

Performance of agri-food organizations in the Colombian Central Region supplying food to Bogotá

Desempeño de organizaciones agroalimentarias de la región Central de Colombia que abastecen alimentos a Bogotá

Miguel Augusto Delgado-López^{1*}, Juan Carlos Barrientos Fuentes¹, and Dursun Barrios¹

ABSTRACT

The city of Bogotá requires approximately 2.7 million t of food products annually, of which 84% comes from the territories associated with the Central Region of the country (Bogotá, Boyacá, Cundinamarca, Meta, and Tolima). Small agricultural producers, who supply food to the main urban centers through intermediaries, are now targeted by a new marketing strategy promoted by the district. The objective of this strategy is to transform *agroredes* (organizations of small agricultural producers, in Spanish) into participants in the food market in the city of Bogotá. However, these organizations need to enhance their operations; measuring their performance is fundamental for this purpose. The objective of this research was to assess the performance of 60 *agroredes* in the Central Region of Colombia using the organizational performance index (OPI). For this, a quantitative, transversal and descriptive research was carried out, evaluating agricultural organizations across various dimensions, including administration and finance, associativity and network management, marketing, information and communications technology (ICT), management and logistics, and storage. The organizational performance of the *agroredes* in the Central Region of Colombia is currently in a consolidation stage. The performance dimensions that have been identified are associativity and network management. However, the most significant challenges are found in ICT management.

Key words: agricultural markets, agricultural enterprises, agricultural management, rural economy.

RESUMEN

La ciudad de Bogotá requiere anualmente aproximadamente 2.7 millones t de productos alimenticios, de los cuales el 84% proviene de los territorios asociados a la región Central del país (Bogotá, Boyacá, Cundinamarca, Meta y Tolima). Los pequeños productores agrícolas, que abastecen de alimentos a los principales centros urbanos a través de intermediarios, son ahora el objetivo de una nueva estrategia de comercialización impulsada por el distrito. El objetivo de esta estrategia es transformar a las *agroredes* (organizaciones de pequeños productores agrícolas) en participantes del mercado de alimentos de la ciudad de Bogotá. Sin embargo, estas organizaciones necesitan mejorar sus operaciones; medir su desempeño es fundamental para este propósito. El objetivo de esta investigación fue determinar el desempeño de 60 *agroredes* de la región Central de Colombia mediante el índice de desempeño organizacional (IDO). Para tal fin, se realizó una investigación cuantitativa, transversal y descriptiva, evaluando las organizaciones agrícolas en diversas dimensiones, incluyendo administración y finanzas, asociatividad y gestión de redes, marketing, tecnologías de la información y las comunicaciones (TIC) y gestión y logística, y almacenamiento. El desempeño organizacional de las *agroredes* de la región Central de Colombia se encuentra actualmente en una etapa de consolidación. Las dimensiones de desempeño que se han identificado son la asociatividad y la gestión de redes. Sin embargo, los desafíos más importantes se encuentran en la gestión de las TIC.

Palabras clave: mercados agrícolas, empresas agrícolas, gestión agrícola, economía rural.

Introduction

Recently, citizens from various regions of Colombia have been migrating to Bogotá due to the job opportunities and support benefits offered by the capital city (Pinto *et al.*, 2019). According to the 2018 census, Bogotá had approximately 7.1 million inhabitants, which translates to an annual food demand of 2.7 million t (DANE, 2018).

The food supply of the city of Bogotá relies on the production from nearby territories (Reina-Usuga *et al.*, 2020). It is estimated that the internal supply of food production reaches 60 thousand t, accounting for a dependency rate of 97.9% (RAPE, 2020).

The territories of the Central Region of Colombia produce approximately 84% of the food supply for Bogotá. This

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¹ Grupo de Investigación Biogénesis, Departamento de Desarrollo Rural y Agroalimentario, Facultad de Ciencias Agrarias, Universidad Nacional de Colombia, Bogotá (Colombia).

* Corresponding author: madelgadol@unal.edu.co



region, with its diverse thermal floors, also possesses favorable geographical conditions that highlight its agricultural potential for the food supply. Thirty three percent of the essential food items consumed in the capital city are sourced within a distance of 40 km from the capital. Among these, 58% of the vegetables, legumes, tubers, and plantain come from municipalities in the department of Cundinamarca, 22% from the department of Meta, and 12% from the department of Boyacá (Mejía *et al.*, 2021).

The consumption of the basic food basket in the Central Region amounts to approximately 4,996,619 t, where 55.6% is consumed in Bogotá. Additionally, the region is home to around 15.7 million inhabitants, and its annual food production reaches 15 million t (DANE, 2020).

In 2019, the Central Region had a multidimensional poverty rate of approximately 34.6%. This figure breaks down into an average of 10.1% for urban areas and 23.5% for rural areas. This condition is heterogeneous in each department that makes up the region (Arredondo Sánchez, 2021). Food marketing is marked by inequity in distribution, with producers assuming economic risks due to price changes and market instability. The distribution of these products is characterized by high production costs, long transportation times, inadequate road infrastructure, low levels of associativity, frequent reshipments, and underutilized vehicle capacity. Furthermore, limited opportunities for direct market access and the low administrative, logistical, financial, and associative capacity of growers further exacerbate their dependence on intermediaries (Romagnoli *et al.*, 2018).

Approximately 750,000 persons are involved in food production and supply, with 67.7% of them being elderly individuals who earn less than a monthly minimum wage (\$289,24 USD). Additionally, their products pass through up to eight intermediaries before reaching the supply centers. This results in long marketing circuits and minimal value addition to the final product (Borsellino *et al.*, 2020).

To address the limitations in the food supply, the creation of the Master Plan for Food Supply and Food Security for Bogotá Capital District (PMASAB) has been established, along with the implementation of the *agrored* strategy. An “agrored” is defined as a collective of food producers aiming to enhance the efficiency of food supply to urban areas. It also strives to optimize production costs and boost the income of the rural population (Castellanos & Parrado, 2020). Its primary purpose is to streamline the supply and processing within a subregion, as per Decree 315 of 2006 by the Mayor’s Office of Bogotá.

This strategy focuses on establishing networks that integrate rural production and neighborhood management. Its objective is to organize the supply and processing of food within subregions of the Central Region, thus, reducing input costs and expenses associated with production dispatch, product distribution, and intermediation (Mejía & García-Díaz, 2018). Additionally, the *agroredes* are part of the regional integration policy, which promotes their contribution to regional rural development (Ussa Garzón *et al.*, 2020).

The *agrored* strategy involves aligning supply policies with the capacities of producers to generate value-added transformed products. It also contemplates a long-term vision to avoid the centralization of resources in short-term projects without proper monitoring (Novoa & Aranda Camacho, 2019).

In the light of this perspective, government entities endorsed strengthening of associative processes among producers in production areas. However, limited understanding of organizational challenges and cultural barriers diminishes the effectiveness of the objectives set by rural agricultural organizations (Minh, 2019). Organizations of small growers face limitations in achieving the desired results, due to the lack of strategic plans and collective decision-making, deficiencies in task distribution among the participants, and low participation of the associate members (Morris *et al.*, 2017). In this context, an organizational performance tool emerges, which evaluates the extent to which objectives have been accomplished (Singh *et al.*, 2016). Its measurement enables continuous assessment of strategies, improvement of decision-making, implementation of new management approaches, and the assurance of long-term profitability (Barrios *et al.*, 2020).

The objective of this research was to assess the organizational performance of the *agroredes* of the Central Region of Colombia that supply food products to the city of Bogotá.

Materials and methods

The research was of quantitative, cross-sectional, and descriptive nature. The use of a quantitative approach was necessary to evaluate numerical data for subsequent statistical analysis. The research was cross-sectional and descriptive to allow describing a phenomenon and its characteristics at a specific moment in time, using surveys for data collection (Nassaji, 2015).

The study was conducted in the territories comprising the Central Region of Colombia, which include Boyacá,

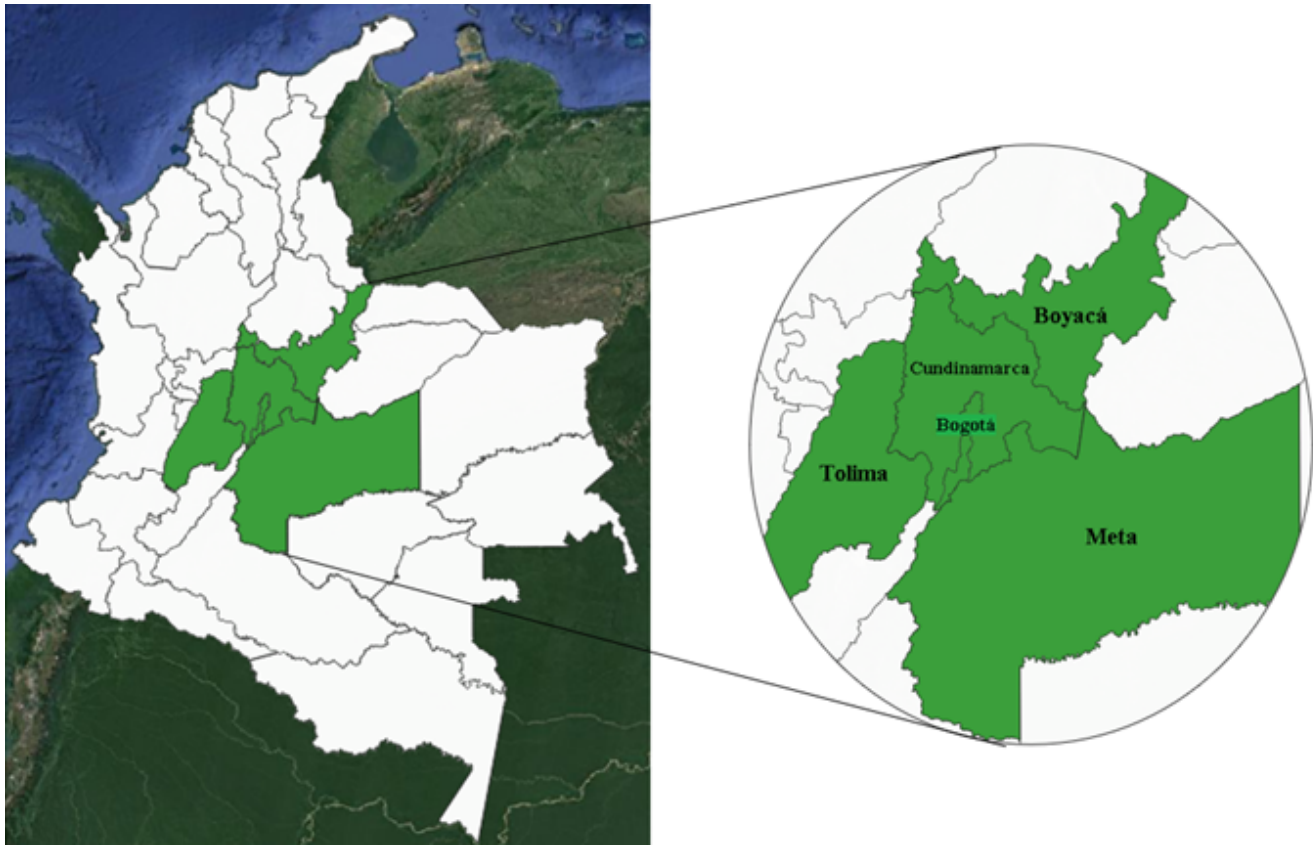


FIGURE 1. Central Region of Colombia and the departments that comprise it. Source: RAPE (2021).

Tolima, Meta, Cundinamarca, and the capital district of Bogotá (Fig. 1).

The sample consisted of 60 agroredes, selected through convenience sampling using a call and subsequent selection process. The criteria for selection included active operation, greater supply capacity and commercial coverage, agro-ecological production, differential population linkage, and seniority. For this study, it was not possible to consider the size of the population.

A diagnostic instrument was utilized to examine the organizational characteristics of the agrored and its level of performance across the components of marketing, administration and finance, associativity and network management, information and communication technologies (ICT) and logistics and storage (Giudici *et al.*, 2018; Cristobal-Fransi *et al.*, 2020; Santos *et al.*, 2020). Data collection was conducted through face-to-face interviews with the leaders of each agricultural organization from December 2021 to June 2022. The interview questions consisted of closed-ended, multiple-choice statements rated on an ordinal scale ranging from 0 to 3 points. According to SDDE (2020), the following data were presented (Tab. 1).

An Organizational Performance Index (OPI) was constructed using 45 items, which were divided into five dimensions (Tab. 1). The weighting factor for each dimension was determined based on the proposal by SDDE (2020). The OPI was calculated with the following equation:

$$OPI = \sum_{j=1}^5 \left(\sum_{i=1}^n \frac{vi}{n} \right) * P \quad (\text{Eq. 1})$$

where:

OPI: Organizational Performance Index;

j: number of dimensions;

i: number of items per dimension;

vi: value obtained in item i of dimension j;

n: number of items in dimension j;

P: weighting of each dimension.

The OPI considered a nominal value of 50 points to represent the ideal state of organizational performance. The performance level of each agrored was determined based on the OPI value, as outlined in Table 2 according to SDDE (2020).

TABLE 1. Dimensions and items for measuring the organizational performance of agroredes.

Dimension	Item
Marketing	Products offered
	Portfolio availability
	Marketing channels
	Business plan implementation
	Issuance of legal invoice
	Use of bank account
	Commercial alliances
	Participation in trade fairs or business roundtables
	Marketing through electronic platforms
	Logo usage
	Access roads
	Commercial and logistic services to members
	Record
	Certified properties
Administration and finance	Working capital
	Budget preparation
	Accounting
	Update of financial statements
	Socialization of financial tools
	Knowledge of tax obligations
	Knowledge of the Special Tax Regime
	Sources of resources for the operation
	Microcredits
	Access to formal associative credit
	Access to supplier credit
	Financial services to members
	Financial management instruments
Associativity and network management	Operation of committees and work areas
	Defined functions known by members
	Attendance at meetings
	Network management
	Conflicts
	Structuring of projects or profiles of productive projects
	Participatory strategic planning exercises
	Articulation of the organization with other organizations
	Productive services with members
	Other services of the organization with members
Information technology and communication (ICT) management	Management tools
	Communication channels for product promotion
	Effective use of the computer
Logistics and storage	Creation and use of email, social networks, and website
	Quality certificates
	Logistics processes
	Postharvest handling
	Infrastructure, machinery, and equipment

TABLE 2. Classification of organizational performance in agroredes.

Score	Organizational performance level	Stage of development
Under 15	Low	Initiation
Between 15 and 30	Medium	Consolidation
Between 30 and 50	High	Maturity

Results and discussion

Out of the 60 participating agricultural organizations, 56.7% (34 agroredes) were from Cundinamarca, 16.7% (10 agroredes) from Boyacá, 16.7% (10 agroredes) from the capital district Bogotá, 6.67% (4 agroredes) from Tolima, and, finally, 3.33% (2 agroredes) from Meta (Tab. 3).

Among these organizations, 50% were not legally constituted. This lack of legalization can be attributed to the expensive procedures and high costs associated with legal registration and taxation which, in turn, limit the growth of these productive units (Rodríguez-Soto & Alvis, 2018). Benhassine *et al.* (2018) also indicate that legalization of an agricultural company leads to greater commercial skills training, while Tijdens *et al.* (2015) affirm that legalization provides access to credit, financial education, social protection, economic growth, and job creation.

The most prevalent type of agricultural organization among the agroredes was the peasant agricultural association, accounting for 80% of the total. Regarding the time of creation, most of the agroredes had less than 25 years of existence. This could be seen as a strength for these organizations, since, according to Messeni Petruzzelli *et al.* (2018), companies older than 15 years tend to have greater organizational maturity and are able to take advantage of their accumulated knowledge. This can be attributed to the learning experience gained over extended periods of time which allows for a more effective examination and utilization of knowledge.

The greatest benefit generated by associativity of growers is the generation of economies of scale (Melo Torres *et al.*, 2017). These economies enable productive efficiency, lower product costs and facilitate access to inputs, market information, and financial resources. They also ensure the use of new technologies and improve the quality of food production (Fischer & Qaim, 2014). As suggested by Orsi *et al.* (2017), collective actions promote social, technological and innovative development, adding value to products and facilitating access to productive resources for commercialization of agricultural products.

TABLE 3. General distribution of agroredes in the Central Region of Colombia.

Territory associated with the Central Region	Number of agroredes	Legally constituted (%)		Years of existence (%)			Type of agored according to the offer of products (%)		
		Yes	No	Less than 25	Between 25 and 50	Over 50	Agricultural	Livestock	Agricultural and livestock
Cundinamarca	34	44	56	44	38	18	50	3	47
Boyacá	10	30	70	100	0	0	90	0	10
Meta	2	100	0	100	0	0	0	50	50
Tolima	4	75	25	75	25	0	100	0	0
Bogotá	10	30	70	100	0	0	40	0	60

Organizational performance

The average Organizational Performance Index (OPI) for the agroredes was 24.4, indicating a medium level of performance that aligns with the consolidation stage. This result suggests that organizations acknowledge the importance of process management across different areas of the company and the generation of productive projects, as highlighted by King *et al.* (2019). Similarly, Solarte-Pazos and Sánchez-Arias (2014) suggested that at the medium level of organizational performance, each worker within the company has well-defined roles and the fundamental processes are communicated effectively. Additionally, Savanevičienė *et al.* (2021) state that at the average performance level, experienced employees recognize the values of the organization, maintain positive associative relationships, exhibit job satisfaction, acknowledge the importance of process changes and rely on the organization image to collaborate with other organizations (Tab. 4).

Each dimension of organizational performance yielded a score below 30 points, indicating that no component has reached a maturity level. This result highlights the need for increased efforts in process management to achieve the objectives framed by the agored. It is important to emphasize the significance of the ICT management dimension,

especially after the pandemic, since organizations must leverage technological resources for production and marketing purposes. Those agri-food organizations that embraced digital marketing during the pandemic experienced a threefold increase in sales volume. This reflects a shift in consumer behavior towards online purchases, without overlooking the importance of voice-to-voice interaction (Csordás *et al.*, 2022).

At the territory level, the performance of the agroredes was found to be at a medium level, corresponding to the consolidation stage (Tab. 4). These results could be associated with the basic conditions of the Competitiveness Index, which indicated that territorial gaps (institutions, infrastructure, market size, education, health, and environment) were at an intermediate level across all associated territories in the Central Region (RAPE, 2016).

In the dimensions analyzed by territory, results ranging from 20 to 30 points were observed, confirming the average performance level in each dimension. However, there were atypical scores, with low scores in ICT management in the department of Cundinamarca (19.1) and Tolima (15.3) and high scores in Associativity and Network Management in the department of Meta (31.1) (Tab. 5).

TABLE 4. Organizational performance index by dimension and territory in the Central Region of Colombia.

Territory	Marketing	Administration and finance	Associativity and network management	ICT management	Logistics and storage	Global Organizational Performance Index
Bogotá	22.0	26.0	27.9	22.2	26.3	24.9
Boyacá	23.2	23.1	25.5	23.3	22.1	23.4
Cundinamarca	24.2	23.9	26.8	19.1	25.1	23.8
Meta	26.2	28.2	31.1	27.8	27.1	28.1
Tolima	22.3	26.9	23.5	15.3	20.8	21.8
Central Region	23.6	25.6	26.9	21.5	24.3	24.4

ICT - Information technology and communication.

TABLE 5. Organizational performance of agroredes in the Central Region of Colombia by dimension.

Dimension	Item	Score
Marketing	Products offered	1.15
	Portfolio availability	1.34
	Marketing channels	1.42
	Business plan implementation	1.49
	Issuance of legal invoice	1.32
	Use of bank account	1.62
	Commercial alliances	1.32
	Participation in trade fairs or business roundtables	1.83
	Marketing through electronic platforms	1.30
	Logo usage	2.34
	Access roads	1.51
	Commercial and logistic services to members	0.94
	Record	1.19
Administration and finance	Certified properties	1.11
	Working capital	1.57
	Budget preparation	1.30
	Accounting	1.58
	Update of financial statements	1.52
	Socialization of financial tools	1.75
	Knowledge of tax obligations	2.10
	Knowledge of the Special Tax Regime	1.67
	Sources of resources for the operation	1.85
	Microcredits	1.47
	Access to formal associative credit	1.43
	Access to supplier credit	1.55
	Financial services to members	0.50
Associativity and network management	Financial management instruments	0.78
	Operation of committees and work areas	1.08
	Defined functions known by members	2.08
	Attendance at meetings	2.51
	Network management	1.34
	Conflicts	2.62
	Structuring of projects or profiles of productive projects	2.13
	Participatory strategic planning exercises	1.58
	Articulation of the organization with other organizations	1.32
	Productive services with members	0.96
	Other services of the organization with members	0.87
	Management tools	1.43
ICT management	Communication channels for product promotion	1.38
	Effective use of the computer	1.15
	Creation and use of email, social networks, and website	1.19
Logistics and storage	Quality certificates	1.70
	Logistics processes	1.64
	Postharvest handling	1.81
	Infrastructure, machinery, and equipment	0.66

ICT - Information technology and communication.

Marketing

Brand positioning emerged as the item with the highest value, which could be attributed to the fact that the agroredes participated in at least three trade fairs or events over the last year to increase visibility of their products. This

finding aligns with those of Santos *et al.* (2021), in which producers acknowledged the significance of participating in commercial events for establishing networks with groups of interest. Additionally, participating in such events facilitates access to innovation opportunities and contributes to the creation of value in the products offered, as indicated by Rinallo *et al.* (2017).

Furthermore, the majority of the agroredes had a representative logo but they did not use it. The lack of a logo limits the potential positive correlation with the development of competitive advantages. A logo is crucial for enhancing corporate identity, instilling a sense of belonging, cultivating skills for monitoring market trends and adopting best practices (Cannas, 2023).

Weak subcomponents were identified, particularly in terms of the limited commercial and logistic services the organization offered to its members. These findings differ from those of Kirezieva *et al.* (2016), which showed a positive relationship between the promotion of the organization services among the associates and the quality of the product as well as the effectiveness of the supply chain. However, each associate offered food products with different quality levels, which made it difficult to standardize the processes (Pereira *et al.*, 2022). Similarly, the organizations that had contracts for marketing the products exhibited higher levels of logistics and supply chain capabilities (Uddin, 2017). These findings confirm that the anonymity of producers in the market can lead to lower quality indices compared to competitors (Bizikova *et al.*, 2020).

Likewise, less than 33% of the properties where the agroredes operated had some certification demonstrating the quality of the products, registration of the harvested areas, and production volumes. These findings are consistent with the research by Furumo *et al.* (2020), which examined the factors influencing compliance with quality certifications. The study concluded that high initial costs posed a significant limitation and that characteristics of the cultivation area, household size, and access to extension services were decisive factors in implementing a certification (Kassa *et al.*, 2021).

Administration and finance

The tax subcomponent obtained higher scores, indicating that the representatives of the agroredes were aware of tax obligations. However, the organization was not fully compliant with these obligations. This discrepancy may be attributed to a reluctance to undergo audits for the calculation of taxes. In other words, the likelihood of being

audited decreases the willingness of producers to fulfill their tax obligations (Mensah *et al.*, 2021).

On the other hand, financial services and financial management tools received lower scores, indicating that the organizations made limited use of financial tools and offered few financial services to their members, such as electronic transfers, microcredits, and financial support. These findings align with those reported by Ankrah Twumasi *et al.* (2020), which highlighted that only educated farmers possessed the necessary skills to understand the financial market, emphasizing the need to strengthen financial literacy among small producers. Likewise, Bizikova *et al.* (2020) found that small producer households had varying incomes, placing them at the margin, with limited resources to bear the high transaction costs associated with accessing banking services.

Associativity and network management

The subcomponents related to decision-making, management, and participation obtained the highest scores, indicating that the organizations did not experience conflicts that negatively affected the operation during the last year. Additionally, assemblies were held in which approximately 50% of associates participated. Participatory methodologies with partners to identify needs and propose alternative solutions could improve their commitment to intervention processes (Espinosa *et al.*, 2018). These methodologies also allow the creation of social capital to strengthen governance and generate control mechanisms for conflict resolution (Saz-Gil *et al.*, 2021).

The importance of attendance by producers at meetings aligns with the findings described by Skaalsveen *et al.* (2020), with regular meetings proving instrumental in enhancing organizational planning by keeping associates informed and sharing responsibilities. The scheduled meetings facilitated cooperation within the group and encouraged active member participation in collective decision-making and the distribution of functions.

Challenges were identified in the subcomponents of other services, productive services, and articulation as the organizations offered limited productive, cultural, educational, and health services to the producers. These findings align with the research by Bizikova *et al.* (2020) who suggested that the services offered by the organizations generated positive impacts on the development of skills, knowledge, and information. However, implementing these services can often be costly and may require infrastructure for their application. In addition to capital limitations, organizations

may prefer to allocate resources to other activities that they consider more important, despite the fact that most of the associates recognize the importance of these services.

The agroredes made limited efforts to establish collaborations with other organizations, not heeding the results reported by Santos *et al.* (2021). Their research indicates that establishing relationships with stakeholders enhanced innovation capabilities. Additionally, a high level of network creation among farmers fosters a favorable environment for interaction with interest groups and promotes a learning environment.

The subcomponent of organizational management tools revealed a lack of strategies for creating documents, such as statutes, a strategic plan, and management reports, not heeding the results presented by Namugenyi *et al.* (2019), who identified that organizations that implemented a business plan enhanced product market access, underscoring the significance of strategic planning in optimizing resources for effective business management.

ICT management

The agroredes made limited use of technological and digital tools for communication with their clients, which is similar to the results presented by Morris and James (2017) in their study on the use of social networks and platforms for food marketing in agricultural organizations in the United Kingdom. Their research revealed that less than 6% used social networks to promote their products. However, they recognized the crucial importance of these tools, which are more commonly used by the younger members of the organization. Bernal Jurado *et al.* (2019) showed that organizations offering organic food products had a greater interaction on digital platforms and social networks. Horská *et al.* (2020) also found that, in the dairy sector, producers who used digital platforms had sales four times higher on average compared to those who did not. In the subcomponent ICT, it was evident that organizations made limited use of computers to enhance process efficiency. This is consistent with the findings of Bowen & Morris (2019), in which small producers refrained from using computers for resource management, primarily due to associated costs and poor internet quality in rural areas. Barriers included a fear of technology, advanced age, slow typing skills, and a perception that computers were not essential for communication and information.

Logistics and storage

The lack of machinery, equipment, land, and infrastructure for the efficient product logistics was evident, aligning

with the results presented by Mottaleb *et al.* (2016), which showed that the availability of labor can affect the ownership of equipment. This suggests that the effective use of machinery requires a demand for skilled labor.

Access to electricity is another key factor influencing the adoption of machinery and equipment. According to Mottaleb *et al.* (2016), on average, 3% of producer households operated at least one farm machine that required electricity. Similarly, it was stated that road improvements could accelerate the adoption of machinery and enhance the flow of information among producers. Therefore, households with larger land holdings, a higher number of cattle, and access to water sources were more likely to own machinery.

The agroredes have implemented quality systems to prevent failures in food products, such as safety and health issues, consumer complaints, and costs associated with these failures. The adoption of a quality system improves competitiveness and provides strategic advantages in the market. It also ensures the quality of the operations and, consequently, the quality of the products (Liu *et al.*, 2021).

The quality subcomponent revealed that the agroredes did not possess certificates for activities in the processing plant, and only carried out a limited number of post-harvest processes, with the participation of between 33% and 66% of the associates. These results align with research conducted by Meemken (2020), who emphasized that implementing a quality system is usually expensive and can be a determining factor for small companies in underdeveloped countries when deciding whether to adopt such systems. Also, limited education can make the certification process difficult for small producers. However, there have been discussions about the possibility for small producers to meet certification requirements if they collaborate and receive assistance from intermediaries (Soundararajan & Brammer, 2018).

This research underscores specific limitations that must be considered when interpreting the results. One of these limitations is the utilization of a convenience sample, which complicates the generalization of the findings. Furthermore, this study is based on the perceptions of the leaders within each organization regarding their performance. Notwithstanding these constraints, it contributes to a deeper understanding of the organizational dynamics within food supply agroredes. The outcomes of this research provide critical information for the development of public policies aimed at enhancing the performance of these organizations and, as a result, ensuring a dependable food supply to urban centers.

Conclusions

The organizational performance of the agroredes in the Central Region of Colombia is currently in a consolidation stage, which presents challenges in various dimensions such as administration, technology, logistics, marketing, and association to achieve the necessary organizational maturity for long-term sustainability. ICT management stands out as the dimension that requires further development.

The areas with the lowest performance within the organization are those related to the services provided to its members, infrastructure, and financial management. This indicates the need to promote plans and programs aimed at enhancing and implementing assistance services for the well-being of the associates, as well as facilitating access to financing for technological adoption.

Despite its limitations, such as relying on leaders' perceptions and using a convenience sample, this study provides valuable information about the organizational dynamics of food-supplying agroredes. Its results offer crucial information for crafting policies that can improve these organizational performance and ensure food security in urban areas.

We recommend replicating this study in regions that supply food to major urban centers. This replication would generate valuable information that can be used as input for public policy development and the enhancement of the agroredes operation and the subsequent food supply to the local communities.

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Conflict of interest statement

The authors declare that there is no conflict of interests regarding the publication of this article.

Author's contributions

MDL collected the information, wrote the manuscript, and processed and analyzed the data. JBF reviewed the manuscript. DB conceptualized and revised the final version of the manuscript. JBF and DB designed the research. All authors reviewed the final version of the manuscript.

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