

## Research and its impact on the Colombian Agricultural Innovation System

### *La investigación y su impacto en el Sistema de Innovación Agropecuaria de Colombia*

Julián Londoño-Londoño<sup>1</sup>

<sup>1</sup>Chief Scientific Officer – CSO. Sosteligroup S.A.S, Zona Franca - warehouse 4, Rionegro, Antioquia, Colombia.  
ORCID: <https://orcid.org/0000-0001-6793-0585>  
E-mail: [julian.londono@sosteligroup.com](mailto:julian.londono@sosteligroup.com)

The third edition of the Oslo Manual defines innovation beyond the classic technological perspective of the process and the product that focuses on the technological development of new products and new production techniques for companies. In the broader definition, it emphasizes, even more, the role of links with other companies and institutions in the innovation process, and also takes into account the importance of innovation in low-intensity R&D sectors such as services and industries with low technological content and, therefore, broaden the definition of innovation in order to include two additional types: organizational innovation and marketing innovation (OECD/Eurostat, 2005). In fact, it is clear that innovation processes differ greatly from one sector to another both in terms of development, rate of technological progress, links and access to knowledge, as well as in terms of organizational structures and institutional factors. Some sectors are characterized by rapid changes and radical innovations, while others produce smaller and progressive changes (Malerba, 2002).

Regarding the institutional framework, although the scope of the Oslo Manual deals with innovation at the company level, it also includes the existence of constituent elements of the environment in which it operates, such as: 1) the basic education system, 2) the university system, 3) the specialized technical

training system, 4) the scientific and research base, 5) the common elements of cataloged knowledge (publications, standards), 6) innovation and other policies government policies that influence the innovation of the company, 7) the legislative and macroeconomic framework, 8) communications infrastructure, including the road network, and telecommunications, 9) financial institutions that determine, for example, the ease of access so as to venture capital, 10) market accessibility, including the possibility of establishing close relationships with customers as well as aspects such as the size of the market and ease of access, 11) the industrial structure and the competitive environment, including the existence of supplier companies in complementary sectors (OECD/Eurostat, 2005).

In Colombia, for the agricultural sector, the institutional framework was drawn up by law 1876 of 2017. However, almost two years after its promulgation, many of the actors that must promote it and, even more, the sector to which it impacts, unaware its content and the implications of its implementation. The purpose of this law is “the creation and implementation of the Colombian Agricultural Innovation System (CAIS) (SNIA in Spanish), composed of subsystems, strategic plans, planning and participation instruments, management platforms, procedures for its implementation, as

well as mechanisms for its financing, monitoring and evaluation. This law creates new functions, competences and mechanisms of coordination of the entities and organisms of coordination of the national and territorial order that compose the CAIS, and creates the public service of agricultural extension and norms for its provision". The CAIS is made up of the following subsystems: 1) Colombian Agricultural Technology Research and Development Subsystem. 2) Colombian Agricultural Extension Subsystem. 3) Colombian Formation and Training for Agricultural Innovation Subsystem (Congreso de Colombia, 2017). Table 1 summarizes the functioning of the three subsystems created by the law, detailing the current diagnostic situation and the actions proposed for improving them.

It is worth opening the discussion to a critical review of the role that each of the actors of the CAIS must play in order to make it work. It is about understanding the challenges of relevant university education for the agricultural sector, beyond curricula, infrastructure and resources, focusing on the way it is reconstructed according to the context. In addition, it is necessary to propose a way to approach research for the agricultural sector from the generation and application of contextualized knowledge and finally, it is clear that the practical approach of the agricultural company must be demarcated by the concept of the productive vocation and definition concrete of knowledge necessary to solve the problems that underlie its business vision.

**Table 1.** General elements regarding the subsystems making up the Colombian Agricultural Innovation System (CAIS) (Londoño-Londoño, 2018).

Subsystem	Coordination	Current situation	Action proposed by law
Colombian Agricultural Research and Technological Development Subsystem	Colombian Ministry of Agriculture and Rural Development (MARD) and Colciencias	Dispersed efforts and resources due to the lack of a national science and technology plan for the agricultural sector  Difficulty in coordinating local, regional and national actors, as well as insufficient channels for interlocution and dialogue	Using the Agricultural Science, Technology and Innovation Plan 2017-2017, as well as its R&D&I agenda, for guiding/orientating the framework regarding science and technology agricultural sector policy  Creating and strengthening the following articulation spaces: Local (Municipal Rural Development Councils) Regional (Agricultural Science, Technology and Innovation working groups) National (CAIS higher council)
Colombian Formation and Training for Agricultural Innovation Subsystem	Colombian Ministry of Education	Difficulty in coordinating actors from formal and informal education sectors  Little relevance of formation and training programmes	Defining the actors forming part of the subsystem led by the Colombian Ministry of Education, such as higher education institutions, the Colombian Learning/Training Service (SENA), agricultural colleges and informal education institutions  Ensuring the quality and relevance of formation and training programmes aimed at creating research, technological development, agricultural extension and innovation-related skills
Colombian Agricultural Extension Subsystem	Colombian Ministry of Agriculture and Rural Development (MARD)	Difficulty in planning the agricultural extension service and evaluating its impact and gradualness  Weak territorial approach to dealing with/addressing the needs of the region regarding agricultural extension	Creating Departmental Agricultural Extension Plans as four-year planning instruments in which every Department, in coordination with its municipalities, districts and other CAIS actors, will define the strategic and operational elements for providing an extension service  Incorporating the concept of Territorial Innovation System - as complex systems emerging in a particular territory established by recognizing specific interactions between their biophysical, cultural, institutional and socioeconomic dimensions

## References

- Congreso de Colombia. Ley 1876 - Sistema Nacional de Innovación Agropecuaria. , (2017).
- Londoño-Londoño, J. (2018). Oportunidades y retos desde el territorio para consolidar el sistema de innovación agropecuaria. *Orinoquia*, 22(2), 129–131. <https://doi.org/10.22579/20112629.521>
- Malerba, F. (2002). Sectoral systems of innovation and production. *Research Policy*, 31(2), 247–264. [https://doi.org/10.1016/S0048-7333\(01\)00139-1](https://doi.org/10.1016/S0048-7333(01)00139-1)
- OECD/Eurostat. (2005). Oslo Manual 2005. In *Communities*. <https://doi.org/10.1787/9789264013100-en>