

Impact assessment of the Coffee Social Network (Rede Social do Café)

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ABSTRACT

The aim of the present study was to assess the impacts of the Coffee Social Network (Rede Social do Café, in portuguese) among different categories of users through the proposal of a method based on multidimensional indicators. The CSN shares information about coffee and promotes collaboration and exchange of experiences in the coffee ecosystem. In an online study conducted in 2019 with 366 respondents, we observed an overall measured impact of the CSN of 29.1%, ranging from 25% to 37%, among eight categories of users: Agroindustry, Technical Assistance and Rural Extension (TARE), Commercialization, Communication, Education, Research, Agricultural Production, and Other. The most expressive results were found in the Quality, Evolution in Knowledge, and Adoption of Technologies indicators, at 44.4%, 39.4%, and 38.4%, respectively. Such indicators refer to an established pattern in each one of the categories of users and are aligned with the objectives of the CSN and with its most frequent themes. The results found are relevant for the management of the platform, whether as informative content or in relationship with users. Finally, the model of impact assessment proved to be appropriate for the CSN and can be applied in other social networks linked to agribusiness.

Key words: Social network; impact assessment; coffee; agribusiness.

1 INTRODUCTION

In a recurring manner, action taken by an agent in attempting to achieve a certain objective lead to two questions. The first consists of understanding if the objective was fulfilled in a complete or partial manner and what results were obtained. The second deals with the attempt to measure the efforts employed for achieving that purpose. Different factors are evaluated so as to achieve the same or even better objectives in the future, while minimizing the efforts undertaken and maximizing the benefits achieved. All the elements that compose this process should in some way be identified and measured. This reflection, in a summarized fashion, involves an impact assessment (IA).

Among the conceptions found in the literature, Gertler et al. (2011) define impact assessment as a tool for measuring the results obtained by project execution, public policy, programming, and other objects of study that can modify the well-being of individuals and families. IA identifies a causal relationship between the action and long-term results. Thus, the authors highlight that IAs, when well-constructed and applied, allow obtaining reliable evidence that assists decision making for different interested parties. In addition, they represent a relevant contribution to accountability, resource allocation, monitoring directives,

and other decisions. IA is also part of the analysis of execution of a program cycle or public policy, providing sound input for decisions regarding performance and continuity (Carvalho et al., 2018).

In the context of public policy, there is increasing demand for impact assessments (Salles-Filho et al., 2011), including those of communication programs and activities, above all, those that involve popularization of themes of public interest (Brandão, 2007; Duarte, 2007). In Brazil, companies and institutions increased their concern with organizational communication in the second half of the 1980s. Kunsch (2017) argues that organizational communication needs to be in the interests of society. She highlights that practicing public communication must be open and interact with society, the media, and the productive system.

Created in 2006, Coffee Social Network - CSN (*Rede Social do Café*) is an online tool of communication based on concepts of social media¹, that aims the disclosure of news, information, and technologies regarding coffee. When it

¹For Recuero (2008), social media refers to the tools of communication that allow the emergence of social networks, overturning the logic of mass media (one for all) to the logic of participation (all for all). According to the concept of Altermann (2010), social networks represent groups of people that have some level of mutual relationship or interest, while social media would be the online tools used to disclose content, with the possibility of participation.

began, it sought to promote collaboration, knowledge, and business in the ecosystem of coffee agribusiness (Pereira; Aguiar, 2013). Over time, the objectives have changed, with expanded reach of the information, the exchange of experiences, and the disclosure of technologies remaining. From the beginning, it has been maintained through support from the institutional program of the Brazilian Consortium for Coffee Research and Development (*Consórcio Brasileiro de Pesquisa e Desenvolvimento do Café*), including public resources.

Thus, we propose a method based on multidimensional indicators for analyzing the results and impacts of CSN on its users. We aim to evaluate the impacts of CSN by category of user. For that purpose, indicators that allowed measurement of additionality and causality were proposed and analyzed; these elements are important in an IA (Salles-Filho et al., 2010). Additionality consists of measuring the difference of a determined indicator in time T_1 in relation to its value in time T_0 . In this variation, exogenous and endogenous factors may be present that need to be considered in the model. That way, the attribution of causality relates how much of the variation found can be attributed to the object evaluated (Capanema et al., 2013). The IA was performed based on the perception of users of the CSN, divided into interest groups.

In addition to this introduction and final considerations, the study has three other sections that deal with contextualization of the assessment, methodological procedures, and results and discussion.

2 CONTEXT OF IMPACT ASSESSMENT

A study performed in 2020 indicates that 84% of Brazilian farmers use at least one digital technology in their production process and 57.5% use social networks as information channels. The main function of the digital technologies used by farmers is obtaining information and planning the activities of the property. Prominent among the advantages perceived from use of the digital technology are increased productivity, greater efficiency in the labor force, and quality in production (Bolfe et al., 2020).

The use of Internet tools has transformed the way people communicate and allowed new social groupings, new forms of conversation, and identification of new actors and their connections (Recuero, 2008; Lemos, 2003). This new configuration, called WEB 2.0, has had important social repercussions, strengthening processes of collective work, of affective exchange, of production and circulation of information, and of social construction of knowledge supported by information technology (Primo, 2007).

With the emergence of the digital economy, dynamic networks of cooperation among different social and economic agents have been considered the organizational format suitable for promoting learning and for generating, communicating, and transferring knowledge and innovations. Thus, creating alliances is analyzed as a possibility of disseminating knowledge regarding the sector, promoting value for the companies, partners, and customers/clients (Aguiar et al., 2012).

Cerqueira and Silva (2011), nevertheless, indicate the need for selecting pertinent indicators, as well including a step that seeks to identify correlations, motives, effects, consequences, and variations in perceptions in analysis of the interactions in these networks. However, the development of IA methods is not a trivial task and it involves complexity, due to attribution of criteria of causality and additionality, the specificities of the object studied, and the need for accountability (Pereira et al., 2019).

In dealing with assessment of programs for communication in the online environment, like the object of the present study, it is necessary to recognize its complexity because it involves many factors and dimensions of analysis. According to Pellegrini (2014), this assessment generally involves identification of patterns of interaction among the different actors and monitoring of reactions in the face of available resources. According to Macnamara (2018, p. 24), an assessment of the communication process must have the public as the main focus: "In public communication, the audiences determine if the communication is effective or not, especially in the final stages of change of attitude or behavior".

Based on a broad survey of theories of public communication and influence, Atkin and Rice (2013) argue that public communication campaigns can generate moderate to strong influence on the results of cognition, and less influence on attitudinal and behavioral results. Regarding this limitation, Macnamara (2018) affirms the importance of carrying out systematic assessments of the communication process, in contrast with naive suppositions, to promote an action or program. In highlighting cases of success, the author emphasizes that communication is generally better assessed when there is direct involvement of the public with the media or there is the perception of benefits.

3 MATERIAL AND METHODS

The first phase of the research involved a study of the context of the CSN, including mapping of user profiles, themes of interest, areas of operation, and ways of making use of the products offered by the network. This set of information provided the basis for constructing the method based on multidimensional indicators for impact assessment, serving as

a model that can be used in assessment of agribusiness social networks.

For this, we carried out an in-depth study of the context of CSR, which considered information on its institutional trajectory, the development and implementation process, and the current situation of the network. A literature review and institutional documents supported this study. This set of information supported the construction of themes, dimensions, and evaluation indicators, which are the basis of the conceptual proposal presented in this article. From definition of dimensions and indicators, a questionnaire was prepared, composed of five sections: a) User Characterization; b) Products Offered; c) Credibility and Reliability; d) Results Achieved; and e) Demands and Improvements. However, for this article, we only address the “Results Achieved” section.

The dimensions of the impact assessment present a transversal nature in the different links of the coffee production chain due to the nature of the network product and the information. The information generated by the network has a dynamic character of the use, molded from interests, which vary according to the actor or user, which results in a diversity of uses and, consequently, impacts. Figure 1 illustrates this dynamic.

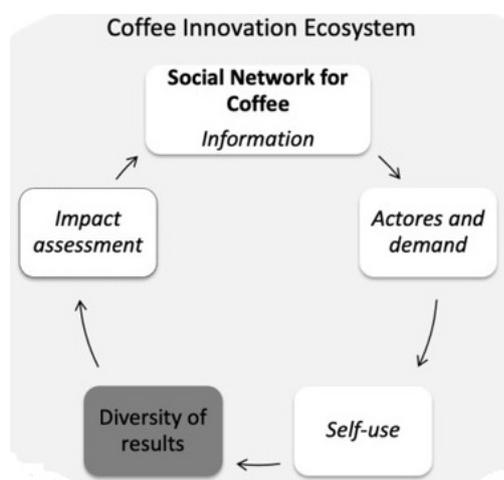


Figure 1: Dynamics of information generation in the Café Social Network

Source: prepared by the authors.

The questionnaire was applied through the *Google Docs* tool in the period from 20 November to 10 December in a random, non-probabilistic, convenience sample with respondents representing eight user categories of the CSN: Agroindustry, Technical Assistance and Rural Extension (TARE), Commercialization, Communication, Education, Research, Agricultural Production, and Other. Each one of these categories and their respective impacts will be discussed

in the next section. A total of 374 questionnaires were collected, eight of which were eliminated as they showed inconsistencies, resulting on a total of 366 valid questionnaires.

The questions were constructed from categorical variables to calculate the impact on the indicator, with possibilities of responses regarding perception of the influence of the CSN being (0) does not apply, (1) low, (2) medium, and (3) high.

Specifically, in this article, we present the method developed for impact assessment in the dimension “Results Achieved”² by the CSN considering the use of the information by users and the perception of its influence on the following indicators: a) Evolution in Knowledge; b) Evolution of Income; c) Completion of Transaction(s); d) Quality; e) Management of the Rural Property; f) Agricultural Productivity; g) Forming and Strengthening of Networking; and h) Adoption of Technologies. The “Results Achieved” dimension merited special attention in this article because it presented the additionality and causality elements desired in an IA. Thus, the information and the calculations obtained allowed analysis of the impacts of the CSN. The causality shows the effect of the CSN on the evolution of each indicator.

The “User Characterization” and “Products Offered” dimensions portrayed the CSN and its users, without presenting elements of additionality or causality. The “Credibility and Reliability” dimension analyzed aspects of additionality, showing the evolution in the perception of users on the content made available, though without causality. The “Demands and Improvements” dimension inquires about the possibility of refinement through open questions.

The information collected was consolidated in MS Excel – Office, which assisted in the calculation of the indicators impact according to Equation 1:

$$R_i = \frac{\sum_{i=1}^n \alpha \times \left(\frac{T_0 + T_1}{2} \right) \times C_{CSN}}{n} \quad (1)$$

where

R_i = impact on the indicator

n = number of valid responses in the indicator

T_0, T_1 = value of the attribute

$\alpha = -1$ if $T_0 > T_1$

$\alpha = +1$ if $T_0 \leq T_1$

C_{CSN} = influence of the CSN on the indicator

²The name given to the dimension “Results Achieved” alludes to the objectives of the CSN and to the perception of the users. It should be noted, however, that the terms “result” and “impact”, though commonly used interchangeably, are distinct in this study. Results are more immediate, and can be considered as intermediate steps in the direction of long-term impacts ([https://www.tcd.ie/civicingement/assets/pdf/engaged-research/planning-for-impact-guide.pdf](https://www.tcd.ie/civicingagement/assets/pdf/engaged-research/planning-for-impact-guide.pdf)). For the purposes of this study, we will use the following definition of impact: “Positive and negative, primary and secondary effects of long term produced by an intervention of development, directly or indirectly, whether intentional or not” (OCDE, 2002).

The calculation of R1 considers the mean between the values of T_1 and T_0 , because there are cases in which the individuals did not show changes in the indicators during the period considered in the assessment, that is, for the cases in which the calculation of additionality resulted in zero ($T_1 - T_0 = 0$). However, we observed that causality was present in the responses, indicating that, although there was no evolution in the indicator (additionality equal to zero), the CSN had an effect, resulting in a final impact different from zero. The parameter establishes the evolution in the indicator measured. For cases in which the individual evolved or remained constant in the indicator, is positive; otherwise, it is negative.

Upon analyzing the data obtained through Equation 1, we noted that the interval of the impact of the indicator ranged from -6 to +9. Thus, the interval was normalized to [-1; +1], without distorting the original responses or results, through the following Equation 2:

$$I_f = \frac{(2 \times R_i) - 3}{15} \quad (2)$$

where

R_i = impact on the indicator

I_f = normalized impact on the indicator

Thus, the impacts of each of the indicators proposed were obtained and then analyzed in the following section, together with the results for each user category.

4 RESULTS

Among the evaluated indicators, Quality, Evolution in Knowledge, and Adoption of Technologies were the ones with

the highest impacts, over 40 percent (Figure 2). Regarding the categories of users analyzed, users belonging to Agroindustry were the most impacted by the contents made available on CSN (37.2% of general impact), followed by the category of users linked to Education (33.8%) (Figure 3).

5 DISCUSSION

In this section, we discuss the impact assessment of the CSN in the “Results Achieved” dimension. First, we will discuss the results of the indicators in a general manner, and then by user categories.

5.1 Impact Indicators of the Coffee Social Network

Eight indicators were proposed for the “Results Achieved” dimension: Evolution in Knowledge, Management of the Rural Property, Evolution of Income, Completion of Transaction(s), Forming and Strengthening of Networking, Quality, Agricultural Productivity, and Adoption of Technologies. The impact on each one of these indicators, according to the responses obtained from the total of 366 respondents, ranged from 9.2% in the Evolution of Income indicator to 44.4% in the indicator referring to Quality (Figure 2).

In relation to the Quality indicator, the CSN had an effect on advancement in coffee quality regardless of the user category. The network disseminates agronomic techniques, post-harvest procedures, and industrial practices that affect quality. From the result determined, many made use of this information to increase their attention regarding product excellence, or they judged that the CSN positively affected this indicator.

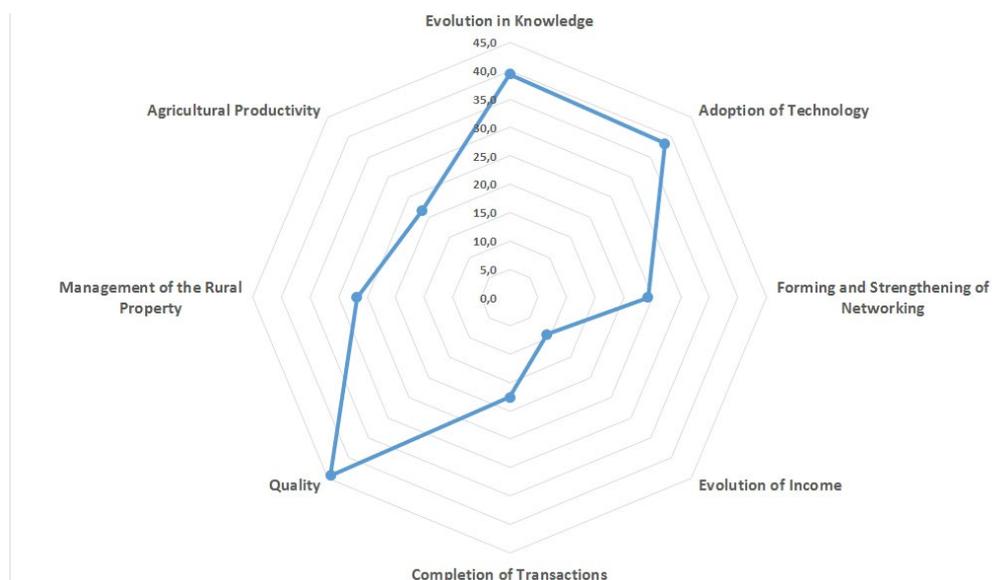


Figure 2: Impacts on the indicators in the “Results Achieved” dimension, CSN, 2019

Source: prepared by the authors.

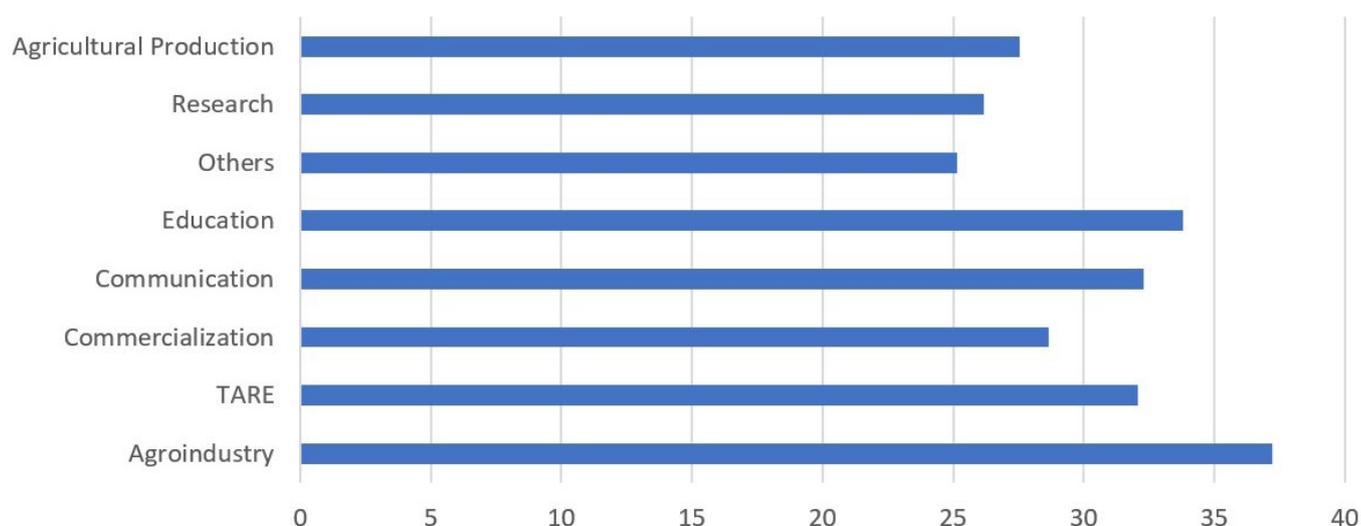


Figure 3: Impacts of the indicators on the “Results Achieved” dimension, by user category, CSN, 2019

Source: prepared by the authors.

Another prominent indicator was Evolution in Knowledge in topics related to the theme of coffee, which confirms achievement of one of the missions of the CSN, which was created precisely to disseminate information to the coffee community. The impact of the CSN on this indicator was 39.4%, allowing one to infer that the CSN is important for maintaining and/or increasing the knowledge of its users. A similar result of impact was found in relation to the Adoption of Technologies indicator, which obtained 38.4% impact, showing that the CSN contributes to dissemination, transfer, and adoption of coffee technologies.

Analyzing these two indicators together, it can be inferred that the CSN not only affects advancement in knowledge but also supports the dissemination and consequent adoption of technologies. In other words, it confirms that technological dissemination for the purpose of fostering innovation and increasing the competitiveness of the Coffees of Brazil segment can be partly attributed to the CSN. Currently, it is recognized that part of the economic success in coffee growing can be observed through the Management of the Property indicator, the result of which was positive, at 26.8%. This impact refers to the effect of the CSN on improvements in management of the different activities of the coffee production system, as well as on maintaining agricultural ventures.

The CSN contributed to increasing the relationship networks, since the digital environment facilitates the establishment of contacts and interactions with the diverse actors in the coffee ecosystem. Thus, the CSN affected the Forming and Strengthening of Networking indicator, which showed a positive impact result of 24.2%.

In the indicators related to Agricultural Productivity, Completion of Transaction(s), and Evolution of Income, the impacts were relevant, though less than those mentioned

above. In relation to Agricultural Productivity, the impact of the CSN was 21.7%. This value is not directly correlated, but it leads to the inference that the greater knowledge and use of technologies attributed to participation in the CSN also had an effect on the productivity indicator.

In the case of the Completion of Transaction(s) indicator, the impact of the CSN was 17.6%. Although completing business transactions is not the focus of the CSN, users affirmed that they were positively affected by participation.

Concluding the discussion of the indicators assessed, the CSN has an informative character and a limited capacity to affect the income of its users. This can be confirmed from the result obtained by the Evolution in Income indicator, which was the indicator that showed the least impact (9.2%) among all those analyzed. In this respect, it is not the role of the CSN to modify the income of users, but rather to make content available so that they can receive this information and make use of it. This result confirms the observation of Atkin and Rice (2013) and Macnamara (2018) when they emphasize that campaigns and communication programs have more effect on cognition and less effect on attitudinal and behavioral results. But it also supports the idea of Macnamara (2018) when it indicates that the evaluation is related to direct involvement of the public with the media or there is the perception of benefits.

5.2 Impacts on User Categories

In this section, we will present analysis of the results of impacts by user category: Agroindustry, Technical Assistance and Rural Extension (TARE), Commercialization, Communication, Education, Research, Agricultural Production, and Others. It is noteworthy that there was a

larger number of responses for the Agricultural Production, Research, and TARE categories, concentrating approximately 65% of the total interviewees (Table 1).

Table 1: Distribution of the respondents by user category, 2019.

User Category	Number	%
Agricultural Production	102	27.87
Research	75	20.49
TARE	59	16.12
Commercialization	51	13.93
Others	24	6.55
Communication	22	6.01
Agroindustry	17	4.71
Education	16	4.64
Total	366	100.0

Source: prepared by the authors.

These different categories of users were positively influenced by the CSN in all the indicators proposed, the impact ranging from 25% to 37%, as can be seen in Figure 3. These results lead to the inference that in greater or lesser magnitude, the CSN had a positive impact, regardless of the category.

The CSN had the greatest influence on the agroindustry category, representing 37.2% impact (Figure 3). This result may stem from the need of the actors present in this segment to diversify sources of information regarding quality, market, and commercialization, because these themes are frequent within the daily posts of the CSN.

After that, the most significant aspects were in the user categories of Education, at 33.8%, and Communication, at 32.3%. The objective of the CSN is to disseminate technical-scientific and market knowledge regarding coffee growing, allowing real time monitoring of that which influencers and decision makers are putting forth. The CSN essentially operates as an informal continuing education system for its users. It should be emphasized that in these categories, journalists, communicators, professors, and students (technical education, undergraduate or graduate studies) participate in the CSN as receivers and producers of information/content.

In the TARE category, impact was evaluated at 32.4%, a result aligned with the role of these professionals in disseminating technologies and innovations. The other user categories have impact values from 25% to 30%: Commercialization (28.7%), Agricultural Production (27.6%), Research (26.2%), and Others (25.2%) (Figure 3).

Among these, the Agricultural Production user category is noteworthy, since it includes coffee growers and represents the largest number of respondents (27.8%), constituting the group that most accesses the CSN in this study (Table 1). It should be remembered that the CSN was created in 2006 with the objective of integrating research, TARE, and coffee growers, and the percentages of impact achieved in these categories show the success of the strategy conducted up to now.

We will now discuss the results of each one of the indicators in accordance with the different user categories (Figure 4). In relation to the Agricultural Production category (Figure 4a), the Quality indicator recorded one of the greatest impacts (48.8%) and, in fact, the themes of coffee quality, trends, and post-harvest practices have been highlighted by the CSN over the years. Furthermore, within this category, the Adoption of Technology and Evolution in Knowledge indicators were positive, both greater than 38%. Upon disseminating content regarding coffee production from genetics to consumption, the CSN impacts the Agricultural Production user category above all. In the other indicators, the impacts were positive, though of lower magnitude, in the following decreasing order: Management of the Rural Property (20.6%), Forming and Strengthening of Networking (18.5%), Completion of Transaction(s) (18.5%), Agricultural Productivity (17.5%), and Evolution in Income (8%).

In the Research user category, which corresponds to 20.4% of the total of interviewees, the impacts were more relevant in the indicators of Evolution in Knowledge (42.0%), Quality (39.2%), and Adoption of Technologies (29.6%). Other indicators had impact values below 25% (Figure 4b). It should be noted that the CSN arose from the interaction between the Coffee Research Consortium (*Consórcio Pesquisa Café*) and the National Coffee Council (*Conselho Nacional do Café*) for fostering greater coordination between research on TARE and agricultural production, encouraging exchange of knowledge from the beginning.

In the TARE category, there were significant impacts mainly in the following indicators: Quality (47.8%), Management of the Rural Property (38.5%), Evolution in Knowledge (38.5%), Adoption of Technologies (38.4%), and Agricultural Productivity (32.5%) (Figure 4c). These results are aligned with the mission of the CSN related to dissemination and transfer of knowledge to coffee growers served by TARE. In addition, this category has a prominent role in replication and multiplication of information closely related to coffee growers. In the Evolution of Income, Completion of Transaction(s), and Forming and Strengthening of Networking indicators, impacts were below 22%; though lower than the others, they were still quite significant.

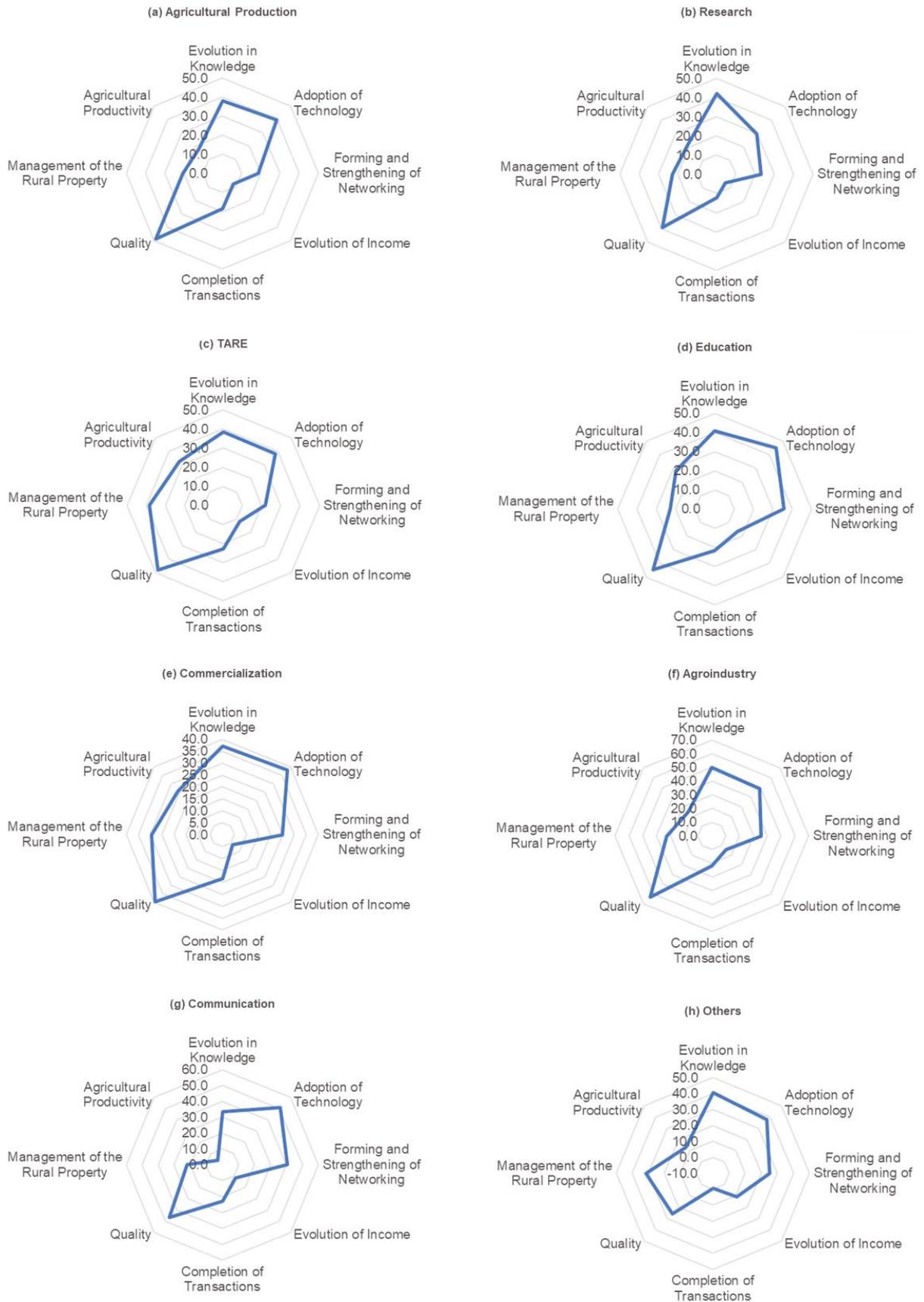


Figure 4: Impacts on indicators by CSN user categories in 2019.

Source: prepared by the authors.

The Education category (professors and students) exhibited a trend similar to that identified in the TARE category – impacts in different indicators greater than 40% (Figure 4d), as observed in Adoption of Technologies (45.0%), Quality (44.8%), and Evolution in Knowledge (40.8%), as well as Forming and Strengthening of Networking (35.8%). Thus, both the TARE category and Education category differ from the others by having transversal activity throughout the coffee ecosystem, making use of the informative content of the CSN, replicating and transferring it to other actors. In the other indicators, the impacts were from 28.3% for Agricultural Productivity to 16.7% for Evolution of Income.

The Commercialization category includes users linked to traders, managers of cooperatives and associations, baristas, and retail companies of inputs, fertilizers, farm machinery, and others; and it also follows a pattern already observed in other categories. Thus, the Sensory Quality, Adoption of Technologies, Evolution in Knowledge, and Management of the Rural Property indicators obtained more significant impacts (Figure 4e); that is, the content made available by the CSN is received by these users linked to business and are reflected in impacts on the indicators cited. For the other indicators, the effect of the CSN on the category was positive, though at lower magnitude.

In the Agroindustry category, the greatest result of impact of the activity of the CSN was obtained for the Quality indicator, at 62.9% (Figure 4f). Furthermore, in this category, the Evolution in Knowledge and Adoption of Technologies indicators achieved impacts of 50.2% and 48.6%, respectively. After that, the Forming and Strengthening of Networking (35.7%) and Management of the Rural Property (32.8%) indicators were prominent. Finally, at lower magnitude, came Agricultural Productivity (24.3%), Completion of Transaction(s) (21.9%), and Evolution of Income (14.4%). Among the indicators evaluated for this category, Sensory Quality stands out, for this is a sensitive topic both for this agro-industrial segment of coffee and for other categories already analyzed. This results in a more attentive look at the knowledge and technologies that add quality to the product and, for that reason, it is present in the content made available by the CSN.

The Communication category, as the others analyzed, showed the pattern of prominence of the Adoption of Technologies (50.9%), Quality (47.0%), and Forming and Strengthening of Networking (40.6%) indicators (Figure 4g). A possible explanation for the greater impacts on these indicators is that they are topics frequently made available by the CSN and that possibly generate interest in communicators. In relation to the Forming and Strengthening of Networking indicator, the category felt that it was influenced, showing that participation in the CSN expands its contact network. For the other indicators, though impact was positive, it was of lower magnitude.

The Others category was placed in the survey as an option for respondents that did not fit in the pre-defined categories, with a total of 24 questionnaires answered. Impacts were identified in the following indicators: Evolution in Knowledge (40.6%), Adoption of Technologies (37.5%), and Management of the Rural Property (31.4%) (Figure 4h). The others 7 showed less expressive impacts. Thus, the lack of homogeneity of the interests of this group of users might not provide an exact perception of the impact of the CSN for this category.

6 CONCLUSIONS

Through a method based on multidimensional indicators, the results of this study indicate that the CSN had a positive influence on all user categories in all the indicators assessed. We can infer that each category uses the information according to its role in the coffee ecosystem and obtains (or expects to obtain) results according to its interests, which consequently results in different impacts both in the indicators proposed and for each category assessed. Through the evidence presented, experiences like the CSN can serve as an example and stimulate other agricultural ecosystems. These ecosystems can increase communication and consequently lead to improvement for the actors in different segments.

Among the indicators evaluated, those that exhibited greatest impact were Quality, Evolution in Knowledge, and Adoption of Technologies, with positive results in the order of 40.0%. These same indicators were those that had the greatest impacts on all the categories analyzed, defining a pattern aligned with the objectives of the CSN and with the content made available in a recurrent manner. The other indicators, in order of impact, were as follows: Management of the Rural Property, Forming and Strengthening of Networking, Agricultural Productivity, Completion of Transaction(s), and Evolution in Income.

Among the user categories most present in the CSN are Agricultural Production, Research, and TARE, which corresponded to approximately 65% of the interviewees. In fact, since conception of the CSN, the objective has been to expand dialogic among these groups, through dissemination of information of technologies to extension personnel and coffee growers, as well as contribute to determining demands for studies.

The procedures adopted will allow systematic assessment, which may enhance investments in human resources, time, and projects, and will support management personnel of the CSN in decision making and activities. Based on the results of the IA, it is possible to identify themes of interest, priority groups, and new forms of conversation and interaction among the different actors.

In the present study, just as in most of the models that seek to indicate causality, we recognize that the results may be affected by biases from this participation and even by the positive perception of the interviewees. These limitations are explained by the complexity of isolation of the factors, as in most of the methods based on the presuppositions of cause and effect and that are used in perception of users. The impacts of communication processes involve several factors, including the need to evaluate the reception of the content and of the information shared.

For future studies, we suggest expanding the methodology of multidimensional indicators for assessment of the impact of other social networks, especially when the desire is to identify the perception of users regarding the effect of this participation on performance of their activities. We also suggest validation of the proposed indicators in other social media, contributing to strengthening the field of assessment studies.

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8 AUTHORS' CONTRIBUTION

SPP participated in the project's conception, including the methodological conception, questionnaire application, elaboration, and revising of the manuscript. LMCB discussed the theoretical and methodological conception, questionnaire application, and elaborating and revising of the manuscript. CEF participated in developing the methodology, elaboration, and application of the questionnaire, statistical analyses, and elaborating and revising the manuscript. CLRV participated in developing the methodology, elaboration, and application of the questionnaire and elaborating and revising the manuscript. CMGAP participated in elaborating and reviewing the final version of the manuscript.

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