



UNIVERSITY OF LIFE SCIENCES "KING MIHAI I" FROM
TIMISOARA
"YOUNG PEOPLE AND MULTIDISCIPLINARY RESEARCH
IN APPLIED LIFE SCIENCES"

13-14 November 2025



"Young people and multidisciplinary
research in applied life sciences"

TOWARDS SUSTAINABLE AGRICULTURE: COMPARATIVE
PRACTICES IN KENYA AND ROMANIA
Cynthia WANJIKU, Francois Guyvenchy, Razvan Bachner GUI, Raul PAȘCALĂU,
Laura ȘMULEAC
University of Life Sciences "King Mihai I" from Timișoara
Corresponding author: raul.pascalau@usvt.ro

Abstract:

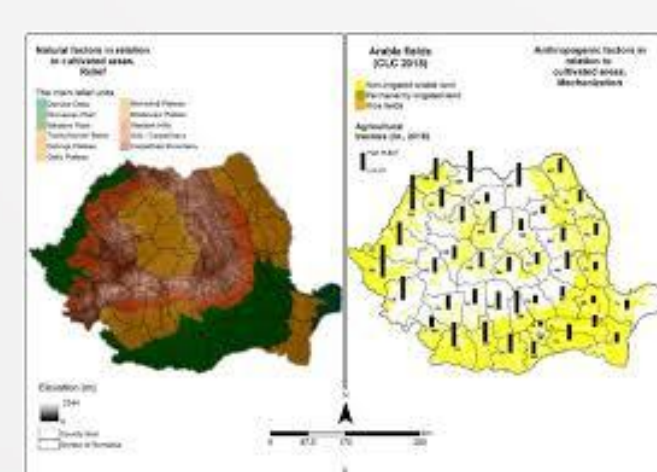
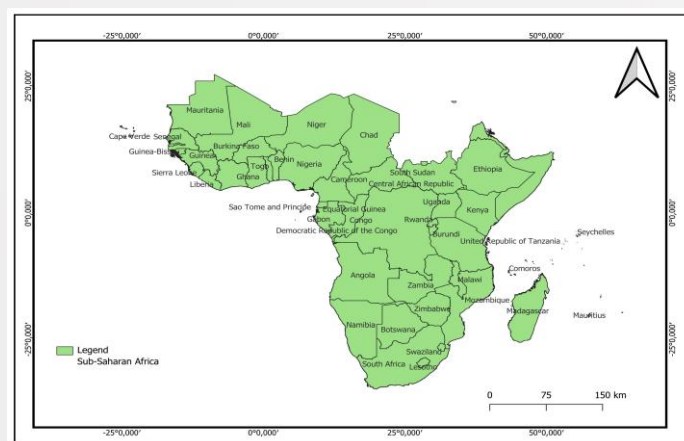
Sustainable agriculture has become an essential global priority in addressing food security, environmental degradation, and rural development challenges. This study explores and compares sustainable agricultural practices in Kenya and Romania, two countries with contrasting agroecological conditions and socio-economic contexts but shared goals of achieving resilient and efficient farming systems. The research draws upon secondary data from scientific publications, government reports, and international organizations such as the FAO and the European Commission. It examines the adoption of conservation agriculture, organic farming, agroforestry, and water management practices in both nations. In Kenya, sustainable farming initiatives have focused on smallholder systems, promoting climate-smart agriculture, agroforestry, and soil conservation to combat land degradation and erratic rainfall. Community-based programs and indigenous knowledge play a crucial role in enhancing resilience and productivity. Conversely, Romania has advanced through the modernization of agricultural systems, integrating precision farming, crop rotation, and eco-friendly technologies supported by European Union policies and funding. Despite differences in scale and resources, both countries face challenges such as limited farmer awareness, insufficient infrastructure, and restricted access to financial and technological support. The comparative assessment highlights that combining local knowledge from Kenya with technological innovations and policy frameworks from Romania could provide a balanced model for sustainable agriculture. Strengthening institutional collaboration and knowledge exchange between developing and European economies offers a promising path toward sustainable, inclusive, and climate-resilient agricultural systems..

Keywords: sustainable agriculture, Kenya, Romania, climate-smart farming, agroecology



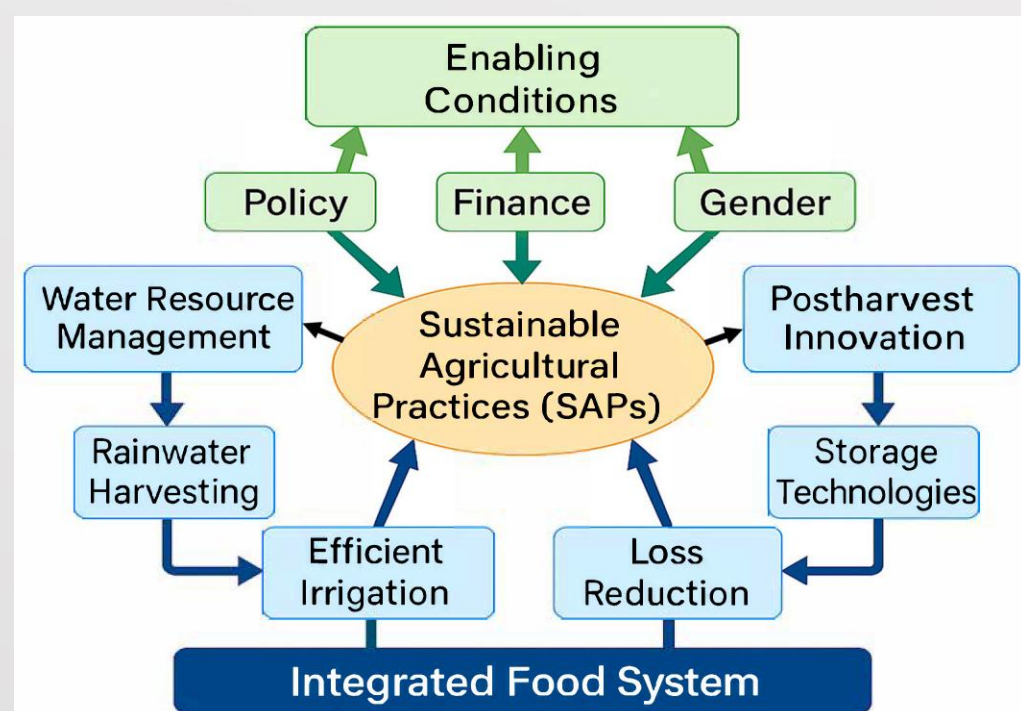
Introduction

Agriculture remains a cornerstone of economic growth, food security, and rural livelihoods across the world. However, unsustainable farming practices, land degradation, and the growing impacts of climate change have placed immense pressure on agricultural systems, particularly in developing and transitional economies. In this context, sustainable agriculture has emerged as a vital approach to ensuring long-term productivity while conserving natural resources and supporting rural communities. Sustainable agriculture integrates environmental stewardship, economic viability, and social equity—principles essential to achieving the United Nations' Sustainable Development Goals (SDGs), especially those related to zero hunger, climate action, and responsible production. This paper presents a comparative analysis of sustainable agricultural practices in Kenya and Romania, two nations that differ significantly in terms of climate, land use, and economic development, yet share common objectives of promoting environmentally sound and resilient farming systems. In Kenya, agriculture is dominated by smallholder farmers who depend heavily on rainfed systems. Efforts to achieve sustainability have focused on climate-smart agriculture, agroforestry, and soil and water conservation to mitigate the effects of drought and soil erosion. In contrast, Romania, a member of the European Union, operates under a more mechanized and policy-driven agricultural framework, where sustainability initiatives are guided by the Common Agricultural Policy (CAP) and environmental standards promoting precision agriculture, crop diversification, and organic farming. By comparing these two distinct yet complementary contexts, this study seeks to identify shared challenges, successful practices, and potential areas of collaboration. The comparative approach offers insights into how diverse agricultural systems can transition toward sustainability through the integration of local knowledge, technological innovation, and supportive policy frameworks.



Material and methods

This study adopted a comparative qualitative research design to examine sustainable agricultural practices in Kenya and Romania. The research aimed to identify similarities, differences, and opportunities for cross-learning between the two countries in their transition toward environmentally and economically sustainable farming systems. The research relied primarily on secondary data sources, including peer-reviewed journal articles, government policy documents, international organization reports, and academic studies published between 2010 and 2025. Data were collected through systematic searches in online databases such as Google Scholar, Scopus, and Web of Science. The main keywords used were "sustainable agriculture," "Kenya," "Romania," "climate-smart farming," "organic agriculture," and "agroecology." Additional materials were drawn from reports by the Food and Agriculture Organization (FAO), the World Bank, and the European Commission, ensuring a comprehensive and up-to-date overview of agricultural sustainability initiatives. The collected information was analyzed through content and thematic analysis, focusing on three main dimensions: Environmental practices – including soil conservation, water management, and agroforestry. Economic sustainability – covering resource efficiency, diversification, and access to markets. Social and institutional factors – such as farmer participation, education, and policy support. Comparative analysis was then applied to highlight how each country's ecological conditions, institutional frameworks, and technological capacities influence sustainable agriculture implementation. Triangulation of multiple data sources ensured reliability and validity of findings, while the cross-country approach allowed for the identification of transferable strategies that could enhance agricultural sustainability in both contexts.



Results and discussions

The analysis revealed that both Kenya and Romania have made significant progress toward sustainable agriculture, though their approaches differ due to variations in climate, resources, and institutional frameworks. In Kenya, sustainability efforts are primarily community-driven and focused on improving resilience in smallholder farming systems. Practices such as climate-smart agriculture, agroforestry, and soil and water conservation have been widely adopted to address challenges of land degradation, drought, and erratic rainfall. Programs led by government agencies and NGOs promote composting, terracing, and intercropping, which enhance soil fertility and reduce erosion. However, widespread adoption is limited by inadequate financing, poor infrastructure, and low access to modern technologies. In Romania, sustainable agriculture is shaped largely by European Union policies and national strategies promoting eco-friendly practices. Farmers increasingly implement precision agriculture, crop rotation, organic farming, and integrated pest management, supported by financial incentives through the Common Agricultural Policy (CAP). Technological advancements and mechanization have improved efficiency, but small-scale farmers often face barriers to adopting modern systems due to high costs and limited knowledge of sustainable techniques. Comparatively, both countries share common objectives—enhancing productivity while conserving natural resources—but differ in implementation capacities. Kenya's strength lies in community engagement and indigenous knowledge, while Romania benefits from institutional support, research, and funding mechanisms. The study suggests that integrating Kenya's local innovations with Romania's technological and policy frameworks could create a balanced model for sustainable agricultural transformation. Strengthening collaboration, farmer education, and access to affordable technology remains essential for both nations.



Conclusions

This comparative research highlights that both Kenya and Romania are actively pursuing the transition toward sustainable agriculture, though through different pathways shaped by their climatic, economic, and institutional contexts. Kenya's progress is driven by climate-smart and community-based practices such as agroforestry, organic composting, and water conservation, which enhance soil health and resilience in smallholder systems. Romania's approach, supported by the European Union's Common Agricultural Policy (CAP), emphasizes technological innovation, precision farming, and environmentally friendly management that improve efficiency and reduce ecological impact. Despite these achievements, both countries face persistent challenges including limited access to finance, inadequate farmer training, and insufficient technological integration. The contrast between Kenya's grassroots initiatives and Romania's policy-driven approach underscores the potential for mutual learning and collaboration. To advance sustainable agriculture, several actions are recommended. First, Kenya should strengthen institutional support, expand access to digital technologies, and promote public-private partnerships to scale up local innovations. Second, Romania should increase support for smallholders, enhance education on sustainable techniques, and encourage greater use of renewable energy in agriculture. Finally, both countries could benefit from bilateral cooperation in research, knowledge exchange, and technology transfer to build more resilient and inclusive agricultural systems. By combining Kenya's adaptive grassroots experience with Romania's technological and policy expertise, both nations can accelerate their journey toward a sustainable, productive, and climate-resilient agricultural future.



Acknowledgement:

Support was also received by the project Horizon Europe (HORIZON) 101071300 - Sustainable Horizons - European Universities designing the horizons of sustainability (SHEs)