


Chapter 11


Governing AI–Driven Agriculture: Policy, Ethics, and the Role of Language in Knowledge Transfer

Hewa Majeed Zangana

 <https://orcid.org/0000-0001-7909-254X>


Duhok Polytechnic University, Iraq

Pratiwi Amelia

 <https://orcid.org/0000-0001-9778-6772>


Universitas Muhammadiyah Bangka Belitung, Indonesia

Senny Luckyardi

 <https://orcid.org/0000-0001-9954-7433>

Universitas Komputer Indonesia, Indonesia

Firas Mahmood Mustafa

 <https://orcid.org/0000-0002-8757-5303>

Duhok Polytechnic University, Iraq

Shuai Li

University of Oulu, Finland

ABSTRACT

Artificial intelligence (AI) is transforming agriculture by enabling precision farming, predictive analytics, and automated decision-making, thereby enhancing productivity and sustainability. However, this rapid technological advancement raises complex policy and ethical challenges, particularly regarding data governance, equitable access, environmental impact, and transparency. This chapter explores the regulatory

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frameworks shaping AI-driven agricultural practices and emphasizes the critical role of language in facilitating effective knowledge transfer among diverse stakeholders, including farmers, policymakers, and researchers. By analyzing interdisciplinary approaches, the chapter highlights how linguistic clarity and ethical considerations underpin responsible AI governance in agriculture, ensuring innovations serve public interest while mitigating risks. Ultimately, it advocates for comprehensive policies that balance innovation with accountability and inclusivity in the evolving landscape of agri-tech.

1. INTRODUCTION

Artificial Intelligence (AI) has become a transformative force across many disciplines, notably in scientific writing and agricultural technologies. Its rapid development is reshaping how researchers generate, analyze, and disseminate knowledge, as well as how agricultural systems operate to meet the pressing challenges of global food security and environmental sustainability. However, the expansion of AI applications brings forth complex challenges related to ethics, governance, cybersecurity, and equitable access, especially in developing countries (Abd-Elsalam & Abdel-Momen, 2023; Aderibigbe et al., 2023; Aggarwal et al., 2024).

In the realm of scientific writing, AI-powered tools such as large language models (LLMs) and automated writing assistants are increasingly adopted to enhance productivity, improve clarity, and assist non-native speakers (Aithal & Aithal, 2023; Alahdab, 2024; Khalifa & Albadawy, 2024). These innovations promise to democratize academic authorship, making scientific knowledge creation more accessible. Nonetheless, they raise profound ethical questions about authorship, originality, transparency, and accountability (Ajiye & Omokhabi, 2025; Dinçer, 2024; Ersöz & Engin, 2024). Scholars have warned of risks including potential misuse, plagiarism, and the dilution of human intellectual contribution (BaHammam, 2023; Casal & Kessler, 2023; Harati, 2024). Furthermore, regulatory frameworks and best practices to govern the ethical use of AI in academia are still nascent, calling for multidisciplinary dialogue and international collaboration (Benabed & Tudoran, 2023; Cath, 2018; AlSamhori & Alnaimat, 2024).

Concurrently, AI's integration into agriculture — often framed as Agriculture 4.0 — is revolutionizing food production, supply chain management, and environmental conservation (Araújo et al., 2021; Bhangar & Shahriyar, 2023; Chen et al., 2024). AI-enabled precision agriculture leverages big data, remote sensing, and machine learning to optimize crop yields, reduce resource waste, and predict pest outbreaks (Ahmed et al., 2024; Bhat & Huang, 2021; Gupta et al., 2024). This potential is critical to addressing the food demands of a growing global population, especially

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