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BOOK OF ABSTRACTS

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What are the specificities of agricultural innovation systems in the South: an approach based on innovation support services

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Short abstract

The Agricultural Innovation System (AIS) approach is playing an increasingly important role in the management of Research and Development projects in the South. However, there is still considerable scope for progress in operationalising it in Southern countries, particularly to assist policy decisions on improving the environment for innovation. We propose to take stock of the characteristics of AIS in Southern countries on the basis of empirical work that we have carried out in the framework of the LEAP-AGRI SERVInnov project from 2018 to 2022 in light with the emerging concept of innovation support services. Our results enlighten the specifities of AIS in the South that enriching the literature and drawing implications for innovation support policies.

Extended abstract

Purpose

The Agricultural Innovation System (AIS) approach is playing an increasingly important role in the management of Research and Development projects in the South. It has become central to the strategies of development organisations such as the FAO, the European Union and the African Union, as well as international research institutes. The raise of interest toward this concept is rooted into its holistic character and its capacity to include complex thinking. However, there are still many criticisms and challenges to its use, as it is a concept imported from industry on the one hand and from developed countries on the other. Since the application of this approach to the agricultural sector in the South (Hall et al. 2006, World Bank 2006), research has focused on its adaptation and operationalisation in these contexts. While the AIS provides an approach and a framework for analysing the functioning of support for the emergence and development of agricultural innovation at different scales, there is still considerable scope for progress in operationalising it, particularly to assist policy decisions on improving the environment for innovation. Several empirical studies have been carried out, either to identify the components of these systems, or to analyse their functioning or to measure their effects. More than fifteen years after the first mobilisation of this concept, we propose to take stock of the specificities of AIS in Southern countries on the basis of empirical work that we have carried out in the framework of the LEAP-AGRI SERVInnov project from 2018 to 2022 in light with the emerging concept of innovation support services.

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Design/Methodology/Approach

Innovation support services

In this study, we mobilise in a cross-cutting way all the data that were collected and analysed in the course of the SERVInnov project. Given that analysis of the data has and will lead to specific publications, we intend to develop a cross-cutting overview of the AIS approach. The data collection was carried out in three countries on the African continent with contrasting contexts (Burkina Faso, Cameroon, Madagascar). We harmonised the data collection tools as much as possible without standardising them to take into account the specificities of each context, and nature of the partnership with development partners. We worked at several scales (case-studies, innovation subsystems, national AIS), while favouring a reflexive approach to the results of our research. We have drawn on the literature on innovation support services (ISS) to design our research (Mathe et al. 2016, Faure et al. 2019, Ndah et al. 2020). ISS are activities carried out between providers and beneficiaries in regular interaction to respond to a specific demand emerging from a joint analysis of a situation (Faure et al., 2019). These are activities by nature, immaterial and intangible, which involve one or more providers and one or more beneficiaries in activities generating interactions to respond to a more or less explicit demand emerging from a problematic situation and formulated by the beneficiaries and to co-produce services aiming at solving the problem (Mathe et al. 2016, Faure et al. 2019). These services are dedicated to help accelerate ideas and inventions, manage a viable innovation project, emerge effective innovation communities, facilitate strategic partnerships between stakeholders for technical or funding purposes, improve the scaling up and scaling down of innovations (Toillier et al. 2018). We have identified seven categories of services (Fig. 1.).



Figure 1. the seven categories of support services

Scales of data collection

Innovation subsystem and support services

In the literature on innovation systems, the scales of study can be sectoral (Malerba 2002), regional (Carlsson 2006) or spatial (Audouin et al. 2018). The mobilisation and application of AIS raises the question of the boundaries of the system and on which features the focus is placed (Mathe et al. 2019). We have studied innovation subsystems under the assumption that these subsystems are shaped and specific to the agricultural sub-sectors (food agriculture, export agriculture) or innovation domain (organic agriculture, digital agriculture) important for the study countries (Mathe et al. 2016, Ndah et al. 2020). An IsubS is a reduced image of a larger system (e.g. a national AIS), focused at the regional (province, district), (sub)sector or product level (dairy, horticulture, organic, etc.), while at the same time some AIS actors and their

interactions remain linked to a larger whole (e.g. operating at a national scale) (Ndah et al. 2020). We studied a total of 12 innovation sub-systems across the three countries. This study involved mapping the organisations/actors that provide ISS (innovation service providers) and their ISS for a given innovation sub-sectors or innovation domain.

Innovation cases

To complement the approach of mapping service providers and existing services at IsubS' level, we observed innovations emanating from most of the sub-systems studied in order to have a finer vision of the effective mobilisation of mapped providers and services. In all, we studied twenty cases of innovation across the three countries, including innovations in processing and pre- and post-harvest management, innovations in value chain structuring and innovations in new production techniques and digital technology. In each of these innovation cases, we studied the innovation trajectories, highlighting the services and suppliers along the trajectory as well as the context. We also assessed the quality of the services provided by the actors (beneficiaries and providers).

Restitution and reflexivity

The usefulness and adaptation dimension of the work carried out was central, which is why this research work was co-designed between the research and the practitioners (support service providers). In addition to this organisation, we added events for intra- and inter-country data synthesis (transversal analyses), we organised in each country workshops for restitution, validation and formulation of recommendations with service providers and public decision-makers. At the end of the project, we organised a global reflection workshop on all the results of the project, which gave rise to the idea of this paper.

Findings: Specificities of innovation systems in Southern countries

Structure and components of AIS

Respect to the institutional environment of innovation, we have observed an over-responsibilisation of research ministries because there is an overlap between research and innovation. The innovation policies that are visible as such are those carried out by the research ministries, whereas several ministries contribute to creating an environment favourable to agricultural innovation, notably the Ministry of Agriculture, the Ministry of Transport and the Ministry of SMEs. There appears to be tensions (conflicting responsibilities) between ministries over the designing and putting in place of innovation support policies.

Furthermore, our work has confirmed our hypothesis of a strong and visible organisation of innovation support service providers according to the agricultural sub-sectors (Mathe et al. 2023). These actors can often be specialised in terms of agriculture sub-sector. This is particularly the case for private actors, farmers' organisations and civil society. Due to their proximity, farmers' organisations play an increasingly important role in supporting innovations across all sub-systems (cash crop, staple food, livestock, etc.).

The positioning of research in AIS occurs in a context of low public investment in research (Temple et al. 2017, Audouin et al. 2021). At the same time, we observe that research endorses a diversity of roles in supporting innovation trajectories. Research is involved both in the production of knowledge and in intermediation to facilitate the networking of innovation actors, as well as in the creation of a enabling environment by helping to make the link with political actors (Toillier et al. 2018). However, research is still not very connected to the private (business) sphere (Temple et al. 2017). Universities are increasingly positioning themselves on the issues of supporting agricultural innovation, through the provision of new knowledge.

Extension and advisory services are involved in innovation support. The services provided by these organisations have diversified recently and are intended to be complementary to other support services (Audouin et al. 2021).

Our results shed light on two components actor categories in AIS that do not appear clearly in the current literature: individual actors and hybrid organisations. We have observed individual actors, especially informal ones, who act as providers of innovation support services. These individuals can provide capacity building, networking or resource provision services that are not visible at the AIS scale but at the scale of innovation trajectories. So-called "hybrid" actors were identified during the mapping of organisations that accompany innovation, namely R&D projects and programmes. These shape the AIS and particularly the time-frame of ISS provision (which are project-time and budget limited), and the links between the AIS organisations, who develop ISS under project partnerships.

Functioning of AIS

In the countries of the South, there is an overlap between the AIS and the general support for development (which can be referred to as a development support system). Indeed, the actors who accompany innovation are not specialised and intervene consecutively in both systems. One resulting consequences for this is the lack of professionalisation of service providers toward supporting innovation. However, there are networks of specialised actors emerging, particularly in West Africa (see Afric'Innov Network). We have developed an approach that enables support service providers to assess their own capacity to support innovation as an organisation called the "organisation capacity assessment approach for innovation support (OCATI). OCATI, enables support organisations: to extract and develop their core competence of supporting innovation, to further develop a strategy for strengthening this process, and to become more professionalised and recognised. (Ndah et al. 2021).

The functioning of AISs is project-driven, we can speak of project-led innovation systems. The innovation support services that we have identified mainly come from R&D projects (Kamga et al. 2022). This situation raises the question of the sustainability of the provision of services over time, as this depends on the life of the projects. Indeed, our results have shown discontinuities in service provision in the innovation trajectories linked to project cycles. On the other hand, it also questions the content of these services, but also the links and orientations given to the innovation trajectories and, more globally, the directionality of the AISs and their governance. This situation casts a shadow over who decides about the innovation agenda in the countries.

Furthermore, we observe that the diversity of services varies according to the agricultural sub-sectors and domain of innovation. The economic models of services are diversified with a dominance of non-market services. ISS remain difficult to identify clearly, particularly networking services, which are difficult to trace because they are sometimes merged with other services (Ndah et al. 2021). The quality assessment of services provided should encompass criteria related to the inclusion of women and young people in the provision of services (Crestin-Billet et al. 2022).

Products

Our results were less substantial on the products of AIS; however, we were able to bring out perspectives and raising issues from the composition and functioning described above. The AIS approach is part of the evolutionary approach to innovation. The innovation follows a selection process which that conducted it to be chosen not because it is the best choice a priori but because it has succeeded in adapting to a given context. The context of disconnectedness of innovation support tends to exacerbate this situation leading to the constant initiation of new innovations that are often left in abeyance with little chance of being taken over by endogenous dynamics, leading to a repetitive circle of new technical solutions implemented but little disseminated. At the same time, there is an abundance of endogenous innovations that do not necessarily have access to the necessary support (Waters-Bayer et al. 2015). The current structure and functioning of the AISs leads to the implementation of a system of replication or incrementation of innovations (adaptation of innovations coming from other contexts) and leaves little room for the emergence of breakthrough innovations.

Practical Implications: Implications for innovation support policies

Our results and the regional and national workshops drawn on substantial recommendations to emerge in order to strengthen AIS in the South.

- For service providers
 - Need for professionalization of ISS providers
 - Need for capacity building of suppliers
 - Need for networking platforms for ISPs at national and regional levels
- For the support of innovation
 - Need to track down existing innovations (including endogenous innovations) in order to support them
 - Create meeting places (both virtual and physical) for innovative initiatives and service providers (innovation platforms on ISS)
 - Need to integrate ISS within agronomic curricula at university level both public and private
- For the enabling environment
 - Need for cross-sectoral policies on innovation
 - Need for dedicated funding to support endogenous innovations or those initiated by external actors
 - Regional organisation of innovation systems with inter-country clustering of innovation systems

Theoretical Implications: Rethinking the AIS approach in the South and policies to support innovation

Our results propose a more comprehensive framework for the analysis of AISs integrating structural, functional and processual perspectives (Toillier et al. 2018) and an ambition to operationalise the AIS approach by focusing on the dynamic features of innovation support: the features of the service relationship (Figure 1).



Figure 2. Scheme of services-based analysis of AIS

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