



Brain-be 2.0

STATE OF THE ART

Futures4Food

**Connecting futures and stakeholders of food systems by
designing effective transition trajectories**

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Introduction - *Research and its central theme briefly*

FUTURES4FOOD (F4F) team members aim to develop and test a methodology based on an iterative, co-created transdisciplinary approach called the designing feasible futures framework (DF3), geared to effective implementations of sustainable and resilient futures of the cereal sector and protein shift in the human diet in Belgium. This co-creative approach will take root in experiences and lessons of past multi-actor projects, in each involved actor's sector knowledge and experience and will mobilize diverse collective intelligence insights, methods and practices. Originally inspired by the framework "Ten Reflective Steps" [1], and by the experience of working with teams of students during the Honours Program Transdisciplinary Insights since 2016 (KU Leuven)¹, a first outline and trial of this approach was developed and led by the Institute for the Future in a project concerning pandemic preparedness [2]. Key to the approach is the facilitation of a team of diverse actors through a transdisciplinary process of co-creating systems, target and transformation knowledge geared towards action for desirable futures. The approach is also meant to stimulate an intrinsic motivation of the team members to contribute to the co-creation process.

This approach will now be further explored and tested on one of the wicked societal challenges of our time, being the transition of our food sector in the large context of climate change and specific context of the European Green Deal and the Farm2Fork strategy. Food production and consumption have indeed been called on to play an essential role in a global transition process given their key societal role and their documented impact on greenhouse gases balance and planetary boundaries. The DF3 approach will be adapted to this sector by co-developing a methodology with the sector through continuous research, constant aim of fluid reflexions and dynamics and by welcoming emergent demands, needs, projects, questions and views from each involved person. This emergence is notably favoured by a more flexible *stakeholder* involvement throughout the iterations. Stakeholders, who will be further on referred to as "sector partners" will be active participants in the transdisciplinary process which involves different disciplines (economy, philosophy, humanities, medicine, geography, engineering).

State of the art

i. Context

At the global and local levels, the agri-food system significantly impacts our society's sustainability. Across the nine planetary boundaries related to Earth-system processes, the agri-food system affects at least five: biodiversity loss, nitrogen and phosphorus cycles, climate change, biochemical flows, and land use change [3]. In addition, human diets are strongly linked to human health and well-being (either positively or negatively) as well as to questions of social equity, important for the Sustainable Development Goals [4]. This is why agri-food systems are being challenged, from farm to fork [5]. Despite a large body of knowledge and evidence, transforming the agri-food system towards a sustainable future has been particularly hard, typical of wicked problems, for which the acceptability of solutions depends on diverging sector partners' interests. This situation complicates the governance and the needed transition of agri-food systems both

¹ <https://rega.kuleuven.be/if>

locally and globally. It requires rethinking methods and pathways towards more transdisciplinarity, such that from the start, a broader inclusion and active participation of sector partners than what has previously been achieved, is sought.

We have identified two major sustainability challenges of the Belgian agri-food system: one being the cereal sector transition as it represents the largest share of our agricultural land and the second being the shift to more non-animal protein in the human diet (both directly and indirectly through animal feeding) as a key step towards decreasing the pressure on our planet's resources.

Context of our case studies²

- **Sustainable futures for the Belgian cereal sector.**

Cereals are the major production system encountered in the country and represent 25%³ [9] of the Belgian agricultural area (up to 57% if we include forage maize). This importance comes with a long history of development, actors, actors' dynamics and multiple governmental interventions, supports and programmes.

- **Protein transition as a key pathway towards sustainability**

The transition of the agri-food protein system to more non-animal protein is regarded as one of the most important transitions within our agri-food system. The development of alternative, non-animal-based proteins (plant-, fungi-, insect- or cellular proteins (here pooled under non-animal) based) are an important pathway to meet the challenge of feeding an increasing world population in a healthy and sustainable way. This shift is generally coined as the "protein transition" [6].

ii. Multi-actor experience and research context of our case studies

Cereal sector

In Wallonia, a mapping of the cereal sector was undertaken by Sytra in 2017 including the characterisation and mapping of the modes of production as well as a mapping of the value chain flows and actors [10]. That work led to a renewed attention to the cereal sector with the emergence of several projects by diverse actors and the establishment in 2019 of a 10-year strategy for the development of the food-purposed cereal sector [7].

The 2017-mapping of the production modes gave a first overview on the existing practices and served as the foundation for the prospective approach and construction of 3 scenarios: one business-as-usual scenario and

² Cereals and proteins: a convergent approach of both cereals and proteins production will also be considered and documented throughout the program as a key pathway to document as intercropping and its co-benefits are constantly more documented and tested on-fields. [17,20–22]

³ Nowadays, most of that production is dedicated to feed (46%), energy (32%), and export (13%); only 9% of our current production is dedicated to food.[10]

two transition scenarios built and discussed with about 20 key actors. An update and in-depth development of that 2017-study as well as its extension to Flanders will be led in this project⁴.

Protein transition

When it comes to the protein transition, there is a big difference between Wallonia and Flanders. While the subject is still rather marginal in Wallonia, Flanders has taken some first policy steps such as the development of a protein plan and the 'Green Deal eiwitshift'. This is a voluntary commitment between the industry, NGOs and the government to make a consumption shift away from animal proteins. In 2019, both the agricultural research institute (ILVO) and food research platform (Flanders' FOOD) initiated an alternative proteins research programme. When it comes to livestock systems, prospective approaches have been rolled out at the EU (TYFA) and the Belgian level for the performance and impact of different production systems including the feasibility of an agroecological transition [8]. Three scenarios (business as usual, moderate transition and radical shift) have been designed and presented to the livestock sector key actors. This exercise can serve as a basis for further transition processes.

iii. Key research hypotheses in the field of the research project

Wicked problems require a transdisciplinary approach which is different from an interdisciplinary approach in that it requires not only interaction between different disciplines but rather an ecosystem to be developed with the sector partners [6]. When interdisciplinary research fails at the implementation phase, it is often due to neglecting the knowledge and participation of the (local) sector partners [1]. While co-creation has been around for decades, broadly successful transdisciplinary frameworks are only recently being developed [10,11]. Based on methodologies developed by the Transdisciplinarity Lab at ETH Zürich, the Leuven IF designed the Designing Feasible Futures Framework, that is novel in its sought-for *flexible involvement* of sector partners throughout an iterative process, prioritising dynamics emerging from shared mental model or shared horizon in early iterations. The framework also builds heavily on the facilitation of the sector partners to become one or more learning communities, such that multiple futures are allowed simultaneously. The emergence of multiple futures makes room for a diversity of views, and transition pathways and thus increases also the resilience of the entire endeavour. Rather than focusing on scenario building as final results, a value-based approach opening the way to common horizon discussion and learning communities' creation could lead to richer thematic work and more embedded and integrated transition pathways. Such an approach is a potential gamechanger, opening the way to discussing existing lock-ins, tension, and loss of interest frequently associated with projects trying to address wicked problems.

Learning from previous transdisciplinary transition processes

⁴ This will be done, building on lessons learned and feedbacks collected from the 2017 exercise as well and mostly, on the newly developed co-construction process, described in previous chapter, with the sector partners throughout the duration of the program.

Consumers and informal institutions are driving the food transition, but a number of intervention points are needed to accelerate it while at the same time aligning all the different sector partners with this transition [12,13]. Different organisations and stakeholders have already been involved in **attempting to transform the sectors towards a more sustainable approach**. In Flanders, three main initiatives tried to reach this goal over the last 20 years [14].

In 2002, the "On tomorrow's ground" initiative worked on a possible transition of the Flemish agricultural sector by 2020 [15]. The project consisted of a multi-stakeholder process which aimed at developing a shared vision on the sustainability of the Belgian agri-food sector. In a first stage, a group of scientists drafted a vision, consisting of two types of farms, envisioned 30 years from now. Subsequently, this vision was discussed with a total of 130 stakeholders over the course of 3 workshops.

- A self-indicated downside of this project was the imbalance between stakeholder groups, as one third were farmers, one third were scientists and government representatives, and the other stakeholder groups were represented only in the last third of participants.

In 2010, "The New Food Frontier" (NGOs, sector organisations, scientific actors) tried to convince a large group of stakeholders of the need to have a long-term shared vision [16]. The project first established an "image group" of relevant stakeholders to develop creative and long-term future images of the agri-food system. Then they discussed these images with a broader stakeholder group and aimed at establishing a government supported transition network.

- However, the project was discontinued after what was described as a "process of constant tension".

In 2013, "The Flemish agri-food system transformation towards sustainability" (Flemish government, industry partners, and a research institute) used transdisciplinary principles to accelerate the transition [14]. This initiative was different from the previous ones in the sense that the project initiators were agri-food industry actors rather than scientists and policy makers and because the project focused on action and experiments instead of the development of a shared vision.

- After the project, three critical factors for future transdisciplinary approaches were identified: (i) the historical and institutional context of previous collaborations should be taken into account as well as the individual previous experiences of the stakeholders, (ii) transdisciplinary processes should be formalised, meaning that different roles and decision-making processes should be explicitly clarified, communication should be transparent and realistic stakeholder expectations should be set, (iii) the designed process should be adaptive, flexible and iterative.

Further observations and explanations have been established to explain the lack of sufficient results of those transdisciplinary projects:

- too much focus on the process may affect the interactions between actors,
- insufficient scientific back-up or moving too fast to action while skipping the stage of developing a shared vision for the future.
- A lack of proper co-creation. In several cases, a draft of a future vision or desired project outcome was made by a select group of scientists or stakeholders after which a broader stakeholder group was consulted for input, rather than truly co-creating the common vision [24, 25].

iv. F4F Research Contribution

On the methodological level, several learning traditions have been described in the literature. However, these traditions have hardly been conceptualised and investigated in the field of sustainability transitions [17]. In their review of four well-established learning traditions, Van Mierlo *et Al.* (2018) describe how those traditions can be relevant for projects involving learning teams, while highlighting some remaining gaps in the field of learning in sustainability transitions, e.g.:

- the importance of certain conditions such as diversity of actors,
- the need for clear roles of the government and the process facilitators in the different phases of sustainability transitions,
- the gap between individual learning and organisational learning,
- the relation between superficial and deep learning,
- further study on the presumed positive relation between learning process and outcome: this positive relation needs to be further studied.

Inspired and aware of those lessons learned, potential shortages and risks, and equipped with diverse experienced teams, F4F aims to consider and address those aspects in order to progress further in the development of an effective transdisciplinary approach – methodology that may accelerate potential transitions.

F4F aims to adapt the *Designing Feasible Futures Framework* for the co-creation of sustainable and resilient futures in the cereal and agri-food protein sectors in Belgium. The research objectives are 3-fold:

1. To co-develop a robust iterative transdisciplinary methodology for supporting social learning processes, co-creating inclusive roadmaps towards more sustainable and resilient futures with sector partners (government, industries, profit and non-profit organizations, universities, and citizens).
2. To build a learning community and network capital embedded in the case study sectors, to foster an inclusive, integrated sustainable transition by delivering learning communities and alliances to facilitate:
 - a. for the transition of the cereal sector and
 - b. the transition of the agri-food protein sector to more non-animal protein
3. To ensure that the methodologies and the insights obtained become available beyond the scope (and actors involved) of this research project through the development of training modules.

In addition to all the methodological work and process, F4F should benefit from a specific institutional environment as well as a favourable societal environment. On the institutional aspects: Institute for the Future, is an outsider and neutral partner for the sectors addressed, and the Belspo funds enable the project to develop a national approach which is welcomed by the sector partners. Concerning our societal environment: there is now, compared to 10 years ago, a greater sense of urgency among experts and the general population: climate change is already affecting agriculture and everyone in Belgium, through increasing extreme weather conditions such as heat waves and excessive rainfall. The core values of producing and consuming food expand well beyond the sector, into health and well-being, and planetary boundaries, putting extra pressure on food production methods. In response to that situation, there are

currently more bottom-up activities and movements (e.g., climate activists) as well as supportive top-down incentives for change such as the European Green Deal and Federal priorities [18]. Moreover, the COVID-19 pandemic has proven that change can happen quickly if the incentives are overwhelming. Moreover, the pandemic has created a momentum and a critical mass: many scholars and citizens are more actively reflecting on what society we want, and there is the push to not go back to business as usual but to leap forward towards a more sustainable future at all levels of society.

v. Expected results and perspectives

The project's approach will go beyond existing experimentations to transition approaches (hence "beyond the state of the art in terms of approach"). The project's core impact is to build a higher level of consensus among sector partners (including policy-makers, operational actors, and their representative bodies) as a needed base for effective transition experiments. At the end of the project, F4F will have:

- designed and tested a new transdisciplinary methodology to draw the futures of farm and food systems,
- bridged the gap between local and regional actions and the objectives of the European Green Deal and the Farm2Fork strategy,
- developed quantitative and qualitative indicators on the farm and food systems in Belgium with specific attention to new indicators combining production, sustainability, and food issues,
- collected data but also developed narratives in order to enrich and support the public and political debate on the futures of agri-food systems in an inclusive and transformational perspective, especially in the cereal and protein sectors,
- created a better knowledge base supporting the possible transition pathways and the related lock-ins on these different pathways.

The different learning communities will have the opportunity to develop connections with the policy-level actors, with other operational actors and research actors for greater knowledge development.

Further perspectives

F4F project will open **opportunities for collaborations: topic related (cereals and protein transition) as well as methodological (futures, complexity, multi-actors, and transdisciplinarity).**

National level. Other organisations and research centres (Flanders Food, UGent, ILVO, ...) have gained experience in the topics and can be invited to collaborate with setting up learning communities in the long-term process of transformation. Belgium is facing other complex challenges that require appropriate methodologies for which the cereal and protein transition case studies presented here could be an inspiration. Its central position and specific and diversified challenges make it a relevant case for other European countries.

International level. Opportunities for collaboration exist: both topic-related such as in the frame of the European Green Deal and the Farm-to-Fork Strategy, as well as method-related: working with international partners with respect to exploring various transdisciplinary frameworks.

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