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Bridging Strong Institutions and Agricultural Innovation: Insights from Latin America

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Introduction

Technological innovation plays a fundamental role in shaping the future of agriculture in Latin America. Discussions often focus on biotechnology, digitalization, drones for crop monitoring, and precision agriculture. However, it is less frequently acknowledged that agricultural innovation does not rely solely on scientific and technological advances; it also depends critically on the institutional quality that either facilitates or constrains its adoption. Finger [1] shows that without institutional robustness, digitalization in agriculture deepens inequalities instead of fostering resilience. Similarly, Addorisio et al. [2] underline that institutional reforms ranging from secure land rights to coordinated actor networks are essential for innovation to translate into tangible gains in productivity, sustainability, and competitiveness [1,2]. Strong institutions characterized by transparent governance, effective regulatory frameworks, and well-functioning extension services play a pivotal role in enabling agricultural innovation. In Latin America, variations in institutional quality across countries and regions have significant implications for the adoption of new technologies, the diffusion of best practices, and the overall productivity of the agricultural sector [3,4].

Empirical Evidence: Institutions and Innovation in Latin America

Figure 1 illustrates the relationship between institutional quality and the Global Innovation Index across 17 Latin American economies in 2024. A clear positive association emerges, countries with stronger institutions, such as Chile, Uruguay, and Costa Rica, consistently achieve higher levels of innovation performance. In contrast, Venezuela, Nicaragua, Honduras, Guatemala, Bolivia, and Ecuador illustrate the negative relationship between weak institutions and low innovation performance. As shown in Figure 1, these economies are located in the lower-left quadrant, where limited institutional quality coincides with low levels of innovation. Venezuela represents the most critical case, combining institutional collapse with minimal investment in research and development. Central American economies such as Honduras, Nicaragua, and Guatemala face structural challenges including weak rule of law, political instability, and low public investment in higher education, which together hinder their capacity to adopt and diffuse new technologies. Similarly, Bolivia and Ecuador have attempted to expand public investment in education and agricultural research, yet weak regulatory frameworks and political volatility have curtailed their effectiveness.

This evidence reinforces the argument that innovation does not thrive in institutional vacuums: as Donges, Meier, & Silva [3] demonstrate, inclusive and stable institutions are fundamental to sustaining technological progress. Gutiérrez Cano et al. [4] highlight that agricultural innovation systems depend on the interaction of R&D, training, and extension services, all of which are undermined in contexts of weak governance. More broadly, Finger [1] emphasizes that digital innovations in agriculture require robust institutional frameworks to ensure effective adoption and long-term impact [3,4]. This evidence reinforces the argument presented above, agricultural innovation in Latin America cannot be explained solely by technological breakthroughs. Rather, the ability of countries to translate these innovations into tangible

improvements in productivity and sustainability depends critically on the robustness of their institutional environments. Stronger governance, transparent regulations, and effective support systems provide the foundation upon which biotechnology, digital tools, and precision agriculture can thrive.

Figure 1: Institutional Quality and Innovation Performance in Latin America, 2024.

National Experiences and the Role of the Private Sector

The stronger institutional quality found in countries such as Brazil, Chile, Costa Rica, and Uruguay has significantly benefited the private sector, fostering more active participation in agricultural R&D activities. In Brazil, for instance, private companies have made substantial contributions to the development of new and improved varieties of soybeans, maize, sugarcane, fruits, and vegetables. Similarly, in Chile and Mexico, the private sector has played a key role in driving the introduction of new horticultural varieties, particularly grapes, avocados, and vegetables. Costa Rica, in turn, has consolidated its position as an important hub for private R&D due to the concentration of multinational companies that have established research centers in the country [5,6].

Conclusion

One of the key lessons for Latin America is that, without strong institutions, agricultural innovation becomes a privilege accessible only to a few. Institutional strengthening ranging from ensuring legal security over land tenure to promoting initiatives that encourage investment in agricultural R&D constitutes an essential condition for the region to fully harness the potential of innovative agriculture in the face of challenges such as climate change, food security, and global competition.

References

1. Finger, Robert (2023) Digital innovations for sustainable and resilient agricultural systems. European Review of Agricultural Economics 50(4): 277-1309.
2. Addorisio R, Spadoni R, Maesano G (2025) Adoption of Innovative Technologies for Sustainable Agriculture: A Scoping Review of the System Domain. Sustainability 17(9): 4224.
3. Donges A, Meier Jean M, Silva RC (2022) The Impact of Institutions on Innovation. Management Science 69(4): 1951-1974.
4. Gutiérrez Cano LF, Zartha Sossa JW, Orozco Mendoza GL, Suárez Guzmán LM, Agudelo Tapasco DA, et al. (2023) Agricultural innovation system: analysis from the subsystems of R&D, training, extension, and sustainability. Front Sustain Food Syst 7: 1176366.
5. Alejandro NinPratt, Gert-Jan Stads, Luis de Los Santos, Gonzalo Muñoz (2023) Unlocking innovation: assessing the role of agricultural R&D in Latin America. Inter-American Development Bank.
6. Soko Nyembezi N, Kaitibie Simeon, Ratna Nazmun N (2023) Does institutional quality affect the impact of public agricultural spending on food security in Sub-Saharan Africa and Asia? Global Food Security 36: 100668.

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