VALUMICS
Food Systems Dynamics

H2020 VALUMICS Project

Policy conditions for a just transition of the French dairy and wheat sectors

Research findings and Policy brief

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Combining environmental and social objectives

The recent Farm2Fork strategy highlights the importance of carrying out a "just transition" of the European food system that brings "environmental, health and social benefits, offer(s) economic gains (… and) a sustainable livelihood for primary producers".

Methodological developments

An innovative methodological framework based on two original models has been developed to explore under what conditions the transition of the French dairy and wheat value chains may be both environmentally sustainable and socio-economically viable in terms of farm income and farm and agroindustry employment.

Introduction

Given the current ecological crisis, European food value chains must undergo profound transformations to become more sustainable. However, meeting environmental objectives must also go hand in hand with creating a socially fair and economically viable food system. The recent Farm2Fork strategy highlights the importance of carrying out a "*just transition*" that brings "environmental, health and social benefits, offer(s) economic gains (… and) a sustainable livelihood for primary producers"[1]. Key socio-economic challenges concern the improvement of farm income and the preservation of jobs in the agricultural and agri-food sectors.

In this context, an innovative methodological framework (based on two original models - MoFOT and an Agent-Based Model) was developed as part of VALUMICS WP7 and WP8 to explore a central question: under what conditions may the transition of the French dairy and wheat value chains be both environmentally sustainable *and* socially fair and economically viable? To this end, the modelling work assesses the socio-economic impacts and policy implications of two contrasting "transition pathways" of the food system:

- A *global market-led scenario* which focuses exclusively on resolving climate issues, without questioning the general market dynamics of concentration/specialization processes underway in the food system. Decarbonization is carried out by the strictly necessary modifications in the political framework and the technical-economic organization.
- A *local policy-led scenario* which sets more ambitious and comprehensive objectives from the outset on all issues at stake (climate, biodiversity, health, employment) and envisages important shifts in the economic strategies of value chain operators.

The impacts of these distinct scenarios on three socio-economic challenges are assessed: (i) agricultural income, (ii) agricultural employment, (iii) and employment in the agri-food sector. Comparing the two scenarios helps to identify a certain number of key policy issues to ensure the deployment of a just transition of the food system.

An innovative methodological framework

The effective inclusion of socio-economic issues in the dialogue on the sustainable transformation of the European food system is currently obstructed due to considerable methodological difficulties. Indeed, the models with the ability to capture socio-economic impacts are only capable of understanding marginal changes to the food system: in other words, they cannot deal with scenarios involving biophysical breakthroughs, although such scenarios are necessary if we are to achieve carbon neutrality. Conversely, models that provide a robust

[1] European Commission. (2020). *Farm to Fork: For a fair, healthy and environmentally friendly food system.*

representation of the biophysical transformations that would keep the food system within planetary boundaries are unable to capture the socio-economic impacts. Furthermore, most biophysical models are incapable of accurately capturing the challenges of preserving biodiversity in agricultural landscapes, and generally focus on the challenge of decarbonization alone[2]. As a result of these methodological difficulties, the debate is dominated by single-issue visions (most focusing on climate), that are far removed from the concept of sustainable development, which by definition is a multi-issue subject.

In this context and in order to ongoing debates, two original models were developed that combine biophysical modelling of the food system with an understanding of market dynamics from two complementary angles: that of value chain actors' economic strategies at every link in the chain; and that of the policies that influence market balances, targeting supply, demand or the ways in which the two come together. The first model, MoFOT, analyses the evolution of two sectors of the French food system: dairy and the COP (Cereals, Oilseeds and Protein crops) sector. These were chosen for their importance in the functioning of French agriculture: representing 70% of the Utilized Agricultural Area (UAA), 52% of value creation in agriculture, and 40% of value creation in the food industry. The Agent-Based Model (ABM) was developed specifically for the French wheat-to-bread value chain.

Starting from the same indicative decarbonization pathway at the scale of French agriculture, the two methodological frameworks explore two contrasting scenarios for the French food system to reach a common climate goal. At the biophysical level, they take as a starting point (for both scenarios) the projections for agriculture contained in France's National Low-Carbon Strategy (SNBC), published in 2020 by the Ministry of Ecology[3], which aims to halve greenhouse gas (GHG) emissions from the agricultural sector by 2050. These projections are based on a physical/agronomic representation of French agriculture, on a 5-year time scale, in terms of surface area, livestock, yields and associated production.

Two different transition pathways

The socio-economic impacts and policy implications of two contrasting "transition pathways" of the food system were assessed:

- The global market-led scenario focuses exclusively on resolving climate issues, without questioning the general market dynamics of concentration/specialization processes underway in the food system.

- The local policy-led scenario sets more ambitious and comprehensive objectives on all issues at stake (climate, biodiversity, health, employment) and envisages important shifts in the economic strategies of value chain operators.

Contrasted transition pathways of the French food system

The global market-led scenario is primarily based on a policy framework in which climate issues prevail over all others, and in which the transition depends first on supply side policies, without any notable interventions on market organisations or on the demand. Such a scenario is likely to increase the polarisation of the food system at all levels—from the producer to the consumer—, between highly sustainable but poorly accessible niche markets and modes of production based on price competitiveness. This results in the continued concentration of supply to achieve efficiency gains and to reduce production costs. In terms of demand, the shift towards lower meat consumption continues, but very unevenly within the population; the consumption of highly processed foods with no direct link to their agricultural origin remains stable, or even increases.

On the contrary, the local policy-led scenario takes the European Farm to Fork Strategy announcements seriously and assumes ambitious changes at all levels in modes of production and consumption: accompanied by ambitious mechanisms, demand shifts in favour of more local, seasonal, and minimally processed products, while animal protein intake continues to diminish. In terms of production, the agricultural link is encouraged within relative despecialisation processes that also help to slow the pace of concentration and to rediversify agricultural systems and landscapes. At the level of the agri-food sector, a less concentrated "Italian style" system is established, giving VSEs and SMEs growing importance in the overall

[2] Searchinger T.D., Wirsenius S., Beringer T., *et al.* (2018). Assessing the efficiency of changes in land use for mitigating climate change. *Nature*, 564 (7735), 249-253.; Lóránt A. & Allen B. (2019). *Net-zero agriculture in 2050: how to get there?* Brussels, Report by the Institute for European Environmental Policy, 41 p.

[3] MTES. (2020). Stratégie nationale bas-carbone : La transition écologique et solidaire vers la neutralité carbone.

economic structure of the sector. The labour intensity of production is higher here, being less standardized and more connected to agricultural production

Table 1. Overview of the assumptions for each scenario (source: authors)

Component	Variable	Local policy-led scenario	Global market-led scenario
Dietary practices	Dietary composition	Sharp reduction in proportion of animal protein from 63% to 50%, increase in fruit and vegetables	Small reduction in animal protein intake (from 63% to 55%), stagnation in fresh fruit and vegetable intake
	Product type	Decrease in proportion of ultra-processed food, increase in proportion of local and region-specific food	Continued increase in proportion of ultra-processed foods, limited emphasis on local production
	Willingness to pay	Slight increase	Decline
Organization of agrarian systems	Level of farm concentration	Stabilization	Continued concentration
	Level of farm specialization	Re-diversification	Specialization continues
	Level of crop-livestock connection and of territorial specialization	Relative reconnection of crop and livestock farming on territories (or even on the farms)	Territorial specialization stabilizes at the 2015 level
Agro-industrial complex	Relative importance of the $AFI_{Upstream}$/$AFI_{Upstream\text{-}Downstream}$/ $AFI_{Downstream}$	$AFI_{Upstream\text{-}Downstream}$ become more important, employment intensity increases in some sectors	Continued strong separation of $AFI_{Upstream}$ / $AFI_{Downstream}$, employment intensity decreases due to specialization
	Relative importance of small/medium/large entities in processing agri-food volumes	Rebalancing of the relative importance of small businesses in terms of employment and total output	Continued polarization of the agri-food complex;

Impacts of the global market-led scenario

- ***a 10% reduction in agricultural jobs compared to current trends, due to continuing concentration and an increase in the capital intensity of farms***
- ***a risk of income loss for farmers in the absence of compensation, especially because of increased debt levels***
- ***and job losses in the agri-food sector reaching 12% of current jobs.***

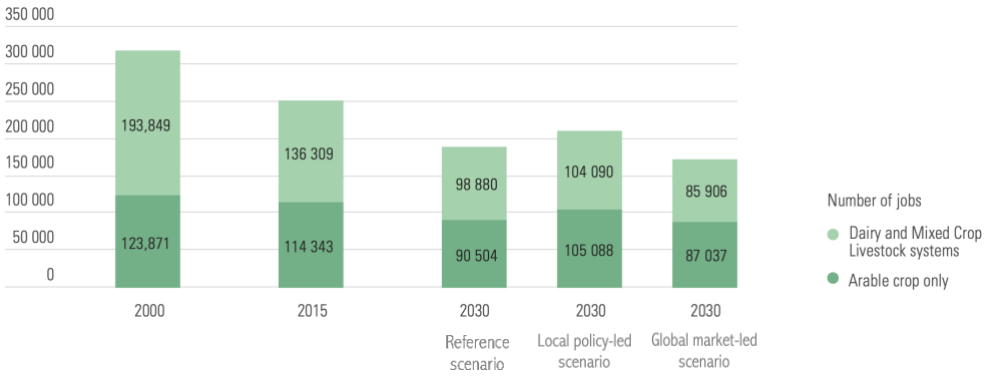
Contrasted socio-economic impacts

Agricultural employment

The first major result is that the local policy-led scenario could maintain more jobs than a continuation of the current trend by reducing the rate of farm loss, without a decline in income – despite the reduction in total production. About 28,000 farms and 20,000 jobs could be maintained in the sectors studied (dairy and arable crops) compared to the current trend. This is possible due to the evolution of the global context, which is more favourable to the development of new strategies for diversification and for more upmarket products.

On the other hand, in the global market-led scenario – that is, in a context where price competitiveness is strengthened, and political support focuses only on the mitigation of climate change - the majority of strategies would lead to a highly significant reduction in the number of jobs through a reinforcement of capital/labour substitution, with major risks for income levels. The increase in labour productivity is the main factor of competitiveness in this context. It is estimated that the global market-led scenario would lead to the loss of 9,500 farms and 16,500 jobs compared to current trends.

Figure 1. Change in job numbers in farming systems in 2030



Source: RICA, processed by IDDRI

Impacts of the local policy-led scenario

- ***agricultural employment is 10% higher compared to the business-as-usual trends, despite a drop in volumes produced***
- ***farm income is maintained without increasing the price of agricultural raw materials***
- ***jobs in the agri-food industry increase by 7% while offering more diversified and less processed foods.***

Farm income

The local policy-led scenario puts the emphasis on obtaining good value from production while reducing costs. Investments and supply costs are limited in "self-sufficient" type systems, but labour income is high compared to the level of production, and the monitoring of new standards can lead to significant costs for the farmer. Having a high premium is then fundamental to ensuring a farm's economic viability. The share of value added dedicated to labour remuneration increases from 48% to 58% for the dairy sector and from 51% to 64% for the arable sector. If wages remain constant, dairy farms would generate a surplus of 0.55 billion euros, which represents an increase in wages of 28% (from 1.2 to 1.5 times the minimum wage), or the hiring of 24,000 workers at constant wages (1.2 times the minimum wage).

Contrastingly, in the global market-led scenario, the dominant strategy is to increase competitiveness through a reliance on economies of scale and high-volume production. The increase in production capacity leads to significant investment needs which take up a large part of the expense account (amortization and depreciation). The viability of the system then depends on maximizing the volume produced per AWU (Annual Working Unit), which makes it possible to limit wage costs. The proportion of value added dedicated to labour remuneration falls from 48% to 38% for the dairy sector, and from 51% to 45% for the arable sector. At constant wages, dairy farms will have to mobilize an additional 0.54 billion euros to ensure the transition and to finance the major investments – according to our reconstruction. This corresponds to a 6% increase in milk prices or a 25% increase in subsidies.

Employment in the agri-food industry

The local policy-led scenario shows an increase in the labour requirement of the agri-food industry. By placing greater value on products derived from artisanal producers who implement strategies of differentiation, combined with an increase in investment for secondary and tertiary industrial processing, this scenario forecasts an increase in the number of jobs in the agri-food industry for the COP sector (6%), and in the dairy sector (12%).

The global market-led scenario shows the opposite trend. The increased specialization of the French agro-industrial complex leads to a reduction in the number of agri-food jobs in the COP sector (10% decrease) and the dairy sector (11% decrease). This decline in the number of jobs is the result of two trends. Firstly, there is a decrease of between 5% and 10% in the employment intensity of all sub-sectors compared to 2015, due to the large-scale adoption of strategies of concentration and economies of scale. Secondly, the product mix evolves towards industrial sectors that are characterized by lower employment intensities because they are less linked to production in VSEs and SMEs.

Policy conditions

All in all, the modelling results demonstrate that a climate-focused transition pathway based essentially on a change in supply-side policies but with minor interventions on demand and market organization, would have significant socio-economic impacts. In contrast, the results of the local policy-led scenario for the two sectors studied make credible the hypothesis of a just transition of the food system. The economic viability of such a scenario depends, however, on a simultaneous transformation of supply, demand and market organization - and therefore on major policy changes in these three areas.

In terms of demand, the current consumption dynamics in France and Europe carry encouraging yet weak signals for transition issues (a reduction in the consumption of animal proteins, an increase in the share of organic food, demand for local products). However, changes in the average food basket mask disparate food practices, partly related to the increasingly insecure situation of more and more consumers, for whom any increase in the food budget (whether in euros or in time) would be inconceivable. Substantial interventions are therefore needed to accompany practice changes and to make healthy, sustainable food more accessible. Although many possible measures have been under discussion, sometimes for a number of

Key policy challenges

The economic viability of a "just transition" of the food system will depend on major policy changes :

- ***a proactive approach to demand at the national level, mobilising a wide range of tools and making the healthiest and most sustainable choice the most obvious one for consumers***

- ***a convergence of visions between European Union member states, to ensure the implementation of national strategic plans in the context of the Common Agricultural Policy setting comparable objectives and production conditions for producers***

- ***an ambitious approach to international trade to foster and accompany the adoption of ambitious production standards.***

years, their widespread deployment now comes up against strong opposition, especially in the name of "consumer freedom".

In terms of market organisation, the challenge is twofold. First, it is necessary to create more convergence between the different member regarding how best to decarbonize the European food system. This will prove necessary to avoid increasing competitiveness gaps, given in particular the differences that already exist between member states. Although this is a complex task, the existing institutional frameworks can help to organise such discussions. But beyond this, the challenge is also to harmonise production conditions with non-European producers or, failing that, to at least temporarily protect the European market in order to avoid "carbon leakage" or limiting the potential for development of key sectors for the transition, such as protein crops, which are currently struggling to expand due to almost unbeatable competition from American soya (from both North and South America). The ongoing discussions on the carbon border adjustment mechanism could help to address these issues, but there is no doubt that they will prove difficult to resolve. More generally, as the leading exporter and importer of food products in the world, the European Union could and should be a source of proposals to implement ambitious standards towards more sustainable modes of production and consumption, and to advance these issues not only in the bilateral agreements it signs, but also at the level of the WTO.

In terms of policies to support the agricultural sector, the ongoing reform of the Common Agricultural Policy should help to align the member states' visions at the agricultural level through an accountability mechanism for the national strategic plans organised at the Council level; in order to be truly effective, it should nevertheless be accompanied by binding targets for states, an option so far rejected by the Council and the Parliament. At the food processor level, the development of environmental labelling, which is currently being tested in France, and the implementation of nutritional labelling throughout Europe should be encouraged as a follow up of the F2F: not only do they have an impact on consumer choice, but they are also a powerful means of transforming supply itself, through the explicit benchmark they provide for producers, which then helps to produce positive competition between economic operators.

The above-mentioned policy changes are largely a European matter. Therefore, they require an alignment of views on the transformation of the European food system among Member States in the European Council, which can only happen if there is a simultaneous push by the Commission, the Parliament and civil society. The establishment of a legislative framework for a sustainable food system, anticipated by the "Farm to Fork" strategy by 2023, may provide the opportunity for such an alignment - in a context where the current negotiations on the post-2020 CAP show significant divergences.

Key sources for further information

To discuss the research presented in this brief, please email pierremarie.aubert@iddri.org

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