

Scientific Evidence for Formulating Public Policies Aimed at Rural Development: The Role of Scientific Dissemination

By Cristiane Bernardo*

This article aims to analyze how scientists in the field of sustainable rural development provide scientific evidence for public policies on sustainable rural development and the role of scientific dissemination in this process. To this end, the research topics and researchers were selected based on a report prepared by Bori-Overton (2025). Analyzing those researchers as influential in government policy documents, the research highlights a significant geographic concentration in São Paulo and Rio de Janeiro, a notable gender gap, and a thematic focus on ecosystems and land use. Findings suggest that media visibility, institutional prestige, and geographic location are key drivers of scientific influence, with traditional press and YouTube playing central roles. Ten researchers were also interviewed, who shared their views on how they use evidence to inform public policy. The study concludes that strengthening structured science communication is crucial to create a connection between academia and policymakers, fostering more sustainable, evidence-based rural development in Brazil. A gap persists between technical scientific output and the needs of policymakers, who require accessible communication over academic jargon. Preliminary findings suggest that researchers who successfully create this connection often benefit from institutional prestige, proximity to major urban centers, and leadership in high-impact fields.

Keywords: *scientific dissemination, scientific evidence, public policies, sustainable rural development, policymakers*

Introduction

The recent global crises that society has been facing, such as COVID-19; refugee issues; opioid epidemics; global warming; and many others, have made it even more evident how important and necessary it is for policymakers¹ to use scientific research to develop more effective public policies (Crowley et al. 2021).

These complex social, economic, demographic, technological, environmental, and cultural challenges are multiplying and becoming more constant every day, and, in this sense, the need to address them is also becoming urgent. According to Powell et al. (2018), such complex problems must be solved by combining different types of knowledge, among which they list political, cultural, and contextual awareness in combination with theoretical knowledge; empirical research knowledge associated with

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¹For the purposes of this research, policymakers will be considered to include both those with decision-making power and those who perform analytical and advisory functions in the development of public policies.

the experiential knowledge of policymakers, professionals, service users, and citizens in general. Such arrangements are part of the process of knowledge mobilization.

Levin (2008) defines knowledge mobilization as the process of bringing high-quality information to the right people, in the right format and at the right time, in order to influence decision-making. Thus, knowledge mobilization includes the dissemination, transfer, and translation of scientific knowledge that can be fundamental to public policy analyses. However, approaching public policy from this perspective cannot ignore the disputes waged by the different groups and actors who will define the public.

Therefore, it can be said that it is impossible to analyze the policy context without examining the disputes waged by the various actors involved in the process of setting an agenda and, consequently, the alternatives presented. Riege and Lindsay (2006) assert that public policies, in general, are based on social and behavioral theories and are influenced by the interests that a given government prioritizes and, to that end, allocates public resources for that purpose. The authors further assert that the deeper the knowledge underpinning a policy, the greater its likelihood of success.

According to Silva et al. (2017), although there is a consensus on the positive relationship between the use of scientific evidence² and determining where the government should optimally allocate resources, this relationship does not automatically materialize in practice. In this sense, the collaboration between science and policymakers becomes extremely important, as the former provides the necessary groundwork so that public policies can be based on solid evidence grounded in high-quality research. For a type of evidence to be relevant to use in policy formulation, it must be relevant, representative, and reliable (Solesbury 2001).

In this regard, scientific dissemination can play a crucial role in helping public policymakers and society at large understand research findings, effectively reducing denialism and fostering a culture grounded in scientific evidence (Bernardo & Gleiser 2022). Although there are many concepts of scientific dissemination, this article draws on the concept of scientific dissemination proposed by Bernardo and Gleiser (2022, p. 23), according to whom it is

a set of activities that fosters dialogue—either indirectly or directly—between scientists and public outpeers, with the overall goal of raising public awareness of science and specific objectives including the democratization of knowledge; citizen empowerment; the promotion of institutional visibility; the presentation of the beauty of science (wonder); scientific literacy (educational); supporting public policy and stimulating interdisciplinary research.

It should be noted that the definition adopted in this article already sets as its specific objective the use of scientific dissemination to inform the formulation of public policy. In Brazil, the use of scientific dissemination for this purpose is not yet a common practice, and even where it is, no studies have yet evaluated its

²For the purposes of this research, scientific evidence will be defined, according to Silva et al. (2017, p. 31) as “knowledge produced from data and the use of rules and procedures known and shared by the community, identified with the scientific method.

effectiveness. Effective initiatives are already underway in countries such as the United States, where the American Association for the Advancement of Science (AAAS)—the world's largest multidisciplinary scientific society—has undertaken various efforts to bring scientists and public policymakers together, with the aim of promoting the use of scientific evidence. The association even maintains a network that brings together scientists and policymakers—the Local Science Engagement Network (LSEN).

In this context, it is clear that it is extremely important to examine the practices employed by scientists who have provided scientific evidence for Brazilian public policies, in order to assess the role of scientific dissemination among these practices. With regard to the provision of scientific evidence specifically geared toward public policies for sustainable rural development in Brazil, certain scientists have stood out. A report prepared by Overton (an international platform that aims to map the interface between science and public policy) and Agência Bori (an agency that seeks to connect Brazilian science and knowledge production to society through the media) highlighted 107 Brazilian scientists who influenced documents used by governments to inform public policy between 2019 and 2025, among whom 44 conduct research directly or indirectly related to sustainable rural development, with perspectives focused on land use, ecosystems, climate change, food and nutrition, economics and finance, and sustainability (Bori-Overton 2025).

In this regard, seeking to address this gap, this research aims to analyze how scientists in the field of sustainable rural development provide scientific evidence for public policies on sustainable rural development and the role of scientific dissemination in this process. The report prepared by Bori-Overton (2025) served as the basis for selecting the research topics and the researchers included in this study.

The following sections are organized as follows: a literature review, which presents the main concepts used in this article, notably public policy, scientific evidence, rural development, and scientific dissemination. The following section describes the research methodology used to develop the article, which includes a literature review, document analysis, and the administration of a survey. Subsequently, the results found in both the Bori-Overton (2025) report and the data obtained from the questionnaires are presented and discussed. The article concludes with the findings and the references used.

Literature Review

According to Bevilacqua et al. (2021), the reasons for the lack of use of scientific evidence in public policy stem from various factors, including access to research; the training of policymakers; comprehension ability; the nature of the policy; and even the difficulty in discerning high-quality research. According to Silva et al. (2017), in addition to the difficulties already mentioned, Science, Innovation, and Technology (SIT) are only taken into consideration in the Brazilian National Congress if they serve the interests of the groups that dominate the country's politics, leaving public interests in the background.

Faria and Sanches (2022) summarize several factors that hinder the incorporation of high-quality scientific evidence into public policy-making, namely: the provision

of inadequate or inaccessible information; scientists' limited understanding of the public policy-making process and unrealistic recommendations; inefficient dissemination of research results; lack of knowledge and even ignorance among public policymakers; low capacity of public policymakers; "politicization" of research, selected to legitimize decisions already made; discrepancies and gaps in understanding among scientists, the public, and public policymakers; a time lag between the dissemination of research results and their impact on policy; failure to address the political and even ideological interests of public policymakers; and the fact that certain forms of knowledge are considered more valid than others.

Dias et al. (2015), referring to the health sector, highlight the lack of communication and collaboration between scientists and policymakers as one of the most significant barriers in the use of scientific evidence in the development of such plans. There is also the question of how scientific information reaches policymakers. It is well known that research results are published by scientists in scientific journals, written in jargon and intended for peer review, and are often incomprehensible to professionals in other fields.

However, initiatives already documented in the literature suggest that such barriers could be overcome if there were sufficient interest. And although scientists have often mobilized to contribute to important issues where science would be decisive, they do not always achieve effective participation. An iconic Brazilian example of these efforts, undertaken practically in vain, concerns the amendment to the Forest Code. According to Carneiro and Silva Rosa (2018), although it is a topic of broad relevance to society, scientists' participation in the amendments to the Brazilian Forest Code occurred solely through initiatives by the scientists themselves and, for that very reason, took place when discussions were already well advanced in the National Congress. It took considerable insistence by the scientific community on political bodies for them to be able to present research findings and participate in the discussions. The authors report that "unfortunately, the scientists' efforts were practically in vain; their important contributions were scarcely incorporated into the final text of the law" (Carneiro & Silva Rosa 2018, p. 334).

In this sense, scientific dissemination becomes a vital pillar for both society and public officials to understand research, combating denialism, and fostering a culture of evidence (Bernardo & Gleiser 2022). According to Innvaer et al. (2002), this communication is key to breaking down barriers to dialogue between scientists and policymakers. However, the field faces challenges, as the lack of precision regarding the concept of public participation undermines both theory and practice (Rowe & Frewer 2005). In Brazil, Bueno (2010) emphasizes that the lack of conceptual refinement in the literature makes it difficult to clearly define the limits of communication and scientific dissemination.

Koga et al. (2020) emphasize that public policy-making is a multifaceted process, which makes it crucial to identify policymakers' sources of information. For Hutchings and Stenseth (2016), and Hutchings (2022), the success of this process lies in "scientific advice," which uses accessible communication to create a connection between science and government. This practice takes various forms: Breviglieri et al. (2019) explore the use of documentaries in climate policy, while Pugel et al. (2022) analyze email as a direct channel. However, Purtle et al. (2017)

highlight the urgent need for studies that test the actual effectiveness of these different dissemination strategies.

Böcher (2008) argues that scientific dissemination is essential for evidence-based rural development policies, treating information as a strategic resource for policy solutions. Similarly, Kumar (2022) argues that scientists and government agencies share a social responsibility to promote technologies and policies for rural areas. In Brazil, this agenda gained momentum under European influence, prioritizing a territorial approach to strengthen the network of actors (Hentz & Aparecida de Medeiros Hespanhol 2019). For Schneider (2004), the success of this model in the country depends on four pillars: social actors, rural poverty, territory, and the environment, allowing rural programs to transform the space beyond agriculture and legitimize local actors.

From the perspective of Stumpf and Balsadi (2015), rural development emerges as a new paradigm in light of the inadequacy of the sectoral approach to mitigating historical problems of exclusion and poverty. This model responds to the urgent need for sustainable production processes in the face of environmental damage caused by extensive agriculture and livestock farming, taking the form of a multidimensional dynamic. It brings together diverse actors and institutions—from farmers to universities and public managers. Furthermore, this perspective embraces the sociopolitical identities of the countryside, integrating indigenous peoples, traditional communities, and family farmers as key players in the sector.

The complexity of the Brazilian rural landscape requires science and public policy to work in tandem to promote sustainable growth. As Stumpf Junior and Balsadi (2015) point out, the impact of agricultural research is shaped by policies that extend beyond the productive sector, ranging from credit and logistics to fundamental rights such as health and education. Thus, rural development must be treated as a cross-cutting issue, bringing together social, environmental, and economic dimensions.

Methodology

This study adopts a multi-stage approach grounded in the theory of knowledge mobilization to map and understand the flow of scientific evidence into public policies. To provide a rigorous and replicable empirical baseline, the methodological design was structured as follows:

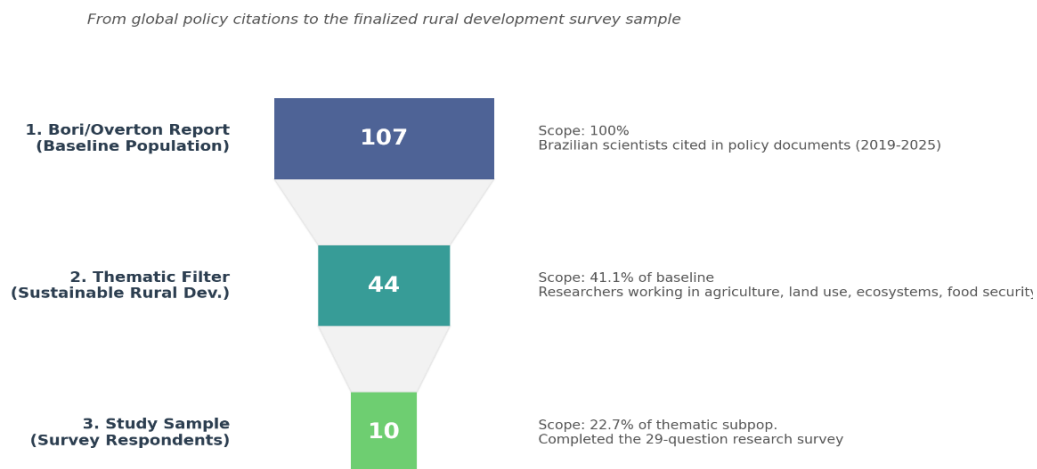
Sample Selection of Scientists

The target population was defined based on the Bori-Overton (2025) report, which identified 107 Brazilian scientists whose research was cited in public policy documents between 2019 and 2025. To narrow the focus to sustainable rural development, we applied thematic filters, identifying 44 researchers whose work relates—directly or indirectly—to this field. The selected policy areas encompass agriculture, food and nutritional security, territorial development, and the environment. The 44 researchers identified in the report were further investigated

through systematic searches of media outlets and social media platforms, particularly LinkedIn and YouTube. Searches were conducted using the researchers' names and research areas as search strings to identify their media presence, public engagement, and dissemination of scientific knowledge.

From the defined subpopulation of 44 eligible scientists, 10 participated in the study and completed the research instrument, representing a response rate of 22.7% over the 30-day data collection period. Participants were invited by email, and the questionnaires were administered via Google Meet and recorded with the respondents' consent. Given the voluntary nature of participation, the resulting sample was a convenience sample (Figure 1).

Figure 1. Methodological Funnel of Study Sample Selection



Source: Prepared by author based on the Bori-Overton (2025) Report.

The analysis of responses from the 10 researchers underscores the exploratory nature of the study and enabled a more in-depth qualitative examination of the data, particularly the responses to the open-ended questions.

Survey Administration

Data collection was conducted through a structured online survey consisting of 29 questions. In total, the questionnaire comprises 11 open-ended and 18 closed-ended questions. The open-ended questions collect information on the researchers' names, affiliated institutions, years of professional experience, age, the areas in which their research has contributed scientific evidence, the barriers that hinder researchers from providing evidence for public policy, and their suggestions for institutional actions to strengthen dialogue and promote the use of evidence in public policy. The 18 closed-ended questions were designed to identify the channels most frequently used for science communication and to assess respondents' levels of agreement with statements and the frequency with which they engage in activities related to science communication and public policy formulation.

The questionnaire was designed to profile the scientists and gather data to test eight core hypotheses regarding the interface between science and public policy: (1)

Sources of evidence; (2) Policy area for rural development; (3) Communication channels; (4) Policy beneficiaries; (5) Attributes of the scientist; (6) Structural factors; (7) Organizational factors; and (8) The quality of the relationship between scientists and public policymakers. The instrument combined closed-ended questions (designed to measure levels of consensus and agreement) with open-ended fields, allowing participants to provide qualitative explanations of their experiences, barriers, and perceived communication challenges.

Data Analysis

Survey responses were analyzed using a mixed-methods framework:

- **Quantitative Analysis:** Closed-ended questions were analyzed by mapping the consensus levels among the respondents, categorizing their feedback into distinct levels of agreement (e.g., complete agreement, partial agreement, or partial disagreement) across the eight proposed hypotheses.
- **Qualitative Analysis:** Open-ended responses and qualitative commentary were subjected to thematic analysis to extract primary barriers, motivators, and institutional recommendations.
- **Triangulation:** The empirical findings from the survey were triangulated with the theoretical literature on knowledge mobilization barriers and the data obtained regarding the researchers from media and social networks and the Bori-Overton (2025) report.

Note: This research was approved by the Research Ethics Committee via the Plataforma Brasil system, under CAAE No. 93336925.2.0000.5663.

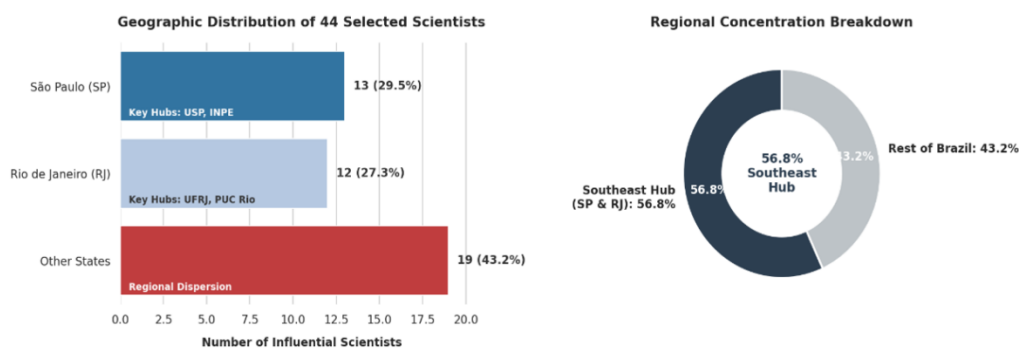
Results and Discussion

The results presented reveal a complex and strategic landscape regarding the intersection between science and sustainable rural development policies in Brazil. Analysis of these data highlights both the practical impact of scientific knowledge and the structural challenges of representation and communication.

The initial analysis focused on the 44 researchers identified in the Bori-Overton (2025) report whose research addresses sustainable rural development. The predominance of researchers from Brazil's Southeast region—particularly São Paulo (13), with strong representation from institutions such as the University of São Paulo (USP) and the National Institute for Space Research (INPE), and Rio de Janeiro (12), including the Federal University of Rio de Janeiro (UFRJ) and the Pontifical Catholic University of Rio de Janeiro (PUC-Rio)—reveals a concentration of policy-relevant scientific production within established academic and technological centers (Figure 2). This geographical concentration is analytically relevant because rural development is inherently territorial and encompasses highly diverse social, economic, environmental, and productive contexts. Although the concentration of researchers in these institutions does not, in itself, imply a lack of quality or relevance, it may shape

which rural issues are investigated, which forms of knowledge gain greater visibility, and which types of evidence become more accessible to policymakers. Moreover, the proximity of these institutions to major political and governmental centers may facilitate interaction between researchers and policymakers, potentially contributing to the greater visibility and mobilization of their research in policy processes. Thus, the findings suggest that the distribution of scientific capacity should be considered when assessing the representativeness and diversity of the evidence available for rural policy formulation. In this context, evidence-based policymaking requires not only evidence that is scientifically robust and reliable, but also evidence that adequately reflects the diversity of territories, populations, and challenges that rural policies seek to address.

Figure 2. *Centralization of Influential Scientific Production in Traditional Hubs*



Source: Prepared by the author based on Bori-Overton (2025).

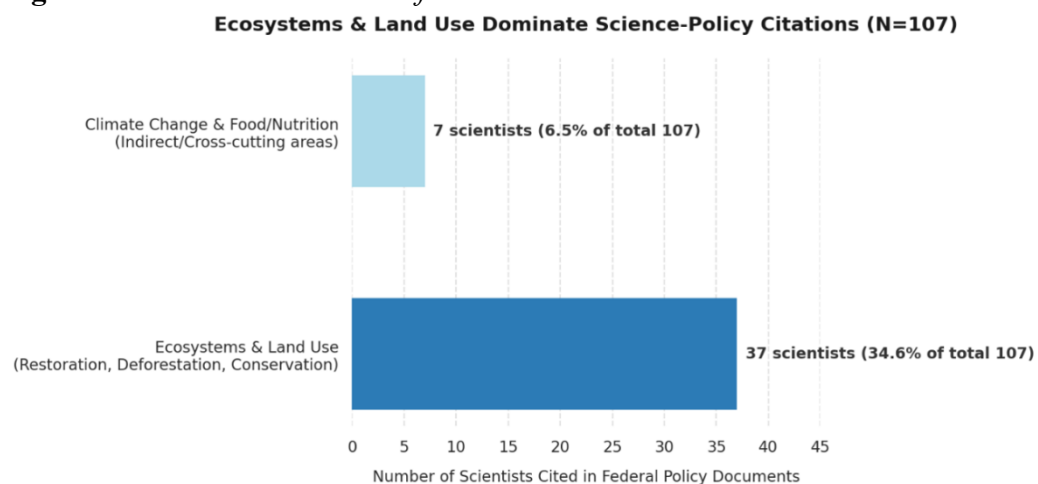
A critical issue is the underrepresentation of women among the researchers identified in the Bori-Overton (2025) report. Women account for only 20.4% of the scientists in the report overall, and this proportion falls to 15.9% among those working on sustainable rural development. This disparity is particularly relevant to knowledge mobilization because the production and use of scientific evidence are not neutral processes; they are shaped by the experiences, perspectives, and networks of the actors involved. As Powell et al. (2018) argue, effective knowledge mobilization requires the integration of different forms of knowledge and perspectives to address complex problems. In the context of rural development, where policy challenges intersect with social, economic, cultural, and territorial dimensions, the underrepresentation of women may constrain the range of experiences and perspectives incorporated into the production and mobilization of evidence. This does not imply that female researchers necessarily produce different or more socially relevant evidence, but rather that a more balanced representation may broaden the diversity of perspectives available within science-policy interactions. The finding therefore points to gender representation not only as an issue of equity within the scientific system, but also as a potential dimension of the diversity and inclusiveness of the evidence base informing rural public policies.

The Bori-Overton (2025) report identifies 44 scientists whose research is relevant to sustainable rural development. Among them, 37 (35%) have research

cited in policy documents addressing ecosystems and land use, particularly studies on restoration, deforestation, conservation, climate regulation, and the provision of ecosystem services. This pattern is analytically significant because it suggests that environmental and land-use research constitutes an important pathway through which scientific evidence enters policy debates related to rural development. The prominence of these topics also reflects the strategic role of Brazilian research in addressing issues with both national and global implications, particularly those related to the Amazon, biodiversity conservation, climate change, and sustainable land use.

The inclusion of an additional seven scientists whose research on climate change and food and nutrition is directly or indirectly related to sustainable rural development results in a final sample of 44 scientists (Figure 3). Rather than representing a homogeneous research field, this group illustrates the interdisciplinary and multidimensional nature of contemporary rural development research. This finding is consistent with the paradigm described by Stumpf Junior and Balsadi (2015), which moves beyond a predominantly sectoral and agricultural perspective toward an approach that integrates environmental, economic, social, and political dimensions. The composition of the sample therefore suggests that the scientific evidence mobilized in relation to rural development extends beyond agricultural production itself, encompassing broader questions of environmental sustainability, food systems, climate governance, and land-use management. This multidimensionality is particularly relevant to science–policy interactions because it implies that addressing rural development challenges requires evidence produced across different fields of knowledge and connected to multiple policy domains.

Figure 3. *The Thematic Anchor of the Selected Authors*



Source: Bori-Overton (2025) Report based on 44 scientists in Sustainable Rural Development.

Ultimately, the incorporation of research produced by these scientists into climate treaties and policy frameworks for environmental management indicates that scientific knowledge can extend beyond academic production and become embedded in high-level policy processes (Bori-Overton 2025). Among the policies and policy-related instruments that draw on research produced by the 44 scientists

whose work intersects with sustainable rural development are those addressing agricultural expansion and its impacts, the restoration of degraded areas, and the monitoring of tropical forest loss. These cases are particularly relevant because they illustrate that the policy use of scientific evidence is not limited to the identification or diagnosis of rural problems; research findings can also contribute to defining policy priorities, establishing monitoring parameters, and designing strategies for environmental restoration and climate governance. In this sense, the Bori-Overton (2025) findings provide evidence of a science-policy interface in which scientific knowledge is translated into information and parameters that can support concrete governmental decisions. At the same time, the presence of scientific evidence in policy documents does not necessarily imply a direct or linear transfer from research to policy. Rather, it suggests a process of knowledge mobilization in which the visibility, accessibility, credibility, and relevance of scientific findings may influence their uptake by policymakers. This perspective reinforces the importance of examining not only whether scientific evidence reaches policy processes, but also the mechanisms through which it becomes visible, accessible, and usable to decision-makers.

A second stage of the research sought information about the 44 researchers in the press, media, and on social media, particularly on the professional networking site LinkedIn. A search of major Brazilian media outlets reveals an important pattern in the relationship between scientific visibility and policy relevance. The scientists whose research is most frequently cited in rural development policy documents also tend to receive greater attention from the traditional media, including invitations for interviews and requests to comment on current events. However, this visibility does not appear to result primarily from their own active engagement in social media. On LinkedIn, for example, the six scientists with more than 500 citations in public policy maintain profiles but display limited activity, while institutional accounts and other researchers frequently mention and disseminate their work. Similarly, searches on YouTube reveal a substantial audiovisual presence, with some of these highly cited scientists appearing in more than 600 videos, including interviews, lectures, debates, and courses. Taken together, these findings suggest that scientific visibility in the public sphere may depend less on researchers' individual efforts to communicate and more on the existence of intermediary networks involving journalists, scientific institutions, universities, and professional peers. This is particularly relevant to knowledge mobilization because such intermediaries may determine which researchers and which bodies of evidence become visible to broader audiences and, potentially, to policymakers. Thus, scientific communication should not be understood solely as a direct relationship between scientists and the public; it also involves communication networks that can amplify, filter, and legitimize scientific knowledge. In this context, the prominent role of the press may help explain why some researchers become recurrent references in public policy debates, even when their personal engagement in digital communication is relatively limited.

Finally, the questionnaire results offer a complementary perspective on this process. All respondents agreed that high-quality scientific evidence contributes to the effectiveness of public policies. This consensus aligns with Riege and Lindsay (2006), who emphasize the importance of evidence in strengthening policy outcomes,

and with Silva et al. (2017), who highlight the need to foster closer ties between scientists and policymakers so that scientific knowledge can provide a robust basis for policy formulation. However, the convergence between the documentary findings and the survey results also points to an important distinction: recognizing the value of high-quality evidence does not necessarily guarantee its incorporation into policy-making processes. The fact that highly cited researchers also gain greater media visibility suggests that the mobilization of evidence may depend not only on its scientific quality but also on the communication channels, networks, and institutional relationships through which it circulates. In this regard, scientific communication can act as a mechanism that enhances the visibility and accessibility of evidence, potentially facilitating its transition from academic production to broader spheres involving the public and policy-making.

Scientists partially agreed that evidence used in public policymaking is predominantly produced by public research institutions, while there was complete agreement that evidence originating from prestigious institutions is more frequently used. Taken together, these findings suggest that the incorporation of scientific evidence into policy may be shaped not only by the quality or availability of research, but also by the institutional reputation of the organizations that produce it. Institutional prestige may function as a form of epistemic authority, increasing the visibility and perceived credibility of scientific findings among policymakers. This raises an important question, however, about whether evidence produced by less prestigious or less visible institutions faces greater barriers to entering policy processes, even when it is scientifically robust.

Regarding policy areas related to rural development, the respondents partially agreed that environmental policymakers make greater use of scientific evidence than policymakers in other areas. This perception may be associated with both the extensive scientific literature available on environmental issues and the scale and complexity of the challenges involved, which have implications across multiple policy domains. The interviews, however, revealed an important tension: although respondents recognize the existence of a substantial body of high-quality research on issues such as land use and deforestation, they also perceive these issues as highly politicized. In such contexts, the availability of robust evidence does not necessarily translate into its incorporation into policy decisions. Rather, the mobilization of evidence may be mediated by political interests, institutional priorities, and conflicts among stakeholders.

From the interviewees' perspective, this politicization can lead to situations in which scientific evidence is selectively mobilized—used to support or legitimize decisions that have already been politically defined, while evidence that challenges dominant interests may receive less attention. This interpretation is consistent with Faria and Sanches (2022), who highlight the political and institutional barriers that can constrain the incorporation of high-quality scientific evidence into public policymaking. The findings therefore suggest that the science-policy interface cannot be understood solely in terms of the production of high-quality evidence. It also depends on the political context in which evidence is interpreted, selected, communicated, and ultimately mobilized. This distinction is particularly important for rural development, where decisions concerning land use, deforestation,

agricultural expansion, and environmental conservation involve competing economic, social, and political interests.

When asked about the communication channels used to convey scientific evidence to public policymakers, the scientists partially disagreed that scientific articles constitute a primary channel through which evidence reaches policymakers. Although policymakers with expertise in a particular field—and, in some cases, scientists themselves—may consult the scientific literature directly, the respondents characterized this practice as the exception rather than the rule. In contrast, they indicated that scientific evidence more frequently reaches policymakers through reports produced by groups of researchers working collaboratively on specific policy issues, often in response to requests from policymakers or government ministries. This finding suggests that the accessibility and usability of scientific evidence may be as important as its availability. Rather than relying directly on individual scientific articles, policymakers may benefit from synthesized and contextualized forms of evidence that translate specialized research into information more readily applicable to specific policy questions.

One respondent further noted that such collective initiatives tend to emerge when scientists perceive an issue as particularly urgent or consequential. The mobilization of scientific expertise around Brazil's Forest Code and the production of reports by the Intergovernmental Panel on Climate Change (IPCC) illustrate how scientific communities can organize to bring consolidated evidence into politically relevant debates. These examples also reveal, however, that the production and communication of evidence do not guarantee its incorporation into policy decisions. The case of the Forest Code, in particular, illustrates the tension between scientific mobilization and political decision-making: despite efforts by the scientific community to contribute evidence to the debate, much of this input was reportedly not incorporated into the final legislative text, as discussed by Carneiro and Silva Rosa (2018). This suggests that the science-policy interface is not simply a matter of improving the transmission of scientific information. It is also a process of negotiation in which evidence competes with political interests, institutional priorities, and other forms of knowledge and expertise. From this perspective, science communication may contribute not only by disseminating scientific findings, but also by synthesizing, contextualizing, and translating evidence in ways that increase its accessibility and potential usability within policy processes.

With regard to scientific dissemination, the respondents perceive it as an important mechanism for increasing the visibility and accessibility of scientific evidence among public policymakers. However, they also indicate that its potential remains underexplored in Brazil, with only a limited number of isolated initiatives. This perception points to an institutional gap between the recognized importance of communicating science and the resources and structures available to support such activities. Several scientists argued that funding agencies should provide greater financial support for scientific dissemination, emphasizing that effective communication cannot be ensured simply by requiring researchers to engage in outreach activities without providing appropriate training, institutional support, and resources. As one respondent noted, the objective should not be merely to impose dissemination responsibilities on researchers, since not all scientists have the skills

required for effective communication, but rather to ensure resources that enable outreach at the institutional, research-group, or individual project level.

The reference to FAPESP provides an illustrative example of this institutional role. According to one respondent, the agency has developed relevant science communication initiatives, particularly by disseminating research conducted across different fields to the scientific community itself. This example, however, also highlights a distinction between scientific dissemination aimed at strengthening communication within the academic community and communication designed to make scientific evidence accessible and usable to policymakers and broader publics. The findings therefore suggest that expanding science communication for policy purposes requires more than increasing the volume of dissemination activities. It may also require diversifying their target audiences, strengthening researchers' communication skills, and creating institutional mechanisms that connect scientific production with the specific information needs of policymakers. In this sense, funding agencies may play a strategic role not only as financial supporters but also as facilitators of knowledge mobilization between researchers, institutions, policymakers, and society.

"I, for example, would never read an article on quantum physics, and FAPESP gives me the opportunity to learn what a scientist in this field is working on, but this information rarely reaches the general public." This statement illustrates an important distinction between the production of scientific knowledge and its accessibility to audiences beyond the academic community. Institutional communication initiatives can increase the visibility of research across scientific fields, but their potential to support public policy depends on whether scientific findings are also translated into forms that are accessible and relevant to policymakers and other non-specialist audiences. In this sense, all respondents agreed that scientific dissemination in Brazil remains an underutilized mechanism for connecting scientific evidence with public policy and represents a potentially important channel that has yet to be fully developed.

As one scientist emphasized, "Research institutions and universities that truly want to have an impact on society and influence public policy must turn to scientific dissemination." This perspective suggests that science communication should not be regarded merely as an additional responsibility assigned to individual researchers, but as part of the institutional infrastructure required for knowledge mobilization. The availability of dedicated funding from research funding agencies is therefore particularly important, as effective dissemination requires time, communication expertise, appropriate channels, and institutional support. Rather than simply increasing the volume of communication activities, institutions need to develop strategies capable of connecting scientific findings with the information needs of policymakers and society. From this perspective, institutionalized science communication can function as an intermediary mechanism between knowledge production and policy use, increasing the visibility, accessibility, and potential usability of scientific evidence. Without such support, the capacity of research institutions and universities to translate scientific production into broader social and policy impacts may remain constrained, as argued by Bernardo and Gleiser (2022).

When considering the beneficiaries of public policies, the respondents perceived an important asymmetry in the use of scientific evidence. According to the scientists

interviewed, policies targeting settlers, small-scale farmers, and family farmers tend to rely less on scientific evidence during their formulation, although scientific evidence is more frequently incorporated into subsequent policy evaluation. In contrast, most respondents indicated that policies targeting commodity producers tend to make greater use of scientific evidence in their formulation. This difference raises an important question about the conditions under which scientific knowledge is valued and mobilized across different policy constituencies. It may suggest that the incorporation of evidence is influenced not only by the availability or quality of scientific research, but also by the political and economic interests associated with particular policy agendas.

This asymmetry is particularly relevant in the context of rural development because it may reflect unequal capacities among different social groups to mobilize scientific knowledge and gain access to policy networks. As Capella (2018) argues, policy formulation is shaped by competing interests and by the dynamics through which certain issues and actors gain greater political visibility. From this perspective, scientific evidence may receive greater attention when it aligns with established institutional priorities or economically influential interests, while evidence concerning socially vulnerable or less politically influential groups may face greater barriers to incorporation. Importantly, the findings should not be interpreted as indicating that policies directed at family farmers necessarily lack scientific foundations. Rather, they suggest a possible asymmetry in how evidence is mobilized across policy stages and beneficiary groups. The fact that evidence is reportedly more common in policy evaluation than in formulation for these groups may also indicate a predominantly retrospective use of knowledge, in which scientific evidence is used to assess policies after decisions have already been made rather than to inform the design of those policies from the outset.

This finding reinforces the importance of understanding rural development as a multidimensional and cross-cutting policy agenda. For rural development to effectively address the needs of different groups—including family farmers, settlers, and traditional peoples—it cannot be reduced to a sectoral focus on agricultural production. As proposed by Stumpf Junior and Balsadi (2015), rural development encompasses interconnected social, environmental, and economic dimensions. The findings of this study suggest that this multidimensionality should also be reflected in the evidence base informing public policies. A broader and more inclusive mobilization of scientific knowledge could help ensure that policy formulation considers not only productivity and economic outcomes, but also social inequalities, environmental sustainability, territorial specificities, and the diverse needs of rural populations.

Data collection also revealed that, according to the respondents, the characteristics associated with scientists who contribute evidence to public policies are closely related to their fields of expertise and institutional contexts. Although the respondents did not perceive gender and age as determining factors in the mobilization of scientific evidence, the findings reveal a marked predominance of male researchers in the field of rural development. This underrepresentation of women, discussed above, raises questions about the diversity of perspectives represented in the science–policy interface.

The researchers' institutional location also emerged as a potentially relevant factor. The concentration of researchers in major urban centers, where universities and research institutions are often located closer to governmental and political institutions, may facilitate opportunities for interaction with policymakers. Such proximity can create more frequent opportunities for dialogue, participation in policy discussions, and the presentation of research findings. In turn, repeated interaction may strengthen relationships and networks through which scientific evidence becomes more visible and accessible to policymakers. Rather than indicating that geographical proximity alone determines the use of scientific evidence, the findings suggest that location may operate as one component of a broader institutional and relational context that facilitates knowledge mobilization.

The respondents also indicated that scientists who devote more time to research may be better positioned to produce, disseminate, and discuss scientific evidence with policymakers. Greater research engagement may provide both a stronger evidence base and more opportunities to communicate findings through academic, institutional, and policy networks. However, this relationship may also reflect differences in institutional conditions, such as access to research funding, research support, communication infrastructure, and opportunities for interaction with policymakers. Thus, the mobilization of scientific evidence appears to depend not only on individual characteristics of researchers, but also on the institutional environments and professional networks in which they operate.

With regard to structural factors, the scientists partially agreed that incomplete, uncertain, or controversial evidence tends to be used less frequently in public policymaking. This finding suggests that the perceived certainty and clarity of scientific evidence may influence its policy uptake, particularly when policymakers face complex or politically sensitive decisions. However, the lower use of partial or contested evidence should not necessarily be interpreted as an indication of lower scientific value. In many areas of rural development, uncertainty and conflicting evidence are inherent to complex socio-environmental problems. The challenge, therefore, may lie not only in producing more conclusive evidence, but also in developing mechanisms capable of communicating uncertainty and competing interpretations in ways that remain useful for decision-making.

Regarding organizational factors, the findings indicate that institutional encouragement for scientists to provide evidence to policymakers may facilitate its use. This suggests that knowledge mobilization is not solely an individual responsibility, but is also shaped by organizational cultures, incentives, and support structures. When research institutions recognize engagement with policymakers as a legitimate component of scientific activity and provide appropriate support, scientists may have greater opportunities to communicate their findings and participate in policy processes.

Finally, regarding the relationship between policymakers and scientists, the respondents perceived a positive association between the strength of these relationships and the likelihood that scientific evidence will be used in policymaking. This finding reinforces the relational dimension of knowledge mobilization: evidence does not enter policy processes through information channels alone, but also through interactions, trust, dialogue, and networks between knowledge producers and decision-makers. Taken together, these findings suggest that the uptake of scientific

evidence is shaped by the interaction of three dimensions: the characteristics and perceived quality of the evidence itself, the institutional conditions that support its mobilization, and the strength of the relationships connecting scientists and policymakers. Thus, improving evidence-based policymaking may require not only producing high-quality research, but also creating institutional incentives and sustained spaces for dialogue in which evidence can be interpreted, contextualized, and incorporated into policy processes. Table 1 synthesizes and systematically organizes the data presented in the interviews.

Table 1. *Synthesis of Hypotheses and Agreement Levels among Interviewed Scientists*

Proposed Hypothesis / Dimension	Predominant Consensus / Agreement Level	Qualitative Synthesis & Contextual Evidence from the Study
(1) Sources of Evidence	Complete Agreement (on policy effectiveness and institutional prestige) Partial Agreement (on public source dominance)	High-quality scientific evidence is unanimously seen as a driver of public policy success. While prestigious institutions are preferred, scientists only partially agree that public research entities are the sole providers of this data.
(2) Policy Area for Rural Development	Partial Agreement	Environmental policymakers are perceived to use scientific evidence more frequently due to the high volume of research. However, severe political contention and "politicization" around land use and deforestation often relegate science to a secondary, legitimizing role.
(3) Communication Channels	Partial Disagreement (on academic articles) Agreement (on technical reports and demand-driven outreach)	Traditional academic articles written in jargon are rarely used by policymakers. Instead, evidence flows through technical reports prepared under direct government demand or prompted by scientific mobilization during environmental crises (e.g., the Forest Code debates).
(4) Policy Beneficiaries	General Consensus	Policies targeting large commodity producers rely more on scientific evidence during their formulation phase. Conversely, policies for family farming, settlers, and smallholders rely less on evidence during formulation, but utilize science extensively during monitoring and evaluation phases.
(5) Attributes of the Scientist	Geographic & Field Influence (Gender and age excluded)	While age and gender do not directly affect evidence demand, there is an extreme gender gap in the field (only 15.9% of female scientists in rural development). Proximity to major urban/political centers and leadership in high-output fields strongly increase a scientist's influence.
(6) Structural Factors	Partial Agreement	Partial, incomplete, or controversial scientific evidence is significantly less likely to be integrated or utilized in public policy designs.
(7) Organizational Factors	Complete Agreement	Active institutional support and professional encouragement from universities and research centers are essential to motivate scientists to engage with policymakers.
(8) Quality of Relationship	Complete Agreement	The strength, continuity, and directness of the personal and professional relationships between scientists and public managers are the strongest predictors of evidence adoption.

Conclusions

Although Brazil possesses a strong scientific base with international relevance in sustainable rural development, the findings indicate that the existence of high-

quality scientific evidence does not, by itself, ensure its mobilization in public policymaking. The incorporation of scientific knowledge is shaped by structural, institutional, relational, political, and communication factors that influence the visibility, accessibility, credibility, and potential use of evidence by policymakers. In this context, the study highlights a persistent gap between the production of scientific knowledge and its effective circulation within policy processes.

Brazilian scientific research plays an important role in environmental and rural policy debates, particularly through research on ecosystems, land use, deforestation, restoration, and climate change. Evidence produced in these areas has been incorporated into policy documents and has contributed to debates concerning climate governance, environmental management, and deforestation monitoring (Bori-Overtton 2025). At the same time, the concentration of researchers in the Southeast, particularly in major academic and technological centers, suggests that the geographic distribution of scientific capacity may influence the visibility and accessibility of evidence to policymakers. The marked gender imbalance, with women representing only 15.9% of the researchers identified in the sustainable rural development field, also raises concerns about the diversity of perspectives represented in the science–policy interface. These findings do not demonstrate that geographical concentration or gender imbalance directly determines the use of evidence, but they point to dimensions that warrant further investigation in relation to the diversity and inclusiveness of the knowledge mobilized for rural policy.

The findings further suggest that scientific evidence does not reach policymakers primarily through scientific articles. Instead, reports produced by groups of researchers, institutional communication, media coverage, and direct interactions with policymakers appear to play important roles in making evidence more accessible and usable. The prominence of highly cited researchers in both policy documents and the media also suggests that scientific visibility may be associated with institutional networks, professional relationships, and intermediary actors. Institutional prestige, proximity to policymakers, and participation in established research networks may therefore contribute to the circulation and uptake of scientific evidence. These findings reinforce the distinction between producing evidence and mobilizing evidence: scientific quality is essential, but it must be accompanied by mechanisms that make knowledge visible, accessible, relevant, and usable within policy contexts.

The study also identified an important asymmetry in the use of scientific evidence across policy beneficiaries. According to the respondents, policies directed toward commodity producers tend to make greater use of scientific evidence during formulation, whereas policies targeting family farmers, settlers, and small-scale producers appear to rely more heavily on evidence during evaluation and monitoring. Although this finding should be interpreted cautiously given the exploratory nature of the survey, it raises the possibility that scientific knowledge is mobilized unevenly across different policy constituencies and stages of the policy cycle. This asymmetry may reflect differences in political influence, institutional networks, and the capacity of different groups to mobilize scientific knowledge. It also reinforces the importance of treating rural development as a multidimensional and cross-cutting agenda encompassing economic, environmental, social, and territorial dimensions.

The findings further indicate that the uptake of scientific evidence is not determined solely by the quality of research. Respondents associated greater use of evidence with prestigious research institutions, institutional support for engagement with policymakers, and stronger relationships between scientists and decision-makers. At the same time, the interviews revealed concerns about the politicization of evidence, particularly in contentious areas such as land use, deforestation, and agricultural expansion. In such contexts, scientific evidence may be selectively mobilized, with some findings gaining visibility when they align with prevailing political or institutional interests and others receiving less attention when they challenge them. Thus, the science-policy interface should not be understood as a linear process in which scientific findings are simply transferred into policy. Rather, it is a dynamic process of interaction, interpretation, negotiation, and selection.

Against this background, scientific dissemination emerges as a potentially important mechanism for strengthening knowledge mobilization in Brazil. The respondents recognized its relevance but also emphasized that its potential remains underexplored and insufficiently supported. The findings suggest that scientific dissemination should not be treated merely as an additional individual responsibility for researchers. Effective communication requires institutional commitment, dedicated funding, communication expertise, appropriate channels, and opportunities for sustained interaction with policymakers and other audiences. Research institutions and funding agencies can therefore play a strategic role in creating the conditions under which scientific evidence can move more effectively from research environments into public and policy arenas.

The results should be interpreted as exploratory rather than as representative of the broader population of Brazilian researchers. The survey included responses from 10 of the 44 researchers targeted, and the findings therefore do not support statistical generalization. Nevertheless, the combination of documentary evidence and respondents' perceptions provides relevant indications of mechanisms that may shape the mobilization of scientific evidence in rural policymaking. These include institutional prestige, participation in influential research networks, proximity to policymakers, media visibility, organizational support, and the quality of scientist-policymaker relationships. Future research involving a larger and more diverse group of researchers could further investigate the extent to which these factors influence the uptake of scientific evidence across different policy areas and beneficiary groups.

Overall, the findings suggest that strengthening evidence-informed policymaking for sustainable rural development requires moving beyond the view of science as a static "stock of knowledge" toward an understanding of scientific evidence as part of a continuous process of communication, interaction, and knowledge mobilization. Scientific dissemination is therefore not merely an educational activity; it can function as a strategic mechanism for increasing the visibility, accessibility, and usability of scientific knowledge. For Brazil, strengthening this interface may contribute to more informed and inclusive public policies capable of integrating economic development, environmental sustainability, social equity, and the territorial diversity of rural populations.

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