



# Nutri2Cycle

## D.8.3 Midterm meeting report

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<b>Author(s):</b>	Evi Michels & Anne Adriaens (Ghent University)
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<b>Coordinator:</b>	Prof. Erik Meers, Ghent University
<b>Contact details:</b>	Erik.meers@UGent.be





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## Abbreviations

CBA: Cost Benefit Analysis

EU: European Union

LCA: Life Cycle Analysis

MCD: Multi Criteria Dimension Analysis

NTF: National Task Force

sLCA: Social Life Cycle Analysis

WP: Work Package





## Glossary

**Cost benefit analysis:** A cost-benefit analysis is the process of comparing the projected or estimated costs and benefits (or opportunities) associated with a project decision to determine whether it makes sense from a business perspective

**Indicator:** a framework of indicators reflecting agro-economics & environmental impact at farm system level (micro-economics) (see D1.5)

**Innovation funnel:** Data sourcing and scrutinizing strategy to evaluate and prioritize solutions for their ability and potential to close N, P and C loops and their technological, environmental and economical validity.

**Life cycle assessment:** Life cycle assessment or LCA is a methodology for assessing environmental impacts associated with all the stages of the life cycle of a commercial product, process, or service.

**Longlist:** Nutri2Cycle acquired a “longlist” of technical/management solutions/scenarios aimed at gap closure in C, N and P loops through the strong combination of research insights and input from stakeholders (see D2.1).

**Research line:** is defined as a research domain that characterizes a cluster of solutions being researched in frame of the project ; Nutri2cycle has 5 distinct research lines

**Shortlist:** the shortlist is a selected reduced list of solutions, taken from a longer list of suitable subjects to investigate ; shortlisting is performed from pragmatic perspective that not everything can be covered within any single project and helps towards laying focus on those aspects and solutions that are investigated in further detail

**Solution:** a Nutri2Cycle solution is a proposed optimized farming system, aimed at closing nutrient loops and efficient mitigation measures





## 1. General introduction & agenda

Due to the COVID19 restrictions the Nutri2Cycle midterm meeting took place on 15-16/02/2021 in a digital setting.

All partners were represented at the meeting. The following delegates attended:

	Institute	Participant
1.	Ghent University	Erik Meers Evi Michels Aurore Assaker Anne Adriaens Ivona Sigurnjak Ana Robles Hongzhen Luo
2	Universita Degli Studi Di Milano	Fabrizio Adani
3	Politechnika Czestochowska	Danuta Drozd
4	United Experts	Filip Raymaekers Lies Bamelis
5	Fundacion Cartif	Francisco Corona
6	Johann Heinrich Von Thuenen Institut	Mareike Soder Jorg Rieger Davit Stepanyan Susanne Klages
7	Soltub	Zoltan Hajdu
8	Stichting Wageningen Research	Chantal Hendriks JanPeter Lesschen
9	Instituto Superior de Agronomia	David Fangueiro
10	Kobenhavns Universitet	Lars Stoumann Jensen Sander Bruun Myriam Beyers
11	Terra Humana	Edward Someus
12	Chambre d'Agriculture	Jean-Philippe Bernard
13	Zuidelijke Land- en Tuinbouw organisatie vereniging	Fauve Henst Rembert Van Noort
14	Institut De Recerca I Tecnologia agroalimentaries	Assumpcio Anton August Bonmati Zein Kallas (CREDA) Edilene Pereira
15	Teagasc	Patrick Forrestal Ashekuzzaman SK
16	European Biogas Association	Gregory Reuland Mieke Decorte Marco Giacomazzi





17	IPS Konzalting	Ana-Marija Spicnagel Barbara Dukic
18	Inagro	Sander Vandendriessche
19	Conorzio Italbiotec	Ilaria Re Giuliana D'Imporzano

Taking in account the timeline of the project the meeting focused on specific topics rather than on work packages. The following meeting schedule was respected.

Monday February 15, 2021	
13:00 – 13:30	Midterm revision : the need for quantified indicators (UGent)
13:30 – 14:20	Strategy on quantifying baselines (WR-Jan Peter)
14:20 – 14:30	Break
14:30 – 15:30	Strategy on further development of indicator set (IRTA- August)
15:30 – 15:40	Break
15:40 – 16:30	Quantifying agro-technical research (UMIL-Giuliana)
16:30 – 17:00	Management overview (UGent)

Tuesday February 16, 2021	
9:00-10:30 :	Prioritization 24 shortlisted => 12 priority solutions (UGent +all (discussion))
10:30-10:40 :	Break
10:40-11:00 :	Introducing sLCA + needs from the consortium (IRTA )
11:00-11:30 :	Introducing WP5 stakeholder activities + needs from the consortium (CREDA -Zein)
11:30-12:15 :	WP6 – proposed Demonstrations, strategy & timing (TEAGASC - Ashek)
12:15-13:15 :	Lunch break
13:15-13:45 :	Introducing CBA + needs from consortium (UE- Lies)
13:45-14:30 :	WP4 modelling approach + needs from consortium (Thuenen- Jorg)
14:30-14:40 :	Break
14:40-16:40:	Research Lines 1, 2, 3, 4, 5 (20 min each) Overview + key investigators involved (contacts for data acquisition) (RL leaders)
16:20-16:40 :	Break
16:40-17:30:	Wrap up and conclusions (UGent)





## 2. Minutes of meeting

The main outcome of the discussions following the presentations on the midterm meeting are summarized below, structured per topic with indication of the work package. The minutes reflect what has been presented during the meeting (“key points”) and the discussion points. Prior to the Nutri2Cycle specific presentations a comprehensive overview on the project status was presented by the coordinator, accompanied by the goals of the meeting.

### 2.1. Midterm revision : the need for quantified indicators (UGent)

UGent provided a status overview of the project, including the status of the requested review.

A stepwise run through across the most important points of the review were presented. One of the comments that came back recurrently in the revision remarks was more focus on the quantified indicators on nutrient recovery research. In order to meet the conflicting recommendations between the need for early reporting in scope of the project (e.g. early deadlines for WP1 deliverables in order to be able to launch other activities that build on that) and waiting for full results to become available AFTER research is concluded, we propose a pragmatic approach by adding an additional Deliverable to the Workplan which contains the quantified update of D.2.3.+ D.2.4. + D.3.1. and this for the prioritized solutions identified in D.3.2. We propose this update D.2.6. after 'trials are conducted and reporting is concluded and the data assessment in WP3-WP5 is acquired" as put forward by the reviewer. The new D2.6 will report filled quantified Tables meeting the reviewer comments.

All revised deliverables need to be submitted by end of February. Based on the received remarks the following goals for the meeting are formulated:

- Simplification
- Reconnecting all actions
- Data needs for WP 4-5-6 and who will provide
- Clear path for WP2: demo vs non demo solutions
- Timeline and realistic goals – Covid situation: extension of the project?





## 2.2. WP1: Strategy on quantifying baselines (Jan Peter Lesschen, WR)

The work done in the past months for WP1 was explained, as well as a status update on the revised deliverables.

Key points:

- Emission baselines are available and extended to include applicability to other regions. In total 10 baselines are available, 10 were modelled with DAISY, 6 also with ANIMO (which has the advantage of modelling P flows). These baselines are representative for the majority of EU land-based agriculture. Specific baselines per solution are very difficult as mostly no data are available and modelling is very complex.
- The environmental impact of the current situation (baseline 2017) is available from the MITERRA-Europe modelling. The N and P flow schemes, that were presented in D1.5 at EU level, were found very informative, and can be made available at country level as well.
- Feasibility assessment for all 45 shortlisted solutions has been done
- WP1 has predominantly focused on environmental parameters, however economic aspects will be further elaborated in the CBA and economic modelling in WP3/WP4.

The following points were discussed:

- The idea for package creation for MITERRA was launched: birds perspective on what the research lines (based on WP2) could mean on a broad EU scale (coop WP4). This could be compared to a broader baseline. The LCAs would then give a more detailed view.
- In MITERRA emission/reduction factors from emission based modelling (Task 3.1) of the selected solutions will be included by WR.
- For each research line a system boundary was established. However, we anticipate to make the results from D1.5 more specific to farming systems.
- Scenarios with implemented solutions will be run and compared against a specific baseline.
- Effect on C/N/P flows will in first instance be done on the 12 priority solutions, to maximize the knowledge on these. The selection of which solutions will be modelled with DAISY or ANIMO will be made in March/April 2021. Extension to the other solutions can then be considered.
- Results will be published in scientific papers by WR. The following papers are expected to be produced by WR (ultimately at end of project): a) CNP stoichiometry in agricultural systems as concept for improving circularity in European agriculture (based on Deliverable 1.3); b) Current CNP flows and nutrient use efficiency in EU agriculture (based on Deliverable 1.5); c) Simulation of field C and N turnover after application of N fertilisers using field-scale modelling tools Daisy and SWAP/ANIMO: An European case study (based on Deliverable 1.5)







### 2.3. WP2: Quantifying agro-technical research (Giuliana D'Imporzano, UMIL)

Key points:

- The overall workpackage and partner involvement was presented
- A request to WP 3-4-5 and 6 was made to have a comprehensive mapping of the information needed for further elaboration. WP leaders agreed to deliver a list of data needed from solutions for further elaboration their WPs.
- The research plan for the next 6 months was presented and a preview for the m36-m48 activities, which included the collection of the data from solutions needed by WP 3-4-5 and 6. The timeline foresees the collection of data within M 33 for tier 1 solution and within M39 for tier 2 solution. M40 deliverable D2.6 completed. The following is foreseen:

**M29 – February 23.** WP3-WP4 and WP5 deliver tables of data required, to be inserted in the reviewed D.2.3.

**M30 – March 15.** WP2 leader + WP2 task leader meeting -

Topic: starting data collection for 1<sup>st</sup> Tier (filling Tables WP3, WP4 and WP5 and Multicriteria).

**2 months for collecting data + 1-month review = M33 data collection completed.**

**M36 – Sept. 15.** WP2 leader + WP2 task leader meeting

Topic: starting data collection by task leaders for 2<sup>nd</sup> Tier. (filling tables WP3, WP4 and WP5 and Multicriteria).

**2 months for collecting data + 1-month review = M39 data collection completed.**

**M40:** Deliverable D.2.6 , including qualitative MCDA ranking

**M43** – end of Agro technical research.

**M45** – data collection completed.

**M48** Final deliverable (D2.5).

The following was discussed:

- The MCDA will consider environmental costs, economic and social dimension and potential of implementation in the EU context
- It was agreed on that the recovery part is the overarching common ground, however the fate and consequences in the environment are still not quantified and evaluated (common criteria for different solutions)
- The common criteria were presented. From this it is clear that some data will be readily available, some will come from the collection of data (from solutions) needed by WP 3-4-5 and 6, but also a lot of data will need to be further gathered to fill gaps and understand assumptions. Specific data gathering is planned from March on. It is clear that more (detailed)





data will be available for the shortlisted solutions. UMIL will make a summary TABLE with all the investigations, and its respective ability to both close macro-nutrient loops and reduce GHG and other emissions, all with a quantitative approach. It will come within the last report

- A close collaboration will be made with the CBA and the (S)LCA work to avoid over questioning of the partners. Giuliana and Lies (UE) will separately discuss, following this meeting.
- The weight of indicators was discussed. It was agreed that environmental consequences (+/-) will have a higher weight as compared to cost, labor, energy and social dimension.

## 2.4. WP3: Strategy on further development of indicator set (August Bonmati, IRTA)

Key points:

- Based on EU indicators and literature a proposal for environmental dashboard indicators and their units was presented
- This list has also been translated to different impact categories (that should be used in full assessments, such as LCA)
- Guidelines for calculation from the WP2 data have been distributed
- The conclusions of a first screening are presented, indicating that several indicators remain unknown (mainly in relation to emission indicators), so there is need for quantitative results.
- For quantification, this will need to be done either through measurement, modelling or default values.

The following points were discussed:

- It was decided to keep the qualitative/semi-quantitative assessment of all shortlist solutions, as it represents an important and useful dataset for the assessment and selection of technologies. However, there remains a considerable risk of bias in the assessment of technology by responsible researchers/owners/contact persons, although they have the best insight and knowledge. In order to improve the assessments and make them more objective, the shortlisted solutions will be reviewed by and only within the research line by the research line leaders (in coop with the responsible). The specifications will be discussed at the March WP3 meeting under the lead of UCPH.
- The need remains to translate the broad indicator assessment to a number of easy to calculate and understandable indicators. A discussion was held on the primary stakeholders. Three predominant groups could be distinguished, namely 1) policy makers, 2) farmers/farmer associations and 3) general audience.
- It was agreed on that policy makers are quite acquainted with indicators such as f.e carbon footprint, eutrophication while this is less the case for farmers/general audience. It was agreed to proceed as following:





- there will need to be a communication strategy in function of the stakeholders (not reducing the indicators but aggregating them, paying attention to specific focus points of the target group). The possibility of an infographic approach will be explored . It might be good to “test” with farmer associations this approach to see if this is a good way to reach the group farmers. If necessary also a factsheet approach can be considered towards the end of the project. In frame of WP6 UGent/Teagasc will design infographic on the demo’s, comprehensive info on the indicators can be included. The infographics should be ready by March 2022 so they can be used during NTF/physical meetings.

- To cope with different local interests/circumstances the NTFs will play a crucial role in spreading the dashboard results. UGent will take this up in the communication strategy for the NTFs with relation to the demo’s.

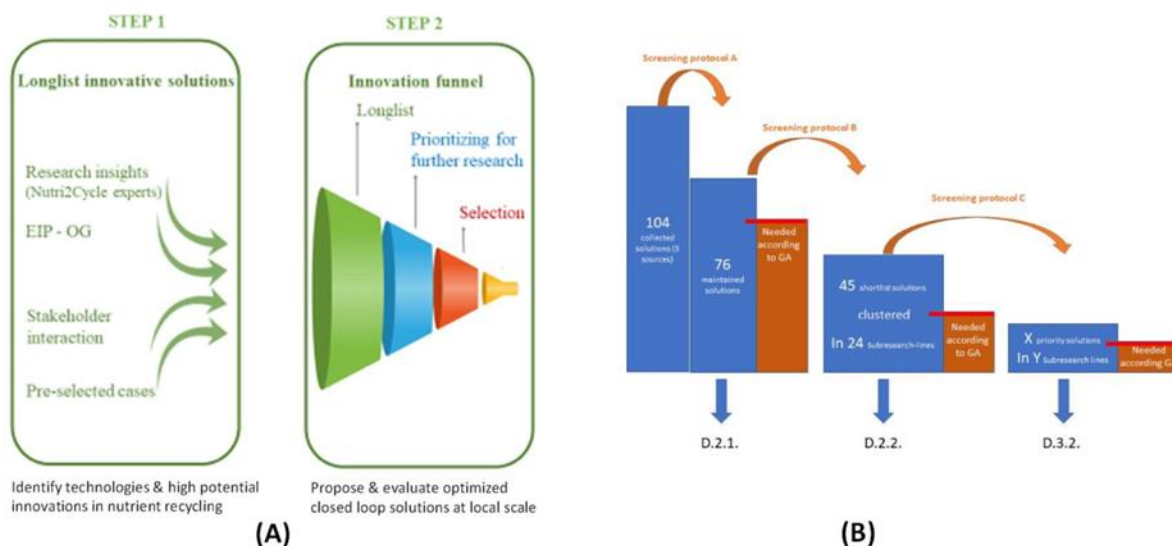
## 2.5. WP3: Prioritization 24 shortlisted => 12 priority solutions (Erik Meers, UGent +all (discussion))

### Key points:

Erik explains the steps of the flow in data gathering and prioritization within the project.

The Nutri2Cycle project provides a channelling and funnelling strategy in which in at first in D.2.1 we first attracted a broad list of suitable solutions that can optimize N, P and (organic) C cycles in European agriculture. This ‘longlist’ contained ongoing research from the participating partners as well as information gathered from other parties engaged in relevant research and development. In order to rationalize the workload and provide focus in the work plan of the project, the longlist was reduced to a shortlist (D.2.2) at a dedicated ‘boot camp’ linked to the European Sustainable Initiative conference. In further internal alignment of research efforts as well as to integrate even greater focus, the short list was further reduced to a priority list (in D.3.2.). The overall selection process is schematically presented in Figure 1.





**1<sup>st</sup> step:** 104 solutions were gathered and after scrutiny poured into a Longlist of 76 Solutions (which are reported in D.2.1) .

**2<sup>nd</sup> step:** shortlist – the work within N2C was prioritized to a shortlisted list of 24 which were structured in the 5 research lines of the GA :

- Innovative management systems, tools & practices for optimized nutrient and GHG management in animal husbandry
- Innovative soil, fertilisation & crop management systems & practices for enhanced N,P efficiency and increased soil OC content
- Tools, techniques & systems for higher-precision fertilization
- Biobased fertilisers (N,P), soil enhancers (OC) from agro-residues
  - a. Engineering nutrient recovery processes
  - b. Substituting primary resources by biobased products
- Novel animal feeds produced from agro-residues

The “shortlisting” from the extensive list of (longlisted) possibilities was performed at a dedicated ‘boot camp’ associated to the 1<sup>st</sup> edition of the ESNi-conference (Brussels) in presence of the full consortium General Assembly.

**3<sup>th</sup> step:** Go from 24 to 12 solutions. In the Grant Agreement it is stated that from the Shortlist, at least 12 solutions will be prioritized for demonstration purposes (WP6) and detailed impact assessment (WP3), including Life Cycle Assessment (LCA), Social LCA and Cost Benefit Analysis (CBA).

This selection is based on Screening protocol C using a Venn diagram approach, in which solutions were scored across three dimensions:

- C1.** Potential availability of background information & documentation related to environmental analysis (in order to be able to conduct reliable LCAs),



**C2.** Sufficient agrotechnical expertise, competence, and research capacity on the solutions within the Nutr2Cycle consortium,

**C3.** Potential for scalability and demonstration of proposed solution within the project duration.

The approach positioned all investigations from the Shortlist and placed them on a Venn-diagram and solutions which scored positively in all three dimensions are placed in the centre of the Venn diagram, those that score positive according to two dimensions are placed in between both of them and those that only score for one dimension are only placed in the appropriate part of the Venn-diagram.

The three sets of criteria C1-C3 are that data needs to be available (or be made available) on which to assess environmental impact, it makes little sense to prioritize on solutions for which there is no or limited expertise and capacity within the consortium and the solutions need to be scalable with access to potential infrastructure (either at farms or at institutes involved).

For each of the three dimensions, a dedicated survey & analysis were therefore performed:

For **dimension C1**, a “traffic light” study was carried out by UCPH in which the feasibility of each shortlisted solution for subsequent environmental modelling and/or LCA analysis was scored using a green-orange-red light system indicating positive (green), negative (red), or expected problems/limitations (orange). Each shortlisted solution was reviewed by Daisy, SWAP-ANIMO, and MITERRA-Farm modellers to assess its feasibility to be simulated by each model. The assessment took into account model capability, assumptions that must be made, Technology Readiness Level (TRL), and potential data availability by M16 (tier 1) and M20 (tier 2). Following that, the solutions were also screened by LCA partners to select their preferred cases for LCA, considering both the scientific merit, and data availability from modelling and technology owners. The selection process also aimed to distribute the selected LCA cases among the 5 research lines as well as partner countries. Finally, the overall feasibility for each shortlisted solution was scored by combining the two assessments.

For **dimension C2**, a survey was carried out by Ghent University in which the consortium was probed for active expertise and capacity – both in human resources (PhD, postdocs, PIs) and research infrastructure to address the solutions.

For **dimension C3**, a mapping exercise was carried out by Teagasc in which the pilot & demonstration capacity on each of the solutions was evaluated, which combined both ‘scalability’ of solutions within the project lifetime as well as the infrastructure at hand allowing a TRL-lift within and by the project.

The outcome of the Venn-diagram investigation, converging the three above-mentioned dimensions into one Venn-diagram comparison was presented at the midterm consortium meeting in February 2021. The ensuing discussion that emerged from that analysis resulted in the prioritization, bearing in mind the following criteria:





- Solutions scoring positive in two or three of the Dimensions (C1-2-3) deserve priority based on the alignment between agro-technical capacity, environmental data & infrastructure availability/suitability.

- In the discussion further scrutiny was needed and applied in order to further streamline the number of retained solutions to add focus in the project. The consortium was guided by the following key questions:

- 1) are all 5 research lines sufficiently represented in the final list of priority solutions?
- 2) do we expect good accessibility and willingness-to-share economic data so that abovementioned studies can be expanded with the full (required) economic assessment on the final solutions?
- 3) from which of the solutions do we expect most/least direct impact on advancing the state of knowledge and our ability to validate on closing NPC cycles within the project lifetime?

In addition to the priority listing, at the consortium meeting (15/02/2021) it was confirmed that ongoing investigations and communications which are NOT on the final priority list, themselves do not need to end or be discarded. The priority list implies further scrutiny, prioritization, alignment and focus but Nutri2Cycle will continue to also support the other originally (short-)listed solutions. Nonetheless emphasis for further environmental, agro-technical, economic and social investigation will be placed on the selected priority solutions.

**Conclusion** : the final priority list following the consortium meeting, divided over the 5 (colour-coded) research lines are depicted below. The SRL in the titles above the tables refer to “Sub Research Line” which is the identifier for the 24 shortlisted solutions (D.2.2.) that branched as sub-research lines under those 5 colour-coded main research lines depicted below. The numbers in the tables themselves refer to the identifier code of the solutions in the original longlist of solutions (D.2.1.). So the taxonomy is Research Line (RL; listed in the Grant Agreement) > Sub research Line (SRL ; listed in D.2.2.) > Longlist Solution (LL ; listed in D.2.1.)



**Innovative soil, fertilisation & crop management systems & practices for enhanced N,P efficiency and increased soil OC content**

**SRL 1 : Practices for increasing soil organic matter content**

16	Using digestate, precision agriculture and no-tillage focusing on OM stocking in an area characterize by the lack of OM in sandy soil	UML
17	Crop farmer using a variety of manure and dairy processing residues to recycle and build soil C, N, P fertility	TEAGASC

**Tools, techniques & systems for higher-precision fertilization**

30	Precision farming coping with heterogeneous qualities of organic fertilizers in the whole chain	THU
73	Precision arable farming using bio-based fertilizers in potato growing	ZLTO

**Substituting primary resources by biobased products**

**SRL-4 : Substituting external mineral nutrient input from synthetic fertilisers by recycled organic based fertilizers in arable farming**

1	Ammonium stripping / scrubbing and $NH_4NO_3$ as substitute for synthetic N fertilizers	UG/INAGRO
2	Ammonium stripping / scrubbing and $NH_4SO_4$ as substitute for synthetic N fertilizers	UG/INAGRO
9	Liquid fraction of digestate as a substitute for mineral N & K fertilizer	UG/INAGRO
55	Groot Zevent (NL) ~ Biogas refineries	WUR

65	Struvite as a substitute of synthetic P fertilizer	UG
49	Nitrogen and phosphorus recovery from pig manure via struvite crystallization and design of struvite based tailor-made fertilizers	CARTIF

**SRL-8: P recovery from animal bones**

22	BIO-PHOSPHATE: high temperature reductive thermal process recovery of concentrated Phosphorus from food grade animal bones	TH
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**SRL-7 : Pig manure processing and replacing mineral fertilizers**

20	Low temperature ammonium-stripping using vacuum	IRTA
6 / 43	Manure processing and replacing mineral fertilizers	WUR + ZLTO +UG

**Innovative management systems, tools & practices for optimized nutrient and GHG management in animal husbandry**

**SRL-13: Anaerobic digestion strategies for optimized nutrient and energy recovery from animal manure**

10	Small / Farm scale anaerobic digestion of agro-residues to increase local nutrient cycling & improve nutrient use efficiency	IA
48	Recovery of energy from poultry manure and organic waste through anaerobic digestion	PCZ

**SRL-15: Organic matter recovery from manure and associated valorisation strategies**

24	Adapted stable construction for separated collection of solid manure and urine in pig housing (followed by separate post-processing)	UG/INAGRO
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**Novel animal feeds produced from agro-residues**

**SRL-12 Floating wetland plants grown on liquid agro-residues as a new source of proteins**

41	Floating wetland plants grown on liquid agro-residues as a new source of proteins	
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Priorities : 9 SRL ~ 18 original LL-solutions

## 2.6. WP2 : Research lines

All the research line leaders presented an overview of the research that is ongoing in their research line.

Research line 1: Innovative solutions for optimized nutrient & GHG in animal husbandry by Ashekuzzaman SK and Patrick Forrestal

Research line 2: Innovative soil, fertilisation & crop management systems & practices for enhanced N,P efficiency and increased soil OC content by David Fanguiro

Research line 3: Tools, techniques & systems for higher-precision fertilization by Chantal Hendriks and Jan Peter Lesschen

Research line 4: Biobased fertilisers (N, P) and soil enhancers (OC) from agro-residues by Ivona Sigurnjak and Erik Meers

Research line 5: Novel animal feeds produced from agro-residues by Sander Vandendriessche

The presentations were envisaged to provide a state of play, to ensure that all partners are aware of the research that is being done. For more detailed info see slides on the Google Drive



## 2.7. WP3 : Introducing sLCA + needs from the consortium (Edilene Pereira, IRTA )

Key points:

- T3.2 Environmental and Social Life Cycle Assessment
- T3.2 focusses on environmental and social LCA. For now there are no standardized indicators and scarce literature data for novel technologies and prospective assessment are available for social LCA. Therefore, the following step plan was created by IRTA team and presented to the consortium:
  - Step 1: create baseline scenario to identify hotspots for agriculture across Europe (Final results in January 2021)
    - o 56 indicators from the PSILCA database are used
    - o Scenarios were created by country selecting 'product systems' related to Agriculture for the 12 countries (partners) in N2C
    - o These indicators are translated into impacts applying the impact assessment method "Social Impacts Weighting method" using the LCA software OpenLCA
  - Step 2: indicators for social assessment of the 45 technologies to assess/estimate potential impacts from the technologies (Final results expected in March 2021)
    - o A set of 17 aspects/indicators was developed taking into account (see slides):
      - Literature data for emerging technologies;
      - Aspects related to nutrient emissions and social impacts and
      - Relevant social indicators that should be applied for novel/emerging technologies to be used in agriculture and livestock
    - o The aspects selected are linked to 24 social indicators to demonstrate where the N2C technologies could impact
  - Step 3: case study and final evaluation of the technologies (Expected to be finished in May 2021)
    - o The approach selected for the assessment is prospective (identifying potential impacts) , qualitative (using Delphi method and literature data for validation) and assessed through a questionnaire for experts with a Likert scale (Strongly agree, Agree, Neither agree or disagree, Disagree and Strongly disagree). For each indicator, there is a clear description of the different Likert-scale options.
    - o The questionnaire will be conducted through an excel file containing sheets with 'Indicators' definitions, Likert scale used explanation and Social assessment by technology (see document 'Social Aspects – N2C - Partners').
    - o Results are resumed in a final table.

The following was discussed:







- The baseline will be established per country. It is not possible to establish 1 baseline that is representative throughout Europe due to internal differences found for the social indicators per country.
- Some parameters overlap between sLCA and LCA (f.e air quality parameters). We have to avoid double counting of the impact of certain parameters, as this can lead to conflicting results if it is intended to provide a sustainability analysis for the technologies. It was decided that environmental LCA will deal with health issues (for example NH<sub>3</sub>, NO<sub>x</sub>) in general but social LCA will focus more on specific labour environment situations (for example High NH<sub>3</sub> exposure in a specific technology). Still this will remain an attention point throughout the WP3 meetings and strategies to avoid and to manage this conflicts will be addressed in the deliverables.
- Data collection has to be structured consistently in cooperation with other tasks (for ex CBA data required) → strong cooperation is needed, this will also be done in the WP3 meetings

One of the goals of the social assessment is to contribute to the improvement of SLCA, showing and testing alternatives to assess novel technologies (exploring qualitative and prospective assessments) and selecting indicators that are more relevant to addressing social issues in agriculture that until then were not included in the SLCA.

## 2.8. WP3 : Introducing CBA + needs from consortium (Lies Bamelis, United Experts)

Key points:

- UE explains the focus of the task, which does not focus on research articles or European modelling, but real case, concrete investments. The outputs should be oriented towards a non-scientific audience and be usable as a guidance for investments and/or policy proposals.
- Some potential visualization methods were shown
- A (non-limitative) list of data requirements is presented

The following points were discussed:

- It is impossible to correctly assess all European situations in a CBA. It was decided to assess all installations in their region of origin + versus a Flemish benchmark ( as intensive region)
- A discussion was held on the baseline and the functional unit to be used. It was decided to define a baseline and a functional unit according to the research line as this contributes greatly towards comparability (within the research line).
- A target of 12 CBA's has been put forward. CBA should preferentially be done for the selected demo's as this surely will be a recurrent question from stakeholders and we can expect the most accurate real-life data to evaluate the conducted CBA's.
- Good data collection will be crucial. It is expected that there will be some overlap with the data collection for the social LCA, MCA, LCA,.... If possible the surveying should be performed





jointly, however if this lead to a delay in timing, partners will proceed individually. This will be discussed at a dedicated WP3 meeting beginning of March.

- Data collection and results will need to be validated through the demo's but also through feedback from the National Task Forces. Results will need to be compared to already existing studies/reports if applicable
- A responsible per region as contact person would be beneficial. A list will be drafted. Lies (UE) will create a Doodle
- The CBA results will not specify names/locations so no GDPR issues are expected

## 2.9. WP4 : modelling approach + needs from consortium (Joerg Rieger, Thuenen Institute)

Key points:

- Thuenen presented the status of the work package.
- A CAPRI modeling of innovations has been performed for a selected solution and a feasibility analyses on the LCA list was presented, including a list of required parameters for modelling

The following points were discussed:

- T4.1: literature review on transferability and uptake incl critical review of the criteria used by farmers to make their decisions. Linked with D5.1 and D6.1. So in case of extension, all connected Ds will have to shift.
- D4.3 Policy Briefs: UGent takes the lead and will seek for a synergy with European projects such as Systemic, Fertimanure, Lex4bio and Circular Agronomics. to avoid double work.
- D4.2 effects of innovations at regional, national and EU level
  - o Capri study on precision fertilization: Erik proposes to benchmark with the work done by UGent/ZLTO on precision farming
  - o Capri modelling is very time consuming > priority list has to be made >ask to fill out data requirement list > Based on that list, decide priorities for modeling

## 2.10. WP5: Introducing WP5 stakeholder activities + needs from the consortium (Zein Kallas, CREDA)

Key points:

- The set-up and outline of the questionnaire has been determined and presented
- There is still need for differentiation for which partner input is needed





The following was discussed:

- T5.4 and 5.5 will be done through 1 survey to improve efficiency
- Some questions/answers need differentiation (f.i. price for products/country) > input from partners will be asked for that by email
- For now the questionnaire seems a little too long in text, making it quite demanding, a scrutinization step will be done by WP leader by mid March 2021
- Individual partners will be responsible for the translation for the following countries Belgium, Ireland, The Netherlands, Croatia, Hungary, Italy, Spain, Denmark, Poland. This will need to be done by mid April 2022
- the WP meader will make specific country links available for spreading, the individual partners are then responsible for spreading
- start up questionnaires foreseen early May 2021
  
- For T5.1: 8 case studies are needed for the adoption study. These will be selected in preference according to the demo's
- Input from the partners is needed – an overview of this input is given
- Per case study a focus group (to discuss the case) has to be organized This includes quite a lot of work, as established in GA. However, for the moment this is hampered by the corona-outbreak, as ideally this is not done in a digital setting.
- A dedicated meeting will be organized to decide on the case studies. Zein sets up a Doodle

## 2.11. WP6 : Proposed Demonstrations, strategy & timing (S.M. Ashekuzzaman, TEAGASC)

Key points:

- TEAGASC explains the rationale for the selection of the demo-options
- Ideally, a demo solution offers 1) research components, 2) data availability to feed into the other WP, 3) operational/market scalability and 4) a clear intent to fully engage on stakeholder interaction and communication.
- A template for the demo protocol has been proposed and distributed. An overview of the responses was given.

The following was discussed:

- Some of the proposed demos have no active research in frame of the project. It was decided to in first instance focus on the lighthouse projects. These will also be taken up in the associated deliverable. However, the non-light demo's will be taken up also in communication efforts through WP 7 and also be used as inspiring case for example through the NTFs.
- The consortium deems it very important that it is very clear to the outside world that the different demo's reside under the Nutri2Cycle umbrella. Therefore a close collaboration will





be set up with WP7 so the same communication tools can be used. It was also suggested to have a dedicated communication campaign (newsletter, social media,...) on the demo network to maximally attract stakeholders. Aurore and Ashek plan a meeting on this. This will be taken up in D6.1

- In frame of the current COVID restrictions stakeholder involvement in the demo's will be challenging. An extension seems extremely important for this WP (see also partim management)
- All proposed demo candidates should once more revise. A final demo list will be available beginning of March. In March also a meeting with the primary WP6 members will be organized (Doodle).

## 2.12. WP8: Management overview (Evi Michels, Ghent University)

Key points:

- The project cohesion must be improved, especially non WP leader partners should be more involved
- In general deliverables reach the coordinator too late, making a stringent quality check difficult with respect to the deadline.
- Specific focus was put on the necessity of open access of results, also for results that are not being published. The revised data management plan lists all the options, partners should actively engage on this.
- Partners were encouraged to actively engage on the continuous reporting.
- The COVID19 restrictions have a serious influence on the project, despite the mitigation measures taken. An open discussion was held on the possibilities to amend this situation.

The following points were discussed:

- Project cohesion must be further stimulated through scheduled WP meetings (at least one/2 months) on top of the already established monthly WP leader meeting. The WP leaders (UGent/WUR/UMIL/TEAGASC/THUENEN/IRTA) will send a series of Doodles to fix dates.
- To establish better deliverable quality a "quality trial" will be established through an internal revision system. Both scientific quality and compliance with DoA will be scrutinized through a revision board. A list will be drafted by UGent, based on the following principle: 6 weeks before submission a deliverable should be ready for revision by selected members of the consortium, the WP leader and the lead partner.
- Partners acknowledge the need for an extension of project in frame of COVID19 effects, especially in this crucial point of the project lifetime. The lead partner will request the modalities of an extension request to the project officer. All partners are requested to check in their institute





if an extension is feasible. Extension should not lead to “dilution” of deliverables. If partners object they are invited to contact the lead partner before 23/02.

- The timeline for the next reporting period has been set. This timeline is provisional as at this point it is unclear if an extension request also affects the reporting timeline:

- All WP leaders collect info from all beneficiaries through a template over summer. This template will be provided by the lead partner in June.
- End of September: submission PR report to coordinator, submission due end November 2021
- Answering review remarks will be part of the reporting template. The lead partner will provide specific questions to be answered

### 2.13. Wrap-up

In the wrap up the initial goals of the meeting were reassessed

- Simplification and clear path for WP2: demo vs non demo solutions: in the next phase of the project a clear focus will be on the prioritized solutions, without losing track of the non – priority cases. The novel delivery D2.6 will be a method of collecting and presenting the data uniformly and cohesive
- Reconnecting all actions: the interlinkage between actions has been refreshed during this meeting. Besides the already existing WP leader meetings the lead partner has also insisted on more structural WP meetings.
- Data needs for WP 4-5-6 : data needs have been presented and a series of Doodles will be launched after the meeting
- Timeline and realistic goals – Covid situation: an extension process with the request for one year extension will be started by the lead partner if no objections are being raised by 23/02

