

## ECOSSISTEMA DE INOVAÇÃO SOCIAL E PRESERVAÇÃO DA MATA ATLÂNTICA NO SUL DO BRASIL: O CASO ARAUCÁRIA +

### SOCIAL INNOVATION ECOSYSTEM AND PRESERVATION OF THE ATLANTIC FOREST IN SOUTHERN BRAZIL: THE CASE ARAUCÁRIA+

#### ANDRÉ SOUZA NORONHA NEPOMUCENO

Mestre em Administração pela Universidade do Estado de Santa Catarina (UDESC)

Pesquisador no Centro de Economia Verde - Fundação Certi

ORCID: <https://orcid.org/0000-0001-5426-1095> / E-mail: [nepoma@gmail.com](mailto:nepoma@gmail.com)

Campus Universitário UFSC, Setor C, Rua Engenheiro Agrônomo Andrey Cristrian, Ferreira - Pantanal, CEP: 88040-970 - Florianópolis - SC

#### GRAZIELA DIAS ALPERSTEDT

Pós-doutora em Administração pela Fundação Getúlio Vargas (EAESP) e em Ciências Humanas (Interdisciplinar) pela Universidade Federal de Santa Catarina (UFSC)

Docente no PPG Profissional e Acadêmico em Administração

Universidade do Estado de Santa Catarina (UDESC)

ORCID: <https://orcid.org/0000-0003-0144-0406> / E-mail: [gradial@gmail.com](mailto:gradial@gmail.com)

#### CAROLINA ANDION

Pós-doutora em Administração Pública e Governo pela Fundação Getúlio Vargas (EAESP) e em Economia Social pela Universidade de Valência.

Docente no PPG Acadêmico em Administração

Universidade do Estado de Santa Catarina (UDESC)

ORCID: <https://orcid.org/0000-0003-4723-343> / E-mail: [andion.esag@gmail.com](mailto:andion.esag@gmail.com)

Submissão: 31/10/2022. Revisão: 09/01/2023. Aceite: 25/03/2023. Publicação: 04/04/2023.

**Como citar:** Nepomuceno, A. S. N.; Alperstedt, G. D.; Andion, C. (2023). Ecosistema de inovação social e preservação da mata atlântica no sul do Brasil: o caso Araucária +. *RGO - Revista Gestão Organizacional*, 16(3), 98-120. <http://dx.doi.org/10.22277/rgo.v16i3.7392>.

### RESUMO

**Objetivo:** Explorar as controvérsias entre os atores mapeados no projeto Araucária + para entender as questões que impedem um avanço mais rápido na preservação da floresta com Araucárias no sul do Brasil na direção do ODS 15.

**Método/abordagem:** Estudo de caso qualitativo e interpretativo que considera o contexto cultural, histórico e político da região e observa as tensões na dinâmica e gestão das interações dentro do ecossistema de inovação social estudado.

**Principais Resultados:** A pesquisa apresenta os atores, seus papéis e relações, revelando duas controvérsias principais: (1) ausência de consenso sobre a necessidade de proteger a floresta e, (2) a questão da pecuária e seu impacto nas florestas remanescentes.

**Contribuições teóricas/práticas/sociais:** Este estudo contribui para problematizar e avançar em relação a modelos teóricos normativos, estáticos e predeterminados que descrevem modelos de ecossistemas de inovação social ideais, sem trazer à tona as particularidades e controvérsias existentes em ecossistemas específicos. O artigo contribui, assim, para a

compreensão da complexidade de um ecossistema de inovação social destinado a proteger a Mata Atlântica no Sul do Brasil, a partir da literatura sobre Ecossistema de Inovação Social.

**Originalidade/relevância:** Ao contribuir para a compreensão de uma rede de atores específica voltada para a preservação da Mata Atlântica sob a perspectiva da abordagem dos ecossistemas de inovação social, o artigo fornece insights sobre a complexidade dessa rede que foge dos modelos ideais encontrados na literatura, assim como traz luz a uma importante experiência voltada para a preservação de florestas, em conexão direta com o ODS 15 e indiretamente com os demais ODSs.

**Palavras-chave:** Ecossistemas de inovação social. Mata Atlântica. Desenvolvimento sustentável. Araucária +. Sul do Brasil.

### ABSTRACT

**Purpose:** To explore the controversies between the actors mapped under the Araucária + project in order to understand issues that prevent a faster advance in the preservation of the araucaria forest in southern Brazil towards SDG 15.

**Method/approach:** Qualitative and interpretive case study that considers the cultural, historical and political context of the region and observes tensions in the dynamics and management of interactions within the social innovation ecosystem studied.

**Main findings:** The research presents the actors, their roles and relationships, revealing two main controversies: (1) lack of general consensus on the need to protect the forest, and (2) the livestock issue and its impact on remaining forests.

**Theoretical, practical/social contributions:** This study contributes to problematize and goes beyond normative, static and predetermined theoretical models about social innovation ecosystem that describe ideal models, without bringing up the particularities and existing controversies in specific ecosystems. The article thus contributes to the understanding of the complexity of an ecosystem of social innovation designed to protect the Atlantic Forest in southern Brazil from the literature on Ecosystem of Social Innovation.

**Originality/relevance:** By contributing to the understanding of a network of actors focused on the preservation of the Atlantic Forest from the perspective of approaching social innovation ecosystems, the article provides insights into the complexity of this network that deviates from the ideal models found in the literature, as well as sheds light on to an important experience focused on the preservation of forests, in direct connection with SDG 15 and indirectly with the other SDGs.

**Keywords:** Social innovation ecosystems. Atlantic Forest. Sustainable development. Araucária +. South of Brazil.

### 1 INTRODUCTION

This work sheds light on a network of different actors engaged in promoting positive results for society – economic, social and environmental – articulated from an initiative aimed at the conservation of a natural ecosystem belonging to the Atlantic Forest biome and the sustainable development of communities associated with this ecosystem in southern Brazil.

It starts with the idea that sustainable development is possible through interactions between environmental, social and economic dynamics in which the economy is seen no longer as an end, but a means based on values from which the focus on market gives way to

society (Schmitt & Neto, 2012). Understood in this way, the sustainable development paradigm proposes not only greater attention to the environmental dimension, understanding ecological integrity as an unavoidable condition, but also a reflection on the social and economic dimensions, rethinking the content of each of these dimensions (Lévesque, 2009).

At its core, sustainable development is a process of change in which the exploitation of resources, the direction of investments, the guidance of technological development and institutional change are in relation and reinforce the current and future potential to satisfy human aspirations and needs (United Nations, 1987).

Despite the conceptual appropriation of sustainable development by researchers, the causes of current socio-environmental problems are much more associated with the sphere of praxis than of theoretical production (Andion, Serva & Lévesque, 2006). This reveals numerous evidence of “the existing gap between the advances that were produced in conceptual terms”, in the academic environment or in conferences between countries, and “the effective changes undertaken in individual behaviors and in socioeconomic systems and management of natural resources”. There is clearly a much greater concern with achieving the goals established for achieving sustainable development than with the means and procedures for their implementation (Andion, Serva & Lévesque, 2006, p.203)

Furthermore, in developing countries, there is a strong tendency to reproduce development models based on ideals from countries in the northern hemisphere (Schmitt & Neto, 2011). Such models are often characterized by their indifference to the territorial dimension and an emphasis on mass production that is not concerned with diversity, with the purpose of development only being economic, with a supposed dream of endlessly extracting resources supposedly infinite (Pecqueur, 2006a, 2006b; Pecqueur & Vieira, 2015, Schmitt & Neto, 2012).

In front of this, this work departs of the assumption that more sustainable trajectories of development could be conceived by social actors, exploring regional potential and opportunities and avoiding, avoiding the importation of models that may, in many cases, be strongly inadequate. It is also considered the need for a critical reflection on the finitude of natural resources (Pecqueur & Vieira, 2015).

With regard to the Sustainable Development Goals, the case analyzed here focuses on objective 15: “protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss” - Life on land (United Nations, 2015). Although SDG 15 clearly mentions the issue of forests, the preservation of the Araucaria Forest in southern Brazil is directly and indirectly related to the other 16 sustainable development objectives (Bukoski et al., 2018). The forest preservation actions developed by the Araucária+ project involve sustainable economic growth, the production and consumption of forest goods, combating climate change, in addition to promoting the sustainable use of forest resources in order to also try to respond to the problem of the income of the family framers that live and work in the forest.

In addition to this, in terms of theoretical advances, Chateauraynaud (2011) argues that even with the growing number of publications related to environmental issues since the 1970s, it will still take many years of studies to develop a field of knowledge on environmental issues, in the social sciences. For the author, the approaches need to incorporate analytical and descriptive frameworks that separate the research from the content produced by activists, analyzing the issues more technically. In this direction, Chateauraynaud (2011) points out that a ‘sociology of controversies’ has played a prominent role, because reality, far from

being linear, is permeated by actors who do not always agree on the same ideas and, therefore, cannot be analyzed as a black box.

In this perspective, the social innovation ecosystems (SIEs) borrow aspects of the biological concept of 'ecosystem,' which is defined as a network of interactions between organisms and their environment (Schulze, Beck & Müller-Hohenstein, 2005; Andion, Alperstedt & Graeff, 2020). In this case, human and non-human – forests, animals, places or things – (Cefaï, 2009) interact with each other in a complex and dynamic network, with flows of resources among the actors and consequences coming from a process that is non-regular and permeated by controversies (Chateauraynaud, 2011).

However, as discussed by Andion, Alperstedt and Graeff (2020), many SIE models takes in account the demands and aspirations of the target audiences involved with social innovation initiatives. In this sense, this normative logic leaves little importance to understand the specificities of the analyzed regions and territories. For Pelka and Terstriep (2016) many projects address general and universal problems, giving little emphasis to understanding the specific demands of each territory.

In view of these assumptions, it is observed that more and more organizations realize that the costs of socio-environmental responsibility may be lower than those of irresponsibility (Lèvesque, 2009). Organizations of all types admit the complexity of the wicked public problems and observe several vectors of pressure that continue to aggravate the situation, demanding solutions and innovative proposals, developed from a systemic vision in face of these grand challenges of society.

The "Araucaria+" (A+) project represents one of these initiatives. Promoted by Fundação Grupo Boticário, the project sought to understand the impacts of non-timber production chains involving native species in the Araucaria forest. Two of these chains stand out in the study: the pine nut, which is characterised as a simplified commercialisation chain, with a strong informal nature (with no registration and consequently poor data); and the yerba mate, which is a better-structured chain when compared to the pine nut. Together these chains have a sufficient volume of commerce to cause significant and common impacts in different regions of this natural ecosystem (Fundação Certi, 2012a).

Once this potential was identified, A+ focused on strengthening and developing these production chains of pine nut and yerba mate. Certi Foundation was the organisation responsible for carrying out a diagnosis of the two production chains, studying the main impacts of the extraction of these products from the forest remnants. In addition, the foundation mapped other elements impacting the forest areas that are not directly associated with the production chains, such as cattle production and forests' biodiversity-damaging management practices (such as fires and use of agrochemicals).

After understanding the production chains' main impacts, Certi Foundation proposed alternatives for the protection of the Araucaria rainforest, through the reorganisation and strengthening of production chains that are associated with the natural habitat. Based on this, the foundation developed a pilot project started in March 2013 and expected to last for three years, to test and adjust to the needs of the target region (Serrana region of Santa Catarina). Although the CERTI Foundation has a vast and successful experience in coordinating this type of organizational arrangements, this was the first application aimed at the conservation of natural habitat.

This study describe and analyzes this network of actors involved in the preservation of the threatened Araucaria Forest in Santa Catarina, from the approach of social innovation ecosystems and a pragmatist methodology (Andion et al., 2017; Andion, Alperstedt & Graeff,

2020). The objective was to explore the controversies between the actors mapped under the Araucária + project in order to faster advance in the preservation of the araucaria forest in southern Brazil towards SDG 15. The research explores the complexity of the social innovation ecosystem Araucária + (SIA+), describes its actors and their relationships, but also brings up its controversies, aspects almost non-exploited in the available theoretical models. The next sections present the conceptual axes of the work, presenting a description of the analysis carried out.

## 2 SOCIAL INNOVATION ECOSYSTEMS (SIE)

The concept of social innovation ecosystem (SIE) recognizes the plurality of actors participating public or private sphere civil society as a whole. In this sense, social innovations are strongly linked to the characteristics of a territory, including its social, economic and cultural elements (Domanski, Howaldt & Kaletka, 2020).

Authors such as Domanski, Howaldt and Kaletka (2020), Brandsen et al. (2016), and Moulaert, Martinelli, Swyngedouw and González (2005) highlight the importance of research focused on the consequences of SI on local and regional development. For them, the problems originate from existing demands in local contexts, and may require unexpected collaborations and sharing of multiple skills to find solutions (often using resources). Therefore, the elements and conditions for social innovation to flourish may be found locally (Brandsen et al, 2016). This dynamic occurs amid everyday struggles, where actors from different sectors are often in conflict but also share ideas, and interests.

Howaldt, Kopp, and Schwarz (2015) stress the cooperation among actors from different sectors when discussing social innovation, which is corroborated by Domanski (2018), who stresses that such cooperation, networks, and new forms of production are crucial to achieve sustainability-oriented governance. Phills Jr, Deiglmeier, and Miller (2008) had already observed that intersectoral fertilization lead to the creation of mixed value (understood as in Emerson, 2003). Also, SIEs emphasise dimensions such as ecology, local identities, history, and socio-ecological interactions that are at the foundation of different localities, gathering human and non-human elements in the analysis (Latour, 2012).

In this sense, the assumption of replicability of social innovations as a form of ready-made solution can be counterproductive, as it disregards local social, economic, cultural, and environmental challenges (Mehmood, 2016).

Authors like Stam (2015), Lévesque (2016), Domanski et al. (2020), and Terstriep et al (2020) bring attention to the need for less normative frameworks that avoid the trap of establishing standard solutions or tautological models to explain social innovation and its consequences and that consider the multiplicity of experiences in terms of social innovation, giving importance to empirical researches (Andion et al., 2022, p. 1262).

In this sense, an SIE cannot be explained by traditional forms of collaboration arising from heuristic models, such as the triple or quadruple helix (government, industry, academia, and civil society), and must be observed based on the notion of systemic complexity (Sgaragli, 2014). The current knowledge on SIEs is still scarce and confusing, but it is possible to argue that the concept of SIEs as the environment where SI occurs (which may be different from the environment where technological innovation occurs) implies understanding SI based on a multisectoral perspective – extrapolating the actor-centred ideas of innovation, redefining the concept of governance, favourable infrastructure, and specific legal and cultural norms (Domanski, 2018).

Therefore, an analysis on the SIEA+ can be considered as a strategy to understand how different publics relate and develop solutions to the problem of the Araucaria rainforest protection in Santa Catarina. So, to understand this ecosystem of social innovation, it is necessary to map the roles (formal and informal) played by different actors, as well as a clear notion of the relationships established between them, their practices and their connection with the territory.

Considering this set of evidence, it is still unclear how institutions can support the social innovation process. However, a SIE approach may be able to provide a framework for exploring the role the interactions and institutions in social innovation (Phillips et al., 2015). Thus, it is assumed that each SIE counts on different types of actors and roles, as well as different inter-organizational arrangements and ways of acting to promote social innovations to address sustainability problems (in this case, the extinction of tropical forest). This relationship between social innovation and sustainable development is already widely discussed in the literature (Moulaert et al., 2013, Varadarajan, 2014, Olsson et al., 2017).

Although social and technical innovation are often treated as our hope, that we can innovate our way out of the environmental crisis that is looming, unless those innovations are undertaken in ways that are different from the social innovations of the past, their impact is as likely to be negative as positive (Olson et al., 2017, p.1).

### **3 SUSTAINABLE DEVELOPMENT AND TROPICAL FORESTS**

Forests play an important role in providing ecosystem services essential for human well-being and are central for humankind in the context of the UN Agenda 2030 and the 17 Sustainable Development Goals (SDGs). Therefore, studies of environmental protection initiatives, their effectiveness and challenges, have gained space even though it is clear that much more needs to be done to increase forest protection.

Sayer et al (2019) discuss trade-offs between Sustainable Development Goal 15 (SDG 15) and other SDGs. These relationships result in competition for land, synergies, and opportunities. For the authors, the main opportunity brought by SDG 15 is the integration with the other SDGs. However, in addressing issues of forest sustainability, short-term priorities that hinder synergy are at stake. There is a clear link between the need to conserve life on earth and the limited resources available, which brings enormous challenges. Intersectoral barriers must be broken, requiring not only policies aimed at this, but integration between sectors.

Baumgartner (2019) argue the dual role of forestry for the SDGs, suggesting that this activity has negative and positive impacts. For the author, it is essential to assess the forest-related policies both quantitatively and qualitatively, in order to identify their effects on sustainable development. In this same perspective, Aryal, Laudari and Ojha (2020) show the contribution of local development practices in Nepal's community forestry to the achievement of the SDGs. The authors found that the main objectives and results of the community forestry overlap with the 29 targets of the SDGs. The research findings indicate a convergence between the role of community forestry and the possible institutional arrangements related to the SDGs.

Hiratsuka et al. (2019) assessed whether a participatory land and forest conservation initiative in South Kalimantan, Indonesia, contributed to the SDGs. The initiative managed in a participatory manner by the local community seeks to rehabilitate a 410-ha rubber plantation that resulted in opportunities for subsistence, poverty reduction, and promoting equality in the local community. This case shows the importance of cooperation and demonstrated how forestry contributed to SDG 1 (poverty), SDG 10 (Inequality), and SDG 15 (considering the outcomes of forest recovery and the reduction of forest fires). In this way, the success of the SDGs has to do with coordination, governance, and awareness among all those involved, implying cooperation – which reinforces the notion of SIE discussed above. Therefore, activities of forest protection must consider the actors incentive to cooperate.

The case of the araucaria forest in southern Brazil can be analysed through the same lenses as Abramovay's (2019) study about the economic growth in the Amazon region in recent years. The author says that such growth is supported by the economy of the destruction of nature, weakening the local economy, and privileging exploitation of wood and cattle production. These industries offer rapid financial returns and benefit from lack of inspection by public agencies, producing deforestation and fires.

Also analysing the Amazon forest, Nobre et al (2019), defend the exploitation through a forest biodiversity economy, a new economic model based on bioeconomy, valuing renewable natural resources, environmental services, biomimetic assets, molecules, and materials from biodiversity. Thus, the products of socio-biodiversity in the forest with Araucarias in southern Brazil have enormous potential for use by the pharmaceutical, cosmetic, and food industries, mainly due to the great diversity of ingredients, and, consequently, the potential to generate innovation for these sectors. Given this bioeconomic potential, the work carried out by A+ contributes to the preservation of the forest, as it seeks to align socio-environmental interests without neglecting economic issues, in contribution to the fifteenth Sustainable Development Goal.

#### 4 METHODOLOGY

This research is characterised as a qualitative, descriptive, and interpretive case study (Stake, 2005, p.436). Documents, semi-structured interviews, and participant observation were used as data sources, supported by a field diary. The study analysed the social innovation ecosystem Araucária + (SIEA+), an ecosystem originated from an initiative with the same name, created and developed in a partnership between the Certi Research Foundation and the Boticário Group Foundation for Nature Protection to protect the Araucaria Forest and promote sustainable development of the communities associated with this natural ecosystem in southern Brazil.

The social innovation ecosystem around the A+ was chosen based on its relevance for the preservation of the Araucaria Forest in the region. The study required the researchers permanence in the initiative's location, so they could have direct contact with the landowners' daily activities – as instructed by Stake (2005, p. 450) for qualitative research.

Like Kirillov, Slipenchuk and Zengina (2016), the research was conducted over a period of two years, between 2016 and 2018, contemplating field research and several interactions with the different audiences of SIEA+. The intense interaction allowed understanding effective praxis associated with forest conservation, especially carried out by forest owners, considered the leading actors.

The study started with a cartography of the actors in the SIEA+, conducted in the scope of the A+. The technique was supported by a documentary analysis of secondary data

collected with the organisations and institutions involved. The roles of the actors were identified from both the secondary data and primary data obtained from semi-structured interviews with them. After, the connections and interactions within the SIEA+ were analysed, based on primary data collected through participant observation and unstructured interviews. The primary data was also used to identify the processes of coordination conducted in the scope of the A+. Participant observation allowed researchers to observe events that participants did not report or sometimes did not want to share, helping to identify distortions or inaccuracies in the descriptions provided by them and prescribed in the Certi Foundation model (Marshall & Rossman, 1995).

The interviews were face-to-face with a semi-structured script, recorded and later transcribed by one of the researchers. They lasted an average of 60 minutes. The questions were directed at the actions performed by the family farmers that works and leave in forest, their interpretation in relation to preservation and their relationships with the other actors involved with the Araucaria forest. Initially, six interviews were carried out with rural producers who own forest areas. Respondents were chosen from landowners who had a history of interacting with A+. In addition to the interviews, three meetings were held with landowners and two technicians who work at the hub agent, to systematize and consolidate the SIEA+ analysis. The interviews and field observations were carried out at times when the owners participated in forest protection activities promoted under the A+.

The interpretative analysis was based on a categorization process developed in the Excel software. The analysis started from data-based information coding (Gibbs, 2009), from open coding to the development of initial codes (Strauss & Corbin, 1998). Next, a thematic analysis (Bryman, 2016) involved constant reading and rereading of the material, in order to organize the data into categories (Rossman & Rallis, 2011) naming them with a term (Creswell & Creswell, 2021). Based on the literature on social innovation ecosystems, it was possible to analyze the categories of types of actors, roles, connections and interactions between actors and existing controversies that can prevent the preservation of the forest. Finally, meaning was extracted from the coded material. This interpretation phase involved comings and goings, in a sequence of questions about the information obtained (Creswell & Creswell, 2021, Rossman & Rallis, 2011).

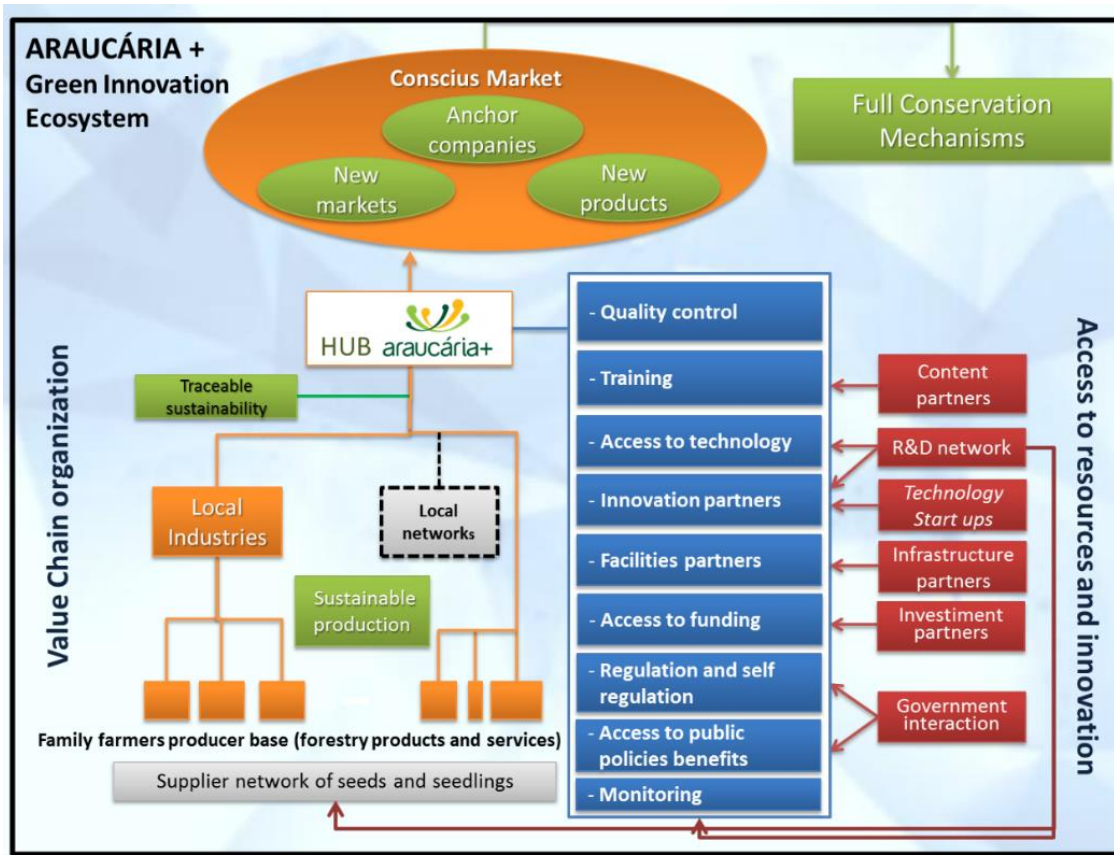
## **5 SOCIAL INNOVATION ECOSYSTEM FOR THE PROTECTION OF THE ARAUCARIA RAINFOREST**

In the institutional model of the Araucária + (Figure 1), the central actor is the Articulating Agent (AA), promoting and facilitating innovation through the articulation of actors in (and for) the production chains, enhancing the collective action to generate social innovation and direct conservation of the Araucaria Forest.

The network articulated by the Araucária+ Initiative is made up of different actors (related to regulation and public policies, generation of knowledge, capital, technology, product and market) articulated by a team called “Agent Articulator” (or HUB), whose role is to attract partners to compose the network, coordinating processes and stimulating cooperation, thus creating a synergistic and favorable environment for innovation (Fundação Certi, 2012).



Figure 1  
Aracáuria + Model



Source: Fundação Certi, 2018.

In the theoretical approach of this work, we seek to understand the vision of these actors who develop practices of conservation or degradation of the Araucaria Forest. In the view of an SIE they are the central elements of this network. The arrangement of actors in this context involves different types of organizations, institutions and individuals, who play different roles and functions in this SIE for forest conservation and the sustainable development of associated communities. However, the idea is to depart from this framework in order to understand the existing controversies between the actors that prevent further progress in forest preservation.

This section describes the elements, based on secondary data from documents produced by the institutions involved in A+ and on primary data collected through interviews as described in the methodology section. The types of actors below, however, represent an attempt to classify the actors at the time of the research, i.e., future analysis on the same phenomenon may adjust or introduce other typologies.

### 5.1 TYPES OF ACTORS

As described in the methodology, the different actors that form the SIEA+ were identified based on fieldwork and immersions carried out together with a member of the HUB. A description of the type of actors and their role and activities are provided below, as well as details on the connections they establish within the network.

The types of actors can be segmented into two major groups according to their role in the SIE: (i) conservation “practitioners”, who perform actions to protect or degrade the forest areas. These types of actors include the owners of forest remnants, actors operating in the extractive chain, and civil society organisations focused on environmental protection; (ii) “support” actors, who create conditions and promote the practitioners’ actions toward forest protection or degradation.

### 5.1.1 Conservation Practitioners

#### a) Owners of forest remnants

The Serrana region of Santa Catarina presents different profiles of that live and works in the forest. In general, the Araucaria + coordinates and interacts with three different categories: (i) farmers – with different profiles according to the size of the property and the socioeconomic profile of the family; (ii) owners of Private Owned Natural Reserve, (known as RPPN), whose area has specific and compulsory conservation commitments imposed by environmental agencies of the different levels of Brazilian government (local, state, federal); and (iii) the so-called “neo-rural” – individuals who migrated from urban to rural regions motivated by the quality of life and who bring a mindset with urban or globalised aspects.

#### Extractive actors

The research considers extractive actors those that directly perform forest management of native species of non-timber products for commercial purposes. This group comprises intermediaries who do not necessarily carry out manual labour per se. The teams performing the activities are usually led by a person who owns a truck and is in contact with those who sell non-processed yerba mate. This intermediary is a common figure in all forest extractive chains and Brazilian rural areas as a whole. Intermediaries play a vital role for the region, since they are often the only option for the outflow of non-timber forest products of the rural properties, providing extra income for the families that depend on revenues derived from extractive activity, especially pine nut and yerba mate, in the case of the Araucaria rainforest.

#### b) Civil society organisations focused on environmental protection

Among the civil society organisations (CSOs) it is possible to observe two main profiles: (i) those that focus on social development and coordination; and (ii) those that focus on environmental issues (also involving social aspects, since it is impossible to dissociate one dimension from another).

CSOs focused on environmental protection are usually initiatives and organisations connected to researchers, and there may be a direct and institutional relationship with research institutions that develop actions to raise awareness among farmers and produce research and knowledge regarding the region’s environment. Some of these CSOs engage in forest conservation practices, such as the installation of receptacles for bird nests inside the forest areas owned by the organisation’s partners.

### 5.1.2 Support Actors

#### a) CSOs focused on socioeconomic development

Historically, the region has been assisted by different Civil Society Organisations, mainly associated with assistance and rural extension, bringing knowledge and resources to rural life. Some have more than 30 years’ experience in the region and have a direct relationship with rural development of that region.

Other types of CSO with a socioeconomic focus are the cooperatives and membership organizations present in the region. Those involving more producers and better managed are associated with products such as fruit and vegetables, or wood (Pinus and Eucalyptus). The membership organizations with direct relationship with the native forest - linked to the tourism chains, yerba mate, pine nuts - have, in general, a low level of organisation and breadth of activity, characterised as small groups usually isolated. In some cases, these groups are connected with others from different municipalities, working in coordination with the CSOs providing rural assistance.

b) Companies demanding non-timber forest products

Different types of companies interact with the SIEA+. In a first classification, it is possible to find: (i) companies that act indirectly with the forest production chains; and (ii) those that act directly with the products of the extractive chains of non-timber forest products (NTFP) of the Araucaria rainforest.

In the first group of companies that do not act directly with the chains of NTFP, the actors of the SIEA+ are those that interact directly and contribute through technological development to the production chains of the ecosystem or act in the logistics chain. In addition to these companies, there are others that have no relationship with the chains of NTFP but are connected to the SIEA+. They are companies in the segments of paper and cellulose, and in the furniture industry. They exploit the abundant Pinus and Eucalyptus plantations in private areas located between fragments of Araucaria rainforest and may also exploit licensed commercial plantations of Araucaria angustifolia, for timber-related businesses.

The second possibility of segmentation is between (i) business to business (B2B) companies, intermediaries that develop industrial inputs, unfinished products; and (ii) business to consumer (B2C) companies, responsible for developing products that are sold directly to the consumer. In both, it is still possible to classify companies that have socio-environmental responsibility strategies, but also traditional market companies that are based on products and strategies focused only on the economic dimension, without having an institutional concern with the sustainability and conservation of natural environments.

c) Scientific, technological and innovation institutions (STIs)

The SIEA+ counts on the involvement of STIs that develop research, technology, and innovation to protect the Araucaria rainforest. This social innovation ecosystem directly and institutionally involves federal higher education institutes, state and federal universities (from different states), and other STIs that are engaged in basic or applied research of scientific or technological nature or the development of new products, services or processes.

d) Government/governmental institutions

The SIEA+ influences and is influenced by the government. The ecosystem interacts directly and indirectly with local governments (mayors and municipal secretariats), state (state secretariats, state institutions, regional development agencies (or ADRs in the State of Santa Catarina)), and federal government (ministries, agencies). All these governmental institutions have an essential role in monitoring the actions carried out in the territory where the SIEA+ is located, facilitating the interactions, and clarifying the possible ways to establish a dynamic of Sustainable Territorial Development.

#### e) Financial institutions

Different financial institutions interact with the ecosystem studied. Farmers and production actors access funding from credit unions and banks, which support the development of properties and of companies that invest in their structure resulting in higher demand for forest inputs.

#### f) The HUB

The SIEA+ counts on the active role of this actor in the coordination of all the parties to create synergy for the development of production chains that increase the value perceived by owners regarding the remnants of the Araucaria rainforest. The coordination of this actor in the SIEA+ has been observed since the start of the initiative “Araucaria+,” in 2013, establishing many relations with the most diverse actors of the territory, one by one. With an approach similar to the snowball sampling method the HUB identifies actors based on the appointment of other actors, forming the interaction network of the SIEA+. The mediation between the production actors and the market is one of the most critical attributions of the HUB, respecting the different degrees of “maturity” of the players, the values and local culture, and understanding that the response times and dynamics of the community, the territory, government and of the other actors are different from that usually found in the market.

### 5.2 ROLES OF THE ACTORS

The description of the different types of actors shows that there are several roles performed in the SIEA+. In many cases, these roles are performed cumulatively. The analysis from secondary data and interviews identified the roles that were separated in categories to better understand the connections and interactions within the network. It is worth mentioning that the roles are extremely dynamic and were framed here to portray a picture of the SIEA+.

#### a) Regulation

The regulation role associated with the conservation of the Araucaria rainforest is assumed by different actors, in different dimensions. From the normative and legal point of view (by the government), to other aspects such as the regulation on the possibilities and restrictions of management of forest areas, norms and agreements established in cooperation networks between farmers that have participatory organic certification (where there is social control on the practices of forest conservation and land use of the property as a whole), including regulation posed by the initiative “Araucaria+”, in which there is an ecological view on the property as a whole, with rules associated with an ability to access the markets coordinated by the Initiative.

In these situations, provided by the new Brazilian Forest Code, the lists of species that cannot be cut without permission must be observed, and local, state, and federal regulations are applied. According to Art.70 of the forest code, these three levels of government are responsible for “prohibiting or limiting the cutting of rare, endemic, endangered or threatened species of flora, as well as the species necessary for the subsistence of traditional populations, establishing the areas included in the government act, making the cutting of other species in the secure area subject to prior authorisation”.

#### b) Coordination

The role of coordination has to do with the understanding of the collective interest, or the accommodation of the different interests associated with the collective interest. The intention is to create convergence and synergy between the actors and promote actions for the forest protection in the process of co-construction of the SIEA+.

Among the actions related to this role is the search for partnerships; attraction of new organisations to collaboration network around the SIEA+; organisation of the farmers and production actors; coordination of potential investors; investments in the integral conservation of areas; traceability of sustainability in the production chain; attraction of companies in a differentiated market; promotion of R&D related to the forest; and interaction with public policies.

#### c) Technical Support

Different actors and different actions support the SIEA+. In general, this role is related to a unidirectional effort, from one party to the other. One type of support technical that occurs in the SIEA+ is the support for association activity. CSOs with a focus on socioeconomic issues and the HUB are the entities performing this role, working to organise groups of farmers to operate in the form of membership organizations. This involves tasks such as the creation of legal entities (which involve bureaucratic and legal procedures), training to develop managerial competencies, technical assistance, and the development of new products. Regarding the development of the properties, the support for rural extension and technology transfer to improve rural production is carried out mainly by state-owned agricultural research enterprises (owned both by state and federal governments). Another form of support is related to R&D, conducted by Scientific, Technological, and Innovation Institutions (STIs), creating new products especially for companies, and prospecting potential forest species that can be economically explored. Finally, legal support for the safety of all parties involved. In this case, the Araucaria + Initiative formalises contracts regulating some of the interactions within the SIEA+. The organization HUB developed tools to facilitate the elaboration of such contracts.

#### d) Training

The training role is carried out by different actors within the SIEA+, although always directed to farmers. One example is the CSOs focus on socioeconomic issues, continually providing courses, workshops, training for individual or groups of farmers on topics such as organic production, biodynamic agriculture, association, and production chains of native species. Groups of farmers perform the training role on a secondary basis by replicating the knowledge to other farmers. Similarly, CSOs with a focus on environmental protection provide training activities for farmers on issues such as forest conservation, ecology, awareness of threatened species, or even more practical aspects such as leaving “dead” trees in forest areas to serve as a nest for migratory birds. Another type of training is offered by the agricultural research companies, which promotes field training and workshops to transfer technologies they develop or to disseminate updated agricultural practices. The STI also promotes training for farmers in order to add value to the products of the forest, such as the production of jam. One example is a course promoted by a federal higher education institution of the territory, which taught farmers to brew craft beer using pine nuts.

### e) Acceleration

The acceleration role has two aspects: (i) the catalytic effect promoted by the HUB through continuous prospecting, which increased the complexity of the network and attracted new actors. Thus, actions in the SIEA+ became more intense and frequent, accelerating the development of the network; and (ii) the expansion of activities toward the forest protection, promoted by increased demand for forest inputs, i.e., the increased commercialisation of raw forest materials from properties engaged in sustainable extraction.

Table 1  
Types and roles of SIEA+ actors

|                                | Actor   | Types of actors  | Roles by type of actors   |
|--------------------------------|---|--|---|
| (i) conservation practitioners | Owners of forest remnants                                   | Rural landowners act to protect or degrade the forest areas  | Practice  |
|                                | Extractive actors   | Actors working in the extractive chain, whether sustainable or not   | Practice  |
|                                | CSOs with focus on environmental protection                 | Usually research related, some of these CSOs engage in forest conservation practices such as the installation of receptacles for birds | Training<br>Communication<br>Practice   |
| (ii) Support actors            | CSOs with focus on socioeconomic development                | Mainly associated with assistance and rural extension, bringing knowledge and resources to rural development                           | Regulation<br>Coordination<br>Technical Support<br>Training<br>Communication                  |
|                                | Companies demanding non-timber forest products              | Non-wood products supply chain companies that require products of forest owners  | Acceleration<br>Communication   |
|                                | Scientific, technological and innovation institutions (STI) | Source of basic or applied knowledge of scientific or technological nature or the development of new products, services, or processes  | Technical Support<br>Training<br>Communication  |
|                                | Governmental institutions                                   | They influence and are influenced by the social innovation ecosystem in the different layers of government                             | Regulation<br>Coordination<br>Support<br>Training<br>Communication                            |
|                                | Financial institutions                                      | Funding to develop properties and of companies that invest in their structure resulting in higher demand for forest inputs             | Funding   |
|                                | The HUB   | Act to coordinate all the actors of SIEA+ to create synergy for the development of production chains                                   | Regulation<br>Coordination<br>Support<br>Training<br>Acceleration<br>Funding<br>Communication |

f) Funding

The HUB is funded by the foundations that started the initiative. Also, it counts on a grant by a corporate foundation established by a bank, and a grant by a national development bank, both grants awarded after a competitive selection process.

g) Practitioners

No matter how public policies are created, and regardless of the support from CSOs, governmental institutions or companies, the farmers are the key players to guarantee the conservation of the Araucaria rainforest. This is because the most significant part of the forest remnants in southern Brazil is in private areas with less than 80 hectares, usually family farms. Thus, protection or degradation practices are carried out by the owners of forest areas, with or without the influence of other actors. It is possible to synthesize these types and roles in the Table 1.

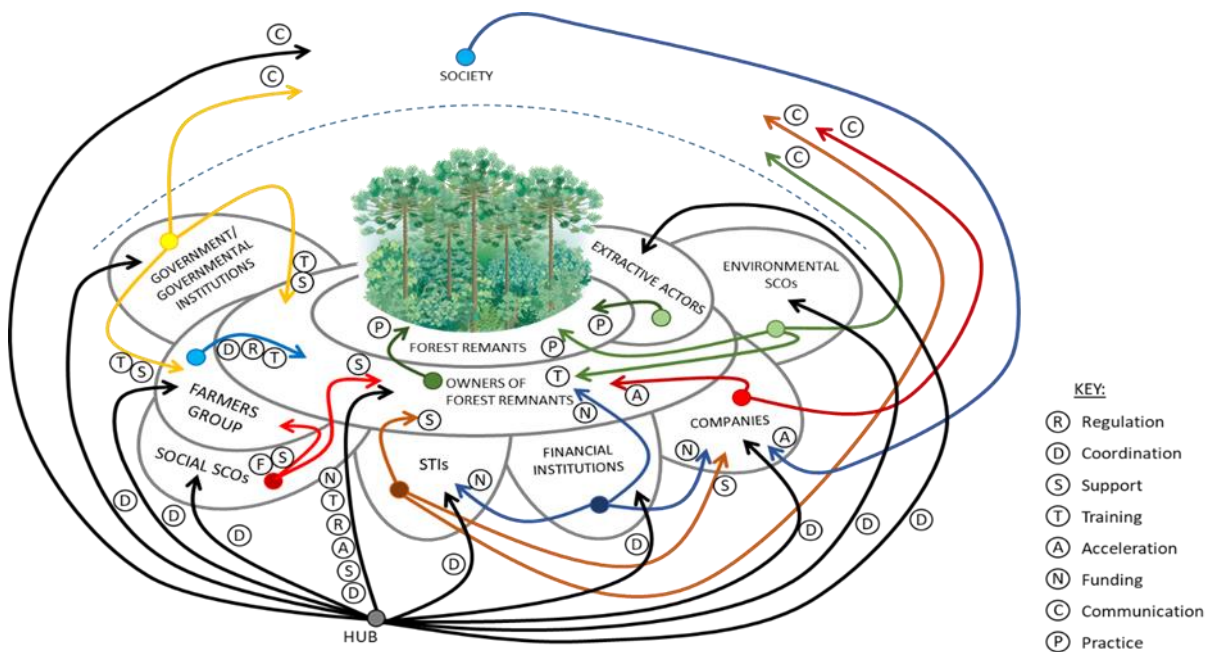
5.3 CONNECTIONS AND INTERACTIONS BETWEEN ACTORS

The way in which the actors interact directly influences the outcomes of the SIEA+ regarding the public problem, i.e., the protection of the Araucaria rainforest.

Based in primary data it is possible to construct a visual summary (Figure 2) of the interaction logic and the flow of the efforts and roles of the actors, associated to the level of intermediate social forces in the analysed ecosystem.

Figure 2

Connections and interactions between the actors in the SIEA+, based on field research



Some actors perform different roles toward various publics or perform several roles directed to the same public. The roles can be separated into those that directly promote forest conservation (roles in the category “practices”), and the roles that strengthen and support the adoption of practices associated with forest conservation.

There is considerable support for training and support in the form of technical assistance, technological transfer, and promotion of agriculture and cattle production, despite the almost absence of technical support mechanisms and programs, as well as lack of funding toward social innovation and entrepreneurship in the territory. The incentives observed are some government programs to stimulate agriculture, managed by traditional financial organisations offering financing conditions similar to those practiced in the market.

As observed in the researchers' opportunities for interaction with the farmers of the region, their perception about the support network is somewhat unclear. Despite the history of interaction and support provided in the region – promoting association, environmental education, technical assistance, and rural extension – the perception is of low value and small legacy. Reports of rejection or non-perception of the support offered are common. It is possible to notice a feeling of incompleteness regarding the support offered, which is reflected in an almost universal narrative for the region, associated with the generation of economic results: “they only help from the gate inwards”. In the farmers interviews the training of cultivation practices and technologies, the supply of varieties of cultivars, the diversity of inputs and other support activities in the property were considered helpful. However, the farmers pointed out that the support to access markets was insufficient, resulting in a poor sale or even loss of production, particularly due to the lack of deposits structures. Without having a buying market, the farmers ended up having to sell their product with the same price as conventional ones, which ends up increasing the use of fertilizers, as explained by a farmer in the city of Urupema, Santa Catarina, when talking about their organic strawberry production. Due to a poor market for the differentiated product, they “lost” part of the production – indicating that they would return to cultivate strawberries in a “traditional” way. In their words, “I have much more work, and I get the same value per box, and I lose more with the organic product”.

It is possible to observe when talking to the various actors that, in addition to the lack of market-oriented technical support, there is no support for incubation or acceleration of new ventures, and no financial incentives for the development of new products. This context may be directly related to the low diversity of entrepreneurship, and the lack of leadership in piloting new possibilities of products or market in the communities associated to the forest, which can be a worrying factor for the sustainability of the properties in the long term.

## **6 ANALYSIS OF EXISTING CONTROVERSIES**

The data from this research showed that the preservation of the Araucaria forest depends on the “owners of the forest”, i.e the people that work and leave in the forest. In this sense, it remains to be seen how they interpret the issue of forest protection and how they intend to act in the face of this problem. Based on the situations identified from interviews, we explore inflection points and disputes that are present in the field when analysing the issue of forest protection. It is important to emphasize that the existing controversies between the actors involved with forest conservation are not part of the normative model of the A+, but were raised during field work, with interviews and informal conversations. Chateauraynaud (2011) in his work clarifies that our systems are not linear and are always subject to different ways of thinking and acting, which makes the theoretical models little aligned with the reality that presents itself.

So, based on the primary data, two controversies related to the forest conservation stand out and are described and analysed below.



### 6.1 IS THE ARAUCARIA RAINFOREST IN DANGER?

The protection of the Araucaria rainforest is considered controversial. It is common for farmers to express that they are already protecting the forest, since they inherited the areas from their ancestors. In their understanding, the forest was not completely suppressed in the period of logging exploration because they are acting for forest conservation. However, from the technical point of view of conservation, the ecological quality of the remnants is increasingly compromised due to the simplification of biodiversity (varieties of canelas, imbuías, araucaria, cedars, xaxim), previously frequent and dominant, which have become rare by excessive and disordered exploitation (Vibrans et al., 2011). There is, in this sense, the challenge associated with valuing conservation practices, that is, how to make communities and society see value in the conservation of the forest. According to discussions in the field of environmental ethics, a living being or a habitat only has value if it is useful to satisfy people's needs or it alone has sufficient value, thus the importance of its conservation is evident (Florit, 2016). This dialectic brings to light the reflection on how conservation actions are guided by value judgments. The fact that there is no recognition of the current state of the forest as a public problem by a large part of the actors involved indicates the need to provide mutual engagement in different ways, such as education for conservation and incentives associated with results achieved regarding conservation.

There is a given dilemma that current economic practices are harmful to the environment. On the other hand, environmental sustainability must be associated with economic sustainability. Since the owners of the forest remnants are responsible for the protection or degradation practices, it is necessary for them to meet their economic needs so that environmental and social practices become sustainable in the long term. This issue reinforces the view of Sayer et al. (2020) on forest sustainability since short-term priorities make it difficult to look at preservation. The reason for this is because while preserving life on Earth is important, limited resources are available.

Therefore, the forest territory could be used for other sources of income. The A+ (HUB) works in this sense, seeking to develop a market for forest biodiversity products, in view of an economic model based on bioeconomy, valuing renewable forest resources and services, and encouraging innovation among the industries that benefit from the products such as food and pharmaceuticals. This kind of action represents, therefore a third option considering the two opposing views found in the national debate on forest protection and exploitation (Nobre et al., 2019), one defending the complete isolation of the forest for conservation purposes and the other a development model advocating "sustainable" exploitation of agriculture, cattle, and mining.

### 6.2 FORESTS WITH OR WITHOUT CATTLE?

Among the most iconic controversies, the decision to withdraw cattle from forest remnants stand out. Diagnoses of various specialists and institutions relevant to environmental protection, particularly the IFFSC, issued warnings about the fact that large animal farming is the main reason for deforestation of the Araucaria rainforest. Such warnings motivated commitments to limit the movement of large animals in forest remnants, mainly because of impact on the soil (compacting and erosion) and the fact that they are herbivores. Observing these warnings, the initiative "Araucaria+" developed, together with several specialists, the set of environmental commitments (called "standards of sustainable production") that farmers participating in the initiative must adopt. Among the commitments, there was a strong stance by the initiative on the total withdrawal of cattle from the forest

area, even if gradually (providing for the establishment of an adaptation plan), which generated resistance on the part of the producers. The different experiences that the HUB had to engage farmers in adopting best practices in the use of forest areas led to numerous situations of resistance and incompatibility of a conservation imperative: “we are going to try to establish a more friendly and fair model for animals, but we cannot avoid raising cattle [...] we haven't bought the animals yet, but we have already invested in 4 hectares [equivalent to 40,000m<sup>2</sup>] of pastures for this” (Farmer G).

Given the impasse and mediating characteristic of the initiative, the HUB issued an alert for the actors to present the different justifications in a test situation within this public arena, with the intention of collectively finding a direction, “where are we going?” This initially triggered a series of interactions with experts and, finally, immersion with different publics – farmers, government agencies, CSOs, experts from different areas – to discuss alternative ways to reduce the impact of cattle on the Araucaria rainforest, in a public investigation considering the various possibilities, and the different perspectives on this problematic situation.

Like the research conducted by Aryal, Laudari and Ojha (2020), the A+ showed its contribution to preserving the Araucaria Forest in southern Brazil, through local partnerships developing a market for forest products, convincing the landowners to protect the forest in their properties. Additionally, the data reveals the importance of the relationship of cooperation built through the initiative. This experience corroborates the findings about cooperation observed in the research by Nakamab, Satriadic and Fauzic (2019) who demonstrated the potential of participatory land and conservation initiatives to contribute to SDG 15 based on a case study conducted in southern Kalimantan, Indonesia.

## 7 ANALYSIS AND FINAL CONSIDERATIONS

This research described and analysed the social innovation ecosystem (SIE) focused on the preservation of the Araucaria forest in compliance with SDG 15. The case studied was promoted by the initiative Araucaria +, using a theoretical-methodological approach that coordinates the perspective of the sustainable development and the findings of recent research on SIEs, adopting a qualitative point of view. The case reveals a strategy of development that considers regional potential and opportunities, in view of the finitude of natural resources (Pecqueur & Vieira, 2015).

The analysis focused on the dynamics established in the interaction among the actors of the SIE showed specific social innovation ecosystem linked to rainforest preservation. The analysis identified the different types of actors, the roles performed by them and the way they relate to each other and reveal that the case Araucária + have local elements and conditions for social innovation flourish (Brandsen et al., 2016). This dynamic occurs amid everyday struggles, where actors from different sectors are often in conflict but also share ideas, logics, and interests.

However, the dialogue with the actors showed that there is a lack of market-oriented technical support, and lack of support for the development of new ventures, which results in low diversity and entrepreneurship, and low level of leadership in the development of new products and solutions to problems in the territory, which may jeopardise the long-term sustainability of the properties.

In addition, the research revealed that the EIS network is permeated by controversies (Chateauraynaud, 2011) surrounding forest conservation, calling attention to the dynamics of social systems whose interaction theoretical models fail to capture. In this sense, the results

point to the fact that structural changes only occur when the social and environmental dimensions are treated in an integrated way since they are naturally inseparable. Given that practices of protection or degradation are carried out by the forest owners, with or without the influence of other actors, it is important to emphasise that engaging and raising awareness among forest owners must always be one of the priorities of the SIEA+, keeping in mind that they are the most significant connection between the forest and society. However, their minimum economic conditions must be met so that there are real mobilisation and sufficient commitment to generate structural and permanent changes regarding the public problem of protecting the Araucaria rainforest.

There is a search for regularity for more control in all sciences, but if the challenges of society become increasingly complex, systemic, and global, we must find innovative solutions that require approaches considering aspects not necessarily measurable, controllable, or predictable (Domanski, 2018, Domanski, Howaldt & Kaletka, 2020, Andion, Alperstedt & Graëff, 2020, Andion et al., 2022). Moreover, considering that the world is extremely complex, we will always have enormous challenges in controlling diversity and adversities such as the ones observed in the Araucária + Initiative.

Theoretically, this study contributes to a more complex view of the discussion around the achievement of SDGs in a specific territory. This approach reveals that understanding social actors implies observing real practice rather than normative or social rules (Bursztyn & Bursztyn, 2012). In addition, the study also exposed existing theoretical controversies around preservation that offer barriers to achieving SDG 15. The findings presented in this article may help practitioners and government officials to understand the importance of protecting the forest and increase funding to support social innovation and entrepreneurial initiatives engaged in such a mission. As Bukoski, Drazen, and Johnson (2018) state, “researchers must continue to demonstrate the wide-ranging ecological and socioeconomic benefits of tropical forests in order to motivate governments and other organizations to prioritize the conservation, restoration and sustainable use of tropical forests for generations to come” (p.80).

The consequences of a potential failure of this SIE are directly connected to the loss of collective wealth, although it is not possible to observe consequences in the short term. The study represents only a picture of the situation of the SIEA+ in 2018, which can be identified as a limitation of this study. A better understanding of the outcomes in the long-term depends on longitudinal follow-up, revealing opportunities for future research and for achieving the SDGs, especially SDG 15: life and land.

#### **ACKNOWLEDGEMENTS**

This work has been supported by the following Brazilian research agencies: Fundação de Amparo à Pesquisa e Inovação do Estado de Santa Catarina (FAPESC) e Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq).

#### **REFERENCES**

- Abramovay, R. (2019). *Amazônia: por uma economia de conhecimento da natureza*. São Paulo: Elefante.
- Andion, C., Alperstedt, G. D., & Graeff, J. F. (2020). Social innovation ecosystems, sustainability, and democratic experimentation: a study in Florianópolis, Brazil. *Revista de Administração Pública*, 54(1), 181-200.

- Andion, C.; Ronconi, L.; Moraes, R. L.; Gonsalves, A. K. R.; Serafim, L. B. D. (2017). Civil society and social innovation in the public sphere: A pragmatic perspective. *Revista de Administração Pública*, (51)3, 369-387.
- Andion, Carolina; Serva, Maurício; Lévesque, Benoît. (2006). O debate sobre a economia plural e sua contribuição para o estudo das dinâmicas de desenvolvimento territorial sustentável. *Eisforia: desenvolvimento territorial sustentável: conceitos, experiências e desafios teórico-metodológicos*. Florianópolis, 4(4), 199-211.
- Andion, C., Alperstedt, G. D., Graeff, J. F., Ronconi, L. A. (2022). Social innovation ecosystems and sustainability in cities: a study in Florianópolis, Brazil. *Environment, Development and Sustainability*, 24(1), 1259-1281.
- Aryal, K., Laudari, H. K., & Ojha, H. R. (2020). To what extent is Nepal's community forestry contributing to the sustainable development goals? An institutional interaction perspective. *International Journal of Sustainable Development & World Ecology*, 27(1), 28-39.
- Baumgartner, R. J. (2019). Sustainable Development Goals and the forest sector - A complex relationship. *Forests*, 10(2), 152. <https://doi.org/10.3390/f10020152>
- Brandsen, T., Cattacin, S., Evers, A., & Zimmer, A. (2016). *Social innovations in the urban context*. Springer Nature.
- Bryman, A. (2016). *Social research methods*. Oxford University Press.
- Bukoski, J. J., Drazen, E., Johnson, W. R., & Swamy, L. (2018). Tropical forests for sustainable development: Shaping the 2030 Agenda for Sustainable Development with knowledge from the field. *Journal of Sustainable Forestry*, 37(2), 77-81.
- Bursztyn, M. A. (2018). *Fundamentos de política e gestão ambiental: caminhos para a sustentabilidade*. Editora Garamond.
- Cefaï, Daniel. (2009). Como nos mobilizamos? A contribuição de uma abordagem pragmática para a sociologia da ação coletiva. *Dilemas-Revista de Estudos de Conflito e Controle Social*, 2(4), 11-48.
- Chateauraynaud, F. (2011). Argumenter dans un champ de forces. *Essai de Balistique Sociologique*. [http://gspr.ehess.free.fr/docs/FC/doc/doc-FC-2010-BALISTIQUE\\_4\\_PAGES.pdf](http://gspr.ehess.free.fr/docs/FC/doc/doc-FC-2010-BALISTIQUE_4_PAGES.pdf)
- Creswell, J. W., & Creswell, J. D. (2021). *Projeto de pesquisa: Métodos qualitativo, quantitativo e misto*. Penso Editora.
- Domanski, D. (2018), 'Developing regional social innovation ecosystems', in Y. Franz, H-H. Blotevogel and R. Danielzyk (eds), *Social Innovation in Urban and Regional Development: Perspectives on an Emerging Field in Planning and Urban Studies*, ISR-Forschungsbericht Heft 47, Vienna: Verlag der Österreichischen Akademie der Wissenschaften, 117-28.

- Dewey, J. [1915] (1981) *Experience et Nature*. Paris: Gallimard.
- Dewey, J. [1927] (1954) *The public and its problems*. Chicago: The Swallow Press.
- Domanski, D., Howaldt, J., & Kaletka, C. (2020). A comprehensive concept of social innovation and its implications for the local context—on the growing importance of social innovation ecosystems and infrastructures. *European Planning Studies*, 28(3), 454-474.
- Domanski, D., Kaletka, C. (2018). Social innovation ecosystems. In J. Howaldt, C. Kaletka, A. Schröder, M. Zirngiebl (Eds.), *Atlas of social innovation: New practices for a better future*, 208–210.
- Emerson J. (2003), The blended value map. Integrating social and financial returns. *California Management Review*, 45(4), 34-51.
- Florit, L. F. (2016). Conflitos ambientais, desenvolvimento no território e conflitos de valoração: considerações para uma ética ambiental com equidade social. *Desenvolvimento e Meio Ambiente*, 36, 255-271. <http://dx.doi.org/10.5380/dma.v36i0.41624>
- Fundação Centros de Referência em Tecnologias Inovadoras – CERTI (2012b). *Análise Integrada das Cadeias Produtivas de Espécies Nativas da FOM e seu impacto sobre este Ecossistema: Volume II - Estratégia de Valoração da Floresta com Araucária*.
- Fundação Centros de Referência em Tecnologias Inovadoras - CERTI. (2012a). *Análise Integrada das Cadeias Produtivas de Espécies Nativas da FOM e seu impacto sobre este Ecossistema: Volume I - Relatório Final: Diagnóstico das Cadeias Produtivas do Pinhão e da Erva-Mate*.
- Gibbs, G. (2009). *Análise de dados qualitativos: coleção pesquisa qualitativa*. Bookman Editora.
- Hazarika, R., & Jandl, R. (2019). The Nexus between the Austrian Forestry Sector and the Sustainable Development Goals: A Review of the Interlinkages. *Forests*, 10(3), 205. <https://doi.org/10.3390/f10030205>
- Hiratsuka, M., Nakama, E., Satriadi, T., Fauzi, H., Aryadi, M., & Morikawa, Y. (2019). An approach to achieve sustainable development goals through participatory land and forest conservation: a case study in South Kalimantan Province, Indonesia. *Journal of Sustainable Forestry*, 38(6), 558-571.
- Howaldt J., Kopp R. & Schwarz M. (2015). *On the theory of social innovations: Tarde's neglected contribution to the development of a sociological innovation theory*. Weinheim, Beltz Juventa.
- Howaldt, J., & Schwarz, M. (2010). *Social Innovation: Concepts, research fields and international trends*. Sozialforschungsstelle Dortmund.

- Kirillov, S., Slipenchuk, M., & Zengina, T. (2016). Management of the sustainable development of the Baikal natural territory in Russia. *International Journal of Innovation and Sustainable Development*, 10(1), 57-68.
- Latour, B. (2012). *Reagregando o social: uma introdução à teoria do ator-rede*. Edufba.
- Marshall, Catherine & Rossman, Gretchen B. (1995). *Designing qualitative research*. Newbury Park, CA: Sage.
- Lévesque, B. (2009). Economia plural e desenvolvimento territorial na perspectiva do desenvolvimento sustentável: elementos teóricos de sociologia econômica e de socioeconomia. *Política & Sociedade*, 8(14), 107-144.
- Mehmood, A. (2016). Institutional forms of social innovation. *International Journal of Innovation and Sustainable Development*, 10(3), 300-311.
- Moulaert F., Martinelli F., Swyngedouw E., & González S. (2005), Towards alternative model(s) of local innovation. *Urban Studies*, 42(11), 1969-1990.
- Moulaert, F., MacCallum, D., Mehmood, A., Hamdouch, A., Mehmood, A., & Parra, C. (2013). Social innovation in an unsustainable world. *The international handbook on social innovation*.
- Nobre, I., & Nobre, C. (2019). *Projeto "Amazônia 4.0": definindo uma terceira via para Amazônia*. Sorj, B.; Soupizet, Jf; Fausto, S. Futuribles, São Paulo: SP, 7-20.
- Olsson, P., Moore, M. L., Westley, F. R., & McCarthy, D. D. (2017). The concept of the Anthropocene as a game-changer: a new context for social innovation and transformations to sustainability. *Ecology and Society*, 22(2), 31. <https://doi.org/10.5751/ES-09310-220231>
- Pecqueur, Bernard. (2006a). A guinada territorial da economia global. *Eisforia*, Florianópolis, 4(4), 81-106.
- Pecqueur, Bernard. (2006b). Qualidade e desenvolvimento territorial: a hipótese da cesta de bens e de serviços territorializados. *Eisforia*, Florianópolis, 4(4), 135-153.
- Pecqueur, Bernard; VIEIRA, Paulo Freire. (2015). Territorial Resources and Sustainability: Analyzing Development in a "Post-Fordist" Scenario. *Sustainability*, 141-157. [https://doi.org/10.1007/978-94-017-9532-6\\_12](https://doi.org/10.1007/978-94-017-9532-6_12)
- Strauss, A., & Corbin, J. (1998). *Basics of qualitative research: techniques and Procedures for Developing Grounded Theory*. Sage Publications. London.
- Terstriep, J., & Pelka, B. (2016). Mapping Social Innovation Maps—The State of Research Practice across Europe. *European Public & Social Innovation Review*, 1(1), 3-16. <https://doi.org/10.31637/epsir.16-1.1>



- Phillips, W., Lee, H., Ghobadian, A., O'regan, N., & James, P. (2015). Social innovation and social entrepreneurship: A systematic review. *Group & Organization Management*, 40(3), 428-461.
- Phills Jr. J.A., Deiglmeier K., & Miller D.T. (2008), Rediscovering Social Innovation. *Stanford Social Innovation Review*, 6(3), pp. 34-43. Emerson, 2003.
- Rossman, G. B., & Rallis, S. F. (2011). *Learning in the field: An introduction to qualitative research*. Sage.
- Sayer, J., Sheil, D., Galloway, G., Riggs, R. A., Mewett, G., MacDicken, K. G., ... & Edwards, D. P. (2019). SDG 15: life on land—The Central role of forests in sustainable development. *Sustainable Development Goals: their impacts on forests and people*. Cambridge University Press, Cambridge.
- Schmitt, V. G. H., & Neto, L. M. (2011). Associativismo, comércio justo e o desenvolvimento territorial sustentável: a experiência da Toca Tapetes. *REGE-Revista de Gestão*, 18(3), 323-338.
- Schulze, E-D., Beck, E., Müller-Hohenstein, K. (2005). *Plant Ecology*. Springer-Verlag, Berlin.
- Sgaragli F. (2014). *Enabling social innovation ecosystems for community-led territorial development*. Rome, Fondazione Giacomo Brodolini.
- Stake, R. E. (2005). Qualitative Case Studies. In N. K. Denzin & Y. S. Lincoln (Eds.), *The Sage handbook of qualitative research* (pp. 443–466). Sage Publications Ltd.
- United Nations (2015). *Transforming our World: the 2030 agenda for sustainable development*. United Nations, New York.
- Varadarajan, R. (2014). Toward sustainability: Public policy, global social innovations for base-of-the-pyramid markets, and demarketing for a better world. *Journal of International Marketing*, 22(2), 1-20.
- Vibrans, A. C., Sevegnani, L., Uhlmann, A., Schorn, L. A., Sobral, M. G., de Gasper, A. L., ... & Verdi, M. (2011). Structure of mixed ombrophylous forests with *Araucaria angustifolia* (Araucariaceae) under external stress in Southern Brazil. *Revista de Biologia Tropical*, 59(3), 1371-1387.
- Vibrans, A. C.; Sevegnani, L.; Gasper, A. L.; Lingner, D. V. (2013). *Inventário florístico florestal de Santa Catarina: Floresta Ombrófila Mista*. Blumenau: Edifurb, 25-271.