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## Alternative agricultural approaches for the South: All the same or clear distinctions?

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### Abstract

The objective of this study is to assess alternative agricultural approaches that have the potential to cope with the multiple crises smallholder farmers in the South are confronted with.

Agri-food systems have been identified to contribute to soil degradation, loss of biodiversity, and greenhouse gas emissions at least substantially. Meanwhile, the threat particularly to livelihoods in areas of the global south intensifies but the challenges go beyond environmental aspects. The mineral fertiliser crisis – high prices, accessibility, and lack of delivery in time –, while alternative approaches to fill the gap are lacking, is further increasing food insecurity. Equally, the role of socioeconomic and political disturbances becomes more and more apparent and necessitates addressing contemporary and future crises of agri-food systems.

Today, we are confronted with a plethora of approaches that aim at transforming agricultural systems towards a more sustainable relationship between humankind and the environment. Consequently, many of these introduce innovations in the composition of crops, technology, and applied practices but likewise address the social and ethical dimensions of agriculture. The manifold approaches lead to a lack of clarity for all actors coping with agriculture.

Addressing this complexity, we selected six agricultural approaches for further analysis based on their agroecological potential, their transformative claims, the variety of their methods/practices, and their current distribution: Conservation tillage, evergreen agriculture, holistic management, regenerative agriculture, syntropic agriculture, and organic agriculture are all approaches that have shown promise in improving sustainability in agriculture. As they focus on different ways to tackle environmental and social issues and employ different practices, we argue that there is no one-fits-all solution to every/each future challenge and trade-offs are necessary.

We differentiated these systems according to their ecological, cultural, economical, and market potentials, and assessed their strengths and weaknesses against a set of ecological and socio-economic criteria, to provide a comprehensive overview and subsequently identify merging potential and possible synergies. Doing so, we refer to scientific literature defining and assessing these agricultural approaches.

We finally examined the applicability of those approaches to smallholder farms in (sub-)tropical surroundings and conclude with policy recommendations.

**Keywords:** Agri-food systems, conservation tillage, evergreen agriculture