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SOCIAL INNOVATION AND HIGH-QUALITY COCOA PRODUCTION: A CASE STUDY OF THE 'CACAU SUL BAHIA' NETWORK

INOVAÇÃO SOCIAL E PRODUÇÃO DE CACAU DE ALTA QUALIDADE: UM ESTUDO DE CASO DA REDE 'CACAU SUL BAHIA'

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Abstract

This study aimed to analyze whether the formation of the 'Cacau Sul Bahia' Network promoted social innovation in southern Bahia, Brazil. Data were collected through participant observations, documental analysis and bibliographic based in the history of the region, and semi-structured interviews with 8 institutions and 10 cocoa producers who are members of the Cacau Sul Bahia Association (CSBA). Social network data were analyzed using UCINET. The approaches of social innovation, territorial development and social networks were the basis for the analyzes. The results showed that 'Cacau Sul Bahia' Network promotes some aspects of social innovation, such as cooperation, social governance, collective efforts and trust building. Although the main goal of Network is to improve the quality of cocoa beans and add value to local chocolate, its effects reach much farther. The 'Cacau Sul Bahia' Network formation, with the creation of the Cacau Sul Bahia Association leveraged the cultural value and historical importance of cocoa in the region, which has recently been granted geographical indication protection. Actors participating in the 'Cacau Sul Bahia' Network contribute to territorial development in southern Bahia. Personal and professional ties between actors are strong and play an essential role in the success of the association. However, strengthening the social capital is needed to reinforce the process of social innovation more broadly. This empirical research provides scientific and technical contributions about social innovation, high-quality production systems and geographical indication protection in a developing country, showing

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that social dialogue, community governance, and collective efforts can stimulate sustainable development and quality improvement in disadvantaged rural areas.

Keywords: Social innovation. Territory revalorization. Social capital. Network.

Resumo

Este estudo objetivou analisar se a formação da Rede ‘Cacau Sul Bahia’ promoveu a inovação social no sul da Bahia, Brasil. Os dados foram coletados por meio de observações participantes, análise documental e bibliográfica a partir da história da região, e entrevistas semiestruturadas com 8 instituições e 10 produtores de cacau, membros da Associação Cacau Sul Bahia (ACSB). Os dados da rede social foram analisados usando UCINET. As abordagens de inovação social, desenvolvimento territorial e redes sociais foram a base para as análises. Os resultados mostraram que a Rede ‘Cacau Sul Bahia’ promove alguns aspectos da inovação social, como cooperação, governança social, esforço coletivo e construção de confiança. Embora o objetivo principal da Rede seja melhorar a qualidade dos grãos do cacau e agregar valor ao chocolate local, seus efeitos vão muito além. A formação da Rede ‘Cacau Sul Bahia’, com a criação da Associação Cacau Sul Bahia, potencializou o valor cultural e a importância histórica do cacau na região, que recentemente recebeu proteção de indicação geográfica. Atores participantes da Rede ‘Cacau Sul Bahia’ contribuem para o desenvolvimento territorial do sul da Bahia. Os laços pessoais e profissionais entre os atores são fortes e desempenham um papel essencial no sucesso da associação. No entanto, o fortalecimento do capital social é necessário para fortalecer o processo de inovação social de forma mais ampla. Esta pesquisa empírica fornece contribuições científicas e técnicas sobre inovação social, sistemas de produção de alta qualidade e proteção de indicação geográfica em um país em desenvolvimento, mostrando que o diálogo social, a governança comunitária e os esforços coletivos podem estimular o desenvolvimento sustentável e a melhoria da qualidade em áreas rurais desfavorecidas.

Palavras-chave: Inovação social. Revalorização do território. Capital social. Rede.

Introduction

Rural producers who have a competitive disadvantage are becoming the center of a new organizational dynamic. Commitment, social capital, and valorization (or revalorization) of culture, tradition, and product origin are essential to increase these farmers’ competitiveness. Geographical indication protection is a strategy to enhance social innovation and territorial development. It is a quality assurance and rural development tool that has the power to connect people, products, and places (TASHIRO, UCHIYAMA AND KOHSAKA, 2019; BOWEN, 2010; BOWEN AND ZAPATA, 2009). A geographical indication label indicates that the product has a specific geographical origin and possesses qualities, reputation, or characteristics that are attributable to its origin (WIPO, 2017). This article contributes directly to the discussion of territorial development, product revalorization, social capital, social network, and the geographical indication protection of a Brazilian region.

Social innovation has an important role in neo-endogenous rural development (NEUMEIER, 2012; LEE et al., 2005). Development is largely dependent on the actors’ ability to develop sustainable structures and establish a sense of balance that, on the one hand, promotes innovation, creativity, new ideas, and actions, and, on the other hand, maintains stability. According to Bock (2016) and Moulaert, MacCallumm and Hillier (2013), social innovation stems from collective actions and social learning and aims at meeting social needs and addressing social exclusion, alienation, and deprivation. Social actions, added to personal relationships and structures (or networks), lead to the generation of trust, a crucial factor for social innovation. Social relations, rather than institutional arrangements or generalized morality, are majorly responsible for the production of trust in economic life (GRANOVETTER, 1985).

A social network of cocoa and chocolate producers emerged in 2014 in southern Bahia, Brazil, for the geographical indication protection⁶ of the region. Products with geographical indication must comply with certain quality and origin specifications related to sustainability, agricultural knowledge, and cultural practices (BOWEN, 2010). The protection offers various advantages to rural development, including intellectual property rights (PETIT AND ILBERT, 2015; ADDOR AND GRAZIOLI, 2002); maintenance of traditions, collective decisions, increased product value and reputation (ADDOR AND GRAZIOLI, 2002); value creation from agriculture (TASHIRO, UCHIYAMA AND KOHSAKA, 2019); creation of income and employment opportunities, preventing rural exodus (DOGAN AND GOKOVALI, 2012); and access to local, national, and international markets (CALDAS, CERQUEIRA AND PERIN, 2005). Lamine, Garçon, and Brunori (2019) showed that collective brands and alternative food chains, in addition to geographical indication protection, can lead to agroecological transitions. Coq-Huelva, Sanz-Canada, and Sanchez- Escobar (2017) investigated the quality of organic Spanish olive oil and observed that geographical indication protection increased the price and market distribution of the product.

Goodman (2003) compared aspects of the industrial world, such as standardized quality measurements and mass commodity production, to those of the domestic world, such as quality conventions embedded in trust, tradition, and origin and opportunities for differentiated, ecological products and forms of economic organization. Despite the potential benefits of geographical indication protection to local development, its impact depends on the institutional structure in which the protection is implemented, the relations between actors of the supply chain, and the support of institutional actors, especially in developing countries (BOWEN, 2010). In Nicaragua and many other American countries, the joint action of governmental and non-governmental organizations is rare (MANCINI, 2013). Rural development policies may be necessary to support weaker actors and prevent isolation.

In Brazil, a developing country with favorable climatic conditions, extensive rural areas, and production of diverse agricultural crops, geographical indication protection of socially disadvantaged areas can yield economic, cultural, social, and environmental benefits. This study sought to answer the research question, “Was the Cacau Sul Bahia Network formation able to promote social innovation in southern Bahia?” An institutional landmark denotes the relationship with the formation of the network, on April 24, 2018, the publication in the Website of the National Institute of Industrial Property of Brazil, of the Granting of the Certificate of Registration of the Indication of Origin of Southern Bahia - IP Sul from Bahia (FERREIRA AND SANTANA, 2017).

Our hypothesis was that the social network of cocoa and chocolate producers was capable of promoting social innovation through production and technological changes and, particularly, social organization, as public and private actors were united under the goal of revalorizing the territory. Our main objective was to analyze whether the formation of the ‘Cacau Sul Bahia’ Network promoted social innovation in southern Bahia, Brazil. This involves understanding the events leading to the formation of Network from the CSBA and the ties and social capital of the social network.

Theoretical framework of social innovation and territorial development

Scientific studies on social innovation and territorial development have gained momentum as our society seeks to find solutions to contemporary problems through interdisciplinary approaches. Important contributions were made to the field in the last decades. Neumeier (2017; 2012), Bock (2016. 2012), and Butkeviciene (2009) demonstrated the importance of social innovation for initiating collaborative actions in agriculture and promoting rural development. In an empirical study in rural Mediterranean areas, Petruzzella, Brunori, and Antonelli (2017) analyzed the best practices in social innovation. Rover, Gennaro and Roselli (2017) and Xavier, Naveiro and Aoussant (2015) focused their discussions on rural development initiatives in developing countries. Using a different approach, the Organization for Economic Cooperation and Development (OECD, 2011)

⁶ Normative Instruction no. 25/2013 of the Brazilian National Institute of Industrial Property (INPI) defines two types of geographical indication: (a) indication of origin, the geographical name of a country, city, region, or locality that has become known as a center for the extraction, production, or manufacture of a particular product or service, and (b) designation of origin, the geographical name of a country, city, region, or locality designating a product or service whose qualities or characteristics stem exclusively from the geographical environment, including natural and human factors (BRASIL, 2013).

discussed social innovation from the perspective of social entrepreneurs and public policymakers. Pol and Ville (2009) demonstrated that social innovation is a pathway to improved living conditions and business innovation, and Moulaert (2008; 2005) described the relationships between territorial development, urban community governance, and quality of life.

The European Commission (2013) and OECD (2011) conceptualized social innovation as new strategies, ideas, products, processes, models, and organizations that provide solutions to social problems in a manner that broadens and strengthens civil society, such as through improvements in working conditions, education, health care, and community development. According to these organizations, what distinguishes social innovation from other types of innovation is the focus on the wellbeing of individuals and communities and the strong link with local development. Smith, Voß and Grin (2010) preferred the term “socio-technical innovation” because of the inseparability of technical and social innovation processes. The construction and introduction of new technologies change the interaction between “things,” actors, and institutions and are shaped by how society is organized.

Social innovation is more likely to occur in social networks rich in social capital where actors with aligned interests participate in collaborative groups (BOCK 2016; MOULAERT, MACCALLUM AND HILLIER, 2013; NEUMEIER, 2012). According to Butkeviciene (2009), it is possible to deepen our understanding of how social innovations emerge in rural areas by analyzing the type of innovations (ideas, knowledge, design), the problems that they seek to solve or eliminate, and the actors involved in the process. These factors will be analyzed in this empirical study.

Adopting a territorial approach, Moulaert (2008) and Moulaert et al. (2005) examined different dimensions of social innovation. The authors discussed the differences between creative ideas associated with innovative actions, organizational changes driven by individual initiatives (mainly leaders), and legal institutional changes that can only be achieved with individual and collective empowerment. According to Miquel, Cabeza and Anglada (2013), public actors can innovate by promoting new forms of organization and coordination, by increasing the access of other actors to services and resources, and by adopting new approaches to political problems.

The association of social innovation with territorial development has produced positive results in different communities. For example, Carra et al. (2018) found that citizens and associations participating in the “Quartiere Bene Comune” (Neighborhood as Common Good) project, implemented in the Reggio Emilia region, Italy, were highly committed to the promulgation of local projects, recognized the value of public policy action, and had a high level of satisfaction with their community. In southern Brazil, the Ecovida Network, a horizontal and decentralized association of farmers, cooperatives, consumers, non-governmental organizations, and institutions, is evidence of the important role of social innovation in sustainable rural development (ROVER, GENNARO AND ROSELLI, 2017; XAVIER, NAVEIRO AND

AOUSSANT, 2015). The initiative promotes participatory certification of organic foods based on reciprocal trust relationships between members and the market. Social innovation projects have also been shown to impact public sector policies and increase cooperation between social actors in rural and urban areas. Gobattoni et al. (2015), in discussing the application of the LEADER approach for obtaining controlled origin denomination and typical geographical indication for Teverina wines in Italy, recommended stakeholders and policymakers to address the growing need for re-development and social innovation in rural areas.

Thus, the goal of social innovation is social change. Projects can have a socioeconomic, environmental, or cultural focus to change the dynamics of an organization or a territory. Either way, social change is established by the promotion of social capital in the social fabric of the community, through networks of relationships, norms, and trust (PUTNAM, 1995; 1993; COLEMAN, 1988) that facilitate the coordination and cooperation of actors, leading to the generation of social and economic values for the territory and, concomitantly, its development. Social resources can then be exchanged between actors in the form of information, financial resources, goods and services (FOA AND FOA, 2012), affectivity (MITCHELL, 1994), status, power, and social ties (LIN, VAUGHN AND ENSEL, 1981), which further promotes social and economic development. Studies on social innovations in rural areas need to be performed using an integrative approach that takes into account social interactions, social capital, and networks. These topics are discussed in the following sections.

Social networks and social capital

In business, more important than competitive advantages given by natural, local, or sectoral attributes are social proximity and coordination among actors who value their environment and use it as the basis for innovative enterprises (ABRAMOVAY, 2000). According to Edwards-Schachter, Matti and Alcántara (2012) and Dro, Therace and Hubert (2011), social innovation always produces or increases social capital, which is not tangible in itself but can lead to tangible results.

There are different forms of social capital. Some examples are obligations and expectations, which depend on the reliability of the social structure, the information potential that is inherent to social relations and provides the basis for action (Smith, 2000; Coleman, 1988), and norms, sanctions, and standards (PRETTY AND WARD, 2001; OSTROM, 2000; PUTNAM, 1995; COLEMAN, 1988).

The analogy with physical or human capital may help clarify how social capital can be increased. In the same manner that tools and training can improve human productivity, social networks (PRETTY AND WARM, 2001; PORTES, 1998; PUTNAM, 1995; 1993), trust (PRETTY AND WARD, 2001; PUTNAM, 1995; 1993), and organizational factors that facilitate coordination and cooperation for mutual benefits can strengthen social capital. The social structure affects the economic results of actors by influencing the flow and quality of information; as it is costly to verify the accuracy of information, actors tend to disregard impersonal sources, trusting only in people they know. Social networks are also an important source of reward and penalty, both of which are often magnified in their impact when coming from people closely known (GRANOVETTER, 2005).

In social network analysis, relationships between people, groups, departments, or even organizations are structurally analyzed and mapped (HENNEBERG et al., 2009; CROSS, BORGATTI AND PARKER, 2002). A social network can be described in terms of nodes (number, identity, and characteristics), connections (location, type, and strength), and the patterns resulting from such connections, also known as network architecture (AHUJA, SODA AND ZAHEER, 2012). The degree of a node reflects the number of connections the node has to other nodes in the network. Some nodes in the network may form several connections while others may have few links. When nodes have a similar number of connections, the distribution of status, power, or prestige among actors can be considered balanced (AHUJA, SODA AND ZAHEER, 2012; AHUJA, POLIDORO AND MITCHELL, 2009). Network cohesion and proximity between actors improve the transfer of knowledge. According to Reagans and McEvily (2003), knowledge transfer is strengthened by the willingness of individuals to devote their efforts to assist others, which in turn favors reciprocity and trust.

Schlithler (2004) argued that the existence of social networks is based on three premises: that authors have (i) autonomy of action, (ii) an understanding that group work is a valuable strategy, and (iii) the perception that dialogue (horizontal, democratic, and participatory) is necessary for success. As theorized by Jürgen Habermas and Ferdinand Tönnies, these characteristics suggest that relationships of trust, rather than strategy and structure, form the foundation of urban society.

Research methods

This qualitative study used social innovation, social capital, and social network approaches to analyze the relationship and perspectives of farmers, organizations, and public and private institutions connected to 'Cacau Sul Bahia' Network. Data were collected through document analysis, participant observations, direct participation of one of the authors in the Network, and personal semi-structured interviews with 8 institutions and 10 farmers who participate of the Network. All interviews were carried out according to the respondents' availability to participate in the research.

In the document analysis, we examined Network (actors) and CSBA files and records to review the historical events that led to their formations and investigate social innovation strategies, their purposes, and the actors and social capital involved in the project. The cocoa history in Bahia was an important aspect of the research, being recognized through bibliographic reviews, document analysis and the experience of one of the researchers working in the region itself.

The following institutions were interviewed: the Brazilian Support Service for Micro and Small Enterprises (SEBRAE), a private non-profit organization; the Cabruca Institute and the Arapyaú Institute, non-profit associations for the promotion of sustainable agroforestry and cocoa production; the Executive Committee of Cocoa Cultivation (CEPLAC), a public institution that aims to increase the competitiveness and sustainability of cocoa-producing states; a cocoa cooperative (C1); a chocolate cooperative (C2); and CSBA.

Most interviewed cocoa farmers engaged in diverse economic activities, such as rural tourism, fruit production, rubber extraction, and livestock farming. Some farmers cultivated cocoa in organic systems, but none were certified. The mean cocoa yield in 2013/15 was 23.750 kg.

Interviews were conducted in 2016, and participant observation sessions took place from 2014 to 2022. Questionnaires included questions about the level of trust in other actors, frequency of use of technological information sources, the actors who most contributed to social change in the region, the main reasons for maintaining relationships with other actors, the types of ties formed, and their views and knowledge about local history and political empowerment. Social network data were analyzed using UCINET. The participant observations took place at various times, in addition to those in field research, as in the event *I Jornada de Saberes do cacau: da árvore ao chocolate*, realized in 2017, in Ilhéus (Bahia), in which the researchers of this article participated, dialogued with the agents of the production chain and visited properties and the Cocoa Innovation Center; and participation of team researchers in research and extension projects in the southern region of Bahia, through an extension program (Project and Consulting Office of the State University of Santa Cruz), between 2012 and 2022.

In this study, we analyzed cocoa production systems in a specific region and the changes promoted by geographical indication protection. The need to improve regional development, which had been strongly impacted by decades of phytosanitary⁷ and economic problems, necessitated the strengthening of social networks, the increase in social capital, and the revalorization of local products. New networks were created with the engagement of public and private actors, leading to collective actions for local development. The central question of this research is: Was 'Cacau Sul Bahia' Network formation able to promote social innovation in southern Bahia? The results are discussed from the perspectives of social innovation, territorial development, social network, and social capital.

Results and discussion

History of cocoa production and cocoa quality in southern Bahia and emergence of the 'Cacau Sul Bahia' Network

Global cocoa production in 2018/2019 was estimated at 4.8 million tonnes (ICCO, 2019). It increased by 37% in relation to 2008/2009 (ICCO, 2015; 2019). Brazil is the eighth largest producer (ICCO, 2019), and its cocoa beans are mainly used for the production of cocoa butter, liquor, and chocolate. Bahia is one of the major cocoa producers in Brazil. From the mid-1970s until the early 1990s, it accounted for 90% of the national production. From 1990 onward, cocoa trees were affected by witches' broom. Bahia and national production was significantly reduced, the latter from 319 thousand tonnes in 1980 to 196 thousand tonnes in 2000. In the years that followed, production gradually increased, reaching 273 thousand tonnes in 2014 (FAOSTAT, 2017). According to the Brazilian Institute of Geography and Statistics (IBGE, 2019), in 2018, Bahia produced 47.6% of the national cocoa volume. The state was not able to recover its position as the major producer because of the cyclical nature of the cocoa economy, economic crisis, decline in regional productivity, and conservatism of the agricultural sector (DIAS AND LOIOLA, 2004; BAIARDI AND ROCHA, 1998).

These events culminated in the migration of families to urban areas and impoverishment of those who remained in rural areas. Public agents, such as CEPLAC and the Cabruca Institute, assisted cocoa farmers by supplying cocoa seedlings and providing technical information on cocoa harvesting, drying, and fermentation. However, these actions were not sufficient to increase productivity or improve the economic status of farmers.

The need to develop and apply quality management practices, both in large- and small- scale cocoa production systems, became evident in the 21st century (Estival, 2013). Governmental and non-governmental organizations implemented projects of value chain development for cocoa and chocolate production in Brazil. For instance, in 2004, the Brazilian Ministry of Agriculture, Livestock, and Supply (MAPA) established the Chamber of the Cocoa Production Chain to promote

⁷ Witches' broom, a disease caused by the fungus *Moniliophthora perniciosa* (syn. *Crinipellis perniciosa*), causes major economic losses in cocoa farms. Endemic to the Amazon region, the fungus disrupts the plant hormonal balance and eventually tree death (CALDAS AND PERZ, 2013).

discussions between public and private sector representatives. The state government donated land for a new chocolate factory and for the Cocoa Innovation Center (BAHIA, 2017).

In 2011, the Institute for Forestry and Agricultural Management and Certification together with the Cabruca Institute published guidelines on certification, good environmental practices, pest control, and cost reduction in cocoa farms. As a result of these actions, the number of associations and cooperatives in the region increased. Their goals have been to unite family farmers and entrepreneurs and encourage chocolate production. According to field survey information, the Cooperative of Family Agriculture and Solidarity Economy of southern Bahia (COOPFESBA) stands out as one of the largest in the region. It is composed of 10 cooperatives with the participation of up to 4,500 families producing cocoa in three regions in southern Bahia. Other associations were created to valorize the sustainable production of cocoa and conserve the Atlantic Forest, such as the Cabruca Cooperative (currently formed by 32 farmers), which produces certified organic cocoa under agroforestry systems.

From the analysis of the history of the region, the observations of the participants and the participation in a sector event in the region in 2017, it became evident that efforts to improve the quality of cocoa have begun to bear fruit. In 2006 and 2010, cocoa producers from Bahia participated in the Salon du Chocolat, an annual international event held in Paris, and won the award for the best cocoa in Latin America. Since then, Brazilian cocoa beans have been showcased in the event, adding to the tourism potential of southern Bahia. The region received even more prominence after hosting the annual International Chocolate & Cocoa Festival. Created in 2009, it is the largest chocolate-of-origin event in Brazil. The festival unites the entire chocolate production chain and promotes cultural and artistic activities. In 2013, the Chocolate Forests Seminar was created, supported by SEBRAE, the Cabruca Institute, and the Arapyaú Institute, among others, focused on discussions about the production of chocolate of origin. In April 2014, the actions taken by public and private actors in favor of the cocoa production chain led to the creation of CSBA⁸, whose aim was to obtain and manage the geographical indication protection of southern Bahia.

The interviews, field visits and participant observations carried out in this study show that these actions have strengthened the spirit of change and entrepreneurship in young farmers and researchers. One of the interviewees points out precisely *'yes, the ecological movement, expansion of fair trade, organic products and participation in the 1st agroecology festival'* (interview, January 2016) as strengthening elements, and another producer emphasizes *'rural tourism and the chocolate agro-industry in the property'* (January 2016 interview).

It is added that the performance of the researchers of the article in research and extension projects in the southern region of Bahia, through an extension program (Project and Consulting Office of the State University of Santa Cruz), between 2012 and 2022, bring the view that family farming producers, mainly women and young people, have shown greater interest in seeking qualification and professionalization, through partnerships with Universities, Sebrae, Senai, and participation in incubation, acceleration programs, activities in partnership with the Cocoa Innovation Center, among others. Technical, higher-level and specialization courses emerged in the region, focusing on cocoa and chocolate, which attracted professionals interested in increasing training for qualified performance in the market.

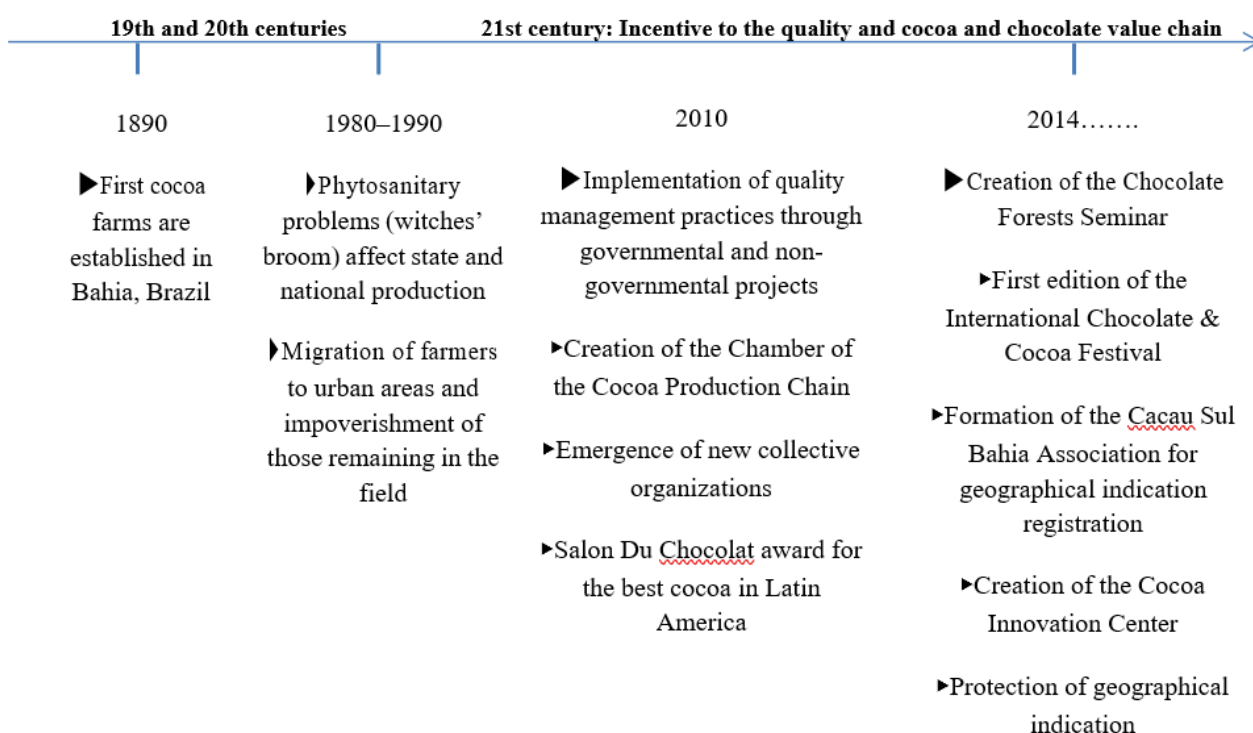
Emerging from the crisis experienced by previous generations, they began to rescue the local identity of cocoa production by revalorizing the territory and the cocoa produced in the region. Discussions were held by CSBA and other Network actors to define the criteria for geographical indication. The aim was to obtain geographical indication protection and guide the production of cocoa and chocolate in the region toward quality improvement. An overview of the events leading to geographical indication is illustrated in Fig. 1.

In the face of the growing demands of the processing industry, producers have two options: a) produce high-quality cocoa in sustainable production systems, such as that of the Cabruca agroforestry system or b) produce cocoa in full sun under intensive production systems using large amounts of chemical inputs and fertilizers (ESTIVAL, 2013).

⁸ Composed of 14 organizations, including farmers' associations and cooperatives representing about 3.000 producers and over 300 thousand ha of cocoa cultivation. It is focused on increasing product quality and territorial development and revalorizing local culture (SANTANA, 2017).

From a visit to the Cacau Innovation Center (2017) it was also possible to capture that the southern Bahia geographical indication was based on important quality parameters. The protection label allows producers (whether individually or collectively) to sell cocoa beans to national and international markets at higher prices and adopt a vertical integration strategy for chocolate production. The revalorization of cocoa production in the region has the potential to help farmers and their children remain in rural areas and contribute to the history of the land.

Fig. 1. Events leading to the formation of the ‘Cacau Sul Bahia’ Network



Source: elaborated by the authors on the basis of document analysis and data presented in Estival (2013).

Brazilian Normative Instruction no. 38/2008 defines the minimum quality standard for cocoa beans. Cocoa beans are classified into grades 1, 2, and 3 or off-grade according to the percentage of moldy, smoky, insect-damaged, slaty, and germinated beans. Grade 1 cocoa beans have the lowest percentage of defects, and off-grade beans have the highest (BRASIL, 2008). These standards alone, however, cannot guarantee a high-quality product. Southern Bahia cocoa beans must comply with higher quality standards than those set by the government. For example, cocoa beans cannot smell of smoke and the pH must be between 5.5 and 6. (Cocoa beans usually have pH greater than 6, indicative of a low level of fermentation).

The southern Bahia geographical indication for cocoa beans was granted in January 2018 by INPI on behalf of CSBA (BRASIL/INPI, 2018). Eighty-three municipalities are now protected by the geographical indication, where it is estimated that 600,000 ha are cultivated with cocoa trees, totaling an annual production of 300,000 tonnes (SMITH, 2014).

Social network and social capital in southern Bahia

Understanding the importance of the ‘Cacau Sul Bahia’ Network and its related social capital involves assimilating the actions taken by the Association. The actions taken by CSBA to increase cocoa quality have increased social capital in the region. CSBA encourages producers to seek cooperatives and collaborations to have easier access to subsidies, resources, and technical assistance. The association also provides access to new technologies by promoting dialogue and interaction with important academic and research institutions, such as the State University of Santa

Cruz (UESC), CEPLAC, the Federal Institute of Bahia, and the Federal University of Southern Bahia (UFSB).

CSBA, in addition to managing the geographical indication, strengthens its associated collaborative organizations and the cooperation between cocoa and chocolate producers. The technological and product innovation brought by CSBA occurred within a specific social context, in line with the definition of social mechanism of innovation discussed by Bock (2012). In this study, we analyzed whether social relations among actors (farmers, organizations, and institutions) were enhanced by the creation of CSBA. The interviewed actors agreed unanimously that the actions taken by CSBA for geographical indication protection strengthened the social relationships between SEBRAE, CEPLAC, Cabruca Institute, Arapyaú Institute, UESC, other Brazilian public universities, municipal governments, associations, cooperatives, and farmers.

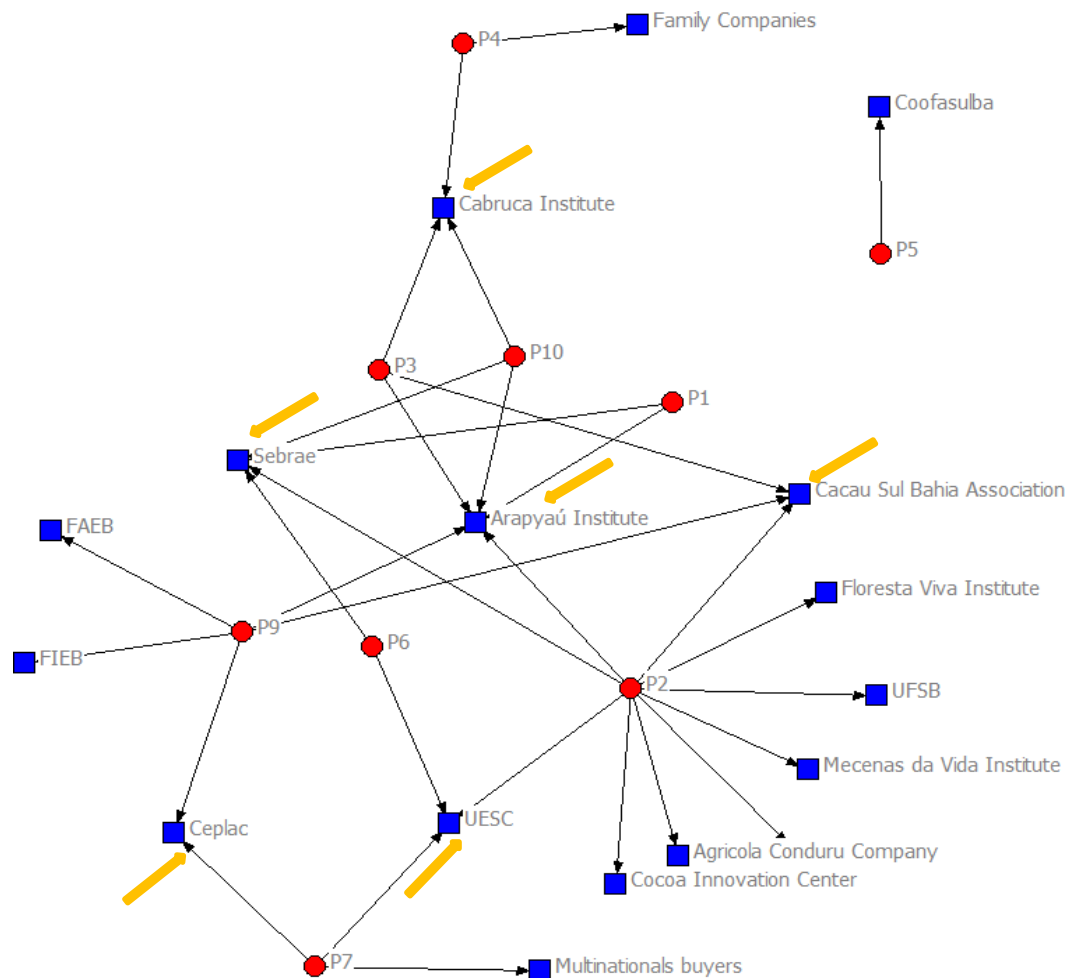
After the Salon du Chocolat award, it became clear to local actors that the region was able to produce high-quality cocoa and that continuous actions could be developed to increase region and product prominence with the establishment of a network of support. According to farmers, social relationships began to grow from 2014 onward with the Chocolate Forests Seminars and the Cocoa Southern Bahia discussion forum held by SEBRAE. The cooperatives stated that continuous work is necessary because farmers are resistant to paradigm shifts, given the production trajectory and economic crisis of the last decades. They also observed that partnerships with universities are of paramount importance for acquiring knowledge. Cooperative leaders stated that social relationships became stronger in 2000, when small-scale farmers created the chocolate cooperative (C2).

Farmers reported that the actors (nodes) that most stimulated social relations, in alignment with Henneberg et al. (2009) and Cross, Borgatti, and Parker (2002), were the Arapyaú Institute (5 indications), SEBRAE (4 indications), the Cabruca Institute, CSBA and UESC (3 indications), and CEPLAC (2 indications) (Fig. 2). Below, we give a brief explanation of the identity and characteristics of each main actor in cocoa production.

The Arapyaú Institute is supported by the Brazilian Biodiversity Fund (FUNBIO)⁹ and carries out projects related to cocoa and chocolate production. The institute has promoted social and environmental investments in the production chain and financed the creation of the Cocoa Innovation Center, a reference center for the analysis of cocoa bean quality, serving as an intermediary between farmers and processing industries. SEBRAE has a project aimed at enhancing social governance and networks and disseminating technologies among farmers and organizations related to cocoa and chocolate production.

⁹ A not-for-profit civil association that acts as a financial mechanism (FUNBIO, 2017).

Fig. 2. Most influential actors (indicated by yellow arrows) in the network of cocoa and chocolate production in southern Bahia, as perceived by farmers



Source: interviews with farmers

The Cabruca Institute provides rural extension services and carries out participatory research within settlements, quilombos, and indigenous communities. It acts within the cocoa–chocolate network by coordinating projects aimed at the production of high-quality cocoa and certified organic cocoa in southern Bahia. UESC performs research on topics related to cocoa production and management and actively participates in the development of the southern Bahia cocoa–chocolate social network. In 2017, the Cocoa Innovation Center was established within the university.

CEPLAC helps farmers adopt strategic planning to add value to their products. It stimulates the production of bean-to-bar chocolate, performs sensory analysis, develops actions to improve the quality of cocoa beans, and supports the Ilhéus Chocolate Festival, held annually in Bahia and Pará.

There is a clear relationship between the social actions of these agents and technological development within the network, corroborating the concept of socio-technical innovation advocated by Smith, Voß, and Grin (2010). In other words, the combination of technical knowledge, support from different institutions, and the leadership role of certain actors were crucial for CSBA to obtain geographical indication protection for southern Bahia. As a result, the power of the social network was enhanced (BIGNETTI, 2011; BUTKEVICIENE, 2009; MOULAERT, 2008; MOULAERT et al., 2005), mainly with efforts of these nodes major to assist others, which in turn favors trust, according Reagans and McEvily (2003).

Farmers gain innovation information from actors of the Network, such as cooperatives, other farmers, employees, processing industries, universities, and the Institute of Socio-Environmental Studies of Southern Bahia. The interviews revealed that farmers seek these actors for information on production processes (38.3%; harvesting, fermentation, and drying), management practices (34.8%; production control worksheets, training, quality improvement), and cocoa beans (26.7%; clonal seeds selected for chocolate production). Farmers in the region use clonal plants that are resistant to some plant pathogens and have shorter reproductive cycles. Farmers also blend cocoa beans during fermentation for the production of chocolates with different flavors and textures.

As highlighted by Smith (2000), Granovetter (2005), and Coleman (1988), a good flow of quality information is essential for building trust within a social network. Organizations such as SEBRAE, CEPLAC, and public universities possess explicit and tacit knowledge on cocoa production and therefore have gained the trust of farmers. SEBRAE, UESC, and CEPLAC are three of the six main actors in the cocoa–chocolate production network in southern Bahia (Fig. 3). The information exchanged among actors and the norms established collectively for the definition of the geographical indication are important forms of social capital (PRETTY AND WARD, 2001; SMITH, 2000; OSTROM, 2000; PUTNAM, 1995; COLEMAN, 1988), which have contributed to the strengthening of bonds.

Institutional changes can also contribute to the strengthening of the intangible assets of the network's social innovation (MOULAERT, 2008; MOULAERT et al., 2005). Such changes can increase the number of actors in the network in the medium and long terms.

The connections established within the social network contribute to increasing the social sustainability of the community and help overcome difficulties related to production. This statement is also supported by the participant observations and the involvement with the actors in the *I Jornada de Saberes do cacau: da árvore ao chocolate*, held in 2017, in Ilhéus (Bahia). Neumann and Neumann (2004) defended that no ready-made solutions exist for strengthening the social capital of communities or groups and emphasized the importance of communication and encouragement between individuals and institutions. Relationship ties are important means of fostering social capital within a social network. Family, community, and religious ties provide a safe environment for trust building (PUTNAM, 1993; COLEMAN, 1988). Therefore, for social innovation to take place, exchange of information and technology between actors is crucial. The approval of the geographical indication protection, improved cocoa quality (sold at higher prices), and production of high-quality regional chocolate are examples of successful integration. Cultural, family, and friendship ties are also important for territorial development.

Social innovation

The actors of the southern Bahia social network are united not only to increase the quality of cocoa but also to revalorize the territory. Their goals reveal the important role of innovations and the positive consequences of the geographical indication to rural development (TASHIRO, UCHIYAMA AND KOHSAKA, 2019; BOCK, 2016; MOULAERT, MCCALLUM AND HILLIER, 2013; NEUMEIER, 2012; DOGAN AND GOKOVALI, 2012; BOWEN, 2009; LEE et al., 2005; ADDOR AND GRAZIOLI, 2002).

Regardless of whether cooperation between actors is based on technical or organizational purposes (technical training or market access), the social proximity promoted by cooperation allows for coordination between agents. Such coordination can facilitate the vertical integration of chocolate production and investments in production technologies (ABRAMOVAY, 2000). According to the leaders of the organizations and institutions interviewed, monthly employee–employer meetings, use of email for communication, and meeting reports have contributed to the governance, cooperation, and integration among members. These simple mechanisms, which are designed to facilitate the lives of actors, may represent actions of self-interest rightly understood, as defined by Tocqueville (1987). The author states that collective wellbeing is a precondition for individual wellbeing, supported by trust, belonging, and communication.

Over the years, actions taken by the federal, state, and municipal governments have contributed to cooperation and trust among actors. An example was the establishment of the Cocoa Innovation Center within UESC. The center provided the legal basis for the registration of the geographical indication. Local actors were, therefore, able to rely on public institutions, showing the

relevance of institutional actors to social innovation and development (MIQUEL, CABEZA AND ANGLADA, 2013; CLOUTIER, 2003).

Ecological tourism became possible in the region, intensifying the relationship between humans and nature (BUTKEVICIENE, 2009). From 2004 to 2017, various collective organizations of cocoa and chocolate producers were created. These organizations increased the adoption of good cultivation practices and stimulated the production of other products, such as chocolate bars and drinks.

We highlight that it is still too early to quantify the territorial development resulting from the formation of 'Cacau Sul Bahia' Network. The Association creation promoted dialogue and integration for geographical indication registration, contributing to the revalorization of the territory and the feeling of belonging. However, territorial development—improvement of community wellbeing and meeting of basic human needs (EUROPEAN COMMISSION, 2013; BOCK, 2012)—is still incipient. Therefore, we were not able to fully confirm our research hypothesis.

Also, the context of the research in the period of data collection and in the current period (years 2021 and 2022) shows a growing number of initiatives to promote cocoa quality markets, mainly with the integration between chocolate companies, processors and the development of the supply chains, the expansion of the participation of family farming, with a focus on promoting businesses with added value and competitive differentiation, such as the so-called impact businesses in the cocoa and chocolate production chain. However, actions to strengthen the region and producers agents are still necessary, in light of the Cocoa guidelines for 2030 (OIL, 2021), which provide for the articulation between the actors in the production chain with a view to increasing the knowledge base and awareness of the rights of workers in the cocoa production chain; a public power at the local level strengthened to promote decent work and keep children in school, higher levels of productivity and income for the cocoa producer, and monitoring of working conditions in the cocoa production chain.

About the quality standards, farmers face many difficulties to achieve minimum quality standards. About 32,000 family farmers are involved in cocoa production in the region, and less than 1% meet the minimum quality criteria for access to and participation in new markets, according to CSBA. These numbers reveal that collective organizations must expand to include these producers and help them meet quality standard demands, thereby contributing to equitable distribution among actors.

The actors' trust in the geographical indication norms and public and private institutions will only be maintained through continuous involvement and cooperation. Then, the 'Cacau Sul Bahia' Network was able to generate some important aspects of social innovation, such as cooperation, social governance, collective efforts and trust building, as discussed by Bock (2016) and Moulart, MacCallum and Hillier (2013), but not achieved the social exclusion and territorial development, more broadly. And the sustainability of this innovation (as evidenced by equal distribution of economic value, diffusion of social values, and territorial development) will depend on continuous efforts, increased social capital, farmer participation, and strong relationships (MANCINI, 2013; PETRUZZELLA, BRUNORI AND ANTONELLI, 2017).

Social innovation is more likely to occur in social networks rich in social capital where actors with aligned interests participate in collaborative groups (BOCK, 2016; MOULAERT, MACCALLUM AND HILLIER, 2013; NEUMEIER, 2012).

However, the results of the study indicate that the recovery of affectivity, commitment, and tradition within the community goes beyond valuing the territory, as previously discussed by Ferdinand Tönnies. It leads to a shift in the focus of production from quantity to quality.

Conclusions

Analysis of the network of actors involved in cocoa and chocolate production in southern Bahia revealed that rural communities will adjust their production and livelihoods to the demands of urban consumer societies. Special attention should be given to new trends based on product quality (such as flavor, production system, and origin) rather than quantity. Such trends may open paths toward sustainability and community extension.

Actors in the network have sought to revalorize the territory and the product, resulting in technological and product innovation, and some aspects of social innovation. Farmers and producers

seek innovation information and build partnerships on the basis of ties of trust. These relationships increase social capital and allow actors to compete in the cocoa market.

The 'Cacau Sul Bahia' Network (with the important CSBA present) has unique organizational and social aspects. In addition to helping improve cocoa quality, it has helped recover the cultural value and importance of cocoa for regional development by obtaining the geographical indication protection of southern Bahia. Private and public organizations comprising the association have important technical, financial, managerial, and social roles within the network.

The research hypothesis was partially corroborated, as there was an organizational and institutional change in the region, with new ideas and formation of the network to solve social problems (in line with exposed in OECD (2011), NEUMEIER (2012), MOULAERT, MACCALLUM AND HILLIER (2013), The European Commission (2013) and BOCK (2016)) arising from sanitary crises faced in previous decades. However, this process still does not achieve changes in quality of life in a more profound way (perspective of MOULAERT, 2005; 2008). Furthermore, increased social capital (by linking more local producers and reducing social exclusion) is needed to strengthen the process of social innovation more broadly. Thus, new actors are expected to emerge and the professional and personal ties between actors are expected to strengthen, adding to the success and competitiveness of the network.

Our study provides empirical evidence that cooperation, social governance, and collective efforts can yield positive results and that improvements in production quality in rural areas can stimulate sustainable territorial development. Chocolate and cocoa producers can benefit from the results of this study, as we present different forms of cocoa production (agroforestry systems) and chocolate consumption (high quality, bean-to-bar chocolate), which are based on principles of environmental and social sustainability.

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