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LALICS

LATIN AMERICAN NETWORK FOR ECONOMICS OF LEARNING,  
INNOVATION AND COMPETENCE BUILDING SYSTEMS

# Results and Impacts Evaluation of the Coffee Social Network<sup>1</sup>

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## Abstract

The evaluation of results and impacts is a hard task due to the specificities of the studied objects. Another complex point is the measurement of causality and additionality from the definition of a baseline. This paper aims to present a method of evaluating the results and impacts of the Coffee Social Network. The method is supported by a set of indicators and multidimensional metrics. In the construction of dimensions, indicators and evaluation metrics we considered a study of the institutional trajectory of the Coffee Social Network and the analysis of the primary information obtained in its databases. The results obtained from the application of the method will allow measuring the impacts of the main characteristics of the network. Future assessments of social networks related to agribusiness can be supported by the method presented and discussed in this article.

**Keywords:** Coffee Social Network, Impact Assessment, Multidimensional, Agribusiness.

## 1. Introduction

The organization of the coffee research in Brazil, as well as the institutional trajectory of some public research institutes may be blended with the country's history of socioeconomic and cultural development. This historical connection is evidenced in the literature by several classic works. As an example of the importance of the coffee culture in Brazil, in 1887, the Agronomic Institute of Campinas (IAC) was created to lead research on this culture. The research developed by IAC can be considered pioneers in the institutionalization process of the agricultural research in Brazil. Important results regarding to the coffee culture R&D were achieved by IAC (Turco et al., 2013).

In Brazil, the coffee innovation ecosystem is well structured and stands out due to the intense use of technology. The search for innovations is an intrinsic feature of this ecosystem; an example of this aim was the development of a digital information platform named the Coffee

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<sup>1</sup> Research support for Brazilian Consortium for Coffee Research and Development.

Social Network (CSN) (Bliska et al., 2015; Conceição, Ellery Junior, Conceição, & others, 2017; Pereira & Aguiar, 2013; Turco et al., 2013; Vegro, Fronzaglia, & Veiga Filho, 2009).

CSN is a different innovation when compared to other technologies present in agricultural innovation ecosystems. It is a communication tool based on social media concepts, which organizes and disseminates information on the Internet about the coffee innovation ecosystem. CSN was developed and implemented in 2006 as a social media platform, and it was conceived within the scope of the Brazilian Consortium for Coffee Research and Development (RCC). At that time this type of tool was not usual in the Brazilian agribusiness environment. These elements characterize CSN as an innovation that have contributed to the development of Brazilian agriculture.

CSN is connected to the RCC; this link strengthened the legitimacy and reliability this tool. RCC is an important institution in the coffee innovation ecosystem in Brazil; it was created in 1997 and now is coordinated by the Brazilian Agricultural Research Corporation (Embrapa). Other actors have participated in this institutional arrangement, such as Universities and Research Institutes, which together plan and execute the National Coffee Research and Development Program (Araújo, Antonialli de Brito, & Guerrini, 2010).

CSN is supported by the Peabirus platform. In 2006, Peabirus brought together virtual networks aligned with a common goal, i.e., networks aiming at to promote collaboration, knowledge and business. The Peabirus' virtual environment has provided channels for professional and institutional visibility, by attracting new users. At the beginning of its activities there were 25 thematic networks on coffee, which rose to 50 in 2008. The number of thematic networks linked to Peabirus has declined over the years. In 2016 only the CSN remained. CSN was also based on requirements specified by Peabirus and RCC (Pereira & Aguiar, 2013).

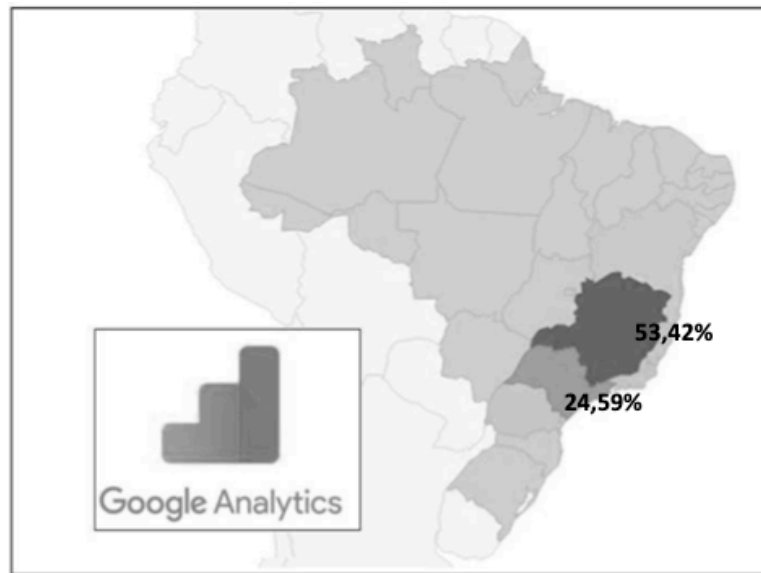
In the context of the information economy, dynamic networks of cooperation involve social actors and can be considered organizational forms. These formats allow conceiving learning environments supported by intensive communication processes. This learning and interactivity environment, enrich the transfer of knowledge and contribute to innovation (Cohen, 2002). In the case of CSN, the forms of interaction allow an articulation between the actors who seek to achieve results on R&D, education, production, business and social welfare.

### ***The Coffee Social Network***

Information from the Peabirus database (from 2006 to 2018) showed the CSN received 21 million hits to its page. Users have searched for more than 50,000 different terms related to the coffee innovation ecosystem. Among the sought-after terms were the related to technology, agricultural supply, market, events, consumption, services, legislation, climate, among others.

Google Analytics was used to analyze CSN aiming at to provide the rates of views and clicks as well as the geographic location of visitors. These access indicators show the effectiveness in the sharing process of news, experiences and diffusion of agricultural technologies for the coffee innovation ecosystem.

Figure 1: Accesses to the Coffee Social Network, Brazil, 2009-2018



Source: Research data.

According to Google Analytics, in 10 years (2009-2018) CSN achieved 637,175 hits, 1,856,124 sessions and 3,470,231 page views. In this long period, users from 178 different countries accessed the network, with emphasis on Brazil, which accounted for 94.27% of accesses. The 5 first countries in quantity of accesses were Brazil, United States, Colombia, Portugal and Nicaragua. We highlight that these countries have an important participation in the global market of coffee.

In Brazil, the states that most look for information on CSN are Minas Gerais and São Paulo, which accounted for 53.42% and 24.59% of hits, respectively. Although the national comprehensiveness of CSN, more than half of accesses arise from Minas Gerais, due to it is the state with higher production of Brazilian coffee. We highlight São Paulo because there is a concentration of several actors of the coffee innovation ecosystem in this state, such as roasters, factories, traders, infrastructure and logistics for exporting the Brazilian coffee (Figure 1).

CSN has positively influenced the innovation ecosystem of coffee, especially in Brazil, over 13 years of uptime activity. CSN was selected as the object of study due to it is an innovation and by the great potential of digital influence. Hence, this article aims to present a method for evaluating the results and impacts of the CSN.

## 2. Methodology

This study was based on the guidelines for the results and impacts evaluation of agricultural R&D activities proposed by Capanema et al 2018. The proposed reference framework arises from the research conducted in the Agronomic Institute and the guidelines for evaluation of results and impacts are: nature of the activities of C, T&I; R&D model; multifunctionality of agriculture and specificities of the case study (Capanema, Fredo, Bin, & Sachs, 2018).

The literature review shows that impact assessment studies should be supported by multidimensional analyzes due to the need to capture a diversity of results, which are characteristic of C, T&I activities (Capanema et al., 2013; Gaunand, Hocdé, Lemarié, Matt, & De Turckheim, 2015; Gertler, Martinez, Premand, Rawlings, & Vermeersch, 2011; Matt, Gaunand, Joly, & Colinet, 2017; Penfield, Baker, Scoble, & Wykes, 2014; Salles-Filho, Avila, Alonso, & Colugnati, 2010). Thus, for evaluating CSN the multidimensional study was chosen due to the specificities of the results of the network. We highlight that these results are dynamic and it arises from the use of information by several categories of users of the network.

The use of the method presented by Capanema et. al (2018), as background for evaluating the impacts of CSN, is due to the network is part of the coffee innovation ecosystem, its strong connection with the Coffee Research Consortium as well as it is a tool for knowledge transfer.

A study of the context in which CSN is inserted was carried out by means the collection of information about the network's institutional trajectory. This phase was supported by a bibliographic review and a review of institutional documents. Interviews with manager and network users were also performed. Database information was used to map user profiles, interest topics, user interest areas, and products offered by the network<sup>2</sup>. This set of information, together with the analysis of the data previously presented, supported the construction of the themes, dimensions, indicators and metrics for assessing impacts of the Coffee Social Network<sup>3</sup>.

### 3. Results and discussion

Assessment dimensions, indicators and metrics for measuring impacts compound the proposed method. The development of the proposed method was supported by strategic information that arises from the document review, the information collected in the social network database and the interviews with managers and users.

A classification of the CSN users was proposed and conceptualized, based on the mapping of user profiles and their search themes. We identified 8 main categories, which reflect the coffee innovation ecosystem in Brazil. The 8s main categories of the CSN users are:

*i.*        **Research, Technical Assistance and Rural Extension:** Users working on R&D, technical assistance and rural extension. They act in various links of the coffee production chain. They are researchers, agricultural assistance technicians, and agricultural extension workers.

*ii.*       **Education:** Users who teach and learn, e.g., teachers and students.

*iii.*      **Trading:** Users that work as brokers, by intermediating the trade between the farm production and the domestic and external market.

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<sup>2</sup> SNC offers access to “News”, “Lecture Menu” and “Virtual Field Days”.

<sup>3</sup> This phase was supported by the decomposition method, which combines deductive and inductive actions from information collected and validated by specialists(Salles-Filho et al., 2010).

**iv. Commercialization:** Users that perform various activities related to the distribution and commercialization of the product. They are, for instance, traders, baristas, managers of cooperatives, coffee crushers and tasters.

**v. Farm-level:** Users who perform various activities related to agricultural production. They are farmers, traders of supply and agricultural machinery, rural managers, auditors and quality certifiers.

**vi. Agro-Industrie:** Users that work on the processing of coffee, e.g., factories that roast grains.

**vii. Consumption:** Consumers of coffee and its byproducts.

**viii. Communication:** Users that act in a transversal manner in the coffee innovation ecosystem. They are working on media and publicity, among other communication roles; for example, they act in magazines, radio, TV, Web sites, etc.

After the classification and conceptualization of the categories of users, a study of searching terms was carried out. This study allows us to define the dimensions of impact analysis. In the process of defining the impact dimensions we considered the elements identified in the bibliographical and documentary review, namely: frequency, novelty, quality, aligned with users' demands.

We observed the generation of information in the CSN has its own structure. The facts, information, and skills acquired by the CSN user, and its results, are shaped according to the users' experience, which results in a diversity of impacts to be evaluated. In this case, the results of applying the proposed method can be characterized as information inputs in the social network framework. In Figure 2 we present the information frame of the Coffee Social Network.

The method for evaluating the results and impacts of the CSN depict that the dimensions of the analysis should be in line with the previously presented categories of users. Therefore, the evaluation dimensions and their conceptualization are:

- **Outline of CSN information**

This dimension aims to quantify information from users, such as a professional activity, motivation for access the network, interest in coffee species, search topics, preference of information formats, period and frequency of access.

- **Products of CSN**

This dimension aims to quantify and qualify the interest and access to the network products (News, Lecture Menu and Virtual Field Day).

- **Credibility and reliability of CSN**

This dimension aims to quantify and qualify users' perceptions of aspects related to the reliability, such as novelty of information, problem solving, sharing with third parties, reading and comments.

- **Outcomes of CSN**

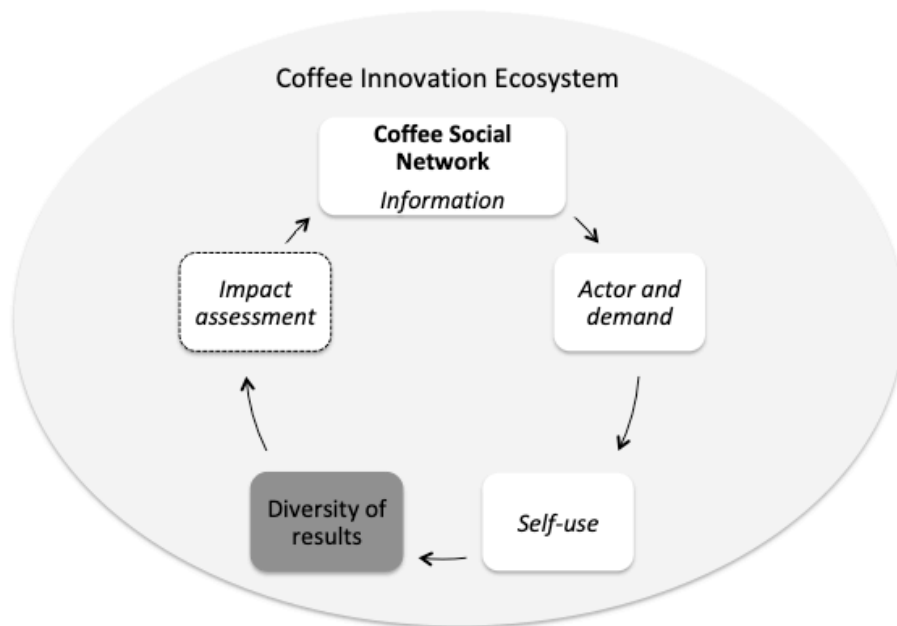
This dimension aims to find out information on the outcomes identified by the network users, such as learning, capacity building, income variations, business, life

quality, sensory quality of coffee, farm management, agricultural sustainability, partnerships, productivity, adoption and diffusion of technologies.

- **Improvement of CSN**

This dimension aims to identify and qualify the CSN improvement needs.

Figure 2: Generation of information in the Coffee Social Network.



Source: Research data.

From the definitions of the evaluation dimensions, a set of indicators aligned the dimensions and user categories were defined. In Table 1 we present the dimensions and indicators, which support the measurement of the results and impacts of the CSN.

The evaluation dimensions allow us to collect primary data by user categories by means of a survey. In this survey, the respondent will have access to groups of questions by categories, which means access to a reduced number of questions. This survey format is important to ensure a quantity of responses that allows the analysis.

Table 1: Dimensions and indicators for assessment results and impacts of the CSN

Dimension	Indicator
<b>Outline of CSN information</b>	Occupation field Occupation field localization Motivation for network access

	<p>Search topics</p> <p>Interest in coffee species</p> <p>Device used to access</p> <p>Main format for access to the contents</p> <p>Main platform for access or redirection to the contents</p> <p>Access information on the site</p> <p>Access frequency</p> <p>Time of access</p>
<b>Products of CSN</b>	<p>Access frequency the Virtual Field Day</p> <p>Access frequency the Lecture Menu</p> <p>Access frequency the News</p>
<b>Credibility and reliability of CSN</b>	<p>Novelty of information</p> <p>Reliability of information</p> <p>Quality of information</p> <p>Problem solving</p> <p>Frequency of information sharing</p> <p>Frequency of comment writing</p> <p>Frequency of reading comments</p>
<b>Outcomes of CSN</b>	<p>Knowledge variation</p> <p>Income variation</p> <p>Quality life variation</p> <p>Business variation</p> <p>Sensory quality variation</p> <p>Farm management variation</p> <p>Agricultural sustainability variation</p> <p>Agricultural productivity variation</p> <p>Networking</p> <p>Technology adoption variation</p>



	Technology diffusion variation
<b>Improvement of CSN</b>	Topics news
	Improvements
	Other suggestion

Source: Research data.

#### 4. Conclusions

The conceiving process of the proposed method, as well as its application in the Coffee Social Network, was a challenge due to the nature of the studied object: the knowledge. Knowledge, which is the main product of CSN, is transformed by its use and the individual interests of the network users shape it. The assimilating process of knowledge is interactive and results in a large quantity of results and impacts to be evaluated.

The survey conceived to collect primary information will consider the period from 2013 to 2018. Therefore, the proposed indicators can measure a five-years evolution of the knowledge generated by the CSN.

The evaluation is based on multidimensional indicators. In addition, the indicators and their metrics allow us to capture the causality and additionality aspects. These aspects are in general pointed out in the literature as an obstacle for the development of impact assessment methods. Identify causality and additionality, from the "information" object, is an advance in the knowledge on the agribusiness related social networks.

The proposed method is meant to support future assessments of the CSN as well as other similar research objects. Finally, the application of the proposed method allows us to create qualified and relevant information for social network managers and other actors interested in the development of the Brazilian coffee innovation ecosystem.

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