Editorial

Economic Strategies and Policy Suggestions of Agricultural Sustainable Food Production

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Sustainability is increasingly becoming a keyword for viable agriculture and food production. Alongside Agenda 2030, sustainability is acknowledged as a multidimensional issue involving three main spheres of knowledge and action: environmental, economic, and social. Agriculture and food are strongly influenced by climate change, increasing scarcity of natural resources, and changes in land availability and use. At the same time, the agri-food system is at the center of relevant economic interests, both at the global and local level, which rise relevant social conflicts involving local communities, city dwellers, and institutions. This calls for a new approach to be established regarding primary agricultural activities and food production, and a different perspective for studies and projects is also needed.

A sustainable approach to agriculture, in the context of global governance, can lead to an improvement of ecosystems, a reduction of waste of food and natural resources, equitable access to food, and require a new set of policies able to overcome the trade-offs among objectives and searching for win–win solutions.

The articles in this Special Issue contribute to the investigation, discussion (at a scientific level), and dissemination (at an international level) of the possible economic strategies and policies for implementing sustainable agricultural systems and food products, and making rural areas more attractive, thus reducing unbalances concerning urban areas. The result is an Issue rich of interesting innovative approaches and challenging methodologies, including contributions from all over the world, in the right spirit of the free circulation of ideas and research.

The 12 articles in this Special Issue of *Agriculture*, entitled "Economic Strategies and Policy Suggestions of Agricultural Sustainable Food Production", include contributions from a variety of researchers from various countries, following different scientific approaches and methodologies, but all aimed to investigate the complex relationships between the three dimensions of sustainability. Their full list is presented in Table 1.

Firstly, a paper by Italian researchers [1] on consumer evaluations and attitudes towards new genome editing techniques emphasizes the importance of communication and dissemination activities, where clarity and broad appeal are key to assessing knowledge levels and determining how consumers' backgrounds, including social and demographic characteristics, affect their knowledge levels.

Next, a study by Chinese researchers is included, which, through a spatial correlation network structure of and factors influencing technological progress in citrus-producing regions in China, shows that Chinese mandarin and tangerine production is experiencing technological progress, with a gradual slowdown [2]. However, mandarin production technology is advancing faster than tangerine production technology. Overall, network structures are rather dense and complex, with spatial spillovers. Economically developed eastern regions have a higher status and stronger control in spatially correlated networks. Key factors influencing technological progress in citrus production include education, informatization, economic development, innovation, and financial support.

A work by Ecuadorian researchers analyzes how family farming contributes to food sovereignty [3], using the community of Guarainag (in the canton of Paute, in the province of Azuay-Ecuador) as a case study. This work responds to the need to explain the elements that influence food sovereignty in the current food crisis in Latin America, specifically in Ecuador, in the search for self-sufficiency in healthy food and local culture.

Another paper by Chinese researchers [4] investigates the reasons for the "Mezzogiorno trap" (inspired by a well-known economic paradox regarding the Italian Southern regions) in the Chinese agricultural economy and presents constructive recommendations based on the research findings. The research process shows that this methodology is better suited to studying regional disparities in specific economic sectors, and the results obtained are more stable and reliable.

As reported by an Italian research group in an analysis of preference weights and priority setting by users of irrigation extension services based on the analytical hierarchy process, "ensuring economic sustainability" is the most important criterion [5]. The contribution of this study is twofold: First, it presents the application of a methodology that involves converting farmers' linguistic judgment into a matching weight. Second, it addresses the decision-making process to improve the use of IAS by evaluating the preferences expressed by stakeholders. Irrigation extension services can play a vital role in helping users adopt new techniques and technologies for more efficient water use and increased production.

The aim of the South African authors in their work was to influence smallholder farmers' perceptions of the adoption of digital technologies in the Eastern Cape Province of South Africa [6]. Their study aimed to identify factors influencing smallholder farmers' perceptions towards the adoption of digital technologies. It used a purposively selected sample of 250 smallholder farmers who were interviewed cross-sectionally in the local municipalities of Port St Johns and Ingquza Hill in South Africa. This study recommends the provision of low-cost digital technologies that promote indigenous knowledge, targeting youth and young farmers with lower educational attainment who live in small households and who are full-time farmers with medium to high incomes and are part of farmer groups/organizations.

Another study on citrus was conducted by Chinese researchers [7] on the spatial-temporal evolution and spatial convergence analysis of total factor productivity of citrus in China. This study shows that from the perspective of time series evolution, the growth rate of total factor productivity of mandarin and tangerine in China slowed down year by year after reaching its maximum value in 2008. Technological progress was the main factor influencing the total factor productivity of citrus fruits. The total factor productivity growth of mandarin was more stable than that of tangerine. Moreover, the pure technical efficiency index and the scale efficiency change index of mandarin and tangerine were not stable.

A study carried out by Italian researchers [8] proposes a business model (BM) as a tool for scaling up irrigation advisory services (IASs) within a business perspective, with the aim of promoting the diffusion of this technology while enhancing the associated environmental and social benefits; BM provides a detailed revenue strategy that guarantees the financial sustainability of IASs. The Business Model Canvas © was adopted for the design and presentation of our BM. In conclusion, an innovative and well-structured BM has the potential to make IASs profitable and capable of ensuring environmental and social sustainability.

Research in Saudi Arabia and Egypt tested an extended model of the Theory of Planned Behavior (TPB) to investigate the determinants of green investment intentions in the Saudi food industry [9]. This study, using PLS-SEM, found that a positive attitude, perceived behavioral control, green investment knowledge, and commitment to green consumption significantly influence potential investors' green investment intentions. Conversely, subjective norms had a negative impact, while religiosity played a moderating role in these relationships. The implications highlight the importance for academics and policy-makers in higher education to prioritize instilling positive attitudes, enhancing behavioral control, and providing green investment knowledge to graduates in order to promote environmentally responsible investments.

Table 1. Summary of the twelve articles included in this Special Edition and their contributions to Agricultural Sustainable Food Production.

	Authors	Article	Focus	Outcome
1	Romeo Lironcurti, S.; Demaria, F.; D'Annolfo, R.; Sardone, R.	Consumer Evaluations of and Attitudes towards New Genome Editing Techniques: An Italian Case Study	The research aims are twofold: (a) to assess the level of knowledge and (b) to determine how consumer background, including social and demographic characteristics, affects their level of knowledge.	Emphasize the importance of communication and dissemination activities, in which clarity and a broad appeal are key.
2	Gu, Y.; Qi, C.; He, Y.; Liu, F.; Luo, B.	Spatial Correlation Network Structure of and Factors Influencing Technological Progress in Citrus-Producing Regions in China	The research has a dual focus: firstly, assessing technological progress in key mandarin and tangerine-producing regions in China between 2006 and 2021. Secondly, examining the network structures of spatial correlations in citrus production technology progress, both overall and individually. The study utilizes the quadratic assignment procedure to analyze factors impacting the spatial network.	Chinese mandarin and tangerine production is experiencing technological progress, with a gradual slowdown. Mandarin-production technology is advancing faster than tangerine technology. Overall network structures are denser and more complex, displaying spatial spillover effects. Economically developed eastern regions have a higher status and stronger control in spatial correlation networks. Key factors influencing citrus-production technology progress include education, informatization, economic development, innovation, and financial support.
3	Verdugo, G.; Cuadrado, G.; Castillo, Y.	Family Farming as a Contribution to Food Sovereignty, Case Guarainag Parish	The objective of this research is to analyze how family farming contributes to food sovereignty; the Guarainag parish of the Paute canton in the province of Azuay-Ecuador is taken as a case of study. This work responds to the necessity to explain the elements that impact food sovereignty in the existing food crisis in Latin America and specifically in Ecuador in search of self-sufficiency for healthy food products and people's own local culture.	The research has a correlational and explanatory scope; quantitative methods were used to measure food sovereignty through a binary logit regression model, which provided an answer to the hypothesis of the research, which consisted of testing the influence of family farming on food sovereignty. Furthermore, to collect the information, a survey was applied to 372 small farmers with the support of digital mapping and the Kobol Tulboox software version 1.27.3. The result was a Food Sovereignty Index of 59.79%, which, according to the scale used, places the territory in a high average.
4	Li, X.; Yang, P.; Zou, Y.	An Empirical Investigation of the "Mezzogiorno Trap" in China's Agricultural Economy: Insights from Data Envelopment Analysis (2015–2021)	This paper proposes a methodology for identifying the "Mezzogiorno Trap". By employing this approach and combining panel data on Chinese agriculture from 2015 to 2021, it is discovered that despite the overall development of the Chinese agricultural economy during this period, the "Mezzogiorno Trap" still exists.	The paper analyzes the reasons behind the "Mezzogiorno Trap" in the Chinese agricultural economy and presents constructive recommendations based on the research findings. The research process demonstrates that this methodology is better suited for studying regional disparities in specific economic sectors, and the obtained results are more stable and reliable.

Table 1. *Cont.*

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5	Donati, I.; Viaggi, D.; Srdjevic, Z.; Srdjevic, B.; Di Fonzo, A.; Del Giudice, T.; Cimino, O.; Martelli, A.; Dalla Marta, A.; Henke, R.; Altobelli, F.	An Analysis of Preference Weights and Setting Priorities by Irrigation Advisory Services Users Based on the Analytic Hierarchy Process	The present study has two objectives. The first is to individuate the priorities of the preferences expressed by the stakeholders. The second objective is to carry out a ranking of the weights of the criteria by case study, ranking the groups and their associated properties among farmers' profiles.	The results show that "assuring economic sustainability" was the most important criterion. The contributions provided by this study are twofold: firstly, it presents an application of a methodology that involves the conversion of a linguistic judgement of farmers in a correspondence weight. Secondly, it tackles decision making regarding improving the use of IASs, evaluating the preferences expressed by the stakeholders. Irrigation advisory services can play a key role in assisting users to adopt new techniques and technologies for more efficient water use and increased production.
6	Bontsa, N.; Mushunje, A.; Ngarava	Factors Influencing the Perceptions of Smallholder Farmers towards Adoption of Digital Technologies in Eastern Cape Province, South Africa	The objective of the study was to determine the factors that influence the perceptions of smallholder farmers towards the adoption of digital technologies. A purposively selected sample of 250 smallholder farmers who were cross-sectionally surveyed from Port St Johns and Ingquza Hill Local Municipalities in South Africa was used in the study.	there are economic, social justice, and traditional perceptions towards digital technologies by smallholder farmers, with socio-economic factors affecting the perceptions. The study recommends providing low-cost digital technologies that promote Indigenous Knowledge, which should target the youth and young farmers with less education in small households who are full-time farmers with moderate-to-high incomes and are part of farmer groups/organisations
7	Gu, Y.; Qi, C.; Liu, F.; Lei, Q.; Ding, Y.	Spatiotemporal Evolution and Spatial Convergence Analysis of Total Factor Productivity of Citrus in China	In this study, the DEA–Malmquist index method was used to measure the total factor productivity of citrus in seven major mandarin-producing provinces and seven major tangerine-producing provinces in China from 2006 to 2020.	The results show that from the perspective of time series evolution, the growth rate of total factor productivity of mandarin and tangerine in China slowed down year by year after reaching the maximum value in 2008. Technological progress was the main factor affecting the total factor productivity of citrus. The total factor productivity growth of tangerine was more stable than that of mandarin, and the pure technical efficiency index and scale efficiency change index of mandarin and tangerine were not stable.
8	Santini, A.; Di Fonzo, A.; Giampietri, E.; Martelli, A.; Cimino, O.; Dalla Marta, A.; Annosi, M.; Blanco-Velázquez, F.; Del Giudice, T.; Altobelli, F.	A Step toward Water Use Sustainability: Implementing a Business Model Canvas for Irrigation Advisory Services [8]	This paper proposes a business model (BM) as a tool for scaling up IASs within a business perspective, with the aim of encouraging the diffusion of this technology while enhancing the associated environmental and social benefits.	BM provides a detailed revenues strategy that guarantees the financial sustainability of IASs. To design and represent our BM, the "Business Model Canvas ©" has been adopted. Concluion swonn an innovative and well-structured BM has the potential to leave the IASs profitable and capable to ensure environmental and social sustainability

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9	Aliedan, M.; Alyahya, M.; Elshaer, I.; Sobaih, A.	Who Is Going Green? Determinants of Green Investment Intention in the Saudi Food Industry	This research tests an expanded model of the Theory of Planned Behaviour (TPB) to investigate the determinants of green investment intention in the Saudi food industry. A questionnaire survey was electronically directed to 550 fresh agricultural and food sciences graduates in public KSA universities.	This study, utilizing PLS-SEM, revealed that positive attitudes, perceived behavioral control, green investment knowledge, and commitment to green consumption significantly influence potential investors' green investment intentions. Conversely, subjective norms exhibited a negative impact, while religiosity played a moderating role in these relationships. The implications emphasize the importance for scholars and policymakers in higher education to prioritize instilling positive attitudes, enhancing behavioral control, and imparting green investment knowledge to graduates for fostering environmentally conscious investments.
10	Xiuling, D.; Qian, L.; Lipeng, L.; Sarkar, A	The Impact of Technical Training on Farmers Adopting Water-Saving Irrigation Technology: An Empirical Evidence from China	The study takes 707 farmers who grow watermelons and muskmelon in Yuncheng and Xian City of Shanxi and Shaanxi provinces as the research object to analyse the influence of risk aversion and technical training and their interaction terms on farmers' WSIT adoption behaviour. The study uses the Probit and moderating effect models to outline the findings	The empirical analysis reveals the following outcomes: (i) 27.44% of the sample farmers adopt water-saving irrigation technology, indicating that the current adoption rate and the enthusiasm for adoption are relatively low; (ii) risk aversion has a significant negative impact on farmers' adoption of WSIT; (iii) both online and offline technical training have a significant positive impact on farmers' adoption of WSIT; (iv) significant group differences exist in the effects of risk aversion, online technical training, offline technical training and interaction items on farmers' WSIT adoption behaviour.
11	Borsotto, P.; Cagliero, R.; Giarè, F.; Giordani, G.; Iacono, R.; Manetti, I.; Sardone, R.	Measuring Short Food Supply Chain Sustainability: A Selection of Attributes and Indicators through a Qualitative Approach	This paper presents the results of a participatory analysis conducted within the agro BRIDGES H2020 project, with the aim of defining a list of economic, social, and environmental attributes and indicators to assess the sustainability of SFSC, Short food supply chains, and set up a decision-making tool to support producers in self-assessing their sustainability level and choosing the most appropriate business model (BM) from those identified within the project.	Early results highlighted three main issues: indicator calculation feasibility, business model categorization, and the simplicity of the framework for sustainability self-assessment. Some recommendations are made, including the importance of using a participatory process in building an evaluation framework on SFSC sustainability and the necessity of its adaptation to territorial contexts and needs.

Table 1. *Cont.*

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12	Sudomo, A.; Leksono, B.; Tata, H.; Rahayu, A.; Umroni, A.; Rianawati, H.; Asmaliyah; Krisnawati; Setyayudi, A.; Utomo, M.; Pieter, L.; Wresta, A.; Indrajaya, Y.; Rahman, S.; Baral, H.	Can Agroforestry Contribute to Food and Livelihood Security for Indonesia's Smallholders in the Climate Change Era?	In Indonesia, smallholders have historically practiced agroforestry, which warrants examination in terms of food and livelihood security within sustainable community forest frameworks. Based on a literature review, we analyzed these two forms of security related to smallholder agroforestry practices.	Main findings indicate diverse agroforestry systems, with 88% focusing on non-timber forest products (NTFPs) and 12% on timber. While 42% prioritize direct food supply, 58% emphasize income generation through product sales. However, agroforestry that does not produce food for direct consumption by smallholders generates revenue for purchasing food necessities. Agroforestry supports both food needs (46–61%) and income (51–54%) for smallholders, surpassing traditional agriculture (13%). Semi-commercial agroforestry (57%) is a predominant livelihood prospect. The remaining 27% are purely subsistence, and 15% are purely commercial. However, the commercialization of agroforestry that focuses only on high-value commodities results in a negative impact on biodiversity.The research directly related to food security and ecosystem services quantification remains limited, necessitating further investigation. Policy support and incentives are essential for smallholders practicing complex agroforestry for climate adaptation and mitigation.

Australian and Chinese researchers are evaluating the impact of technical training on farmers' adoption of water-saving irrigation technology [10]. In this work, an in-depth analysis of the impact of risk aversion, technical training, and their interaction on farmers' adoption of WSIT will help the government to promote WSIT to facilitate agricultural resource conservation and sustainable development. Their study suggests that the role of technical training in the diffusion of WSIT should be strengthened and that differentiated technical training for various types of farmers should be implemented to reduce the degree of farmers' risk aversion.

Subsequently, Italian researchers carried out a study of the Short Food Supply Chain (SFSC), which can be understood as a supply chain with a minimum number of intermediaries [11]. Although they have been shown to bring economic, social, and environmental benefits, they still represent a niche phenomenon in the agri-food market.

Finally, "Can agroforestry contribute to food and livelihood security for Indonesia's smallholder farmers in the era of climate change?" is the research question investigated by Indonesian and Chinese researchers [12]. They found that research directly related to food security and the quantification of ecosystem services is still limited and needs further investigation. Hence, policy support and incentives are essential for smallholders practicing complex agroforestry for climate adaptation and mitigation.

Conflicts of Interest: The authors declare no conflicts of interest.

References

1. Borsotto, P.; Cagliero, R.; Giarè, F.; Giordani, G.; Iacono, R.; Manetti, I.; Sardone, R. Measuring Short Food Supply Chain Sustainability: A Selection of Attributes and Indicators through a Qualitative Approach. *Agriculture* **2023**, *13*, 646. [CrossRef]
2. Xiuling, D.; Qian, L.; Lipeng, L.; Sarkar, A. The Impact of Technical Training on Farmers Adopting Water-Saving Irrigation Technology: An Empirical Evidence from China. *Agriculture* **2023**, *13*, 956. [CrossRef]
3. Aliedan, M.; Alyahya, M.; Elshaer, I.; Sobaih, A. Who Is Going Green? Determinants of Green Investment Intention in the Saudi Food Industry. *Agriculture* **2023**, *13*, 1047. [CrossRef]
4. Santini, A.; Di Fonzo, A.; Giampietri, E.; Martelli, A.; Cimino, O.; Dalla Marta, A.; Annosi, M.; Blanco-Velázquez, F.; Del Giudice, T.; Altobelli, F. A Step toward Water Use Sustainability: Implementing a Business Model Canvas for Irrigation Advisory Services. *Agriculture* **2023**, *13*, 1081. [CrossRef]
5. Gu, Y.; Qi, C.; Liu, F.; Lei, Q.; Ding, Y. Spatiotemporal Evolution and Spatial Convergence Analysis of Total Factor Productivity of Citrus in China. *Agriculture* **2023**, *13*, 1258. [CrossRef]
6. Bontsa, N.; Mushunje, A.; Ngarava, S. Factors Influencing the Perceptions of Smallholder Farmers towards Adoption of Digital Technologies in Eastern Cape Province, South Africa. *Agriculture* **2023**, *13*, 1471. [CrossRef]
7. Donati, I.; Viaggi, D.; Srdjevic, Z.; Srdjevic, B.; Di Fonzo, A.; Del Giudice, T.; Cimino, O.; Martelli, A.; Dalla Marta, A.; Henke, R.; et al. An Analysis of Preference Weights and Setting Priorities by Irrigation Advisory Services Users Based on the Analytic Hierarchy Process. *Agriculture* **2023**, *13*, 1545. [CrossRef]
8. Li, X.; Yang, P.; Zou, Y. An Empirical Investigation of the "Mezzogiorno Trap" in China's Agricultural Economy: Insights from Data Envelopment Analysis (2015–2021). *Agriculture* **2023**, *13*, 1806. [CrossRef]
9. Verdugo, G.; Cuadrado, G.; Castillo, Y. Family Farming as a Contribution to Food Sovereignty, Case Guarainag Parish. *Agriculture* **2023**, *13*, 1827. [CrossRef]
10. Sudomo, A.; Leksono, B.; Tata, H.; Rahayu, A.; Umroni, A.; Rianawati, H.; Asmaliyah; Krisnawati; Setyayudi, A.; Utomo, M.; et al. Can Agroforestry Contribute to Food and Livelihood Security for Indonesia's Smallholders in the Climate Change Era? *Agriculture* **2023**, *13*, 1896. [CrossRef]
11. Gu, Y.; Qi, C.; He, Y.; Liu, F.; Luo, B. Spatial Correlation Network Structure of and Factors Influencing Technological Progress in Citrus-Producing Regions in China. *Agriculture* **2023**, *13*, 2118. [CrossRef]
12. Romeo Lironcurti, S.; Demaria, F.; D'Annolfo, R.; Sardone, R. Consumer Evaluations of and Attitudes towards New Genome Editing Techniques: An Italian Case Study. *Agriculture* **2024**, *14*, 51. [CrossRef]