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1. https://www.un.org/sustainabledevelopment/

European Commission

Science for Environment Policy

Balancing research, policy and practice could help agriculture meet Sustainable Development Goals

A study into how agriculture can help humanity meet the United Nations' Sustainable Development Goals finds that research in Europe on agricultural land systems largely omits key priorities from policy and practice. The researchers identify 32 variables that researchers, policymakers and practitioners collectively prioritise when it comes to European agricultural systems, and suggest that future research includes these in order to more comprehensively analyse trade-offs and identify opportunities for sustainable progress.

Due to its core role in society and substantial impact on land, biodiversity, water and our climate, agriculture is a key factor in achieving the United Nations' Sustainable Development Goals (SDGs)[1]. These 17 goals aim to address, by 2030, the challenges facing humanity on a global scale — climate, environmental degradation, peace and justice, poverty, inequality, and more — and to ensure a more sustainable future. However, how agriculture could or should support the SDGs, and what it should prioritise in its efforts to do so, remains somewhat unclear.

This study analysed what researchers, policymakers, and practitioners prioritise in their understanding of agricultural systems. It did so by analysing 69 research articles, the SDGs and four EU policies, and seven agricultural sustainability assessment tools aimed at farmers. Of an initial set of 239 environmental and social **drivers**, management **choices**, and **outcomes** of agricultural systems, the researchers found 32 variables that all perspectives — research, policy, and practice — define as being essential to agricultural systems. These could define a shared area of focus to help clarify agriculture's possible contributions to realising the SDGs.

Drivers (9):
Environmental: Habitat conservation status.
Social: Supply-chain structure; education and training; renewable-energy policy; agricultural policy; environmental policy; climate policy; subsidies; land ownership.

Management choices (13):
Environmental: Tillage; soil erosion control; fertiliser use; water consumption; irrigation; habitat reclamation; pesticide use; spatial cropping patterns; livestock heads/density; expansion of agricultural area; ecological buffer strips.
Social: Energy consumption; labour use.

Outcomes (10):
Environmental: Soil loss; soil organic carbon; soil quality; GHG emissions; species diversity; land cover.
Social: Income; yield; labour productivity; un/employment rates.

The researchers highlight that the four prevailing approaches to agricultural-land-systems research in Europe omit most of the variables considered important from policy and practice perspectives. They suggest that these approaches should consider including these 32 variables to facilitate more policy- and practice-relevant research in the future; and also propose that policymakers, practitioners and stakeholders come together throughout the research process to collaborate and co-design research questions, in order to help align the priorities of agricultural research with those of both policy and practice.

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Balancing research, policy and practice could help agriculture meet Sustainable Development Goals *(continued)*

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The four prevailing approaches:

a) Environmental determinism. Focuses on environmental drivers influencing soil and/or landscape-composition outcomes, with an understanding that agricultural system drivers directly affect outcomes — with limited regard for management choices.

b) Production management. Emphasises the effects of agricultural management choices on a range of environmental and economic outcomes, generally with little to no focus on specific drivers influencing management choices.

c) Sociopolitical. Stresses the importance of the political drivers affecting agricultural systems, but generally lacks a functional system perspective.

d) Quasi-systematic. The closest to a holistic approach, this contains system components of all functions (drivers, management, outcomes) across environmental and social domains, but lacks consideration for many social management choices and outcomes.

As 207 variables appear in only one or two perspectives (research, policy, practice), and more than half in only one perspective, potential trade-offs may be overlooked. The researchers suggest incorporating priorities across research, policy, and practice as a way to balance and implement sustainability goals for various sectors and regions — and to help design future research to analyse such trade-offs and identify opportunities for achieving the SDGs.