Methods to apply a Rapid Appraisal of Agricultural Innovation Systems under AE

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Introduction

Innovation policy is moving beyond supply-driven approaches that focus on R and D and specific technologies promoting to a network-based setting, in which a more inclusive, interactive and participatory approach fosters greater innovation in response to pressing challenges facing the food and agriculture systems.

The new perspective of agricultural innovation system can be defined as the network of organizations, individuals, and institutions involved in generating, disseminating, and utilizing agricultural innovations. This system includes all the actors involved in the agricultural innovation process, including farmers, researchers, policymakers, extension workers, private sector actors, and other stakeholders. The AIS approach emphasizes the importance of collaboration and knowledge exchange among these actors to foster innovation and improve agricultural productivity, sustainability, and resilience. It also recognizes that innovation is not just about new technologies but also encompasses changes in policies, institutions, and social practices that can contribute to more sustainable and inclusive agricultural development (Spielman et al., 2009)

One of the commonly used methods to study AIS is the Rapid Appraisal of Agricultural Innovation Systems (RAAIS) which is a participatory and rapid assessment approach that aims to identify the strengths and weaknesses of existing Agricultural Innovation Systems. The RAAIS approach is based on the belief that effective agricultural innovation requires the collaboration and interaction of different actors within the system, including farmers, researchers, extension agents, policymakers, and private sector actors. The RAAIS approach involves a series of structured and participatory activities, including interviews, focus group discussions, and stakeholder workshops, to identify the actors, institutions, and relationships involved in the AIS, as well as the strengths and weaknesses of the system. The approach also identifies the key drivers and barriers to innovation, and helps to identify opportunities for enhancing the effectiveness of the AIS. The RAAIS approach is designed to be flexible and adaptable to local contexts, and it can be used by a range of stakeholders, including development practitioners, policymakers, and researchers. The approach can help to facilitate a more inclusive and collaborative approach to agricultural innovation, and can support the design and implementation of more effective policies, programs, and projects to enhance agricultural productivity and sustainable development (Schut et al., 2015).

Aim

To adapt this methodology to assess agroecological transition under the CGIAR AE Initiative on system transformation?

Method

Conceptual framework for RAAIS

- *Stakeholders' identification* In agricultural innovation system stakeholders can be divided into 5 major groups

Table1. Stakeholders' classification and diversity

Stakeholder groups	Diversity within stakeholder group
Farmers	Smallholder farmers, agro-industrial farmers
Non-governmental organizations (NGO) and civil society organizations	Inter/national agricultural networks and associations, development organizations, donors
Private sector	Input and service providers, Processors, Traders..
Government	Politicians, policymakers
Research and training	National agricultural research institutes, agricultural education and training institutes, universities, international research institutes, extension officers

- *Understanding the complexity of agricultural problems:* Complex agricultural problems are those that include a variety of actors and stakeholders, have numerous dimensions (an interplay of biophysical, technical, social-cultural, economic, institutional, and political elements), and are rooted in interactions at several levels (schut et al., 2013). Actors can be anybody who is directly or indirectly connected to an issue or its possible solution. Participants in the exploration of potential solutions to complex agricultural problems are known as stakeholders, and their involvement is seen as a crucial success element (e.g. Giller et al., 2011).
- *Qualifying Innovation capacity in the agricultural system:* The ability of these actors and organizations to create new and mobilize existing competences to continuously identify and prioritize barriers to innovation and opportunities in a dynamic systems context is referred to as innovation capacity in the agricultural system.
- *Identifying the agricultural innovation support system:* The structural circumstances that can promote (when present) or restrain (when missing or dysfunctional) innovation within the agricultural system and its subsystems are provided by the agricultural innovation support system (Wieczorek and Hekkert, 2012).

Table2. Different structural conditions for innovation

Structural conditions for innovation	Description
Infrastructure and assets	Knowledge, R and D infrastructure; infrastructure; agricultural inputs distribution;
Institutions	Agricultural policies; laws; regulations; informal institutions ..
Interaction and collaboration	Multi-stakeholder interaction for learning and problem-solving; knowledge and information sharing; public-private partnerships; representative bodies (farmer organization)
Capabilities and resources	human resources and qualifications; education and literacy rates; financial resources

- *Defining the interactions between complex agricultural problems, innovation capacity and the agricultural innovation support system* to provide a coherent set of specific and generic entry points for innovation

Methodological framework for RAAIS (data collection)

- Multi-stakeholder workshops: to identify, categorize and analyze constraints for innovation in the agricultural system.
- Semi-structured in-depth interviews: To identify and to anticipate interesting storylines related to the problem under review, and allows validation of data that was gathered during previous interviews or during the workshops.
- Surveys: To provide more insights about the socio-economic characteristics of smallholder agriculture.
- Secondary data collection: To analyze the complexity of agricultural problems, the innovation capacity of the system or the functioning of the support system.

Results

The full perspective

To consider this full perspective (Figure 1) a bundle of methods is needed (Table 3) helping to understand the complexity of the system and the under-review problem (Schut et al., 2013).
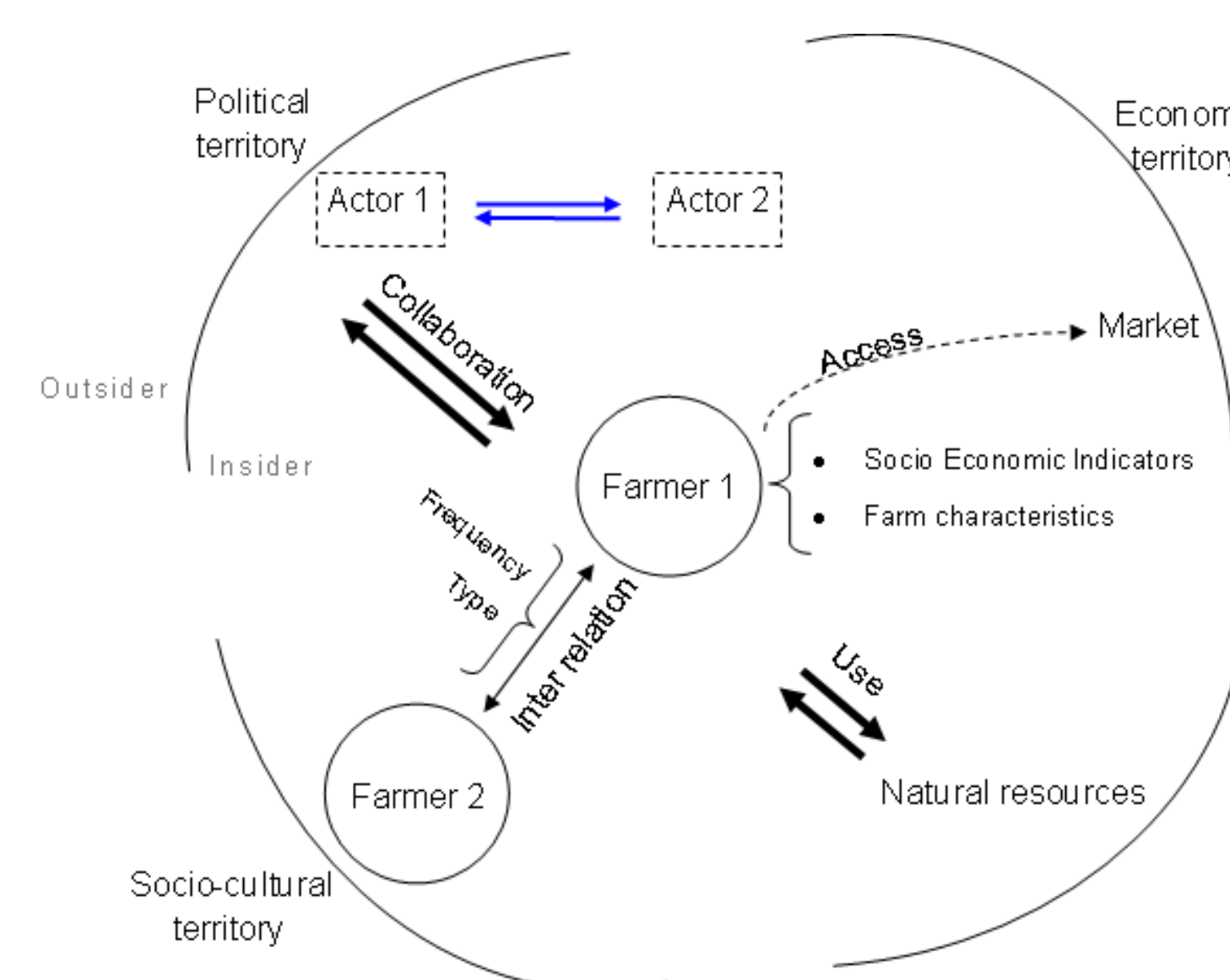

Figure 1. Interactions among actors

Methods to adapt and apply RAAIS

Based on literature Giller et al., 2011; Sartas et al., 2018; Sartas et al., 2019; a set of methods (table3.) is needed to obtain accurate results.

Table3. Suggested analysis among different levels

Level	Enabling Environment (Economy/Policy)	Institutional landscape	Community	Farm
Suggested analysis	Policy review	Stackholders mapping	Social network analysis	Production system characterization
Indicators/ data needed	Historical data on the agricultural policies (changes) Current agricultural policies Data on agricultural production The economic performance of the agricultural sector (GDP, exports..)	Identification Stakeholder roles: their functions, responsibilities, and activities. Interactions and relationships types Power dynamics: relative influence	Flow type Flow intensity Communication pattern.	Land tenure Agricultural practices Productivity Natural resources exploitation

Discussion

In the realm of understanding Agricultural Innovation Systems (AIS), various methods have were proposed in literature, each with its own set of advantages and limitations.

One such method is the Rapid Appraisal of Agricultural Innovation System (RAAIS), which offers a swift and localized assessment of innovation systems, ideal for pinpointing key actors, connections, and constraints at the community or specific level. RAAIS excels in efficiency and resource economy, making it an apt choice for smaller-scale, ground-level projects (Giller et al., 2011; Sartas et al., 2018; Sartas et al., 2019).

In contrast, the Kaleidoscope Model for Policy Changes adopts a more comprehensive approach, diving deeply into systemic and policy aspects at a national or regional level. This model is better suited for strategic analyses, particularly for crafting policy changes and promoting innovation on a larger scale. However, it comes with the trade-off of requiring more time and resources due to its broader scope (Quintero & McCartney, 2021; Blesh et al., 2023; Dhehibi et al., 2023; Resnick et al., 2018; Larsen et al.,2019).

The selection between these methods should be driven by the specific project goals, scale, and available resources, ensuring the most effective analysis of the Agricultural Innovation System.

Conclusion

Transdisciplinary thinking is an essential approach in agricultural innovation systems because it brings together diverse perspectives and knowledge from different disciplines to address complex and dynamic challenges. Agricultural systems are complex, dynamic and multi-dimensional, and require a holistic and integrated approach to problem-solving.

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