

Extended Abstract
Please do not add your name or affiliation

Paper/Poster Title	Agro-ecology and agricultural transformation: conceptual analysis and theoretical considerations
---------------------------	---

**Abstract prepared for presentation at the 96th Annual Conference of the
Agricultural Economics Society, K U Leuven, Belgium**

4th – 6th April 2022

Abstract	200 words max
<p>Sustainability of agricultural production systems is of growing concern. Agro-ecology has received considerable interest as an alternative to conventional farming. Clarity of both concepts is a precondition for any assessments. Large-scale adoption of agro-ecology could yield profound changes in rural Africa. Therefore, its promotion should be cautiously investigated and guided not only by its environmental effects but also by its ability to contribute to food systems sustainability and development of rural economies. Analysis of agro-ecology should be connected to the objectives of agricultural transformation. Based on a meta-analysis of multiple online reference databases, the concepts of agricultural transformation and of agro-ecology are assessed, and a conceptual framework to guide future empirical analyzes of the role of agro-ecology on agricultural transformation is proposed.</p>	
Keywords	Agro-ecology, agricultural transformation, conceptual model, Africa.
JEL Code	Agriculture Q1 Environmental Economics Q5 Agriculture: General Q10 Micro Analysis of Farm Firms, Farm Households, and Farm Input Market Q12 R&D; Agricultural Technology; Biofuels; Agricultural Extension Services Q16 Land Ownership and Tenure; Land Reform; Land Use; Irrigation; Agriculture and Environment Q15 see: www.aeaweb.org/jel/guide/jel.php?class=Q)
Introduction	100 – 250 words
<p>This paper is motivated by two observations related to the literature on rural development in Africa. First, in the current context of climate change and foreseen demographic growth, the sustainability of agricultural production systems is more than ever important in the design of sustainable food systems. Agro-ecology has received a growing interest as an alternative to conventional farming. Large-scale adoption of agro-ecology could yield profound changes in rural Africa. Therefore, its promotion should be cautiously investigated and guided not only by its environmental benefits but also by its ability to contribute to the development of rural economies. Consequently, the analysis of agro-ecology should not be disconnected from the objectives of agricultural transformation.</p>	

Second, agricultural transformation is defined as the process by which an agri-food system transforms over time from being subsistence-oriented and farm-centered into one that is more commercialized, productive, and off-farm centered (Timmer, 1988), mainly through labor productivity increase. This definition needs to be updated when we consider today's context for African countries with low access to irrigation, low soil fertility as compared to countries where agriculture has transformed, global economic exchanges, technological advancements, societal and environmental goals, and institutional factors.

This paper bridges these two concepts by providing a conceptual framework to analyze the role of agro-ecology on agricultural transformation.

Methodology	100 – 250 words
--------------------	------------------------

The paper first revises the conceptual frameworks of agricultural transformation and agro-ecology through a review of the most significant papers on the concepts and uses the economic theory of household decision-making as well as innovation and sustainable agriculture theories to show the pathways through which agro-ecology is linked to agricultural transformation.

To select the papers on agricultural transformation, we departed from the seminal work of Timmer (1986 and 1988) and used multiple online reference databases (Web of Science, Econlit, AgEcon, and Connected Papers) to find and explore related high-impact (in terms of journal ranking and citation) peer-reviewed papers and non-peer-reviewed papers with strong methodological grounds. The same approach was used for agro-ecology departing from the comprehensive review on the historical development of agro-ecology as a science, a practice, and a movement of Wezel et al (2009).

This conceptual literature was complemented by the literature on the aforementioned theories and high-impact empirical peer-reviewed literature on agro-ecology in Africa.

Results	100 – 250 words
----------------	------------------------

This paper has three main results. First, it proposes a comprehensive conceptual framework of agricultural transformation that not only integrates labor productivity but also environmental, socio-economic and institutional factors that enable or hinder transformation as well as the welfare results that are expected after an agricultural transformation occurs (e.g. food security and poverty reduction). Second, the paper suggests a more practical definition of agro-ecology as compared to existing broad definitions.

Last but not least, the paper presents a conceptual framework that explicitly shows the pathways through which agro-ecology is related to agricultural transformation.

Discussion and Conclusion	100 – 250 words
----------------------------------	------------------------

The conceptual framework suggested here to frame the analysis of agro-ecology at the household level, shows that agro-ecology can play a role in agricultural transformation as it affects productivity through the practices or approaches adopted which affect (and are in return affected) by the results to expect once transformation has occurred or is in the process (environmental, economic, and societal goals). It also interacts with the enabling environment which can favor or hinder its feasibility. Agro-ecology adoption or promotion can in turn affect the way the enabling environment, comprising the resource-base and climatic conditions, the institutional and policy environment, and farmers' socio-economic conditions, is shaped as the environment

can adjust to accommodate agro-ecology. Therefore, there are complex linkages between agro-ecology and agricultural transformation that, in addition, are variable across locations and depend on the degree of combination between agro-ecology and other production models. These relationships may result in social, economic, and environmental trade-offs that involve time-related arbitrage, with dynamics that are yet to be fully understood. Such trade-offs can lead to negative externalities at different scales and for different actors. These linkages also give room for positive synergies and the reconciliation of agricultural production models.

Analyzing agro-ecology using the conceptual framework of agricultural transformation can help gain greater knowledge of those synergies and negative externalities which should be taken into consideration in the process of upscaling agro-ecology. The conceptual framework presented here can also serve as guidance for empirical research on agro-ecology or in a broader way research on sustainable production.