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Plantain socio-productive system (*Musa* AAB): An initiative to revalue agriculture in western Antioquia

Sistema socio-productivo de plátano (*Musa* AAB): revalorización de lo agrícola en el occidente de Antioquia

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ABSTRACT

Scattered across all departments, plantain has long been a traditional crop within the Colombian peasant economy, making it fundamental to food security. The western region of the department of Antioquia has excellent production potential, given its optimal agroecological conditions and comparative advantages for production and marketing. However, emerging organizational processes, the loss of agricultural tradition, a lack of agro-industry, and inadequate soil and water management have hindered agricultural development. Mining extraction activities and agricultural production coexist in the region, leading competition for productive resources. De facto value chains provide an analytical and operational framework for identifying stakeholders, prioritizing technological limitations, and coordinating territorial and institutional stakeholders. Therefore, this research aimed to characterize plantain socio-productive units and value chains in the municipalities of Cañasgordas, Giraldo, Buriticá, and Santa Fe de Antioquia. The study was conducted in 2022 and 2023, following a qualitative descriptive method under multivariate analysis, social network analysis, and elements of the governance analytical framework. The production method is a low-tech system with a high potential for satisfying local and regional markets. Despite projects promoting plantain plantations, fundamental technological problems persist that must be addressed by building cross-cutting and specific capacities for co-validating technologies focused on generating quality plant material and managing pests and diseases.

Keywords: agricultural innovation; food security; governance; network analysis; peasants; value chain

RESUMEN

El plátano ha sido un cultivo tradicional de la economía campesina colombiana, disperso en todos los departamentos es fundamental para la seguridad alimentaria. El occidente del departamento de Antioquia cuenta con gran potencial, dada su óptima oferta agroecológica y sus ventajas comparativas para la producción y comercialización. Sin embargo, los incipientes procesos organizativos, la pérdida de la tradición agropecuaria, la carencia de agroindustria y el inadecuado

uso de suelos y aguas han dificultado su desarrollo. En la región coexisten actividades de extracción minera y de producción agropecuaria, que han generado competencia por recursos productivos. Las cadenas de valor de facto son un marco analítico y operativo que permite identificar actores, priorizar limitantes tecnológicas y articular actores institucionales territoriales. Por lo tanto, el objetivo de la investigación fue caracterizar las unidades socio-productivas de plátano y la cadena de valor en los municipios de Cañasgordas, Giraldo, Buriticá y Santa Fe de Antioquia. El trabajo se desarrolló en 2022-2023 y siguió una metodología descriptiva cualitativa bajo un análisis multivariado, análisis de redes sociales y elementos del marco analítico de gobernanza. El método de producción es de baja tecnificación, pero con alto potencial para la satisfacción del mercado local y regional. El estudio indicó que, a pesar del desarrollo de proyectos que promueven la siembra del cultivo, persisten problemas tecnológicos fundamentales que deben ser atendidos mediante procesos de fortalecimiento de capacidades transversales y específicas en la co-validación de tecnologías, centrados en la generación de material vegetal de calidad y el manejo de plagas y enfermedades.

Palabras clave: análisis de redes; cadena de valor; campesinos; gobernanza; innovación agrícola; seguridad alimentaria

INTRODUCTION

Plantain is a traditional crop in the Colombian peasant economy with high geographical dispersion. It is of great socioeconomic importance for household food security, job creation, and income generation; however, plantain cultivation has a low level of investment and modernization (Espinal *et al.*, 2005). Rural and urban homes and restaurants consume more than 80 % of national production, and the industry consumes less than 1 %. Losses due to marketing and transportation are estimated at 12 %. Additionally, 80 % of the planted area is managed by small-scale producers and 15 % by medium-scale producers.

In 2022, the harvested area in Colombia was 440,267 ha, with a yield of 7.8 t ha-1. The departments with the largest planted area were Antioquia (61,043 ha), Arauca (35,080 ha), and Valle del Cauca (30,462 ha) (MADR, 2022). The domestic market is covered by the coffee-growing areas in the Andean region (61 % of the harvested area), contributing 59 % of national production (Barrera *et al.*, 2020).

The municipalities in Antioquia with the largest planted areas are Turbo (10,654 ha), San Juan de Urabá (7,470 ha), and Necoclí (2,714 ha). The average yield is 6.2 t ha-1, and their production is intended for export. In the west of the department, Cañasgordas, Buriticá, Santa Fe de Antioquia, and Giraldo report areas of 228, 33, 31, and 19 ha, respectively, with yields below department and national averages (MADR, 2022). This region has enormous potential for crop production, given its optimal agroecological offer and comparative advantages for marketing processes. However, its production is limited by weak organizational structures, loss of agricultural tradition, lack of agro-industrial stakeholders, and inadequate land and water use (Universidad de Antioquia, 2019).

the relative unimportance of agricultural activity in the region is due, among other factors, to the mining boom that the country has experienced since the 2000s (Ariza *et al.*, 2020) and more specifically since 2011 in the western part of the department. It transformed from being a predominantly agricultural region to one characterized by a mining economy, where various stakeholders and mining types coexist (Restrepo, 2021), resulting in intense competition for resources, mainly labor and local services, at certain times and in specific areas of the territory.

Country-wise, numerous studies have documented the impacts of this economic activity (Ariza *et al.*, 2020). Remarkably, the region has seen negative

and positive effects, including socio-environmental conflicts, degradation of natural resources, social migration, job creation, and improved public infrastructure and service coverage (Domínguez *et al.*, 2020).

Despite the tensions arising from the coexistence of multiple economic activities, such as mining and agriculture, these municipalities are interested in encouraging and revaluing agricultural practices that meet the food and agro-industrial needs of the region, even more so when they have comparative and competitive advantages.

For this purpose, de facto value chains serve as an analytical and operational framework (Pomareda & Arias, 2007) to identify stakeholders, prioritize technology limitations, and coordinate the resources and capacities of territorial institutional stakeholders to reduce transactional costs and add value to market products to increase market efficiency in peasant systems (Anacona *et al.*, 2023). Chains refer to continuous and discontinuous flows of products, processes, and value addition that the primary products follow until they reach the end consumer, including not only the stakeholders' interrelations from seed production but also inputs and equipment (La Gra *et al.*, 2016).

Studying production systems and their value chains is fundamental to determining the advantages and disadvantages of the links comprising them, thus obtaining the best possible performance (García *et al.*, 2016). It also allows for the combination of quantitative and qualitative methods of analysis and modeling the competitiveness of a production process (Tapia *et al.*, 2015).

Research on the classification and characterization of peasant production and its marketing channels shows producers' technical and socioeconomic particularities, regardless of crops. Engagement in the market and transformation processes are usually the most critical elements that define and differentiate agricultural value chains (Merma & Julca, 2012; Mercado *et al.*, 2022). The delimitation of its particularities not only defines the technology needs of socio-productive systems but also provides guidelines to design and implement strategies for technology strengthening, agricultural extension, and territorial institutional coordination, resulting in better sustainability of systems over time, better performance, and higher family income.

This study aimed to characterize the production, social, and technological conditions comprising the plantain socio-productive units and value chain in the municipalities of Cañasgordas, Giraldo, Buriticá, and Santa Fe de Antioquia. We intend to provide a valuable methodological and analytical approach for inter-institutional interventions contributing to local co-innovation processes in a specific territory. It was conducted within the framework of the "Plantain Technology Transfer (vinculación) Plan" project in phase IV, run by the Colombian Corporation for Agricultural Research (AGROSAVIA) in agreement with Zijin Continental Gold and the Western Technology Corporation (TECOC).

MATERIAL AND METHODS

The study was carried out in 2023 in the municipalities of Cañasgordas, Buriticá, Giraldo, and Santa Fe de Antioquia (Antioquia, Colombia). The subregion is 7,291 km2, the fifth of nine subregions in size, and represents 11.6 % of the Antioquia territory. Agricultural activity occurs in mountainous areas with erodible soils and high slopes. The share in the department's GDP was 1.7 %, with agriculture contributing the most, with 23.5 % (Universidad de Antioquia, 2019).

The methodology involves qualitative descriptive research that combines participatory and interactive techniques to gather primary and secondary information. The activities were grouped into two moments: (1) a characterization of the plantain socio-productive units and (2) an identification and classification of the value chain in producing areas in the last five years (Figure 1).

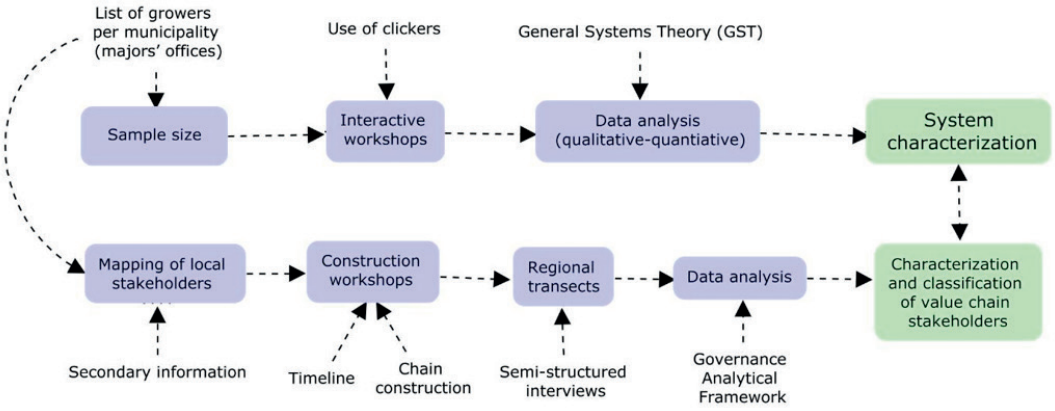

Figure 1. *Diagnostic-participatory methodological diagram of plantain in western Antioquia*

Local technology and conditions of the socio-productive unit

Primary information was collected through surveys of plantain producers enrolled in organizations in the four prioritized municipalities. The minimum sample size for the survey was calculated using probabilistic sampling (Otzen & Manterola, 2017), given that the population was finite but of unknown size. Equation 1 was used to determine the sample size, which reached a total of 40 farmers (Table 1).

$$n = \frac{Z_\alpha{}^2 * p * q}{d^2}$$

Where: n = sample size; Z = confidence level (95%); p = probability of success or expected proportion (0.5); q = likelihood of failure (0.5); d = accuracy (maximum allowable error in terms of proportion) (6%).

Table 1. *List of Surveyed Farmers*

Municipality	No. of producers
Cañasgordas	23
Buriticá	9
Giraldo	2
Santa Fe de Antioquia	6
Total	**40**

The guided surveys were conducted in interactive workshops using an electronic tool (clickers-turning point®). This method visually and interactively examined the technical, social, and economic aspects of the plantain system, complemented by continuous variables such as demographic data, farm and

crop area, location, age, and family data. Subsequently, the resulting values were collectively validated by the workshop participants, providing a greater understanding of the responses and their implications. We obtained written informed consent from the 40 participants according to current regulations (in compliance with Article 7 of Decree 1377/2013, whereby Colombia's Law 1581/2012 is regulated) (Espacio Virtual de Asesoría, 2013).

The data were analyzed in frequency tables and complemented with information derived from the discussions in each workshop, thus establishing emerging qualitative categories that strengthened the quantitative analysis. The information was examined using the general systems theory (GST) approach and grouped into three components: social and economic, local technology, and phytosanitary management (Escobar & Berdegue, 1990). For each, we identified elements that are positive for the production and performance of the system, aspects that negatively, directly, and significantly affect production and, therefore, must be addressed through shock or short-term actions, and factors that must be strengthened comprehensively with other local stakeholders through processes sustained over time.

Classification of socio-productive units

The information collected was classified into categorical, qualitative, or ordinal variables and processed through multiple correspondence analysis (MCA) in SPSS version 27. MCA allows for the creation of factorial plans where the similarity between producers and their relationship with technical and social variables of the production units can be studied (Ceballos-Freire *et al.*, 2024). The utility of this technique lies in its ability to compare all observation units with the resulting profiles in each dimension and demographic variable, summarizing the set of observed characteristics into a small number of quantitative variables related to the set of qualitative variables studied, which facilitates comparison and aggregation into homogeneous groups.

Transects by production area

Transects are a technique used in disciplines such as biology and anthropology. It involves a field check following the movement or behavior of living beings; in this case, production and value-added process of a specific agricultural product (López-Sánchez *et al.*, 2018). In the case of plantains, the production link was taken as a reference. We covered everything from the growing areas to the points of sale, asking about the stakeholders who provide goods and services and buy the plantain production. Thus, we determined the five links, the stakeholders for each, their interrelationships, interactions, products, and flows. A semi-structured interview was conducted with at least two stakeholders per link in the chain, totaling ten.

Characterization of stakeholders and their links

Information on institutional stakeholders at the municipal and regional levels was collected through interviews in each municipality and processed in the governance analytical framework (GAF) matrix, which aims to combine regulatory and descriptive approaches attributed to governance. The analysis discriminated between three types of stakeholders: i) strategic (any person, organization, or group with sufficient resources or power to prevent or disrupt the operation of rules or decision-making and conflict resolution); ii) relevant (those who participate in the established institutional framework with the

necessary resources to be considered strategic stakeholders but do not mobilize their resources or are dominated in the process); and iii) secondary (those who do not have enough power and resources to influence the rules of the game) (Hufty, 2007; Hufty, 2010; Tobasura & Ospina-Parra, 2010).

Afterward, the information on the relationships between the identified stakeholders was processed through a social network analysis (SNA) (Aguilar-Gallegos *et al.*, 2016) using the Ucinet® and Netdraw® software. The SNA made measuring and describing the types and degrees of relationships between nodes and stakeholders possible. We also estimated cohesion and intermediation indicators to propose the best management and coordination strategies for inter-institutional governance settings at the local and regional levels.

Finally, the value chain was illustrated using the CmapTools® software, which is a free pedagogical and graphical tool that allows the relationships between ideas, concepts, and problems to be represented (Didaskalou *et al.*, 2021). In this case, it makes it possible to visualize the actors (nodes) and their flows (links) in the value chain of plantain and its by-products at different stages.

RESULTS AND DISCUSSION

Characterization of the production system partner

In the social and economic component, the relative availability of production resources stands out since land ownership predominates (80 %), there is labor (own and mixed) (76 %), and more than half of the producers have a technical assistance service (55 %). The factors to be improved are 80% of the producers lack bank credit for use in the plantain system or on their farm; incipient organizational processes (40 %); and low or medium levels of schooling, since only 38 % have secondary education and 15 % have completed university studies.

While some production factors favor innovation and production in the plantain system, efforts must be increased to expand the coverage of bank credit services that facilitate the improvement or expansion of production areas and take action to enhance organizational processes and build technical capacities. Supported by a broad agricultural tradition, all this will contribute to technological development and better production performance (Foguesatto *et al.*, 2020).

The local production technology points to a low degree of modernization, reflected not only in the yields but also the agronomic management given to the crops, including the non-use of soil analysis (53 %), lack of production infrastructure as a system of risks in an area requiring it (90 %), unavailability of quality plant material with registration by the Colombian Phytosanitary Authority – ICA (70 %), and failure to carry out practices such as bagging (70 %) and weed management (78 %). Relatively effective implementation of other practices, such as fertilization (65 %), unweeding (85 %), and mooring (75 %), is noted.

Regarding the phytosanitary component, the high incidence of diseases and pest insects of economic importance for the cultivation of Musaceae stand out, such as black sigatoka (Mycosphaerella fijiensis), reported by almost all producers (85 %), for which traditional control is claimed, and banana weevil (Cosmopolites sordidus), reported in more than half of the farms (63 %). Of note is that official control of diseases, banana moko caused by the bacteria Ralstonia solanacearum race 2 and Fusarium race 1 (Fusarium oxysporum f. sp. cubense race 1), reports an incidence of 23 % in the farms analyzed in the region. Other phytosanitary problems mentioned, and no less limiting, are bacteriosis (Dickeya

sp.) and striped weevil (Metamasius hemipterus) (33 %).

Based on the phytosanitary status of the farms addressed, implementing coordinated and differentiated strategies is a priority in reducing crop sensitivity and improving quality and production (Loranger-Merciris *et al.*, 2023).

Classification of the socio-productive system

The variables with the most significant incidence in the multivariate analysis were seed origin, technical assistance service, soil analysis, and age for the first dimension, and schooling and health service for the second. Three groups of producers are associated with the degree of technology and socioeconomic aspects. The first group is called "technologically advanced," with seed obtained from registered nurseries, farms with monoculture arrangements, technical assistance services, temporarily hired labor, and no limiting phytosanitary problems; this group is mainly from Cañasgordas. The second group is "new producers," located mainly in Buriticá and Giraldo, with prevailing characteristics such as producers under 30 years of age with incomplete studies, no technical assistance service, and phytosanitary problems. Finally, the third group, with producers from the four municipalities, although mainly from Santa Fe de Antioquia, is a mixed group that shares characteristics of the previous groups; however, the high academic level, farm ownership, application of cultural practices, and presence of phytosanitary problems stand out. This group has been called "transitional" since they are expected to develop their production potential more quickly (Figure 2).

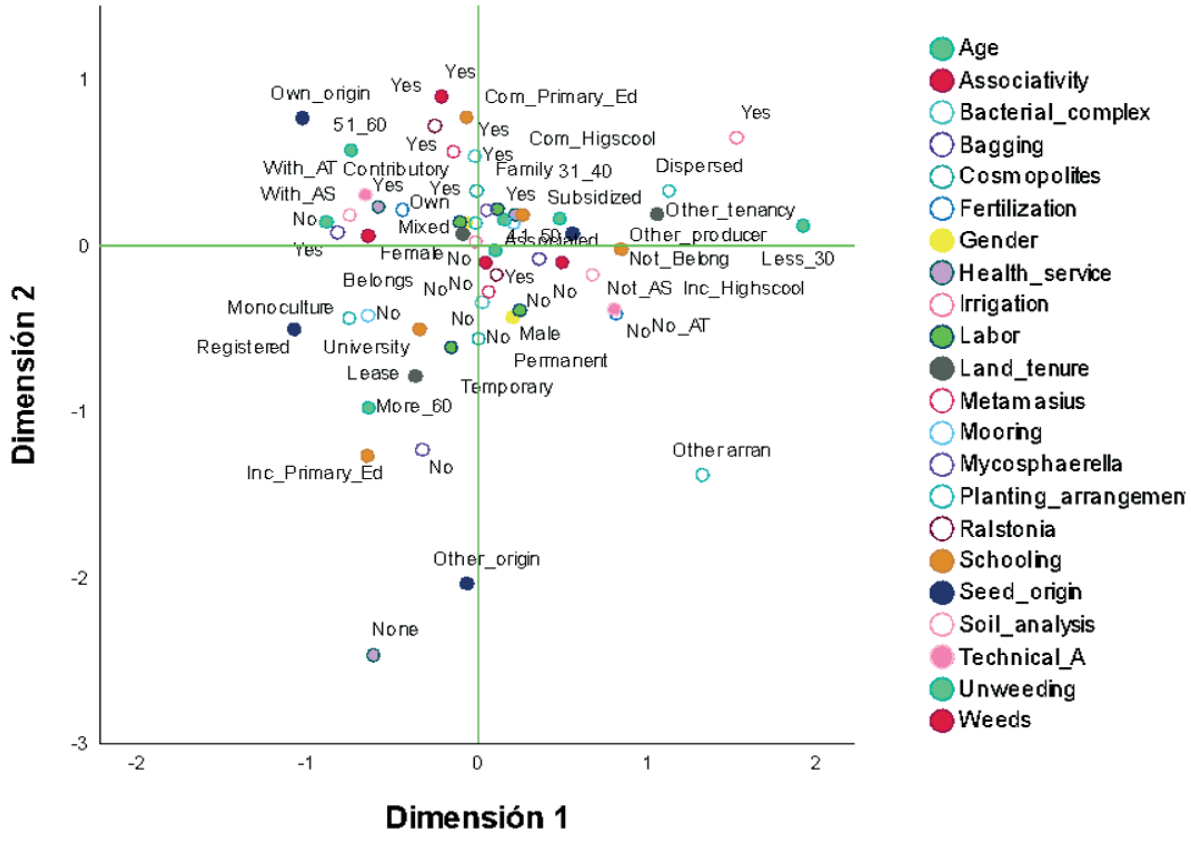

Figure 2. *Behavior of all the variables analyzed*

Characterization of institutional stakeholders

Regional institutional stakeholders. These stand out for being local or regional and implementing permanent actions in the municipalities. Institutions in the agricultural sector linked to other sectors prevail. However, despite the interest and willingness, no territorial processes or settings for coordination or governance are sustained over time.

Strategic stakeholders include the role of mayors, who channel and operate actions in their municipalities. Although for the analysis, they are grouped as a single stakeholder, they differ in the structure of technical teams, assigned budgets, projects, and priorities, and converge in that they can mobilize political and economic resources for the agricultural sector. Producer organizations with social resources generally serve as participants and beneficiaries of agricultural projects. Other strategic stakeholders are "Tecnológico de Occidente" (TECOC), a technical university with more than 20 years of experience operating in the area, and Zijin Continental Gold, a mining company that leverages economic development initiatives in the region and can mobilize economic and business resources.

Relevant stakeholders are regional stakeholders with actions in the territory and operations limited to specific projects in which the availability of resources associated with agricultural technology prevails. They provide services to local producers or institutions. Some relevant stakeholders are the Antioquia Governor's Office (project financing), Asohofrucol, and the Coffee Growers Committee (provision of agricultural extension services), ICA (surveillance and implementation of current regulations), AGROSAVIA (technology implementation projects), and the National Training Service (SENA, for its acronym in Spanish; offer of technical and technological education).

Secondary stakeholders, such as those participating in initiatives in conjunction with other institutions, may be national or regional, depending on their relationships with other stakeholders. They cannot promote processes in the municipalities and lack direct relationships with regional social groups. Some secondary stakeholders include the Universidad Nacional campus with its Cotové agricultural station in Santa Fe de Antioquia, companies leading macro projects in the region with trade-off actions in the agricultural sector, autonomous regional corporations in charge of environmental affairs, and some rural agro-industries with small-scale processes within short marketing circuits (Table 2).

Table 2. *Characteristics of Identified Institutional Stakeholders*

Role	Stakeholder	Available resources				Will	Resource mobilization	Impact
		Social	Politicians	Economic	Technological			
Strategic	Municipal mayors' offices	-	+	+	-	+	+	+
	Tecnológico de Occidente	-	-	-	+	+	+	-
	Producer organizations	+	-	-	-	+	+	+
	Zijin Continental Gold	-	+	+	-	+	+	-

Role	Stakeholder	Available resources				Will	Resource mobilization	Impact
		Social	Politicians	Economic	Technological			
Relevant	Antioquia Governor's Office	-	+	+	-	+	+	-
	ASOHOFRUCOL	+	-	-	+	+	-	-
	AGROSAVIA	+	-	-	+	+	-	-
	Coffee Growers Committee	-	-	-	+	+	-	-
	ICA	-	+	-	+	+	-	-
	SENA	-	-	-	+	+	-	-
	Universidad Nacional	-	-	-	+	-	-	-
	Satellite companies with macro projects	-	-	+	-	-	-	-
Secondary	Corpourabá	-	+	-	-	-	-	-
	Coffee Growers Cooperative	+	-	-	-	-	-	-
	Rural agro-industries	-	-	+	+	-	-	-

(+) Activated or available factor or resource; (-) Inactivated or unavailable factor or resource.

Relationships between identified stakeholders (SNA). The SNA shows that Zijin Continental (54.6), the mayor of Cañasgordas (36.8), and TECOC (7.3) are the local coordinators for implementing projects in these municipalities, each with different roles, missions, and resource allocation, which are critical to the performance of inter-institutional actions in the region, and facilitate intermediation with other regional or national stakeholders and producer associations. Although nodes of producer associations and national agencies are detected, their actions are subject to relationships with local social processes and stakeholders (Figure 3).

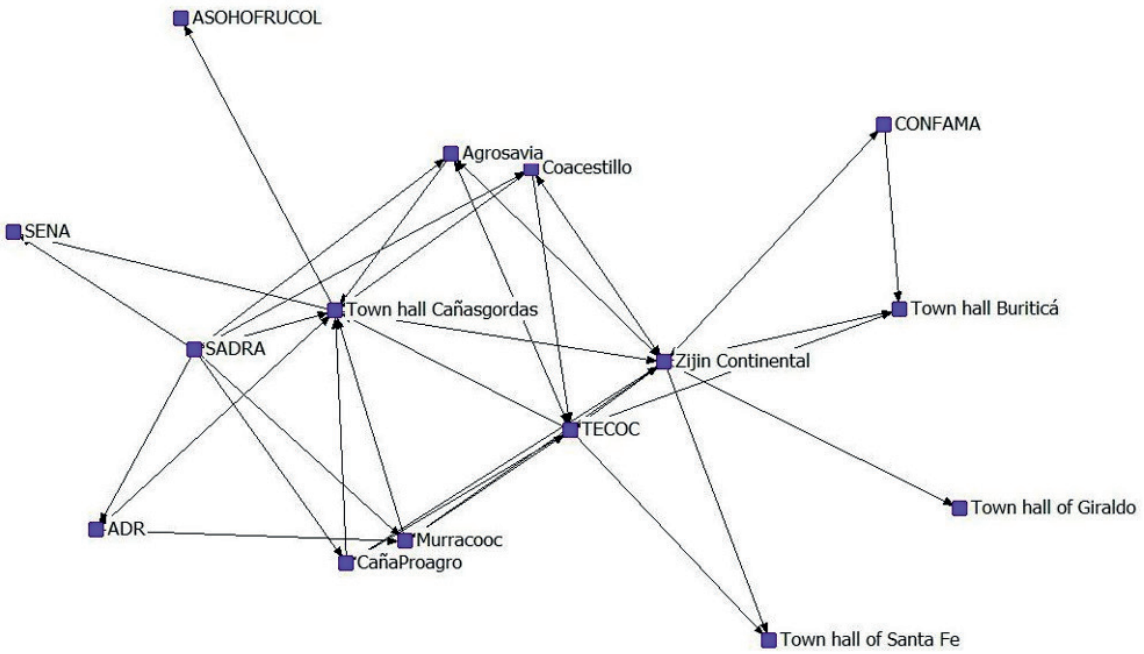

Figure 3. *Institutional stakeholders and their relationships, February 2023*

There is a basic social and institutional fabric that must become cohesive by opening territorial governance settings that strengthen local interactions and coordination with other stakeholders at different levels, facilitate the implementation of actions in the short and medium term, and positively impact communities. Both the classification of stakeholders and the SNA allow for the identification, differentiation, and complementarity of key stakeholders' capacities to dynamize territorial governance processes (Esparcia *et al.*, 2015).

This is consistent with the study by Restrepo and Martinez (2019). They state that the importance of a mining business stakeholder in the status of Zijin Continental can become such that they begin to regulate and take on many of the roles of the state. In a conflict territory where the state's presence is not significant, the state is even said to be represented by the private sector (the mining company in this case).

Plantain value chain in the West

A de facto chain is found in Western municipalities, where local stakeholders who lead the assistance and support of regional and national institutions prevail. It is a chain in the making, strengthened by crop technology and production development projects, that emerges as a viable, natural option with production, agro-industrial, and commercial potential. The five links or segments are determined by the actors (nodes) and flows (lines) involved in the plantain chain; these vary according to the intensity of the connection, the orientation, and the degree of continuity (Figure 4).

In the first link, the suppliers of inputs and services (i) are located in the municipal capitals, and some regional suppliers are concentrated in Santa Fe de Antioquia. Mayors and agricultural warehouses provide services or sell goods required for agricultural production. Other regional institutions that contribute to the chain are the ICA Western Division, Asohofrucol, and SENA, which run programs for the agricultural sector that impact plantain production.

The production link (ii) comprises associated and non-associated producers from the four prioritized and neighboring municipalities in southwest Antioquia. According to local merchants, even local production does not meet their demand; therefore, resorting to neighboring producing regions is necessary.

Primary and secondary sellers (iii) buy the fruit from local producers and other regions and, at the same time, sell the fruit to wholesale collection centers in Medellín or the Urabá region or in marketplaces in the four municipalities, with Santa Fe de Antioquia being the primary market due to its economic and tourist dynamics. Short economic circuits prevail due to local demand; hence, the great potential to increase crop area and yield in the short and medium term.

No relevant agro-industrial processing stakeholders (iv) have been identified in the region; however, in Medellín, some food industries have expressed interest in sourcing fruit from this region, subject to formal agreements on quantity and quality. Likewise, the institutional market emerges as a continuous and formal fruit buyer throughout the year. Small agribusinesses from Santa Fe de Antioquia make snacks and foodstuffs based on plantains and other products, which impact local dynamics.

Finally, consumption (v) of plantains produced or marketed in the west is intended for national consumption, mainly local and regional, despite being close to the country's main plantain export area. This is an opportunity to improve processes in production and processing.

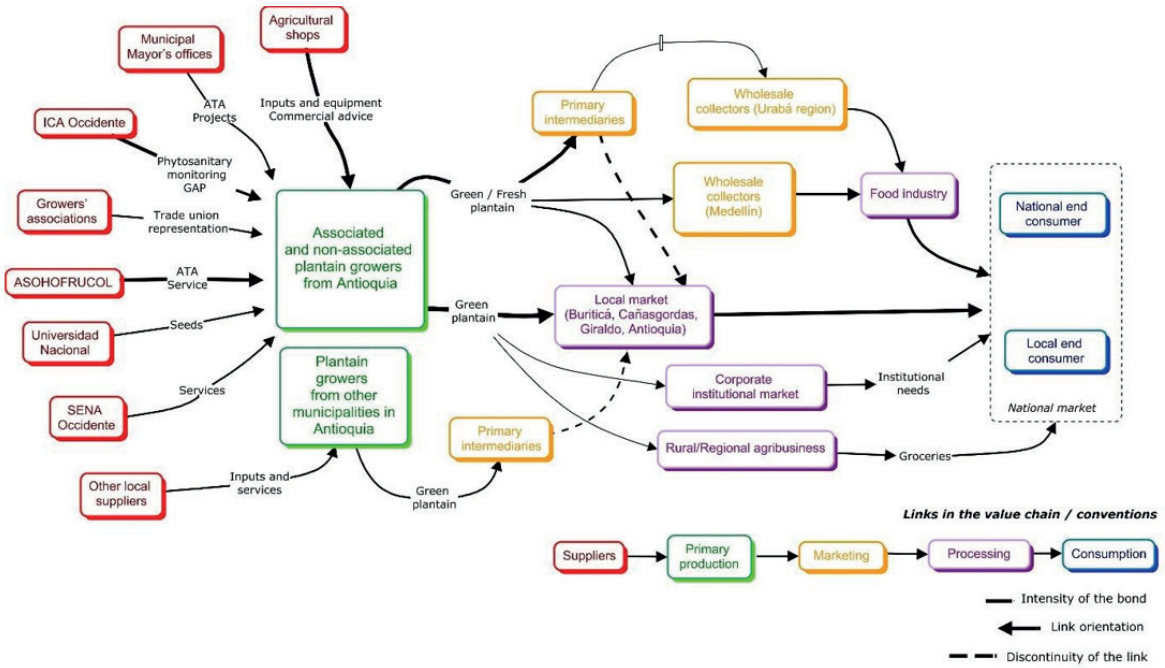

Figure 4. *Plantain value chain in western Antioquia, November 2022*

Local governance management for activating production processes

The social and production conditions of the plantain system, the various types of producers, the presence and interaction of institutional stakeholders, and the dynamics of the de facto value chain in the region represent a social, institutional, and production environment favorable to activate and stimulate agro-industrial plantain production. For this purpose, we propose a strategy with three lines:

1) Territorial governance management: Like in other regions of the country, the coordination of local, regional, and national inter-institutional actions toward shared objectives through cooperative actions contributes not only to the activation of production and rural development processes (Patiño-Murillo *et al.*, 2023) but also to the optimization of efforts and the maximization of positive impacts (Ospina-Parra *et al.*, 2020).

2) Production capacity-building: While production factors indicate relatively good knowledge of crop management, there is a technology offer available for validation and appropriation processes in the region, particularly in components such as quality plant material, phytosanitary issue management, and agro-industrial processes. Meanwhile, processes to build technical capacities must be implemented with local producers and extension agents according to their socio-productive needs and available resources, accompanied by technology validation and appropriation initiatives (Futemma *et al.*, 2020). A greater presence must accompany these efforts, and coordination with agricultural credit institutions that enable increased investment and access to technologies that enhance yields. (Rivera-Acosta & Xu, 2023).

3) Value chain dynamization: Potentialities are identified in the de facto chain, including the possibilities of value addition, diversification of products and by-products, horizontal integration of links, particularly with quality seed

provision and bio-input production, and entrance into rural agro-industry processes that diversify, decentralize, and encourage local production and consumption (Arias & Rendon, 2015). In addition, a growing demand for fruit is reported in the local, regional, and national markets.

CONCLUSIONS

Cañasgordas has a longer tradition in plantain cultivation, while it has excellent potential for Buriticá, Giraldo, and Santa Fe de Antioquia. The plantain system has poor technology and a high potential for satisfying the local and regional markets. Despite developing projects promoting this crop, fundamental technology problems persist that must be addressed by building cross-cutting and specific capacities to co-validate technologies focused on generating quality plant material and managing pests and diseases. The institutional fabric is interested in potentiating the system and the value chain by relying on comparative and competitive advantages. For this, settings must be promoted for institutional coordination around the agricultural sector, where stakeholders and cooperation come together at different levels of action beyond the production system. Mayors or local stakeholders are called upon to lead these processes with the support and advice of regional or departmental stakeholders. Unlike other plantain-producing areas (Coffee Belt, Tolima, and Cundinamarca), advantages are identified for marketing and agro-industrial processing, promoted not only by growing local and regional demand but also by the proximity to large consumption centers, which is a reality with the development of infrastructure projects. Implementing innovative technologies, such as quality seed production and high-density systems, can be triggered to improve the production performance of the system and ease the creation of production environments that foster institutional coordination aimed at common goals.

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CONFLICT OF INTEREST

The authors declare no conflict of interest.

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