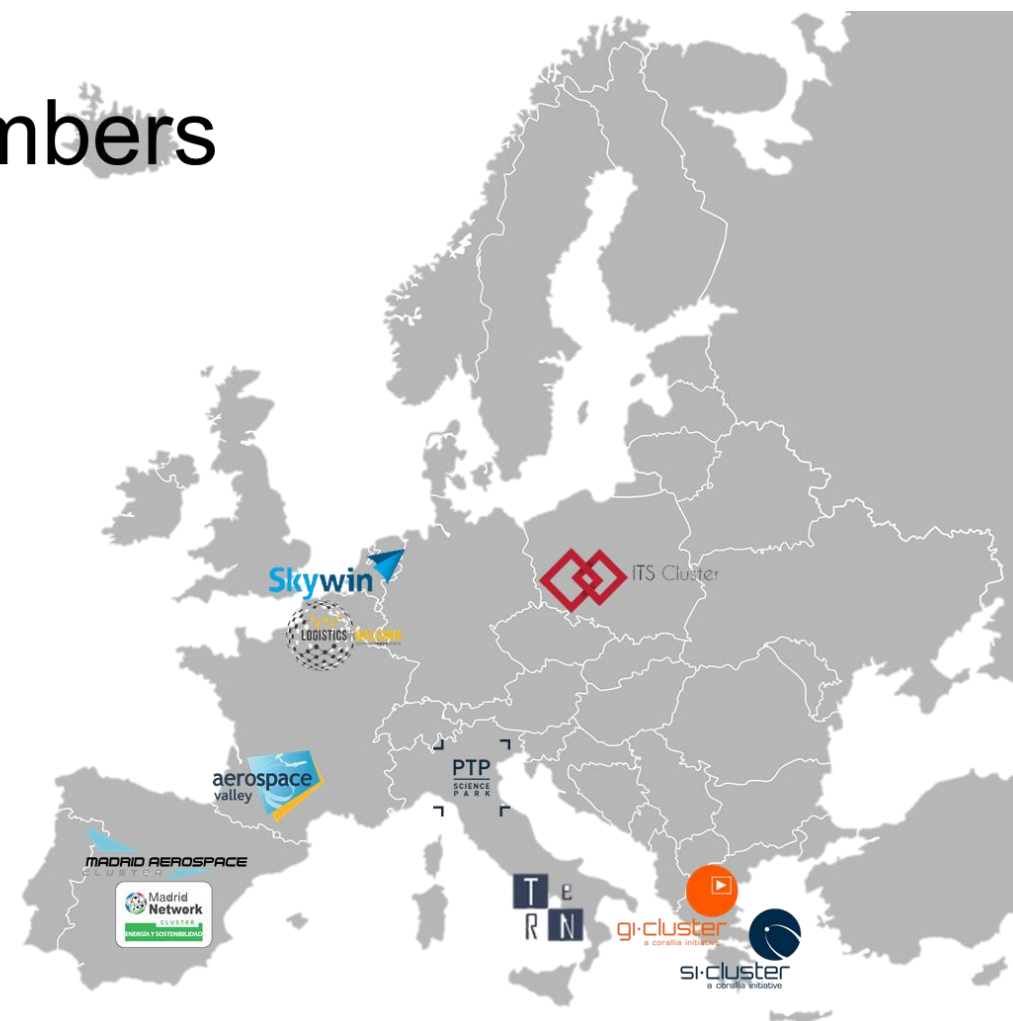


## The founding members

**10** clusters

**6** countries

**500** companies







# SPACE2ID CONCEPT



**M**OBILITY



**E**NERGY



**L**OGISTICS



**C**REATIVE  
INDUSTRIES




**A**GRICULTURE





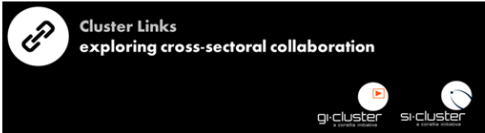
# Raising awareness among cluster communities

A   
Precision farming  
Culture harvest  
Weather forecast  
for cocoa plantation  
...

**Analysis of MELCA  
business trends**



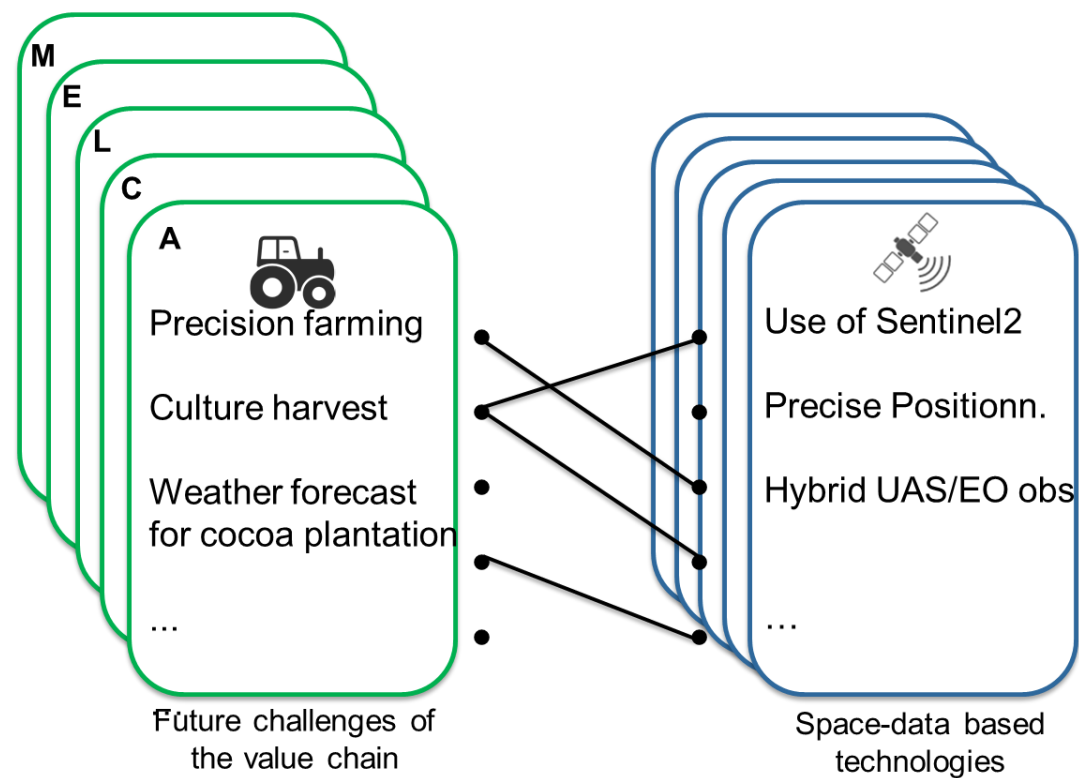
**Overview of space  
data enablers**



**Sensibilisation  
workshops**

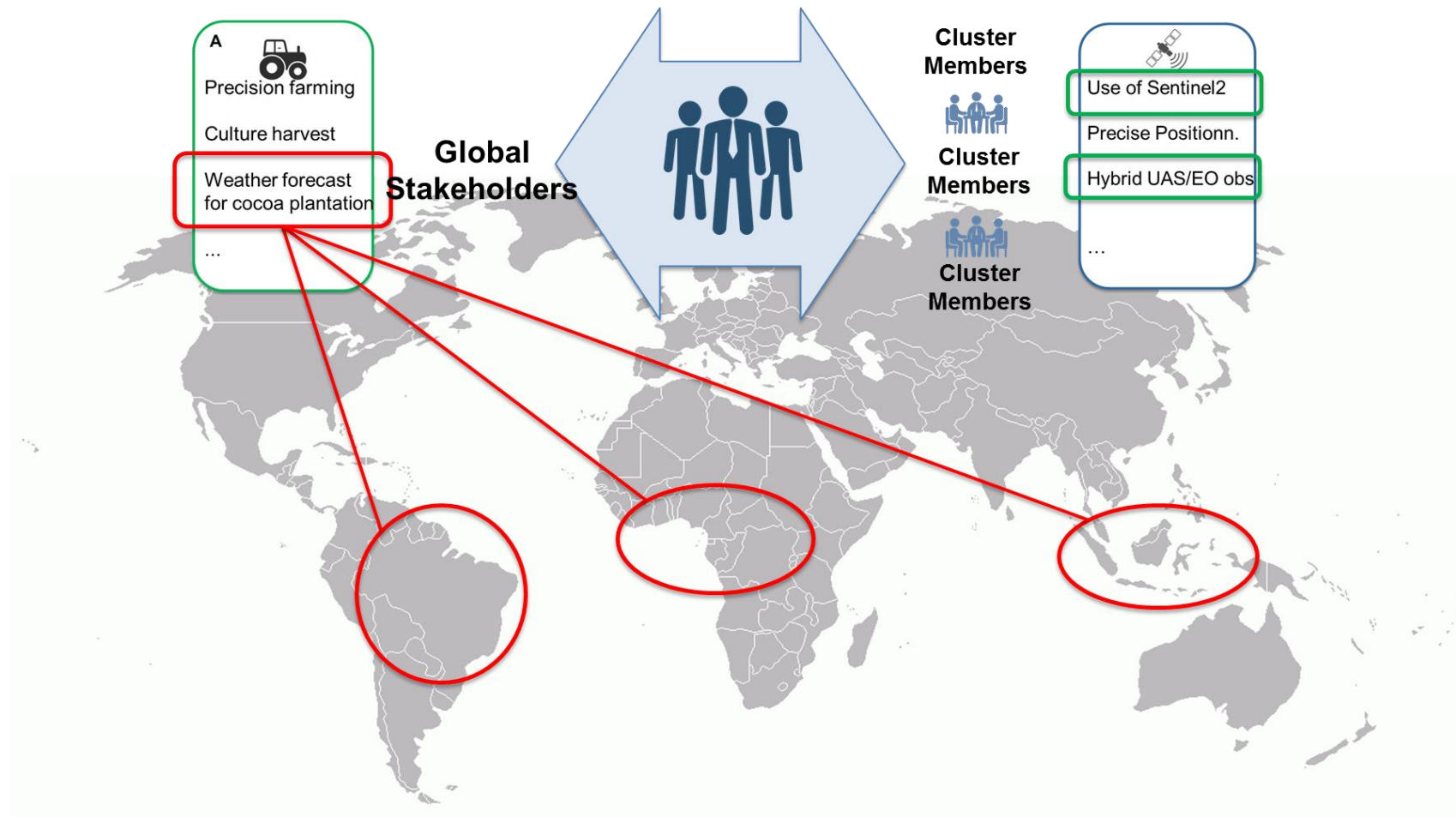


## Liaising space and non-space cluster communities





And detect international business opportunities of mutual interest





# Summary of objectives

- MELCA value chain segments where space data can bring added value
- Detect potential stakeholders and geographical areas of interest
- Draft collaboration communities mutual international cooperations

## **PARTNERSHIP AGREEMENT**

**Signed by 10 Clusters in Matera, Nov 16<sup>th</sup>**





## Coming next

- A 2-year internationalisation strategy plan 2017 - 2018
- Joint fact-finding missions bringing together Space2ID clusters
- Trade missions for European space-based SMEs



# Activities and preliminary Results

## AGROFOOD Focus

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- **WP2 goal:** to study the **international markets and trends** especially in terms of the prospects of technology evolution for each industrial sectors: **M:** Mobility - **E:** Energy - **L:** Logistics - **C:** Creative Industries - **A:** Agro-food
- **WP3 goal:** is to **select the most promising space assets and applications** to be integrated to the different MELCA business value chains for international exportation, based on the **consortium's capacities in downstream services and space technologies**. The main actors will be defined (at a European level) in order to **create 5 dual communities** (Space and MELCA actors).



# Analysis of global market and trends in MELCA sectors

## AGRIFOOD FOCUS

### First Task - WP2

Analysis of markets and trends of MELCA (Mobility, Energy, Logistics, Creative Industries and Agriculture) sectors in order to:



- Give a Global overview of the sector
- identify a 5 major challenges for future market trend in the sector
- Identify EU and NON-EU countries with market expansion potentialities (including ECCP MOU countries) for Space sme

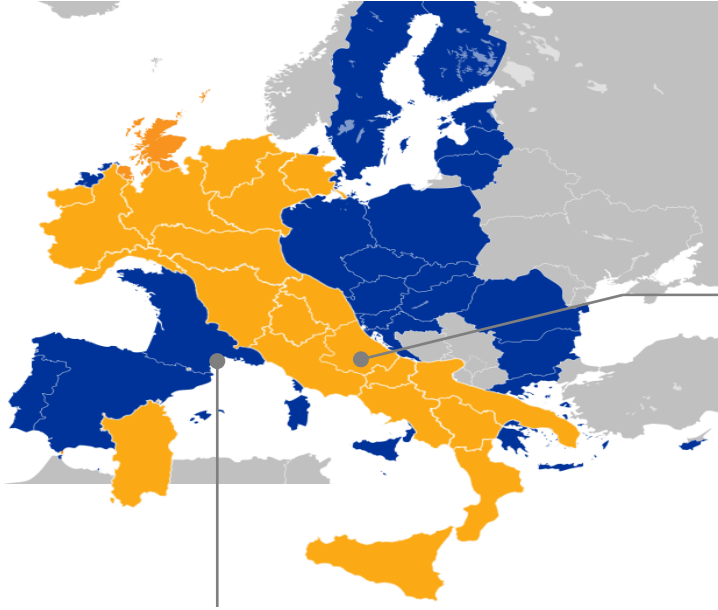
AGRO-FOOD NEEDS: DEMAND POINT OF VIEW



# Analysis of global market and trends in MELCA sectors

## AGRIFOOD FOCUS

### Global Sector Overview




#### National level – Strategic asset

- 13.2% of the workforce (3.3 M workers)
- 8.7% of GDP (119 B€).
- 76 B€ in wages that are paid out annually
- 23 B€ in investments and the contribution to tax revenues, which, net of grants received by enterprises, reaches out more than 20 B€.

#### EU level – Trade data (2014)

- Net agriculture trade of around 19 billion EUR driven by higher exports (+4%)
- EU agricultural exports set around 118 billion EUR
- US is the first EU destination (13% of the total agriculture exports - 15 billion EUR )
- EU agricultural imports sets around 100 billion EUR
- Brazil which accounts for 13% of total EU agricultural imports whose main imported products consist of animal feeding stuffs and oilseeds (mainly soybeans) and the category "coffee, tea and mate".





# Analysis of global market and trends in MELCA sectors

## AGRIFOOD FOCUS

### General Trends

- **The overall trend masks a complex picture which varies from one commodity to another and from one country to another.**
- The prices of rice, wheat and maize - the world's major food staples - fell by around 60 percent. This indicates that, globally, supplies outstripped the agricultural products demand.
- **Future Demand for agricultural products** is expected to slow down from 1.6% (period 1999 – 2015) to 1.4 % a year (period 2015 – 2030). In developing countries the slowdown will be more dramatic from 3.7% to 2%.
- **Producers have satisfied market demand and will continue to do but effective demand does not represent the total need for food and other agricultural products because hundreds of millions of people lack the money to buy what they need or the resources to produce it themselves.**
- A surprising report based on the analysis of 429 Italian agricultural enterprises shows how companies are more and more **Willing to introduce innovation in a business considered as traditional**
- The 5 technologies that are reported as the most interesting for small businesses are namely (a) genomics applications for food safety, (b) drones for remote sensing, (c) “sensormining” as the usage of in-field sensors, (d) big data for farming, (e) “digital agronomist” technology applied on field.



# Analysis of global market and trends in MELCA sectors

## AGRIFOOD FOCUS

### International Major Challenges

#### Mobility

- Improve the safety of users
- Limiting the negative impact of transport systems on the ecosystem
- Enhancing mobility efficiency and the wellbeing of travellers
- Better controlling and managing the costs associated with mobility
- Facing stronger requirements in term of interoperability, standards of technology and the management of large amount

#### Energy

- Improve the Europe's energy security
- Emissions
- Reducing European energy dependence
- Middle East instability
- Energy efficiency

#### Logistics

- Increase vehicle performance and connection to the infrastructure
- New organisational models (more efficient, more organised, more 'communicative')
- Regulations adapted to the evolution in practices
- Make flows more fluid to adapt to commercial channels which are migrating, and to growing e-trade practices, by intensifying inter-modality
- More sustainability

#### Agrifood

- Open and easier access to Culture and Heritage
- Sustainable, Efficient And Cost-Effective Farming
- Meeting future demand for food
- Conserving and enhancing water, soil and habitat
- Improving metrics, data and access to information
- Climate change and agriculture





# Analysis of global market and trends in MELCA sectors

## AGRIFOOD FOCUS

### Preliminary Results

#### CHALLENGES:

1. Sustainable, Efficient And Cost-Effective Farming
2. Meeting future demand for food
3. Conserving and enhancing water, soil and habitat
4. Improving metrics, data and access to information
5. Climate change and agriculture

#### EU-Countries

Eastern Europe

Southern Europe

#### Non EU-Countries

Global coverage, most interesting countries: Chile and USA

Global coverage, most interesting regions: South Asia, sub-Saharan Africa, Chile and USA

Global coverage, most interesting regions are sub-Saharan Africa, south Asia, Latin America ,Chile and Israel

Global coverage, most interesting countries: Chile, USA and Israel

Global coverage, most interesting region is the Mediterranean area

#### Needs

GNSS,  
UAVs

EO

EO

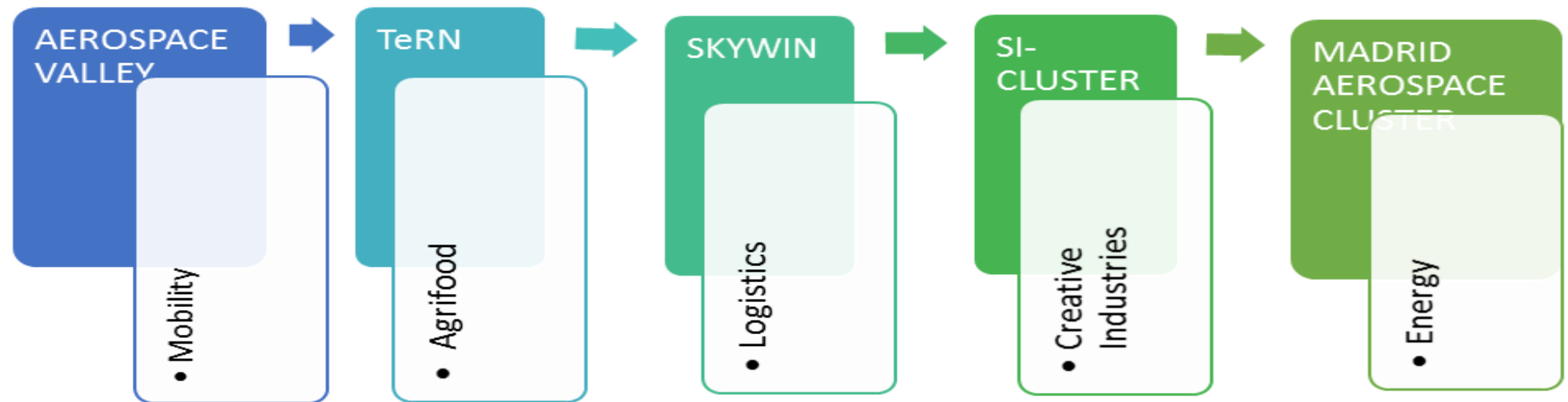


# Diversification Clusters meet Space Application

## AGRIFOOD FOCUS

### Second Task – WP2

Diversification Meetings to facilitate the exchange of know-how on space technology potential on one side and MELCA (**M**obility, **E**nergy, **L**ogistics, **C**reative Industries and **A**griculture) business value chains on the other in order to determine the applicability of space technologies on the MELCA sectors





# Diversification Clusters meet Space Application

## SPACE meets AGRICULTURE



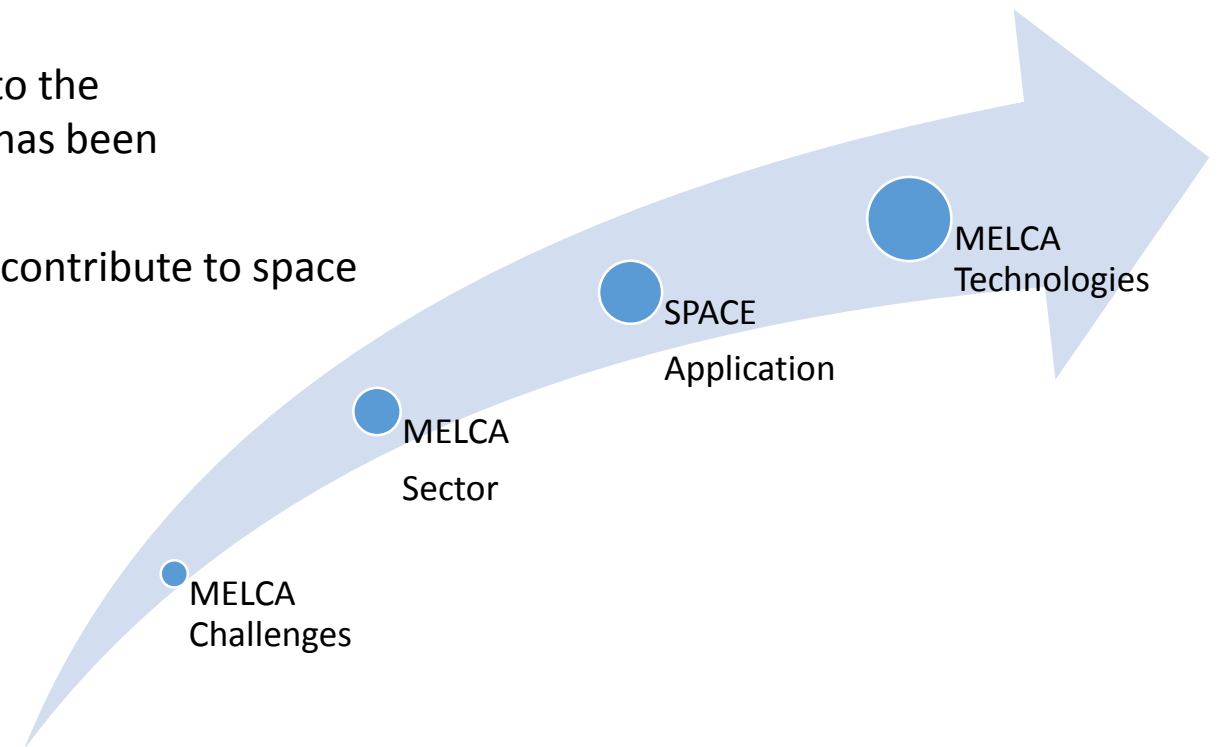
- ▶ **Section A** - SPACE Cluster presents the existing space technologies/application considered of major interest for the linked AGRICULTURAL sector.
  - ▶ State of the art of space technologies and applications already used
  - ▶ Availability of space data (new generation of EU satellites , e.g. ESA Sentinels, are already providing value added data and information available in an open, full and free mode)
- ▶ **Section B** - AGRICULTURAL Cluster the priority needs present in the market segments identified in Task 2.1
- ▶ **Section C** - Discussion :
- ▶ common interesting areas/problems identification:
  - in some cases, as for the agriculture sector, has been possible identify space data that seemed not directed linked to the sector but can have a great interest and may be investigated from space or by remotely sensed technologies.
- ▶ follow-up section/activities planning to investigate more in deep the output of workshops and potential collaboration activities :



# Prospects and market trends of space technologies application on AGROFOOD sector

## Third Task – WP2

- Each challenge identified in D2.1 has been reanalysed.
- AGROFOOD segment or potential markets related to the challenge have been identified.
- The potential contribution of space to the corresponding AGROFOOD markets has been recognized.
- AGROFOOD technologies that could contribute to space sectors are mentioned.







# Prospects and market trends of space technologies application on AGROFOOD sector

MELCA Challenge as identified in Del. 2.1	MELCA Sector / potential market	Space service/application that can contribute to the MELCA value chain (if exist)	MELCA technologies/applications may bring added value to Space Sector (if applicable)
Sustainable, Efficient And Cost-Effective Farming	Precision Farming	Provision of data, analysis of the macro scenario aiming at identifying at an early stage potential trends in terms of climate patterns etc... and, in almost real times, specific areas of danger in order to provide effective solutions (i.e. lack of water in specific areas).	Integration of real time drones monitoring to bridge the gap of real-time and specific target monitoring.
Sustainable, Efficient And Cost-Effective Farming	Remote sensing and automation	Real time cattle management in open areas (i.e. mountain and difficult-to-reach areas)	Integration of precision breeding applications i.e. collars and other precision livestock tools
Conserving and enhancing water, soil and habitat	Production and trend analysis	Provision of information based on EO data (Soil and plants monitoring, vegetation status maps, crop water requirement map, ...) in order to optimise the water and chemical use	Digital agronomist: remote interpretation of data and dashboard to provide remote consultancy
Meeting future demand for food	Precision Farming	EO based crop monitoring services. Gathering crop statistics and yield assessment through satellite imagery analysis	Integration of in-field sensor
Improving metrics, data and access to information	Big data	Integration of GNSS, SATCOM and EO technologies to enable Farm Management Information Systems (FMIS)	Development and interpretation of metric systems, NGS technologies to integrate the analysis
Climate change and agriculture	Climate trend analysis	Service based on time series analysis of EO data (e.g. Desertification Risk map, Landslide map and movements) as climate change impact analysis and natural hazard protection	
Climate change and agriculture	Water management	EO based soil moisture maps. High spatial resolution satellite images to derive crop evapotranspiration. Drought assessment and monitoring.	Integration of water distribution systems i.e. drop irrigation
Climate change and agriculture	Natural hazards assessment	Provide Early warning on imminent food crises in countries affected by natural disasters	
Climate change and agriculture	Phytopathology	Integrating weather (e.g. temperature, humidity) and surface (e.g. vegetation status) satellite remote sensing products to forecast/map/monitoring possible disease events	

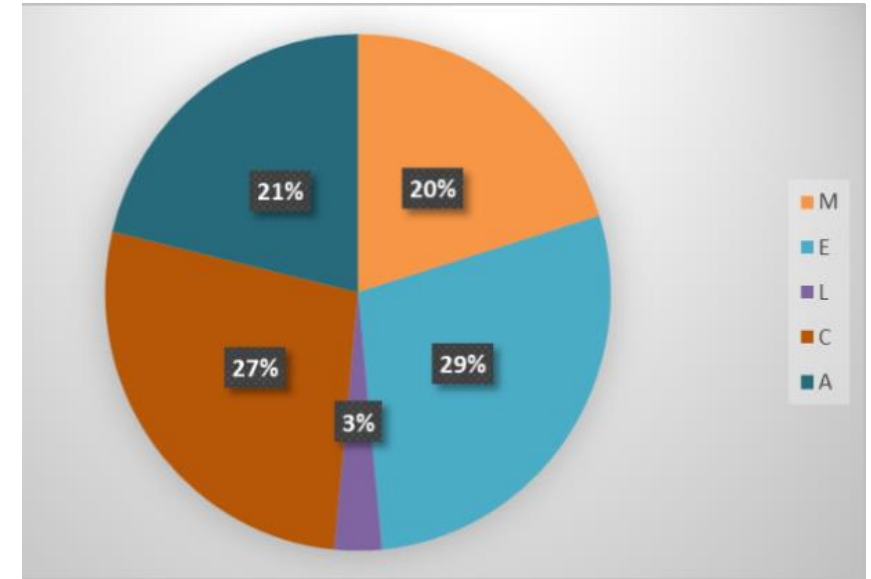
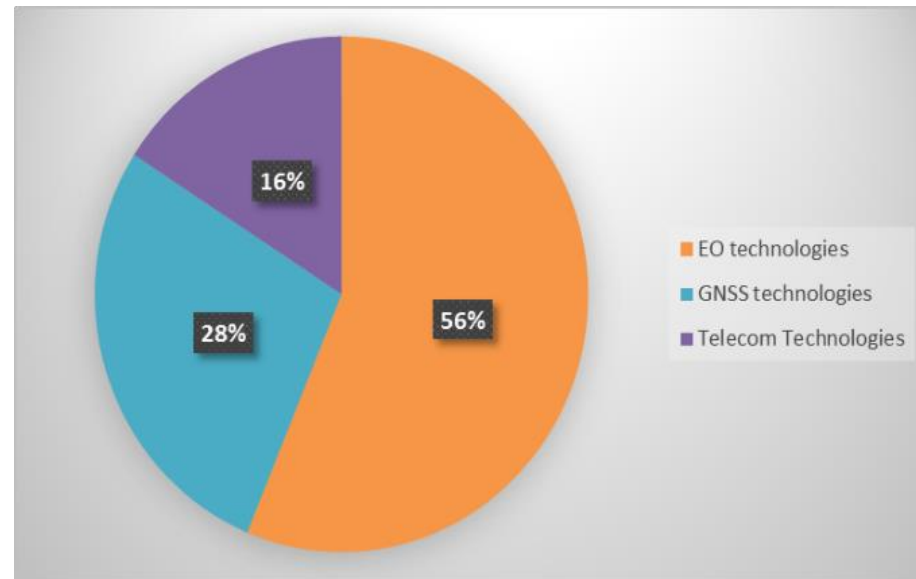
# Mapping the most promising space assets for MELCA Community

## AGRIFOOD FOCUS

### First Task – WP3

selecting in each space clusters various projects, products or companies having a space activity in link with one of the MELCA challenges in WP2

The objective was not to provide an exhaustive view of the technological capacity in each cluster, to propose a selection of high potential SPACE-MELCA pairs to be supported by SPACE2ID consortium activities



Repartition of the projects identified per MELCA sector



### Second Task – WP3

Comparison between the Challenge expressed by the MELCA to the 176 experiences and skills of Space2ID consortium.

#### • AGRICULTURE

AGRICULTURE			
Markets / Segments	Earth observation	GNSS	Telecom
Agriculture machinery	⊗	⊗	⊗
Animal production	⊙	⊗	⊗
Assess environmental impact of farming	⊙	⊗	⊗
Fertilizers, Pesticide Optimization	⊙	⊗	⊗
Assess crop damage due to storms	⊙	⊗	⊗
Monitor crop disease and stress	⊕	⊗	⊗
Assess crop acreage and yield harvest	⊙	⊗	⊗
Monitor specific crop types	⊕	⊗	⊗
Forecast crop yields	⊙	⊗	⊗
Monitor water use on crops and horticulture	⊙	⊙	⊗
Detect illegal or undesired crops	⊗	⊗	⊗
Measure land use statistics	⊙	⊗	⊗
Monitor land pollution	⊙	⊗	⊗
Assess environmental impact of farming	⊙	⊗	⊗
Automatic steering	⊗	⊗	⊗
Water shortage	⊙	⊗	⊗
Food Security	⊙	⊗	⊗
Organic Agriculture (Certification)	⊙	⊙	⊗
<b>Total number of occurrences</b>	<b>21</b>	<b>2</b>	<b>0</b>

12

6

1

5

1

#### CHALLENGES

- Sustainable, Efficient And Cost-Effective Farming
- Conserving and enhancing water, soil and habitat
- Meeting future demand for food
- Improving metrics, data and access to information
- Climate change and agriculture

The results are in the Table her under with lines in :

⊗ red colours (Market/segment not covered by S2ID skills),

⊙ yellow and white colours (Market/segment partially covered by S2ID skills)

⊕ green colours (Market/segment well covered by S2ID skills)



# Space assets adaptation to MELCA needs for internationalisation

## AGRIFOOD FOCUS



### STRENGTHS

- Quite huge experience in monitoring, forecasting crop, fertilizer, water,... management. (Challenges 1-2)
- around 20 projects focus on these topics
- Focus on short term and small areas challenges in Agriculture
- Challenge 4 address partially the Big Data issue for Agriculture but not enough.
- 

### WEAKNESSES

- Practically no projects meeting global challenges as future demand of food and climate change
- No experience in Agriculture machinery
- Poor experiences in Precision Agriculture (GNSS)
- No experience in SatCom for agriculture issue (Could be an advantage for deveopping Space applications in emerging countries)

### OPPORTUNITIES

- Big Data cross challenges (Agriculture versus other sectors)

### THREATS

- EU Galileo programme can represent a big opportunity for SMEs hard to be fully exploited due to the poor experiences and competencies in GNSS technologies within the consortium





# WHEN SPACE MEETS AGRICULTURE

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## MANY THANKS!

[www.space2id.eu](http://www.space2id.eu)

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This document is part of the project SPACE2ID which has received funding from the European Union's COSME Programme (2014-2020)



Co-funded  
by the COSME programme  
of the European Union