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Guest editorial

Knowledge and Information for a Sustainable and Innovative Agri-Food System: Insights from Research and Policy

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Across the globe, agri-food systems are under unprecedented pressure. Climate change, biodiversity loss, resource scarcity, market volatility, and rising social expectations for environmental and ethical responsibility are converging to create a new and complex operating environment for agriculture and food production. In all the World, the need for deep sustainability transitions is no longer a matter of debate, but rather an urgent imperative.

Yet, achieving a sustainable and innovative agri-food system is not solely a matter of introducing new technologies or setting environmental targets. It also requires reconfiguring how knowledge is produced, shared, and applied across the value chain, from research institutions and public authorities to farmers, food businesses, and consumers. In this regard, information quality, stakeholder learning, and participatory governance become as essential as technological innovation itself.

This special issue brings together three papers originally presented at the XXXII Conference of the Italian Society of Agri-Food Economics (SIEA) on "Knowledge and Information for a Sustainable and Innovative Agri-Food System" held in June 2024 in Ragusa (Sicily, IT). These contributions offer timely and complementary perspectives on the pivotal role of information in driving behavioral, market, and policy change in agriculture. They also reflect broader debates about how to align economic development, environmental stewardship, and social inclusion in the global food system.

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The first article, "*Consumer's attitude in driving choices towards wine products derived from* ***New*** *Genomic Techniques (NGTs)*", addresses one of the most debated topics in agricultural biotechnology today: how to reconcile innovation with consumer trust. By examining the attitudes of Italian consumers toward wine produced using NGTs – advanced biotechnologies that promise greater crop resilience and reduced pesticide use – the authors provide empirical evidence on the critical role that accurate and accessible information plays in shaping public acceptance. The study's findings suggest that better-informed consumers are more open to innovation, particularly in light of potential regulatory reforms within the EU. But the implications go far beyond Europe: in a global context where misinformation and distrust can derail technological progress, this paper underscores the need for science communication strategies that are transparent, targeted, and sensitive to consumer concerns.

The second paper, "*The implementation of EU Optional Quality Term 'Mountain Products' in Italy*", explores how geographical labeling and place-based branding can support rural development and environmental sustainability. Focusing on the "Mountain Product" designation, the authors investigate why this EU Optional Quality Term (OQT), despite its potential to differentiate products and add value in marginal regions, remains underutilized. Through survey data from Italian producers, the study reveals a disconnect between the perceived benefits of the label and its actual market visibility, pointing to the need for more robust institutional support, marketing strategies, and consumer education. While the analysis is set in the European mountain context, the lessons are globally relevant: rural territories everywhere need better tools to capitalize on their unique ecological and cultural assets, especially in a globalized food system that often undervalues local identities and traditions.

The third article, "*Reconsidering EU Pesticide Policy to Address Sustainability*", tackles one of the most politically charged debates in agri-environmental governance: the future of synthetic pesticide use. Set against the backdrop of farmer protests and the European Commission's Strategic Dialogue on the Future of EU Agriculture, the paper examines how stakeholder input shaped the discourse on pesticide reduction. Through a qualitative analysis of official documents, the study demonstrates how deliberative governance processes can foster consensus around sustainability goals, while also revealing the structural, economic, and informational barriers that must be addressed for effective policy implementation. Although focused on the EU, this contribution speaks to a broader need for inclusive, knowledge-driven policymaking in agricultural transitions worldwide, particularly in balancing the trade-offs between ecological protection, food production, and rural livelihoods.

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Together, these articles suggest that the informational infrastructure of agri-food systems is as important as their technological or financial components. Whether through biotechnology acceptance, quality certification uptake, or policy negotiation, what people know, how they learn it, and who controls knowledge access deeply influence the success or failure of sustainability transitions.

The articles in this special issue highlight a shared insight: without informed, empowered, and connected stakeholders, the sustainability transformation of agriculture will remain incomplete. Farmers require clear and actionable information to adopt new technologies. Consumers need transparent and trustworthy data to support sustainable purchasing choices. Policymakers must create platforms where diverse voices can shape the rules of the game.

The role of knowledge and information must be placed at the center of the debate.

Moreover, these contributions focus the attention to the global nature of agri-food challenges and the importance of localized, context-sensitive solutions. The dynamics of technology adoption, quality labeling, and pesticide regulation may vary across regions, but the underlying need for credible knowledge, participatory processes, and strategic communication is universal.

This special issue aims not only to disseminate the findings of these studies, but also to foster a broader reflection on the strategic role of knowledge and information in shaping the future of food systems. As the world moves toward increasingly ambitious sustainability goals, through frameworks like the EU Green Deal, the UN 2030 Agenda, and various national climate and food strategies, it becomes ever more crucial to invest in knowledge infrastructures that are inclusive, adaptive, and future-oriented.

This includes digital platforms for data sharing, open science initiatives, agricultural advisory systems, and inclusive spaces for dialogue between scientists, farmers, institutions, and consumers. In a context of misinformation, polarization, and fragmented governance, the capacity to build collective intelligence (i.e., a shared, plural, and reflexive understanding of agri-food challenges) is a public good of increasing strategic importance.

We hope the contributions in this issue will inspire further interdisciplinary research, policy innovation, and collaborative engagement between institutions, producers, and society at large. Only through shared understanding and informed cooperation can we truly redesign agri-food systems that are not only more productive, but also more just, resilient, and sustainable.

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