

COMMUNICATION AND CO-PRODUCTION OF KNOWLEDGE IN THE ECOSYSTEM OF THE SMART B100 ADVANCED RESEARCH CENTER

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Abstract— The article examines the role of communication in the co-production of knowledge within the ecosystem of the Smart B100 Advanced Research Center (CCD-SB100), an initiative that integrates science, technology, and society in the agricultural sector. Based on a qualitative and exploratory approach, the study identifies the profiles and interaction dynamics of the strategic publics involved. It proposes ten communicational and psychosocial dynamics aimed at fostering mobilization, engagement, and the social appropriation of scientific knowledge. Grounded in frameworks of public communication, rural extension, and collaborative innovation, the study also offers insights into psychosocial processes relevant to collaboration, engagement, and shared meaning in complex multi-institutional environments. The study concludes that communication constitutes a structuring axis of governance and the public legitimacy of science.

Keywords— Communication, Co-production of Knowledge, Research Center, Strategic Publics.

I. INTRODUCTION

The advancement of digital technologies applied to agriculture has engendered profound transformations in the production, management, and circulation of agronomic knowledge, reshaping the modes of interaction between science, technology, and society. Within this context, new demands emerge for communicational processes capable of integrating multiple forms of knowledge, technical-scientific, empirical, and local, within collaborative innovation ecosystems that foster sustainability, productive efficiency, and the social appropriation of knowledge. It is in this horizon that the Center for Science for Development – Smart B100 Advanced Research Center (CCD-SB100) is situated. This initiative is funded by the São Paulo Research Foundation (FAPESP), the São Paulo State Secretariat for Agriculture and Supply (SAA-SP), Brazil, and a consortium of public and private institutional partners. The project's central purpose is the development of the Smart Boletim 100 Platform (SB100), a digital solution that integrates generative artificial intelligence, environmental data, and advanced agronomic models to produce management recommendations that are more precise, efficient, and sustainable for rural producers.

Within the scope of the CCD-SB100, communication emerges as a transversal and strategic axis of the entire research and innovation ecosystem. Far from being confined to the instrumental function of scientific dissemination, communication is understood as a space of mediation, co-production, and social articulation of knowledge, contributing to the transformation of scientific outcomes into socially meaningful practices. Through structured communicational processes, it becomes possible to consolidate relations of trust, collaborative networks, and mechanisms of knowledge transfer, which are essential for strengthening the interface between research and agricultural practice. Consequently, organizational and scientific communication is conceived as a constitutive dimension of the project's governance, supporting both the mobilization of strategic publics and the symbolic cohesion among partner institutions, while fostering the social appropriation of scientific results [1] [2].

The effective mobilization of agricultural and agribusiness publics around the SB100 Platform requires dialogical communicational processes grounded in active listening, participation, and co-creation, transcending the mere technical diffusion of information. The challenge lies in translating scientific knowledge into practical, contextualized, and socially relevant value, capable of fostering critical engagement among the diverse actors of the agri-food system. As Massarani and Moreira [3] argue, contemporary models of science communication must transcend unidirectional transmission, promoting critical appropriation and the co-production of knowledge. From this standpoint, dialogue among researchers, technicians, extension agents, and rural producers demands integrated communication strategies that recognize the plurality of rationalities present in rural contexts and value communication as a relational and transformative practice.

This study aims to propose communicational and psychosocial dynamics that foster knowledge co-production and the mobilization of agricultural and agribusiness publics within the ecosystem of the Smart B100 Advanced Research Center (CCD-SB100). These propositions are grounded in the analysis of profiles, interests, and

engagement patterns of the identified strategic publics, seeking to contribute to the development, implementation, and social appropriation of the SB100 Platform as an integrative space linking science, technology, and society. Methodologically, this research adopts an exploratory and descriptive design, developed throughout the first year of implementation of the Smart B100 Advanced Research Center (July 2024 – June 2025). The investigation is anchored in the identification and analysis of strategic publics within the CCD-SB100 ecosystem, combining procedures of mapping, systematization, and qualitative interpretation of data concerning their profiles, interests, and modes of engagement. The chosen approach seeks to understand how communicational and psychosocial dynamics and conditions for knowledge co-production are configured among the diverse segments that constitute the Smart B100 ecosystem.

The methodological process also encompassed an interdisciplinary literature review, drawing upon references from the fields of communication, sociology of science, and innovation studies. This review supported the development of analytical categories designed to inform the formulation of integrated communicational propositions aimed at strengthening interactions within the Smart B100 ecosystem. Thus, the methodology combines empirical diagnosis and theoretical reflection, guided by the perspective that communication, by mediating flows of knowledge and practice, constitutes a structuring element of the co-production of scientific, technological, and social knowledge.

The structure of the article follows a logical progression that reflects the analytical and conceptual path of the study. The first section presents the institutional and scientific context of the project, positioning it as an innovation ecosystem aimed at integrating science, technology, and society. The second section deepens the theoretical foundations that support the analysis, discussing communication as a mediating and structuring practice in knowledge co-production processes. The third section focuses on the empirical mapping and characterization of the actors involved, highlighting their interactions and modes of knowledge appropriation. Finally, the article proposes a set of participatory communicational and psychosocial dynamics that translate, into concrete practices, the project's commitment to the co-production of knowledge, public engagement, and the communicational governance of science.

The results obtained during the first year of CCD-SB100 implementation enabled the formulation of a preliminary model of communicational governance oriented toward knowledge co-production and the mobilization of strategic publics. Based on the qualitative analysis of profiles, practices, and relational dynamics observed within the Center's ecosystem, it was possible to identify opportunities for improving the interaction between science, technology, and society, leading to the proposal of a set of participatory communicational and psychosocial dynamics that will guide the next phase of research. These dynamics, constitute a practical framework for strengthening dialogue, engagement, and the social appropriation of the Smart Boletim 100 Platform, reaffirming the role of communication as a structuring axis of governance and the public legitimacy of scientific knowledge within the context of São Paulo's agribusiness.

Understanding these communicational and psychosocial dynamics and their structuring role within the CCD-SB100 ecosystem requires an in-depth examination of the theoretical foundations that articulate communication, knowledge co-production, and public engagement with science. The following theoretical framework delineates the main conceptual approaches underpinning this investigation, emphasizing that communication should be understood not merely as an instrumental practice but as a constitutive dimension of scientific production and social innovation.

In addition to contributing to the fields of communication, science studies, and innovation ecosystems, this study also offers a relevant interface with work and organizational psychology. The CCD-SB100 operates as a complex, multi-institutional environment in which researchers, technicians, extension agents, and rural producers engage in cognitively and socially demanding collaborative practices. Understanding how strategic publics mobilize, exchange, and co-produce knowledge provides insights into motivational processes, trust formation, participatory behaviors, and collective sensemaking, phenomena that are central to contemporary organizational psychology. By analyzing communicational and psychosocial dynamics that structure interaction, coordination, and engagement across diverse actors, the study advances a psychosocial understanding of how knowledge-intensive organizations create conditions for collaboration, reduce uncertainty, and sustain shared goals within innovation-oriented work systems.

II. SMART B100 ADVANCED RESEARCH CENTER (CCD-SB100)

The Smart B100 Advanced Research Center (CCD-SB100) is a network-based scientific initiative led by the Agronomic Institute of Campinas (IAC) and composed of eight other research institutions from the state of São Paulo (Brazil): the Faculty of Technology of Cotia (Fatec-Cotia) and the Faculty of Technology of Pompeia (Fatec-Pompeia); the Biological Institute; the São Paulo State University (Unesp), represented by the Faculty of Architecture, Arts, Communication and Design (FAAC) in Bauru, the Faculty of Agronomic Sciences (FCA) in Botucatu, the Faculty of Philosophy and Sciences (FFC) in Marília, and the Institute of Biosciences (IB) in Rio Claro; in addition to the Luiz de Queiroz College of Agriculture (Esalq) at the University of São Paulo (USP). The project is funded by the São Paulo Research Foundation (FAPESP), the São Paulo State Secretariat for Agriculture and Supply (SAA-SP), and private organizations, with the Shunji Nishimura Foundation for Technology serving as its managing entity.

The purpose of the CCD-SB100 is to accelerate the circulation of scientific knowledge produced in academia toward the publics of agriculture and agribusiness. This circulation materializes through the creation of the Smart Boletim 100 Platform (SB100), a digital environment that integrates agronomic data, research results, and

artificial intelligence technologies to transform the cumulative knowledge of the traditional Boletim 100, developed over decades, into a living system of knowledge transfer, translation, and social appropriation. More than a technical repository, the platform is conceived as a mediating space among different rationalities, scientific, productive, environmental, and communicational, where knowledge is continuously reinterpreted, updated, and returned to society in applicable formats [3].

The Boletim 100, originally published by the Agronomic Institute of Campinas (IAC) in 1996, became one of the primary references for soil fertility management in the state of São Paulo. It translates, into accessible and practical language, the collective work of more than one hundred specialists who, over the years, have produced technical recommendations on fertilization and liming grounded in scientific evidence. The most recent update of the document, organized by the IAC (2022), reaffirms the public commitment to sustainability and innovation.

Within this context, the Smart B100 Platform emerges as the communicational and digital evolution of this scientific legacy, designed to enhance its dissemination, accessibility, and integration with contemporary agricultural decision-making practices.

The conceptual model of the CCD-SB100 is structured around three fundamental axes: (i) an advanced interface between agronomic knowledge and digital platforms, which organizes and communicates data intelligibly to diverse publics; (ii) the creation of indicators and decision-making criteria aimed at increasing efficiency in the use of fertilizers and bioinputs, thus bringing science and sustainability closer together; and (iii) the transformation of data and research results into communicational products and practical guidelines, capable of generating social meaning and value.

These axes operate under a logic of knowledge co-production within a quadruple-helix innovation ecosystem, which recognizes the interdependence among universities, government, industry, and civil society [4]. The CCD-SB100 therefore extends beyond the development of a technological solution; it seeks to build a space of dialogue and engagement between science and society, wherein communication performs a structuring role, both in the public legitimation of scientific practices and in the articulation among diverse languages and epistemic modes [1].

As a scientific structure, the Center reflects a broader trend among the Applied Research Centers funded by FAPESP, which aim to stimulate interaction between academic research and technological innovation in pursuit of sustainable development. However, the distinctive feature of the CCD-SB100 lies in its understanding that knowledge transfer and co-production are not achieved solely through technical means, but rather demand communicational strategies of translation, dialogue, and mobilization.

It is precisely at this intersection that the theoretical and empirical interest of the present study is anchored: to understand communication as a strategic dimension of scientific and technological innovation processes, by analyzing communicational practices associated with knowledge transfer and public mobilization within the contexts of agriculture and agribusiness. The study thus seeks to bridge the fields of communication and innovation, demonstrating how the shared construction of meaning can enhance the circulation of knowledge and reinforce the public function of science.

III. COMMUNICATION, CIRCULATION, AND CO-PRODUCTION OF SCIENTIFIC KNOWLEDGE

The debate on the co-production of scientific knowledge has expanded over recent decades beyond the traditional boundaries of science and technological innovation. In place of a linear diffusion model, in which knowledge is produced by academia and subsequently transferred to society, there now prevails the notion of circulation and co-production of knowledge, wherein communication plays a structuring role in mediating between different rationalities and regimes of value [5] [6].

From this perspective, science communication is not limited to the dissemination of results but constitutes a social and political practice that organizes information flows, establishes networks of meaning, and articulates scientific knowledge with social demands [3]. The process of knowledge circulation [7] [8] involves the transmission and reconfiguration of discourses across distinct fields, academic, media, institutional, and popular, requiring strategies of translation, contextualization, and legitimation. Communicating science, therefore, also means building connections, bridging languages, and creating spaces for dialogue among diverse regimes of symbolic production.

Inspired by Freirean pedagogy, Luvizotto and Almeida [9] observe that rural extension in Brazil has historically oscillated between a diffusionist paradigm, based on the vertical transfer of technology, and a dialogical paradigm, centered on the shared construction of knowledge. Emancipatory processes require active listening and horizontal dialogue between educator and learner [10]. Thus, extension work is not limited to the dissemination of agricultural techniques; it constitutes a symbolic space of meaning-making, in which the rural producer is a subject of knowledge rather than a mere recipient of instructions [9].

This Freirean interpretation allows for the reconceptualization of knowledge transfer as a two-way communicational process, whose effectiveness depends less on isolated technical precision and more on the quality of communicative relationships among actors. Problem-posing and participation, central categories in Freire's thought, become methodological tools for transforming scientific knowledge into socially appropriated practices, reinforcing both the public legitimacy of science and the sense of belonging of individuals to innovation processes [10].

By articulating Freire's liberating pedagogy with the analysis of institutional communication in extension practices, Luvizotto and Almeida [9] argue that communication is a structuring axis of mediation between science and society: it not only translates technical content but also builds trust, values local knowledge, and enables the

co-production of knowledge. This perspective aligns with contemporary approaches to knowledge co-production and knowledge mobilization, in which scientific circulation is conceived as a dialogical, inclusive, and emancipatory process requiring mutual recognition between those who produce and those who apply knowledge. The notion of knowledge transfer has been progressively replaced by more open concepts such as knowledge exchange, knowledge mobilization, and knowledge co-production [11]. These approaches acknowledge that knowledge is only transformed into innovation and social change when a relational system of trust and reciprocity is established, in which individuals and institutions share responsibility for the interpretation and application of knowledge. In this sense, communication is understood as a constitutive dimension of innovation ecosystems [4], functioning as the connective tissue linking science, public policy, markets, and civil society.

Within the context of the Smart B100 Advanced Research Center (CCD-SB100), this approach gains tangible expression. The project proposes not merely a digital platform for scientific dissemination, but a collaborative and communicational environment dedicated to the social appropriation of agronomic knowledge. The construction of the Smart Boletim 100 Platform (SB100), by integrating research results, field data, and artificial intelligence technologies, demands the creation of interactive communicational and psychosocial dynamics that facilitate the circulation of knowledge among specialists, technicians, and rural producers. The challenge lies not only in the transmission of technical information, but also in the translation of languages, the construction of shared meanings, and the legitimization of communicative processes [1].

The recent literature on knowledge co-production and governance underscores that the effectiveness of science communication depends on its ability to engage actors in the stages of knowledge generation, validation, and use. In the case of the CCD-SB100, knowledge transfer is conceived as a continuous communicational process—understood as co-production, that interconnects information circulation, social recognition, and the engagement of strategic publics, dimensions that are further explored in the following section.

In this framework, communication is consolidated as both an epistemological and operational axis of knowledge co-production. It ensures not only the dissemination of research results but also the mediation among diverse temporalities, knowledges, and interests. By articulating the scientific and the social, communication grants public legitimacy to science, contributes to knowledge governance, and facilitates the mobilization of publics around causes, technologies, and sustainable development practices. In the specific case of the CCD-SB100, this means transforming agronomic knowledge into a common good.

Understanding communication as the mediating dimension of knowledge transfer and co-production thus implies recognizing that its effectiveness depends on the articulation among actors, institutions, and socio-territorial contexts. The circulation of scientific knowledge can only be achieved through a communicational ecosystem capable of integrating diverse actors, researchers, extension agents, rural producers, and policymakers, into relational dynamics of trust and shared responsibility. It is at this juncture that the CCD-SB100 asserts itself not only as a center for applied research but as a networked communicational system, in which the mobilization of strategic publics becomes a fundamental condition for the social appropriation of knowledge and for the transformation of scientific results into sustainable practices. The next section deepens this perspective by examining the publics and relational interfaces that structure communication within the CCD-SB100 ecosystem.

IV. STRATEGIC PUBLICS AND RELATIONAL COMMUNICATION ECOSYSTEMS IN THE CCD-SB100

The experience analyzed by Luvizotto and Almeida [9] concerning the work of the National Agency for Technical Assistance and Rural Extension (ANATER) demonstrates that the effectiveness of rural extension policies depends, to a large extent, on the quality of communicational processes established between institutions and their strategic publics. The authors show that when institutional communication is conceived as a constitutive dimension of public action, it transcends a merely informational function and assumes a structuring role in creating trust-based relationships, constructing shared meanings, and socially legitimizing extension practices.

From this perspective, Luvizotto and Almeida [9] emphasize that public communication carried out by rural extension institutions must align with democratic principles of transparency, dialogue, and accountability, promoting active listening and effective participation of diverse social actors. This approach acknowledges that producers, technicians, and managers not only receive information but also share experiences and local knowledge, thereby enriching the collective knowledge base. By highlighting the complementary roles of digital platforms and face-to-face interactions, particularly in contexts marked by technological exclusion, the authors underscore the importance of hybrid communication models that integrate multiple channels and foster both the dissemination and the social appropriation of scientific knowledge in rural territories.

Within the scope of the Smart B100 Advanced Research Center (CCD-SB100), one of the inaugural initiatives led by the Integrated Communication and Public Mobilization Hub consisted of a systematic study aimed at identifying and characterizing key publics. This report sought to understand the profiles, interests, communicational needs, and potential forms of engagement of the various actors that compose the value chain of agriculture and agribusiness, thereby providing the foundation for communication strategies capable of recognizing and incorporating the sociotechnical and territorial diversity of rural contexts.

The investigation adopted a qualitative and exploratory approach, grounded in the principles of dialogical communication [10], strategic public relations [1], integrated organizational communication [2], and public communication of science for non-specialized audiences. The study enabled the development of an expanded map of strategic publics involved in the CCD-SB100 ecosystem, revealing not only their functional and institutional diversity but also their distinct modes of appropriating, circulating, and co-producing scientific knowledge in the field. The following segments were identified:

1) Small- and medium-scale rural producers – They represent the fundamental link between applied research and everyday agricultural practice. Generally exhibiting low familiarity with technical-scientific language, they require accessible and context-sensitive communication strategies capable of translating scientific terminology into practical repertoires. These actors display a high dependency on technical assistance and agricultural inputs, valuing the mediation of trusted agents, such as technicians and local consultants. Communication with this group calls for dialogical and face-to-face approaches, grounded in trust and reciprocity, where knowledge is shared through experience and practice [10].

2) Agro-industrial cooperatives – These organizations possess well-established internal communication structures and an organizational culture oriented toward innovation management and sustainability. They are receptive to adopting digital technologies that enhance productive efficiency and competitiveness, acting as intermediaries between producers and research centers. Cooperatives are thus strategic partners in the diffusion and implementation of technological solutions, especially due to their capillary influence on regional agricultural practices.

3) Technicians, agronomists, and field consultants – Identified as key actors in technology transfer and scientific knowledge translation, these professionals serve as epistemic mediators between scientific production and practical application in the field. Their daily practice grants legitimacy to technical recommendations, and their ability to interpret and adapt knowledge to local realities positions them as co-producers of hybrid knowledge, in which scientific and empirical dimensions intertwine.

4) Rural extension agents and Technical Assistance and Rural Extension (ATER) institutions – They perform an essential mediating role between public policy, science, and agricultural practice, acting as vectors for the democratization of knowledge and the dissemination of sustainable social technologies. Due to their territorial presence and direct connection with rural communities, these agents possess strong potential to translate scientific guidelines into contextualized productive practices, reinforcing communication as a tool for inclusion and rural development.

5) Decision-makers and public managers – **This group includes government secretariats, funding agencies, and regulatory bodies** that require qualified technical data and scientific evidence to support the formulation and evaluation of agricultural policies. They demonstrate significant interest in evidence-based governance models, wherein science communication assumes a strategic function by linking research with policy design, thereby strengthening the social legitimacy of science.

6) Researchers and students in related fields – This audience comprises individuals with high scientific and technological literacy, engaged in collaborative and interdisciplinary research dynamics and science communication practices oriented toward social impact. They are simultaneously producers and recipients of knowledge, operating in networks that transcend academia and connect to innovation environments, living labs, and communities of practice.

7) Agribusiness companies and industry actors – These organizations, integrated into supply chains of inputs, technologies, and agricultural services, demonstrate a growing interest in solutions that combine innovation, sustainability, and data-driven decision-making. Their involvement in the Smart B100 ecosystem broadens the potential for technology transfer, co-development of products, and the strengthening of university–industry collaboration, in alignment with the quadruple-helix innovation model [4].

In the context of science and innovation ecosystems such as the CCD-SB100, the concept of “strategic publics” transcends the market-oriented notion of target audience, acquiring a relational and co-creative dimension. Here, the public is not merely a receiver of information, but a co-producer of meaning and legitimacy. This view aligns with the relational paradigm of public communication and with the notion of publics in communicative co-presence [7], where interactions are characterized by circulation, negotiation, and symbolic contestation. Conceiving communication through this lens entails recognizing that the publics of the CCD-SB100 actively participate in translating scientific knowledge into social value, contributing to the appropriation and public recognition of science.

The transformations brought about by digitalization and artificial intelligence amplify this scenario, reconfiguring the boundaries between producers and receivers of information. Digital platforms and social media now function as environments of communicational co-production, where farmers, technicians, researchers, and managers interact, share experiences, and build collective repertoires of trust [6]. In this sense, the strategic publics of the CCD-SB100 are not merely segments of interest, but actors within a sociotechnical knowledge network that must be continuously mobilized, heard, and engaged.

This hybrid communicational environment requires scientific institutions such as the CCD-SB100 to develop expanded relational and communicative competencies, directed not only toward scientific dissemination, but also toward the participatory management of knowledge. In this case, communication becomes a strategic practice of mobilization, sustaining the public legitimacy of research and fostering connections among actors from science, markets, and civil society.

In this scenario, the central challenge for the CCD-SB100 lies in transforming the diagnosis of publics and communication channels into concrete communicational and psychosocial dynamics capable of sustaining dialogue, translation, and the co-production of scientific knowledge within the complexity of rural contexts.

V. HELPFUL HINTS A CONTRIBUTION BY WAY OF CONCLUSION: PROPOSAL OF COMMUNICATIONAL AND PSYCHOSOCIAL DYNAMICS FOR THE CCD-SB100

A conclusion may review the main points of the paper, do not replicate the abstract as the conclusion. A conclusion might elaborate on the importance of the work or suggest applications and extensions. Public communication of

science has increasingly become a strategic dimension of contemporary systems of knowledge production. Far from being limited to the dissemination of results, this practice embodies a model of communicational governance oriented toward the social legitimation of science and the expansion of its public relevance [5]. In the context of applied research centers and innovation ecosystems, such as the Smart B100 Advanced Research Center (CCD-SB100), public communication of science acquires a structuring role: it organizes the symbolic flows among researchers, rural producers, companies, and policymakers, establishing itself as a transversal axis for knowledge transfer, co-production of knowledge, and the mobilization of strategic publics.

Recent literature on scientific circulation and social engagement reinforces the need to understand communication as a continuous process of mediation and negotiation of meaning [12]. In this regard, communicating science implies building relationships of trust, fostering citizen participation, and bridging specialized knowledge with local experiences, thereby constituting what Nowotny [12] defines as the social contextualization of knowledge. This perspective aligns with the frameworks proposed by Freire [10] and Luvizotto & Almeida [9], who identify communication as an emancipatory and dialogical practice, capable of integrating diverse rationalities and strengthening the agency of individuals in innovation processes.

Drawing on the analysis of ANATER's activities and other public institutions of rural extension, Luvizotto and Almeida [9] demonstrate that public communication is an essential component of participatory knowledge management, as it promotes dialogue, collective learning, and mutual recognition between science and society. This understanding is particularly relevant to the CCD-SB100, whose mission encompasses not only the creation of a digital platform but also the consolidation of sociotechnical networks of trust that sustain the social appropriation of data and agronomic recommendations. Thus, knowledge transfer and co-production, beyond their technical dimension, become communicational, cultural, and political practices—a movement of translation, circulation, and shared meaning [7] [8].

The present study proposes a set of participatory communicational and psychosocial dynamics to be implemented by the CCD-SB100 during the second and third years of the project, considering that, according to its initial planning, the Center has a total duration of five years. These dynamics aim to strengthen mediation between research hubs and the strategic publics of agriculture and agribusiness in São Paulo, fostering knowledge co-creation, public engagement with science, and the social appropriation of research outcomes.

The proposals are structured around ten integrated axes, derived from the observation of the profiles and interaction dynamics of the CCD-SB100's strategic publics, oriented toward knowledge co-production within the ecosystem and responsive to the communicational needs of the project:

1) Territorial Awareness and Engagement

The first axis involves implementing on-site listening activities, technical visits, and community dialogues across agricultural regions to recognize local symbolic repertoires and identify key interlocutors. These initiatives aim to legitimize the institutional presence of the CCD-SB100, enhance understanding of local production practices, and strengthen relationships of trust between research teams and rural communities, essential foundations for participatory innovation processes.

2) Participatory Communicational Diagnosis

The second dynamic centers on developing collaborative processes to identify barriers and opportunities in communication among researchers, extension agents, and local leaders. By mapping existing information flows and diagnosing communicational gaps, this stage supports the design of contextualized strategies that better connect scientific research to local realities, thus improving knowledge exchange within the ecosystem.

3) Continuous Dialogue and Engagement

This axis proposes establishing hybrid channels, both digital and face-to-face, for ongoing interaction between scientists, technicians, and agricultural practitioners. These channels promote sustained dialogue and mutual trust, ensuring the continuity of relationships and facilitating the emergence of communities of practice that link research, experimentation, and application in the field.

4) Knowledge Validation and Exchange Events

The fourth dynamic emphasizes organizing public events such as Field Days, innovation fairs, workshops, and discussion panels as spaces for knowledge validation and collective learning. These encounters promote the socialization of scientific findings, enable participatory evaluation of research outcomes, and expand social participation, reinforcing the public legitimacy of the CCD-SB100's scientific outputs.

5) Institutional Feedback and Technical Follow-up

The fifth axis focuses on creating formal feedback mechanisms regarding both the Center's activities and the usability of the Smart B100 Platform. These processes allow continuous improvement of the platform, strengthen transparency, and enhance institutional responsiveness to the expectations and experiences of different user groups and partners.

6) Communicational Training and Capacity Building

This dynamic encompasses the development of training programs on public communication of science, plain-language strategies, and dialogical mediation. The goal is to equip researchers, technicians, and communicators with improved skills to engage with diverse publics, fostering inclusive, empathetic, and effective interactions that sustain the long-term credibility of the CCD-SB100.

7) Co-produced Narratives and Media Content

The seventh axis calls for the collaborative creation of audiovisual and digital materials involving farmers, technicians, and researchers. Through co-authorship and shared storytelling, these initiatives promote the

valorization of local and empirical knowledge, while simultaneously increasing the visibility of the CCD-SB100 among broader audiences and contributing to the democratization of scientific information.

8) Knowledge Ambassadors Network

This dynamic proposes establishing a decentralized network of local multipliers, comprising producers, students, and technicians, trained in communication, mediation, and innovation practices. These “knowledge ambassadors” act as connectors between science and society, helping disseminate good practices, expand the territorial reach of the CCD-SB100, and encourage local leadership in sustainable innovation.

9) Observatory of Communication and Scientific Co-production

The ninth axis involves creating a monitoring and evaluation hub dedicated to analyzing communicational practices and public engagement processes. By generating qualitative and quantitative indicators, this observatory will provide evidence for improving communicational governance, supporting decision-making, and assessing the impact of CCD-SB100 activities in terms of inclusion, participation, and knowledge appropriation.

10) Systematization and Dissemination of Institutional Learning

The final dynamic consists of producing reports, manuals, and publications that document the methodologies, tools, and communicational processes developed throughout the project. This systematic effort to register and share experiences contributes to consolidating institutional memory and enables other research and innovation ecosystems to learn from the CCD-SB100 model of participatory science communication.

These dynamics shape a model of communicational governance centered on reciprocity, trust, and multichannel mediation, principles that articulate science, public policy, and citizenship. By placing strategic publics at the core of the communicational process, the CCD-SB100 reaffirms its commitment to an open, socially responsible, and responsive science, in line with international guidelines on sustainable innovation and knowledge co-production [4]. In this sense, the model proposed here not only fosters the circulation of scientific and technical knowledge, but also transforms the project into a living environment of communicational experimentation, where knowledge and social practices intertwine to drive sustainable and inclusive rural development.

The contribution of this study goes beyond a theoretical and methodological proposal in communication, constituting an applied reflection on the integration between science, technology, and society. By conceiving communication as a structuring axis of knowledge governance, the model developed within the CCD-SB100 offers concrete tools to rethink the relationship between scientific research and social impact. The emphasis on co-production and public mobilization demonstrates that communication is not merely a final stage of dissemination, but a continuous process of mediation that generates public legitimacy, social appropriation of knowledge, and innovation oriented toward the common good. This constitutes a significant contribution to strengthening participatory communicational practices within contemporary science and technology ecosystems. This perspective directly aligns with the commitments of the United Nations 2030 Agenda for Sustainable Development, which recognizes the importance of science and communication as essential drivers of sustainable development. The study is particularly consistent with Sustainable Development Goals (SDGs) 2, 9, 10, and 17, by demonstrating how the articulation between public communication, rural extension, and technological innovation can foster social transformation. The approach proposed by the CCD-SB100 puts into practice a vision of open and collaborative science, contributing to the creation of more inclusive, efficient, and sustainable knowledge systems.

In relation to SDG 2 – Zero Hunger and Sustainable Agriculture, the communicational model developed in this study promotes the circulation and social appropriation of agronomic knowledge, encouraging responsible use of inputs, food security, and sustainable production practices. Through listening and co-creation processes among researchers, technicians, and rural producers, the CCD-SB100 helps make technological innovation accessible and contextually relevant, reducing informational asymmetries and strengthening farmers’ autonomy in decision-making processes.

Regarding SDG 9 – Industry, Innovation, and Infrastructure, the proposed communicational and psychosocial dynamics reinforce communication as a symbolic and relational infrastructure that sustains innovation ecosystems, stimulating the co-development of technological solutions and the transfer of knowledge among academia, government, and the private sector. Simultaneously, by incorporating the principles of SDGs 10 and 17 – Reduced Inequalities and Partnerships for the Goals, the study emphasizes the creation of multisectoral collaborative networks that promote inclusion, equity, and shared responsibility. The communicational governance model thus contributes not only to reducing inequalities in access to knowledge, but also to strengthening strategic partnerships that enhance the role of science as a public good and an instrument of social transformation.

This study fulfills its objective by critically analyzing communicational practices associated with knowledge transfer and co-production, and by proposing concrete dynamics for their implementation within the context of the CCD-SB100. Through the integration of theoretical frameworks from public communication, rural extension, and knowledge co-production, the research advances the understanding of mediations between science, technology, and society. Its main contribution lies in offering a communicational model that combines methodological rigor, social sensitivity, and institutional innovation, serving as a reference for science and technology policies guided by participation and sustainability.

By transforming communication into a structuring axis of public mobilization, the CCD-SB100 establishes itself as a space of collective experimentation and learning, reaffirming that communication is not merely a means of scientific dissemination, but the foundation of science’s social legitimacy and a precondition for the development of an intelligent, inclusive, and socially responsible agriculture. By demonstrating that co-production of knowledge depends on communicational infrastructures that support inclusive interaction and shared meaning,

the article provides a framework that may inform future research on organizational behavior, teamwork, and the socio-cognitive foundations of collaborative work in science and technology ecosystems.

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