Chapter 8
The Role of Language in Regulating AI and Agricultural Technologies:
Legal Perspectives from a Globalized World

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ABSTRACT

Language plays a pivotal role in shaping the legal and regulatory frameworks that

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govern the development and deployment of artificial intelligence (AI) and agricultural technologies. In a globalized context, regulatory language not only influences legal interpretation and policy implementation but also impacts international cooperation, compliance standards, and ethical discourse. This chapter explores how linguistic nuances, translation challenges, and semantic ambiguities can affect the formulation and harmonization of legal norms across jurisdictions. By examining case studies and regulatory instruments from diverse legal systems, the chapter highlights the complexities of crafting clear, inclusive, and enforceable legal language in the face of rapidly evolving scientific and technological landscapes. The chapter argues that a multilingual and interdisciplinary approach is essential for creating robust regulatory ecosystems that promote innovation while safeguarding societal and environmental interests.

1. INTRODUCTION

The rapid advancement of artificial intelligence (AI) has profoundly reshaped contemporary scientific landscapes, revolutionizing domains as diverse as agriculture, education, environmental science, and academic writing. What was once an emerging concept is now a transformative force driving productivity, innovation, and decision-making across sectors (Groumpos, 2023; Girasa, 2020). The integration of AI technologies into academic and scientific domains is increasingly accompanied by critical questions surrounding ethics, governance, regulation, and trustworthiness (Cath, 2018; Farah & Varela, 2023).

In the field of academic writing, AI-powered tools such as ChatGPT and other large language models (LLMs) have dramatically enhanced researchers' capabilities to draft, edit, and translate content with unprecedented efficiency and fluency. However, these tools have raised significant ethical concerns, particularly around authorship, plagiarism, data fabrication, and the erosion of scholarly rigor (Casal & Kessler, 2023; Guleria et al., 2023; Chetwynd, 2024). The ongoing discourse surrounding responsible use underscores the need for well-defined ethical standards and institutional guidelines (Dinçer, 2024; Alahdab, 2024; Harati, 2024; AlSamhori & Alnaimat, 2024).

Simultaneously, AI has emerged as a key enabler in agriculture and environmental sustainability, promising to address global challenges such as food security, climate adaptation, and land degradation. The Fourth Agricultural Revolution—often referred to as Agriculture 4.0—leverages AI for precision farming, crop monitoring, yield prediction, and efficient resource allocation (Araújo et al., 2021; Chen et al., 2024; Bhat & Huang, 2021). Studies have shown how machine learning models and robotics can optimize agronomic practices, reduce environmental footprints,