

Follow-up and monitoring of the Venezuelan migratory crisis in the city of Arauca-Colombia, El Refugio settlement. Spatio-temporal analysis between 2015 and 2023

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Abstract

Venezuelan migration has impacted the socio-spatial and demographic transformation of the El Refugio settlement in the city of Arauca, Colombia. This phenomenon has led to changes in the territorial configuration, with a marked increase in population density and the creation of new housing sectors. The exponential increase in households in the settlement, which rose from 108 in 2015 to 1,248 in 2023, reflects the magnitude of this transformation. Sectors such as 20 de April and Llano Alto experienced high growth, driven by irregular, accelerated, and unplanned urbanization.


This demographic growth has stimulated local economic development, with a flourishing of commercial ventures, especially in the food sector, and an expansion in sectors such as agriculture and construction. However, this economic boom has been accompanied by challenges, such as competition in the labor market and pressure on health and education services. Additionally, the rapid urban expansion has led to concerning environmental impacts, such as deforestation and the overexploitation of natural resources, highlighting the urgent need for responsible and sustainable urban and environmental planning.

Keywords: Migration; Spatio-temporal; Settlement; Changes and planning.

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Seguimiento y monitoreo a la crisis migratoria venezolana en la ciudad de Arauca-Colombia, asentamiento el Refugio. Análisis espacio-temporal entre 2015 y 2023

Resumen

La migración venezolana ha ejercido impacto en la transformación socioespacial y demográfica del asentamiento El Refugio en la ciudad de Arauca, Colombia. Este fenómeno ha dado lugar a cambios en la configuración territorial, con un marcado aumento en la densidad demográfica y la creación de nuevos sectores habitacionales. El incremento exponencial de hogares en el asentamiento, que pasó de 108 en 2015 a 1.248 en 2023, refleja la magnitud de esta transformación. Sectores como el 20 de abril y Llano Alto experimentaron alto crecimiento, impulsado por la urbanización irregular, acelerada y no planificada. Este crecimiento demográfico ha estimulado el desarrollo económico local, con un florecimiento de emprendimientos comerciales, especialmente en el sector alimentario, y una expansión en sectores como la agricultura y la construcción. Sin embargo, este auge económico ha venido acompañado de desafíos, como la competencia en el mercado laboral y la presión sobre los servicios de salud y educación. Además, la rápida expansión urbana ha generado impactos ambientales preocupantes, como la deforestación y la sobreexplotación de recursos naturales, destacando la necesidad urgente de una planificación urbana y ambiental responsable y sostenible.

Palabras clave: Migración; Espacio-temporal; Asentamiento; Cambios y planificación.

Summary: 1. Introduction, 2. Methodology, 2.1 Context, 3. Findings, 3.1 Urban transformation of the city of Arauca associated with Venezuelan migration, 3.2 Socio-spatial and demographic transformation of the El Refugio settlement, 4. Conclusions, 5. Bibliographical references.

1. Introduction

The Venezuelan migration crisis has triggered a series of socioeconomic and demographic impacts in various regions of Latin America (Eguren, 2021), and Colombia has been no exception. Amid this crisis, Colombia has emerged as one of the main destinations for those seeking to escape their country's political and social difficulties. The growth of the Venezuelan population in Arauca has generated challenges in terms of housing and reconfiguration of urban space. In this context, the El Refugio settlement, located in the city of Arauca, has stood out as one of the epicenters of this migration, experiencing transformations in its urban and demographic structure from 2015 to 2023. This period has witnessed a dynamic evolution, where the constant arrival of migrants has modified the morphology of the settlement and has generated challenges and opportunities for the local community and the population coming from Venezuela.

In order to understand the magnitude and implications of this migration crisis in the El Refugio settlement, it was necessary to follow up and monitor its spatio-temporal evolution. This research addressed the changes observed in the territorial configuration of the settlement and the social and economic dynamics resulting from migration, relying on information from various sources such as demographic data, cartographic data, and field analysis collected directly. Quantitative and qualitative techniques, such as surveys and data analysis, were used to obtain accurate information on migrants and individual interviews to understand and contextualize the experiences and perceptions of institutional actors, migrants, and the host population. This multidisciplinary approach allowed us to examine how the constant influx of migrants has shaped the human geography of the El Refugio settlement over time, identifying patterns, trends, and determinants.

Among the aspects addressed were the increase in population density, the creation of new housing sectors, the emergence of commercial enterprises and services to meet the needs of the migrant population, as well as the challenges and opportunities that have arisen in areas such as the labor market, urban infrastructure, access to essential services and social integration. In addition, this study covered the environmental implications of migration and the accelerated expansion of settlement, considering the preservation of natural areas, environmental sustainability, and the responsible management of natural resources in the context of urban development.

2. Methodology

The methodological design was based on the critical paradigm (Van-Dijk, 2016), which analyzes power structures and domination relations in society, facilitating the understanding of how political, economic, and social factors influence Venezuelan migration and territorial reconfiguration in El Refugio. The type of research is descriptive (Cauas, 2015), aimed at analyzing the characteristics of the Venezuelan migrant population in El Refugio and its influence



on the territorial reconfiguration of Arauca. A mixed approach was used for this research (Acosta-Faneite, 2023) that combines quantitative and qualitative elements to obtain a complete understanding of the phenomenon studied and strengthen validity and reliability through the triangulation of results.

In the quantitative phase, an analysis was conducted using data from governmental and academic sources, highlighting those provided by Migración Colombia. This analysis focused on the distribution of the Venezuelan population in Colombia, with special emphasis on the department and city of Arauca. Demographic statistics and migration trends over time were examined, as well as the socioeconomic factors that influence migration to this area of the country. In addition, geospatial tools were used to map the location of sectors within the El Refugio settlement and their relationship with urban infrastructure and natural resources, and primary information was collected directly in the field through surveys.

For the collection of quantitative data, surveys¹ Designed in the Kobotoolbox platform, they were applied to households in the settlement to obtain demographic and socioeconomic information on Venezuelan migrants. The surveys were conducted in person, ensuring the informed consent of the participants and the equal inclusion of men and women. Data analysis was carried out using statistical techniques, presenting the results in graphs and tables and validating the information by comparing it with other sources, such as census data and official statistics. The sample was non-probabilistic (Hernández-Sampieri & Mendoza-Torres, 2018, p. 176), covering 100% of the households in El Refugio to ensure the inclusion of diverse population categories.

In the qualitative phase, semi-structured interviews² were conducted with community members, local leaders, and representatives of non-governmental organizations working in the migration and urban development field in Arauca. These interviews provided a qualitative perspective on the experiences and perceptions of Venezuelan migrants and the challenges and opportunities associated with urban transformation. A probability sampling approach (Hernández-Sampieri & Mendoza-Torres, 2018, p. 175) was applied to ensure representativeness.

The interviews were administered using a protocol of questions also designed in Kobotoolbox, addressing issues such as obstacles and opportunities for economic development, challenges in territorial planning, infrastructure, and service needs, and participation of the migrant population in decision-making and territorial management. The selected participants included institutional actors, local officials, the Arauca community, migrants, and the population settled in El Refugio, ensuring a diverse and comprehensive view of the situation.

¹ Sociodemographic characterization <https://ee.humanitarianresponse.info/x/G5qW7WDX>.

² - Interviews with institutional actors <https://ee.humanitarianresponse.info/x/Y0KcsKOM> - Interviews with local population <https://ee.humanitarianresponse.info/x/zhfVC6iz> - Interviews with migrant and settled population in El Refugio <https://ee.humanitarianresponse.info/x/7wdZMdHO>

The following calculation formula was used for the interviews with the local population and the migrant population settled in El Refugio.

$$n = \frac{Nz^2p(1-p)}{(N-1)E^2 + z^2p(1-p)}$$

Where:

n = sample size

N= population size

E = margin of error within which the estimation of the proportion is acceptable.

0.05 o 0.01

z= confidence level, z-score for the probability that the value of the means will fall within the interval +/- E if we repeat the sampling over and over again.

95%: 1.96, for 99%: 2.5758

p = estimated proportion in the population; the closer to 0.5, the larger the sample size.

The selection of the sample for the interviews with institutional actors and officials was based on persons between 18 and 59 years of age, according to the characterization survey. The total population was calculated by arithmetic operations of the surveyed households, ensuring that there was no duplication of representation within the same household. Table 1 shows the sample distribution used in the study. The sampling distribution was carried out with a confidence level of 95% and a relative standard error of 7%. The study groups, their population, and the corresponding sample are specified.

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Table 1. Sample selection.

| Sample distribution | | |
|-------------------------|------------|--------|
| Confidence level | 95% | |
| Relative standard error | 7% | |
| Study groups | Population | Sample |
| Persons per household | 3323 | 52 |

Source: own elaboration (2023).

The triangulation of quantitative and qualitative data provided an understanding of the impacts of migration in the city of Arauca and in the El Refugio settlement. This approach facilitated the identification of challenges and needs, opening the way to guide intervention strategies and studies, including the importance of adequate and sustainable urban planning, which promotes the economic and social integration of migrants.

2.1 Context

Since the 1950s, Arauca has been one of Colombia's departments heavily plagued by violence (Plazas-Díaz, 2017). Since that time, internal migration, associated with forced displacement and other typologies of the armed conflict, has caused thousands of movements of people from one region to another within Colombia. The above means that those who assumed forced displacement as a protection mechanism sought to establish a new residence in other areas of the department. The capital of Arauca has 17 self-built neighborhoods as a result of the armed conflict.

Along with the actions of the armed conflict against the civilian population, which has caused the forced internal migration mentioned in the previous paragraph, Arauca is currently experiencing the consequences of migration from Venezuela. This situation was also experienced by different Venezuelan states when, during the height of the armed conflict, thousands of people from this department decided to migrate to the neighboring country. In the words of Koehlin and Eguren (2018), it would be "the historical debt (...) with Venezuela, thanks to its generosity in past times in welcoming immigrants" (p. 354).

According to the report on the distribution of the Venezuelan population in Colombia provided by Migración Colombia (2024), the number of Venezuelan citizens present in the national territory as of December 31, 2023, amounts to 2,864,796. Within this group, 490,304 are in an irregular situation, while 1,981,877 maintain a regular status, and 392,615 are in the process of obtaining a Temporary Protection Permit (PPT).

According to the Migration Colombia report (2024), on the same date, the department of Arauca remained in eleventh position in the national ranking in terms of the number of migrants, a position it had maintained since the October 2022 report (Migration Colombia, 2023). Although this position represents only 2.7% of the total number of migrants in Colombia, its importance lies in the fact that it constitutes 28.4% of the total population of Arauca according to the 2018 DANE population census (Departamento Administrativo Nacional de Estadística [DANE], 2023). "It is even the department of the country with the highest number of Venezuelan migrant population compared to the Colombian population in the 2018 census" (Hoyos-Mendoza, 2023, p. 1037).

According to Hoyos-Mendoza (2023), Venezuelan migration in Colombia has formed 11 improvised urban settlements in Arauca. Some occupy public land originally designated for special economic zones or urban development projects. Others are located on the banks of the Arauca River, including in areas susceptible to flooding. Some are close to the municipal oxidation lagoon, which increases their risk of overflowing during rainy seasons.

In spatial terms, the El Refugio settlement, which covers approximately 40 hectares, is located east of the city of Arauca at 7° 4' 46.38" north latitude and 70° 44' 15.95" west longitude, near the José Antonio Páez International Bridge that connects Colombia and Venezuela. To the north are the municipality's oxidation lagoon, the settlements of Puerto Alegre and Brisas del Puente, and the Arauca River. To the south is the Santiago Pérez Quiroz Airport, to the east is the Meridiano 70 neighborhood, and to the west is the Monserrate neighborhood. The rapid expansion of the El Refugio settlement has generated changes in population density, with previously unoccupied areas now populated by new residents. This urban transformation has led to the construction of improvised housing and the creation of specific peri-urban sectors, impacting quality of life and environmental sustainability. Deforestation, fragmentation of natural ecosystems, and overexploitation of resources are environmental concerns that must be addressed through responsible and collaborative planning between local authorities, non-governmental organizations, and the community.

El Refugio was built on invaded land, which has resulted in a lack of essential services such as potable water, sewage, and natural gas. However, electricity is provided by ENELAR E.S.P. Access to water is through deep wells or water points, although many of them are contaminated. Regarding health care, the settlement depends on ESE Hospital San Vicente de Arauca, which provides hospital care. In addition, international cooperation organizations offer complementary health services in areas such as prenatal care, contraception, dentistry, and general medicine. In terms of education, school-age children and adolescents attend Gustavo Villa Diaz School, while young people continue their technical and technological education through programs offered by SENA in Arauca. Public transportation is limited in the settlement, with motorcycle cabs being the most common means of transportation. Cab services are available upon request. Garbage is collected twice a week on the main road.

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El Refugio consists of 10 sectors and is located in an area prone to flooding. The houses were initially improvised with recycled materials, but over time, they have been improved using more solid construction materials. In each sector, grassroots social and community leaders and organizations are represented by the presidents and are part of the settlement's Community Action Board. It is important to remember that creating a Community Action Board (JAC) is intended for legally constituted neighborhoods. (Hoyos-Mendoza, 2023, p. 1039)

El Refugio consists of 10 sectors and is located in an area prone to flooding. The houses were initially improvised with recycled materials, but over time, they have been improved using more solid construction materials. In each sector, grassroots social and community leaders and organizations, represented by the presidents, are part of the settlement's Community Action Board. It is important to note that the creation of a Community Action Board (JAC) is intended for legally constituted neighborhoods.



3. Findings

Venezuelan migration in Arauca has left a deep imprint on territorial transformation, particularly with regard to the urban and territorial structure of the city of Arauca. The massive arrival of migrants from Venezuela has led to a reconfiguration of the territory, manifested in the establishment of new informal settlements in previously unoccupied or depressed areas. This concentration of migrants in specific sectors has given rise to challenges in terms of integration and access to services.

The rapid expansion of the El Refugio settlement has generated significant changes in population density, with previously unoccupied areas now populated by new residents. This urban transformation has led to the construction of improvised housing and the creation of specific peri-urban sectors, which has impacted quality of life and environmental sustainability. Deforestation, fragmentation of natural ecosystems, and overexploitation of resources are environmental concerns that must be addressed through responsible and collaborative planning between local authorities, international cooperation organizations, and the community at large.

3.1 Urban transformation of the city of Arauca associated with Venezuelan migration

Venezuelan migration in Arauca has had a profound impact on the transformation of the territory, especially in terms of the urban and territorial structure of the city. The massive arrival of migrants from Venezuela has generated some changes in the reconfiguration of the territory, given that these people have sought to settle in different areas (Buitrago-Ruiz, 2022). One of the most notorious aspects is the increase in the number of settlement sectors and housing construction in depressed or previously unoccupied areas. Migrants, upon arriving in Arauca, have established communities in areas where infrastructure and essential services are limited, which has led to the formation of new informal settlements, as in the case of El Refugio.

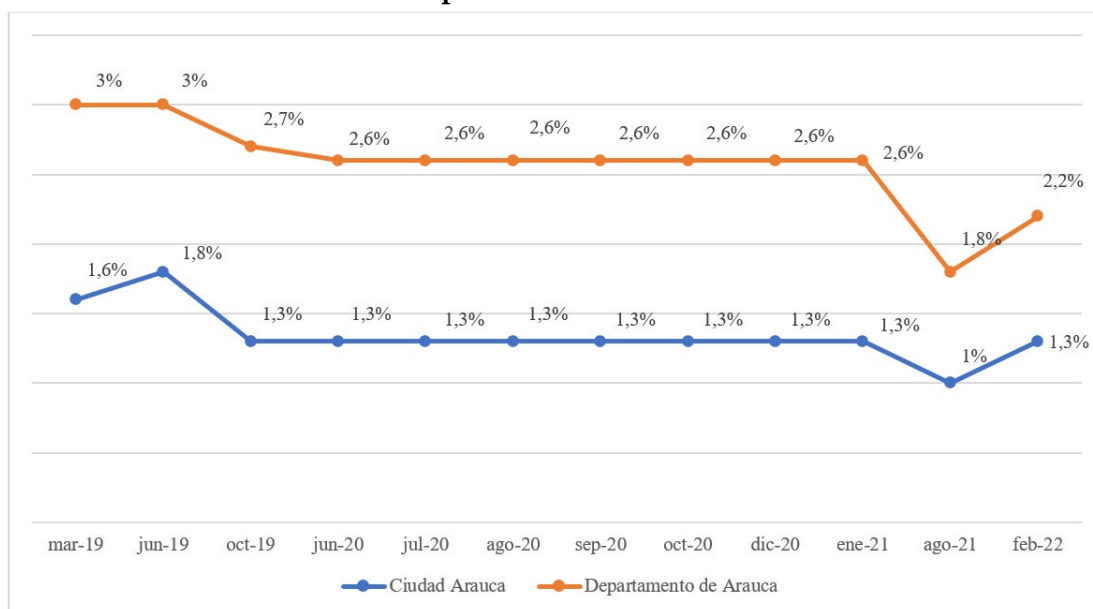
This concentration of migrants in certain areas has led to the creation, in addition to the 11 human settlements, of 10 specific neighborhoods or peri-urban sectors.³ With their own cultural and social identity, generating a diversity of communities that have enriched urban life but have also presented challenges in terms of integration and access to services. In addition, migration has driven the expansion of the city in general, with a greater demand for services, resources, and employment. This has led to an increased need to build and strengthen urban infrastructure, such as roads, schools, and health centers, to meet the growing population's needs. However, this rapid expansion has also created challenges for urban and territorial planning, as existing infrastructure

³ Nueva Jerusalén, Lagunita, Miramar and Libertadores. Corregimiento Caracol and Clarineteros, El Vapor, La Panchera, Todos los Santos and Sinaí.

and services are being overwhelmed, and the lack of adequate planning leads to problems of congestion, lack of public spaces, and socioeconomic inequalities in certain areas.

Between 2019 and 2022, the migrant population from Venezuela increased in the city and department of Arauca. This phenomenon was most pronounced in March, June, and October 2019, when growth rates of over 1.5% were recorded in the city of Arauca and 2.6% in the department of Arauca, as evidenced in Figure 1.

Figure 1. Increase in the migrant population in the city and department of Arauca during the period 2019-2022.



Source: Migration Colombia (2023).

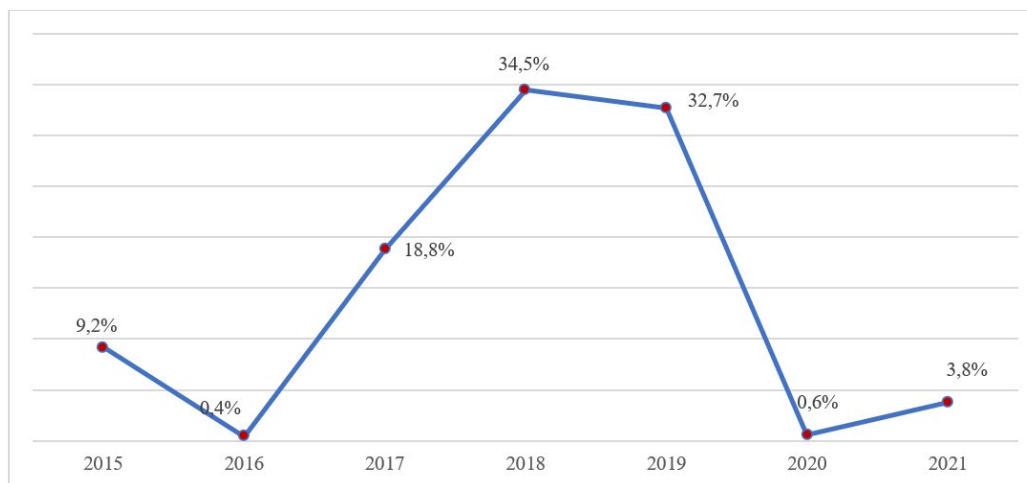
During these months, Venezuela experienced a multi-faceted crisis that motivated a massive migration of its citizens. That country faced a difficult economic situation, with hyperinflation of 9585.49% in 2019 (Instituto de Investigaciones Económicas y Sociales de la Universidad Católica Andrés Bello [IIES-UCAB], 2022), food and medicine shortages, and a generalized loss of purchasing power. In addition, political instability and tensions between the government and the opposition generated a climate of uncertainty and violence. Protests were repressed by security forces, leading to security and civil rights concerns. The collapse of public services and the lack of employment and opportunities also affected the quality of life of Venezuelans. Faced with this situation, many citizens have decided to seek Refuge in other countries, including Colombia.

Throughout the period analyzed, from June 2020 to January 2021, specific stability in migration growth rates was observed, remaining around 1.3% for the city and 2.6% for the department of Arauca. The COVID-19 pandemic played a notorious role, as travel restrictions,

border closures, and confinement measures globally limited the mobility of people, including migrants. From August 2021 onwards, there was a change in growth trends. In this period, growth rates in the city of Arauca decreased to 1%, while in the department, they decreased to 1.8%, different from the rest of Colombia, where for that period of time, a rebound in the arrival of the Venezuelan population was beginning to be registered.

Under this temporal perspective of the evolution and changes of the Venezuelan exodus to Arauca, the graph below shows the arrival of the migrant population to the settlement of El Refugio between 2015 and 2021. In 2015, 9.2% of migrants arrived at the settlement. This year, Venezuela was already immersed in an economic crisis characterized by high inflation levels and food and basic goods shortages. Social discontent manifested itself through protests and conflicts. In contrast, 2016 showed the lowest growth, with only 0.4%. This figure reveals a drastic decrease in migrant arrivals compared to the immediately preceding year, suggesting a reduction in migration flows to the settlement during that period. Figure 2 below illustrates the annual variations in the percentage of migrants arriving at this settlement during the period between 2015 and 2021.

Figure 2. The arrival of the migrant population to the El Refugio settlement between 2015 and 2021.



Source: own elaboration (2023).

In 2017, there was a rebound in the arrival of the migrant population, reaching a growth of 18.8%. This year, the political crisis intensified with the convening of the National Constituent Assembly. The opposition and much of the international community widely questioned and rejected this process. This increased political polarization and tensions in Venezuela. The growth trend continued in 2018, with a marked increase of 34.5% in the arrival of migrants to the El Refugio settlement. This year represented one of the periods with the highest growth, reflecting a massive exodus to Arauca. This year was characterized by rampant hyperinflation, which drastically affected the purchasing power of Venezuelans and exacerbated the economic crisis.

Migration from Venezuela increased in this context as many citizens sought economic stability and opportunities abroad.

The year 2019 maintained a high growth rate of 32.7%, indicating that the arrival of the migrant population to the El Refugio settlement remained significant and constant in that period. In Venezuela, the political crisis became even more acute with the emergence of two parallel presidencies. This political conflict exacerbated the situation and led to an intensification of protests and repression. In 2020, a drastic decrease in growth was once again evident, with only a 0.6% increase in migrant arrivals to the Refuge. This decline is related to the COVID-19 pandemic, which affected mobility and migration flows. Despite travel restrictions, Venezuelan migration persisted, with many citizens fleeing to other countries in search of better living conditions and opportunities.

Finally, in 2021, a slight growth of 3.8% was observed, although it was still below the growth rates experienced in previous years. One reason for this resumption is the relaxation of sanitary measures by COVID-19. With the reduction of restrictions and the easing of confinement measures, people's movement was facilitated. This created a window of opportunity for Venezuelan migrants to resume or increase their migration plans to Colombia.

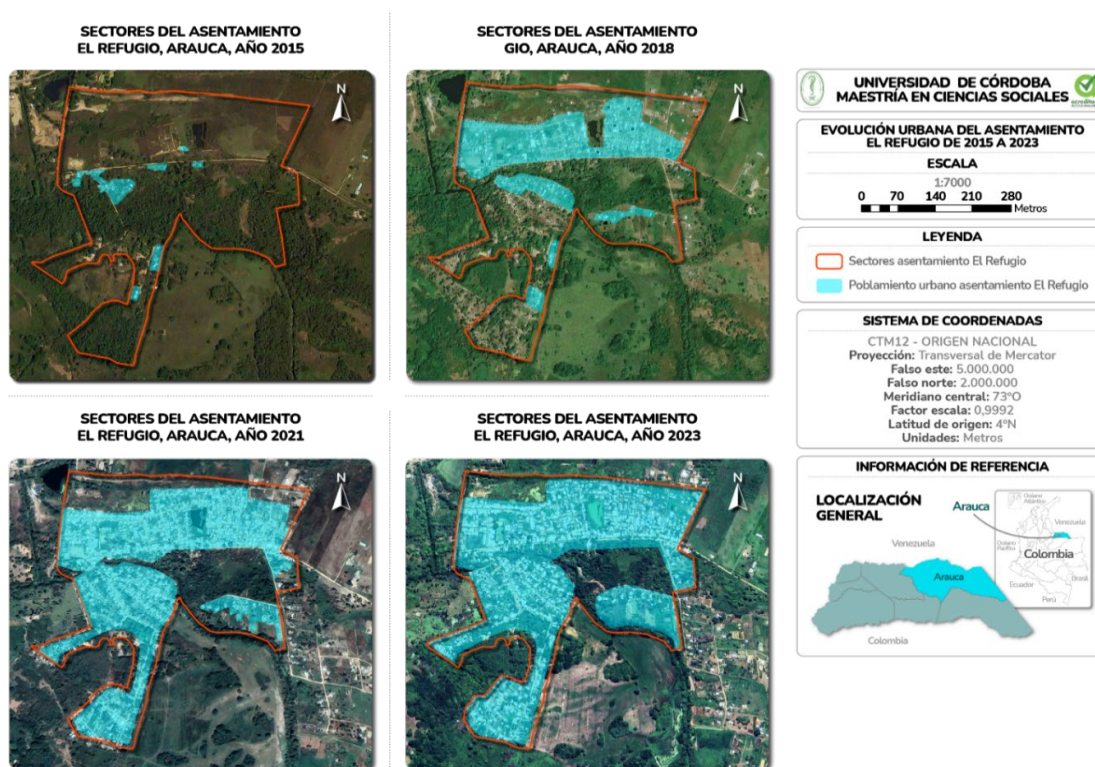
The above provides a vision of the impact of Venezuelan migration in Arauca between 2015 and 2023, both locally and in the national context. These migratory phenomena are connected to the fourth and fifth migratory waves identified by Hoyos-Mendoza (2024, pp. 22-23). According to the author, between 2016 and October 2022, the number of Venezuelan migrants in Colombia increased from 53,747 to 2,894,593, representing an increase of more than 5,280%.

3.2 Socio-spatial and demographic transformation of the El Refugio Settlement

The use and development of cartographic information below clearly show how the influx of Venezuelan migrants has resulted in changes in the territorial configuration. The El Refugio settlement has experienced an increase in its demographic density from 2015 to the present, with areas that were initially unoccupied now being occupied by new residents, including victims of the conflict, host population, and, therefore, migrants. Likewise, a dispersion of the population is observed towards previously less populated sectors where Venezuelan migrant communities have been established. This analysis provides a perspective on how migration has influenced the human geography of the city of Arauca, allowing for a better understanding of the challenges and opportunities that arise as a result of this ongoing migratory phenomenon. Below, Figure 3 presents a map showing significant changes in the structure and expansion of the settlement in the years 2015, 2018, 2021, and 2023, evidencing the rapid growth and transformation of El Refugio.



Figure 3. Transformation of El Refugio: Urban evolution of the settlement from 2015-2023.



Source: own elaboration (2023).

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In addition to the above, during the period between 2015 and 2023, the El Refugio settlement continued to experience multiple changes, among them related to the population structure, reflected in the number of households in each of its sectors. According to primary data collected directly in the field, in 2015, a total of 108 households were counted in the settlement, while by 2023, this number increased significantly to 1,248 households, i.e., in 9 years, the increase in households was over 1,000%, as evidenced in Table 2. g

Table 2. Number of households by sector in the El Refugio settlement between 2015-2023.

| Sectors of El Refugio | 2015 | 2017 | 2019 | 2021 | 2023 |
|-----------------------|------|------|------|------|------|
| April 20 | 2 | 115 | 214 | 308 | 336 |
| Llano Alto | 62 | 81 | 151 | 286 | 312 |
| Javillos | * | 63 | 99 | 142 | 148 |
| La Paz | 19 | 36 | 61 | 78 | 83 |
| San Jose | * | * | * | 66 | 82 |
| Cinaruco | 13 | 24 | 51 | 62 | 75 |
| Los Naranjos | 5 | 32 | 68 | 69 | 73 |
| Villa Linda | * | * | * | 51 | 64 |
| Las Parcelas | 7 | 31 | 34 | 45 | 48 |

| | | | | | |
|------------------------|------------------------------------|-----|-----|-------|-------|
| Indigenous reservation | * | * | * | * | 27 |
| TOTAL | 108 | 382 | 678 | 1.107 | 1.248 |
| * | Sectors that had not been created. | | | | |

Source: own elaboration (2023).

Among the different sectors of El Refugio, varied demographic dynamics were observed. For example, the 20 de abril sector showed pronounced growth, increasing from just 2 households in 2015 to 336 households in 2023, representing a percentage increase of 16,700%. This particular area experienced accelerated urbanization. Another sector that experienced notable growth was Llano Alto, with an increase from 62 households in 2015 to 312 households in 2023, representing a percentage increase of 403.2%. This sector also experienced a considerable increase in housing and services demand during the studied period.

Sectors such as Javillos, San José, Villa Linda, and Resguardo indígena did not present data available in 2015, so their creation and start of housing construction was after the year indicated, even the creation of San José and Villa Linda occurred in 2020, and the sector of Resguardo indígena in 2023. The case of the Los Naranjos sector also stands out, which experienced growth in percentage terms, going from 5 households in 2015 to 73 households in 2023, representing a percentage increase of 1,360%. This rapid growth indicates a strong urbanization dynamic in that particular area.

The presence of the migrant population in the El Refugio settlement and its surroundings has spurred a flourishing of commercial enterprises and services designed specifically to meet the demands and needs of this growing community. One of the sectors that has experienced strong development is that of stores and businesses specializing in typical Venezuelan food and products. These establishments offer a variety of products that remind migrants of their culture and traditions, allowing them to feel more connected to their roots and facilitating adaptation to their new life in an environment different from that of their country of origin. The emergence of these commercial ventures and specialized services has not only enriched the local supply. However, it has also generated employment opportunities for the migrants and local community members who have decided to participate in these entrepreneurial initiatives. This has contributed to the economic and social integration of migrants, fostering collaboration and mutual understanding among the different communities present in and around the settlement.

However, it should be noted that challenges have also been associated with this commercial boom and the rapid expansion of settlement. Competition among businesses, mainly those catering to a specific market, such as Venezuelan food and products, has led to market saturation and, in some cases, a need for more sustainability for certain ventures, even for local people's own small businesses and enterprises.

As in trade, the availability of an additional labor force has also boosted sectors such as agriculture and construction, contributing to the region's economic growth. With the arrival of the Venezuelan population, one of the sectors that has benefited the most is agriculture, as the availability of more workers helps increase agricultural production and improve efficiency in the harvesting and cultivation of local products. According to figures from the Colombian agricultural sector information and communication network (Agronet) of the Ministry of Agriculture (2023), cocoa yields in the city of Arauca have experienced an increase in recent years. In 2018, a yield of 0.60 tons per hectare was recorded, remaining at that level since 2015. However, in 2019, this yield increased to 0.82 tons per hectare and has continued above 0.80 tons per hectare in 2020 and 2021.

As for banana cultivation, the harvested area has experienced remarkable growth. In 2017, 289.5 hectares of plantains were cultivated, but this number increased significantly to 800 hectares in 2020, registering a progressive increase in 2018 and 2019. Papaya and pineapple are crops that had not previously been harvested in the city of Arauca. In 2016, no production of either of these fruits was recorded, but by 2021, 14 hectares of papaya and 25 hectares of pineapple were harvested. Finally, the cassava crop has also experienced an increase in the area planted. In 2015, 450 hectares of cassava were cultivated, and this figure increased to 710 hectares in 2021.

Migrant participation in this area has revitalized agricultural activity and contributed to income generation for farmers and farm workers. In addition, the construction sector has experienced a key boost from the additional labor available. It has served housing construction, infrastructure, and commercial projects the growing demand for labor has served.

According to the Arauca Chamber of Commerce, cited by Colombia Joven (2022), the business sector experienced an increase in registrations and registration updates, mainly for micro businesses related to food and beverage services, retail trade, food production, clothing, vehicle maintenance, and repair, among others (p. 1). For example in 2019, 50 ventures were registered and financed with USAID resources (Cámara de Comercio de Arauca, 2020). One aspect to highlight is that this boost in workforce and entrepreneurship has benefited the specific sectors mentioned and has a positive effect on the local economy.

On the negative side, however, the increase in labor supply due to Venezuelan migration has generated a competitive situation in the labor market, especially in areas where migrants and local workers compete for similar jobs. According to information obtained in the field, this competition has led to downward pressure on wages and working conditions as employers take advantage of the availability of workers to reduce costs and maximize profits.

As of 2023, the daily value of day labor is in the range of 40 to 45 thousand Colombian pesos. However, this figure is decreasing due to the abovementioned situation, reaching between 30 and 35 thousand pesos. In the case of Venezuelan workers, some employers are reducing daily

wages even further, reaching levels of 25 to 30 thousand Colombian pesos. As a result, some local workers feel that their employment opportunities and working conditions have been negatively affected by the presence of migrants willing to accept lower wages. This situation generates tensions and discontent in the Arauca community, as local workers have perceived migrants as a threat to their job stability and income.

Venezuelan migration has had a substantial impact on the urban infrastructure of the El Refugio settlement and its surroundings. The increase in population due to the arrival of new migrants has generated a growing demand for housing and essential services, prompting the construction of new improvised housing without urban regulation and construction permits in sectors of settlements and depressed areas. The need to house the growing migrant population has led to the creation of new neighborhoods and sectors, such as those already mentioned at the beginning of this chapter, some of which have emerged spontaneously as informal settlements. However, these improvised dwellings provide a place of residence for migrants; 100% lack adequate basic infrastructure, such as access to drinking water and sewage, which poses challenges to the quality of life and well-being of those living there.

The expansion of the settlement into previously unoccupied areas has also generated transformations in the urban structure of the area. New neighborhoods and frequently built sectors have been formed, which has modified the morphology and dynamics of the city. These changes in urban infrastructure are both positive and negative. On the one hand, the growth of new neighborhoods and sectors brings with it the development of new infrastructure, such as access roads, parks, and community centers, which would improve the inhabitants' quality of life. On the other hand, rapid and disorganized expansion also leads to problems of road congestion, saturation of public services, and the need for more planning in urban development.

This accelerated expansion of the El Refugio settlement and some sectors in Arauca also has environmental implications. The construction of new housing and urban growth affects local ecosystems and the use and availability of natural resources such as water and land. Proper urban planning and collaboration between local authorities, international cooperation organizations, and the community at large are essential to address these dynamics. In addition, it is important to ensure that urban development is sustainable, inclusive, and environmentally friendly. The creation of policies that promote access to adequate housing, basic services, and employment opportunities for migrants is essential to achieve effective integration and harmonious coexistence between the different communities present in the settlement and the city of Arauca.

Proper land use planning has also become essential to avoid disorganized and chaotic development. Zones for housing, commerce, green areas, and services must be defined to promote balanced urban development and avoid land use conflicts. Territorial planning must also consider the protection of natural areas and environmental sustainability, avoiding negative impacts on the environment and encouraging the responsible use of natural resources.

The accelerated growth of the El Refugio settlement has generated a worrisome environmental impact. Deforestation, loss of natural habitats, and overexploitation of natural resources threaten the environmental sustainability of the city of Arauca, requiring a responsible approach to urban planning and development. With settlement expansion into previously unoccupied areas, trees have been cut down, and green areas have been eliminated to make way for new construction and improvised housing. This deforestation has irreversible consequences for local biodiversity, affecting the native fauna and flora that depend on these habitats for their survival.

In addition, urbanization and infrastructure construction lead to the degradation and fragmentation of natural ecosystems. Biological corridors and conservation areas are disrupted, hindering the flow of species and reducing their ability to adapt to climate change and other environmental disturbances. The loss of green areas also increases local temperatures and contributes to the urban heat island phenomenon, affecting air quality and the health of residents. Another environmental impact of concern is the overexploitation of natural resources. The rapid expansion of settlement increases the demand for resources such as water and soil, leading to unsustainable exploitation of these resources and their long-term depletion. In addition, population growth results in increased energy consumption and waste generation, which requires proper waste management and a transition to more sustainable and environmentally friendly practices.

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Although the *Arauca Municipal Development Plan 2020-2023* (Alcaldía de Arauca, 2020) and the *Basic Land Use Plan 2015* (Alcaldía de Arauca, 2015) address sustainable environmental development approaches in the area where the El Refugio settlement is located, both plans ignore the growing problem of unplanned urbanization that was being generated as a result of Venezuelan migration in Colombia. For example, Arauca's development plan does not include any programs or projects aimed at the urban and environmental development of this area; in other words, for the municipal administration, this populated sector within Arauca's urban environment seems to go unnoticed as for the Arauca 2015 Basic Land Use Plan (PBOT), the only reference to the area of El Refugio is that it is considered inappropriate for any construction, whether road, residential, entertainment, commercial, or industrial. Instead, the PBOT highlights its value in the preservation of the natural environment and the surrounding ecosystem (Acuerdo 200.02.013 de 2015) and needs to consider the problem of unplanned urbanization adequately.

To address these challenges, responsible and sustainable urban planning must be implemented. Development strategies that promote the conservation of green areas and natural habitats and the restoration of degraded areas should be considered. Creating protected areas and biological corridors helps preserve local biodiversity and ensure connectivity between ecosystems. In addition, it is essential to promote sustainable construction and urbanization practices that minimize environmental impact; however, since this is an institutional issue, the



environmental authority (Corporación Autónoma Regional de la Orinoquia - Corporinoquia) has turned its back on this problem.

For this reason, the presence of Corporinoquia in the El Refugio settlement is key, in order to work in coordination with the community on issues related to environmental education and awareness of the importance of conservation and responsible use of natural resources, key to promoting a culture of respect and care for the environment, especially for the environmental wealth of this area, such as the lagoon that is in the middle of the April 20 sector, the Llano Alto stream and other flood zones of Las Parcelas.

Access to health services is a critical aspect that has been impacted by Venezuelan migration in the city of Arauca. The increase in population due to the arrival of migrants has put additional pressure on existing health systems, creating challenges in terms of capacity and resources, especially for the public health network. Based on the right to health, it must be guaranteed that all residents of Arauca, migrants, and the local population have equitable access to health services without barriers, especially in emergency services. However, to achieve this, it is essential to strengthen and expand infrastructure and resources in healthcare facilities, including the San Vicente de Arauca Hospital, health centers, and clinics, in order to meet the growing demand for healthcare. In addition, the need for collaboration between government agencies and international cooperation organizations is critical. Thus, coordination of efforts and resources would help effectively address the additional demands migration has placed on health systems and ensure that everyone has access to quality and dignified health services.

In terms of health, the El Refugio settlement is in a complex situation due to its status as an informal urbanization and the need for proper legalization of its land. As a result, it lacks any health infrastructure to attend to the needs of its population. To supply this care, the settlement relies heavily on the ESE Hospital San Vicente de Arauca, which provides essential hospital services, and on international cooperation organizations that carry out health brigades, especially for pregnant women, women of reproductive age, and children.

Venezuelan migration has also generated challenges in access to education, especially for migrant children and youth seeking to integrate into Arauca's educational system. The assistance of cooperation organizations has been essential to guarantee the adequate provision of educational services amid the migration emergency. In addition, migration generates traumatic experiences and emotional stress, and having psychological support services helps to mitigate the adverse effects and facilitate the adaptation and resilience of migrants in their new environment, especially in education. There is also no educational infrastructure at any level in El Refugio. Despite the high number of school-age children and adolescents identified in the population characterization, the possibility of establishing an educational center is hindered by the lack of legal regularization of the land where the settlement is located.

4. Conclusions

Venezuelan migration in the city of Arauca has triggered a series of socio-spatial and demographic transformations. This phenomenon has been evidenced by the rapid growth of the migrant population and the consequent urban transformation of the territory, with the formation of informal settlements such as El Refugio and the emergence of new peri-urban neighborhoods. Venezuela's economic, political, and social crisis, exacerbated by hyperinflation, food and medicine shortages, and institutional instability, has been the main driver of this exodus.

Despite the restrictions imposed at the time of the COVID-19 pandemic, the population exodus persisted, albeit at fluctuating rates due to health conditions and mobility policies. However, with the relaxation of the measures, a resumption of migration growth was observed in 2021. This situation has posed challenges in terms of integration and access to essential services for the migrant population, putting pressure on local infrastructure and resources. Therefore, responsible urban and territorial planning is needed to address the needs of this population, ensuring their integration and the sustainable development of the city of Arauca.

In addition, the increase in the migrant population has stimulated economic growth by flourishing commercial ventures and boosting sectors such as agriculture and construction. However, it has also generated competition in the labor market and challenges in terms of wages and working conditions for local workers. In terms of health and education, migration has put pressure on systems, requiring an expansion and strengthening of the infrastructure and resources available to ensure equitable access to these services.

At the environmental level, the accelerated expansion of the El Refugio settlement has raised concerns about deforestation, loss of natural habitats, and overexploitation of natural resources. This points to the need for adequate urban and environmental planning to mitigate these impacts, promote sustainable urban development and environmental conservation practices, and foster collaboration between local authorities, international cooperation organizations, and the community at large to effectively address these challenges.

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