APP4FARM – Artificial intelligence aPPlication for FARMing

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2022 Joint Call
Kick-off Projects Seminar
31st January 2024

Involved countries and partners

Duration and overall budget

Partner	Country	Budget (k€)
University of Brescia **(Coordinator)**	IT	78.2
Consiglio Nazionale delle Ricerche	IT	73.8
German Research Centre for Geosciences	DE	213
Munster Technological University	IE	374
University of Florence	IT	76
TOTAL		815 (Funded: 774)
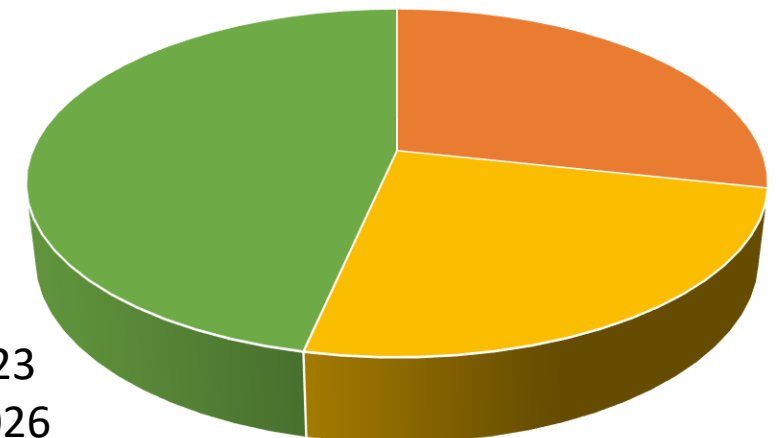
Start: April 2023
End: March 2026
Duration: 36M

Objective

- Definition of an **ICT infrastructure** allowing the farmer to monitor nitrogen loss
  - Efficient management of nitrogen-based fertilisers
  - Control of farming costs
  - Control of Nitrogen oxide emissions in the atmosphere leading
- The infrastructure will include
  - **A monitoring system** allowing to trace:
    - Meteorological and soil data
    - Nitrogen emission levels
  - **A Decision Support System** that will give the farmer:
    - All the measured data
    - Forecasts up to 3 days in advance

Main project activities and challenges

- Definition of Decision Support System (DSS) to support the optimal use of nitrogen-based fertilizers:
  - Development of the dashboarding system for the DSS
  - Development of Machine Learning/Artificial Intelligence forecasting models
- Definition of a sensing system for monitoring environmental and soil health
- Design tailored sensors for N-related microbial activity in soil
- Definition of a virtual sensor linking environmental variables and N-related microbial diversity in soil

Expected results and potential impact

Expected results
- Monitored variable values, trends and statistical analysis
- Monitored variable AI based forecasting
- Virtual sensors for non monitored variables

Potential impacts
- Possibility to access the monitored data to make it publicly available, ensuring the transparency of the supply chain from the very beginning.
- Possibility to use the data to start a "green labeling" project.
  - Availability of more traced, sustainable, and healthy food on the market.
- Limitation of the GHG (N2O) and nitrogen oxide (NOx) emissions.
- Limitation of the concentration of ozone (O3) and aerosol (PM10/PM2.5) in the atmosphere.
- Data transparency

Next steps

	Task Name	Duration	Start Month	End Month	YEAR 1												YEAR 2												YEAR 3												
					1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
WP0	Coordination	36	1	36																																				
T0.1	Project Management	36	1	36																																				
T0.2	Finalcial and Administrative Managenet	24	1	36																																				
T0.3	Project Quality Management	24	1	36																																				
T0.4	Data Management	24	1	36																																				
WP1	Taylored sensoring	6	1	6																																				
T1.1	Sensor fabrication	6	1	6																																				
T1.2	Sensor setup and calibration	6	7	12																																				
WP2	Sensor training and microbial analysis	36	1	36																																				
T2.1	Sensor training	6	1	6																																				
T2.2	Profiling of N-cycle related microbial genes in the field	12	7	18																																				
T2.3	Correlation of N- related genes to N-emissions	24	13	36																																				
WP3	Pilot Management	14	11	36																																				
WP4	DSS Development	18	19	36																																				
T4.1	Data Analysis	3	19	21																																				
T4.2	Monitoring phase development and implementation	6	22	27																																				
T4.3	Forecasting phase development and implementation	9	28	36																																				
T4.4	Information collection and dashboard implementation	4	33	36																																				
WP5	Dissemination	36	1	36																																				
T5.1	Construction of Dissemination and Communication Plan	36	1	36																																				
T5.2	Implementation of Dissemination and Communication Plan	36	1	36																																				

We are here!

LET'S KEEP IN TOUCH!

Please feel always free to reach out to us.

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Thank you for your attention!