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Review Article

The role of agriculture in the post-growth economy

Belletti Matteo*

Department of Agricultural, Food and Environmental Sciences, Polytechnic University of Marche, Italy

Corresponding author: Belletti Matteo, Department of Agricultural, Food and Environmental Sciences, Polytechnic University of Marche, Italy.

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Introduction

If the only possible development path for humanity seems to be that of rethinking the economic model in terms of "degrowth", the ideological and political framework in which such an evolution should take place is not yet clear.

At a macroeconomic level, the evidence in terms of the need for a socio-economic paradigm shift raises political questions with respect to democracy functioning and social governance as well as technical questions with respect to societal structures [1]. Agricultural systems are the basis of the shape of socio-economic structures therefore the need to rethink social organization implies that of rethinking the functioning of the agricultural systems.

The boundaries of scientific research indicate the need for an evolutionary phase in which societies will have to deal with decreasing return to growth due to environmental and climate risk as well as to the growing complexification of social systems [2-4]. How will agricultural systems evolve in this scenario? And above all, are these systems evolving quickly enough even just as a function of a single quantitative target such as the target for reducing greenhouse gas?

On this premise, the questions we want to propose and explore in the present study are the following:

- What is the role of "agriculture" in the post-growth economy?
- How are agri-food systems evolving, particularly in Europe?

Finally, it is important to underline that as a consequence of the pandemic shock, and in the light of the current geopolitical situation in Eastern Europe, the centrality of the agricultural and food issue at a global level is reinforcing so much to cause a clear increase in the importance of the concept of food security even in more advanced countries and regions, therefore no longer only in those countries characterized for being backward economies.

In this regard we must remember that the food security policy has been one of the policies on which the European Community born after the Second World War and what happens is that, currently, after almost a century, this issue returns to be central at the level of European political debate.

Methods

In the present study we employ both systematic and scoping review [5] to define a framework synthesis [6] for bringing to light scope and nature of existing scientific literature on the topic of interest. Moreover, we decided to support the analytical phase of the scoping review by means of a citation patterns analysis. For this purpose, we used an open-source software tool named Cit Net Explorer [7] with the aim of interlinking and screening the scientific literature in terms of its nature, features, conceptual boundaries, and advancement in results. The use of a citation patterns analysis tool allowed us to map the development of the target research topic over time, visualizing the most important publications on the subject and discovering how publications build on each other. The reviewing method we applied allowed us to carry out a snapshot

of what appear to be the principal clusters defined by the scientific literature on the evolution of agricultural systems with a "post-growth" perspective [8].

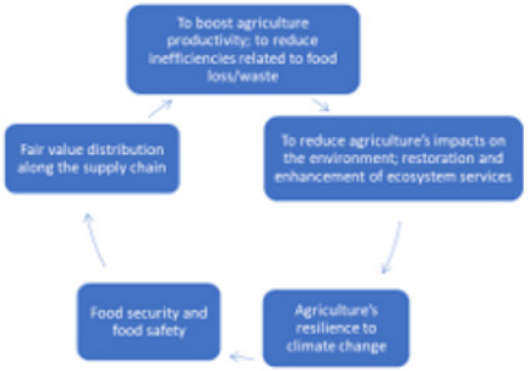
We decided to adopt a framework synthesis approach because it is a narrative approach to systematic review that is adequate when the researcher must develop a framework in an iterative process until the body of evidence can be presented coherently in a defined shape. Thus, this approach allows us to begin with a tentative framework constructed from key analytical dimensions emerging by our citation patterns analysis. Moreover, the framework synthesis approach is useful to have greater flexibility in constructing meanings and this is our case for exploring (by the citation network analysis) the emergence of multiple narratives on a heterogeneous and multidisciplinary research topic like the one we are interested in. Finally, the analysis of the scientific literature on "agriculture in the post-growth economy" is also compared to the most recent reports at the level of the European Union, United Nations, and World Economic Forum on the matter "food security" and "agricultural development".

Results

The analytical foundations of the scientific research investigated is visually grouped into three networks of citations which, depending on the titles of the publications, can be (qualitatively) defined as follows:

- Agriculture, innovation, technological change.
- Agriculture and climate change.
- Agriculture, agri-food regimes, and social change.

The first agglomeration of scientific research is on the need to optimize the agricultural production processes and the supply chains at a merely technological level. The dynamics of the agri-food sector is inevitably influenced by the change in the dominant technological paradigm, and as widely known, this paradigm is characterized by the digital transition and the search for environmentally sustainable solutions. However, a background question that emerges from this study is the following:



Source: our elaboration on [13].

Figure 1: Agrifood systems challenges.

- To what extent the innovation process is capable to respond to one or more of the agrifood system's challenges? The challenges that the food system must face for becoming more sustainable and resilient follow:

The second scientific research "cluster" identified (particularly interrelated to the first) is oriented to explore and analyses:

- The need to reconceptualize both the role and the structure of farming models and agri-food chains [9]. Such a reconceptualization emerges as a necessity induced primarily by climate change constrains.
- The need to exit from the social order based on fossil fuel economy. This point is closely connected to the reflection on the necessary reform of the general economic model. The agrarian question is less and less a sectoral affair, more and more a topic characterized to state a strong systemic interest.

The third area of investigation is more anthropological, sociological with a critical slant on the dominant economic model which is expressed by a portion of the scientific community convinced that a radical change of the economic paradigm should be driven by the political and social change which are emerging locally and globally.

This nest of scientific publications is strongly connected to the other two clusters of publications. Nevertheless, compared to the other two networks, this is characterized by being less dependent on the environmental and climate conjectures. The sociological approach (i.e., fairness, food security, cultural identities, etc.) associated with the evolution of agricultural systems emerges as a

central one and as a mirror of a society that is increasingly aware about the strategic role of agriculture in the post-growth era.

Finally, the comparison of the literature review with the most recent reports of the main international institutions about i) food security, ii) agricultural development, iii) evolution of agri-food markets, completes the interpretative framework of this study. These institutions all seem inclined to find the main reasons for the worsening of the trend of the indicators relating to the Sustainable Development Goals [10] in recent systemic shocks (pandemics, wars, etc.). It seems to us, however, that even regardless of the impact of these important events, society and the world economy are still based on operating patterns that do not seem adequate, net of available technologies, to solve the problems that need to be solved in a time horizon that can no longer even be defined as long.

Concluding Remarks

In a "post-growth economy" hypothesis, "change" is the key word emerging from the present study. The entire scientific community interested in agricultural economics seems to agree on the need for a radical change (a transformation) of agricultural systems and more generally of the agri-food regimes [11].

But the questions that remain open are:

- What does "change" mean[12]?
- How to evaluate whether a dynamic of change (if present) is (or will be) effective with respect to one or more objectives to be achieved?

One of the key factors of change on which both the scientific literature and the main political forums seem to converge is technological innovation.

However, based on the results of the present study, two questions that seems to emerge are the following:

- Given the current trends in terms of consumption of agri-food resources at a global level, will the technological innovation path be effective in solving the agrifood systems challenges?
- If technological innovation were not enough, what other drivers of change should we necessarily consider, and measure?

Acknowledgement

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Conflict of Interest

No conflict of interest.

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