

ORIGINAL
Research article

Agricultural development as a contribution to the rural economy of Catatumbo, Norte de Santander*

Desarrollo agropecuario como contribución a la economía rural del Catatumbo, Norte de Santander

Received: May 11, 2022 - Evaluated: August 23, 2022 - Accepted: November 25, 2022

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To cite this Article

Báez-Sandoval, G. M., Mogrovejo-Andrade, J. M., & Bastos-Osorio, L. M. (2023). Agricultural development as a contribution to the rural economy of Catatumbo, Norte de Santander. *Revista Gestión y Desarrollo Libre*, 8(15), 1-12. <https://doi.org/10.18041/2539-3669/gestionlibre.15.2023.10103>

Editor: PhD Rolando Eslava-Zapata

Abstract

The objective of this article is to develop agricultural aspects to determine the rural economy and its economic and social growth in the area of Catatumbo, Norte de Santander. Highlighting the opportunities generated in the territory through data analyzed by the main control entities and international cooperation organizations. The method used for the development of this paper is based on a descriptive qualitative study where organizational and academic references are identified to break down, identify and propose strategies for the improvement of agricultural practices. The results of the research on the areas of agricultural units according to their extension in each municipality of the region show the distribution of hectares in the municipality of Carmen, which has the largest number of hectares with agricultural production units, with a total of 158.879, followed by Abrego with 102.859 hectares, Convenció with

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91.403, Sardinita with 90.203, Teorema with 30.468, Ocaña with 25.216, Tibú with 21,216, La Playa with 11.621, Hacari with 5.975 hectares, El Tarra with 177 hectares, and San Calixto being the last due to its UPA percentage of 0. The conclusions are recommended practices for improvements in the sector to provide income expansion and to decrease multidimensional poverty.

Keywords: Agricultural Development, Rural Economy, Catatumbo Area, Economic Growth

Resumen

Este artículo tiene por objetivo desarrollar aspectos agropecuarios que permitan determinar la economía rural y su crecimiento económico y social en la zona del Catatumbo, Norte de Santander. Destacando las oportunidades generadas en territorio mediante datos analizados de los principales entes de control y organizaciones de cooperación internacional. El método usado para el desarrollo de este escrito se basa en un estudio cualitativo descriptivo en dónde se identifican referentes organizacionales y de relevancia académica que ayudan a desglosar, identificar y plantear estrategias para el mejoramiento de las prácticas agropecuarias. Los resultados de la investigación de las áreas de unidades agropecuaria según su extensión en cada municipio de la región refleja la distribución de hectáreas del municipio del Carmen el cual cuenta con mayor cantidad de hectáreas con unidades de producción agropecuaria y un total de 158.879, le sigue Abrego con 102.859 hectáreas, Convenció con 91.403, Sardinita con 90.203, Teorema con 30.468, Ocaña con 25.216, Tib con 21.216, la playa con 11621 y Hacari con 5.975 hectáreas, quedando de ultimo San Calixto, debido a su porcentaje UPA de 0 y, el Tarra con 177 hectáreas. Se concluye las prácticas para las mejoras del sector que proporcionen la ampliación de ingresos y la disminución de la pobreza multidimensional.

Palabras Clave: Desarrollo Agropecuario, Economía Rural, Zona del Catatumbo, Crecimiento Económico

SUMMARY

INTRODUCTION. - RESOLUTION SCHEME. - I. Research problem. - II. Methodology. - III. Draft plan. - 1. Catatumbo region in terms of agricultural development. - 2. Rural economy of Catatumbo. - IV. Research results. - 1. Difficulties for agricultural development in the Catatumbo área. - 2. Opportunities for agricultural development. - CONCLUSIONS. - REFERENCES.

Introduction

For the productive and social development of the agricultural sector, there is a constant seek to identify some elements that are rooted in the farming communities of the region to transfer knowledge that allow an adequate implementation and improvement of agricultural practices for the optimization of available resources (Díaz, Osorio, Hernández, Pallares, Canales, Paternina & González, 2022). This guarantees decreased production costs and the scope of scale economies to increase the conditions and the appropriate living standards for development and growth.

The identification of problems and opportunities (Ramírez, 2017) that the practices and tools represent in the agricultural sector constitutes actions for technological development and the process of knowledge that seek training and education that can implement innovative processes for competitiveness and sustainability of the agricultural sector in Catatumbo, Norte de Santander.

This article presents the aspects of agricultural development that contribute to the rural economy of the region (Prieto, Estévez & Ariza, 2022), supporting the approach of

management instruments and public planning that allows the national, departmental, and municipal government to orientate strategies and operations that improve the conditions of the agricultural sector, in coherence with the exposed in government policies and land-use planning, recognizing the geographic diversity (Georgi, 2022) that identifies the significant economic activities and the impact on the population. This article on the qualitative approach shows the difficulties of the agricultural sector and the availability of information that consolidates the activities in recent years.

The Catatumbo region currently does not count with agro-industrial development due to the low coverage of rural extension and resources to implement new technologies. To this problem add the fact that the population needs the skills and abilities to commercialize their products, creating a stagnation of goods and services in the region; all of this is caused by road inefficiency to transport to the country's center. Thus, complicating the production processes and the usage of agricultural machinery would increase production to allow the rural population to increase their income, affecting their quality of life and their poverty level, which are strongly related to this population's income level.

Resolution scheme

1. Research problem

What aspects of agricultural development have contributed to the rural economy of Catatumbo, Norte de Santander?

2. Methodology

This study was made around aspects of agricultural development that have had an impact on the Catatumbo region, Norte de Santander, and what it represents for the economic development and growth of the inhabitants of this area (Barrera, Cárdenas, Staples & Kanai 2022). The characteristics for generating agricultural goods and services tend to have a workforce affected by violence, inequality, and few economic, social, and environmental opportunities for many years.

This article presents a qualitative approach (Queen & Boakye, 2022) of descriptive type, supported by a bibliographic exploration. This documentary exercise is based on a non-experimental design, with global references framed in information from organisms of international cooperation and entities of national and regional government control. In its development, there is a matrix of bibliographic analysis that allows us to determine the developmental aspects of the agricultural sector as a dynamizing axis of the rural economy of the Catatumbo region (Lagakos, 2020). The documentary analysis uses at least 30 bibliographic references with academic strictness from the last 10 years.

3. Draft plan

3.1 Catatumbo region in terms of agricultural development

In the northeast of the Norte de Santander department is located the Colombian subregion of Catatumbo, this region extends through the Cordillera Oriental in Colombia and Lake Maracaibo, and it is considered a cross-border region with a high presence of illegal armed

groups and a profound social problematic aggravated by narcotraffic, smuggling and terrorism (Gutiérrez-Sanín, 2021). It consists of 11 municipalities, including El Carmen, Convención, La Playa, Hacarí, El Tarra, Ábrego, Ocaña, Teorama, Sardinata, San Calixto, and Tibú. Within the important aspects to highlight, this region is recognized as a PDET territory, a program with a territorial approach, a policy established for the management and planning of the Colombian government (Georgi, 2022) to promote economic, social, and environmental development in areas affected by the Colombian conflict.

The Catatumbo area was established as a homogenous territory with a wide range of natural resources and diverse social and cultural aspects that show its plurality in their agricultural and livestock rooting, constituting sustainable factors of production (Ríos et al., 2021) with competitive aspects according to the dynamics of economic development; this represents a well-being that promotes equality of conditions for the rural economy and could constitute a focal point for urban development (Rodríguez, Binda, Quintero, García, Gómez, Soto, Martínez & Clerici, 2020). This way, the territorial policies help to manage challenges that have effect in the short and mid-term as a fundamental principle for social growth. For this reason, integrations of the municipalities help strategic actions for the accomplishment of objectives regarding government policies of the department, as well as increasing the regional flows for the consolidation of goods and services for commercialization (Schultze Kraft, 2018), improvement of regional connectivity, diversification of production and decreasing the costs of transportation among others.

Therefore, the conditions and particularities generated by territorial issues constitute a potentiality for strategic proposals for agricultural development, considering strategies that allow prioritized actions (Tatis-Díaz, Osorio, Hernández, Pallares, Canales Paternina & González, 2022) for the different products and services generated in the territory from the rural economy. The territory's demand for agricultural development constitutes a potential sector that allows economic-productive development activities in this sector (Escandón, Urbano, Hurtado & Domínguez, 2019), building a solid offer for national and international commercialization.

The continuous globalization process has allowed the insertion of the national economy into the international market, where the capitalist circles marked by the economic development of large countries predominate (Pinto-Hidalgo & Silva-Centeno, 2022). Therefore, to achieve the development of the rural economy of Colombia, there must be ample effort from the rural society where the productive process adapts to the market's needs to make it more competitive. Developing technologies suitable for the Colombian geographic space and the climate diversity (Zuluaga et al., 2021) present in the region is important.

It is important to emphasize that the population and rural settlements in Colombia and the economic activities they exercise lack the technology and complex productive processes that could derive in a value-added for production (Negret, Sonter, Watson, Possingham, Jones, Suarez, Ochoa & Maron, 2019), it is also important to highlight that the production carried out in rural areas of Colombia in the majority of cases represents the consumption and supply for the same area without considering surpluses that could be commercialized on a national level and with less option at an international level, which reduces to a minimum scale of traceability (Georgi, 2021) of commercialization of products that are produced in these areas.

The main problem of the rural economy the few or poor processes of agricultural production are determined, which include modernization, technology, and specialization of processes in the primary sector, as well as a market willing to pay for the technology of production since they do not have debt capacity, nor enough income for its acquisition (Peñaranda, Urbano,

Andrade, Osorio & Ramírez, 2022). Climate change has shown a generalized decrease and affectation on national production, causing delays and unfulfillments for commercialization. These circumstances jointly show the over-exertion in the regional production that products from the primary sector (World Bank, 2017) require when making them available to consumers. On the other hand, the non-existent and deficient infrastructure of road networks that allow terrestrial connections between the different geographical points hinders the productive process and the national commercialization, pressured by the insignificant use of technological agricultural machinery that could generate an increase in production and allowing to generate income for the population.

3.2 Rural economy of Catatumbo

In order to explain the rural economy of the municipalities in the Catatumbo region, it is indispensable to understand the meaning of agricultural production units, also known by their acronym UPA (Departamento Administrativo Nacional de Estadística, 2020), since these refer to the quantities of structuring of agricultural production, where each unit must meet the following parameters: Produce agricultural, aquaculture, forest or livestock products, having only one producer either a natural or legal person. Also, they must use at least one means of production, which could be machinery, equipment, buildings, or workforce; continuing; this section will introduce the area of UPAs according to their extension in each municipality of the region and, at the same time, comparing them at a departmental and national level. Also, it is important to note that this information was obtained through the Comprehensive Plan for Agricultural and Rural Development with a Territorial Approach (PIDARET) (FAO 2021) by the Food and Agriculture Organization Agency of the United Nations, Rural Development Agency (ADR) (table 1).

Table 1 reveals the total UPAs of each municipality, department, and at the national level to observe with a greater analysis the comparison, this way table 1 shows the distribution by a range of hectares: total hectares of UPAs between 0- and 1-hectare, total hectares of UPAs between 1 and 3 hectares. Thus, it can be analyzed that the municipality of El Carmen has a total of 158.879 hectares of agricultural production units of more than 100 hectares, being the municipality with the highest number of hectares for this range according to the National Administrative Department of Statistics (DANE 2020); on the other hand, San Calixto does not have any UPA located in this range and is also the municipality with the lowest total of UPA's compared to the others, followed by El Tarra with a total of 177 hectares for the range of more than 100 UPAs.

Table 1. Areas of the agricultural production units according to their extension

	UPAs between 0 y 1 Ha	UPAs between 1 y 3 Ha	UPAs between 3 y 5 Ha	UPAs between 5 y 10 Ha	UPAs between 10 y 15 Ha	UPAs between 15 y 20 Ha	UPAs between 20 y 50 Ha	UPAs between 50 y 100 Ha	UPAs of more than 100 Ha
Ábrego	143	926	1.337	3.013	2.120	2.111	7.441	5.717	102.859
Convención	31	139	216	606	427	307	869	436	91.403
El Carmen	10	93	306	1.244	1.410	1.227	4.076	2.128	158.879
El Tarra	1	7	5	5	0	0	65	0	177
La Playa	66	311	384	982	963	838	3.419	2.978	11621
Hacarí	7	305	801	2.226	2.458	2.016	4.789	1.720	5.975
Ocaña	52	469	701	1.843	1.733	1.668	8.675	5.441	25.216
Sardinata	33	333	849	2.838	4.635	4.679	22.571	21.037	90.203

San Calixto	1	2	0	9	11	0	39	0	0
Tibú	44	166	364	1.613	2.032	1.955	11.355	9.838	21.216
Teorama	1	39	35	249	351	188	431	554	30.468
Norte de Santander	3.394	15.521	20.094	53.508	51.737	43.945	183.796	152.566	1.127.928
Colombia	334.615	950.484	875.323	1.801.716	1.391.432	1.161.200	4.604.293	4.217.167	93.657.104

Source: Elaborated with data from the National Administrative Department of Statistics - DANE (2020).

4. Research results

4.1 Difficulties for agricultural development in the Catatumbo area

The low coverage of rural extension does not allow a proper agro-industrial development due to the conditions of the territory and the lack of resources for implementing new technologies that generate a high level of production in economies of scale. Similarly, the lack of skills and abilities of the population for the commercialization of products creates a stagnation of the goods and services that are produced in this area; this stagnation is due to an inefficient road network and the difficult geographic structure for the connectivity with the center and peripheries of the country.

The region's current human and financial resources need the aptitudes needed according to the training required for agricultural and forest development, evidenced by a food safety problem and the production coverage required for the region. The low technical assistance as support for the productive units is not present in the territory for the training and its overall productive processes, soil management, and environmental sustainability practices. This situation presents a possibility to eliminate difficulties and support the technification of specialized tools for production, as well as the qualification of the workforce or machinery that is required.

The existing relationship between the agricultural sector and the rural economy is related to the profitability generated by productive activities and, above all, because of the disadvantages that affect the rural population of this region, which is mainly due to low competition and an interchange fee that relates the investment income and the marketing channels among other factors (Gutiérrez-Sanín, 2021). Just as the quality of life and the poverty level are closely related to the income generated by the population, this has been one of the predominant factors that have interrupted the evolution of development and social equality as a phenomenon of negative growth in rural dynamics.

It is identified as a negative effect of the lack of income, representing one of the most important categories for the index of multidimensional poverty since it does not allow the development of aspects like education, health, housing, and public services according to the established by National Administrative Department of Statistics (DANE, 2020) where the department of Norte de Santander presents one of the highest index of poverty.

Therefore, in Norte de Santander, the tendency for technological practices has been left behind, raising the prices of products (Valencia Pinzón, 2022), complicating production, and decreasing the agricultural workforce; the lack of access to machinery consolidates one of the problems for the extension of crops.

4.2 Opportunities for agricultural development

The population in the Catatumbo region counts with an agricultural productive vocation (Vanegas, Sylvester, Pérez, Ganzenmüller, Löhr, Bonatti & Nunez 2022) that represents the general occupation of the area and an important productive workforce that must be maintained and if possible, should be modernized to improve the productions of the agricultural sector. Considering the availability of land, it is required to have financial resources to create a fund for the agricultural and livestock sector (Thornton, Dijkman, Herrero, Szilagyi & Cramer, 2022) that allows a significant expansion and production of the sector. It could be managed through entities of international cooperation and organizations that support the financing of the agricultural sector.

The forest area is available for agricultural use. It is evidenced as a potential opportunity for the development of food production (Reina, López & Torres, 2023) and the satisfaction of needs in the region. Therefore, some actions are identified for competitiveness and commercialization initiatives of agricultural products that could allow the department to join a participative system, this way increasing the incomes of the population, the use of land, and reducing the payments of taxes for the formalization of activities that could be implemented today within the daily activities to consolidate stable and periodic incomes. It is important to note that the Norte de Santander department has focused on the substitution of illicit crops through different strategies and productive and social alliances that allow the industry (de-Janvry & Saudolet, 2020) and the agricultural sector to dynamize their growth and incomes through palm oil crops and other temporary crops.

Table 2 shows the number of tons produced in temporary crops by each municipality, indicating that these crops have vegetative growth of less than a year. As observed, tomato is the most cultivated crop among the region's municipalities, highlighting the production in Ocaña (Serrano-Guerrero, 2020) with 67.200 tons, followed by La Playa with 9.636 tons. Similarly, maize is the second temporary crop with the most production in the municipality of Ábrego, with 2.769, followed by Tibú with 2.404. On the other hand, some crops only produce in a specific municipality, such as cucumber in Convención (250 tons) and rice in Tibú with 3.855 tons.

Table 3 evidences the number of tons of permanent crops each municipality produces in the area, emphasizing that permanent crops take longer to reach their productive time. Plantain is one of the most cultivated permanent crops in the region. However, San Calixto is the only municipality that does not cultivate it; yucca crops are cultivated in all municipalities except Teorama (Valencia-Pinzón, 2019). On the other hand, arracacha is only produced in Ocaña, and products like palm oil and pineapple are only cultivated in two municipalities in the region.

Table 2 Main temporary crops in Catatumbo

MUNICIPALITIES	MAIN TEMPORARY CROPS							
	MAIZE	PEPPER	CEBOLLA BULBO	CUCUMBER	TOMATO	BEAN	RICE	OTHERS
Ábrego	2.769	2.415	11.820	-	-	-	-	3.637
Convención	120	-	-	250	770	-	-	81
El Carmen	1.156	-	4.580	-	3.520	-	-	885
El Tarra	720	-	-	-	-	240	-	-
La Playa	-	2.660	14.030	-	9.636	-	-	3.383
Hacarí	-	-	1.143	-	1.688	280	-	66
Ocaña	-	-	3.190	-	67.200	2.650	-	7.825
Sardinata	123	-	-	-	105	7	-	-
San Calixto	-	-	10.940	-	1.100	636	-	103

Tibú	2.404	-	-	-	-	-	3.855	-
Teorama	24	-	-	-	2.000	500	-	-

Source: Elaborated with data from the National Administrative Department of Statistics (DANE). Link: <https://www.dane.gov.co/>

Table 3. Main permanent crops in the Catatumbo region

MUNICIPALITIES	MAIN PERMANENT CROPS							
	SUGAR CANE	PLANTAIN	YUCCA	COFFEE	ARRACACHA	PALM OIL	PINNE APLE	OTHERS
Ábrego	1.156	3.969	4.950	-	-	-	-	1.119
Convención	12.024	2.667	4.500	-	-	-	-	-
El Carmen	-	6.798	4.800	997	-	-	-	1.163
El Tarra	700	2.080	8.120	-	-	-	-	465
La Playa	-	379	1.035	149	-	-	-	134
Hacarí	-	3.438	6.100	682	-	-	-	749
Ocaña	-	960	2.800	-	780	-	-	2.591
Sardinata	-	7.473	9.000	-	-	8.175	-	9.344
San Calixto	-	-	588	1.143	-	-	1,19	915
Tibú	-	8.092	45.500	-	-	56.811	-	3.569
Teorama	3.992	4.358	-	-	-	-	8,80	6.046

Source: Elaborated with data from the National Administrative Department of Statistics (DANE). Link: <https://www.dane.gov.co/>

Conclusions

The article identifies some of the key strategies for the territorial development of the Catatumbo region, one of the strategies is technical assistance in the agricultural sector to include the goods and services produced in the territory to the national and international market, formalizing rural economy organizations, this way increasing the number of producers and also the per capita income to decrease poverty. Another strategy is to formalize agriculture and livestock enterprises that generate productive management that pushes the agribusiness of the sector.

On the other hand, the development and sovereignty of food security promote the availability of resources for school feeding programs through the UPAs for self-sustainable consumption. The development of these community projects seeks to increase and protect the production and the organization of associations as a strengthening strategy for quality, coverage, and access to agricultural and livestock products consumed in the region. The qualification of producers is also part of a significant strategy for the development and growth of the region, given the scope of education that is promoted by the sector.

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