Programa de Pós-Graduação Desenvolvimento Regional mestrado e doutorado

DOI: 10.17058/redes.v29i1.19271

Governance in digital food markets: The case of Sembrando Confianza, Colombia

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Abstract
The need to better understand sustainability of agri-food systems has been recognized for some time now, especially in the context of climate change and contingencies such as the Covid-19 pandemic. This research sought to analyze governance as a dynamic or social process of Sembrando Confianza, an agroecological online market for peasant, family, and community farming, located in Bogotá, Colombia. During 2023, interviews were conducted with the market coordinator, 11 consumers, and five farners. SC is a project of a Colombian-French non-governmental organization that employs agroecology as a tool for social transformation. The foundation was created in 2007 and the digital market in 2012, which was aimed to absorb the surpluses from its first project. In 2018, SC set up its e-commerce website, which is now in its second version and supports more than 65 farmers and 109 consumers on a monthly basis. Governance is one of SC's innovative features, as it constitutes a subtle heterarchy with traits of anarchy and hierarchy, while conventional food markets are mostly either anarchic or hierarchical. It is also a challenge, because while some farmers and consumers have disengaged, others wish to participate more actively. It is considered important for SC to structure a governance framework setting who may participate, how and on what purpose, relying on information and communication technologies.

Keywords: Participation. Governance and information and communication technologies. Agroecological market. Agroecology. Sustainability.

Governança em mercados alimentares digitais. Caso Sembrando Confianza, Colombia

Resumo
Há já algum tempo que se reconhece a necessidade de compreender melhor a sustentabilidade dos sistemas agroalimentares, especialmente no contexto das alterações climáticas e de contingências como a pandemia de Covid 19. O objetivo desta investigação foi analisar a governação como uma dinâmica ou. processo social do Sembrando Confianza SC, mercado digital agroecológico para Agricultura Camponesa, Familiar e Comunitária, localizado em Bogotá, Colômbia. Durante 2023 foram realizadas entrevistas com o

coordenador de mercado, 11 consumidores e cinco produtores. SC é um projeto de uma Organização Não Governamental Franco-Colômbia, que utiliza a agroecologia como ferramenta de transformação social. A Fundação foi criada em 2007 e o mercado digital em 2012 para absorver os excedentes do seu primeiro projeto. Em 2018, SC passou a ter seu site de e-commerce que está em sua segunda versão, atendendo mensalmente mais de 65 produtores e 109 consumidores. A governação é uma das características inovadoras da SC porque é uma heterarquia tímida com características de anarquia e hierarquia, enquanto os mercados alimentares convencionais são maioritariamente anárquicos ou hierárquicos. É também um desafio, porque embora alguns produtores e consumidores se tenham desvinculado, outros querem participar mais activamente. Considera-se importante que a SC estruture um quadro de governação que envolva quem participa, como e para quê, apoiando-se nas Tecnologia da Informação e Comunicação.

Palavras–chave: Participação. Governança e Tecnologia da informação e comunicação. Mercado agroecológico. Agroecologia. Sustentabilidade.

Gobernanza en mercados alimentarios digitales. Caso Sembrando Confianza, Colombia

Resumen
Desde hace algún tiempo se reconoce la necesidad de comprender mejor la sostenibilidad de los sistemas agroalimentarios, especialmente en el marco del cambio climático y de contingencias como la pandemia por Covid 19. El objetivo de esta investigación fue analizar la gobernanza como dinámica o proceso social de Sembrando Confianza SC, un mercado digital agroecológico para la Agricultura Campesina, Familiar, y Comunitaria, ubicado en Bogotá, Colombia. Durante 2023 se realizaron entrevistas al coordinador del mercado, a 11 consumidores y a cinco productores. SC es un proyecto de una Organización No Gubernamental colombo francesa, que emplea la agroecología como herramienta de transformación social. La Fundación fue creada en 2007 y el mercado digital en 2012 con el fin de absorber los excedentes de su primer proyecto. En 2018 SC pasó a tener su sitio web de comercio electrónico que va por su segunda versión, apoyando mensualmente a más de 65 productores y 109 consumidores. La gobernanza es una de las características innovadoras de SC porque es una heterarquía tímida con rasgos de anarquía y jerarquía, mientras los mercados alimentarios convencionales son sobre todo anárquicos o jerárquicos. También es un reto, pues mientras algunos productores y consumidores se han desentendido, otros desean participar más activamente. Se considera importante que SC estructure un marco de gobernanza que implique quien participa, cómo y para qué, apoyándose en las Tecnologías de la Información y la Comunicación.

Palabras clave: Participación. Gobernanza y Tecnologías de la Información y la Comunicación. Mercado agroecológico. Agroecología. Sostenibilidad.

1 Introduction

Some previous studies have already pointed out and proposed the promotion of agroecological transition as well as development of local agri-food systems and alternative markets as mechanisms to make food production and consumption sustainable, including improvement in food producers' quality of life and consumers' health, and prioritizing territorial management and strong sustainability approaches (Chaparro & Calle, 2017; Chaparro, 2018).

While such actions are proposed as public policies and initiatives for resistance, cooperation and social mobilization, it becomes clear that there are gaps in public policies and that citizen initiatives tend to be more dynamic and anticipate them, entailing the need to identify such initiatives, study them and learn from them. This is the case of markets for agroecological products, which have been called agroecological markets.

Agroecological markets have been defined as formal or informal organizations that promote the sustainability of agri-food systems by distributing agroecological products through short supply chains, in terms of both distance and intermediaries, involving diverse participants (promoters, producers, and consumers) and interrelations (Chaparro-Africano, 2019). These markets are mainly characterized by their alternative rationality as compared to conventional markets regarding social, environmental, and economic aspects, since their purpose is not profit but the development of solidarity-based exchange mechanisms, which in turn promote agroecological production, sustainable consumption and the well-being of producers and consumers.

These markets focus on agroecological products, mainly food, and are promoted by actors that include producers, consumers, non-governmental organizations and universities, among others. A second key aspect is that these markets are not limited to including peasants, but are extended to diverse producers such as family farmers, indigenous people, neo-rural farmers, beekeepers and urban processors, among others; even the promoters and consumers of these markets themselves are usually producers. Regarding consumers, they combine a varied set of motivations to participate in these markets, including social aspects such as their health, but also environmental aspects as nature protection and conservation, and economic-solidarity aspects as income generation for producers and for the organizations that lead the markets, what goes beyond the mere mercantilist and supply focus of conventional markets (Chaparro-Africano, 2019).

Such markets have been gradually included in digitalization. According to Niederle, Schneider, and Cassol (2021), digital media have expanded and consolidated in different dimensions, making work, production and consumption without technology impossible. Agriculture and food are not secluded from this reality, which, despite being permeated with contradictions and inequalities between social groups and productive activities, is in turn subject to new opportunities and exclusions. In fact, with the Covid-19 health crisis, there was an acceleration in the development of digital food markets, both for large economic and corporate groups (Kenny, Serhan, & Trystram, 2020) and for small-scale social sectors such as agroecological farmers (Da Costa, 2020).

These digital markets for or by family farmers face challenges such as: barriers to entry and competition; scale, scope and stability of supply and demand; logistics; organizational disposition and governance; and information management (Niederle, y otros, 2021). Governance represents an important challenge, since it is an indicator of social participation and inclusion (Cavalcanti, y otros, 2014). Such governance, which is intended to be participatory (Blay-Palmer, 2020), takes varied forms in these digital markets, with greater or lesser participation by producers, consumers, and/or third parties, according to the social dynamics of its actors (Niederle, y otros, 2021).

Governance is crucial for these agroecological markets, now supported by digital processes, to be sustainable. Nevertheless, it has been little studied, especially as regards local experiences. Novoa (2020) carried out an analysis of governance within a market of farmers involved in agroecological transition in Colombia, from the perspective of heterarchical governance. The analysis identified its problems (the need for making alternative production and consumption mechanisms viable), norms, actors (partners, informants, interlocutors and cooperators), nodal spaces and processes, and revealed relationships that go beyond commercial transactions, as well as the autonomy, coherence and cohesion of the market, though not the efficiency or resilience of the processes.

Subsequently, Novoa and colaborators (2021) analyzed a Colombian case of governance for agroecological transition and access to markets, from the perspective of territorial governance. The study highlights the legitimacy of the process, but not its effectiveness, participation or sustainability. In this context, more cases must be analyzed to broaden the perspective, so as to allow a better understanding of the innovation, contributions and challenges of governance in the construction of sustainable agri-food systems, particularly in agroecological digital markets.

Results presented in this paper are part of a broader research project that is examining various agri-food markets for family farming in Latin America.[1] In this case, a digital market for agroecological products called Sembrando Confianza (SC) was analyzed during 2023, focusing on governance as a dynamic or social process that constitutes both a social innovation and a challenge, and discussing how it can be supported by information and communication technologies (ICTs).

2 On digital markets for peasant, family and community farming and its governance

Estimates for 2023 pointed that 80% of urban people would be using internet as compared to 51% of rural populatons (range 17–88% across low- to high-income countries) globally, while 78% of world population would have a mobile phone. For the Americas these estimates rise to 90% and 74%, respectively, for the internet use and to 89% for mobile phones (International Telecommunication Union ITU, 2023). This access to ICTs will continue to increase rapidly, including in rural areas.

Additionally, and due to the dynamism of Industry 4.0, in the next ten years significant changes are estimated in many sectors, including the agri-food system, driven by technological advances and digital innovations such as blockchain, internet of things (IoT), artificial intelligence (AI), immersion in virtual reality, among others, changing consumer preferences and demands, e-commerce share in the agri-food system, its impact on climate change, among other aspects. The challenge lies in that such context must not become a problem or generate greater inequality, but rather an opportunity to rely on technologies to achieve a more productive, efficient,

[1] This article is part of the results of research activities planned in the project "Digital food markets in Brazil: dynamics, innovations and challenges of marketing in family farming" funded by the National Council for Scientific and Technological Development (CNPq), Ministry of Science, Technology and Innovations (MCTI), through Call 40/2022 (Process No. 409231/2022-3).

sustainable, inclusive, transparent and resilient agri-food system (Food and Agriculture Organization FAO, 2017).

Digitalization refers to sociotechnical processes that involve the use of digital technologies and it differs from digitization, which refers to the mere conversion of analog information into digital format (Niederle, y otros, 2021). The digitalization of agriculture and rural areas is already a political priority globally, since it is deemed to be a solution to many of its challenges (Trendov, y otros, 2019). However, this must be a reflective and planned process, since previous technological revolutions have not necessarily been positive and/or neutral (Bronson, y otros, 2019). There are different approaches to development, each with its winners and losers (Klerkx, y otros, 2020). Therefore, it has been proposed that research and innovation should be done responsibly (Lajoie-O'Malleya, y otros, 2020), what can be difficult, in part, because current digital technologies can bring about several undesirable, unobserved and unknown or emerging impacts, which only become evident when technologies are put into practice (Klerkx, y otros, 2020). It has already been established that digital technologies, by favoring large actors, can reinforce economic and social unsustainability (Clapp, y otros, 2020).

The concept of appropriate technology, or technology suited to the environmental, cultural and economic context for which it is intended, defines that it should involve fewer resources, lower costs and lower environmental impacts (CSIR Built Environment Unit , 2008). These technologies must also consider social aspects such as the culture of the people to which it is intended, and participatory diversity. Some authors have suggested a more systematic approach to mapping innovations related to digital agriculture, inclusion of diverse participants, and practical tests of innovations to estimate whether the processes can be made more socially responsible (Rose, y otros, 2018).

Governance, in turn, has been defined as the political relations between various actors who decide, execute and evaluate matters of public interest, in processes where competition and cooperation coexist (Whittingham, 2010). When applied to social processes, it largely determines their sustainability, although being a great challenge (Chaparro-Africano, y otros, 2022).

Previously being a relevant matter predominantly for governments, governance has become increasingly relevant in social processes, and addressed by multiple disciplines, to achieve coordination between actors. There are different classifications of governance and in each of them different types are recorded – which constitute its determining aspect. Governance can be classified as centralized in the State or distributed among other actors of the system, which is called polycentric (Whittingham, 2010); it can be territorial governance, which incorporates the proximity approach (Ramírez, 2023); also, can be anarchic, hierarchic or heterarchic governance (Jessop, 1998). Furthermore, there is the interaction between governances, which is called metagovernance (Unterhitzenberger, y otros, 2023), among other classifications and types.

The classification that groups anarchic, hierarchic and heterarchic governance is of great interest in this case. Hierarchic or command governance involves vertical relationships, an example being States. Anarchic or interchange governance is based on individual interest and lack of coordination between actors, an example being the conventional market. Heterarchic or dialogic governance involves complex relational

dynamics (multiple and dynamic), and its horizontality is common in work networks (Jessop, 2003).

In operational terms, the determinant variables of governance operationality include participation, equity, accountability, and efficiency. Secondary variables include responsiveness, administrative and/or managerial innovation, public-private partnerships, state – citizenry – non -governmental organizations (NGO) interaction, decentralized administration, networking, and human resource development (Whittingham, 2010). Hufty (2007) proposes an analytical framework for governance that includes the problem, norms, actors, nodal points and processes. Jessop (2003) proposes four conditions for effective reflexive self-organization at interpersonal and interorganizational levels: (a) models and practices that reduce the complexity of the world but are congruent and relevant to actors; (b) capacity for dynamic and interactive social learning, among autonomous but interdependent agencies, about causal processes, responsibility, capacity for action and possibilities for coordination in complex environments; (c) methods to coordinate actions among actors who have different identities, interests, and time-space horizons; and (d) a common vision for individual action and a meta-governance system to stabilize actors' orientations, expectations, and rules of conduct. Finally, Chaparro-Africano y Páramo (2022), propose an analytical framework for participation, which applies to governance, and includes: who participates (diversity and equity), how (capacity, motivation, trust, efficiency, continuity, communication, and procedures) and why (effectiveness), and they suggest managing these variables with "dynamic equilibrium".

Yet, Jessop (2003) advises that all types of governance entail dilemmas, contradictions, paradoxes and failures, implying that it will not always generate benefits for all actors, at all times and under all expectations. So, it is, implicitly, reflexive, dynamic and complex. Here meta-governance emerges, which seeks to manage the complexity of coordination modes and proposes a judicious combination of market, hierarchy and networks to achieve the best possible results from the point of view of those who participate.

This analysis of governance of agroecological markets also becomes important in the context of Agenda 2030 and its Sustainable Development Goals (SDGs). Particularly, a better understanding of the governance of digital agroecological markets for peasant, family and community farming (PFCF) would make great contributions to their strengthening and, therefore, in view of all the aspects they affect, to the fulfillment of SDGs such as the end of poverty; zero hunger; health and well-being; gender equality; clean water and sanitation; affordable and clean energy; decent work; innovation; reduction of inequalities; sustainable cities and communities; responsible production and consumption; climate action; life below water and life on land; peace and justice; alliances; because of all the edges that impact.

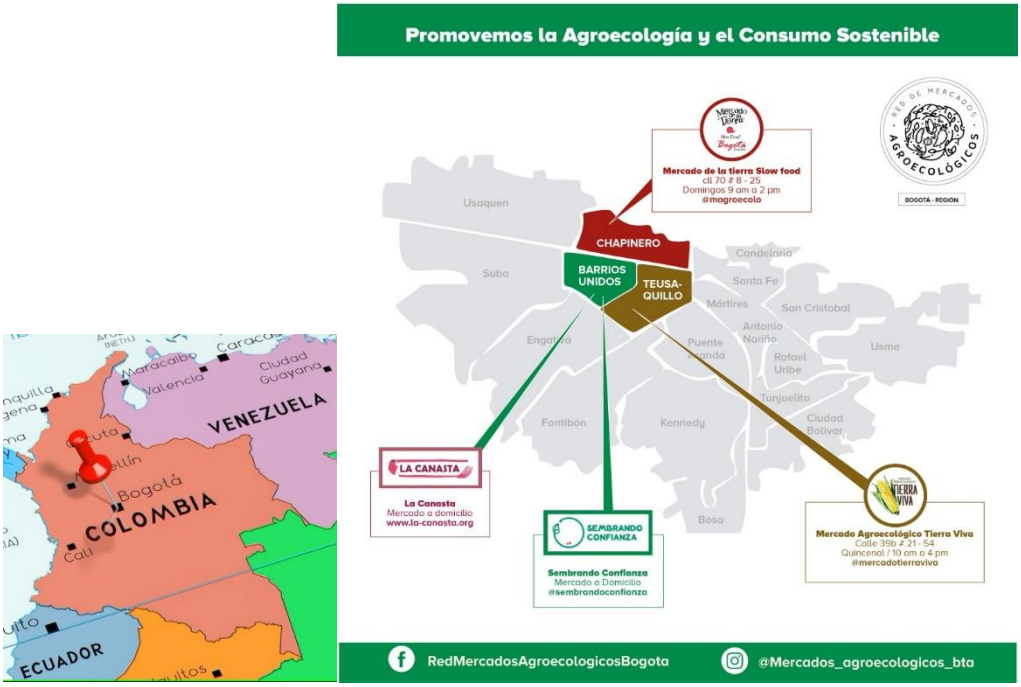
3 Methodology

Sembrando Confianza's participation in this research was agreed during the second half of 2023. SC is an agroecological market of the Colombian-French foundation Fundación Proyectar Sin Fronteras (FPSF), a member of the Red de Mercados Agroecológicos de Bogotá Región (RMABR- Bogotá Region

Agroecological Markets Network), which is fully committed to promoting agroecology, sustainable consumption and the solidarity economy since its creation in 2012.

Sembrando Confianza is located in Bogotá, the capital district of Colombia (Figure 1), its website is https://sembrandoconfianza.com/ and its most used social network is Instagram https://www.instagram.com/sembrandoconfianza/

Figure 1. Location of the Bogotá Region Agroecological Markets Network in Colombia and of Sembrando Confianza in Bogotá.



Source: Freepick and RMABR, 2024.

Information collection included an interview with the market coordinator, as well as with 11 consumers and five producers selected by the market. These interviews aimed at determining their social dynamics and processes, innovations and challenges regarding the digital market. In the case of producers, fresh and processed foods were included; as for consumers, no criterion was set for their selection. All interviewees referred to are clearly some of the most accessible producers and consumers, in terms of time or availability for collaboration.

Consumers included one restaurant and ten families whose number of members ranges from one to four people – mostly two or three people. In the case of the restaurant, the interviewee was the chef, and in the case of households, interviewees were those who place the order in SC, among which seven were women, two were men, and a couple in one case. Seven consumers are Colombian and four are Europeans living in Colombia. Three consumers are flexitarian, three have restricted diets, one person is flexitarian and has a restricted diet, three people do not have a particular diet, and the restaurant offers menus with and without meat. All them are located in Bogotá.

The questionnaires were managed using the digital research application Alimentario, developed by the project mentioned in the footnote, to facilitate the collection, processing and analysis of statistical data.[2]

Regarding the producers, two of them are peasants and three are neo-rural people, comprising two women, one man and two families. The households range from two to five members. Producers' ages range from 34 to 66 years, with the majority around and above 50 years old. They are all located in municipalities of Cundinamarca, the department of Colombia where the capital district is located, except for one producer who is located in the rural area of Bogotá, the capital district of Colombia. The SC market coordinator at the time of the research was a young Tunisian of French nationality, 28 years old.

The interview with the agroecological market coordinator included aspects related to the identification and profile of SC and FPSF, SC's governance, digital infrastructure and physical and digital markets. Consumers were asked about their personal data, their socioeconomic profile and internet use, their consumption habits and their satisfaction with the service offered by SC. Producers were asked about demographic data, the available digital infrastructure, their physical and digital markets and marketing channels and their participation in SC. In all cases, they were asked about innovations and challenges they perceived in SC. The interviews with the SC coordinator and producers were done in person, as were most of the interviews with consumers.

This paper focuses on analyzing the governance of the digital market evaluated, its relationship with the access to and use of ICTs by producers and consumers and the implications for its sustainability.

4 Description of the agroecological market and its governance processes

SC is a program of Fundación Proyectar Sin Fronteras. FPSF was created in 2007 with the aim of supporting the construction and consolidation of social and economic fabric in marginalized communities. SC was born in 2012, intended to reduce economic vulnerability of its participants and to improve environmental sustainability, using agroecology as a tool for social transformation. The SC online store was created six years later, in 2018. SC works on three strategic lines through projects (Sembrando Confianza, 2022):

1. Support to small producers in adopting agroecological practices and the creation of equipment for clean production.
2. Consolidation of supply chains to connect conscious consumers with a network of agroecological certified producers.
3. Food aid and awareness raising on sustainable practices for populations most affected by the crisis arising from COVID-19.

SC is committed to agroecology, which for FPSF "...is a, both scientific and social, powerful solution that seeks food systems' sustainability and justice, by promoting natural ecological processes to improve productivity and avoid

[2]Available at:
https://pb.utfpr.edu.br/geppadem/alimentario/index.php/admin/authentication/sa/login

agricultural problems,... to guide us towards sustainable food systems , supported by diversity, co-creation and knowledge exchange, synergies, efficiency, recycling, resilience, human and social values, gastronomic culture and traditions, responsible governance, circular and solidarity economy". FPSF differentiates agroecology from organic farming, because – although being similar in achieving production free of chemical substances and making responsible use of resources – they differ in the type of certification, the type of producer who carries them out, and the multidimensionality of agroecology (Sembrando Confianza, 2022).

The principles that govern Sembrando Confianza include:

- *Fair trade*: short marketing circuits, 60% of what consumers pay reaches the producers, fair and responsible treatment of producers and consumers.
- *Protection of ecosystems and promotion of agrobiodiversity*: practices such as crop association and rotation, natural fertilizers and self-managed bio-inputs are promoted.
- *Sustainable production and consumption*: local, 100% chemical-free, healthy food that reduces the carbon footprint.
- *Support for farmers*: certification of the Participatory Guarantee System - SPG, projects to strengthen and make peasant work visible.
- *Food security*: prioritizing self-sufficiency and recognition of ancestral and traditional practices.
- *Solidarity economy*: spirit of solidarity, cooperation, participation and mutual aid, self-managed and entrepreneurial administration.
- *Environmental resilience*: promoting practices for adaptation to climate change and global change.
- *Gender equality*: recognition of the role of women in agricultural production (Sembrando Confianza, 2022).

The motivation that gave rise to Sembrando Confianza was to create a new market for PFCF, in order to absorb the surpluses from the Foundation's first project (San Cristóbal Sur vegetable garden), which was geared toward self-sufficiency (Gueribi, 2023). This coincides with the main challenges registered for PFCA and Étnica, one of the most important of which is marketing (Food And Agriculture Organization FAO, Onda Rural, 2021).

SC is a digital marketplace that currently receives weekly orders until Tuesday at 5 pm and makes deliveries on Fridays. SC supports 65 producers located at an average of 42 km from its collection center, and 109 consumers who altogether make 209 purchases per month and are located within a range of 5-10 km from the collection center. About 1,700 units of fresh food are sold per month, plus about 446 units of processed foods. Fresh food (agricultural and livestock) comprises 72% of sales in weight and 86% in units. From 2012 to 2018, SC's sales were managed through Excel worksheets; afterwards they created a website including e-commerce, which was updated and improved about three years ago.

SC carries out promotion to consumers, makes sales, mostly through the website and, in some cases, through a messaging application (WhatsApp), places orders with producers, transports the products to its collection center in part of the route that is negotiated with each producer or group of producers, prepares consumer orders and delivers them (a small proportion of consumers pick up their orders at the collection center). SC offers 12 product categories (selected and

complete baskets; vegetables and tubers; fruits; eggs and dairy products; condiments, spices and aromatics; household products; sauces and vegetable burgers; mushrooms; grains, flours and seeds; jams, honey and sweeteners; snacks and healthy breakfasts), for a total of 495 products, including all their presentations and flavors (Gueribi, 2023).

The actors involved in SC's governance mainly include members of the Foundation who work in the market. Although consumers and producers are not part of direct governance, they participate indirectly through feedback focus groups, which have been conducted since 2022 and whose results inform the elaboration of SC's work plan. In 2022, 12 producers were invited, four of which participated, in addition to six consumers, although many more wanted to participate. Low participation by producers is possibly due to the fact that they are usually highly demanded to attend various extra-productive activities in markets or projects to which they are linked (Gheribi, 2023), although factors such as difficult mobility in Bogotá (RTVC Noticias, 2023), little time available due to production involvement and the scarce available labor (Chaparro-Africano, y otros, 2022), among other reasons, may also be added. Other actors include advisors, researchers, and financers, among others, from whom no information was collected.

Producers are quite diverse. The interviewed cases include two peasant families comprised of two members: producer 1 comprises an elderly woman, a peasant, and her adult son, who does not work in the production system; producer 4 comprises an adult man, a peasant, and his mother, an elderly woman, who no longer works in production. These are the cases that showed most limitation in terms of access to and use of ICTs, in which these are not used exclusively for production systems, what is due to a lack of interest and poor development of technological capacities related to the age of producers, as well as to their low purchasing power and the rural location that limits the coverage and quality of the Internet. These producers live off their production systems.

Producers 2 and 3 correspond to neo-rural families. Producer 2 is a family of adult spouses and three young adult children. The spouses live with their youngest daughter and have her permanent support. This family lives off the production system. Producer 3 is similar, although the father died recently, the mother is elderly, and the adult daughters are the ones who lead production. They, however, are only there intermittently to take care of their mother and the farm, and they do not live off the production system. In these cases, there is more access to and use of ICTs compared to peasant families, due to the age of those who are dedicated to the production systems, greater interest and development of capacities, better (although unstable) purchasing power, and a location closer to the urban centers of the municipalities, what improves the coverage and quality of the Internet.

Finally, producer 5 is an entrepreneur, young adult, professional and neo-rural woman (from the rural area of Bogotá). Her husband has a different business in another economic sector. She dedicates half of her time to her production system, because her children are still very young, and she dedicates the other half of her time to caring for them. This producer has the best access to ICTs and, together with producer 2, they are the ones who have the greatest use of ICTs, especially focused on their production system, although it is still incipient. Producers 2 and 5, particularly

producer 2, are also those who showed the greatest interest in providing feedback and working more collaboratively with SC.

Four out of five producers sell 99% or more through digital markets, especially through SC. To this end, access to the Internet, smartphones and messaging applications has been essential. The producers and some of their characteristics are summarized in Table 1.

Table 1. Sembrando Confianza's producers interviewed in 2023

Producer	1	2	3	4	5
Location	Municipality of Chipaque	Municipality of Cachipay	Municipality of San Francisco	Municipality of La Calera	Bogota
Family	Ana, 66, primary school, peasant Son 46, technologist	Husband, 58, high school Wife, 51, high school 2 daughters, Daughter, 31, social worker, Ana, 24, high school graduate, lives and works on the farm, Son, 25, bakery technician Neorurals	Mom Alicia, 79, social worker Daughter Martha, 48, fashion designer Daughter Ana, 48, costume jewelry artisan Young adult son, does not participate Neorurals	Jairo, 50, complete primary school Maria Claudina, 76, incomplete primary school Peasants	Lorena, 34, chemical engineer Husband, 50, chemical engineer, master's degree in administration Two children, 7 and 4 years old Neorurals
Internet and other ICTs	Own internet, wi-fi, community network, unstable, little offer, has smartphone and WhatsApp (WA)	internet, wi-fi and mobile on one phone, unstable, has smartphone, computer, uses WA, social networks (Instagram-Ig, Gaia), email	Internet, mobile, good quality, has smartphone, uses WA, social networks (Ig, Galicia), email	Internet, mobile, good quality, has a smartphone, uses social networks (Facebook-FB, personal Ig) and WA	Internet, satellite wi-fi, good quality, good service, has desktop and laptop PC, smartphone, uses social networks (WA), email
ICT knowledge, skills and uses	Does not browse, uses other ICTs Opportunities for improvement in digitalization Son is the one who uses them the most Leisure and entertainment Communication with consumers and buyers 100% digital sales especially SC	Browse and use other ICTs Opportunities for improvement in digitalization Daughter is the one who uses them the most Communication with consumers and buyers Promotional information and training Management and planning Technological and productive topics (App) 99% digital sales especially SC	Browse and use other ICTs Daughters are the ones who use them the most News and training Communication with consumers and buyers Management and planning Technological and productive issues Leisure and entertainment 99% digital sales especially SC	Does not browse, knows how to use some other ICTs He is the one who uses them the most Information and training Communication with consumers and buyers Leisure and entertainment 99% digital sales especially SC	Browses and uses other ICTs Opportunities for improvement in digitalization She is the one who uses them the most News and training Communication with consumers and buyers Management and planning Technological and productive issues 50-70% Digital sales, especially to family and friends

Three interviewed producers (1, 2 and 3) consider market governance to be collaborative between SC and them, while producer 5 considers it to be fully SC's and producer 4 is unsure about it. This question has most likely been only partially understood, since the term governance is not entirely familiar to people. In any case,

it is assumed that everyone is right. On the one hand, those who consider governance to be collaborative do so because they feel included, not in all decisions, but in some they consider particularly important, as producer prices, which are agreed upon. This concept of collaborative governance relates to the concept of social construction of markets that emerges from the coordination between social groups that share common visions and seek to strengthen local economies as a counter-trend to hegemonic markets (Rover, y otros, 2013). On the other hand, those who believe that governance is SC's responsibility are not wrong either, since seeking to reduce producers' workload and facing difficulty in communications SC has opted to make most of the decisions. More recently, however, it has become more open to input from producers and consumers. Finally, those who claim not to know who is responsible for governance are also right, and this is because it is not usually the central aspect of the process for producers, given that day-to-day work absorbs and even overwhelms each producer.

On the other hand, 11 consumers were interviewed, ten of whom are households and one is a restaurant. The interviewees comprised seven women, three men and a couple, all young adults or adults, whose most frequent household income was 8-15 smmlv,[3] all of whom work, and the couple studies. All consumers have greater access to and use of ICTs than producers. Six consumers buy 50% or less of their groceries in SC and the others buy more than 50%; seven are fully satisfied with the accessibility to the platform and eight with the payment method, the others report difficulties in selecting products, carrying out some operations and would like to have more payment options, although they say they have adapted, to the point that eight consumers have constantly recommended the market. Eight consumers want more information from producers in SC media, more interaction with them or even visit them, some have already done so and have attended SC meetings. Consumers and some of their characteristics are summarized in Table 2.

Table 2. Sembrando Confianza's consumers interviewed in 2023

Consumer	Woman 1	Woman 2	Man 1	Man 2	Couple 1	Woman 3	Man 3	Woman 4	Woman 5	Woman 6	Woman 7
Age and income in smmlv	34 8-12	31 8-12	24 doesn't know	26 3-5	22 and 21 4	51 12-15	41 9-14	45-50 does not report	42 does not report	45-50 8-12	18-25 8-12
TIC	PC at the office, wifi, ICT for everything, does not buy many things, Ig, FB and WA	Cellphone, SC website, wi-fi, ICT for everything, FB and WA	Cellphone, poor quality wi-fi, doesn't use ICT much, ICT for everything except shopping, La Trocha: Ig, WA, FB	Cellphone, wi-fi and mobile internet, Ig, FB and WA	PC, wi-fi, Ig and WA, use work, education, contacts, shopping	PC, wi-fi uses for work, friends, cellphone, courses, Ig, FB, WA	PC and wi-fi, uses PC a lot for work and paperwork, training, research, Ig, WA	PC, wi-fi and mobile internet uses for everything, WA	Cellphone, wi-fi and mobile internet uses for everything, WA	PC, wi-fi and mobile internet uses for everything, WA	Cellphone, wi-fi, Ig, FB, WA, uses for everything

[3] SMMLV – Salario Mínimo Mensual Legal Vigente (current legal minimum monthly wage).

% SC purchases	70%	20%	40-50% food	50% Family Market $75,000	70%	50% $500,000 - $550,000	60% $90-130,000	26-50%	76 - 100 % $350,000	26-50%	76-100% $500,000
Accessibility platform	FS	FS	FS	PrS	FS	FS	FS	PrS, difficulty select products	PrS, difficulty some operations	FS	PrS, difficulty select products
Method of payment	PrS	FS	FS	FS	FS	FS	FS	FS	PrS	FS	PrS, wants more options, manages to adapt

Notes: Personal computer: PC, Information and Communication Technology: ICT, Facebook: FB, Instagram: Ig, WhatsApp: WA, Fully satisfied: FS, Partially satisfied: PrS. Man 1 answered the interview as the restaurant chef.

Consumers were not explicitly asked about governance, but their participation in SC decisions is not common, although, like producers, they have been invited to focus groups since 2022 to have their input taken into account. Additionally, some consumers state that, autonomously and individually, they usually provide feedback to SC. In particular, one of the consumers joined SC after starting to advise them on marketing (Woman 3).

This information allow us to infer that SC does not have a structured governance model and that, without a fully structured planning, it experiences a late transition (fifteen years between its creation, in 2012, and the start of meetings with producers and consumers, in 2022) from SC to a subtle heterarchy (Jessop, 1998), in which producers and consumers provide feedback but do not directly participate in decision-making. This is a particular dynamic within RMABR agroecological markets, since other markets have evolved in reverse, from greater heterarchy to greater hierarchy and anarchy, given the difficulty of continuous participation of all members (Chaparro-Africano, 2019; Chaparro-Africano, 2020). A subtle heterarchy is established, since other types of governance intertwined in SC persist, such as anarchy and hierarchy, which will be discussed later on.

SC's governance mode is a social construction, it is not something spontaneous or planned, it is a mixture. This process is explained by the fact that individuals are, at once, producers and products of society (Berger, y otros, 1991), or that markets are a product of their members and in turn shape them (Storr, 2010). So, society and markets would be a social discourse (for example, the governance mode communicates who the actors are), a dynamic dialectical process, with a complex mixture of subjectivity and objectivity that run in spiral (Berger, y otros, 1991). And in this case, although the ideal in any agroecological process would be heterarchical governance, and it seems evident that people can change the society, it does not constitute a simple process – at least not on a large scale, only incrementally and marginally (Berger, y otros, 1991) – what entails that achieving pure heterarchies is unlikely even when desired. In spite of that, it is not a failure – in the case of SC, its mode of governance is an achievement and a social innovation, because, even without reaching the expected scaling, just like most of agroecological markets in Colombia, it persists as an alternative and has managed to sustain itself over time.

In turn, this timid transition to a heterarchy can be mobilized towards a greater or lesser heterarchy, depending on the context, participation and the subject matter. Regarding the context, if the economic situation affects or favors people's purchasing power, or if regulations determine more or less restrictions, less or greater heterarchy will be required in SC to find solutions and make decisions. Participation is also a determining factor. For example, if the actors have a greater or lesser disposition to participate, due to their age, health, education, work, mobility or access to ICTs, due to the presence or absence of generational change, more or less spaces for participation will emerge or the implementation of decisions will be more or less effective. Governance issues also have to do with it, for example, the establishment of sales prices and the forms of payment to producers are more participatory decisions than the mechanisms for promotion, sales, payment and distribution.

In addition to context, participation and the subject matter, the type of governance is also determined by the urgency in decision-making. For example, an increase in market operating costs will require an urgent decision to avoid affecting financial sustainability, while other decisions, such as the implementation of a Participatory Guarantee System (PGS), do not require the same urgency.

This dynamic of alternate and mixed governance modes (Jessop, 1998) has also been highlighted by Crumley (1995), who agrees that power relations are dynamic, and by Cumming (2016), who recognizes that participation of diverse actors implies the need for greater coordination efforts. This can affect the opportunity for decisions and actions, especially because, in agroecology, many actors do not want to participate, what entails the need to keep certain features of anarchy and hierarchy for the sustainability of this type of social constructs.

SC's subtle heterarchy is also an innovation, since markets, traditionally, operate with governance modes that combine anarchy (free market) and hierarchy (state control of the market) (Stark, 2001). However, it could be said, more precisely, that SC carries features of anarchy, hierarchy and heterarchy, since it is a non-governmental organization (NGO) whose producers and consumers are not statutory members. Therefore, decisions fall to the members of FPSF, particularly the market coordinator (hierarchy), although they also respond to a certain anarchy (producers and consumers have their own interests and expectations, and manage their production and supply system as it suits them best). Furthermore, aware of being losing the perspectives of producers and consumers, since 2022, SC has taken into account their contributions more methodically, including with this, characteristics of heterarchy.

Cumming (2016) also defends the idea that heterarchy contains hierarchy. In fact, there is no pure heterarchy; it can be the result of a romantic or desirable perspective, especially when analysing social processes in agroecology. Generally, local and global agri-food systems comprise a diversity of governance modes, as it has already been demonstrated, although in varied proportions, which can change over time and depending on the context, actors' participation and the issue in question.

Such combination of governance modes constitutes a strategy of adaptation and therefore of resilience and sustainability. On the one hand, hierarchy determines greater clarity and practicality regarding who, how, and for what, since the analysis,

decisions and actions occur among fewer people, who usually have common knowledge and expectations. This allows for simple and low-cost processes facilitated by geographic proximity and access to and use of ICTs, what is decisive in cases of urgency. So, hierarchy is not something negative when used properly, according to the context, the subject matter and when other actors' willingness to participate is weak but there is a clear and shared purpose.

Anarchy is not undesirable either, since dealing with one's own problems and expectations, with one's own resources, and doing so in a timely and autonomous manner is necessary in SC and in any market. As the collective well-being depends on the well-being of individual actors, each producer must self-govern his own production system, consumers must self-govern their own supply, the market must be autonomous, so that to be able to govern itself collectively as an agroecological food system. On the other hand, in terms of coverage and costs, anarchy has clear advantages over hierarchy and heterarchy, since having authority or ensuring participation – especially in large groups, geographically distant and with mobility and communication difficulties – implies longer times and, therefore, costs. Thirdly, anarchy is appropriate in agroecology, given the great diversity of producers and consumers who practice it. Among producers, some are more entrepreneurial, while others are permaculturalistis; each has a different political discourse, each has more or less dependencies and different styles of production, making their coordination in heterarchical or hierarchical forms of governance complex; likewise, among consumers, there are those who are more or less militant.

Other authors have also noted that the combination of governance modes stems, for example from government learning based on markets failures when they are excessively hierarchical. In fact, various kinds of anarchy exist for this very reason: the conclusion that anarchy has positive aspects, but absolute anarchy is unviable (Riofrio, y otros, 2020). It is clear that pure forms of these three modes of governance are not found in reality, although one may generally predominate over others.

As an additional advantage, while hierarchy implies relationships of dependence and markets relationships of independence, heterarchy promotes relationships of interdependence (Stark, 2001) that do not restrict the autonomy of any actor and that ensure that each actor is strong enough for participation to be equitable.

Chaparro-Africano & Páramo (2022) and Jessop (2003) also agree in that governance entails dilemmas, contradictions, paradoxes and failures; it is a social process, therefore, it cannot be perfected. For this reason too, governance modes alternate according to the needs of participants and changing contexts (Jessop, 2003), as in SC.

On the other hand, and given that social organization is a permanent process of trial – success / failure – learning – trial…, SC could be entering a phase of greater heterarchy if it so decides and if it manages to develop an appropriate method, what represents a great challenge, since actors may not necessarily be prepared to participate more and better (Chaparro-Africano, y otros, 2022). As Stark (2001) notes, heterarchy is the organization of diversity, a definition that is similar to that by Dekker and Kuchař (2017): the coexistence of multiple orders, principles or systems of government without a clear hierarchy, what adds complexity because of multiple perspectives, expectations, forms of communication, decision-making, action and

learning, also implying more costs and time; therefore, requiring at least a minimum degree of governance planning to prepare the actors.

So far, the best thing to do would be to establish a governance framework determining: who? (diversity and equity), how? (capacity, motivation, trust, efficiency, continuity, communication, procedures) and what for? (effectiveness) (Chaparro-Africano y Páramo, 2022) or, as Jessop (2003) suggests, for governance to be effective (effective reflexive self-organization), the following must be established: 1- simple models and practices; 2- capacity for dynamic and interactive social learning between autonomous though interdependent actors who are responsible and capable of action; 3- methods to coordinate actions between diverse actors who hold different interests and systems of meaning, in different space-time horizons and different domains of action, within a complex and turbulent environment; and 4- a common worldview for individual action and a meta-governance system to stabilize the orientations, expectations and rules of conduct of key actors.

This governance framework must combine aspects of anarchy, hierarchy, and heterarchy, depending on the contexts, actors' willingness to participate and SC's subject matters, to achieve assertive participation by producers and consumers, and even other actors besides SC without affecting timely decisions, actions, and learning, while achieving complementarity and a dynamic balance between these modes of governance and ensuring minimum levels of environmental (agroecology, markets for agroecology, sustainable consumption), social (participation) and economic (finance) sustainability for SC. In addition, it is necessary to prepare the actors to participate in this governance framework, since this is not necessarily a spontaneous process (Chaparro-Africano, y otros, 2022; Bossard, 2020).

Additionally, and since contradiction, paradox and failure are implicit to governance, this latter must be dynamic (Kooiman, 1993), what highlights the metastructures of metagovernance, that is, the governance of governance or the organization of the conditions for governance, fundamental for its management, especially when problems are identified.There are three types: 1 - Meta-interexchange - a reflexive reordering of relations in their functioning and coordination. 2 - Meta-organization - a reflexive redesign of organizations, creation of intermediary organizations, reordering of inter-organizational relations and management of organizational ecologies, when these exist, compete and cooperate. 3 - Meta-heterarchy - organization of the conditions for self-organization, redefining the framework of reflexive self-organization, which includes networking and negotiation. 4 – Metagovernance – the re-arrangement and calibration of different types of governance, managing complexity, plurality and hierarchies (Jessop, 2003).

On the other hand, in the case of SC, digitalization has been a support for its sales and distribution operations, as well as for facilitating income generation for producers and supply of food and other agroecological products for consumers, improving efficiency of the processes. However, it could be enhanced for other purposes.

The shortcomings observed in SC, related to low participation by producers and consumers - as expressed by them – and the particularities in its governance found in this study could be overcome by relying on ICT. Such tools could gain innovative and appropriate uses with respect to the uses that SC has traditionally

made: communication, promotion, sales, payment, design of distribution routes, registration and analysis of information (Gueribi, 2023).

Some authors claim that civil society played a role in the emergence of the Internet, unlike other technologies from which they have been excluded or against which they have protested. At present, grassroots social organizations are some of those that are making the most and best use of ICTs, including to promote heterarchical and polycentric governance (León, y otros, 2021). In any case, there is a persistent conflict, since, depending on the management of ICTs, they may strengthen heterarchical governance and agroecology or contribute to the reproduction of the unsustainable agri-food system (Ajena, y otros, 2020).

Therefore, although consumers have greater access to quality ICTs and wider use of of these than producers, especially peasant producers, at any rate everyone has access, at least to the internet, a smartphone and WhatsApp. Now it is necessary to promote their appropriation of these technologies around the governance of SC, which, again, will not be spontaneous, at least not for everyone and not in all cases. There is still a lack of understanding on how to harness the potential of digitalization to strengthen governance of social processes such as agroecological markets – in this case, SC. What is clear is that the use of ICTs in promoting governance that contributes to sustainability in SC must be inclusive, responsible and effective, and ensure democratic access to information (Tisselli, y otros, 2020; Food and Agriculture Organization FAO, 2018).

For example, SC shows a supportitive intention SC in proposing that producers concentrate on their production system, while SC concentrates on promotion, sales and distribution, which is logical because that is what SC was created for. However, it turns out to be a somewhat paternalistic intention, since SC ends up overwhelmed by the volume of work, while producers ignore tasks that they should support to enable they food to be better promoted, sold, and distributed. This, in turn, eliminates a learning possibility for producers, which could bestow them with greater resilience and sustainability in case the digital market stops operating, or the possibility of making producers' participation in this and other markets from which they benefit more effective and, therefore, render them more resilient.

Paternalism is understood as the extrapolation of the parent-child relationship to other social relationships. It includes interventions (acts or omissions) that interfere with the freedom or autonomy of a person, without their explicit or implicit consent (Dworkin, 2020) and has different intentions. For example, according to Hervouet and Kurilo (2016), in the Belarusian countryside, paternalistic measures have been adopted aimed to change behaviour by means of distribution of symbolic goods (recognition and reputation) – socialist paternalism has been adopted in which subjects are grateful for the benefits their rulers have chosen for them. Such practices are masked as "protection of rural populations", although being rather a political domestication to keep stability.

The opposite of paternalism would be autonomy, understood as each person's capacity to live one's own life according to reasons and motives that are taken as one's own and not a product of external manipulative forces (Christman, 2020). Autonomy is one of the distinguishing aspects of Freire's educational proposal (Freire, 2004) and is part of anarchy as "individual freedoms". Yet, it must also be part of hierarchy and heterarchy, because each actor must be strengthened with

autonomy, so that SC can be strengthened as a whole. In this sense, paternalistic actions towards producers must be avoided and, instead, they must be encouraged to develop the necessary capacities to be autonomous, so that to assertively contribute to the strengthening of this agroecological food system.

For example, producers and consumers should have a greater say in decision making regarding the product. Although producers have autonomy in determining the characteristics of their products, if their sales are too variable or go down, they do not usually question SC assertively to determine if its appearance, smell, taste, texture, presentation, packaging, label, price, etc. are the most appropriate, and SC does not usually question consumers on these same aspects. Only producers 2 and 5 inquired SC about their product and, as a result, established new markets, improved products post-harvest handling or developed new products, thus improving their income. Usually, it is SC that takes the initiative to advise the producer. However, it would be very difficult for this activity to be developed by SC, since 495 product references make it impossible. Here, producers and consumers could have a greater role and initiative supported by ICTs, what is viable if SC's focus as a social construction is maintained.

In the case of "promotion, sales and distribution", it is more complex, since producers and often consumers are completely disconnected, what can be practical for the parties, since responsibilities are clearly set and decisions and actions flow quickly. Neverheless, great options for improvement are wasted that are sometimes not perceived by SC. For example: producers' photos and data are not always published on the website, the product offered is not linked to its producer, the producer does not do promotional campaigns, etc. This is evidenced by the fact that none of the interviewed producers has visited the market's website to analyze how their products are being promoted and sold, and they do not shop on these digital markets.

Regarding consumers, interestingly they, by their own initiative, said they have never been consulted about the aspects of this research, and they are eager to be taken into account. Furthermore, it is evident, from Table 2, that their partial satisfaction with SC indicates opportunities for improvement.

Establishing a governance framework for SC, built participatively and mediated by ICTs, would increase SC appropriation and open the door to improving its sustainability, thus contributing to the construction of a food governance that would redistribute power and democratize decisions around agri-food systems, a demand inherent to agroecology. FAO calls it governance for food security (Food and Agriculture Organization FAO, 2024).

FAO (Food and Agriculture Organization FAO, 2024) has also recognized the importance of responsible and effective governance, at both local and global levels, to achieve sustainable agri-food systems. For this purpose, a dialogue-based governance has been proposed, whose rationale is reflexive and procedural, and the criterion for success is negotiated consent. A typical example is a network, such as SC, connecting producers, consumers and promoters, whose time-space horizon is the re-escalation and configuration of paths (Jessop, 2003), that is, it must be in permanent reconfiguration.

The challenge, then, lies in keeping the vision of an agri-food system, strenghtening its actors and fostering interactions between actors in the system –

producers, consumers, SC, others – while leveraging coincidences of interests or expectations and the interdependent resources. This must be done without spoiling the autonomy of each of these actors, but dispensing with excessively hierarchical or anarchic functioning, and eliminating asymmetries, injustices and lack of commitment and responsibility, among other deficiencies that have been coined in conventional agri-food systems over time, possibly due to a lack of assertive participation, whether by the state, producers, consumers or civil society in general. Achieving this dynamic balance is complex, requires trial and error; failure is unavoidable and one must learn to manage it, with a mixture, also balanced, of reality and optimism. But it is indisputable that governance in these agroecological processes must be maximized, among other reasons because political agroecology, part of political ecology, is deemed decisive for the scaling up of agroecology (Petersen, 2022) and, therefore, the sustainability of agri-food systems on a global scale.

4 Conclusions

Sembrando Confianza is a project of a Colombian-French non-governmental organization, which decided to rely on agroecology to reduce economic vulnerability of its participants and improve the environmental sustainability using agroecology as a tool for social transformation. The Foundation was created in 2007 and the digital market was created five years later, in order to absorb the surpluses from the Foundation's first project. After operating through Excel spreadsheets, in 2018 SC launched its e-commerce website, which is now in its second version. Currently, SC does not have a governance framework that determines who participates, how and for what purpose.

SC's unstructured governance turns out to be one of its innovative features because it is a subtle heterarchy with traces of anarchy and especially hierarchy, while conventional food markets tend to be mostly anarchic or ,if dominated by the State, hierarchical.

SC's governance is also a challenge because, although producers and consumers are not statutory members of the Foundation, SC has recently shown interest in methodically integrating them into feedback processes, without their direct participation in its decisions. On the other hand, while some producers and consumers have disengaged, others participate or wish to participate more actively in the configuration of SC.

Given the diversity of participants – and, therefore, of interests, resources and ways of doing things –, SC's ambitious purpose, and the challenging economic, environmental and social context for agroecology, governance cannot be just a spontaneous exercise, it must be structured in a methodical and reflective manner.

5 Limitations of the research and recommendations

The research did not seek to delve into the governance aspects of digital food markets for the PFCF and, nevertheless, it emerged as a notable finding worthy of analysis. It is suggested that specific research be developed on this topic, aimed at deepening the governance modes of these social constructions, their impacts,

limitations and contradictions, as well as delving into how ICTs can support the strengthening of more participatory governance modes.

SC is encouraged to make a governance agreement and plan, determining who participates (diversity and equity), how (capacity, motivation, trust, efficiency, continuity, communication and procedures) and for what (effectiveness), and it is suggested that said agreement and plan have a "dynamic balance" in order to generate individual and organizational learning, and enable them to be adjusted as SC and its context change.

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