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## Is rapid appraisal of ais the key to deciphering agroecology? A methodological exploration

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### Abstract

The transition to agroecology as a sustainable agricultural paradigm demands frameworks that can critically examine and support innovation processes across diverse contexts. This study presents the Rapid Appraisal of Agricultural Innovation Systems under Agroecology (RAAIS-AE), a conceptual and methodological framework designed to assess agricultural innovation systems with specific sensitivity to the complexity and agroecology transformative goals. Rooted in and expanding upon prior approaches such as Rapid Rural Appraisal and the Rapid Appraisal of Agricultural Knowledge Systems, RAAIS-AE provides a structured, reflective approach that enables researchers, policymakers, and practitioners to engage with innovation systems in a systematic, participatory, and context-sensitive manner.

The core contribution of this conceptual research lies in the development of a methodological guideline that makes explicit the data requirements and expected outputs for effective analysis. This reflection on “what to know” and “what to get” supports a deeper understanding of local innovation dynamics and offers actionable insights into how agroecological transitions can be fostered. RAAIS-AE integrates five analytical components: stakeholder mapping, complexity analysis of agricultural problems, innovation capacity assessment, agricultural innovation support system characterisation, and analysis of the interaction dynamics among these elements. Each component is linked to a clear operational pathway, including suggested data types, collection techniques, and analytical tools. These include methods such as principal component analysis for typology construction, social network analysis for actor mapping, resilience assessment using the RIMA-II model, and regression modelling through PLS, all of which could be implemented through accessible software such as R, SPSS, and SmartPLS.

Rather than offering a static procedure, RAAIS-AE is designed as a modular and flexible toolkit that can be adapted to a wide range of agricultural and policy environments. It is particularly valuable in settings where different categories of actors must co-produce knowledge and co-design innovation strategies. By anchoring innovation system analysis within the principles of agroecology, the framework fosters inclusive dialogue, clarifies actor roles and interconnections, and highlights leverage points for systemic change. Ultimately,

this work contributes a rigorous, theory-informed, and operational methodology to the field of agricultural innovation studies and offers a practical entry point to guide agroecological transitions with evidence and relevance.

**Keywords:** Agricultural innovation system, agroecology, methods, RAAIS, stakeholders