



Technical Advisory Group (TAG) on Nutrient Cycles Accounting and Impact Assessment

Terms of reference for TAG members

BACKGROUND

Environmental assessments of livestock supply chains are challenged by some outstanding methodological issues related to the accounting of nutrients such as e.g. nitrogen (N) and phosphorus (P). Nutrients either mineral or organic are valuable resources used in agricultural systems to mainly produce feed, food, biofuel and timber. However, nutrients use can result in environmental pollution of water, soil and air. Depending on the environmental assessment framework concerned (e.g. Life Cycle Assessment, resource-use efficiency metrics), pollution can be expressed in terms of potential impact on climate change, acidification, eutrophication, degradation of water quality or air quality, or in terms of nutrient pressure (losses or surpluses) per unit of land, product, farm or system. While producing N can be energy intensive, P is a scarce resource, which in the form of phosphate rock is classified as critical raw material by some countries. Several models for nutrient accounting and impact assessment methods exist and assessment results are often questioned.

For example, many nutrients accounting models do not take into account, amongst others, both regional and temporal variability aspects and changes in soil nutrients stocks. Such accounting models seemingly do not distinguish animal categories and require additional accounting layers when it comes to assessments of e.g. integrated production systems (e.g. crop-livestock systems, intra-annual crop rotation, silvo-pastoral systems). Impact assessment methods in Life Cycle Assessment (LCA) often lack acceptance from stakeholders because the “pressure-to-impact” framework lack details and local data. As result, LCAs of livestock products are seemingly struggling to deliver plausible results, which are representative for the geographical areas concerned in the assessments. In addition, nitrogen footprinting approaches and other metrics instrumental to evaluate nutrient use efficiency over the life cycle of livestock products are being developed and fine-tuned. All these assessment frameworks are emerging as addition to the nutrients budget, which are already widely used in many countries in support of both environmental management and monitoring agricultural policies.

AIMS OF THE ACTIVITY

The **Livestock Environmental Assessment and Performance (LEAP) Partnership** members called for sound recommendations on nutrient accounting and impact assessment for inclusion into the LEAP guidelines. To get to a global consensus in the field, this TAG will build a common ground by facilitating technical dialogue between the relevant scientific communities, practitioners, and LEAP stakeholders.

Some of the questions that will be answered by the TAG include the following:

- What are the key features of the different nutrients assessment frameworks? How and to what extent do they differ from each other? What are their key strengths and limitations? Which contexts these assessment frameworks are normally applied in? Do the different frameworks compete in application or can complement each other bringing additional, useful information for informed decision making?
- Which assessment frameworks are suited for benchmarking the environmental performance of livestock supply chains? Which indicators are relevant for assessments conducted at regional or global scale?

- Which accounting method is the most suited to estimate the amount of nutrient losses into the environment?
- How to account for soil nutrients stock changes? How to deal with nutrients carried-over from previous productions? How to take into account biological N fixation? How to frame the accounting systems when land use change took place?
- How to allocate emissions from up-stream activities (e.g. mineral fertilizer production) to integrated crop-livestock production systems or crop rotation?
- What criteria shall be considered to characterize and evaluate the scientific soundness of life cycle impact assessment methods for eutrophication and acidification? To what extent the “pressure-to-impact” models can be tailored to take into account local geographical conditions?
- Which indicators are proposed in the literature to assess phosphorus as critical resource?

Guidance from the Nutrient TAG is relevant for livestock supply chains including feed production from croplands and grasslands, production and processing of livestock products. It will address all livestock production systems and livestock species considered in existing LEAP guidelines.

DELIVERABLES

- LEAP guidelines on nutrient accounting and impact assessment in complement to previous LEAP guidelines on feed and livestock supply chains.
- Peer-reviewed paper for publication in scientific journal

TIMELINE

An indicative timeline for the work programme of the Nutrient TAG is provided below:

Activities	2016												2017				
	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5		
TAG formation																	
Call for nominations	■																
Final nominations	■																
Selection of TAG co-chairs and members	■																
TAG work timeline																	
Preparation of the 1 st face-to-face meeting	■	■															
1 st face-to-face mtg*		■	■														
Online discussion			■	■	■												
First draft of the general guidelines						■											
2 nd face-to-face mtg							■										
Development of cases studies and writing of journal paper					■	■	■	■	■								
Online discussion								■	■	■							
First draft to LEAP Steering Committee										■							
Peer-review										■	■						
Public review/revision												■	■	■			
Final publication															■		

* Ideally, the first meeting will take place in late April-May. The availability of TAG members will be checked through a doodle poll.

ENGAGEMENT

TAG members are warmly invited to participate in person and actively contribute to the two face-to-face meetings on the way to be scheduled this year. Each meeting will last two-three days.

Besides participation in the two meetings¹, TAG members are requested to continue to work on TAG deliverables under the overall guidance of the TAG co-chairs in order to deliver quality technical products on schedule.

Without active participation in TAG activities, no co-authorship of the LEAP technical products is granted.

TAG members report to TAG co-chairs.

LEAP will not grant any honorarium to TAG members, who are also expected to arrange their own trips autonomously. Derogations are only possible in specific circumstances (e.g. ensuring balanced participation of regional experts from developing countries).

QUALIFICATIONS

TAG members are technical experts having a strong background in one or more of the following subjects: soil science, agriculture science, nitrogen modelling, phosphorus scarcity, resource-use efficiency metrics, animal science, hydrology, ecology, nitrogen footprinting, LCA, impact assessment methods on eutrophication, acidification, water quality and air quality.

Ideally, TAG members have a proven track record in research and/or have built technical expertise by implementing nutrients accounting schemes.

Minimum requirements include:

- Working knowledge of English
- Skilled in team working and hence in sharing views and knowledge in a constructive manner
- Highly-motivated and committed to develop sound tools enabling to support transparent decision making at various scales and in all regions worldwide
- Respect of cultural and scientific diversity of TAG members

APPLICATION

Candidates are kindly requested to submit their CVs to the LEAP Secretariat (Livestock-Partnership@fao.org). CVs must include an updated list of publications and work experiences by **March 22nd 2016**.

All applications will be reviewed by the LEAP Secretariat and LEAP Steering Committee. Merit, balanced regional representation of participants and gender balance are three key selection criteria.

¹ While the first face-to-face meeting will be held at the FAO HQ in Rome, Italy, the second one is likely to be arranged outside Europe.