

Border socioeconomic crisis: a view from the sustainable development goals in a binational border context

Crisis socioeconómica fronteriza: una mirada desde los objetivos de desarrollo sostenible en un contexto fronterizo binacional

Crise socioeconômica na fronteira: uma perspectiva a partir dos objetivos de desenvolvimento sustentável em um contexto de fronteira binacional

Nora Marcela Jaimes Méndez¹

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¹ Department of Economics, Faculty of Economic and Business Sciences, University of Pamplona, Colombia.

Email: nora.jaimes@unipamplona.edu.co.

ORCID: <https://orcid.org/0000-0002-9066-1560>.

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Abstract

Introduction: This research is the outcome of a postgraduate master's thesis conducted in the municipality of Villa del Rosario in 2020.

Objective: The study aims to describe the socioeconomic crisis in the border region from the perspective of the Sustainable Development Goals (SDGs), triggered by the unilateral closure of the border by the Venezuelan government, focusing on the Municipality of Villa del Rosario, Colombia.

Methodology: A quantitative, exploratory, descriptive, and inferential approach was adopted. Stratified sampling was employed, and data were collected through the administration of a social survey.

Results: The analysis revealed precarious socioeconomic conditions among the population, particularly concerning housing quality and access to public services.

Conclusion: While the deep historical ties among residents are evident, it is necessary to move beyond a state-centric vision of public policies toward a more balanced development model that involves diverse civil society actors.

Originality: This master's thesis emphasizes the significance of the border zone, its unique dynamics, and the challenges that negatively impact the quality of life of inhabitants in this shared binational region.

Keywords: Border, crisis, development, sustainability, uncertainty, socioeconomic characterization.

Resumen

Introducción: Esta investigación es el resultado del trabajo de investigación del programa de maestría de posgrado realizado en el municipio de Villa del Rosario en 2020.

Objetivo: El propósito de esta investigación es describir la crisis socioeconómica fronteriza desde la perspectiva de los Objetivos de Desarrollo Sostenible (ODS) en el municipio de Villa del Rosario, Colombia, desatada con el cierre unilateral del gobierno venezolano.

Metodología: El estudio se realizó mediante un análisis cuantitativo, exploratorio, descriptivo e inferencial, con un muestreo estratificado mediante la aplicación de una encuesta social.

Resultados: El análisis de la información mostró que la población presenta condiciones socioeconómicas precarias en términos de vivienda y acceso a servicios públicos, principalmente.

Conclusión: Se destacan los vínculos históricos arraigados en los habitantes; al mismo tiempo, se debe superar la visión estatista de las políticas públicas y lograr un desarrollo más equilibrado donde participen los diversos actores de la sociedad civil. *Originalidad:* Esta tesis de maestría destaca la importancia de la zona fronteriza, su dinámica singular y los fenómenos que afectan la calidad de vida de los habitantes de la zona binacional compartida.

Limitaciones: A pesar del problema de seguridad en el municipio, el trabajo de campo se llevó a cabo con calma; existe cierto escepticismo por parte de los encuestados respecto a que el resultado pueda ser utilizado por los responsables de las políticas públicas.

Palabras clave: Frontera, crisis, desarrollo, sostenibilidad, incertidumbre, caracterización socioeconómica.

Resumo

Introdução: Esta pesquisa é resultado do trabalho de pesquisa do programa de mestrado de pós-graduação realizado no município de Villa del Rosario em 2020.

Objetivo: O objetivo desta pesquisa é descrever a crise socioeconômica fronteiriça sob a perspectiva dos Objetivos de Desenvolvimento Sustentável (ODS) no município de Villa del Rosario, Colômbia, desencadeada pelo fechamento unilateral do governo venezuelano.

Metodologia: O estudo foi realizado por meio de uma análise quantitativa, exploratória, descritiva e inferencial, com amostragem estratificada por meio de survey social.

Resultados: A análise dos dados mostrou que a população apresenta condições socioeconômicas precárias, principalmente em termos de moradia e acesso a serviços públicos.

Conclusão: Os laços históricos enraizados nos habitantes são destacados; ao mesmo tempo, a visão estatista das políticas públicas deve ser superada e um desenvolvimento mais equilibrado deve ser alcançado, envolvendo a participação de diversos atores da sociedade civil. *Originalidade:* Esta dissertação de mestrado destaca a importância da zona de fronteira, sua dinâmica singular e os fenômenos que afetam a qualidade de vida dos habitantes da zona binacional compartilhada.

Limitações: Apesar dos desafios de segurança no município, o trabalho de campo foi realizado com tranquilidade; há certo ceticismo entre os entrevistados quanto ao potencial uso dos resultados por formuladores de políticas públicas.

Palavras-chave: Fronteira, crise, desenvolvimento, sustentabilidade, incerteza, caracterização socioeconômica.

1. INTRODUCTION

A border crisis is understood as a conjuncture marked by uncertainty, instability, mistrust, and insecurity, which extends beyond the daily lives of the inhabitants—in this case, the people of Villa de Rosario [1]. This article aims to describe the socioeconomic border crisis experienced in Villa de Rosario, Colombia, which was triggered in 2015 by the unilateral closure of the border by the Venezuelan government. Border crises involve a confluence of human suffering linked to economic, social, demographic, political, and military factors, typically manifesting in contexts characterized by poverty and weak state structures. Due to their multifaceted causes and severity, these crises are classified as complex emergencies, encompassing armed conflict, famine, collapse of formal economies and state institutions, health crises, and mass population displacement [2].

This crisis is also situated within the field of International Relations, as it originates from a political phenomenon on a binational scale involving Colombia and Venezuela, shaped by internal policy decisions and the ways rulers address or articulate issues of security and stability [3]. Against this backdrop, an unprecedented humanitarian crisis unfolds across the shared border region, heavily permeated by informal economic activities, unemployment, poverty, and vulnerabilities at both individual and community levels. These conditions expose residents to risks such as political threats, social conflicts, neglect of public health, environmental degradation, crime, and discrimination [4]. Furthermore, the weakness of state presence has resulted in a centrifugal

zone, distanced from central government influence and dominated by local powers characterized by illegality, corruption, and smuggling.

According to the Ministry of National Education in alliance with the University of Pamplona [5], Villa de Rosario exhibits an Index of Unsatisfied Basic Needs (UBN) of 21.83% in the municipal capital, and 44.9% in other municipal areas, reflecting insufficient income and limited opportunities. Likewise, the Multidimensional Poverty Index (MPI) indicates that 66.794% of the urban population experiences multidimensional poverty, with a 55.5% incidence rate overall [6]. The socioeconomic composition of Villa de Rosario is largely concentrated in the lowest social strata: 93% of residents belong to stratum 1 (59.4%) and stratum 2 (33.6%), highlighting significant poverty and vulnerability. Thus, Villa de Rosario can be classified as a highly vulnerable municipality. The United Nations Development Programme (UNDP) conceptualizes this vulnerability as twofold: one dimension rooted in its historical context and another linked to unequal treatment relative to the broader society—both of which accurately describe the municipality's situation.

In this context, previous studies [7] describe the dynamic and historically rooted relations between Colombia and Venezuela, emphasizing deep social, economic, political, and cultural ties among border communities. These ties include family unity, education, and cross-border living, which facilitate complex socio-economic exchanges and high levels of human mobility. Similarly, research on the Mexico-United States border [8] highlights notable disparities in quality of life and political institutions, which complicate cross-border interactions and affect residents' daily lives. Key policy decisions are often centralized without adequate recognition of the effects on border communities, mirroring challenges seen in the Colombian-Venezuelan border region.

Further socioeconomic analysis [9] reveals that the local economy of Cúcuta and its metropolitan area is heavily dependent on the neighboring country's economy, making it vulnerable to fluctuations in exchange rates and political instability. This highlights the urgent need for territorial development policies that account for the border region's unique characteristics and integration with adjacent economies, which expose it to external shocks impacting economic performance and social structures.

Historically, spontaneous integration between the Colombian and Venezuelan border regions has been recognized [10]. However, economic policy differences and extreme nationalist security policies implemented by both central governments hinder the development of this naturally integrated area. There is a pressing need to move beyond short-term crisis management policies and towards binational development strategies that foster zonal growth and improve living conditions for the border

population. Achieving this requires addressing informality, which currently serves as a survival mechanism but exacerbates poverty and inequality [11].

1.1 Review of the literature and background of the research

Consequently, the theoretical contextualization of borders and border development is grounded in the definition provided by [12], who conceptualizes borders as relatively delimited spaces where two or more States geographically converge. Borders serve as conduits for achieving objectives conducive to improving quality of life—whether through transit by those fleeing conflict and unmet socio-economic needs in their country of origin, or through regular crossings aimed at exchanging goods and deriving economic benefits in the host country. Simultaneously, borders represent spaces of sovereignty where divergences in political and security matters often provoke diplomatic crises and the deterioration of amicable relations between neighboring countries. These dynamics materialize as conjunctural problems, typically manifesting in highly unstable environments characterized by pervasive illegality and institutional fragility.

From a political geography perspective, borders emerge from the interrelation between territory and state sovereignty. According to [13], with the formation of States, boundary lines (boundaries) are established—linear, sovereign spatial entities that delimit jurisdiction in a strictly legal sense, expressed through national citizenship rather than the identity of border regions or frontiers. Conversely, borders function as zones of encounter with an integrative role: they are geographical instruments at the disposal of States to maintain control and ensure functionality, but also serve as elements of differentiation and spatial organization. Their stability is inherently relative, influenced by varying conjunctural factors [14]; [15]. Thus, the border manifests simultaneously as linearity, legal jurisdiction, and zonality, the product of a complex interaction and interdependence at social, economic, political, and cultural levels, where networks of relationships and interests are constructed [16]. Similarly, [17] conceptualizes the border as “a strip extending on both sides of the limit, surrounding the national territory and connecting it with neighboring nations.”

Within this conceptual framework and the specific context of the Colombia-Venezuela border crisis, realism predominates as the dominant theoretical lens. The crisis is framed primarily in terms of power and security considerations, marginalizing the binational agenda [9]. International Relations theory posits that states are principally motivated by the pursuit of security. Accordingly, the Venezuelan government's

unilateral closure of the common border with Colombia was justified on grounds of protecting perceived security threats, as articulated in the official decrees of closure and declarations of a state of emergency.

Moreover, it is essential to frame the study within the scope of border development through a socioeconomic characterization that reveals local particularities, social conditions, and economic realities—critical elements for potential social claims. Characterization typically involves descriptive analyses aimed at profiling groups or populations based on variable expressions, using frequency distributions derived from tailored survey instruments that include demographic data, household composition, housing, services, and economic factors, among others [18].

In this vein, effective border development strategies could incorporate binational plans, designed at the central governmental level, which bolster interactions between the border zones of Colombia and Venezuela. Such strategies should be sensitive to the spatial and political complexity of the region and address the specificities of the socioeconomic crisis in Villa de Rosario.

Accordingly, the general objective of this research is to analyze the border socioeconomic crisis in Villa de Rosario as of 2021. The specific objectives include identifying key theoretical, conceptual, and normative elements framing the Colombian-Venezuelan border crisis; socioeconomically characterizing the population of Villa de Rosario; and determining the impact of the border crisis on the socioeconomic conditions of its inhabitants in Norte de Santander.

Given the complexity of the border crisis, it can be approached from multiple theoretical and empirical perspectives. For instance, transaction cost economics offers a valuable conceptual tool for analyzing how uncertainty and instability affect supply chains, a critical issue in contexts of institutional vulnerability [19]. Additionally, López Celis and Peñalosa [20] emphasize demographic variables combined with corporate social responsibility as significant factors influencing consumption patterns and community resilience. These dynamics are particularly vulnerable to border closures and trade restrictions, which exacerbate economic precarity in affected areas. Together, these studies underscore the interplay between economic and social factors, providing a theoretical foundation for analyzing the coexistence of formal structures and informal economies within crisis settings.

Furthermore, the importance of organizational resilience and technological adaptation to mitigate the impacts of complex crises is increasingly recognized. Díaz Ortega [21] illustrates how company size and profitability may be compromised in unstable environments, contributing to decreased economic efficiency in affected regions. Likewise, other research shows that consumer brand loyalty and perception

may deteriorate under economic instability, highlighting the need for adaptive communication strategies [22].

In this context, the integration of digital technologies and intelligent agents to enable early detection of process failures [23] represents a cutting-edge approach to improving operational resilience in complex environments. Additionally, the adoption of sustainability and social responsibility standards [24] is identified as a critical objective for reconstructing economic and social structures. Emerging research also points to educational quality perception as a key variable influencing social resilience during periods of crisis [25].

2. MATERIALS AND METHODS

The study was conducted using quantitative, exploratory, descriptive, and inferential analytical approaches. Data were collected through a social survey administered to a representative sample of 835 households residing in the neighborhoods of La Esperanza, San Gregorio, Santander, La Parada, Antonio Nariño, and 20 de Julio. These neighborhoods were selected due to their high population density within the municipality of Villa de Rosario, which has a total population of 34,013 inhabitants in these areas.

The sampling method employed was simple random stratified sampling with proportional size allocation to ensure representativeness across strata. Data processing involved exploratory and bivariate descriptive analyses to identify initial patterns.

Given the categorical nature of the variables studied, multivariate statistical techniques were applied to reduce dimensionality and uncover interdependent relationships. Specifically, Multiple Correspondence Analysis (MCA) was utilized via optimal scaling—a procedure that assigns numerical quantifications to categorical variable categories through an iterative alternating least squares method.

The reliability of the optimal scaling procedure was assessed using Cronbach's alpha coefficient. The resulting structure of relationships between variable categories was represented in a two-dimensional perceptual map.

To identify distinct profiles within the data, the K-means clustering algorithm—an unsupervised classification technique—was applied, resulting in three internally homogeneous and mutually heterogeneous clusters.

All statistical analyses were performed using the Multiple Correspondence Analysis and K-means clustering modules available in Leiden SPSS software, version 26.

3. RESULTS

Table 1 presents the study variables along with their corresponding coding schemes, which were utilized in the subsequent data analysis.

Table 1. Study variables

Variables	Code	Category	Variables	Code	Category
Demographic			Housing & Services		
Age Groups	1	18 to 29 years old	Tenure of Housing	1	Rented
	2	30 to 45 years old		2	Familiar
	3	46 and over		3	Own
Marital status	1	Married	Wall Material	1	Bareque
	2	Separate		2	Wood
	3	Bachelor		3	Brick
	4	Widower		1	Earth
Educational level	1	No Level	Flooring Material	2	Cement
	2	Primary		3	Tile
	3	High school	1	Zinc	
	4	Technician	Roof Material	2	Eternic
	5	Universitario		3	Tile.
Nationality	1	Colombian	Housing Layer	1	1
	2	Venezuelan		2	2
Origin of the population	1	Displaced	Phone Ownership	1	No
	2	Migrant		2	Yes
	3	Resident		1	No
Belongs to some social security system	1	No	Internet Tenure	2	Yes
	2	Yes		1	No
			Gas for cooking	2	YES
Household Composition			Economic		
Head of household	1	Mother	Occupation Category	1	Unemployed
	2	Father		2	Formal Employment
Number of people in the family nucleus	1	less than 4		3	Informal Employment
	2	4 to 6	Affected by border closure	1	No
	3	More than 6		2	Yes
			Reduced revenue from border closures	1	No
				2	Yes
			Labor difficulties due to the border closure	1	No
				2	Yes
			Increased needs due to border closures	1	No
				2	Yes

Source: Social survey applied in the neighborhoods of La Esperanza, San Gregorio, Santander, La Parada, Antonio Nariño and July 20, 2021.

Therefore, Table 2 presents a summary of the model estimates. The total explained variance is 35.0%, with Dimension 1 contributing 20.5% and Dimension 2 accounting for 14.5%. The reliability of the Optimal Scaling was assessed using Cronbach's Alpha coefficient, which averaged 73.9%, indicating an acceptable level of reliability for the application of this method.

Table 2. Model Summary

Dimension	Cronbach's alpha	Variance accounted for		
		Total (eigenvalue)	Inertia	% variance
1	0,785	3,906	0,206	20,557
2	0,674	2,770	0,146	14,579
Total		6,676	0,351	
Media	,739a	3,338	0,176	17,568

a. Cronbach's alpha mean is based on the eigenvalue mean.

Source: Own calculations based on multivariate analysis

Following this, Table 3 presents the matrix of discriminating measures, which reflects the contributions of the categories to each dimension. The variables contributing most significantly to the formation of the first dimension are primarily economic factors, including housing stratum, tenure, construction materials, occupation, and the effects of border closures. In contrast, the categories that contribute most to the second dimension are associated with sociodemographic factors.

Table 3. Discriminating measures

	Dimension		Media
	1	2	
Housing stratum	0,307	0,140	0,224
Age Groups	0,027	0,007	0,017
Marital status	0,020	0,141	0,080
Educational level	0,234	0,038	0,136
Origin of the population	0,013	0,011	0,012
Nationality	0,000	0,092	0,046
Belongs to some social security system	0,083	0,068	0,075
Tenure of Housing	0,074	0,020	0,047
Wall Material	0,081	0,078	0,080

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	Dimension		Media
	1	2	
Flooring Material	0,169	0,103	0,136
Roof Material	0,183	0,057	0,120
Telephone	0,340	0,269	0,304
Internet	0,314	0,267	0,291
Gas	0,237	0,203	0,220
Occupation	0,063	0,002	0,033
Affected by border closure	0,406	0,352	0,379
Reduced revenue	0,452	0,368	0,410
Work Difficulty	0,426	0,244	0,335
Increasing your needs	0,476	0,310	0,393
Total assets	3,906	2,770	3,338
% variance	20,557	14,579	17,568

Source: Own calculations

Considering the objective of describing the population through socioeconomic profiles based on the study variables, the unsupervised classification algorithm K-means clustering was applied to the two dimensions obtained from the multiple correspondence analysis. This algorithm groups n observations into k clusters based on their characteristics, by minimizing the sum of distances between each observation and the centroid of its assigned cluster. The goal is to maximize internal cohesion within clusters and external heterogeneity between them. Through this procedure, three clusters or groups were identified.

Graph 1 presents the quantification of the categories of the variables, represented by their coordinates in the two-dimensional plane defined by the two dimensions. The interpretation of the centroids for each category enables an analysis of the relationship patterns between variable categories, suggesting the presence of three distinct profiles. Along the first dimension axis, there is a clear contrast between individuals experiencing deficits in public services, low-quality housing materials, low educational attainment, and unemployment, and those with better education levels, access to services, and higher-quality housing materials.

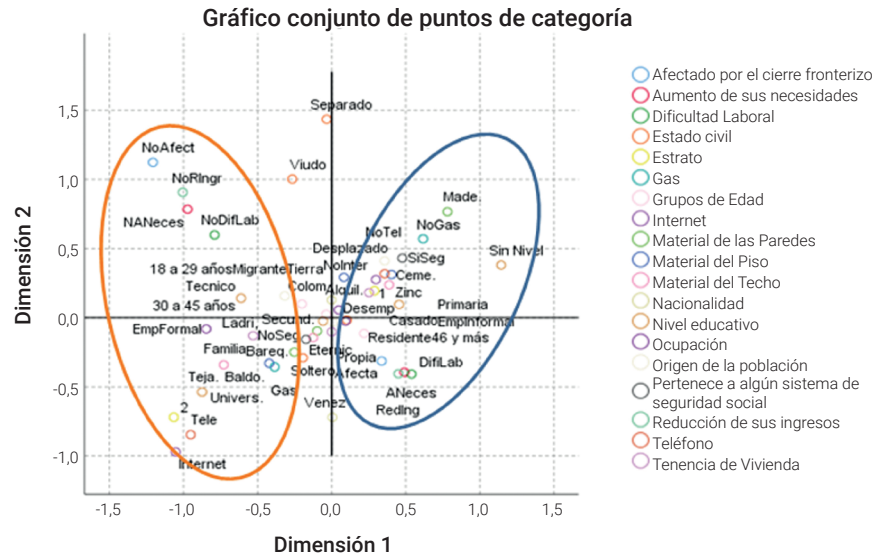


Figure 1. Set of category points.

Source: Own elaboration

Table 4 presents the distribution by Profile Typology in terms of the variables analyzed.

Table 4. Distribution of variables by type of profile

		Typology							
		Group 1		Group 2		Group 3		Total	
		N	%	n	%	N	%	n	%
Total		196	50,9%	98	25,5%	91	23,6%	385	100,0%
Demographic Variables									
Quarter	July 20	40a	20,4%	15a	15,3%	12a	13,2%	67	17,4%

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		Typology							
		Group 1		Group 2		Group 3		Total	
		N	%	n	%	N	%	n	%
Quarter	Antonio Nariño	28a	14,3%	14a	14,3%	11a	12,1%	53	13,8%
	Hope	19a	9,7%	15a	15,3%	12a	13,2%	46	11,9%
	The Stop	66a	33,7%	8b	8,2%	01	0,0%	74	19,2%
	St. Gregory	24a	12,2%	19a	19,4%	17a	18,7%	60	15,6%
	Santander	19a	9,7%	27b	27,6%	39b	42,9%	85	22,1%
Age Groups	18 to 29 years old	48a	24,5%	31a	31,6%	25a	27,5%	104	27,0%
	30 to 45 years old	76a	38,8%	45a	45,9%	37a	40,7%	158	41,0%
	46 and over	72a	36,7%	22b	22,4%	29a,b	31,9%	123	31,9%
Marital status	Married	139a	70,9%	56a	57,1%	53a	58,2%	248	64,4%
	Separate	5a	2,6%	10b	10,2%	01	0,0%	15	3,9%
	Bachelor	47a	24,0%	24a,b	24,5%	37b	40,7%	108	28,1%
	Widower	5a	2,6%	8a	8,2%	1a	1,1%	14	3,6%
Educational level	No Level	7a	3,6%	01	0,0%	01	0,0%	7	1,8%
	Primary	103a	52,6%	27b	27,6%	18b	19,8%	148	38,4%
	High school	63a	32,1%	35a	35,7%	39a	42,9%	137	35,6%
	Technician	17a	8,7%	23b	23,5%	14a,b	15,4%	54	14,0%
	Universitario	6a	3,1%	13b	13,3%	20b	22,0%	39	10,1%
Nationality	Colombian	167a	85,2%	95b	96,9%	65c	71,4%	327	84,9%
	Venezuelan	29a	14,8%	3b	3,1%	26c	28,6%	58	15,1%
Origin of the population	Displaced	12a	6,1%	5a	5,1%	1a	1,1%	18	4,7%
	Migrant	13a	6,6%	9a	9,2%	5a	5,5%	27	7,0%
	Resident	171a	87,2%	84a	85,7%	85a	93,4%	340	88,3%

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		Typology							
		Group 1		Group 2		Group 3		Total	
		N	%	n	%	N	%	n	%
Belongs to some social security system	No	125a	63,8%	76b	77,6%	81b	89,0%	282	73,2%
	Yes	71a	36,2%	22b	22,4%	10b	11,0%	103	26,8%
Household Composition									
Head of household	Mother	68a	34,7%	38a	38,8%	40a	44,0%	146	37,9%
	Father	128a	65,3%	60a	61,2%	51a	56,0%	239	62,1%
Number of people in the family nucleus	less than 4	56a	28,6%	32a	32,7%	24a	26,4%	112	29,1%
	4 a 6	116a	59,2%	60a	61,2%	62a	68,1%	238	61,8%
	More than 6	24a	12,2%	6a	6,1%	5a	5,5%	35	9,1%
	Total	196	50,9%	98	25,5%	91	23,6%	385	100,0%
Housing & Services									
Tenure of Housing	Rented	93a	47,4%	36a	36,7%	17b	18,7%	146	37,9%
	Familiar	23a	11,7%	24b	24,5%	22b	24,2%	69	17,9%
	Own	80a	40,8%	38a	38,8%	52b	57,1%	170	44,2%
Wall Material	Bareque	5a	2,6%	3a	3,1%	3a	3,3%	11	2,9%
	Wood	35a	17,9%	10a	10,2%	01	0,0%	45	11,7%
	Brick	156a	79,6%	85a	86,7%	88b	96,7%	329	85,5%
Flooring Material	Earth	2a	1,0%	1a	1,0%	01	0,0%	3	0,8%
	Cement	130a	66,3%	47b	48,0%	18c	19,8%	195	50,6%
	Tile	64a	32,7%	50b	51,0%	73c	80,2%	187	48,6%
Roof Material	Zinc	121a	61,7%	42b	42,9%	22c	24,2%	185	48,1%
	Eternic	54a	27,6%	29a,b	29,6%	40b	44,0%	123	31,9%
	Tile.	21a	10,7%	27b	27,6%	29b	31,9%	77	20,0%

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		Typology							
		Group 1		Group 2		Group 3		Total	
		N	%	n	%	N	%	n	%
Stratum	1	190a	96,9%	70b	71,4%	43c	47,3%	303	78,7%
	2	6a	3,1%	28b	28,6%	48c	52,7%	82	21,3%
Telephone	No	188a	95,9%	69b	70,4%	23c	25,3%	280	72,7%
	Yes	8a	4,1%	29b	29,6%	68c	74,7%	105	27,3%
Internet	No	192a	98,0%	74b	75,5%	34c	37,4%	300	77,9%
	Yes	4a	2,0%	24b	24,5%	57c	62,6%	85	22,1%
Gas	No	113a	57,7%	33b	33,7%	2c	2,2%	148	38,4%
	Yes	83a	42,3%	65b	66,3%	89c	97,8%	237	61,6%
Economic									
Occupation	Unemployed	72a	36,7%	33a	33,7%	36a	39,6%	141	36,6%
	Formal Employment	8a	4,1%	15b	15,3%	8a,b	8,8%	31	8,1%
	Informal Employment	116a	59,2%	50a	51,0%	47a	51,6%	213	55,3%
Affected by border closure	No	1a	0,5%	82b	83,7%	1a	1,1%	84	21,8%
	Yes	195a	99,5%	16b	16,3%	90a	98,9%	301	78,2%
Reduced revenue due to border closure	No	11a	5,6%	97b	99,0%	11a	12,1%	119	30,9%
	Yes	185a	94,4%	1b	1,0%	80a	87,9%	266	69,1%
Labor difficulties due to the border closure	No	33a	16,8%	981	100,0%	25b	27,5%	156	40,5%
	Yes	163a	83,2%	01	0,0%	66b	72,5%	229	59,5%
Increased needs due to border closures	No	14a	7,1%	96b	98,0%	19c	20,9%	129	33,5%
	Yes	182a	92,9%	2b	2,0%	72c	79,1%	256	66,5%

Source: Own calculations. ^{Bull 2.3}

Based on the results in Table 4, the socioeconomic profiles or groups identified in the study are described as follows:

Profile: Group 1

Group 1 comprises 50.9% of the study population and represents individuals with the lowest socioeconomic conditions. The majority are of Colombian nationality, residents over 30 years old, and 70.9% are married or in a union. Most have only completed primary schooling (52.6%), and 36.2% belong to some social security system. In 65.3% of households, the father is the head of household, and 12.2% of households have more than six members. Housing and access to services are generally poor: 96.9% belong to housing stratum 1. Construction materials include wooden walls or bareque (20.5%), cement floors (66.3%), and zinc roofs (61.7%). Most lack telephone and internet service (98.0%), and over half lack gas for cooking (57.7%). Economically, 59.2% have informal employment, and 36.7% are unemployed. This group is most affected by the border closure crisis: 99.5% report being impacted, 94.4% have experienced income reduction, 83.2% report work difficulties related to the closure, and 92.9% report increased basic needs. Geographically, members mainly reside in the La Parada (33.7%), 20 de Julio (20.4%), and Antonio Nariño (14.3%) neighborhoods.

Profile: Group 2

Group 2 accounts for 25.5% of the population and represents a lower-middle socioeconomic status. The majority are Colombian nationals (96.9%) and residents (85.7%), with 9.2% migrants included. They tend to be somewhat younger, with 31.6% under 30 years old, and have medium or technical education (23.5%). However, 77.6% do not belong to any social security system. Fathers head 61.2% of households, and 32.7% of households have fewer than six members. Housing and services are moderate: 71.4% belong to housing stratum 1, walls are mostly brick (86.7%), floors mostly tile (51.0%), and roof materials include zinc (42.9%) and eternit (29.6%). Telephone service is available to 29.6%, and internet to 24.5%, while 33.7% lack gas for cooking. In terms of employment, 33.7% are unemployed, 51.0% have informal jobs, and 15.3% hold formal employment. Most in this group report not being affected by the border closure (83.7%). They mainly live in the Santander (27.6%), San Gregorio (19.4%), and La Esperanza (15.0%) neighborhoods.

Profile: Group 3

Group 3 represents 23.6% of the population and enjoys better sociodemographic conditions. Most are residents (93.4%), with a mixed nationality: 71.4% Colombian

and 28.6% Venezuelan. Educational attainment is higher, with 22.0% having university studies, though 89.0% lack social security coverage. Household heads are split between mothers (44%) and fathers (56%), and 94.5% of households have fewer than six members. Housing and service access are the best among the groups: 52.7% belong to housing stratum 2, brick walls predominate (96.7%), tile floors (80.2%) and tile roofs (31.9%) are common. Most have telephone service, 62.6% have internet, and 97.8% have gas for cooking. Employment status shows that 8.8% hold formal jobs, 51.6% are informal workers, and 39.6% are unemployed. Despite better conditions, 98.5% report being affected by the border closure, with 87.9% experiencing income reduction, 83.2% reporting work difficulties, and 79.1% noting increased basic needs. They primarily reside in the Santander (42.9%) and San Gregorio (18.7%) neighborhoods.

A VIEW FROM THE SUSTAINABLE DEVELOPMENT GOALS

Based on the data presented, it is imperative that in the department of Norte de Santander, priority be given to addressing structural issues that generate socially undesirable conditions such as poverty and inequality, which severely affect the border communities. Intervention through social protection mechanisms led by subnational entities is necessary. This should be achieved by formulating and implementing public policies, programs, and projects that, in synergy with the private sector, work to mitigate these challenges and promote an improved quality of life for the inhabitants of the border region.

	CONTEXT	ANALYSIS
OBJECTIVE 1		
	Norte de Santander	
	Incidence of Extreme Monetary Poverty 16.8%. tendency to improve.	- The incidence of extreme monetary poverty is 16.8%, which indicates that almost 1 in 5 people in Norte de Santander lives in conditions of extreme poverty.
	Incidence of monetary poverty 52.5%. Tendency to get worse.	- However, there is an improving trend in reducing extreme monetary poverty.
	Social protection	
END OF POVERTY	Percentage of population affiliated to the social security system in health 95.1. tendency to improve.	- On the other hand, the incidence of monetary poverty is 52.5%, which indicates that more than half of the population in Norte de Santander lives in conditions of poverty.
	Percentage of employed population affiliated to the Occupational Risk Administrator 23.5. Tendency to get worse.	- There is a tendency to worsen in the reduction of monetary poverty.
	Percentage of the employed population contributing to the pension system 24.5 Tendency to worsen.	

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	CONTEXT	ANALYSIS
OBJECTIVE 2		
QUALITY EDUCATION	<p>Coverage in higher education 49.6 tendency to worsen.</p> <p>Percentage of official enrolment with an internet connection 37.0 tendency to worsen.</p>	<ul style="list-style-type: none"> - Coverage in higher education is 49.6%, which indicates that almost half of the population in Norte de Santander has access to higher education. - However, there is a tendency to worsen in higher education coverage. - The percentage of official enrollment with an internet connection is 37.0%, which indicates that more than a third of the population in Norte de Santander has access to education with an internet connection. - There is a tendency to worsen in the official enrollment with an internet connection.
OBJECTIVE 3		
DECENT WORK AND ECONOMIC GROWTH	<p>Unemployment rate 14.6 tendency to worsen.</p> <p>Percentage of young people who do not study and are unemployed 27.9, tendency to worsen.</p>	<ul style="list-style-type: none"> - The unemployment rate is 14.6%, which indicates that more than 1 in 10 people in Norte de Santander are unemployed. - There is a tendency to worsen in the reduction of unemployment. - The percentage of young people who do not study and are unemployed is 27.9%, which indicates that more than a quarter of the young population in Norte de Santander does not have access to education or employment. - There is a worsening trend in the reduction of the percentage of young people who do not study and are unemployed.
OBJECTIVE 4		
REDUCING INEQUALITIES	<p>Per capita income growth rate in the poorest 40% of households in the population, tendency to worsen. -15.3</p>	<ul style="list-style-type: none"> - The growth rate of per capita income in the poorest 40% of households in the population is -15.3%, indicating that the poorest households in Norte de Santander are experiencing a reduction in their income. - There is a tendency to worsen in the reduction of inequalities.

Source: Own elaboration based on DNP-2021 data

4. DISCUSSION AND CONCLUSIONS

The results of the research reveal a certain homogeneity in the socioeconomic variables of the population under study. However, through the application of the multivariate statistical technique of multiple correspondence analysis, distinct sets of variables emerged that allowed the identification of three groups with both favorable

and unfavorable conditions. Regarding educational level, housing, and access to public services, these groups can be categorized into low, medium, and better levels, respectively. In the labor and economic context, informality prevails in a greater proportion across the groups.

This situation confirms that the closure of the Colombian-Venezuelan border has had a negative impact on the inhabitants of Villa del Rosario, with the La Parada neighborhood being particularly affected, followed by other neighborhoods. This can be explained by the strong historical border interactions—economic, cultural, familial, and social—that characterize the area, as described by previous studies [8], [26]. Similarly, [7] highlights the deeply rooted historical ties among the inhabitants, which complement the economy, family unity, education, and life on either side of the border, resulting in a spontaneous integration of the Colombian-Venezuelan border regions.

In this context, the socioeconomic crisis of the border shifts from being a dynamic scenario to a desolate and hopeless situation for its residents. According to [9], the National Government declared an “economic emergency” in the region, accompanied by short-term measures such as VAT and income tax exemptions, which serve only as palliative responses to the complex situation. It is important to emphasize that these regional problems are structural in nature, and the border closure merely exacerbates them. Likewise, [10] describes how border populations experience an increased cost of living, which, combined with job losses, income reductions, and increased needs, triggers a domino effect leading to economic recession.

The border closure clearly obstructs the free development of factories, businesses, and companies, disrupting the significant direct link with the neighboring country. Moreover, many inhabitants rely on informal employment, trading goods and hydrocarbons across the border. This is why informality has increased as a result of the crisis, given the absence of significant formal jobs within the Colombian territory, which has historically depended on the informal economy between the two countries [11], [27].

Based on the information described above in relation to the Sustainable Development Goals, it can be concluded that Norte de Santander, as a border department, faces significant challenges in reducing poverty, improving education, and addressing unemployment and inequality. Therefore, the implementation of effective policies and programs is essential to confront these challenges and enhance the quality of life for the population of Norte de Santander.

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