



BBioNets



FOREST4EU



NUTRI-KNOW



Soil-X-Change



AQUAGRI-KNOW

Available resources for OGs: information and training material, support tools and advisory services

“The future of EIP-AGRI Operational Groups: challenges, opportunities and existing support services”

Anna Bagó Mas, BETA Technological Center

NUTRI-KNOW, Coordinator

Online, 14/05/2025



The organising projects are funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Research Executive Agency (REA). Neither the European Union nor the granting authority can be held responsible for them.



NUTRI-KNOW: Available resources for OGs

- **Meta-Database on nutrient management**
 - *containing the outcomes from 12 OGs and their alignment with farmers' needs, current policy framework and cost benefit analysis compared with current scenario*
- **Inventory of current nutrient management practices**
 - *to broaden the screening of practices beyond the 12 engaged OGs*
- **Kit of practice-oriented material**
 - *targeting farmers and practitioners (booklets, audio-visual material, infographics, leaflets, factsheets).*

- **Massive Open Online Course (MOOC)**
 - *together with farming and agricultural schools including educational material targeting farmers and practitioners*
- **Community of Practice (CoP) on nutrient management**
 - *platform to bring together practitioners sharing common concerns and working collectively to reach individual and group goals*
- **Results Amplification Methodology (RAM)**
 - *to accelerate a broader replication of the knowledge and experience obtained*



Meta-Database on nutrient management

Containing the outcomes from 12 OGs and their alignment with farmers' needs, current policy framework and cost benefit analysis compared with current scenario

Name of the OG	Development of a slurry concentrator with continuous total nitrogen data collection
Project partner	UVIC-UCC
Short description of the OG	The pilot project reduces the costs of management of livestock waste by applying a new process from which the slurry coming directly from the farm will be separated into two phases, a first semi-liquid phase with the most of the organic fraction, the nutrients and the larger particles and a second liquid phase with low nutrient concentration. The differentiated management of the two phases will allow to minimize transport costs as well as the optimization of the application of nutrients in the soil, both from an agronomic and environmental point of view.
Keyword category	Farming equipment and machinery; Fertilisation and nutrients management
Partners involved	AGRÀRIA PLANA DE VIC I SECCIÓ DE CRÈDIT; FEDERACIÓ DE COOPERATIVES AGRÀRIES DE CATALUNYA (FCAC); FUNDACIÓ UNIVERSITÀRIA BALMES (UNIVERSITAT DE VIC - UNIVERSITAT CENTRAL DE CATALUNYA); GRUP SOLUCIONS MANRESA
Region, country	Catalonia, Spain
Duration	November 2015 - September 2017
Status	Finalised
maturity level	near to practice
Total budget	270,967 €
Main objectives	The main objective of the pilot project is to reduce the costs associated with the management of livestock waste. This OG implements a new process that separates the slurry into two phases: a semi-liquid phase containing the majority of the organic fraction, nutrients, and larger particles, and a liquid phase with a low nutrient concentration. The differentiated management of these two phases allows for minimized transport costs and optimized application of nutrients in the soil, benefiting both agronomic and environmental aspects.
Methodology	Farming equipment and machinery; Fertilisation and nutrients management Technology Processing Technologies
Keyword categories	
Tangible results categories	
Relevant value chain steps	
Main outcomes	The concentrator prototype used in the project demonstrates successful outcomes. It effectively obtains diluted and concentrated effluents from pig slurry, with the concentrated phase retaining the majority of phosphorus and nitrogen. The system enables continuous monitoring of conductivity and exhibits low energy consumption. Technologically and economically viable, it provides significant benefits to farms and cooperatives in terms of efficient manure management.
Key performance	The innovative nutrient concentration technology employed in the project achieves impressive results. It concentrates 85-95% of total solids, 45-55% of total nitrogen, and 85-95% of phosphorus initially present in a unit volume of raw slurry, reducing the volume by 20-30% while retaining the concentrated liquid fraction. This concentration process is cost-effective, minimizes additional emissions, and requires minimal energy consumption. As a result, transport costs are reduced, and the economically viable export of nutrients to non-vulnerable areas becomes feasible while ensuring environmental sustainability.

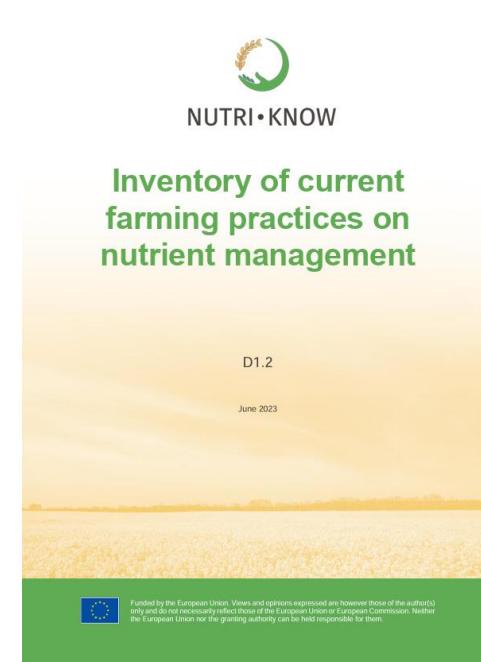
Stakeholder evaluation (D1.3)	Knowledge produced	(8/10) Provides in-depth and expert-level knowledge with extensive and comprehensive data. Also gives well-defined and actionable steps for implementation. The knowledge can be applied in various relevant contexts with some adaptation. The information is broadly applicable but may require adjustments to suit specific scenarios.
	Economic viability	(6.7/10) The technical and financial feasibility of the innovation is well-supported and realistic. The technical requirements can be met, and financial resources can be secured with reasonable effort. Despite offering a transformative market opportunity for end users through its revolutionary technology and innovative business model, its market impact remains limited. This is due to the developing company's lack of resources and capacity to bring the concentrator to market.
	Alignment with law and policies	(6.5/10) The technology is fully aligned with all relevant law policies and regulations. It has a minor impact on nutrient management policies. No special authorization from legal authorities is required to implement the technology.
	Social Benefits	(5.5/10) The technology has a moderate impact on society, it may contribute to notable social improvements and address certain societal challenges. There are some efforts to engage stakeholders on the technology's social impact. However, engagement is sporadic or limited to specific groups.
	Environmental Benefits	(5.2/10) The technology makes a valuable contribution to environmental sustainability efforts, although its impact is not considered revolutionary for the sector.
Stakeholder comments (D2.1)	linked document	D1.3 Results of the cost-benefit and sustainability analysis 1.95/5 (low)
	Awareness of the OG activities	14 of the 22 respondents to the questionnaire have little knowledge of the OG; 1 of them had heard about the OG; 3 indicated that they knew some of the OG activities; 2 knew the OG objectives and activities and another 2 knew very well about the OG (being part of the consortium) 3.05/5 (moderate)
	Effectiveness of the OG outcomes	The 16 respondents to the questionnaire indicated the outcome of this OG is relevant and useful in some of their agricultural activities - Additional investment is needed; - Lack of confirmed results/successful cases; - Lack of information on the cost structure; - Difficult to obtain the permit.
	Challenges in implementing the OG outcomes	- Nutrient use and management in crop and livestock production; - Fertiliser manufacture & trade; - Treatment of animal manure and organic wastes;
	Legislative needs for implementation of the OG outcomes	D2.1 Matchmaking of OG outcomes with market and policy Associació de Joves Agricultors i Ramaders de Catalunya (JARC): https://jarc.cat/ Unió Pagesos Catalunya (UP): https://uniopagesos.cat/ Federació d'Agricultors Viveristes de Catalunya: http://www.viveristes.cat Granges Terragrisa Agrària Plana de Vic i Secció de Crèdit, SCCL: https://www.planadevic.cat/cat/ Cluster Bioenergia de Catalunya (CBC): https://www.clusterbioenergia.cat/es/biogas/ Spanish Biogas Association (AEBIG): www.aebig.org Group of experts in the treatment of livestock waste (GFTDR)
Farmers Related	linked document	

www.nutri-know.eu/operational-group/

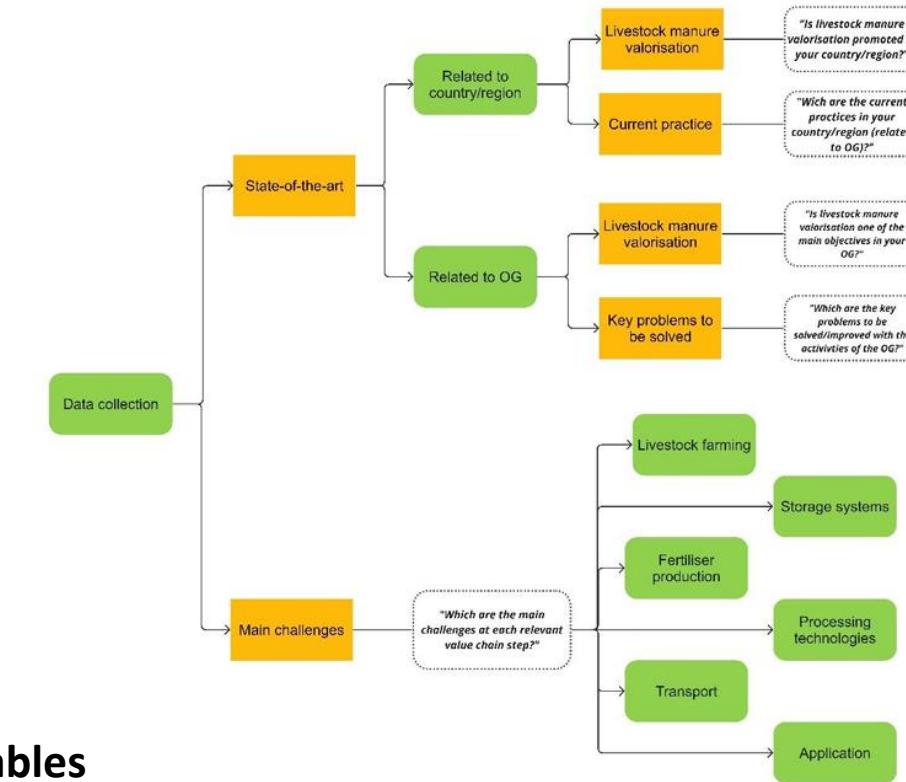


Inventory of current nutrient management practices

- to broaden the screening of practices beyond the OGs engaged to NUTRI-KNOW



www.nutri-know.eu/resources/#deliverables





Kit of practice-oriented material

Practice Abstracts

Activities

- Laboratory analysis and testing for optimal nutrient management
- Management and implementation of the prototype treatment plant
- Monitoring of the efficiency of the prototype in reducing ammonia and phosphorus content in digested manure and digestate
- Monitoring of emissions (ammonia, dust and odour) from spreading
- Evaluation of the economic and environmental benefits of the innovation
- Dissemination of the results achieved and training courses

Further details

- Total budget: € 181.000
- Main funding source: Rural Development Operational Program for Operational Groups
- Rural Development Programme (Region): Emilia-Romagna - 2014/2020 (Italy)
- Onderzoek (01/04/2020 - 27/03/2023)
- Italy, Emilia-Romagna Region
- Centro Ricerche Produttivo Animali - Centro Ricerche - Research Institute - Reggio Emilia (Italy) - InformaG

Struvite

Results

The recovery of phosphorus and nitrogen from agricultural digestate through the prototype treatment plant is technically feasible. The produced struvite can be marketed as a fertiliser manufacturer, in order to effectively replace phosphate fertilisers. Struvite recovered from the prototype treatment plant is in accordance with the new European fertiliser regulation.

Objectives

The goal of the Struvite Operational Group (OG) was to decrease the nitrogen (N) and phosphorus (P) content of the manure and digestate, in order to reduce the environmental impact of the prototype treatment plant. The supervisor is depilated in nitrogen and phosphorus. For this reason the prototype treatment of digestate was effective in reducing the nitrogen and phosphorus content of the manure and digestate. The nitrogen and phosphorus recovered produce a renewable, slow-release fertiliser that can be used as a phosphate fertiliser in nutrient-deficient areas.

To achieve this goal the OG designed and implemented a prototype system capable of producing and extracting struvite. The high concentration of solids and organic matter in the slurry makes the system more efficient; the prototype treatment system can therefore be made more efficient.

Post-treatment for sludge recovery (above) and treated manure (below)

NUTRI-KNOW

Learn more about the project at www.nutri-know.eu

Follow our journey!
Visit www.nutri-know.eu

Factheets

Context

Animal manure is an excellent fertiliser, mostly for crop production. However, in its raw state it contains ammonia and organic matter, which are useful for the productivity of agricultural soils. The ammonia is the main nutrient lost through volatilisation, when slurry during storage and spreading.

Activity

- Monitoring the efficiency in pig slurry spreading
- Evaluating the impact of different spreading methods on ammonia emissions
- Evaluation of the cost-effectiveness of different spreading methods

In fact, the Italian agricultural sector determines the highest ammonia emissions, and of this about 80% comes from pig manure. As for ammonia emissions, the agricultural sector accounts for 40% of the total emissions in Italy. The main source of ammonia emissions is the manure coming from manure management (IPRA Reports 38/2020 and 39/2020).

Gas Loop

GOI Gas Loop

Gas Loop has developed and monitored an air washing system that removes ammonia from the air of pig housing and recovers it in an ammonium sulphate solution. This increases animal welfare and productivity due to better air quality inside the pig house.

Biorefinery Glás

Small-Scale Farmer-led Green Biorefineries

Biorefinery Glás focuses on the demonstration of a small-scale grass biorefinery with farmers in South West Ireland to diversify farmer produce while resolving significant challenges in traditional agriculture.

Activity

- Monitoring the efficiency in pig slurry spreading
- Evaluating the impact of different spreading methods on ammonia emissions
- Evaluation of the cost-effectiveness of different spreading methods

In Italy there are areas with a high presence of manure and digestate, and the spreading of animal effluents and digestate could result in reduced emissions. Not only that, a nutrient management system that recycles nutrients contained could promote the relocation of nitrogen from the soil to the plant, and the use of manure as a soil instead characterised by chemical fertiliser. The project aims to demonstrate the use of biological recovery and reuse and the farm to fork targets. The farm to fork strategy promotes a more sustainable food system, and the European Green Deal, one of the main goals of which is to reduce agricultural fertiliser use by 20% and nutrient loss by 20% by 2030.

Pocketboer II

More performant operation of pocket digesters

Pocketboer 2 aimed to find solutions for persistent problems with pocket digesters. It encouraged implementation of more solutions of many existing and future plants to improve:

- More performant operation of pocket digesters
- More efficient slurry spreading
- More efficient nutrient application

Slurry Concentrator

to enhance the efficiency of soil nutrient application

Challenge

Bios and digestates are produced in large quantities, are expensive to transport and electricity and held by most companies. The cost of digestate can be high, while digestate can be a valuable product for the soil improver.

Concentrator

Concentrator can reduce existing long-term nutrient management problems by reducing the amount of water required to meet the farms' demand.

Efficiency

The innovative system yields two liquid fractions: a semi-solid phase (concentrating the organic matter and nutrients) and a liquid phase (which is mainly water). Where nutrients are not available, and a liquid fraction is available, the semi-solid fraction can be applied in a nearby fields.

Cost Savings

Using the same equipment for digestate treatment, both investment and operating costs, while also decreasing the time required for the treatment.

Enhanced Monitoring and Precision

The system enables easier monitoring of liquid fractions, which in turn can track the nutrient content of the liquid fraction. This allows for more accurate nutrient application, reducing nutrient losses and reduces emissions, thereby guaranteeing soil health and productivity.

Slurry Concentrator

Follow our journey!
Visit www.nutri-know.eu

Funded by the European Union

Materials available to EU open repositories such as EU-Farmbook

Filters

RESOURCE TYPE

TOPIC

CONTRIBUTION LANGUAGE

LOCATION

PROJECT

NUTRI-KNOW

EU-FarmBook

OG_Renure: Agronomic performance of manure-derived ammonium salts as RENURE fertilisers

OG_Pocketboer II: Tips & tricks van en voor pocketboeren

OG_Pocketboer II: Nieuwsartikels

OG_Pocketboer II: Nieuwsartikels





Massive Open Online Course (MOOC)

- together with farming and agricultural schools including educational material targeting farmers and practitioners

Search

Value Chain

- Application 5
- Fertiliser production 3
- Livestock Farming 3
- Processing Technologies 4
- Storage Systems 3
- Transport 1

APPLICATION

Complete the questions to gain a certificate for this module.

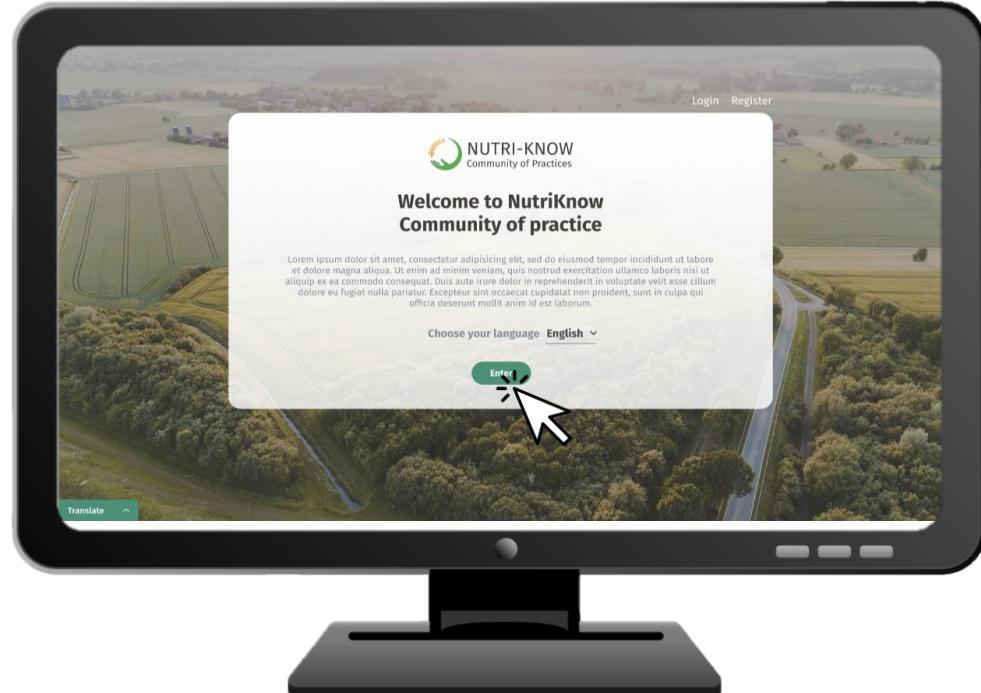
Start

<https://www.nutri-know.eu/lesson/>



Community of Practice (CoP) on nutrient management

- *platform to bring together practitioners sharing common concerns and working collectively to reach individual and group goals*

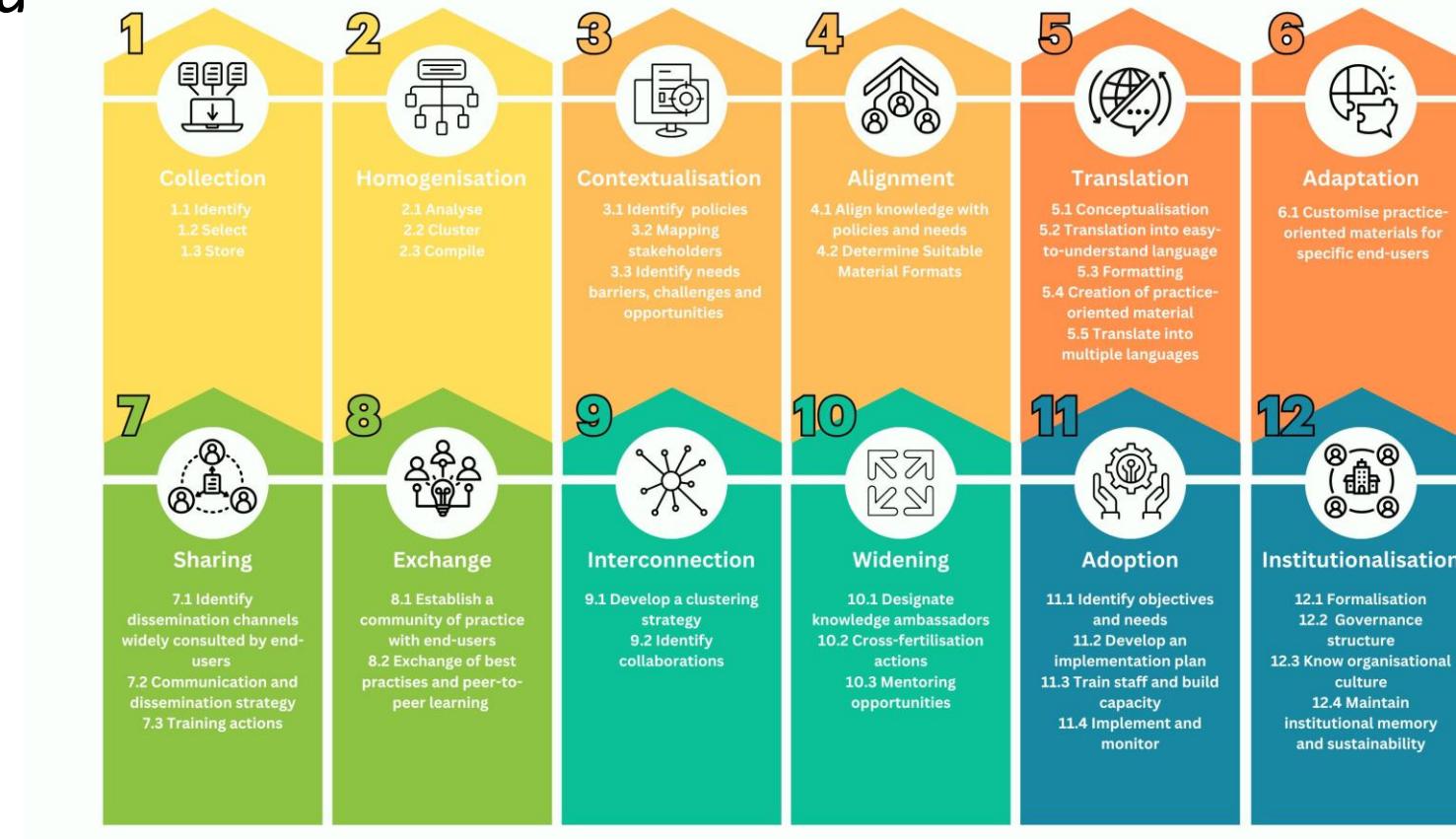


<https://cop.nutri-know.eu/>



Results Amplification Methodology (RAM)

- *to accelerate a broader replication of the knowledge and experience obtained*



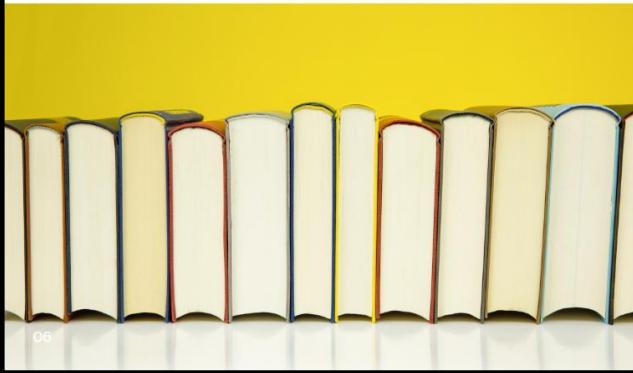


Results Amplification Methodology (RAM)

MODULE 1 COLLECTION

By Shawn Garcia
Photography by Helene Paquet

The **Collection** module serves as the foundation for the RAM. It ensures that all relevant knowledge, data, and experiences are systematically gathered and stored in an organised manner. This step is critical for building a robust base of information that can be further refined and applied to the intended objectives. By integrating diverse knowledge types and data sources, a comprehensive knowledge base is established, enhancing insights for strategic planning.



06

Why it is important?

Missing critical knowledge at this stage can lead to gaps in analysis and hinder subsequent steps. By being exhaustive, this step ensures no stone is left unturned and establishes a solid starting point.



How to implement:

- Define the scope of the search: Determine the themes, topics, or specific questions that guide the collection process.
- Use diverse sources: Combine primary sources (e.g., interviews, surveys) with secondary sources (e.g., published articles, existing databases).
- Employ both manual and automated techniques: Conduct web searches using specific keywords, and set up alerts in academic platforms like Google Scholar or PubMed to capture new publications.

NUTRI-KNOW BOX



- NUTRI-KNOW experience in knowledge identification

08 RAM

BECOME A VALIDATOR

<https://forms.gle/xQ3WZkSnJtAF5jCdA>



Why contribute?

- ✓ Access the RAM framework and share your valuable feedback 
- ✓ Help shape a methodology that could become a standard for knowledge amplification 
- ✓ Position yourself at the cutting edge of EU innovation & governance practices in agri-food and rural development 
- 🔗 **Click to become a RAM Validator and contribute to this exciting step forward: Validation Form – RAM methodology** 

Thank you!



www.nutri-know.eu

