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Ciudad Constitución: Urban utopia and sustainability in the peruvian Amazon

Ciudad Constitución: Utopía urbana y sostenibilidad en la Amazonía peruana

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ABSTRACT Ciudad Constitución was founded in 1984 as part of the Special Project Pichis-Palcazú, conceived by the Peruvian State to integrate the Amazon through infrastructure, directed colonization, and new economic dynamics. The study evaluated urban sustainability over four decades by analyzing documentary records, expert opinions, and selected demographic, socioeconomic, and physical-environmental indicators. The Analytic Hierarchy Process (AHP) was applied to construct a sustainability ranking considering conflicting objectives. Three stages of urban evolution (foundational, intermediate, and current) were compared against the objectives of the original plan. Although informal urban growth, low population density, increasing deforestation, and social vulnerability are evident, the city shows positive indicators: sustained population growth, a proportion of urban population that shows its temporal persistence, a reduction in poverty rates, and improvement in the Human Development Index. To enhance its sustainability, the city requires greater attention from the State, under a renewed approach of citizen participation and interculturality.

RESUMEN Ciudad Constitución fue fundada en 1984 como parte del Proyecto Especial Pichis-Palcazú, concebido por el Estado peruano para integrar la Amazonía mediante infraestructura, colonización dirigida y nuevas dinámicas económicas. El estudio evaluó la sostenibilidad urbana en cuatro décadas, analizando registros documentales, indicadores demográficos, socioeconómicos y físico-ambientales, y opiniones de expertos. Se utilizó el Proceso de Análisis Jerárquico (AHP) para construir un ranking de la sostenibilidad donde se compararon tres etapas de la evolución urbana (fundacional, intermedia y actual), frente a los objetivos del plan original. Aunque se evidencia crecimiento urbano informal, baja densidad poblacional, deforestación creciente y vulnerabilidad social, la ciudad presenta indicadores positivos: crecimiento poblacional sostenido, una proporción de población urbana que muestra su persistencia temporal, reducción del porcentaje de pobreza y mejoría del Índice de Desarrollo Humano. Para mejorar su sostenibilidad, la ciudad merece mayor atención del Estado, bajo un enfoque renovado de participación ciudadana e interculturalidad.

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PALABRAS CLAVE sostenibilidad urbana, nuevas ciudades, proceso de análisis jerárquico (AHP), proyecto especial Pichis-Palcazú, Amazonía



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1. Introduction

Ciudad Constitución was founded in 1984 during Fernando Belaúnde Terry's second term in office, as part of a government plan to settle the Peruvian rainforest (Chacón, 2023). Although it did not become a model of sustainable urban development, it remains a key case study for analyzing the limits of developmentalism and urban sustainability in the Amazon.

In the early 20th century, the creation of new cities to decentralize capital cities became widespread in Europe and North America, inspired by the Garden City and New Towns movements (Hall, 2002). These ideas were replicated in Latin America in the 1950s and 1960s, with examples such as Brasília in Brazil, designed by Lucio Costa (Gorelik, 2021), and Ciudad Guayana in Venezuela, developed by the Joint Center for Urban Studies (Massachusetts Institute of Technology and Harvard University) and the Venezuelan Corporation of Guayana (Rots and Fernández-Maldonado, 2019), under the promise of integrating economic growth, modernization, and territorial control. Ciudad Constitución is a later iteration of these "*New Towns*," where Belaúnde's modernizing vision combined urban planning with national integration.

Mid-20th-century Latin American new-city planning responded to rapid urbanization, decentralization policies, and import-substitution strategies. Beginning in the 1970s, these policies evolved toward a centralist spatial planning framework, characteristic of the Latin American structuralist paradigm developed within ECLAC by authors such as Raúl Prebisch and Celso Furtado, which emphasized the need to overcome center-periphery relations through strategies of industrialization, strengthening the domestic market, and territorial integration (Boisier, 2005). In this context, directed colonization and the occupation of peripheral territories were conceived as instruments for promoting regional development.

Brasília, in Brazil, was conceived as a new federal capital based on modernist principles (Gorelik, 2021); Ciudad Guayana, in Venezuela, was promoted as an industrial and regional development hub (Rots and Fernández-Maldonado, 2019), while Ciudad del Este, in Paraguay, was conceived under various names to secure a new river outlet to the Atlantic, as an international trade hub in the Triple Frontier (Argentina, Brazil, and Paraguay), and as an urban support center during the construction of the Itaipú Dam. These three cases share with Ciudad Constitución their origins as strategic projects for territorial integration and economic growth.

However, these four cities trajectories differ significantly. By 2025, Brasília will have a population of around three million and has established itself as a political and administrative center with high levels of public investment. Ciudad Guayana has a population of over 800,000 and serves as a major industrial hub for basic industries and hydroelectric power generation. At the same time, Ciudad del Este is Paraguay's second-largest city, with a highly dynamic commercial sector and an urban agglomeration exceeding 500,000 inhabitants when the urban areas of Foz do Iguaçu (Brazil) and Puerto Iguazú (Argentina) are included. In contrast, Ciudad Constitución has not yet met its projected growth target of 20,000 residents and is characterized by a weak state presence, diffuse urban-rural expansion, and pressures on fragile ecosystems.

The Pichis-Palcazú Special Project (PEPP), promoted by Ciudad Constitución, proposed a model of directed colonization that sought to integrate the Peruvian Amazon into the national economy through infrastructure, planned settlements, and agribusiness (PCM, 1981). Four decades later, the PEPP remains in effect within the Ministry of Agrarian Development and Irrigation, demonstrating the persistence of an approach to Amazonian integration.

Various authors have questioned the developmentalist and ethically problematic nature of this vision, which conceived of the rainforest as an empty territory to be incorporated into the nation-state (Doroujeanni et al., 2021). This approach not only shaped an extractive view of the Amazonian territory but also led to unsustainable patterns of land occupation and consumption.

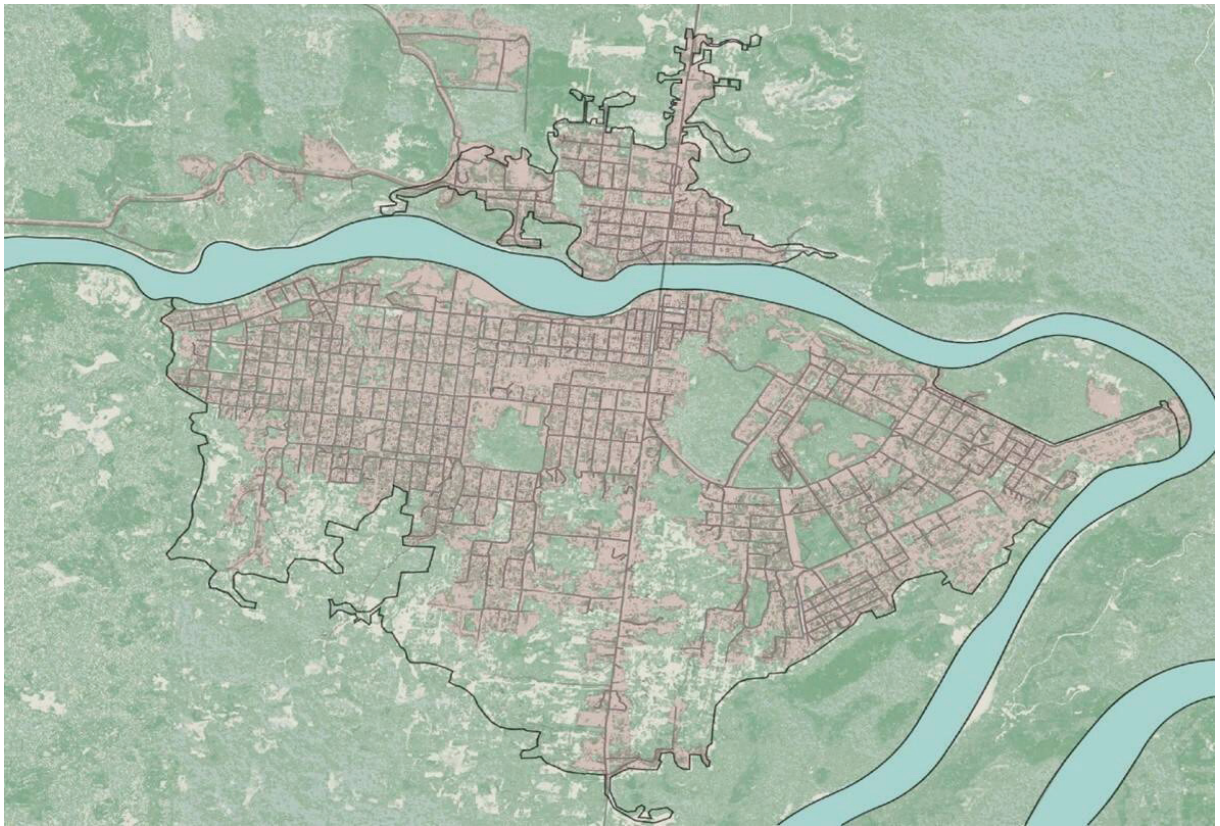


Figure 1: Study area, urban zone of the Constitución district. (2025)

The Peruvian Amazon, which covers 60% of the country's territory, constitutes a diverse and fragile socio-ecological system (Vergara and Figallo, 2014; CEPLAN, 2020). Its cities face informal expansion, extractive pressure, and accelerated deforestation, compromising ecosystems and local ways of life (Moschella, 2023; Salazar Valdivia and Florián Lozano, 2022). Assessing the sustainability of Ciudad Constitución allows for a critical examination of the success or failure of centralist models in the face of environmental, cultural, and economic challenges.

Setting aside arguments for and against, it is worth asking: Was Ciudad Constitución a utopia? Or, on the contrary, is it a sustainable city? This study addresses a theoretical and empirical gap: the scarcity of evidence on Ciudad Constitución's sustainability performance. The study proposes to analyze how the demographic, socioeconomic, and physical-environmental dimensions have evolved from 1984 to 2024. The scale of analysis is intra-urban and district-level, based on census, socioeconomic, and satellite indicators.

In this study, urban sustainability is understood as a multidimensional concept that integrates demographic dynamics, socioeconomic conditions, and physical-environmental processes within the territory (Hiremath et al., 2013; Anguelovski et al., 2020).

From the perspective of urban political ecology (Hädrich et al., 2024), these spaces are understood as hybrid frontiers where extractive logics, colonization, and local resistance converge. Likewise, decolonial planning approaches (Escobar, 2010; Gudynas and Carpio, 2024) recognize the need to rethink the categories of development and sustainability. Thus, the assessment of Ciudad Constitución goes beyond measuring indicators, proposing a critical analysis of the validity of development paradigms and their compatibility with contemporary Amazonian sustainability agendas.

The analysis presented here does not exhaust the subject. Many indicators warrant evaluation to determine the urban sustainability of Ciudad Constitución, such as the potential displacement of indigenous groups, changes in lifestyles and the cost of living, the emergence of illegal economies and rising crime rates, damage to ecosystems resulting from deforestation, the expansion of the agricultural frontier and the introduction of invasive species, the use of renewable energy, water consumption and the treatment and reuse of wastewater, solid waste recycling, sustainable construction practices, the fulfillment of housing needs, the effects of mobility on the expansion of the urban sprawl, greenhouse gas emissions, noise levels, and heat islands, among others.

2. Methods

Given the exploratory nature of the research and the limitations of available information, the indicators used do not comprehensively measure urban sustainability; instead, they serve as proxies to assess trends and compare them with the goals of the original Project. Here, the approach centers on the objectives that guided the city's founding, which involves a temporal analysis spanning several decades that relies on secondary data and satellite imagery. This exploratory study examines a rarely studied case and aims to challenge the paradigm of creating new Amazonian cities.

Within this framework, the study analyzes the urban sustainability of Ciudad Constitución using quantitative and qualitative indicators, integrated through a multi-criteria approach, such as the Analytic Hierarchy Process (AHP).

The Analytic Hierarchy Process (AHP) developed by Saaty (1990) is a flexible technique that allows for the analysis of alternatives and the ranking of conflicting objectives, and has been applied in several studies to analyze urban sustainability, combining expert opinions and numerical indicators—systematized using the Delphi method and AHP—to validate socio-environmental and governance indicators (Zhao et al., 2023), and to evaluate the sustainability of urban infrastructure by integrating energy efficiency and environmental protection (Jiang et al., 2025).

This research seeks to answer three questions: In the Pichis-Palcazú Special Project (PEPP), what demographic, socioeconomic, and physical-environmental objectives guided the creation of Ciudad Constitución? Forty years after its founding, have these objectives been met? Finally, under what conditions would it be advisable to revitalize the urban growth and development of Ciudad Constitución? The research was exploratory and descriptive, using a mixed-methods approach that combines qualitative and quantitative data and draws on data, testimonies, and previous studies.

Qualitative data:

- Testimonies from specialists involved in the design and oversight of the PEPP and the founding of Ciudad Constitución.
- A literature review of technical reports, monographs, and research related to the PEPP and Ciudad Constitución.

Quantitative data:

- Demographic indicators (geometric growth rate, population size, and population density), based on national censuses from 1982, 1993, 2007, and 2017.
- Socioeconomic indicators (Human Development Index, unemployment rate, poverty rate), based on previous research from 2000, 2007, and 2017.

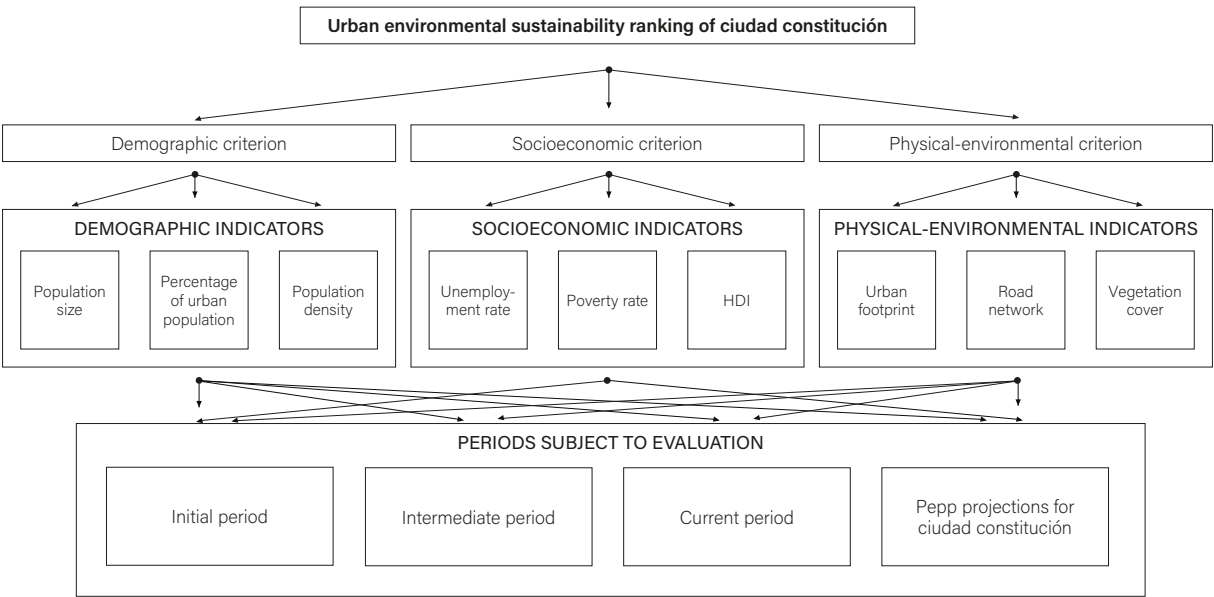


Figure 2: Hierarchical model for establishing a sustainability ranking for Ciudad Constitución. Model based on SuperDecisions (Creative Decisions Foundation, 2025).

- Physical and environmental indicators (urban sprawl, urban road network, and changes in land cover) for the years 2005, 2015, and 2024.
- Analysis of Urban Sustainability in Ciudad Constitución Based on Demographic, Socioeconomic, and Physical-Environmental Data, Using the Hierarchical Analysis Process (AHP).

The spatial scope of the research covers the urban area of the Constitución district, located in the Oxapampa province of the Pasco department in Peru, as shown in Figure 1.

The Analytic Hierarchy Process (AHP) made it possible to rank the sustainability of Ciudad Constitución by comparing three stages of its development with the original plan, using the specified indicators through pairwise comparisons, as shown in Figure 2.

The first level summarizes urban environmental sustainability. The second level specifies the three evaluation criteria: demographic, socioeconomic, and physical-environmental. The third level lists the indicators for each criterion: Based on these criteria and subcriteria, four stages in the city's development were evaluated:

- Initial period, indicators recorded between 1995 and 2005.
- Maturation period, indicators recorded between 2005 and 2015
- Consolidation period: indicators recorded between 2015 and 2024.
- Ideal scenario: objectives pursued by the Pichis-Palcazú Project.

Three premises were considered. The first is that the three criteria and their subcriteria have equal weight or relative importance. The second is that the demographic and socioeconomic criteria are considered equally important, but four times more relevant than the physical-environmental criterion. The third is that the physical-environmental criterion is four times more important than the other two criteria, which have the same relative importance. In all three assumptions, the inconsistency index (IC) is equal to 0.

Since this was an exploratory study, the procedure was based on the unanimous judgment of the researchers, without incorporating external evaluations. Although the participation of experts could provide different weightings and enrich the analysis, the objective was to explore the effects of applying contrasting scores under three premises:

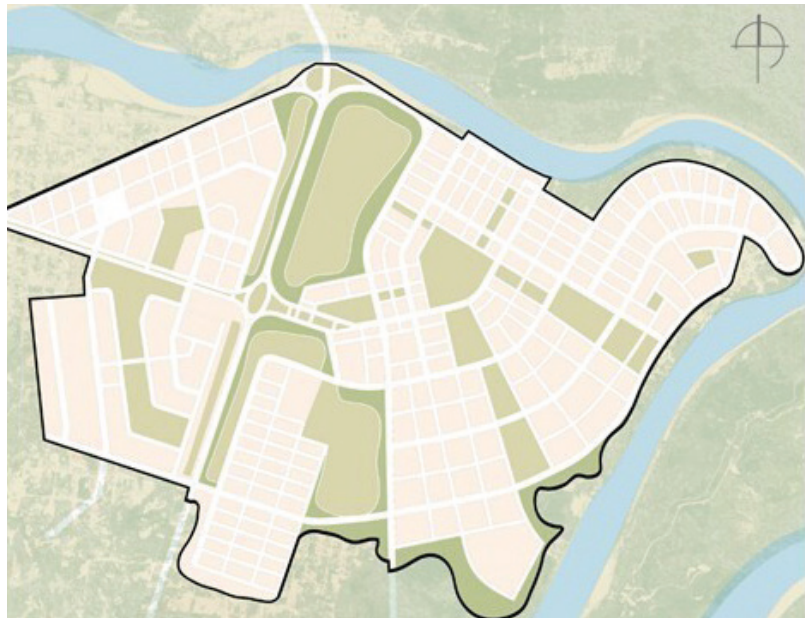


Figure 3: Urban Plan for Ciudad Constitución, based on Julio Gianella's winning proposal. (2025) based on Chacón (2023)

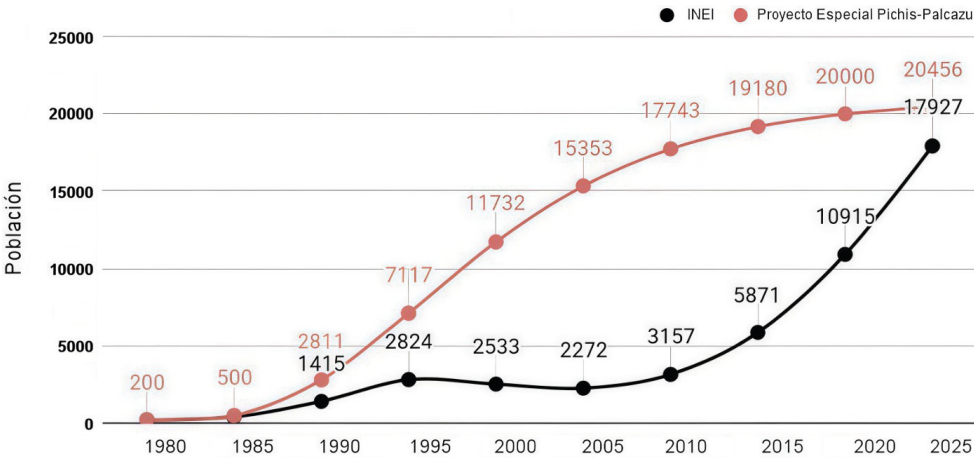


Figure 4: Population growth estimates for Ciudad Constitución, based on PEPP projections and INEI data. (2025)

3. Results

3.1. Premises underlying the founding of Ciudad Constitución

Testimony of Gladys Vásquez (2024):

In the 1980s, Vilma Gladys Vásquez Prada participated in the Pichis-Palcazú Project, which was linked to the founding of Ciudad Constitución, and wrote her doctoral dissertation on the policy of Latin American physical integration and the Marginal Highway of the Jungle (Vásquez, 2023). According to her testimony, the highway was conceived with a centralist vision to incorporate Amazonian areas into national production, address socioeconomic problems, and overcome the weak regional infrastructure that limited Latin American integration.

The plan to colonize “empty” areas—through land subdivisions for Andean migrants selected by lottery, for silvopastoral and forestry purposes—did not take into account the integration of preexisting Indigenous communities. The settlers improved agricultural production, particularly rice, and identified new timber species, but they also introduced oil palm, which had negative environmental impacts.

The founding of Ciudad Constitución had a political dimension: President Fernando Belaúnde aspired to make it the country’s capital, as a symbol of the restoration of constitutional order following the enactment of the 1979 Political Constitution of Peru. However, according to Vásquez, this objective was more of a utopia than a realistic goal.

the first, with equal weighting among criteria; the second, with less weight assigned to physical-environmental indicators; and the third, with greater weight given to the latter. Various references on the use of the AHP indicate that judgments can be individual (Saaty, 2008; Vargas, 1990), provided that the criteria and scales used are clearly specified (Ishizaka and Siraj, 2020).

Three hypotheses were proposed:

- Hypothesis 1: The founding of Ciudad Constitución was guided by premises linked to certain paradigms that have become outdated over time.
- Hypothesis 2: It is possible to identify positive and negative aspects of Ciudad Constitución’s environmental sustainability by analyzing demographic, socioeconomic, and physical-environmental indicators.
- Hypothesis 3: The urban development of Ciudad Constitución remains viable and desirable under a more sustainable approach.

The use of the Hierarchical Analysis Process (AHP) in this study does not seek to determine the city’s level of sustainability in absolute terms, but rather to compare relative scenarios of its evolution over time under different weighting assumptions. In this regard, the results should be interpreted as an exploratory analytical tool that allows for the identification of trends and tensions among demographic, socioeconomic, and physical-environmental dimensions, rather than as a conclusive measure of urban sustainability.

Testimony of Manuel Villena (2024):

Between 1983 and 1985, Manuel Villena Mavila worked as an architectural specialist for the Cartagena Agreement, overseeing the construction of wooden homes in Ciudad Constitución. The colonization of the Amazon sought to secure the border with Brazil through settlements of Peruvian migrants. In this context, the Pichis Palcazú Special Project sought to formalize the local economy through agriculture and the provision of infrastructure and services.

The founding of Ciudad Constitución was based on an urban design competition won by architect Julio Gianella's team, which included specialists from various disciplines. The Cartagena Agreement spurred research into the use of wood in construction, based on vernacular typologies. The Belaúnde administration allocated funding for 100 homes in Ciudad Constitución, of which only 30 were built. The wooden homes proved suitable, and some still stand after four decades.

The change in government in 1985 interrupted the project, which lost its momentum and continuity. The influx of migrants was primarily linked to the construction of the bridge over the Palcazú River and the Marginal de la Selva highway. A large portion of the population settled in an unplanned area to the north, "Villa Cariño," which eventually became the most populous part of the town.

Ciudad Constitución, According to the Presidency of the Council of Ministers

According to the Presidency of the Council of Ministers of Peru (PCM), the Pichis Palcazú Special Project sought to reconcile two extremes: on the one hand, "short-term utilitarianism, based on current market demands," and on the other, "uncompromising protectionism of the Amazonian natural environment" (PCM, 1981).



Figure 5: Population distribution and density of Ciudad Constitución. Year 2017. (2025), based on 2017 INEI census data at the city-block level and on the urban area boundaries in Google Earth (2025)

Regarding projections for Ciudad Constitución, PCM studies anticipated that the urban population would grow from 200 inhabitants in 1985 to 20,000 inhabitants in 2010, while the rural population—described as “nonexistent” in 1985—was expected to grow to 30,000 inhabitants by 2010 (PCM, 1981). In terms of spatial extent, land use was estimated at 41 ha in 1985, and 575 ha were expected to be urbanized by 2010. In the rural area, the projected agricultural expansion was from 0 in 1985 to 145,750 ha in 2010.

To achieve these targets, Ciudad Constitución was to go through three stages: “Structuring,” “Development,” and “Consolidation” (PCM, 1981). These three stages were to result from the agro-silvo-forestry economic activity in its immediate surroundings and from the location of related economic activities that would be concentrated in the city.

There is a strong affinity between the approaches of the Pichis–Palcazú Special Project and the theory of development poles (Perroux, 1973). Ciudad Constitución was expected to achieve the following:

- Economic drivers: The key sectors driving development would be agriculture, livestock, forestry, and transportation.
- Assessment of economic growth and expansion: Local and sectoral GDP would need to grow compared to other areas in the region, and the employment growth rate should be higher, reflecting new job opportunities.
- Spillover and diffusion effects: Productive linkages should be established between agriculture, industry, commerce, and transportation.
- Infrastructure and Connectivity: Roads, waterways, the airport, and telecommunications should facilitate economic exchange.

Urban Planning of Ciudad Constitución

According to architect Carlos Chacón (2023), Ciudad Constitución was considered an “urban enclave in the heart of the jungle” and could have been the “new capital of Peru or the Peruvian Brasilia.” The urban design criteria were: connectivity with the Palcazú River; the inclusion of a civic center that reflects the city’s character and status; an industrial zone on the city’s outskirts; and respect for the Amazonian environment, integrating green spaces and natural forests into the urban area (Figure 3).

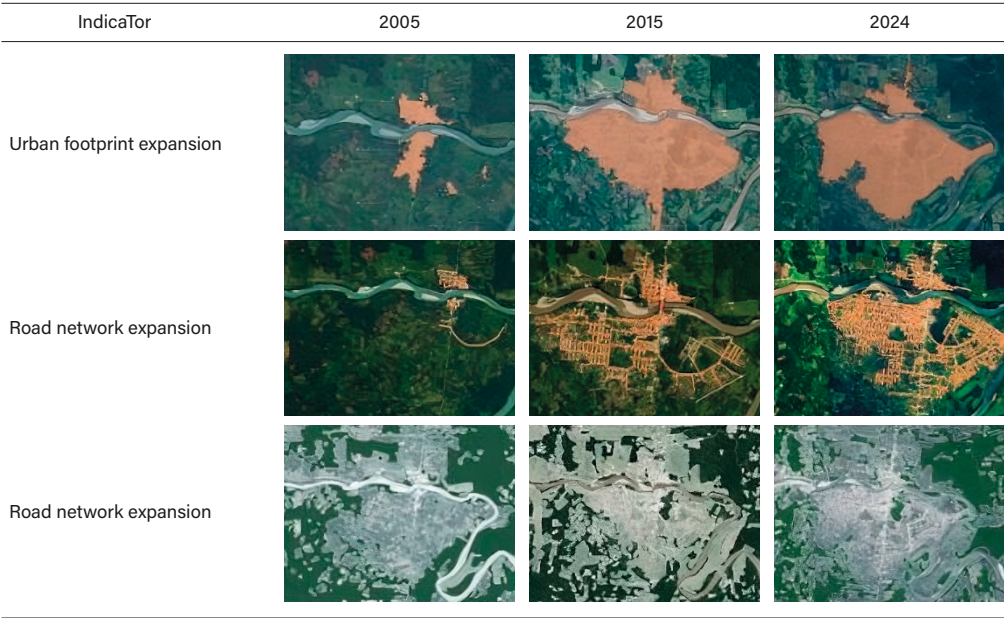


Figure 6: Growth of the urban area and the road network, and reduction of forested areas. Years 2005, 2015, 2024. (2025) based on Google Earth imagery (2025).

The assessment of the territory's characteristics included not only the landscape and topography but also the connection to the Marginal Highway and the bridge over the river. The land-use projection, covering an area of 350 hectares and a population of 21,270 inhabitants, primarily designated housing for exclusive residential use as well as mixed-use areas incorporating "vegetable gardens," commercial spaces, and a civic center.

In 2005, the 2005–2015 Urban Development Plan was formulated, recognizing the urban development north of the river—which today accounts for the largest concentration of the population but was not included in the original urban plan.

3.2. Demographic, socioeconomic, and physical-environmental indicators for Ciudad Constitución

Demographic Indicators

Regarding population size, the urban population figures for Ciudad Constitución for three time periods, based on interpolated census data from Peru's National Institute of Statistics and Informatics (INEI), are as follows:

- Year 1985: 417 inhabitants
- Year 2005: 2,272 inhabitants
- Year 2024: 17,927 inhabitants.

Estimates of the urban population size, based on the Pichis–Palcazú Special Project (PEPP) (PCM, 1981):

- 1985: 1,700 inhabitants
- Year 2005: 5,200 inhabitants
- Year 2024: 20,000 inhabitants.

The urban population has been approaching the final projection of 20,000 inhabitants forecast by the PEPP. When plotting the growth projections against census data (INEI) in Figure 4, it can be seen that both are approaching the 20,000-inhabitant threshold, but in different ways: the PEPP projected a decline upon reaching that threshold, whereas, if current growth trends continue, the city will exceed it.

Note: Five-year interpolation based on 1) Ciudad Constitución's double-exponential growth curve and 2) the intercensal geometric growth rate from INEI data.

Regarding the proportion of the urban population relative to the district's total population, the following table shows the percentage of the urban population based on INEI data:

- Year 1985: 24.3%
- Year 2007: 22.8%
- 2017: 55.2%.

Percentage of the urban population, according to the Pichis–Palcazú Special Project (PEPP) (PCM, 1981):

- 1985: 56.67%
- 2007: 52.31%
- Year 2017: 62.49%.

The data show that, starting in 2017, there has been a migration trend toward Ciudad Constitución, approaching the projections of the Pichis–Palcazú Special Project. A higher proportion of the urban population does not in itself imply an improvement in sustainability, but it is interpreted as an indicator of the consolidation of urban settlement over time.

Regarding the population density of Ciudad Constitución for different time periods, this is calculated by interpolating census data, dividing the population by the area of the urban footprint in hectares, as captured in *Google Earth* imagery for 2005 and 2024, and using the original urban area identified in the PEPP studies (PCM, 1981) for 1985:

- Year 1985: 417 inhabitants / 24 ha = 17.38 inhabitants/ha
- Year 2005: 2,272 inhabitants / 72.26 ha = 31.44 inhabitants/ha
- Year 2024: 17,927 inhabitants / 882.62 ha = 20.31 inhabitants/ha.

Population density according to PEPP (PCM, 1981):

- Year 1985: 1,700 people / 170 ha = 10 people/ha
- Year 2005: 5,200 people / 250 ha = 20.8 people/ha
- Year 2024: 20,000 inhabitants / 575 ha = 34.78 inhabitants/ha.

According to the PEPP, between 2005 and 2024, population density should have increased from 10 to nearly 35 inhabitants per hectare—which, for a new city, are low figures but consistent with the urban design. However, actual growth and distribution differed significantly from expectations. Figure 5 shows the distribution of the population across four major sectors, north and south of the Palcazú River.

Urban growth since 1985 has been haphazard, with population densities ranging from 17.38 inhabitants per hectare to 20.31 inhabitants per hectare—below the expected average for urban planning of 34.78 inhabitants per hectare. It is notable that the unplanned areas to the north concentrate the largest portion of the population, while to the south the city blocks are practically unpopulated, with densities below 10 inhabitants per hectare. Sector 2, which was not part of the original plan, has the highest density, at 41.28 inhabitants per hectare.

Socioeconomic Indicators

The Human Development Index (HDI) consists of three components: Educational Attainment, Life Expectancy at Birth, and Per Capita Income.

For the district of Constitución, this index showed a very slight increase from 2003 to 2017, standing in the latter year below that of the province of Oxapampa (0.3978), the department of Pasco (0.4607), and Peru (0.765). The HDI estimates, based on data from Peru's National Institute of Statistics and Informatics (INEI), are as follows:

- Year 2003: 0.2154
- Year 2010: 0.2535
- 2017: 0.3639.

No projections are available for the Pichis–Palcazú Special Project; however, by 2017, it should have reached at least the HDI of the Department of Pasco: 0.4607. The expected welfare goals for Ciudad Constitución have not yet been achieved

Meanwhile, the unemployment rate in Ciudad Constitución showed a slight decrease over the years, reaching 3.09% in 2017, with minimal variations during the period analyzed. When compared with data from larger municipalities—Oxapampa (2.63% in 2017), Pasco (6.5% in 2007 and 4.4% in 2019), and Peru (4.1% in 2017)—the unemployment situation in Ciudad Constitución is less unfavorable.

Unemployment rate, according to INEI data:

- Year 1993: 3.17%
- Year 2007: 3.12%
- Year 2017: 3.09%.

For comparison with the PEPP, it was assumed that the unemployment rate in Ciudad Constitución should have reached the lowest rate in the region—2.63%, recorded in the province of Oxapampa in 2017.

Finally, according to the INEI, the poverty rate has declined significantly over the decades, falling from 75.5% in 1985 to 12.05% in 2024. The 1985 poverty figure corresponds to the district of Puerto Bermúdez, the jurisdiction to which Ciudad Constitución belonged prior to 2010. This trend reflects a sustained improvement in socioeconomic conditions.

- Year 1985: 75.50%
- Year 2013: 68%
- Year 2018: 36.7%.

The decline in the poverty rate, although still low, is not believed to be related to the investments in agriculture, livestock, forestry, and transportation promoted by the original plan. For comparison with the PEPP, it was assumed that poverty in Ciudad Constitución should have reached the lowest rate in the region—21.30%, recorded in the province of Oxapampa in 2017.

Physical and Environmental Indicators

The satellite images in Figure 6 show the changes recorded at three points over a 20-year period: 2005, 2015, and 2024. The physical indicators reflect an expansion of both the initial urban area and the road network. With regard to forested areas, there is evidence of increasing deforestation adjacent to the city.

Urban land use in Ciudad Constitución has experienced continuous growth, driven by population growth. Between 2005 and 2015, the expansion was remarkable, reaching more than seven times its initial size in ten years.

- Year 2005: 72.26 ha
- Year 2015: 563.50 ha
- Year 2024: 801.67 ha.

Meanwhile, the PEPP's projections for urban sprawl were as follows (PCM, 1981):

- Year 2005: 170 ha
- Year 2015: 550 ha
- Year 2024: 575 ha.

Meanwhile, the road infrastructure in the Ciudad Constitución district experienced significant growth over time, which contributed to the expansion of the urban area, reaching 71.84 km by 2024.

- Year 2005: 5.04 km (26 roads)
- Year 2015: 69.19 km (157 roads)
- Year 2024: 71.84 km (274 roads).

To compare the road network length in Ciudad Constitución's urban planning, the road length was estimated based on the expected extent of the urban area, using a conservative rate of 0.15 km per hectare of urbanized land:

- Year 2005: 25 km (170 ha × 0.15 km/ha)
- Year 2015: 82.5 km (550 ha × 0.15 km/ha)
- Year 2024: 86.25 km (575 ha × 0.15 km/ha).

Based on these considerations, if the urban plan had been fully implemented, its road network would be slightly larger than that recorded in the 2024 satellite images.

Regarding forested area over a 20-year period, an analysis area of 5,279 hectares around Ciudad Constitución was selected and analyzed using satellite imagery from 2005, 2015, and 2024. This area is not limited to the urbanized zone (801.67 ha in 2024) but encompasses a region seven times larger, allowing for the identification of deforestation processes associated not only with direct urban expansion but also with road connectivity and productive dynamics in the peri-urban area.

- Year 2005: 2,643 ha
- Year 2015: 2,518 ha
- Year 2024: 2,078 ha.

These data show that the rate of deforestation has intensified in recent years, both in terms of speed and magnitude, compared to the first 10 years, when it was slower.

The PEPP's projections regarding the expansion of the agricultural frontier were ambitious, exceeding 10,000 hectares, located in various areas along the Pichis-Palcazú highway. To maintain consistency in the analysis, it was assumed that half of the 5,279-hectare study area would have been deforested, leaving a forested area of 2,640 hectares—greater than what was observed in the 2024 satellite images.

3.3. Analysis of the environmental sustainability of Ciudad Constitución using the analytic hierarchy process (AHP)

Ranking of urban sustainability comparing three historical time points and the initial planning goals.

The Hierarchical Analysis Process (Saaty, 1990) was used, employing the *SuperDecisions* software (Creative Decisions Foundation, 2025). To ensure consistent scaling of the indicators—which originally consisted of actual values, percentages, and ratios—each subcriterion was first standardized to a decimal scale (from 0 to 1), as shown in Table 1.

In the case of indicators where a higher value represents lower sustainability—for example, unemployment rate, poverty rate, extent of urban sprawl, and length of the road network—the values were inverted beforehand, so that higher figures reflect a negative impact on sustainability.

The results under Premise 1—which assumes uniformity in the weights among the various criteria and subcriteria—show that the ideal scenario, represented by D_Pichis Palcazú Program, achieves the highest score in the sustainability ranking, followed by A_Initial Period, C_Current Period, and, finally, B_Intermediate Period. These results are presented below in Figure 7.

Under Premise 2, physical-environmental indicators—which favor a smaller urban footprint, a less extensive road network, and less impact on forests—are given less weight than demographic and socioeconomic indicators, placing greater value on the emergence and development of the new city.

Indicators	Value actual	Standardized	Value actual	Standardized value	Value actual	Standardized value
Demographics	Population size		% Urban population		Population density	
Initial period	417 people	0.0103	24.3%	0.1475	17.38 inhabitants/ha	0.1673
Interim period	2,272 people	0.0559	22.8%	0.1384	31.44 inhabitants/ha	0.3026
Current period	17,927 people	0.4414	55.2%	0.3350	20.31 inhabitants/ha	0.1955
Pichis-Palcazú Special Project	20,000 people	0.4924	62.49%	0.3792	34.78 people/ha	0.3347
Socioeconomic	Unemployment rate		Poverty rate		HDI	
Initial period	3.17%	0.2354	75.50%	0.1297	0.2154	0.1665
Interim period	3.12%	0.2392	68.00%	0.1440	0.2535	0.1960
Current period	3.09%	0.2415	36.70%	0.2668	0.3639	0.2813
Pichis-Palcazú Special Project	2.63%	0.2838	21.30%	0.4596	0.4607	0.3562
Physical and environmental	Urban sprawl		Length of the road network		Forest cover	
Initial period	72.26 ha	0.7440	5.04 km	0.8323	2,643 ha	0.2675
Interim period	563.50 ha	0.0954	69.19 km	0.0606	2,518 ha	0.2549
Current period	801.67 ha	0.0671	71.84 km	0.0584	2,078 ha	0.2103
Pichis-Palcazú Special Project	575 ha	0.0935	86.25 km	0.0486	2,640 ha	0.2672

Note: The standardized values for the unemployment rate, poverty rate, urban sprawl, and road network length are calculated as the inverse (1/actual value).

Table 1: Standardization of Indicators. (2025)

Premise 1 – Equal weighting of all criteria and subcriteria					Premise 2—Lower weighting for the physical- environmental criterion					Premise 3 - Greater weight assigned to the physical- environmental criterion				
Name	Graphic	Ideals	Normals	Raw	Name	Graphic	Ideals	Normals	Raw	Name	Graphic	Ideals	Normals	Raw
A_PERIODO INICIAL		0.994640	0.300065	0.100022	A_PERIODO INICIAL		0.547167	0.195208	0.065069	A_PERIODO INICIAL		1.000000	0.457351	0.152450
B_PERIODO INTERMEDIO		0.547668	0.165222	0.055074	B_PERIODO INTERMEDIO		0.489505	0.174637	0.058212	B_PERIODO INTERMEDIO		0.330380	0.151100	0.050367
C_PERIODO ACTUAL		0.772435	0.233030	0.077677	C_PERIODO ACTUAL		0.766317	0.273393	0.091131	C_PERIODO ACTUAL		0.377142	0.172486	0.057495
D_PROGRAMA PICHIS PALCAZU		1.000000	0.301682	0.100561	D_PROGRAMA PICHIS PALCAZU		1.000000	0.356762	0.118921	D_PROGRAMA PICHIS PALCAZU		0.478982	0.219063	0.073021

Figure 7: Reports from the *SuperDecisions* software. Output from the *SuperDecisions* software (Creative Decisions Foundation, 2025)

The results under this new weighting imply a decline in the relative importance of A_Initial Period compared to the other periods, with D_Pichis-Palcazú Program remaining the best option.

Under Premise 3, physical and environmental indicators are given greater weight than demographic and socioeconomic indicators. In this conservation-oriented scenario, the results identify A_Initial Period as the best alternative, followed by D_Pichis-Palcazú Program, then C_Current Period, and finally B_Intermediate Period. Under this evaluation, which focuses on environmental preservation, the Pichis-Palcazú Program loses relevance as ecological criteria are prioritized over urban and socioeconomic ones, although it remains more important than the other two periods.

4. Discussion and Conclusions

The premises that guided the city's founding were rooted in a developmentalist and centralist vision that has lost its relevance as a development paradigm. The development strategy promoted by the state for the Pichis-Palcazú Special Project was influenced by the structuralist paradigm of the Economic Commission for Latin America and the Caribbean (ECLAC) and the theory of development poles (Perroux, 1973; Boisier, 2005). These approaches are no different from other urban planning experiences in the Amazon (Silva et al., 2023). Bunker referred to the extractive and colonizing model that undermines viable development in the Amazon as "induced underdevelopment" (Ortiz-T, 2016; Flores et al., 2024). These approaches do not take into account ecological and cultural diversity or the principles of sustainability and interculturality that govern sustainable development (Escobar, 2010; Gudynas and Carpio, 2024). This does not rule out the state's mission as a promoter of development and its geopolitical vision of integrating the Amazon region with the rest of Peru, which remains relevant.

From an urban perspective, the city was inspired by the *New Towns* (Hall, 2002), but its actual development largely occurred outside the initial plans, characterized by high levels of informality, low density, and increasing deforestation. Informality in land use is a major challenge, as reported in analyses of peri-urban growth in Peruvian (Moschella, 2023), Ecuadorian (Barros Esquivel and Aldeán Aguirre, 2024), and Brazilian (Santos de Matos et al., 2021) Amazonian cities.

Socioeconomic indicators show some improvement compared to 1985, but still reflect negative trends in the Human Development Index (HDI), the unemployment rate, and poverty, according to the 1993, 2007, and 2017 censuses. The objectives of the Pichis-Palcazú Special Project related to poverty reduction, agricultural and agroindustrial economic value chains, and improvements in income and living conditions have not been fully achieved.

Physical and environmental indicators show negative impacts on urban sprawl, the road network, and vegetation cover in 2005, 2015, and 2024 that are greater than those projected in the Project. Available evidence on the Peruvian Amazon (Moschella, 2023; Salazar Valdivia and Florián Lozano, 2022; CEPLAN, 2020) shows that deforestation and urban expansion generate significant ecosystem impacts that go beyond the simple loss of vegetation cover, including a widespread perception of a decline in species abundance and diversity, landscape fragmentation, and alterations in ecological connectivity.

These processes are accompanied by additional biophysical impacts, such as increased soil erosion and alterations to regional hydrological cycles, including changes in precipitation and runoff patterns. Taken together, these indicators demonstrate that urban expansion in Amazonian contexts involves not only spatial transformation but also a profound reconfiguration with effects on biodiversity, ecosystem productivity, and local livelihoods.

The work presented here does not exhaust the discussion on urban sustainability in Ciudad Constitución. The measurement of urban sustainability in Amazonian cities is diverse and almost always faces a lack of data. Approaches can range from regional analyses (Silva et al., 2023) to specific case studies (Santos de Matos et al., 2021). The availability of data for historical tracking depends on official sources, which are sometimes incomplete or insufficient.

However, the application of the AHP to rank sustainability across different stages of the city's growth reveals a gradual increase in urban sustainability relative to the development goals pursued, primarily due to demographic and socioeconomic improvements—an increase that would have been greater had the projections of the Program and the original Urban Plan been met.

According to the data in Table 1, Ciudad Constitución should move toward greater urban compactness (above 35 inhabitants per hectare), maintain a balanced ratio between the urban (60%) and rural (40%) populations, raise its HDI above 0.46, and reduce unemployment (~2%) and poverty (<20%). In addition, it would be necessary to curb urban expansion (currently 801.67 ha), limit the growth of the road network (71.84 km), and reforest at least 600 ha to strengthen environmental sustainability. The low urban density suggests the need to move toward greater compactness, which would optimize land use and reduce infrastructure provision costs. Likewise, the extensive expansion of the road network highlights inefficiencies in the urban structure, underscoring the importance of more integrated planning. Finally, the deforestation processes identified both within and outside the urban area justify the incorporation of environmental protection and ecological restoration strategies, especially in areas of recent expansion.

Given this situation, inclusive development strategies tailored to the local context are necessary. Recent studies promote the bioeconomy, community-based forest management, silvopastoral systems, sustainable aquaculture, and ecotourism as alternatives compatible with Amazonian ecosystems (MINAM and UNDP, 2024; MINAGRI, 2020; Fuentes et al., 2022; MINCETUR, 2019), coordinated with intercultural governance and the circular economy to avoid past mistakes (UNDP and MINAM, 2021; De la Riva, 2020).

In Amazonian contexts, urban planning does not take place on empty territories, but rather in socially and culturally complex spaces where diverse forms of occupation, land use, and social organization coexist. In the case of Ciudad Constitución, the testimonies collected show that the project's original design did not substantively incorporate pre-existing Indigenous communities, reflecting limited consideration of the territory's sociocultural diversity. Furthermore, the subsequent urban expansion—largely unplanned—suggests the emergence of local dynamics that respond to housing, economic, and accessibility needs not foreseen in the initial plan.

These dynamics are consistent with what is noted in the literature on urbanization in the Amazon, which recognizes the presence of hybrid forms of territoriality and intense urban-rural interaction, as well as tensions between state-promoted development models and local practices of land occupation and subsistence (Escobar, 2010; Gudynas and Carpio, 2024). In this regard, the incorporation of intercultural and participatory approaches is not only a guiding principle but also a necessary condition for improving the sustainability of urban interventions, insofar as it allows for the integration of local knowledge, the reduction of territorial conflicts, and the promotion of more inclusive forms of development.

Conflict of Interests. The authors declare no conflict of interests.

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