

Analysis of the knowledge structure evolution of agricultural credit granting

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Introduction

Agricultural credits are financial instruments that are difficult for farmers to access due to their operational instability (Bada Carbajal et al., 2017), the effects of the dynamics of the environment, and the characteristics of the sector itself (Navarro & Pedroso, 2017). Therefore, the rejection of a credit increases the farmer's perception of risk regarding their agricultural production (Diyyala et al., 2025), which negatively affects the operationalization of the supply chain and, consequently, compromises food sustainability (Housni & Lares-Michel, 2024).

Given that fact that farmers are key agents in maintaining global food security (Giller et al., 2021), on one hand, various institutions report to have sought mechanisms (technical assistance and access to credit) to increase farmers' production and, as a result, improve their income (United Nations, 2015). On the other hand, the scientific literature has focused on analyzing the role of firms in granting credit (Belas et al., 2018), and on credit risk management (Castillo et al., 2018).

In this context, it is necessary to explore the scientific literature of those research that focuses on farmers in order to identify relevant elements and mechanisms developed worldwide, which can be replicated or used to design practices that promote sustainable agricultural credit provision to them.

Research Design

A co-occurrence analysis (Callon et al., 1991; Cobo et al., 2011) of authors' keywords was conducted using thematic maps or strategic diagrams, which are part of the science mapping technique in bibliometrics (Donthu et al., 2021). The data were obtained from Scopus (Klarin, 2024) on December 8, 2025, by using the final search string: (TITLE-ABS-KEY ("agricultur* financing" OR "agricultur* credit" OR "agricultur* lending" OR "agricultur* loan*") AND TITLE-ABS-KEY (producer* OR smallholder* OR farmer* OR peasant* OR grower*)) AND (LIMIT-TO (DOCTYPE, "ar") OR LIMIT-TO (DOCTYPE, "re")), which resulted in 719 documents. The database was downloaded, cleaned and subsequently analysed using Bibliometrix (Aria & Cuccurullo, 2017).

Preliminary Results

The analyzed dataset (n = 719) covers a period of just over a century, from 1914 to 2025, including 1,782 authors and 1,575 authors' keywords. This study uses these keywords to create four strategic diagrams (**Figure 1**), derived from four-time segments of an evolutionary map: 1914–2011, 2012–2019, 2020–2022, and 2023–2025; algorithmic outputs generated by Bibliometrix. The strategic diagrams, composed of two dimensions, centrality (x) and density (y) help visualize the categorical evolution of thematic clusters in the credit granting to farmers, based on four quadrants: basic themes, motor themes, niche themes, and declining or emerging themes. Based on what is shown in the four diagrams (**a–d**), in **Figure 1**, the following can be identified: (1) concepts that founded the topic, such as “*credit*,” “*nigeria*,” and “*credit*”; (2) others that have disappeared, such as “*brazil*” and “*deforestation*”; (3) those that have persisted, such as “*agricultural credits*” and “*Pakistan*”; (4) those that have transformed, such as “*women*” → “*gender*,” “*credit*” → “*credit risk*”;

(5) analytical tools, such as “*propensity score matching*” and “*logistic regression model*”; and (6) trending topics that may consolidate in the coming years, such as “*climate change adaptation*” and “*food security.*”

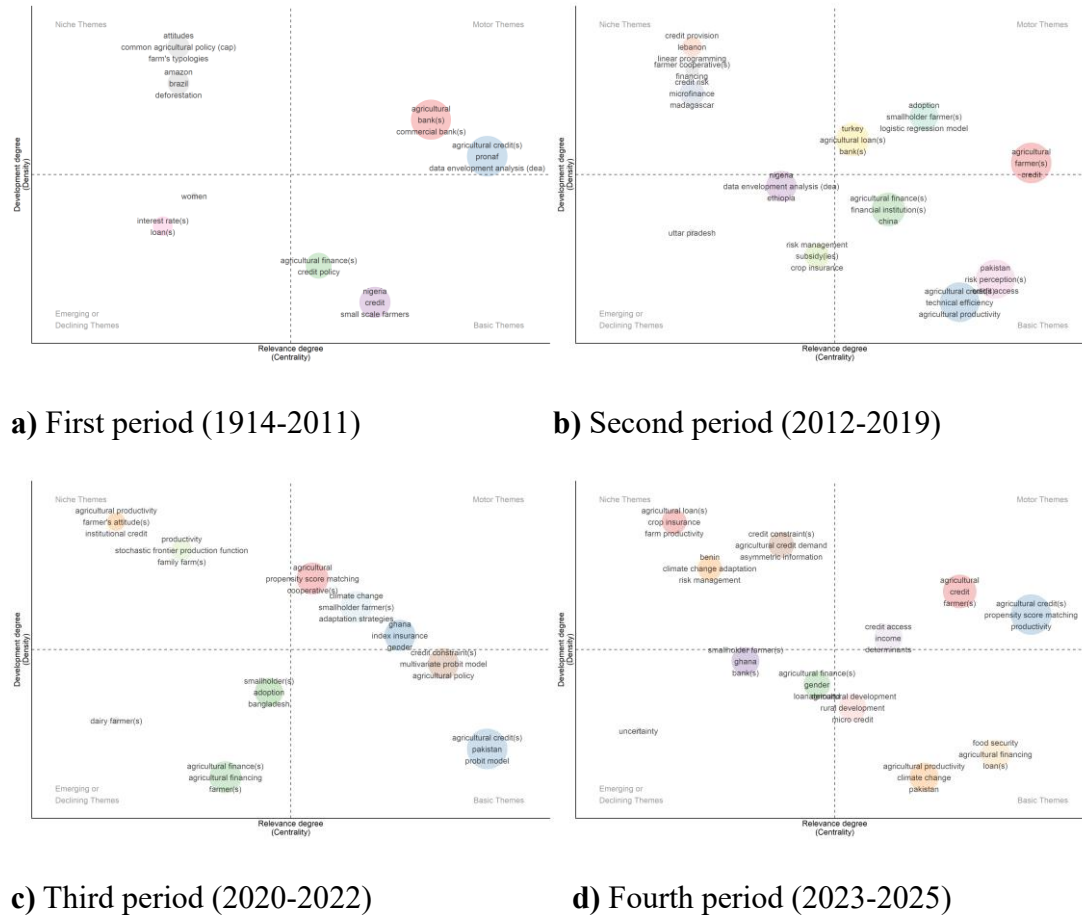


Figure 1. Strategic diagrams by period of thematic evolution.

Preliminary Conclusions

These initial results demonstrate that the topic has grown and evolved across different thematic areas that may be of interest to various stakeholders in the agricultural sector, such as governments, organizations, and firms. The objective of this research was at the time different key elements, instruments, and other themes were identified in the scientific literature. Future analyses aim to delve deeper into the identified clusters to determine their relationship with other topics through co-word networks within the same software.

References

- Aria, M., & Cuccurullo, C. (2017). bibliometrix : An R-tool for comprehensive science mapping analysis. *Journal of Informetrics*, 11(4), 959–975.
<https://doi.org/10.1016/j.joi.2017.08.007>
- Bada Carbajal, L. M., Rivas Tovar, L. A., & Littlewood Zimmerman, H. F. (2017). Model of associativity in the production chain in Agroindustrial SMEs. *Contaduría y Administración*, 62(4), 1100–1117. <https://doi.org/10.1016/j.cya.2017.06.006>
- Belas, J., Smrcka, L., Gavurova, B., & Dvorsky, J. (2018). The impact of social and economic factors in the credit risk management of SME. *Technological and Economic Development of Economy*, 24(3), 1215–1230. <https://doi.org/10.3846/tede.2018.1968>
- Callon, M., Courtial, J. P., & Laville, F. (1991). Co-word analysis as a tool for describing the network of interactions between basic and technological research: The case of polymer chemistry. *Scientometrics*, 22(1), 155–205.
<https://doi.org/10.1007/BF02019280>
- Castillo, J. A., Mora-Valencia, A., & Perote, J. (2018). Moral hazard and default risk of SMEs with collateralized loans. *Finance Research Letters*, 26, 95–99.
<https://doi.org/10.1016/j.frl.2017.12.010>
- Cobo, M. J., López-Herrera, A. G., Herrera-Viedma, E., & Herrera, F. (2011). An approach for detecting, quantifying, and visualizing the evolution of a research field: A practical application to the Fuzzy Sets Theory field. *Journal of Informetrics*, 5(1), 146–166.
<https://doi.org/10.1016/j.joi.2010.10.002>
- Diyyala, R., Wang, Q. J., Mushtaq, S., Palanichamy, N. V., Muruganathi, D., Geethalakshmi, V., & Rajavel, M. (2025). Risk attitude and risk perceptions of climate change among Indian cotton farmers. *Scientific Reports*, 15(1), 19550.

<https://doi.org/10.1038/s41598-025-99125-2>

Donthu, N., Kumar, S., Mukherjee, D., Pandey, N., & Lim, W. M. (2021). How to conduct a bibliometric analysis: An overview and guidelines. *Journal of Business Research*, 133, 285–296. <https://doi.org/10.1016/j.jbusres.2021.04.070>

Giller, K. E., Delaune, T., Silva, J. V., Descheemaeker, K., van de Ven, G., Schut, A. G. T., van Wijk, M., Hammond, J., Hochman, Z., Taulya, G., Chikowo, R., Narayanan, S., Kishore, A., Bresciani, F., Teixeira, H. M., Andersson, J. A., & van Ittersum, M. K. (2021). The future of farming: Who will produce our food? *Food Security*, 13(5), 1073–1099. <https://doi.org/10.1007/s12571-021-01184-6>

Housni, F. E., & Lares-Michel, M. (2024). Food System vs. Sustainability: An Incompatible Relationship in Mexico. *Sustainability*, 16(7), 2811. <https://doi.org/10.3390/su16072811>

Klarin, A. (2024). How to conduct a bibliometric content analysis: Guidelines and contributions of content co-occurrence or co-word literature reviews. *International Journal of Consumer Studies*, 48(2), 1–20. <https://doi.org/10.1111/ijcs.13031>

Navarro, Z., & Pedroso, M. T. M. (2017). A agricultura familiar no Brasil: da promessa inicial aos impasses do presente. *Revista Econômica Do Nordeste*, 7–20. <https://doi.org/10.61673/ren.2014.495>

United Nations. (2015). *Transforming our world: The 2030 agenda for sustainable development*. <https://sustainabledevelopment.un.org/content/documents/21252030>
Agenda for Sustainable Development web.pdf