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Editorial for the special issue on “the economics and sociology of the food-health-environment Nexus”

Stéphan Marette¹ 

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By taking into account approaches in agronomy, ecology, nutrition and/or epidemiology, many scientific contributions underline very deep interactions between food, the environment and human health. Understanding the connections between these dimensions is the objective of a Nexus that ultimately aims to improve the sustainability of food systems. The fragility of the ecosystems that support agriculture implies the need for future shifts in the way food is produced and consumed (IPCC 2019). Using dietary models, several studies have published recommendations for improving consumption (Willett et al. 2019).

Recommendations based on dietary models strongly question consumption habits. However, these models lack precise economic and sociological analyses, focusing primarily on agronomic, environmental and nutritional constraints related to diets. They do not address production and consumption behaviours regarding attitudes towards prices and possible substitutions between foods or public policies that attempt to modify behaviours.

Both private strategies and public policies for improving diets are difficult to implement. In supply chains, contracts and organizations need to integrate numerous objectives related to both the environment and public health. The absence of incentives to provide sufficient environmental/health qualities often lead to sub-optimal choices by farmers, processors and retailers. Consumers also face difficulties in changing their consumption behaviours because of many constraints such as limited incomes, information overload or imperfect recall about the various consumption impacts. In this context, regulation could be useful to guarantee that products provide sustainable attributes for the common good. However, there is no certainty that regulation will improve health, the environment and sustainability because of potential imperfections in regulatory instruments.

In order to be effective, public policies should be designed to integrate different approaches in economics and sociology. It is crucial to have a better understanding of

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production strategies, consumer behaviours and regulatory possibilities. The seven articles in this special issue aim to improve our understanding of these important topics.

The first article, written by Stéphan Marette and Vincent Réquillart, focuses on the potential links between dietary and economic models. This introductory article summarizes the recent findings of both dietary and economic models and presents challenges that economists should consider in order to bridge the gap between these two types of approaches for analysing the food-health-environment Nexus. Accurate economic models integrating environmental and epidemiological criteria are particularly precious when designing effective policies such as taxes on polluting products, subsidies for clean/healthy products, labels, dietary recommendations and/or quality standards that impose requirements on producers.

In the second article, Alban Thomas, Claire Lamine, Benjamin Allès, Yuna Chiffolleau, Antoine Doré, Sophie Dubuisson-Quellier and Mourad Hannachi discuss the role of the economic and social organizations of key stakeholders in agriculture and the food industry. They underline that understanding how organizations work cannot be ignored if society wants to increase the quality and sustainability of food. This contribution emphasizes that combining approaches in economics and sociology is important when defining efficient organizations that can endorse significant dietary changes.

In the third article, Caroline Orset and Marco Monnier consider the role of non-governmental organizations (NGOs) as groups of influences that may spur changes in the dietary behaviour of consumers. In the field of sustainability, NGOs conduct many information campaigns and sometimes manage labels (such as the *Marine Stewardship Council* or the *Rainforest Alliance*). These authors also stress the potential dissemination of incomplete information, or even misinformation, which ultimately raises the issue of the accuracy of science-based messages dedicated to citizens when numerous interlocked criteria are part of the food-health-environment Nexus.

One of the most important developments in dietary models has been the need to reduce animal-sourced foods because of pollution and human health problems from excessive meat consumption. The following two contributions address the impact of meat production on the environment or health. The contribution by Pierre-Alain Jayet, Ancuta Isbasoiu and Stéphane De Cara assesses the potential for increasing the net amount of food calories produced by French agriculture and the possible implications in terms of greenhouse gas (GHG) emissions and agricultural area allocation. The key factors in their analysis of GHG emissions are animal feed and grassland use. This article reminds us of the extent to which studying production systems plays a pivotal role in calculating future market adjustments to achieve ambitious sustainability objectives.

Louis-Georges Soler and Alban Thomas study the health and environmental benefits of reducing the proportion of animal-sourced food, in particular beef, emphasizing the possible conditions for a win-win scenario, where consumer preferences for diets with less red meat are accompanied by a transition in livestock production systems towards a higher average quality of beef. The win-win scenario is possible but not systematic, which also calls into question the hierarchy of priorities when there are potential losses from a sustainable policy.

The two final contributions underscore the major role of analyses of demand and consumption when considering the sustainability of food systems. The article by Erica

Doro and Vincent Réquillart focuses on the possibilities of alternative diets that would be healthier and would generate fewer GHG emissions. They find that it is possible to design economic policies that have positive impacts on both aspects, even if they are difficult to design from a practical point of view because of complex substitutions/complementarities between food products. Taking into account consumers' possible substitutions/complementarities between foods is essential for achieving the ambitious objectives to improve both environmental and human health.

In the seventh contribution, Mathieu Lambotte, Stéphane De Cara and Valentin Bellassen analyse the behaviour of French consumers regarding foods with various quality labels (Organic, *Label Rouge*, and Geographical Indications). They investigate whether or not consumers who purchase a product with a given label once tend to purchase a large proportion of this product (and other products) with the same label. This article allows us to calculate how consumer demand for food can be modified towards high-quality products indicated with labels, which is one of the challenges for food policies targeting a high level of sustainability.

The seven articles of this special issue illustrate the huge diversity of problems and solutions, ultimately raising the question of social choices for improving the sustainability of food systems. In other words, decision-makers face numerous possibilities for regulation with regard to the immense number of economic and social trade-offs arising from the proliferation of interactions between food, the environment and human health. The task of social sciences consists in revealing and quantifying these trade-offs. Along with the scientific complexity of agronomy, ecology, nutrition and/or epidemiology, the additional complexity of this proliferation of trade-offs requires the light shed by social science studies to inform democratic debate and design effective policies.

This special issue marks a new step towards a precise understanding of social behaviours and economic incentives, which appears to be crucial when designing an effective policy that integrates the complexity of the Nexus with the numerous interactions between food, the environment and human health. It should be noted that many authors who contributed to this issue work at the French National Research Institute for Agriculture, Food and the Environment (INRAE), for which the food-health-environment Nexus is a top priority (see Axelos et al. 2019). Additionally, this special issue was also associated with the research programme DIETPLUS (ANR-17-CE21-0003) funded by the French National Research Agency (ANR) and focusing on sustainable diets (see Dietplus 2020). I hope that the following articles will encourage debates about private and public sector initiatives that enable societies and nations to achieve sustainable food systems.

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