

New narratives for rural transformation in Latin America and the Caribbean

Towards a renewed measurement and classification of rural areas

Yannick Gaudin, Ramón Padilla Pérez
Editors



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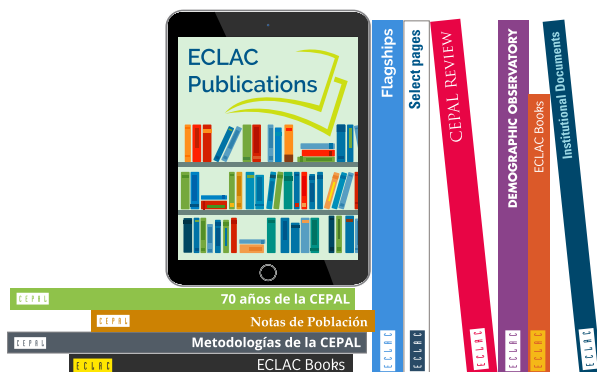


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This document was edited by Yannick Gaudin, a consultant with the Economic Development Unit of the subregional headquarters of the Economic Commission for Latin America and the Caribbean (ECLAC) in Mexico, and Ramón Padilla Pérez, Chief of that unit, as part of the activities of the project between ECLAC and the International Fund for Agricultural Development (IFAD), “New narratives for rural transformation in Latin America and the Caribbean”. The chapters were prepared by the following ECLAC consultants: David Candia, Andrew R. Cummings, Martine Dirven, Juan Fernández, Ignacia Fernández, Marielos García, Yannick Gaudin, Astrid González, Hernán González, Jorge León, David López, Marco Martínez, Celeste Molina, Thibaut Plassot, Moisés Reyes, Mario Samper, César Sánchez and Isidro Soloaga; and by Sara Hess, staff member of ECLAC.

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Introduction

*Ramón Padilla Pérez
Yannick Gaudin*

Rural areas in Latin America and the Caribbean have undergone a series of transformations and mutations over recent decades. In the economic realm, the share of added value and employment generated by agriculture within rural economic activities is generally lower; this is the result of the growing presence of services, such as agritourism, and processing activities. The agricultural sector accounted for 66.0% of the region's total rural employment in 2000, while in 2019 the corresponding figure was 54.6%. In territorial terms, there are increasing interactions between urban and rural areas and a greater appreciation of local and natural resources, and new actors and forms of coordination are emerging, along with other phenomena. Significant demographic changes can also be seen, such as a decrease in the population living in rural areas, as well as new forms of interaction with urban centres. These transformations have led to the forging of new concepts and methods of interpretation and analysis (such as “the new rurality”)¹ that underscore the need to rethink the paradigms of public development policies for rural areas, given their relative economic and social lags compared to the region's urban settlements.

¹ The concepts of rural multifunctionality and new rurality emerged in parallel in Europe and Latin America in the context of the United Nations Conference on Environment and Development, held in Rio de Janeiro in 1992. The diversification of rural production, growing rural-urban interactions and the need for environmental stewardship were highlighted as central issues to be addressed by public policies for territorial development and planning (Grajales Ventura and Concheiro Bórquez, 2009; Bonnal and others, 2004; Delgado Serrano, 2004).

The official methods for measuring rural areas in most Latin American and Caribbean countries are dichotomous and static. They are “dichotomous” because the rural sphere is defined by default, as something residual, and not in terms that reflect its particular reality. In other words, criteria to define the urban are established and, as a result, the rural is the remainder, the non-urban remnant. This binary approach makes it impossible to recognize the existence of a gradient in which there is room for territories with intermediate characteristics between those of a large metropolis and the deeply rural. Similarly, those approaches are deemed “static” because their criteria are based on indicators linked to one specific realm and not on its economic, cultural or social interactions with other areas.

This incomplete understanding of rurality has very significant repercussions for the design and implementation of public policies. A dichotomous and static definition masks socioeconomic realities and their dynamics. For example, as Soloaga, Plassot and Reyes show in chapter IV of this book, according to the official classification used in Mexico—which is binary in nature—40% of the urban population and 65% of the rural population live in poverty. The development of new measurement methods, such as the relative rurality index (RRI) presented in that same chapter, yields a spectrum comprising 10 degrees of rurality, in which the most fully rural areas report a poverty rate of 71%, while the least rural areas report a rate of 44%. A similar situation is found with socioeconomic variables in the areas of health, education, infrastructure, income and so on. A dynamic approach based on gradients, using a territorial approach for understanding different areas, provides a better understanding of the territorial reality and consequently facilitates the design of targeted public rural development policies that take due account of their characteristics, strengths and opportunities.

In Latin America and the Caribbean, as in other regions, rurality is frequently equated with backward, archaic, unevolved and obsolete lifestyles (Echeverri Perico, 2011; Rodríguez, 2011; Urcola, 2011; Ávila Sánchez, 2005; Entrena Durán, 1998). Rural dwellers are often seen as residual factors (or “the remainder”) in a competitive, high-tech, global economy, in which small rural producers no longer have a place and are dismissed as inefficient and uncompetitive (Appendini and Torres-Mazuera, 2008). According to those anachronistic views, the inclusion of rural areas, particularly if their productive vocation and essence is respected, is not an attractive prospect for national development strategies. The focus has more frequently been placed on urbanization, erroneously understood as a synonym for progress and economic development, or on integration into global phenomena, such as global manufacturing value chains.

This book summarizes the work carried out on the “New narratives for rural transformation in Latin America and the Caribbean” technical

collaboration project executed by the Economic Commission for Latin America and the Caribbean (ECLAC) subregional headquarters in Mexico, with financing from the International Fund for Agricultural Development (IFAD).

The general objective of the project, in keeping with the observations outlined in first paragraphs of this introduction, is to redefine the limits and scope of the classic definition of rurality, with a view to generating an analytical study of the recent transformations that have taken place in rural Latin America and the Caribbean. The activities undertaken focused on analysing and discussing the changes in rural areas and the need to modify public policy in line with those changes. The project's specific objectives are: (i) to use the concepts of the new rurality to highlight territorial gaps and contribute to national development strategies for the pursuit of the 2030 Agenda's Sustainable Development Goals (SDGs) and general well-being in rural areas; (ii) to produce solid empirical evidence for the formulation of comprehensive rural development policies; and (iii) to assess the impact of a heterogeneous and dynamic definition of rurality on the measurement of structural gaps and the formulation of public policies.

The *World Social Report 2021*, prepared by the United Nations Department of Economic and Social Affairs, makes an urgent call for a rethinking of rural development strategies. The report recognizes that current strategies are failing to lead to the fulfilment, in rural areas, of the socioeconomic and environmental targets of the SDGs. Four out of every five people in extreme poverty in the world live in rural areas. Many rural areas are being affected by the depletion and deep degradation of natural resources, which severely harms their inhabitants and contributes to climate change (United Nations, 2021). A new understanding of rurality is unquestionably a necessary starting point for redefining rural development strategies.

On previous occasions ECLAC has pointed out that official statistics underestimate the importance of the rural and overestimate the real degree of urbanization in Latin America and the Caribbean. Analysis reveals that many populations officially deemed urban actually gravitate around rural dynamics (ECLAC, 2018a). The redefinition of the rural, in the context of recognizing the phenomena that make up what is called the new rurality, implies a rediscovery of the attractiveness of the rural world. That dynamic will lay the groundwork for designing a strategy to close the gaps between the rural and urban spheres through policies aimed at reducing inequalities (ECLAC, 2018a). As ECLAC acknowledges in the document "Ruralidad, hambre y pobreza en América Latina y el Caribe" (ECLAC, 2018b), rural development can determine the fulfilment of Goal 1 (No poverty) because of the high incidence of poverty in rural territories.

This book calls for a review and modification of the current methods for measuring and classifying rural areas, based on the idea that the way rural areas are measured is not neutral and has implications for public policies. Policy-makers use official statistics as a starting point to define strategies for the design, implementation and evaluation of development policies. The construction of a regional agenda for rural planning and development in pursuit of the SDGs requires prior work on how rural areas are understood and measured in order to correctly categorize them in socioeconomic terms. In the 2010s, through the project “Methodological contribution and regional analysis on the definition of rural areas in Latin America and the Caribbean”, ECLAC and other international organizations and international cooperation agencies promoted a regional debate on the definition of the rural sphere and the importance of incorporating the concepts of the new rurality (Dirven and others, 2011).

The “New narratives for rural transformation” project is part of a history of successful cooperation between ECLAC and IFAD, in which methodologies and tools have been designed to strengthen rural development policies in Latin America and the Caribbean. The collaboration initiatives between these two United Nations agencies have been based on providing technical assistance to the region’s countries, building capacities and contributing to the public agenda. They have also developed new knowledge, based on innovative empirical evidence and solid technical analyses. The project “Inclusive growth, rural industrial policy and participatory value chains in Latin America and the Caribbean”, implemented between 2014 and 2017, focused mainly on the design of strategies for strengthening rural value chains and promoting rural financial inclusion (Padilla Pérez, 2017; Villarreal, 2017). Between 2018 and 2020, with financing from IFAD, ECLAC carried out another initiative to strengthen rural value chains through financial inclusion and the use of family remittances (Padilla Pérez, Stezano and Villarreal, 2020).

The “New narratives” project, like earlier ECLAC and IFAD initiatives, was characterized by strong participatory and capacity-building components. Each stage encouraged dialogue and participation by public officials and academics, with a view to ensuring its relevance and pertinence, as well as the adoption of its results, the strengthening of local capacities and its long-term sustainability.

The project activities were organized into three phases. The first involved analysing the scope and limitations of the measurement methodologies currently in use in the selected countries and studying the principal transformations in rural areas in order to develop three alternative rurality indices based on the contributions made by the theory of the new rurality. The second phase entailed the preparation of maps

depicting alternative rurality scenarios and the socioeconomic analysis of the selected countries based on the new rural reality. Finally, phase three focused on analysing the contributions of the alternative rurality scenarios in terms of public policy, with a concrete implementation through two exercises in each of the selected countries.

The main source of information for this exercise was the population and housing census, which is usually taken every 10 years. The construction of a rural-urban gradient is a structural exercise, which portrays slow and gradual changes over time. The analysis resulting from the redefinition of rural areas does not lead to fundamental alterations in a short period of time. In the case of El Salvador, the most recent census was taken in 2007, which made updated data more necessary. Nevertheless, the countries' public institutions participating in the initiative expressed their interest in updating the indices and maps once the most recent census information becomes available. Population information was supplemented with data on land use, natural resource pools, road networks and distances between localities, and use was also made of innovative techniques such as day-time satellite images and night-time satellite images of light patterns.

The work focused on five Latin American and Caribbean countries (Costa Rica, the Dominican Republic, El Salvador, Mexico and Panama) as initial case studies, with plans to replicate the exercise in other countries of the region at a later date. Those countries were selected on the basis of the following: (i) they had official statistics available to carry out the exercise; and (ii) they were covered by the geographical mandate of the ECLAC Subregional Headquarters in Mexico (Central America, Cuba, the Dominican Republic, Haiti and Mexico). Chapters IV to VII summarize the main results of the work carried out in Mexico, Panama, Costa Rica and El Salvador. Since the exercise in the Dominican Republic was taking place as this book was being prepared, the results will be reported in a separate publication.

In the first chapter, ECLAC consultant Yannick Gaudin examines the main economic, social and cultural transformations in rural areas in Latin America and the Caribbean that have led to talk of a new rural reality. The chapter begins with a brief historical and structural retrospective on the birth of cities, followed by a discussion of the different perceptions and beliefs that prevailed about rural areas until the twentieth century and the tools previously used for their measurement and categorization. The different approaches for understanding rurality are presented, including the theory of the new rurality, along with methods for analysing, classifying and measuring rural areas and their repercussions for public policy. Finally, it argues for improved tools for understanding and measuring rurality in Latin America and the Caribbean.

The second chapter, by ECLAC consultants Martine Dirven and David Candia, offers a critical analysis of the different methods currently used to measure rural areas in Latin America and the Caribbean, as a starting point for the design of new instruments that recognize those areas' dynamic and heterogeneous nature. The chapter emphasizes the need to strengthen measurement methods that take account of the interactions between areas in order to advance towards a framework for a territorial understanding of rurality. Finally, it provides proposals and recommendations to place rurality at the centre of policy attention and to modify the tools that enable its understanding and quantification.

The third chapter, by ECLAC consultants Juan Fernández Labbé, María Ignacia Fernández and Isidro Soloaga, specifically examines the territorial approach to rural analysis as a significant step forward for understanding and transforming those areas. It aims to respond to the demand for tools for understanding rural issues and to contribute to processes of change towards equity and territorial cohesion in Latin America and the Caribbean. After presenting the main characteristics of the territorial approach to understanding rural areas and the concept of the functional territory, the authors offer practical proposals for the creation of cartographic inputs and socioeconomic analyses. Finally, they offer a series of reflections on the design of public policies that could be derived from this approach to understanding and analysing rurality.

These three chapters set the conceptual and methodological foundation for the work undertaken with the selected countries from the region. In light of the contributions made by the theory of the new rurality and the different approaches to measurement and analysis, particularly the territorial approach, the next step was to analyse the main transformations experienced by rural areas in Costa Rica, El Salvador, Mexico and Panama. The scope and limitations of the different methods currently used to measure and classify rural spaces were analysed, and innovative tools for understanding rural areas were developed to create what were termed "alternative rurality scenarios". Using statistics and maps, these innovative methodologies revealed a new rural reality, hitherto hidden by dichotomous and static measurement methods. This effort involved close cooperation with authorities from each partner country.

In the fourth chapter, ECLAC consultants Isidro Soloaga, Thibaut Plassot and Moisés Reyes present four alternative methodologies for using official statistics to measure and classify rural areas in Mexico: the relative rurality index (RRI), the accessibility index (AI), the cluster methodology (using Thiessen polygons) and a measurement method based on 1 km² grids. The chapter's structure follows the stages in which the project was executed: (i) the classification of rurality in Mexico based

on official statistics and the development of alternative rurality indices; (ii) the preparation of maps depicting those scenarios, together with the socioeconomic and georeferenced categorization of the country; and (iii) an analysis of the contributions to public policy that the alternative rurality scenarios could offer. All stages of the technical cooperation project involved interactions with Mexican public agencies in order to seek feedback on the exercises, as well as to disseminate the results and their possible impact on the public agenda. In particular, ECLAC contributed to the work of the National Institute of Geography and Statistics (INEGI), the Secretariat of Agrarian, Territorial and Urban Development (SEDATU) and the National Population Council (CONAPO) to define an alternative methodology for measuring and classifying rural Mexico.

Chapter V, prepared by Isidro Soloaga, Thibaut Plassot, Yannick Gaudin, Moisés Reyes and ECLAC officer Sara Hess, presents three alternative indices for measuring and categorizing rural areas in Panama. In order to compare results with those of Mexico, Panama's rurality was measured with the RRI. After analysing the recent transformations in Panamanian rurality, as well as the limitations of the current measurement method, the country's environmental characteristics were used to construct an environmental rurality index (ERI), together with a demographic rurality index (DRI) that allows population movements within the country to be examined. The study was based on official statistics from the National Institute of Statistics and Census (INEC). A close working relationship was maintained with the Ministry of Agricultural Development (MIDA) and the Ministry of Social Development (MIDES) to explore the potential of the methodologies developed for the country's socioeconomic classification and the possibility of using them for different public policy purposes. The chapter argues in favour of greater inter-institutional interconnections in order to progress towards new ways of understanding and measuring rurality in Panama.

In chapter VI, ECLAC consultants Mario Samper, Marco Martínez, Hernán González and Jorge León examine the scope and limitations of the official definition and method for measuring rural areas in Costa Rica. They develop and present alternative methodologies, taking into account the contributions of the theory of the new rurality and the territorial approach to understanding rural areas. The aim is to move towards a redefinition of rurality and a new measurement and classification of rural areas, with a view to analysing the implications of this for public policies. The consultants developed three alternative rurality indices: the three-dimensional rurality index (3DRI), the functional rurality index (FRI) and the multivariate rurality index (MRI). The authors also constructed a combined rurality index (CRI) from these three proposals, in order to furnish an additional rurality scenario. In addition to presenting the results of these exercises for the georeferenced categorization of Costa Rican territories,

the authors made a special effort to work at several administrative levels: at the level of planning regions through a close working relationship with the Ministry of National Planning and Economic Policy (MIDEPLAN), and at the level of rural territories with the Rural Development Institute (INDER). The exercise underscored the need for a systemic, comprehensive, territorial and multi-scale approach to the socioeconomic classification of rural areas and of rural-urban interactions, both within those areas and in relation to central urban zones. The results contribute to the country's process of regionalization and territorial development planning and, in particular, to convergence between national and regional strategies and initiatives arising from local territories with different types of rurality.

Chapter VII, by ECLAC consultants César Sánchez, Andrew Roberts Cummings, David López, Astrid González, Marielos García and Celeste Molina, classifies and analyses the strengths and weaknesses of the definitions of rural and urban areas based on the official statistics of the Government of El Salvador. Elements of the regional debate of relevance in proposing alternative definitions that go beyond the dichotomous and static are taken up again, through three scenarios that aim at gradually advancing toward more complex conceptualizations of the territorial reality, while maintaining comparability with current statistics. In particular, an innovative exercise to define functional territories was carried out in order to construct alternative rurality scenarios at the municipal and functional territory levels. The incorporation of the functional territory concept allows a critical examination that is of interest for territorial diagnostics, in that it distinguishes intermediate or hinge municipalities that can facilitate the implementation of public policies by revealing links in such areas as economic activity, worker commuting and intermunicipal functionality. A close working relationship was maintained with the Planning Office of the San Salvador Metropolitan Area (OPAMSS) to formulate proposals in pursuit of territorial development in the San Salvador Metropolitan Area, with the specific objective of understanding the interactions between areas for the creation of an integrated care system and strengthening functional economic relationships. The chapter proposes greater multi-scale interaction among development policy-makers through a territorial and functional approach.

Finally, in chapter VIII, Ramón Padilla Pérez and Yannick Gaudin offer a summary and comparative analysis of the results obtained in the four case studies (chapters IV to VII), as well as final reflections on the book's main argument: the need to modify the way rural areas are measured and understood in order to secure a renewed knowledge of territorial dynamics and, consequently, to design more effective public policies for rural development. The book as a whole supports the construction of a new regional agenda for rural and territorial development, with the aim of achieving the SDGs of the 2030 Agenda.

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Chapter I

The new rurality: concepts and measurement criteria

Yannick Gaudin

Introduction

The proposal presented in this study aims to develop new measurement instruments and approaches for analysing rural areas, in light of the major transformations they have undergone in recent decades.

This first chapter offers a bibliographical and statistical review of the changes studied under the concept of “new rurality”. In the definition of that concept, it must be understood that “new” does not only refer to the transformations of rural spaces, but also to a revolution¹ in the patterns used to analyse a complex and dynamic reality (Padilla Pérez, 2017; Romero Cabrera, 2012).

There is no single definition of “rural” because the areas it covers are not homogeneous and undergo constant changes. The initiative summarized in this book aims to conceptually define and empirically analyse the diverse

¹ The term “revolution” is defined here in terms of the concept put forward by Thomas S. Kuhn, which holds that “a new theory, however special its range of application, is seldom or never just an increment to what is already known. Its assimilation requires the reconstruction of prior theory and the re-evaluation of prior fact, an intrinsically revolutionary process” (Kuhn, 1962, p. 7).

ruralities found in Latin America and the Caribbean, and to overcome the collective perceptions and beliefs that alternate between the romantic vision of an idyllic countryside kept safe from urban vices and an exclusively agricultural, backward and archaic view of rural life.

In defining the rural and the urban, Ávila Sánchez (2015 and 2005) puts forward the idea that it is not necessary to formulate a single theoretical definition applicable to each. He maintains that it is more important to use measuring tools with which those areas can be classified. Thus, the task of defining a rural area becomes methodological rather than theoretical. The instruments for measuring rural dynamics and rural-urban interactions allow rural areas to be classified dynamically: i.e. through identified interactions, instead of defining them in an essentialist manner, using restrictive criteria (Gómez Oliver and Tacuba Santos, 2017).

In that context, the limits and statistical biases of the current instruments for measuring rurality in Latin America and the Caribbean must be analysed, in order to create a new understanding of rural areas and measure their heterogeneity and dynamism. At the same time, it is extremely important for public policy to define and measure the rural dimension, since this information generally determines the focus of public rural development strategies. In particular, this perspective is reflected in the allocation of public funds, the support for new institutional frameworks and forms of political representation, the targeting of productive investment and so on (Rodríguez and Saborío, 2008).

This chapter's general objective is to present the different concepts of rurality, the approaches used to analyse, classify and measure rural areas, and their implications for public rural development policy. The aim is not to define rurality in its conceptual, immovable and dogmatic essence, but to highlight different characteristics and to determine the best approaches for measuring and analysing this new rurality. It offers a reflection on the concepts of rurality in Latin America and the Caribbean, while not ignoring the empirical evidence.

The discussion below comprises three sections. Section I presents different concepts and approaches for the analysis of rurality, including the theory of the new rurality in Latin America and the Caribbean. Section II presents and critically analyses several methodologies used to classify and measure rural areas. Finally, preliminary conclusions are offered as a conceptual and methodological starting point for the following chapters.

I. The new rurality

A historical and anthropological analysis is useful as a first step in understanding how the gaps and disparities between the cities and the countryside emerged, with a concentration of power and wealth in the former. The evolution of the rural and the urban is part of lengthy historical processes, in which rurality is assumed to reflect the original distribution pattern of human settlements. Since the founding of the first cities in the Middle East, the population has increasingly concentrated in urban settlements. However, rather than following a linear progression, perceptions of cities have fluctuated, with major variations from one time period to the next (Rodríguez and Saborío, 2008; Ávila Sánchez, 2005).

Until the nineteenth century and the emergence of industrial societies, the expansion of cities was directly related to increasing agricultural productivity. From a viewpoint of anthropological and historical analysis, the accumulation of agricultural surpluses—and the possibility of trading them—was the necessary condition that allowed the emergence and development of those human settlements called “cities” (Rodríguez and Saborío, 2008; Spielvogel, 2003; Fujita and Thisse, 2002).

Agricultural surpluses also favoured the development of artisanship, urban proto-industry, trade and various forms of specialization, which resulted in lower costs of production, communication and exchange: not only for agricultural and manufactured goods, but also for ideas and knowledge (Baldwin and others, 2003; Glaeser, 2003; Spielvogel, 2003; Bairoch, 1985).

From its inception, the city was perceived as a locus of overcrowding characterized by the worst possible hygiene and health conditions. Socioeconomically privileged populations pursued their economic activities and exercised their political power in the city, but they also valued the opportunity to leave whenever they could to enjoy an ecosystem considered pure and healthy.² Patrick Süskind’s novel *Perfume: The Story of a Murderer* provides an example of this contrast between a city steeped in waste and pathogens and the “immaculate” countryside (Vigarello, 1985).³ This was a misleading perception, however: morbidity and mortality caused by pathogens ran very high in rural areas, and their sanitary conditions were extremely precarious.

Towards the end of the eighteenth century, a hygienist and miasmatic revolution took place. Authorities began to sanitize their cities, improve the quality of housing and the water supply and provide facilities for bodily

² Cicero, for example—a representative of the classical elite of Ancient Rome—made this point clear in *De Legibus*, as did Voltaire in *Des singularités de la nature* and the English industrial elites in the nineteenth century.

³ “Immaculate” in its original religious sense, i.e. free from sin and vice.

hygiene and systematic waste collections. The concept of “public health” was born in the cities, through the promotion of preventive measures and the accumulation of scientific knowledge about fighting pathogenic agents. Cities became attractive because they offered better living conditions and stood at the forefront of scientific progress. With the development of industrial societies during the nineteenth century, cities were once again seen as dirty and overcrowded, even though they concentrated productive capital and social progress (Fierros Hernández, 2014; Vigarello, 1985).

With the development of cities came the concepts of *urbs*, *civitas* and *polis*. The Latin noun *urbs* (whence the English words “urbanity”, “urbane” and “urban”) refers to the organized human occupation of space. It also describes the grouping and concentration of human settlements through approaches based on populations and demographics. The Latin term *civitas*—which gave us the words “city”, “citizen”, “citizenship”, “civil” and “civilization”—refers, through a functional analytical approach, to human activities and the consequent social and economic transformations. Finally, from the Greek noun *polis* come the English words “politics”, “police” and “metropolis”. These terms describe the way in which space and human activities are managed within a society (Rubial García, 2012; Capel, 2003). The concept of *polis* allowed the emergence, starting in the sixteenth century, of the concepts of State, sovereignty, institutions and public policy (Delmotte, 2010; Capel, 2003; Herman Hansen, 1998).⁴

This brief anthropological presentation shows that there are different approaches to the analysis and understanding of rurality and urbanity, based on the derivations formed from *urbs*, *civitas* and *polis*. It also reveals that rurality and urbanity are dynamic spaces that undergo transformations and interact with each other.

Although the first cities were founded in the Middle East, much of the conceptual framework presented belongs to the Western anthropological and intellectual tradition. Beginning in the sixteenth century, Latin America and the Caribbean experienced historical processes similar to those described above, albeit with different sequences. The specificities of how the region’s cities developed should be emphasized. The colonial system did not entirely destroy the pre-Hispanic structures for production, exchange and territorial planning; instead, it capitalized on them to economic ends. Territorial segregation was common, with the concentration of European populations in the urban centres and an indigenous population kept in peripheral and rural areas.⁵ The

⁴ In the present day, the concept of “citizen” also involves the national dimension, perhaps more than the local level. A citizen is understood to be a person who has rights and obligations (in the economic, political, social and other spheres). The concept has little to do with the city.

⁵ In the case of New Spain, the colonial power referred to the “Republic of Indians”.

independence processes of the region's countries did not lead to radical change in this paradigm, given that the rural-urban divide was not only ethnic but also economic, political and cultural (Hardoy, Morse and Schaedel, 1978; Singer, 1974; Casimir, 1970).⁶

The classic elements for defining rurality, inherited from ancient beliefs and dichotomous approaches that define the rural in opposition to the urban, are described below. There is, however, no chronological or linear relationship between the different approaches to rural analysis.

A. Classic definition of rurality

The adjective "rural" traces its etymology to the Latin noun *rus*, meaning "countryside". According to the Merriam-Webster Dictionary, "rural" pertains to the country, country people or life, or agriculture.⁷ This meaning encompasses the physical space, a series of cultures and habits, and an economic and social function.

1. Perceptions, collective beliefs and contrast-based definitions

Collective perceptions and beliefs exist about "rural" and "urban" environments that are often not supported by a conceptual or empirical basis. Although shared feelings of belonging to one setting or the other do exist, populations do not always have the identity they claim. Rather than exclusive, these are shared identities (Sabalain, 2011; Méndez Sastoque, 2005).

Much of the classic definition of what constitutes rural comes from collective beliefs, in which rural lifestyles, worldviews and social habits are seen as rooted in the land and its natural resources. As a result, rural settings are often confused with a backward, archaic, unevolved and obsolete way of life (Echeverri Perico, 2011; Rodríguez, 2011; Urcola, 2011; Ávila Sánchez, 2005; Entrena Durán, 1998).

Rural dwellers are often seen as residual factors or the remainder in a competitive, high-tech, global economy, in which small rural producers no longer have a place and are dismissed as inefficient and uncompetitive (Pecini and Torres-Mazuera, 2008). To a large extent, it is the urban elites who forge and disseminate the dominant collective beliefs (Picciani, 2016; Dirven and others, 2011; Lipton, 1977).

⁶ Given the ethnic and even "civilizational" differences between indigenous, Creole and European populations, it can be claimed that rural-urban misunderstandings have been greater in certain regions of Latin America and the Caribbean than in other parts of the world.

⁷ See Merriam-Webster Dictionary [online] <https://www.merriam-webster.com/dictionary/rural> [accessed on 2 April 2023].

City residents generally perceive country dwellers as rooted in an environment unchanged for millennia, in traditions that globalized cities have lost, and which they seek to rediscover by fantasizing that the countryside is like a garden of Eden. Rurality is seen as being closer to the traditional heritage of regional and national culture. Thus, rural people are perceived as figures of honesty, simplicity, humility and basic values, such as hard work and family ties. Some observers see the rural environment as a society based on fraternity that is structured by communities with strong social bonds. (Thiesse, 2010; Méndez Sastoque, 2005).

Contradictory perceptions and beliefs also exist about urban areas. Because it concentrates power and wealth and stands at the forefront of scientific and artistic output, the city is often seen as modern, attractive and with habits and customs that denote good taste. However, and paradoxically, the city is also perceived as the centre of many social problems and failures, such as postmodern individualism, crime, the social brutality that arises from anonymity and, ultimately, the alienation of the individual (De la Paz Hernández, 2009; Arias, 2005; Méndez Sastoque, 2005).

2. Retrospective overview and theoretical markers of rural development policies

In the nineteenth century and with the expansion of classical economic theory, the idea of progress was constructed in contrast to the archaic and obsolete nature of the countryside. The idea was that in order to develop rural areas, agrarianism had to be displaced in order to focus exclusively on the urbanization and industrialization of rural areas, through the soil artificialization and productive transformation. Despite a folkloric and romantic vision of rurality, the prevailing idea was that in order to be developed, the countryside had to cease to be rural (Trpin, 2005).

In the countries of Latin America and the Caribbean, after they had won their independence, debates on rural development revolved around land distribution and ownership. As a fundamental aspect of rural life and a primary productive resource, this issue was omnipresent during the Mexican Revolution and remains so to this day in the discourse of Marxist-inspired guerrillas in Central and South America (Appendini and Torres-Mazuera, 2008).

Between 1940 and 1970, based on the framework of centre-periphery analysis advanced by Raúl Prebisch through structuralist and developmentalist theory, and on the dependency theories of figures such as Ruy Mauro Marini and Celso Furtado, rural backwardness Latin America and the Caribbean was believed to be structural and to be one of the

elements that defined the region as one of developing economies. These authors held that rural areas suffered from structural marginalization as did developing countries vis-à-vis developed nations (Martins, 2013; Marini, 2008; Cattaneo, 1991).

In the 1990s, a new framework for rural analysis began to emerge: one that placed particular emphasis on non-agricultural rural activities, flows and interactions between rural and urban areas, environmental stewardship and the redistribution of the power to design and implement local development measures. From this perspective, the process of rural development is not exclusively one of urbanization (Rodríguez and Saborío, 2008; Echeverri Perico and Ribero, 2002; Gómez Echenique, 2002; Pérez Correa, 2001; Schejtman, 1999).

3. The duality approach: the rural – the non-urban – is the remainder

Until the 1990s, Latin America and the Caribbean were dominated by a dichotomous definition of the rural sphere as the non-urban remainder of the population. This was a pattern for analysing and defining rurality by means of a “duality approach”, in which the rural was categorized as that which was not urban and —by extension and comparison— as that which was depopulated, agricultural and backward (Rodríguez, 2011; Vergara, 2011; Rodríguez and Saborío, 2008; Méndez Sastoque, 2005; Gómez Echenique, 2002; Paniagua, 1998).

Since time immemorial, rurality has been deemed synonymous with farming. That belief was confirmed by two historical phenomena: first, the development of cities and the centralization of political and productive functions there; and second, with the rise of industrialization, production no longer depended on the force of natural elements (such as wind, water or animals). The countryside became almost exclusively agricultural and a strong relationship of dependence with the cities emerged (Picciani, 2016; Matijasevic Arcila and Ruiz Silva, 2013; Dirven and others, 2011; Delgado, 2008 and 2003; Galindo and Delgado, 2006; Ávila Sánchez, 2005; Carlos, 2002; OECD, 1996).

This vision of rurality as exclusively agricultural and as a counterpart to the urban prevailed until the 1990s, for two basic reasons: (i) it was convenient for public decision-makers focused on agricultural and rural development to conceive of and deal with only one type of rural dweller and a single “rural destiny”, and (ii) the development model was geared solely towards industrial development for the purpose of urbanization (Matijasevic Arcila and Ruiz Silva, 2013; Delgado, 2008 and 2003; Galindo and Delgado, 2006).

Although the rural-urban dichotomy expresses simple patterns of spatial occupation from a conceptual point of view, these distinctions are inapplicable within a practical analysis for the design of effective rural development public policies. The evolution of the rural sphere itself and of empirical reality blurred the duality approach and reshaped the concepts and analysis patterns for rurality (Sabalain, 2011; Ávila Sánchez, 2005).

B. Alternative definitions of rurality

1. The new rurality

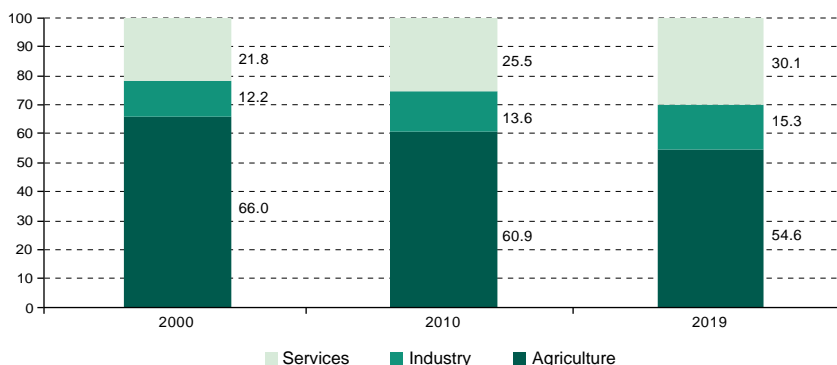
Alternative definitions of rurality exist, which contrast both with the collective perceptions and beliefs and with the duality approach that defines the rural as the remainder. The transformation of rural spaces led to new ideas about a theoretical and analytical paradigm called “new rurality”, which stresses the need to analyse the rural environment dynamically and systemically: in other words, through its flows and interactions.

The concepts of rural multifunctionality and new rurality emerged in parallel in Europe and Latin America in the context of the United Nations Conference on Environment and Development, held in Rio de Janeiro in 1992. The diversification of rural production, growing rural-urban interactions and the need for environmental stewardship were highlighted as central public policy issues for addressing territorial development and planning (Grajales Ventura and Concheiro Bórquez, 2009; Bonnal and others, 2004; Delgado Serrano, 2004).

The theory of the new rurality arose from a slow and profound transformation of rural spaces. Between the early 1990s and the second half of the 2010s, the rural population as a percentage of the total population in Latin America and the Caribbean declined by almost 10 percentage points, while agricultural gross domestic product (GDP) as a proportion of total GDP fell by less than 3 percentage points. Two factors explain this phenomenon: (i) the increased presence in the agricultural and agro-industrial sector of large integrated multinational firms that are less labour-intensive, and (ii) the diversification of rural production, with the industrial and service sectors playing a growing role (Appendini and Torres-Mazuera, 2008; Teubal, 2001).

The transformations can also be seen in employment patterns. In 2000, 66.0% of the rural population of Latin America and the Caribbean was employed in the agricultural sector, compared to 54.6% in 2019. At the same time, the relative weight of the services sector rose from 21.8% in 2000 to 30.1% in 2019 (see figure I.1).

Figure I.1
Latin America (selected countries): rural working population
by economic activity, 2000, 2010, 2019
(Percentages)



Source: Prepared by the author, on the basis of Economic Commission for Latin America and the Caribbean (ECLAC), CEPALSTAT [online database] <https://statistics.cepal.org/portal/cepalstat/index.html?lang=en>.

Note: Weighted average of 18 countries: Argentina, the Bolivarian Republic of Venezuela, Brazil, Chile, Colombia, Costa Rica, the Dominican Republic, Ecuador, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Panama, Paraguay, Peru, the Plurinational State of Bolivia and Uruguay.

The Organisation for Economic Co-operation and Development (OECD, 2006) summarizes the recent changes underpinning the conceptual framework of this new rurality in the following terms (see table I.1):

Table I.1
Recent changes in the rural paradigm

Sectoral
Lower share of agricultural employment and added value in rural economic activity.
Greater interdependence between farming and other sectors.
Rising importance of learning and innovation processes.
Stronger productive chains and possibilities for scaling up.
Demographic
Population decrease in rural areas.
Changes caused by population displacements within rural areas.
Changes in distance to urban centres.
Territorial
Changes in how rural areas are perceived.
Increased value placed on local resources.
Changes in the productive structure leading to a reorganization of spaces and territories.
New actors and coordination methods.
Increasing interaction with urban areas.

Source: Prepared by the author, on the basis of Organisation for Economic Co-operation and Development (OECD), *The New Rural Paradigm: Policies and Governance*, Paris, OECD Publishing, 2006.

The new rurality perspective proposes a functional diversification and assumes a heterogeneous, multisectoral, dynamic and complex space that comes from a systemic point of analysis with different levels of interactions with urban areas (Rodríguez and Meneses, 2011; Ávila Sánchez, 2009; Rodríguez and Saborío, 2008; Arias, 2005; Ramírez Velázquez, 2003; IICA, 2000; Schejtman, 1999).

In 2006, the OECD presented what it called a “new rural paradigm”. This sees rural areas as economically multisectoral, competitive and attractive, with greater connectivity and systemic complexity. The principles of this new rural paradigm are set out on table I.2.

Table I.2
New rural paradigm

	Previous approach	New approach
Conceptual framework for rurality	Essentialist vision and social homogeneity.	Dynamic, evolutionary and heterogeneous vision.
Productive sector	Seen as belonging to the agricultural sector.	Multisectoral systemic perspective with productive linkages.
Public policy objectives	Equalization, farm incomes, agricultural competitiveness.	Competitiveness of rural areas, increased value placed on local assets, exploitation of unused resources.
Main target sector	Agriculture.	Various sectors of rural economies (rural tourism, manufacturing, ICT sector).
Main development policies	Subsidies.	Subsidies and investments.
Leading players	National governments and farmers.	All levels of the administration (supranational, national, regional, local), various local stakeholders (public and private entities, NGOs).

Source: Prepared by the author, on the basis of Organisation for Economic Co-operation and Development (OECD), *The New Rural Paradigm: Policies and Governance*, Paris, OECD Publishing, 2006.

2. Analysis approaches

In order to study these spaces that go beyond the rural-urban dichotomy, Ávila Sánchez (2015 and 2005) proposes new analytical processes based on different study methods. The main approaches that will be presented below are: (i) the gaps approach, (ii) the demographic approach, (iii) the functional approach, (iv) the rural-urban continuum across gradients, and (v) the territorial approach. These approaches are useful tools for measuring and categorizing spaces and they go beyond the simple dichotomous and remainder-based approach detailed above. Each approach can be useful depending on the purpose of the analysis. The numerous definitions of “rural” are neither exclusive nor normative; they are therefore not timeless.

(a) Gaps approach: rurality as a space that accumulates disadvantages

The gaps approach consists of defining rural areas in terms of the obstacles, lags and long-term bottlenecks that characterize them and hamper their development. This approach sees those gaps as a constitutive element of rural life and characterizes rural spaces and populations by their low productivity, poverty, marginalization and vulnerability (ECLAC, 2016a and 2016b).

The gaps approach differs from the duality approach in that it relies on empirical evidence rather than on collective beliefs and perceptions to identify territorial disparities and design development policies. It also embraces the dynamic and heterogeneous nature of the countryside, where different sectors of activity and levels of productivity and development coexist (ECLAC, 2016a and 2016b).

(b) Demographic and population approach

The demographic approach defines rural areas based on their demographic characteristics, where rurality is characterized by low population density and dispersed inhabitants. The demographic approach is generally the most widely used, since statistical information is readily accessible and allows for international comparisons. The population approach suffers from some conceptual constraints relating to the limits of the area to be studied and the density threshold that distinguishes rural areas from urban: this is always subjective, as discussed below (Gallego, 2005).

(c) Functional approach

The functional approach analyses rurality in light of its operational and normative role.⁸ It proposes a systemic analysis framework in which rurality is characterized as an atypical, dynamic and heterogeneous space, on account of the series of power relations it hosts and the social functions it fulfils (Padilla Pérez, 2017; Dirven and others, 2011; Echeverri Perico, 2011; Rodríguez, 2011; Navarro Garza, 2005; Echeverri Perico and Ribero, 2002).

The functional approach does not offer an immutable and essentialist definition of rurality; instead, it aims to categorize rural areas through their economic, social, ecological, cultural and other functions within society as a whole. In this way, it sees agricultural production as a function that is not exclusive to rurality (Gómez Oliver and Tacuba Santos, 2017; Echeverri Perico, 2011; Rodríguez, 2011).

⁸ It analyses how productive activities are located in the environment and how they transform it in economic and sociocultural terms.

This approach involves the development of “non-traditional” rural functions such as agribusiness, tourism and leisure areas. It offers a conceptual and theoretical frame for rethinking the functions of spaces, taking into account that no function is exclusive in defining their identity. It provides a framework for systemic analysis and an innovative paradigm for public action (Picciani, 2016; González Arellano and Larralde Corona, 2013; Rodríguez, 2011; Méndez Sastoque, 2005; Navarro Garza, 2005).

(d) Rural-urban continuum: a dynamic definition of rurality in terms of intermediate spaces and hybrid figures

The concept of the “rural-urban continuum” was proposed by sociologists Sorokin and Zimmerman (1929) in an attempt to overcome the rural-urban duality. This approach suggests the existence of spaces that are neither exclusively rural nor urban —called gradients, intermediate spaces or hybrid figures— that share, to different degrees, characteristics of both (Rodríguez, 2011; Navarro Garza, 2005; Entrena Durán, 1998; Clout, 1976; Pahl, 1966).

The emergence of intermediate spaces does not necessarily come from mutations and transformations in rural spaces, but from a major transformation that cities undergo as they expand and grow (Arias, 2005; Cruz Rodríguez, 2005). The concept of the “diffuse city” arises from an interpretative complication of spaces and portrays a complex and dynamic reality composed of diffuse spaces that are simultaneously both urban and rural. This approach admits the difficulty of segmenting spaces (Delgado, 2008).

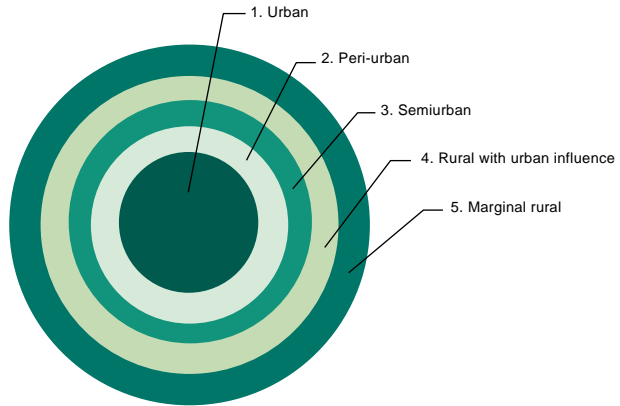
Urbanization processes in low-income areas of Latin America and the Caribbean were the result of other socioeconomic dynamics, such as urbanization caused by migration from rural areas. Foronda Robles (2011, p. 253) states that suburbanization processes became widespread driven by the conquest of the central areas by tertiary activities, the transfer of productive activities to the periphery, the construction of residential estates to address the housing deficit and the rural expansion of the population.

As shown in diagram I.1, the succession of intermediate spaces creates a rural-urban continuum (Cardoso and Fritschy, 2012; Rodríguez and Saborío, 2008; Chomitz, Buys and Thomas, 2005). Each gradient comprises an intermediate space and a continuum can contain several gradients according to the criteria used to characterize each one of them. These criteria include population, functional, geographic and other factors.

Sabalain (2011) maintains that there is no natural line or breaking point that clearly distinguishes the rural from the urban, making it necessary to analyse spaces as hybrid figures. However, the construction of gradients determines markers between spaces, the scopes of which are

usually restrictive and subjective. Thus, the definition of a “segmented continuum” by gradients also separates spaces and restricts the analysis in dynamic and systemic terms.

Diagram I.1
Arrangement of the zones constituting a rural-urban continuum



Source: Prepared by the author, on the basis of M. M. Cardoso and B. A. Fritschy, “Revisión de la definición del espacio rururbano y sus criterios de delimitación”, *Contribuciones Científicas GAEA*, vol. 24, 2012.

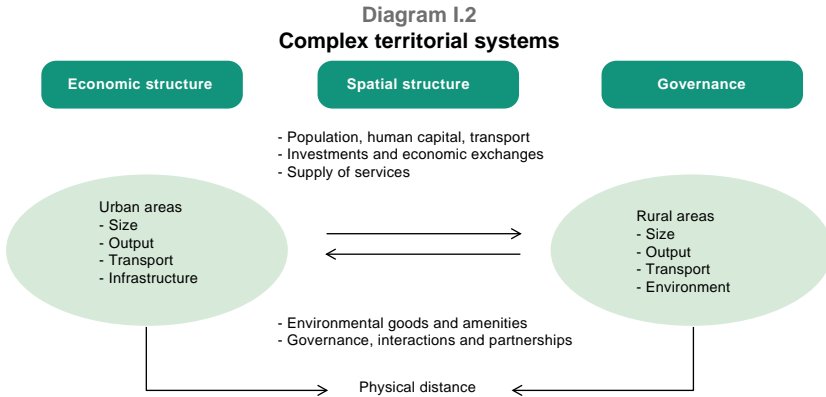
(e) Territorial approach

The territorial approach to rural analysis encompasses concepts from the realms of geography, ecology, regional economics, anthropology and political science. It provides a framework for the analysis and systemic interpretation of all the social, cultural and economic dimensions and phenomena that constitute a territory and give it identity. The approach does not attempt to conceptualize spaces or define them as rural, urban or intermediate; instead, it takes on board a wide range of spaces and analyses their systemic dynamics to reflect their complexity. The approach includes the analysis of rurality in a complex, dynamic, global territorial framework that is shaped by interactions and flows between spaces (Berdegué and Soloaga, 2018; Ávila Sánchez, 2015; Berdegué, Escobal and Bebbington, 2015; Berdegué and others, 2015; Echeverri Perico, 2011; Trpin, 2005; Ministry of Agriculture, Fisheries and Food, 2004; Schejtman and Berdegué, 2004).

According to this point of view, greater interconnections exist between urban and rural areas, which allows development opportunities to be leveraged. Rurality is not defined as the counterpart of the urban, but as a dynamic space that has and offers heterogeneous characteristics and endogenous development opportunities (Berdegué and Soloaga, 2018; Rodríguez and Saborío, 2008; Sepúlveda and others, 2003; Echeverri Perico and Ribero, 2002; Tacoli, 1998).

Rural areas are seen as a complex space, “structured and changing, made up of social groups settled on a foundation of natural resources whose attributes give rise to an economic structure and social relations of production that simultaneously condition the development of institutions, networks and power structures on which social formation processes are based” (Sepúlveda and others, 2003: 76).

Diagram I.2 illustrates the territorial approach to the analysis of rural areas through their interactions with urban spaces and the rural development opportunities offered by those interactions. Rurality is analysed as a component of a complex system in which different productive sectors, traditions, cultures and social habits coexist and interact. The territory is characterized by its internal exchanges and flows.



Source: Prepared by the author, on the basis of Organisation for Economic Co-operation and Development (OECD), *New Rural Policy: Linking up for Growth*, Paris, OECD Publishing, 2015.

Territory is neither a container entity nor a fixed concept: it is an active and dynamic construct with characteristics that do not align with traditional definitions of spaces used for classification and definition purposes, such as population density or the relative weight of farming activity (Ávila Sánchez, 2015 and 2005). Partnerships⁹ (Trpin, 2005) or social or territorial coalitions (Berdegué, Escobal and Bebbington, 2015) are created for the design and implementation of local territorial development strategies.

Table I.3 summarizes the main characteristics of the measurement approaches described.

⁹ Partnerships are defined as the capacity to create levels of joint decision-making among the agents present in a territory (public sector, private sector and NGOs).

Table I.3
Main approaches to the measurement and classification of rural areas

	Characteristics	Illustration and measurement
Gaps approach	Rurality as a space that accrues disadvantages and long-term bottlenecks.	- Disparities in income, productivity, development and well-being indicators between and within areas.
Demographic and population approach	Rurality in terms of demographic characteristics.	- Municipal population. - Population density by area.
Functional approach	Rurality understood in terms of economic, social, ecological and cultural functions.	- Life habits, consumption patterns, social rituals, cultural traits, relationship between economic activities and the environment.
Rural-urban continuum	Dynamic definition of rural areas in terms of intermediate spaces (peri-urban, suburban, rurban, near periphery) with characteristics of both urban and rural areas.	- Construction of gradients with areas classified by population density or population by municipality.
Territorial approach	The territory is a complex socially constructed space with a dynamic structure that changes over time. It transcends the dichotomy between the rural and the urban.	- Labour and commercial flows, illumination of spaces via satellite images.

Source: Prepared by the author.

C. Definition of the new rurality through its measurement

The new paradigms for studying and analysing rurality lead to multiple expressions of the same object and, therefore, overcome the constraints of theoretical determinations and normative prejudices. Although the ruptures between spaces remain salient, their continuities are both central parts of the theoretical definitions of rurality and its main methodological limit. The difficulty arises from the need to deal with a realm of reality and not merely with a theoretical formulation (Méndez Sastoque, 2005). The next chapter of this book deals in detail with the current characteristics of rural measurement in Latin America and the Caribbean, and so this section presents some preliminary reflections.

1. Measuring rurality

Different authors have developed their own criteria to measure rurality and, in so doing, to distinguish it from the urban. Among them: Faiguenbaum and Namdar-Irani (2011) identify four main criteria for measuring rurality and differentiating it from the urban: (i) population size, (ii) infrastructure for the provision of basic public services, (iii) productive activity, and (iv) the administrative criterion, which defines rural as what is not urban by reason of public considerations and decisions (political-administrative hierarchy).

Censuses are one of the main sources for measuring rurality, where rural areas are defined by their demographic and population characteristics: (i) the number of inhabitants per municipality, and (ii) population density. In terms of population numbers, depending on national criteria, urban areas may be defined as municipalities, localities, communes or parishes with a minimum of 1,000, 1,500, 2,000 or 2,500 inhabitants, or as areas characterized by adjacent dwellings. The population density criterion is generally used to study the level of urban clustering, whereby the rural area is the remainder with a low and dispersed population density (ECLAC, 2012; Dirven and others, 2011; Rodríguez and Meneses, 2011).

According to the criterion of infrastructure for the provision of basic public services, areas where the inhabitants have access to a school, a pharmacy or a post office—or where dwellings are connected to a sewage network—are considered urban. Some countries define urban dwellers as people living within five kilometres of one of those services. Rural populations are the remainder.

A municipality can also be considered urban or rural based on its productive activities and the proportion of its economically active population engaged in the agricultural sector. Some countries use the political-administrative criterion and classify the head towns of administrative units as urban, while the remainder is deemed rural by default (ECLAC, 2012; Dirven and others, 2011; Rodríguez and Meneses, 2011).

Many authors use composite indicators to measure rural areas more accurately, combining functional demographic and economic indicators. Some criteria for defining rurality are dichotomous: i.e. the remainder is simply deemed rural. The binary approach arises from the authorities' need to classify spaces for the design of public intervention strategies or because of the non-availability of indicators to measure rural areas. Some countries also favour indicators that allow international comparisons by multilateral organizations such as the United Nations or the OECD (Rodríguez, 2011).

During the second half of the twentieth century, the countries of Latin America and the Caribbean favoured four main criteria for measuring rural areas:¹⁰ (i) demographic criteria, based on population size or density, (ii) the criterion of access to public-service infrastructure, (iii) economic criteria, reflecting the productive activities of the economically active population, and (iv) the political-administrative hierarchy criterion (political and administrative considerations). The region's history shows that these measurement criteria have at times been combined, whereby a space and its inhabitants must present at least two of

¹⁰ The next chapter presents an updated and detailed overview of current methodologies for measuring rurality in Latin America and the Caribbean.

the listed characteristics in order to be considered urban. The rural sphere is the remainder and defined by default (Padilla Pérez, 2017; ECLAC, 2012; Rodríguez and Meneses, 2011).

2. Measuring rurality dynamically and systemically

Between 17 April and 2 May 2008, as part of the activities of the Inter-Agency Working Group for Rural Development in Latin America and the Caribbean and the “Regional methodological and analytical contribution on the definition of ‘rural’ in Latin America and the Caribbean” project, the Latin American Center for Rural Development (RIMISP) and the Agricultural Development Unit of the Economic Commission for Latin America and the Caribbean (ECLAC) organized and coordinated a consultation on modifying the criteria for differentiating between the rural and the urban. The results cited by Rodríguez (2011) emphasize the need to focus on a rural-urban continuum. The following criteria stand at the forefront as elements in rural classification:

- (i) Greater dispersion of the population across the territory.
- (ii) Smaller urban settlements.
- (iii) Greater distance to public services.
- (iv) Reduced availability and use of basic services and infrastructure (streets, footways, street lighting, drinking water, telephones, schools).
- (v) Presence of ecosystems and natural resources, and their legal status, such as protected areas or natural parks.
- (vi) Agricultural frontier zones.
- (vii) Presence of areas of urban expansion.
- (viii) Presence of agro-industrial activities and of activities and services associated with natural ecosystems and “agroecosystems”.
- (ix) Forms of territorial organization.
- (x) Pollution.
- (xi) Presence of temporary or permanent migrant workers.
- (xii) Characteristics of families: female heads of household, traditional family values, low schooling, family members sharing a household, family community models.
- (xiii) Community values and sense of belonging.
- (xiv) Citizen security.

The great heterogeneity of the proposed rurality measurement criteria is evident, as is the need to go beyond classical methods with the use of dynamic sociocultural categories. Gradient measurement within a rural-urban continuum can adopt static and dynamic criteria such as, for example, temporal migrations between areas and mutual influences between rural and urban spaces; it also serves to overcome the urban-rural duality (Rodríguez, 2011). Rodríguez and Saborío (2008) also include land use, employment structures and territorial aggregation (when referring to communities, states, regions and localities) as criteria for measuring rurality. Examples of static and dynamic criteria are shown on table I.4.

Table I.4
Static and dynamic criteria for measuring rurality and the construction of the gradients of the rural-urban continuum

Static criteria	Dynamic criteria
Population density by area	Daily or weekly labour migrations
Presence of public services	Tourism and commercial flows
Importance of farming activities	Origin of the new inhabitants of an area

Source: Prepared by the author.

Three methodologies for the construction of these gradients have been identified.

- (i) The first is the classic rural-urban categorization based on a single indicator: most commonly, population density. The rural-urban differentiation is made on the basis of a small heterogeneous space. For example, degrees of rurality or urbanity can be defined based on the population density of those areas. The OECD, for example, uses a three-element nomenclature for the identification of rural, intermediate and urban areas, depending on the proportion of rural communes in a given territory; this classification does not, however, radically question the characterization of rural areas as “remainders” (Rodríguez, 2011).
- (ii) The second involves the generation of a composite rurality index based on a minimum of two indicators for the creation of gradients. A nomenclature of gradients is generated to classify spaces from rural to urban on a scale (e.g. from 0 to 1); it thus identifies intermediate territories within the rural-urban continuum described above (González Arellano and Larralde Corona, 2013; Candia Baeza, 2011; Rodríguez, 2011; Zamudio Sánchez, Corona Ambriz and López Becerril, 2008; Waldorf, 2006).

- (iii) The third entails the *a priori* construction of a nomenclature of gradients using the variables deemed relevant for a given territory, with priority given to small and homogeneous spatial units. For example, a nomenclature comprising seven gradients can be produced by measuring population density, the economically active population engaged in farming and flows with other areas for each given area, using a scale of 1 to 7 for each indicator (Rodríguez, 2011; Rodríguez and Saborío, 2008).

II. Measuring and analysing rurality with data

A. Updated Latin American and Caribbean rurality data

In 2020, urban dwellers made up 81.2% of the total population in Latin America and the Caribbean, according to current official criteria (ECLAC, n/d). Based on the United Nations methodology, the information was compiled from census data obtained by using each country's measurement criteria. The data reveal a clear trend toward urbanization in the region. The urban population rate was 41.1% in 1950 and 75.2% in 2000, and, by 2050, it could reach 87.8%.¹¹

Figure I.2 shows the major disparities that exist between rural and urban areas in terms of poverty and extreme poverty. Rural poverty is almost twice as high as urban poverty, while extreme poverty in rural areas is typically three times higher in relative terms than extreme urban poverty (ECLAC, 2018b).

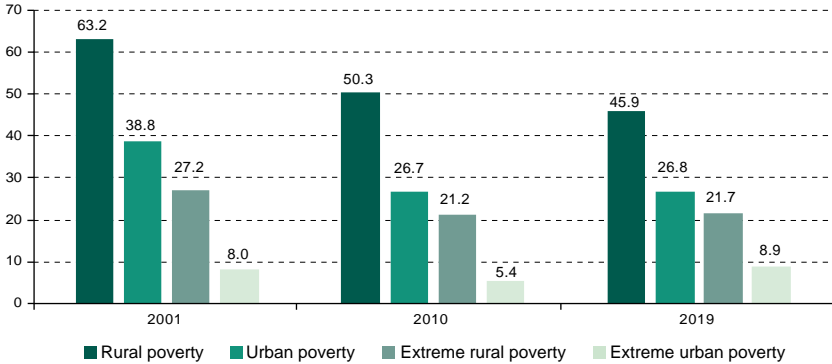
Many peri-urban and suburban areas suffer from more complex problems than some rural areas: for example, income levels, unemployment, access to housing and public services, violence, crime and pollution (OECD, 2015).

The large cities of Latin America and the Caribbean face the challenges inherent to highly concentrated human settlements. In particular, they suffer from problems that affect the population's productivity and well-being, such as overcrowding, mobility, water provision and pollution. Although these are major challenges in developed countries, they are also present in Latin America and the Caribbean, sometimes with greater intensity. New narratives of rurality can serve as a

¹¹ ECLAC projections available through CEPALSTAT (ECLAC, n/d).

renewed engine for inclusive growth in Latin America and the Caribbean by helping to reduce rural-urban disparities and by offering alternatives to development models based exclusively on industrialization and urbanization (Brosio, Jiménez and Ruelas, 2018; ECLAC, 2018a and 2018b; Kaldewei, 2015).

Figure I.2
Latin America (18 countries): poverty and extreme poverty rates
by geographic area, 2001, 2010 and 2019
(Percentages)



Source: Prepared by the author, on the basis of Economic Commission for Latin America and the Caribbean (ECLAC), CEPALSTAT [online database] <https://statistics.cepal.org/portal/cepalstat/index.html?lang=en>.

Note: Weighted average of 18 countries: Argentina, the Bolivarian Republic of Venezuela, Brazil, Chile, Colombia, Costa Rica, the Dominican Republic, Ecuador, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Panama, Paraguay, Peru, the Plurinational State of Bolivia and Uruguay.

B. Critical analysis of the importance of statistical information

The criteria and indicators used to measure rurality differ from one country to the next. Those indicators may yield contradictory results regarding population distribution within the rural-urban continuum, and that has significant implications for the targeting of public rural development policies and for the allocation of public funds to areas found to be lagging behind.

Many of the statistical biases stem from the need to produce internationally comparable instruments

Rodríguez and Meneses (2011) conducted a study to compare the measurements of rural and urban populations in Latin America and the Caribbean obtained by using different methods. Table I.5

shows the results obtained by means of: (i) the national methodology presented in the table of census definitions, (ii) an adaptation of national methodologies for international comparison purposes produced by creating an intermediate gradient, and (iii) a measurement method developed by Chomitz, Buys and Thomas (2005) based on population density and distance from human settlements of more than 100,000 inhabitants. They also define an intermediate category, comprising territories with a population density of between 150 and 500 inhabitants per square kilometre and located more than four hours from a city of 100,000 inhabitants.

It can be seen that, depending on the method used, the urban population around the year 2000 can drop by up to 50 percentage points (Uruguay) and, with the creation of “intermediate spaces”, the rural population can decrease by 50 percentage points (Honduras) or rise by 32 percentage points (Uruguay), compared to the measurements given by other methods. From a conceptual point of view, this table shows that the rural-urban dichotomy belongs to an archaic view of rurality that has already been superseded and that has no conceptual or empirical basis.

The duality-based criterion tends to overestimate the urban population to the detriment of intermediate areas or complex territories, which again illustrates the limitations of the rural-urban dichotomy, while a dynamic rural-urban continuum can be observed through dynamic rural measurement instruments. The criteria that allow international comparisons should be distinguished from measurement methods that focus on national or regional peculiarities and dynamics. In this way, difficulties with the comparability of rurality data between countries and over time can be identified.

What are the implications of a new paradigm for analysing rurality in Latin America and the Caribbean? The dynamic territory as a framework for analysis

One of the first proposals for going beyond the classic criteria for measuring rurality involves abandoning its default classification as the remainder and embracing the singularity, complexity and dynamic nature of each territory (Rodríguez, 2011). According to the Inter-Agency Working Group for Rural Development referred to by Candia Baeza (2011), the problem of rural poverty must be addressed through “a multi-sector vision on the sustainable management of natural resources and land-use with differential application, based on the particular heterogeneity of rural situations in Latin America and the Caribbean”.

Table I.5
Urban and rural population size, according to alternative quantification criteria, around 2000
(Percentages of the total population)

Countries	Official criteria		Modified official criteria			Chomitz, Buys and Thomas (2005)		
	Rural	Urban	Rural: Human settlements of fewer than 2,000 inhabitants	Intermediate: Human settlements of between 2,000 and 20,000 inhabitants	Urban: Human settlements of more than 20,000 inhabitants	Dispersed rural: Territories with fewer than 150 inhabitants/km ²	Intermediate: Difference between dispersed rural and concentrated rural	Concentrated urban: Territories with more than 500 inhabitants/km ² and non-remote human settlements
Argentina	10	90	11	13	77	21	27	52
Bolivia (Plurinational State of)	38	62	37	8	54	31	49	20
Brazil	19	81	21	15	65	18	38	44
Chile	13	87	12	11	77	8	33	59
Colombia	24	76	25	10	65	11	36	53
Costa Rica	41	59	41	10	49	21	29	50
Cuba	24	76	24	21	55	1	49	50
Dominican Republic	36	64	36	11	53	–	100	–
Ecuador	39	61	39	7	54	7	35	58
El Salvador	37	63	39	17	44	–	–	–
Guatemala	54	46	52	17	31	6	55	39
Haiti	59	41	60	6	34	–	100	–
Honduras	55	46	56	11	33	5	52	43
Mexico	25	75	22	17	61	20	39	51
Nicaragua	44	56	45	14	41	17	43	40
Panama	38	62	38	5	57	42	31	27
Paraguay	43	57	46	10	45	32	21	47
Peru	24	76	27	11	62	30	22	48
Uruguay	8	92	13	15	72	40	18	42
Venezuela (Bolivarian Republic of)	10	91	10	15	74	8	37	55
Latin America and the Caribbean	–	–	–	–	–	15	37	48

Source: Prepared by the author, on the basis of A. Rodríguez and J. Meneses, “Transformaciones rurales en América Latina y sus relaciones con la población rural”, document presented at the Reunión de Expertos sobre Población, Territorio y Desarrollo Sostenible, Santiago, 16–17 August 2011, and K. M. Chomitz, P. Buys and T. S. Thomas, “Quantifying the rural-urban gradient in Latin America and the Caribbean”, *Policy Research Working Paper Series*, No. 3634, World Bank, 2005.

One priority challenge for the new rurality conceptual framework is that it should not be limited to merely intellectual progress: rather, it should also assume a practical dimension through the design and implementation of innovative and more efficient public policies for rural development, in which particular attention is paid to vulnerable groups. Rural industrial policy, defined by Padilla Pérez (2017, pp. 83–84) as “the implementation by the State of measures that will strengthen production activities located in rural areas with a view to bringing about structural change via manufacturing and services activities and the integration and complementarity of more dynamic, knowledge-intensive activities, markets and sectors”, represents an essential contribution in this regard. This new paradigm would lead to a rethinking of rural development policies on a regional and local basis within the framework of the overlap between not only productive activities, but also local, national and international rules and regulatory frameworks.

III. Conclusions

The new rurality is the conceptual translation of the far-reaching transformations that rural spaces have undergone in recent decades, both in Latin America and the Caribbean and in other regions of the world. Those changes include the diversification of production, with a relative increase in non-farm employment; growing connectivity with urban and intermediate spaces; and a radical cultural transformation with the emergence of new social habits. The new rurality highlights the heterogeneous and dynamic nature of rural areas, which are in continuous transformation and interaction with other spaces, as a result of which distinguishing between the rural and the urban is increasingly difficult.

Faced with this new rural reality, two primary challenges exist. First, the classic tools used to measure and classify spaces must be modified in order to go beyond the rural-urban dichotomy. The classification and measurement instruments used by the countries of Latin America and the Caribbean do not account for the great diversity of existing spaces; instead, they are mostly limited to readings through the lens of duality and do not explain the complexity of the territorial dynamics that continue to transform rural spaces. Second, the conceptual limitations negatively impact efficiency and effectiveness in the design and implementation of rural development public policies.

The territorial approach identifies the unique nature of each territory, offers new perspectives for policy design and the distribution of public funds for rural development and reduces territorial disparities. Public programmes for rural development in Latin America and the Caribbean,

however, do not take this new rural dynamic fully into account. Remedying that shortcoming could therefore assist rural development and the reduction of disparities between territories.

The new rurality also offers valuable elements to help define new paradigms for territorial growth and development. It incorporates the idea of environmental capital and emphasizes the need to address the vulnerability of rural dwellers to certain types of natural disasters and pollution risks. It highlights the need to rethink the paradigms of land occupation and use in a more lasting and inclusive dynamic, where industrial and service activities exist alongside traditional rural forestry, farming and extractive activities. This new paradigm offers rural areas the opportunity to become “laboratories” for the emergence of new patterns of inclusive growth in Latin America and the Caribbean.

Although this new rurality is a phenomenon that has been observed for several decades, its translation into tools for territorial diagnosis and public programme design is relatively recent. Some territorial development experiences are under way in Western Europe, but it is also a recent challenge for the countries of that region. One of the great challenges now facing Latin America and the Caribbean in this area is to define protocols for the design and implementation of public policies aimed at more efficient rural development that will narrow territorial gaps, inequality and poverty. To that end, rethinking the measurement and classification of rural areas is a fundamentally important first step.

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Chapter II

Measuring rurality for the design and implementation of rural development policies

*Martine Dirven
David Candia*

Introduction

This chapter critically analyses the different methods used to measure and quantify rural areas in Latin America and the Caribbean, as a starting point for the design of new instruments that take account of those areas' dynamic and heterogeneous nature. Enormous territorial gaps in health, education, income, economic dynamism and gender equality have persisted over time. These gaps are both the result and the cause of unequal development opportunities in the territories, and they have a particularly strong impact on rural areas in Latin America and the Caribbean (Latin American Center for Rural Development, 2017).

The rural population is counted and most of the socioeconomic indicators are calculated using the census definitions of rural areas. No definition enjoys global consensus, and in the Latin American and Caribbean region seven major types of definitions are used. Although the number of rural inhabitants varies widely depending on the definition used, the downward trend in rural population numbers is generally maintained.

As discussed in the first chapter of this book, there have been notable changes in rural areas over recent decades, including a steady increase in the proportion of workers engaged in rural non-farm employment (RNFE) as their primary or sole source of work. There has also been a growing dissociation between places of residence and places of work, as well as an increase in exchanges of all kinds and in production chains that cross rural and urban areas (in the same country, in neighbouring countries or globally). These changes led to a rethinking of the concepts of rurality.

Why or why not to continue differentiating between rural and urban areas for the purposes of development policies and actions remains a matter for discussion. Historically, the trend in Latin America and the Caribbean has been to take a sociological approach to the analysis and design of agricultural and rural development policies rather than a spatial one. The perplexed reactions provoked by “the new rurality” would probably have been less with a more territorial vision. That is one of the reasons why this chapter emphasizes a spatial approach. Another reason is the importance of the numbers, since rural areas cover more than 90% of the total territory and account for a great amount of wealth.

Systematically, rural territories have lagged the furthest behind, and lagging territories tend to share common demographic features: there tends to be a lower proportion of people of working age, with higher proportions of children and young people at one extreme and of older adults at the other. It is also common for indigenous or Afrodescendent peoples to live in rural areas (Latin American Center for Rural Development, 2018).

An analysis of the evolution of SDG indicators at the country level shows that, in general, they have tended to improve. Within each of the region’s countries, however, large gaps still remain between one territory and the next. As regards poverty indicators, although most of the countries report reductions in the simple average incidence of poverty in the long term, there have been setbacks in a large number of subnational territories¹ (Latin American Center for Rural Development, 2018).

There is a conviction among ruralists that development within the rural sphere (in its broadest and most complex sense) is necessary to achieve development, sustainability, inclusion and equity, and that the SDGs cannot not be achieved without addressing rural areas. The broadest and most complex version of rural development entails a less dichotomous and more territorial approach.

¹ For example, see the map of Mexico, with data from 2010 and 2015 (Latin American Center for Rural Development, 2018).

One of this chapter's proposals is to place the territory at the centre: in other words, to approach challenges and solutions from an essentially territorial perspective, including the population that lives, works, vacations, eats and earns its income in the territory. Any territory that is not urban is, by definition, rural or —possibly, to different degrees— peri-urban, urban-rural or rurban (see chapter III). Using the current dichotomy-based definition, it is estimated that less than 10% of the world's territories are urban —although approximately 54% of the global population lives in them— and, therefore, 90% or more of its territories are rural or rurban (and are home to 46% of the world's population).²

This 90% of the global territory contains freshwater reserves, a large part of the world's ecosystems and biodiversity, agricultural land and minerals. Thus, it contains renewable and non-renewable natural resources, as well as landscapes and opportunities for recreation in nature, which, as has been shown, are also indispensable for human mental balance. By considering the territory (in physical and geographical terms) as the focus of attention for rurality, the perception of deficiencies and poverty transmutes into one of wealth and ecosystem services to be preserved and, ultimately, economically compensated.

This chapter is divided into five parts: (i) the type of rural definitions currently in use in Latin America and the Caribbean and in other regions; (ii) some of the criticisms of and disagreements with the current definitions, in both conceptual and practical terms; (iii) some of the conceptual discussions under way at the global and regional levels with regard to normative and —at the risk of sounding redundant— conceptual issues; (iv) a look at the territory and rural-urban linkages, subdivided into urban-rural linkages, rural-urban linkages, rural surface, rural territories as (incipient) new poles of attraction and isolated and sparsely populated territories as sources of wealth; and (v) conclusions and recommendations.

I. Current definitions of “rural”

A. In Latin America and the Caribbean

Statistics on population and its characteristics —including statistics on the different dimensions of rural poverty— generally use census definitions of rurality. Most of the census definitions of “urban” and “rural” currently in use in the region were designed for the 1960 census round and have not been substantially modified since. In most of the

² 2015 percentages, calculated on the basis of United Nations (2018a).

countries these definitions are applied dichotomously, although some also use intermediate categories such as dispersed rural, concentrated rural, peripheral urban and other variations.

Definitions differ from country to country and there is currently no consensus on a single definition or threshold that would work for all countries or even subregions within countries. In 1967, the United Nations concluded that “given the variety of situations in the world, it is currently not possible while using reported national data from sources such as censuses or population registers to adopt uniform criteria to distinguish urban areas from rural areas” (United Nations, 2018b, p. 2). The United Nations Population Division maintains that position to this day.

Moreover, rural development stakeholders come from a range of diverse backgrounds and have very different visions of what defines rural and what rural development should target. Additionally, there is no geographic correlation between definitions in the region: in other words, neighbouring countries, with similar geographic conditions or settlement patterns, or that were part of the same nations or administrative divisions in colonial or pre-colonial times, did not opt for similar definitions.

As already noted, census definitions of urban and rural populations are used essentially in socioeconomic indicators, but several public agencies have their own definitions.

B. Other regions of the world, compared to Latin America and the Caribbean

The United Nations Population Division recently reviewed the definitions used around the world to distinguish between urban and rural areas. Of the 233 countries (or areas) examined, 59 use only administrative criteria, e.g. municipal seats; 37 use only population numbers or density to define an area as urban; in eight cases the criteria relate only to infrastructure, such as paved roads, drinking water supply, or sewerage and electricity networks; 12 have no definition or the definition is unclear; and in another 12 cases, the entire population is deemed urban. The remaining 105 countries and areas use two, three or four combined definitions, primarily based on administrative and population criteria (United Nations, 2018b, p. 3).

As in Latin America and the Caribbean, some countries base their definition on urban characteristics: Sweden, for example, uses a threshold of 200 people; municipal seat (India); administrative decision (South Africa); if houses (or buildings) are contiguous (Denmark and Sweden define “contiguous” as a maximum distance of 200 m, while Norway uses a distance of 50 m); employment (Belgium); while Switzerland adds an overnight stays criterion.

Few countries in the world use a “land use” criterion either directly (Trinidad and Tobago) or indirectly, by referring to agricultural employment (Chile and Trinidad and Tobago, among others) or to exceptions (mining or tourist centres in Chile, for example).

The scale used for these definitions also varies widely. Some countries use small geographic areas or grids. The European Union, for example, uses grid cells measuring 1 km by 1 km. Other countries use administrative boundaries, generally at the municipal level, such as Spain, Czechia and Türkiye, with thresholds of, respectively, 2,000 inhabitants for the first two and 20,000 for Türkiye. Classification methods range from dichotomous (rural-urban), to different types of urban and rural areas (Hopkins and Copus, 2018).

Finally, several countries, regions and institutions include some measure of daily commuting journeys (e.g. Belgium, France and the United States) or of remoteness from a city of a certain size (e.g. Scotland, Mexico and the Organisation for Economic Co-operation and Development) (Hopkins and Copus, 2018).³

Berdegúe and others (2015) conclude that cities of a certain size in Latin America and the Caribbean (10,000 inhabitants or more in some countries and slightly more than double that in others) have a significant effect on their rural surroundings in terms of—for example— increased economic growth and reduced poverty levels.

One of the reasons why these authors focused their analysis on intermediate to small cities was because of the high percentage of Latin America’s urban population living in cities of 100,000 inhabitants or less. Three types of territories are taken into consideration: (i) deep rural areas, or areas without an urban core, (ii) rural-urban, or areas with a small to medium-sized urban core and a rural hinterland, and (iii) metropolitan territories, which form around a large city. Berdegúe and others (2015) focus on the effects of urban areas of a certain type on the surrounding rural areas that have multiple linkages, and rather circumscribed to those cities.

From the Latin American and Caribbean Demographic Centre (CELADE)-Population Division of ECLAC, Rodríguez Vignoli (2017) offers the following classification: (i) large cities, 1,000,000 inhabitants or more,

³ In general, the socioeconomic level of rural areas increases with proximity to cities. In Scotland, for example, this is more pronounced in the vicinity of the major cities (Glasgow, Edinburgh and others). Hopkins and Copus (2018, p. 19) explain the phenomenon through the variety and number of high-quality jobs in those cities and, also, because easily accessible rural areas have become attractive as residential areas to certain wealthier households whose members are willing to commute to work or study.

(ii) upper intermediate cities, between 500,000 and 999,999 inhabitants, (iii) lower intermediate cities, between 100,000 and 499,999 inhabitants, (iv) upper small cities, between 50,000 and 99,999 inhabitants, (v) lower small cities, between 20,000 and 49,999 inhabitants, and (vi) the remainder. The remainder includes all smaller administrative divisions that do not have a total urban population of at least 20,000 inhabitants: i.e. all administrative divisions with below 19,999 urban inhabitants, as indicated by each country's census definition. The author states that the remainder is somewhat comparable to rural or semi-rural areas.

Among the ten countries analysed by Rodríguez Vignoli (2017), the remainder would represent 22.6% of the total population (see table II.1). Assuming a similar distribution in the other ten countries that make up Latin America would give a total of between 115 million and 130 million people⁴ living in settlements of fewer than 20,000 inhabitants.

Table II.1
Latin America (10 countries): population by city categories, around 2010

City categories	Inhabitant range	Resident population in the census year	Percentage of total population
Large cities	1 000 000 or more	130 957 264	37.8
Upper intermediate cities	500 000 to 999 999	27 406 682	7.9
Lower intermediate cities	100 000 to 499 999	51 970 165	15.0
Upper small cities	50 000 to 99 999	22 172 936	6.4
Lower small cities	20 000 to 49 999	35 997 837	10.4
Remainder	Fewer than 20 000 inhabitants or dispersed populations	78 187 715	22.6
Total population of the ten countries		346 692 599	100.0

Source: Prepared by the authors, on the basis of J. Rodríguez Vignoli, "Effects of internal migration on the human settlements system in Latin America and the Caribbean", *CEPAL Review*, No. 123 (LC/PUB.2017/24-P), Santiago, Economic Commission for Latin America and the Caribbean (ECLAC), 2017, p. 17.

Notes: Figures include the Bolivarian Republic of Venezuela (2011), Brazil (2010), Costa Rica (2011), the Dominican Republic (2010), Ecuador (2010), Honduras (2013), Mexico (2010), Panama (2010), the Plurinational State of Bolivia (2012) and Uruguay (2011). According to the 2010 figures reported by CEPALSTAT (accessed April 2019), the 10 countries listed above represent 59.3% of the total population of 584,884,000 for the 20 countries that make up Latin America. However, according to CEPALSTAT, the 10 listed countries had a total population of 397,521,000 in 2010, which would represent 68% of the total population of Latin America in that year. See CEPALSTAT [online database] <https://statistics.cepal.org/portal/cepalstat/index.html?lang=en>.

Many authors have offered definitions for the term "rural", but these definitions rarely coincide. According to some, rurality is a subjective mindset, while for others it is something objective that can be measured. The use of different definitions underscores the multidimensional nature of rurality. The United States Department of Agriculture (USDA) concludes

⁴ See the notes to table II.1.

that the choice of a definition of “rural” is best made in light of the intended purpose. Sancho Comíns and Reinoso Moreno (2012) argue that, thanks to increasing data analysis capabilities, discrimination methods based on complex indicators have been developed and can be used.

II. Criticisms of the current definitions

A. Conceptual criticisms

The concept of rural, as opposed to urban, arises from classical dichotomy-based theories. In response to the dichotomous approach, the idea of the rural-urban continuum emerged in the first half of the twentieth century. According to Sorokin and Zimmerman (1929), the differences between rural and urban societies were gradual; hence, there was no unequivocal division line between the two, and the variable that defined the gradient was the proportion of agricultural workers. In contrast, Wirth (1938,⁵ cited in Sancho Comíns and Reinoso Moreno, 2012) held that the continuum’s determining variable was population density. In turn, in his critical review of urban delimitation methodologies, Roca (2003, cited in Sancho Comíns and Reinoso Moreno, 2012) concluded that several gradients have to be taken into account, including urbanization, building density, economic activity and structure, and mobility of people and goods.

In Latin America, disagreement with the definitions of rurality probably comes from three main fronts: (i) the sharp increases observed in non-agricultural rural employment and in flows of goods and people (and information, ideas and values), which blurred the picture that rural sociologists in particular had built up of the predominance of the rural campesino class, (ii) international organizations,⁶ which end up “comparing apples and oranges” in their regional analyses, and (iii) a genuine effort to better reflect reality and to ensure that the definition is useful for analysis and policy design by different government departments and other decision-making and administrative bodies.

The classic paradigms used to understand and measure rurality have been challenged over the past several decades. Perhaps the rurality

⁵ The text cited in Sancho Comíns and Reinoso Moreno (2012) is from L. Wirth, “Urbanism as a way of life”, *American Journal of Sociology*, vol. 44, No. 1, 1938.

⁶ Despite the conclusion referred to above, reached in both 1967 and 2018 by the Population Division of the United Nations Department of Economic and Social Affairs in New York—that the countries’ realities are too diverse to suggest a single definition—in the late 1990s and 2000s, several meetings of the Inter-Agency Working Group for Rural Development in Latin America and the Caribbean were held in a bid to reach consensus on a common definition; those efforts were, however, unsuccessful.

that the scholars wanted to identify never even existed and, therefore, they resisted—and some continue to resist, including several social groups—⁷ this new rurality, which is not new, but which was ignored or was not accepted because it undermined a series of concepts, theories, beliefs and political positions.

According to the Groupe de Seillac,⁸ proposing a new model for relations between the rural and the urban requires redefining the roles of each and devising a new social contract. Through that contract, modern society must recognize and assume the necessary interdependence of rural and urban areas, explicitly define the key role played by the rural sphere and equip it with appropriate development instruments (Pérez, 2001).

In Latin America and the Caribbean, a large proportion of urban dwellers earn their incomes from activities related to the rural sector, and their way of life and many of their values are still strongly influenced by their recent rural past. In spite of this, several circles have concluded that a country's development goes hand in hand with the degree of urbanization of its population. This led Pérez (2001), along with many other ruralists, to pursue a sociopolitical reassessment of rural life.

B. Practical criticisms

Several of the indicators used to define the rural and the urban seem simple at first glance but, in practice, present difficulties. For example, measuring demographics faces three fundamental problems:

- (i) Determining the administrative or other area (e.g. locality, census district, grid cell) to which the measurement applies.⁹
- (ii) Two settlements with similar numbers of inhabitants will not necessarily have the same degree of rurality.
- (iii) Setting the threshold for the transition from urban to rural is a complicated task, and this is a problem common to all the indicators.

⁷ Gómez (2001, p. 29) explains it in the following terms: "Rural social leaders, whether from the business sector, self-employed, wage earners, or from social, cultural or other entities, should broaden the spectrum of their potential bases and be aware of the diversity that this new rurality encompasses."

⁸ A multidisciplinary group of 20 French thinkers of various political persuasions who met in Seillac, France, in 1992 to raise awareness and encourage—through their France-based contributions—a global and long-term international reflection on the relationship between society and rural spaces, innovation, production (in general) and agricultural industries (Groupe de Seillac, 1994).

⁹ The choice will depend on the purpose for which a definition of "rural" is sought. For example, for the Ministry of Education, the municipality may be the appropriate zoom level, while for census agencies the ideal scale is likely to be low-scale grid cells, depending on the availability of data and the capacity to analyse them.

Determining the area to which the measurement will be applied is not a minor issue, since it leads to vast differences in the results. At the national level in Spain, for example, if the “population entity” criterion is used (equivalent to localities in other countries), 6.7 million inhabitants are classified as rural (equal to 96% of the entities), compared to 2.8 million if the measurement unit is the municipality (equal to 71% of the country’s municipalities). There are several reasons for this. First, there are municipalities with no entities of 2,000 inhabitants or more but whose total population exceeds 2,000 inhabitants: hence, they are not considered rural municipalities. Second, there is a constantly increasing number of entities with populations of less than 2,000 located in municipalities with a large population, and these are deemed rural when the population by entity is counted (Sancho Comíns and Reinoso Moreno, 2012).

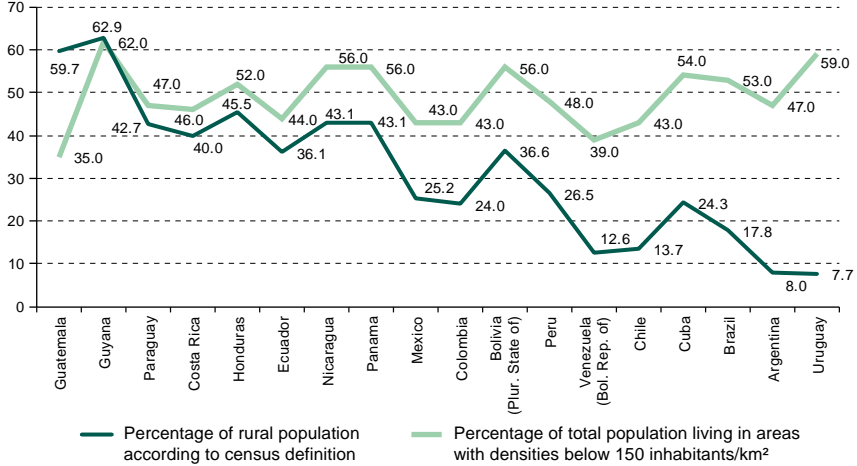
By using the “extended rural municipality” category for those municipalities with a population of over 2,000 people but without any single population entity of that size and adding it to the rural population, a total of 4 million inhabitants is reached, equal to 75% of the country’s municipalities (Sancho Comíns and Reinoso Moreno, 2012). Latin American municipalities tend to cover a larger area than Spain’s and, therefore, tend to be more internally heterogeneous. Thus, conducting the analyses on smaller entities than municipalities would more reliably reflect the local situation.

Compared to the demographic measurements described above, population density has the advantage of giving an idea of the intensity of the territory’s occupation by the population, but its representativeness depends on the size of the sample area.

In order to calculate population density and to overcome the problem of municipalities’ size and internal heterogeneity, Eurostat uses 1 km² cells as its reference point.¹⁰ Figure II.1 gives an idea of the differences between each country’s census definition and the results when the threshold at the municipal level is set at 150 inhabitants per km², which is the (simplified) OECD definition. Figure II.2 shows the population proportions according to different density thresholds.

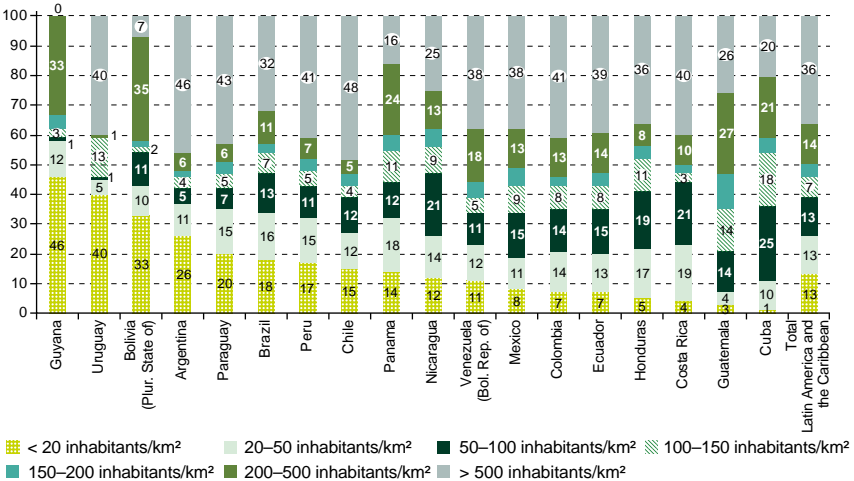
¹⁰ See [online] <https://ec.europa.eu/eurostat/web/rural-development/methodology> [accessed on 3 May 2019].

Figure II.1
Latin America and the Caribbean (18 countries): percentage of rural population according to population density and each country's census definition, around 2002
(Ranked according to the difference in rural population percentages yielded by the two definitions)



Source: Prepared by the authors, on the basis of K. M. Chomitz, P. Buys and T. S. Thomas, "Quantifying the rural-urban gradient in Latin America and the Caribbean", *Policy Research Working Paper*, No. 3634, Washington, D.C., World Bank, 2005.

Figure II.2
Latin America and the Caribbean (18 countries): proportion of total population by population density per km², at the municipality level, around 2002
(Ranked by the percentage of the population living in the lowest density municipalities)



Source: Prepared by the authors, on the basis of K. M. Chomitz, P. Buys and T. S. Thomas, "Quantifying the rural-urban gradient in Latin America and the Caribbean", *Policy Research Working Paper*, No. 3634, Washington, D.C., World Bank, 2005.

The concentric circles model of land use proposed by Heinrich von Thünen (1826) is perhaps one of the best criteria for explaining the urban-rural gradient on the basis of population density. As discussed in ECLAC and GTZ (2005), von Thünen's model tends to equally apply to productive chains and clusters and is also reflected in innovation systems. One of the proposals made in this chapter partly integrates the above by suggesting that average population density—as the basis for a definition of rurality (OECD;¹¹ Chomitz, Buys and Thomas, 2005)—should be enhanced with the use of three factors: (i) a measurement of settlement dispersion and their physical location (or distance from each other), (ii) land use, and (iii) the proportion or number of people involved in that land use in a given area.¹²

Several countries and organizations include some measure of distance to a city of a certain size or of commuting distances in their definitions of “rural”. For Latin America and the Caribbean, the use of the distance in kilometres to a point of interest (market, service)—or, as a proxy, to a city of a certain size—has been suggested, as it is the simplest solution, although travel times¹³ and costs are more relevant for quantifying distance.

The World Bank's analysis of Latin America included a measure of travelling time to a city of 100,000 or more inhabitants, as did the OECD study (see figure II.3). For Mexico, however, Berdegué and Soloaga (2017) conclude that cities with between 350,000 and 500,000 inhabitants seem to have the greatest positive effect on their rural hinterland,¹⁴ although after reaching a level of 15,000 inhabitants or more, cities begin to show a significant and positive effect on income and the different indicators of multidimensional poverty¹⁵ (Chomitz, Buys and Thomas, 2005; Berdegué and Soloaga, 2017).

Primary or extractive activities should continue to be considered an intrinsic part of rural life (particularly the forestry and farming sectors), given their extensive use of land in comparison with other economic activities and the consequent lower population density. Obtaining a complete picture also requires including the number of population units involved in those activities and their spatial distribution, factors that are

¹¹ See, for example, Spiezia (2003) or OECD (2002).

¹² For a detailed analysis of these issues and practical examples from Argentina, Mexico and Panama, see Dirven and Candia (2020), particularly chapter V by the geographer David Candia.

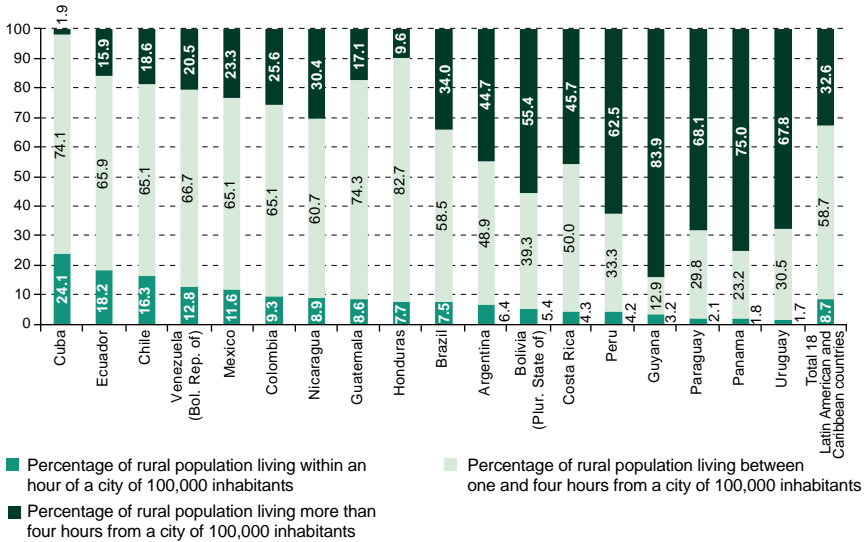
¹³ For a calculation of travel times—to different types of educational and health facilities or to given services, including leisure—plus a cost variable, see Carvajal, Poch and Osorio (2013).

¹⁴ The concept of the “hinterland” refers to a city's zone of influence on intermediate and rural spaces.

¹⁵ Berdegué and Soloaga (2017) define settlements with 15,000 inhabitants or fewer as rural.

in turn influenced by soil quality and climate, the size of properties and the uses made of them, whether the activity is labour intensive or not, and whether it employs family members or hired workers (see the proposed methodology that attempts to measure population dispersion using the Herfindahl-Hirschmann index and the results obtained in chapter V of Dirven and Candia, 2020).

Figure II.3
Latin America and the Caribbean (18 countries): rural population by distance from a city of 100,000 inhabitants
(Percentages)



Source: Prepared by the authors, on the basis of K. M. Chomitz, P. Buys and T. S. Thomas, “Quantifying the rural-urban gradient in Latin America and the Caribbean”, *Policy Research Working Paper*, No. 3634, Washington, D.C., World Bank, 2005.

As regards the grouping of smaller areas and different variables (population density and size), Eurostat specifies that its 1 km² cells must have a population density of more than 300 inhabitants per square kilometre to be considered urban and that, in addition, the set of adjacent cells that exceed that density threshold must have a minimum population of 5,000. A municipality or province is deemed predominantly rural when more than 50% of its population resides in the non-urban cells; intermediate, when between 20% and 50% of the population dwells in rural areas; and predominantly urban, when rural areas account for less than 20% of the population. In addition, a province’s classification changes

from predominantly rural to intermediate if it contains an urban nucleus of more than 200,000 inhabitants that accounts for at least 25% of its total population. A province will go from intermediate to predominantly urban if it contains an urban nucleus of more than 500,000 inhabitants that is home to at least 25% of its total population.¹⁶

III. Conceptual discussions on rural statistics at the global and regional levels

There is a broad spectrum of issues worth addressing in the social, economic and environmental dimensions of rural development, and it could be argued that any national-level indicators could also be developed for rural areas and for the local level. However, this comes up against a variety of obstacles: for instance, the variety of definitions of rurality that exist, and correctly measuring household incomes in the fishing and farming sectors, when all or part of the produce is used for self-consumption. These are particular issues not found in other economic sectors, and they can lead to misrepresentations and false conclusions (United Nations, 2007).

At the same time, economic globalization and environmental concerns have fuelled the need for data that can be aggregated and compared across countries, and so the basic metadata must be the same (United Nations, 2007).

Assembling a rural statistics system requires that five main issues be addressed, as explained below.

- (i) Coverage: in the sense of determining what aspects of rural areas should be described, what are the appropriate indicators for each and, consequently, what data are needed and how frequently they should be gathered.
- (ii) Existing data: finding what data exist, who owns them and how they can be accessed. Comparing this list with what is needed gives an idea of where the data gaps are, which can in turn lead to proposals for filling them.
- (iii) Variables: choice of variables, time periods and basic geographic units for data analysis and aggregation, in order to classify the units as rural and non-rural (plus intermediate classifications to produce a continuum rather than dichotomous measurements).

¹⁶ See [online] <https://ec.europa.eu/eurostat/web/rural—development/methodology>.

- (iv) Data acquisition and management: reviewing organizational issues that need to be addressed when creating a system of rural statistics by bringing together data sets from a range of sources (government agencies and others).
- (v) Management structure: Structuring a management system to gather, tabulate and publish the statistics.

A series of requirements apply to the indicators: they should be relevant; simple and understandable; geared towards the problems to be solved; clearly defined; based on the same statistical units; produce findings that can be easily communicated to policy-makers; and, ideally, be able to portray rapidly changing situations and adapt to them (United Nations, 2007).

Indicator selection is the result of compromises because it depends on the availability of data and funds. Priority tends to be ultimately given to those indicators that assist in the routine monitoring of policies and, therefore, are likely to describe the problems or goals that are common to most of a country's rural areas. Consequently, those indicators specific to the problems of particular rural areas will generally not be included in the statistical system and will only be developed in specific case studies (United Nations, 2007). Hopkins and Copus (2018) add that policy-making at the local level requires a highly detailed resolution of information: in other words, statistics at the level of small submunicipal areas.

Chapters IV, V, VI and VII of this book present four country studies (Costa Rica, El Salvador, Mexico and Panama) that propose both simple and composite indicators for defining rural and urban areas.

IV. A look at the territory and rural-urban linkages

Rural-urban linkages have been broadly defined as reciprocal flows of people, goods, services in general, capital, credit, markets, education, health and —hitherto less accounted for— environmental services. In addition, there are also continuous, less tangible flows, such as ideas, culture and innovations. Many rural-urban linkages are directly or indirectly related to food systems and have emerged thanks to decreasing transport and communications costs (Tagushi and Santini, 2018). Moreover, rural and urban areas often have complementary assets and greater integration between the two is important for socioeconomic performance.

With specific reference to rural development, a degree of consensus exists that smaller to intermediate cities can play a particularly important

role in rural-urban linkages and in shaping functional territories. Berdegúe and others (2015) define functional territories as those spaces with a high frequency of economic and social interactions between their inhabitants, organizations and firms.¹⁷

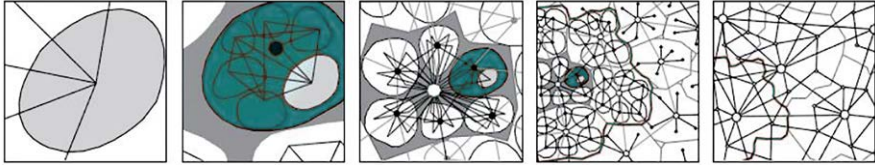
Berdegúe and others (2015) use commuting flows between pairs of municipalities as per census data to define functional territories. Thus, using data from the 1990 and 2000 census rounds —that is, before the mass use of cellular telephones in rural areas— they defined 103 functional territories in Chile, 438 in Colombia and 986 in Mexico. Their definition of functional territories does not include those deep rural territories around cities below a given threshold of inhabitants (18,000 in Chile, between 10,000 and 20,000 in Colombia and between 2,500 and 22,500 in Mexico) because they generally lack a minimum level of services (such as a bank branch, for example).

CRIES (n.d.) differentiates rural territories according to their export orientation and establishes two types: those geared towards local consumption (including “dormitory territories”), essentially defined by the local population’s consumption capacity and preferences; and those oriented towards exports beyond the local area —that is, to other national or international territories— influenced by the dynamism of the corresponding value chains and the extent to which innovations, output, linkages and decisions are local or extra-local. CRIES emphasizes the linkages between territories, which can be physical (road, telephone and other networks) or intangible (social, associative, affective or economic).

Diagram II.1 illustrates rural-urban linkages within a territory and between territories, or between agents within a cluster or territory. The white dot in the centre could represent the rural or urban centre, surrounded by its rural hinterland which, in turn, contains settlements, markets, a range of interconnected producers that connect with each other and, more fundamentally, with the central neuralgic point, to form a functional territory. The diagram on the right could represent this functional territory, with its interconnections with the other functional territories that surround it, within a larger delimited territory (municipality, region, country) and with territories beyond.

¹⁷ The definition of *bassins de vie* used in France is similar to that of functional territories. A total of 1,745 *bassins* with average populations of 12,000 were defined, and “large agglomerations” (171 agglomerations of more than 30,000 inhabitants, which account for two-thirds of the population of France) were left out of this classification. The demarcation was performed by a multidisciplinary working group from four institutions (the Institute of Agronomic Research, the Ministry of Agriculture, the Institute for Environment and the Institute of Statistics) (Julien and Pougard, 2004).

Diagram II.1
Connections and networks at different levels of magnification or scales



Source: F. Oswald, P. Baccini and M. Michaeli, *Netzstadt: Einführung in das Stadtentwerfen*, Birkhäuser, 2003, pp. 56–57, cited in C. Kasper and U. Giseke, “Analytische und konzeptionelle Ansätze für die Entwicklung von Stadt und Land”, *Working Paper*, No. 136, German Environment Agency, 2019, p. 44.

A. The urban-rural perspective

Bellet and Llop (2000), cited in Berdegué and others (2015), identify four services that urban centres offer their rural surroundings: (a) specialized goods and services, (b) greater social, economic and cultural interaction, (c) links to infrastructure networks that connect local communities with regional, national and international communities, and (d) governmental public and administrative services through which local demands and requirements can be channelled. A city can provide the critical mass necessary for a positive private or social cost-benefit ratio to supply infrastructure and services that include the surrounding rural areas (Berdegué and others, 2015).

Commuting or rural migration to nearby small urban centres generally allow for a greater diversification of employment and income and, at the same time, for the continuation of some agricultural production, for either self-consumption or sale, with the additional advantage of reducing pressure on large urban centres (Akkoyunlu, 2015). At the same time, the brain drain is one of the major challenges facing rural areas (Berdegué and others, 2015), although it is also a challenge for smaller cities and even countries, especially less developed ones.

Most cities maintain strong linkages with their surrounding rural areas and they also offer a location for the installation of non-tradable services. Among the exceptions are those cities that develop around a port which does not serve as the point of export for goods produced in the surrounding area (Dávila, 2002). In turn, agrifood systems often link rural and urban communities with other localities, regions, countries and continents. Through productive chains, they play an important role in shaping adjacent and more remote rural areas in terms of land use, production, environmental management, transport, distribution, marketing, consumption and waste generation (Tagushi and Santini, 2018).

The presence of a city in the territory (above a certain size threshold) triggers positive effects on poverty reduction and, in general, the effect is greater when it is a metropolis. Because census data in most of the region's countries do not include intramunicipal transfers, Berdegúé and others (2015) were unable to study them in detail.

Many rural-urban linkages are influenced by the life cycle, cultural idiosyncrasies, interests, the time of year and the fluctuations in the demand for labour, especially in the agriculture, tourism and construction sectors. Rural dwellers maintain frequent ties with their urban relatives, as well as with others, because they facilitate access to secondary education, jobs for their children and specialized health care for the sick and elderly. Those who migrate to cities are also a source of money transfers to their rural relatives, who often reciprocate by sending agricultural produce or other gifts (Tagushi and Santini, 2018).

It should be noted that above a certain threshold, agglomeration disadvantages and various difficulties with issues such as road infrastructure, drinking water supply, excessive vehicular congestion and urban management in general normally begin to appear, often accompanied by rising crime rates. Rural areas represent the antithesis to several of these factors.

B. The rural-urban perspective

OECD questions the excessive emphasis that several rural typologies place on accessibility by reason of the underlying idea of centre-periphery development processes, instead of recognizing and reflecting the endogenous dynamics that originate in rural areas (OECD, 2008, p. 115). The need for the right mix of minimum assets necessary to prosper has been discussed in several spheres.¹⁸

A number of cities, especially small and intermediate ones, owe their existence and economic growth to manufacturing and services linked—both directly, and indirectly through purchases made by farmers and other rural dwellers—to rural production. Moreover, a number of small cities would implode if their surrounding rural areas were to suddenly stop producing or consuming. This perspective is uncommon, yet accurate. Cities are commonly perceived to be independent of production based on natural resources and detached from the environmental services provided by rural areas (Dávila, 2002).

¹⁸ Amongst others, Peter Lanjouw, at least two decades ago at the World Bank, and Claus Köbrich and Martine Dirven, in several of their joint papers for ECLAC.

One might wonder what services rural areas offer to urban centres. Rural areas with ecological value (such as forests, riverbanks, seashores and wetlands) often serve as sources of recreation. In peri-urban areas, their degradation or disappearance particularly affects lower-income urban populations, since higher-income groups are able to seek those environmental services in more distant locations (Wiggins and Holt, 2000,¹⁹ cited in Dávila, 2002). Costanza and others (2014) and Kubiszewski and others (2017) have estimated that the per capita economic value of ecosystem services in rural areas stands at US\$ 33,492 in South America, US\$ 6,844 in Mesoamerica and US\$ 4,090 in the Caribbean. In the case of South America, this would exceed the figure for the highest national per capita gross domestic product (GDP) in the subregion.²⁰

Many rural inhabitants are classified as poor on account of their incomes and, in keeping with current multidimensional poverty indicators, because they lack access to infrastructure and basic services. However, from a different point of view, given the new concerns for climate change mitigation and biodiversity preservation, it could well be that those areas are the most richly endowed and best suited for providing environmental services.

C. Focusing on rural areas

Depending on the criteria and measurement method used, rural areas —i.e. the total area minus the area taken up by urban areas or, alternatively, the land area minus urban areas— account for 85% or more of the world's total surface. The Global Rural-Urban Mapping Project (GRUMP) at Columbia University (which uses night-time illumination recorded by satellites), estimates that only 2.7% of the world's land, excluding Antarctica, is occupied by urban-type settlements. However, by comparing the GRUMP results with the areas occupied by urban blocks according to the censuses of five Latin American countries, Candia (2011) not only arrived at a much finer delimitation, but also identified several urban areas that did not appear in the GRUMP results.

¹⁹ The citation in Dávila (2002) is S. Wiggins and G. Holt, "Researchable constraints to the use of forest and tree resources by poor urban and peri-urban households in developing countries", unpublished report to DFID's Renewable Natural Resources Knowledge Strategy, Department of Agricultural and Food Economics, University of Reading, 2000.

²⁰ Chile, with a GDP at purchasing power parity of US\$ 24,634 per capita (Saravia-Matus and Aguirre Hörmann, 2019).

Regardless of the method used, the rural surface far outstrips the urban, and one of this document's recommendations is to shift the focus, moving (or equalizing) the attention from a dwindling population with shortages, to a territory that covers almost most countries' entire area, with a wealth of renewable and non-renewable natural resources and with the potential to provide answers to many environmental challenges.

D. Rural territories as (incipient) new poles of attraction

Two decades ago, Gómez (2001) expressed his regrets that the traditional conception of rural life hindered the realization that a change of vision was taking place, which translated, in part, into its reappraisal. Behind that re-evaluation was the perception of a deterioration in the everyday quality of life of the inhabitants of large cities and, consequently, a growing attraction towards less artificial ways of life, where tourism, sports and handicrafts came to play a leading role. To accompany that re-evaluation, the following sustainable development policies are proposed.

- In the economic sphere: innovating in emerging sectors, promoting multisectoral ventures, and expanding productive chains and clusters in the agrifood sector, manufacturing, biotechnology, the green economy, in summary, around the bioeconomy.
- In the realm of social relations: assisting the development of human-scale catchment areas that favour a peaceful life, with easy commuting, without vehicular congestion, in a less polluted environment and with services that enable families to flourish in a healthy environment.
- At the environmental level: promoting a healthy environment, with rapid access to natural spaces and protected areas, with an autonomous and diversified agriculture and with the development of clean and renewable energies (Dufregne and others, n.d.).

Dufregne and others (n.d.) highlight that the challenge is to advance in these different areas in a balanced way, in coordination with and among nearby municipalities and with the inhabitants' participation in all the reflection stages.

E. Isolated and sparsely populated areas as a source of wealth

When looking at the most isolated territories, two opposing forces come into play: the economic and social perspective, and the environmental perspective, which is concerned with the richness and preservation of fauna and flora and the provision of environmental services, including the capture of greenhouse gases and other contributions to curbing climate change. According to the economic and social perspective, remoteness and low population density translate into efficiency and effectiveness costs compared to other territories. However, these are costs that must be borne if—as the SDGs maintain—no one is to be left behind. However, according to the environmental perspective, it can be held as a general rule that the lower the human population density and the greater the distance to urban centres, the smaller the anthropogenic footprint will be. Consequently, many of the territories marked by socioeconomic, infrastructure and service provision deficiencies (ECLAC, 2018) could be the richest territories from another point of view.

Thus, as the priority focus moves from social challenges to environmental challenges, the disadvantages of remoteness and low density should be offset by benefits to the Earth's health. Efforts to address environmental challenges are also an intrinsic part of the SDGs.²¹

The change in outlook can be achieved with strategies such as the landscape approach and with the pressure that will increase as concerns about climate change and the actions needed to curb it are integrated into national policies. Parallel to placing greater value on ecosystem services, there should also be a greater appreciation of the contributions made by rural areas (and their populations) and, therefore, the possibility of situating them as one of the central axes of the “new policy”: one that is concerned for the future of the Earth as we know it today.

Examining the latest events related to the COVID-19 pandemic, it is possible to glimpse a new change in the use of rural areas and the distribution of the population in them, given the re-evaluation of space, in addition to the return to rural areas by the most economically affected population segments.

There was already an incipient migratory movement from urban to rural areas, mainly of young people pursuing quality of life and environmental activities. Climate change mitigation measures such as a

²¹ See the 196 targets of the 2030 Agenda for Sustainable Development at [online] <https://documents-dds-ny.un.org/doc/UNDOC/GEN/N17/207/63/PDF/N1720763.pdf>.

carbon taxes, “15-minute cities” and other measures that restrict people’s travel may lead some to consider migrating to less densely inhabited areas, which is made easier by access to communications and telework.

V. Conclusions

This chapter is framed by an attempt to reassess the sociopolitical and environmental value of rural territories in order to place them at the centre of policy focus.

Census definitions of rurality underrepresent the importance of rural territories and the range of contributions they make. This, in turn, has had an impact on the urban bias of most policies. Rather than just changing the name (rural versus urban or other) or its measurement (census versus other methods), what is required —and is feasible today— is to have detailed information at a very low scale, choosing variables, measures, time periods and geographic units that enable the aggregation of data and its analysis in layers and at flexible scales.

Territorial databases should be structured with the same or mutually compatible basic metadata, as recommended by the Wye Group (United Nations, 2007). Also necessary is open-mindedness on the part of analysts, politicians and involved social groups, so that they accept reality and its changes and leave aside normative prejudices and rigid models that lead to incorrect perceptions or conclusions. In the region, this reluctance probably underpinned many of the discussions on the new rurality.

If average population density (at the level of the municipality, for example) is used to define rural areas —either with a single threshold (dichotomous) or with several thresholds, to indicate different degrees of rurality— it should be complemented with three of the elements that constitute or structure it: a measure of the settlements’ dispersion and their physical location (or distance from each other), the prevailing use made of the land and the proportion or numbers of people engaged in that use in a given area.

The pursuit of extractive activities, particularly forestry and farming, leads to a low population density (albeit sometimes concentrated in settlements) with the resulting problems of providing infrastructure and services, although this can on occasions be offset by the high (total) value of their output. In contrast, smallholdings are associated with higher population densities (although never as high as in cities) and, again, often in dispersed settlements. The scarcity of assets generally leads to a low (total) value of output, income and, accordingly, purchasing power and power in general. This is one of the justifications for including both the

economically active population engaged in agriculture and the prevailing land use, at the municipal level or even at a lower scale.

Another recommendation is to change the focus used to approach rural areas: from one of a population characterized by shortcomings to one that addresses a territory that covers almost the entire country, possesses a wealth of renewable natural resources and has the potential to provide answers to many of today's environmental challenges. With this change of perspective, the disadvantages of remoteness and low density, which translate into efficiency and effectiveness costs, should be more than offset by benefits for the good health (or better health) of planet Earth, without forgetting, of course, the inhabitants of rural areas and their well-being, understood in the broadest terms.

With this new focus, those territories —hitherto considered marginal and characterized by the various types of shortcomings their inhabitants face— become rich territories from another point of view. They are generally adjacent to territories that are even richer from an ecosystemic point of view.

Rural and urban development and the multiple links and interdependencies between them should be approached from a territorial point of view, with an emphasis on the landscape approach: in other words, taking account of all their assets and environmental, social, political, cultural and economic processes in a balanced way, in pursuit of human and ecosystemic well-being.

At the same time, use should also be made of the existing approaches. For socioeconomic statistics, each country's census definitions —with all their shortcomings— should continue to be used to ensure the availability of long-term series for analyses. Accordingly, a system of dual accounting should be used: i.e. continued use of the country's census definition with its full set of indicators, together with the parallel formulation of other statistics that are much more focused on the territory.

Agreements need to be reached between the institutions to ensure that the data are compatible (measurements, geographical areas, computer programs, and so on), accessible to all and with data at the lowest/smallest possible geographical level. Rather than static layers at different scales, the use of interactive maps that allow zooming in and out is highly recommended. In addition, local-level analyses intended to produce policies and actions for the local level should receive feedback from the local population and from the professionals among them, so they can contribute their knowledge and provide nuances on the how and why of the reality indicated by the territorial statistical information.

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Chapter III

Territorial approach and dynamic analysis of rurality: scope and limits for the design of innovative rural development policies in Latin America and the Caribbean

*Juan Fernández L.
María Ignacia Fernández
Isidro Soloaga*

Introduction

Rural societies in Latin America and the Caribbean are undergoing radical transformations: urbanization patterns have changed, and small and medium-sized urban centres and interactions between rural and urban areas have become increasingly important. At the same time, labour markets have diversified and non-agricultural rural employment has been gaining ground, and the rural population has become older and more female, as young people, especially men, migrate. Agrifood systems have become more complex, while the duality between one highly productive, globally inserted segment and another more backward and precarious one has become more pronounced.

Rural territories and their inhabitants have lagged behind urban areas in human development and well-being for decades. Nevertheless, their current prospects are encouraging: population growth and the expansion of the middle classes are leading to an increase in the demand for food; phenomena associated with climate change mean that

areas with ecosystem services are being examined from a perspective of sustainability and resilience; and meanwhile, the region is experiencing a period of demographic dividends in which young people offer a transformative potential to open up opportunities for well-being.

Over the last 20 years, the region has seen a far-reaching debate and the rural territorial development (RTD) proposal has emerged in response to the poor results of the strategies for overcoming rural poverty deployed until the end of the 1990s (see also chapters I and II of this book). The territorial approach, which is key to understanding and transforming rural areas, represents a milestone in efforts to improve standards of living in rural areas and has been adopted by many Latin American and Caribbean governments and cooperation agencies as part of their actions. However, its effectiveness still faces many challenges. The persistence of conventional visions of rurality, the deep-rooted perception of them as agricultural areas, the permanent difficulties in institutional coordination and the traditional “top-down” action of States—which fails to provide venues for the participation and prominence of territorial actors themselves—pose significant barriers to achieving territorial cohesion. They also represent great challenges for continuing to make progress, for learning from past experiences and for planning for the goals sought.

This chapter aims to respond to the demand for tools for understanding rural areas as they stand today in order to contribute to the promotion of processes of change towards equity and territorial cohesion in Latin America. The proposal is based on a systematic reflection on the current state of the discussion on this issue, as well as on the lessons learned over the past two decades. It deals with what contemporary rural life represents and its analysis from a territorial perspective, describes the territorial approach and offers thoughts and proposals on rural development processes and the role of public policies within them.

The chapter is divided into six parts: (i) an analysis of different concepts of rurality in Latin America and the Caribbean intended highlight the need to devise a territorial approach for understanding rurality; (ii) a presentation of the territorial approach to the measurement and classification of rural areas; (iii) proposals for analysing rurality in the region using the territorial approach; (iv) a socioeconomic analysis of certain particularly vulnerable population groups; (v) an analysis of public policy proposals that could be derived from the territorial approach to rural analysis; and (vi) conclusions and final thoughts.

I. The concept of rurality in Latin America and the Caribbean: the need for a territorial approach

Criticisms of traditional definitions of rurality have come to the forefront over the past two decades, and significant efforts have been made to produce new conceptual and operational approaches, through both the proposals regarding new rurality and rural development and this endeavour by the Economic Commission for Latin America and the Caribbean (ECLAC) to contribute to the emergence of new narratives for rural transformation. The diversification of production in rural areas, the multiplication of the functions they provide and the growing interactions between them and urban centres of different sizes have led to the adoption of a new, multidimensional perspective that complicates the dichotomous delimitation between the rural and the urban. The territorial approach is the one that seems most appropriate, robust and with the greatest potential, both for a better understanding of rurality and for promoting the transformations needed to reduce poverty and inequality and to increase opportunities for well-being within a framework of territorial cohesion.¹

The concept of territory offers a key for unlocking the dichotomous model that situates the rural in opposition to the urban and defines it as a strictly sectoral realm associated with agriculture. This has direct implications not only for understanding rurality, but also for public policy actions and initiatives in pursuit of rural development, since they demand the coordination of different stakeholders, viewpoints and actions, which requires a multisectoral and multidisciplinary perspective.

Territory, taking the classic definition in the rural development studies of Schejtman and Berdegué (2004, p. 5), is “a set of social relationships that both give rise to and express a shared identity and sense of purpose” over which some form of authority is exercised (Agnew, 2005). The key to this issue is understanding territory as a social construct in which stakeholders determine the meaning and ownership of a given physical and social space through their relationships. Those relationships involve both collaboration and conflict, and the space that is appropriated and signified by the actors (endowed with territoriality) constitutes a means of affirmation for both themselves and their identity (PortoGonçalves, 2009).

¹ See: Schejtman and Berdegué, 2004; Sepúlveda, Echeverri and Rodríguez, 2005; Echeverri Perico, 2011; Dirven and others, 2011; Rodríguez, 2011; Berdegué and Fernández, 2014; Berdegué and others, 2015; Berdegué, Escobal and Bebbington, 2015; Pérez Yruela and others, 2016; Latin American Center for Rural Development, 2012a, 2014, 2016a and 2018.

According to Berdegúe and others (2015), this socially constructed identity arises from a variety of factors, including a distinctive history, ethnicity, culture, economic structure, biophysical conditions, infrastructure, large private investments, social conflicts and the influence of political-administrative boundaries, or a combination of several of those factors.

Geographical, political and social boundaries are drawn in the territory, and there is a social relationship of power that generates and maintains them. In this dynamic, the strategies and interests of different actors come into play, and economic, political, developmental and environmental issues interact (Bebbington, 2011). The idea of territory represents, requires and promotes the participatory construction of a territorial agenda and project by the stakeholders involved (Latin American Center for Rural Development, 2012a; Dirven and others, 2011), since it is in the social and material realm of the territory where the actors' identities and life projects are constructed, alongside the firms' investment strategies and governments' public policies.

A significant portion of these territories are mired in poverty and inequality traps (Bebbington and others, 2016). People's destinies largely depend on the territory in which they are born and live, and the territory is the venue for interactions between institutional structures and arrangements, internal and external actors, markets and economic exchanges, which in practice define its characteristics and development potential (Berdegúe and others, 2014; Berdegúe and others, 2015).

The conceptual openness that the idea of the territory offers also allows for specific and concrete approaches: for example, the identification of a territory as rural on the basis of its social construction, essentially because of its natural resources and what they can offer in environmental or ecosystemic terms, and the structural dependence associated with their management (Echeverri Perico, 2011). The relational essence of the concept of territory broadens the perspective towards an understanding of rural space through its interactions, thereby increasing the number of necessary ingredients to be included while, at the same time, creating opportunities for a more comprehensive and sustainable model of development.²

² Recently, in its policy note on rural development, the Organisation for Economic Co-operation and Development (OECD) highlighted the importance of understanding the functional linkages between urban and rural areas: population, human capital, economic investments and transactions, service provision, environmental goods and services, and interactions within governance (OECD, 2018).

II. The territorial approach to development: origin, characteristics and scope

A. Origin and central elements of the territorial approach

The territorial approach to development emerged in response to the poor results of the strategies deployed to overcome poverty up to the late 1990s. The criticisms focused on sectoral (agricultural) specialization strategies and centralized policy planning, which failed to recognize the diversification of rural economies and the decreasing importance of agriculture in output and employment, along with the progress under way in the construction of democratic societies with greater participation and more active roles for social and territorial actors (Veiga, 2002; Berdegué and Favareto, 2019).

One international reference point was provided by the experience of European rural development policies and the LEADER initiative.³ While the LEADER initiative shared several elements with RTD, it did so in a context that proposed placing value on territorial capital when the basic assets already existed (infrastructure for health, education, energy, communications and transport): a totally different situation from that of Latin America and the Caribbean, where poor rural regions did not have such basic assets (Pérez Yruela and others, 2016) and therefore faced more complex challenges.

At the same time, the territorial approach is based on interconnections between discussions in economics (endogenous development, regional and local economies, neoinstitutionalism) and in sociology (the role of social actors, and relationships between them and the past and present characteristics of the social and institutional environment in which they interact) (Pérez Yruela and others, 2016). Multilateral and regional development agencies have made progress with the discussion of new perspectives for rural development, especially with respect to the phenomenon of non-agricultural rural employment (NARE), after the Latin American Center for Rural Development (RIMISP) presented the work of Schejtman and Berdegué (2004), which achieved a wide dissemination and impact in the region.

³ The acronym “LEADER” comes from “Liaison entre actions de développement de l’économie rurale”, meaning “links between actions for the development of the rural economy”. LEADER is a local development method that has been used for 20 years to involve local stakeholders in the design and implementation of strategies, decision-making and resource allocation for the development of rural areas.

That document underscores the importance of linkages between urban and rural areas and with dynamic markets, and it emphasizes technological innovation and the need for institutional reforms, decentralization and strengthened local governments, and social, intersectoral and public-private cooperation, which leads to the emergence of a collective territorial actor, the driving force behind development processes. Rural territorial development is defined as a process of productive and institutional transformation in a given rural area, intended to reduce rural poverty. According to Schejtman and Berdegué (2004), that productive transformation seeks to interconnect, competitively and sustainably, the territory's economy with dynamic markets.

The territorial approach offers both an analytical approach and a proposal for action to reduce rural poverty, which could later be expanded to include the reduction of inequality and progress towards sustainable development with territorial cohesion (Latin American Center for Rural Development, 2012a, 2014, 2016a and 2018). Territorial cohesion is understood as a situation in which all a country's territories ensure their inhabitants the full exercise of equivalent rights and opportunities, and no person is persistently marginalized (Berdegué and Fernández, 2014).

In the early 2000s, as summarized by Berdegué and Favareto (2019), Latin American discussions on this issue managed to reach consensus on two key statements: (a) rural is not the same as agricultural, and (b) the promotion of rural development under the new conditions prevailing in Latin America and the Caribbean should be based on a territorial approach rather than a sectoral one. In connection with the latter statement, it should be noted that the territorial approach does not mean denying the sectoral approach, but rather incorporating it into the design and implementation of public policies in an interconnected and complementary way. In the same document, the authors state that in the heat of the intellectual debate on the topic in the first half of the 2000s,⁴ five common elements that would constitute the heart of the proposal for a territorial approach to rural development were identified:

- (i) The definition of territory as a socially constructed space, rather than as a geographical area.
- (ii) Recognition of the sectoral diversity of the rural economy, above and beyond agricultural activities.
- (iii) The appraisal of the role of urban areas and rural-urban relations, with their interdependencies and interconnections.

⁴ Encouraged, among others, by Echeverri and Perico Ribero, 2002; Veiga, 2002; Echeverría, 2003; Schejtman and Berdegué, 2004; and Favareto, 2007.

- (iv) Each territory's development strategies and programmes must be devised, built and led from below, from the territory, albeit in dialogue and interaction with supraterritorial dynamics of all kinds.
- (v) The development strategy and programme of each territory includes the construction of a collective territorial actor.

B. Rural territorial dynamics for territorial development

In nearly 20 years of research into rural territorial dynamics, the Latin American Center for Rural Development has accumulated evidence on how certain territorial configurations contribute to inclusive growth (Berdegué and others, 2015), while others cause and reproduce localized poverty and inequality traps (Bebbington and others, 2016).

The inclusive dynamics contain a series of more or less common elements, notably more diversified patterns of land ownership, the development of public policies that ensure minimum levels of infrastructure and services for the population, the existence of urban-rural links that go beyond the merely rural and in which cities—especially intermediate ones—play a role in inclusion processes, and the existence of territorial coalitions of stakeholders who contribute different forms of capital but who have a shared interest in the territory's development.

According to Berdegué and others (2015), territorially unbalanced development is related to the geographic distribution of assets and also to the effects of exogenous trends and events.

The probability that a territory will experience a dynamic of growth with social inclusion and environmental sustainability depends on how structures and institutions interact in a group of critical domains; in other words, the causes are multidimensional and are shaped by interactions between endogenous and exogenous drivers of change, which, according to the results of the RTD programme, can be grouped into the following categories: (i) the agrarian structure and, more broadly, the sets of institutions that govern access to and use of a territory's key natural resources; (ii) the productive structure and the way it interacts with markets; (iii) the territory's links to cities; (iv) the structure of public investment and spending; and (v) the types of social coalitions that emerge and become dominant in the territories, which may involve both stakeholders from the territory and extraterritorial actors.

At the heart of all these factors is the coalition's capacity and potential for transformation. A coalition is a group of different actors who carry out convergent actions around a territorial development dynamic. But not all coalitions have that potential. The potential emerges when the coalition is socially inclusive and represents a range of actors who tacitly or explicitly share certain important development objectives, even if their motivations are different or if there is conflict or disagreement on other issues. Actors in the coalition engage in collective action with a long-term perspective and have sufficient power to at least challenge the current development dynamics. This power is based on a combination of different forms of capital (economic, political, social and cultural) contributed by the coalition's members, in a way so that no coalition member is in a completely subordinate position with respect to the others. Finally, a transforming coalition is able to socialize and legitimize its vision and development strategy in such a way that they are gradually accepted and even endorsed by other actors in the territory (Fernández and Asensio, 2014).

III. Rural analysis from a territorial perspective

A. Functional territories: an operational proposal for the delimitation of territories

Functional territories are spaces that contain a high frequency of economic and social interactions between their inhabitants, organizations and firms. A territory's functionality arises through various mechanisms, including labour markets, markets for goods and services, social networks, ethnic or cultural identity and also the political and administrative organization of the State that creates venues for public services. A set of localities can be part of the same functional territory if people live there and mainly move between them when working, accessing public and private services, buying and selling, or interacting with the people and organizations that are part of their social network. Those interactions require infrastructure and services that facilitate movement and communications between individuals and organizations, as well as the exchange of goods and services.

This concept is equivalent to that of functional regions used in the countries of the Organisation for Economic Co-operation and Development (OECD). It is based on the original work of Tolbert and Killian (1987), who identified areas containing a shared labour market: i.e. the specific space in which interactions between employers and

the economically active population take place most frequently. Those interactions are the result of factors such as people's decisions about where to live, the capabilities, skills and preferences of individuals in the labour market, gender systems, ethnicity and other formal and informal institutions that affect employment decisions. They also involve the decisions of firms and other employers regarding where to invest and where to locate businesses, and transport costs, which in turn depend on public investment decisions in roads and transport services and on the geography of the location.

Formally, a functional territory is a geographically continuous set of municipalities (or the corresponding administrative unit in each country, such as communes, parishes and others) within which a significant percentage of the inhabitants regularly commute to work.⁵ At one extreme, a functional territory defined in those terms would be equal to a municipality, as in the case of those geographically isolated territories with very low levels of daily commuting to and from other settlements. Likewise, a common work area may consist of a relatively large group of municipalities or communes, such as those metropolitan areas characterized by the fact that the places where people live are different from the places where they work.

Information on labour movements appears with increasing frequency in many countries' population and housing censuses and is generally used to identify functional territories defined as common labour areas. A recent publication by Berdegué and others (2019) on the cases of Chile, Colombia and Mexico expands the information on labour flows with data from satellite-generated images of night-time lighting patterns. The satellite images show the pools of light generated by human activities and thus identify the countries' main population centres and the locations of productive activities conducted at night (typically mining activities) or that generate light sources (the petroleum sector).

Technical details on the creation of functional territories may be found in the work of Berdegué and others (2019), which constructed a matrix with daily labour flows in both directions (municipalities of origin and destination municipalities) as a proportion of the total number of workers in both. Once this labour commuting matrix is available, a hierarchical cluster analysis is performed, grouping together the

⁵ The operational definition of a functional territory is that of a common work area, associated with commuting. There is a hypothesis that, in addition to interactions that occur for reasons of employment, people may also pursue other undertakings in the territorial unit where they work, such as cultural and social activities, shopping and so on. However, for reasons of data availability, the method only uses commuting patterns and patterns of night-time illumination.

contiguous municipalities in each study country where the commuting flows account for at least 5% of the total workforce of at least one of the municipalities in question.

Once all a country's functional territories have been identified and delimited, they are classified according to the presence and size of urban centres in each, categorizing the territories according to the same criterion (population size of the urban core and its relationship with the services it contains) but with different cut-off levels according to each country's reality (Berdegué and others, 2019).

B. Application of the functional territories approach in Mexico

The recent study by Berdegué and others (2019) uses the methodology to determine common labour areas in Chile, Colombia and Mexico, while Soloaga (2020) and Romero and others (2020) deal with the cases of Mexico and Guatemala, respectively.⁶

There are almost 2,500 municipalities in Mexico, many of which are very sparsely populated and have scant interactions with other municipalities. Once the functional territories (FTs) have been defined as a group of municipalities with shared urban centres and work areas, they should be identified in terms of three characteristics: (a) the size of the urban centre that serves as the reference point for the inhabitants of the municipalities that make up the FT, (b) connectivity with other municipalities, and (c) the importance of agricultural and agro-processing activities in local employment.

Table III.1 shows how the 2,442 municipalities are grouped into 1,532 FTs following these three criteria. It can be seen that more than half of Mexico's municipalities belong to the rural-isolated category: in other words, they do not have significant interactions with other municipalities. They are home to 14% of the country's population. The 281 FTs deemed rural-urban comprise 665 municipalities and almost 30% of the population, while the remaining 57% live in 401 municipalities grouped in territories considered urban (with head towns of between 380,000 and one million inhabitants) and metropolitan (head towns with populations over one million).

⁶ This section closely follows the work of Soloaga (2020) and Romero Alvarado and others (2018).

Table III.1
Descriptive statistics by type of functional territory

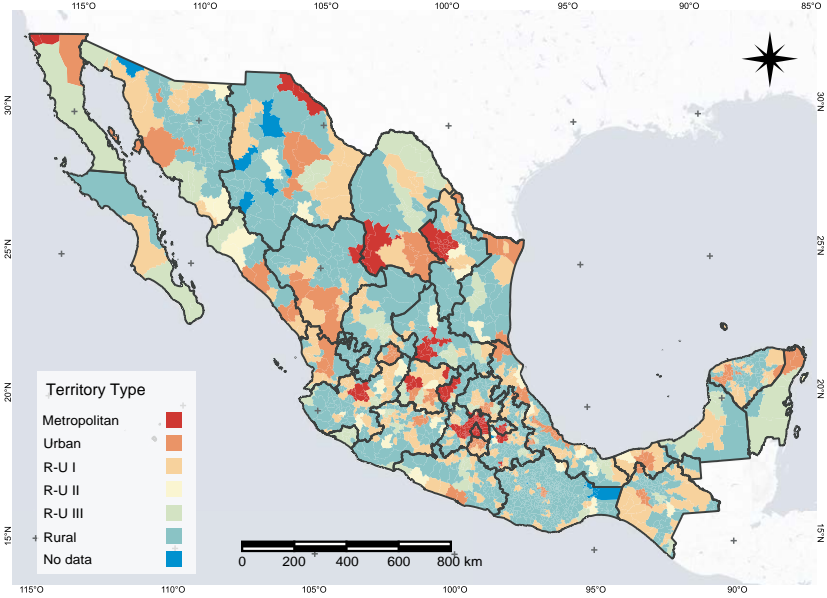
Head town population size	Territory type	Functional territories		Municipalities		Population	
		No. of FTs	As a percentage of total FTs	No. of municipalities	As a percentage of total municipalities	Population (thousands)	As a percentage of total population
Below 15 000	Isolated rural	1 212	79	1 380	56	15 689	14
Between 15 000 and 60 000	Rural-urban I	206	13	416	17	14 968	13
Between 60 000 and 115 000	Rural-urban II	31	2	84	3	5 014	4
Between 115 000 and 380 000	Rural-urban III	44	3	165	7	12 736	11
Rural-urban totals		281	18	665	27	32 718	29
Between 380 000 and 999 000	Urban	29	2	191	8	21 580	19
More than 1 million	Metropolitan	10	1	210	9	42 622	38
Total urban and metropolitan		39	3	401	16	64 202	57
Total		1 532	100	246	100	112 609	100

Source: Prepared by the authors, on the basis of I. Soloaga, "Crecimiento e inclusión social en los territorios rurales-urbanos de México", *Sobre México Temas de Economía. Nueva Época*, vol. 1, No. 1, 2020.

Note: A FT head town size of less than 15,000 inhabitants identifies rural territories in Mexico. The weight of agricultural activities and of farm produce processing allowed the identification of three strata within the FTs with a head town population of more than 15,000 inhabitants: between 15,000 and 60,000, between 60,000 and 115,000, and between 115,000 and 380,000.

The geographical distribution of the territories is shown on map III.1. While urban and metropolitan FTs are located mainly in the central and northern parts of the country, both rural and rural-urban FTs are found nationwide. Similarly, figure III.1 shows indicators that illustrate the unequal levels of poverty and access to health and education in the FTs according to the population of their head towns.

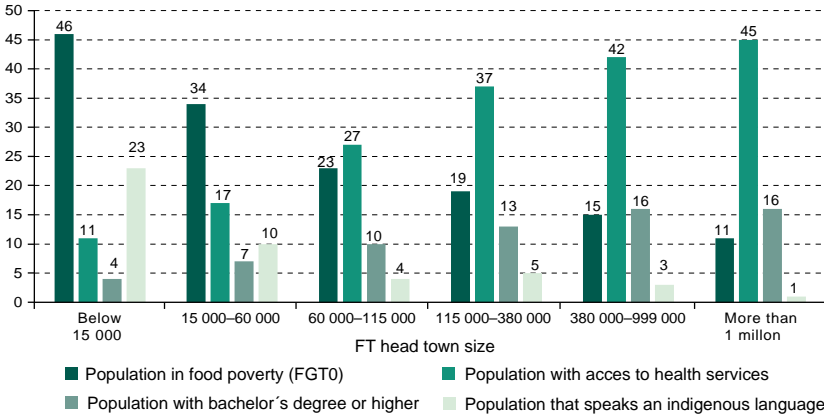
Map III.1
Mexico: rural-urban functional territories



Source: Prepared by the authors, on the basis of I. Soloaga, “Crecimiento e inclusión social en los territorios rurales-urbanos de México”, *Sobre México Temas de Economía. Nueva Época*, vol. 1, No. 1, 2020.

Note: The territories were categorized according to the information shown on table III.1. The territories are classified by the population of the head town’s urban area. The head towns of rural territories have less than 15,000 inhabitants, those of urban-rural territories range from 15,000 to 380,000, those of urban territories go up to 1 million, while metropolitan territories have head towns with more than a million inhabitants.

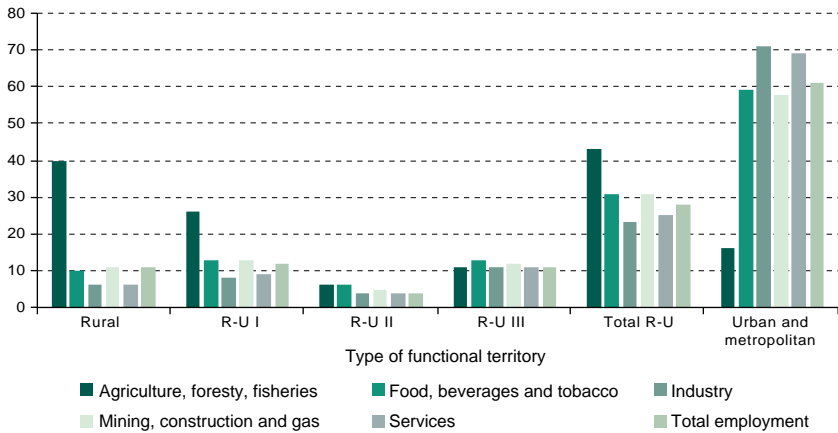
Figure III.1
Indicators of poverty and health and education access in functional territories (2010)
(Percentages)



Source: Prepared by the authors, on the basis of I. Soloaga, “Crecimiento e inclusión social en los territorios rurales-urbanos de México”, *Sobre México Temas de Economía. Nueva Época*, vol. 1, No. 1, 2020.

Figure III.2 shows the percentages of workers employed in each type of territory as a share of total employment. Around 2010, territories classified as rural-urban accounted for 28% of total employment, 43% of agricultural jobs, 31% of food processing jobs, 25% of services jobs and 28% of jobs in industry. In contrast, territories classified as rural accounted for 10% of total employment and 40% of agricultural jobs.

Figure III.2
Shares of total employment,
by type of functional territory
(Percentages)



Source: Prepared by the authors, on the basis of I. Soloaga, “Crecimiento e inclusión social en los territorios rurales-urbanos de México”, *Sobre México Temas de Economía. Nueva Época*, vol. 1, No. 1, 2020.

Note: Because of rounding, totals may not add up to 100.

An indicator of the relative isolation of FTs can be constructed by identifying, for example, the percentage of the population of each type of FT that lives within 60- or 90-minute journeys from a settlement of at least 100,000 inhabitants, using the assumption that a supply of services of a certain degree of complexity can be found there (the “central place theory” of Partridge and others, 2008) and that relative remoteness from them could be considered as an indicator of vulnerability. This is shown on table III.2, where a clear gradient can be seen following the FT classification used in this publication. While only 26% of the population in rural territories is located less than 90 minutes from a town of 100,000 or more inhabitants, this percentage rises to 83% in type RU-III territories (with head towns with between 115,000 and 380,000 inhabitants). Table III.2 shows the gradients that exist in per capita income levels and population density in the FTs.

Table III.2
Isolation, per capita GDP and population density by FT type

FT type	Isolation: percentage of population near settlements of 100,000 inhabitants or more		2010 per capita GDP in pesos	Population density (x km ²)
	Percentages at 60 minutes	Percentages at 90 minutes		
Rural	13	26	1 159	55
R-UI	18	39	1 573	94
R-UII	34	50	1 991	110
R-UIII	77	83	2 374	136
Urban	93	95	2 584	262
Metropolitan	97	99	3 011	620
Total	69	76	2 638	71

Source: Prepared by the authors, on the basis of I. Soloaga, “Crecimiento e inclusión social en los territorios rurales-urbanos de México”, *Sobre México Temas de Economía. Nueva Época*, vol. 1, No. 1, 2020.

Note: 2010 data. The second and third columns indicate the percentages of the population living, respectively, 60 and 90 minutes away from a town of at least 100,000 inhabitants.

C. Analysis of inclusive development, poverty traps and associated factors

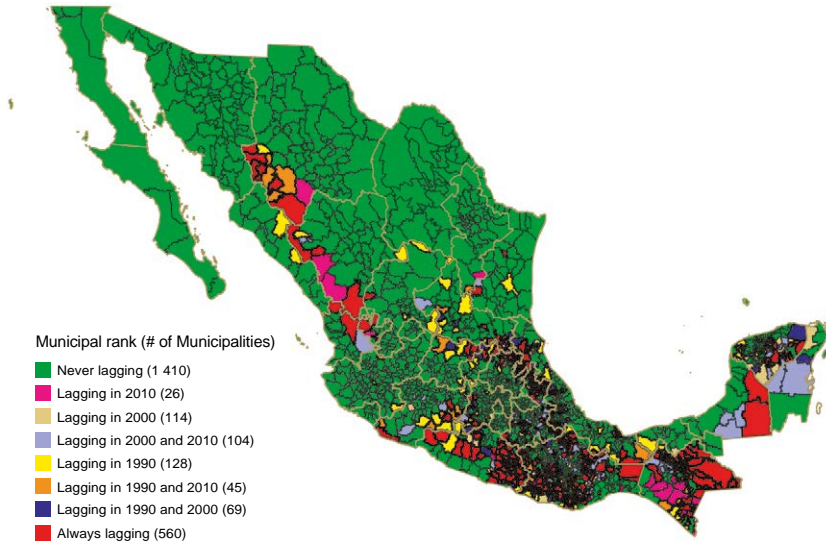
Studies conducted in Chile, Colombia and Mexico have used FT classifications to analyse territories’ dynamics of growth and inclusion and, in the cases of Chile, Mexico and Peru, the existence of poverty and inequality traps, indicated by relative lags in given FTs over one or more decades.

Berdegúe and others (2015) explore the impact on inclusive development of rising urbanization in rural areas of Chile, Colombia and Mexico. In particular, they study whether the presence of medium-sized and even small cities in rural-urban territories improves economic growth along with reducing poverty and inequality. The authors conclude that rural territories that are connected to and close to cities of different sizes (starting with intermediate cities) show higher growth and poverty reduction dynamics than those deemed “deep rural” territories. Regarding the channels through which this influence is transmitted, they found that the “city effect” is a combination of several different factors, some of which clearly favour the reduction of poverty (presence of specialized services, range of available jobs, reduction of the gap between investments directed to urban and rural areas, increased coverage of electricity grids) while the impact of others are less direct (increase in political competition and a narrower gender gap in employment).

The study by Bebbington and others (2016) shows that, in Chile as well as in Mexico and Peru, there is a notable geographic overlap between those territories trapped in low relative levels of well-being for two decades

and those FTs classified as more rural. Furthermore, those territories tend to be the most dependent on non-irrigated agricultural production and to have a large presence of indigenous language speakers. The case of Mexico is illustrated on map III.2.⁷

Map III.2
Mexico: food poverty transitions 1990–2000–2010



Source: Prepared by the authors, on the basis of A. Bebbington and others (eds.), *Trampas territoriales de pobreza, desigualdad y baja movilidad social: los casos de Chile, México y Perú*, Mexico, CEEY Editorial, 2016.

Note: 27% of the municipalities, accounting for 9% of the total population, are permanent laggards (in 1990, 2000 and 2010).

Although economic convergence is occurring in the three countries—a phenomenon whereby the territories that lag behind the most exhibit higher income growth rates than those with smaller lags—the study found that without appropriate territorial policies, that convergence process would take many decades. All three countries are experiencing a process of segregation, through which clubs of poor territories (where individuals converge around relatively low levels of income) and clubs of rich territories (where individuals converge around relatively high levels

⁷ The map shows two broad categories of municipalities: those that never been laggards (shown in green) and those that always been laggards (red). Over the study period (1990–2010), other municipal dynamics were also at play: for example, the group of 128 municipalities that were relative laggards in 1990 but had left that situation in 2000 and remained non-laggards in 2010 (shown in yellow), or the group of 104 municipalities that were not laggards in 1990 but had become relative laggards in 2000 and remained so in 2010. Bebbington and others (2016) use case studies to document the importance of reconfigured local alliances and external shocks as possible explanations for these dynamics.

of income) are being created. In the case of Mexico, there is a clear gradient that follows the size of the reference population of the FTs: the convergence values rise as the size of the FT's urban centre increases.

Finally, according to Bebbington and others (2016), between 30% and 50% of the inequalities in access to opportunities for well-being experienced by the population are determined by the territory in which they live. This is shown by an "equality of opportunities" analysis (Paes de Barro and others, 2006) in which, among persons aged under 18 in the three study countries (Chile, Mexico and Peru), the effect of family circumstances (parents' schooling, occupation, indigenous language speaker, sex and age) on well-being indicators (such as schooling for age, out of poverty, access to quality housing and access to services) is disaggregated and contrasted against geographic circumstances (in what type of territory these young people live). In the three countries, a gradient was found for the influence of territory, whereby the more rural the territory, the greater the negative influence.

To summarize this section, it can be said that the analyses of functional territories conducted in Chile, Colombia, Mexico and Peru suggest that well-being indicators are worse for populations living in the most remote rural areas, while they gradually improve among populations in rural environments connected to urban areas. One notable finding is the existence, in general, of higher levels of well-being when the reference urban areas are larger.

IV. Social exclusion in rural territories: intersecting inequalities among individuals

Recent trends in the analysis of territorial dynamics warn about those social groups that do not participate in or benefit from the fruits of territorial development, even in the context of "successful" dynamics. Such is the case for women, young people and indigenous populations, whose situations of vulnerability are aggravated by intersectional factors. One finding of this research into territorial dynamics is that living in a place that offers general opportunities for social inclusion does not guarantee them for everyone. Many of the territories studied had market linkages and experienced economic growth, but that failed to benefit the majority of the population and certain social groups faced particular forms of economic exclusion (Cortínez, 2016; Latin American Center for Rural Development, 2016a).

A better and deeper understanding is needed of how territorial contexts influence individuals' opportunities, decisions and outcomes, and how those decisions and outcomes contribute to shaping rural areas.

Likewise, this deeper knowledge is necessary to inform the design and implementation of public policies that take account not only of their target populations' individual and family characteristics, but also the physical, economic, social, cultural and institutional variables of their environment. In light of that, the proposal is to jointly analyse the factors that assist and hinder the availability of individual opportunities and their interactions with territorial dynamics, which can also be a source of either assistance or hindrance.

A. Gender and territory: the situation of women and their relationship with territories

Rural women play an important role in preserving biodiversity through the conservation of seeds; they also rescue agroecological practices and guarantee food sovereignty and security through the production of healthy food (Brasilia Declaration, 2014).⁸ Rural women nevertheless continue to suffer from social inequality, particularly in the economic and political dimensions. Their land tenure rights (access, use and transfer) and inheritance rights are weaker. Agricultural censuses indicate that in Latin America and the Caribbean, women are responsible for no more than 33% of agricultural land and that their holdings are smaller than those of men (Deere, 2013; FAO, 2011). In addition, 41.4% of rural women have no incomes of their own, a figure more than 10 percentage points higher than among women in urban areas (ECLAC, 2014).

Analysing territorial dynamics from a gender perspective shows that women's opportunities —both to participate actively in the development of their territories and to benefit from its fruits— are not distributed homogeneously within countries, as they are determined not only by individual characteristics, assets or skills, but also by specific territorial factors.

Gaps between men and women are greater in rural areas than in towns and cities (Latin American Center for Rural Development, 2016a). As noted in the report *Pobreza y desigualdad: informe latinoamericano 2015*, which deals with gender and territory, the possibilities of ensuring women's economic autonomy are unequally distributed among different territories within the countries, and that affects not only the quality of life of the women who live in lagging territories, but also the development processes of the region's countries as a whole (Latin American Center for Rural Development, 2016b).

⁸ See [online] http://www.fao.org/fileadmin/user_upload/rlc/docs/Declaracion_de_Brasilia_AIAF_2014_final.pdf.

Although deep-rooted gender stereotypes that hinder women's work and undermine its recognition and worth are found in a large number of the region's territories, those where productive reconversion processes are under way offer more opportunities for women's economic participation and women are taking advantage of them. Some experiences show that when women have access to assets —such as credit, land, consultancies and so on— they encourage a greater diversification of their local economies and create new opportunities for territories and their inhabitants (Cortínez, 2016).

The region's public policies do not address the overlapping gender and territorial gaps: (a) rural development policies do not include the historical exclusions faced by women in those territories, (b) gender equity policies do not take account of the diversity of women living in the national territory and the different obstacles they face in exercising their rights, and (c) this means that the strategies deployed are not effective in addressing gender gaps in rural territories (Latin American Center for Rural Development, 2018 and 2016a; and Cortínez, 2016).

The report on gender and territory cited above therefore concludes that those territories that have more dynamic markets, high productivity economic sectors, public policies to facilitate women's economic integration and a better distribution of agency among different social groups will assist more in increasing and deploying women's own assets and thus improve their relative situation in those territories. This integrated analysis of territorial factors and the situations of women is the main challenge facing the actions of public institutions and their policies and programmes (Latin American Center for Rural Development, 2016b). Intersectionality in the analysis of gender equity and in the interventions adopted in pursuit of it must include the territorial dimension, just as territorial development projects must include gender awareness. Both contribute to the necessary comprehensiveness and to more inclusive change processes.

B. Rural youth and territory: agents of rural change

Recent studies indicate that the type of territory where young people live has a significant impact on their aspirations for economic inclusion (Cazzuffi and others, 2018), that young people's development paths are diverse, and that certain key transitions (access to education, work, parenthood, migration) define their aspirations (Urrutia and Trivelli, 2018). Although young people are more geographically mobile than adults and the younger population's poles of expulsion are concentrated in rural areas, not all rural areas are losing young people:

the phenomenon is primarily found among those that have higher rates of poverty, greater dependence on agriculture and less human capital (Cazzuffi and Fernández, 2018).

A very small number of programmes for the economic inclusion of rural youth are targeted exclusively at that group. The supports are strongly sectoral and focus on farming activities, ranging from capacity-building to the capitalization of productive projects. In general terms, that situation poses a risk: the needs of rural youth are not being adequately addressed in that their defining features are not taken into account (Rodríguez, 2014). Young people are increasingly abandoning agriculture as they struggle to find jobs in other sectors, and many are forced to migrate as a way to cope with local violence, the lack of employment opportunities or limited access to productive resources.

At a time when the region is experiencing a demographic dividend, rural youth have great potential for meeting the challenges of inclusive and sustainable rural transformation: compared to rural adults, they have more schooling, closer ties to the information society and the use of new technologies, greater capacity for innovation and greater environmental awareness, and they can move more easily between urban and rural areas. There are, however, gaps between rural youth and their urban peers, which restrict their development possibilities (Latin American Center for Rural Development, 2018).

Where they live influences —both positively and negatively— the gaps and constraints rural youth face in deploying their potential. Territorial characteristics mean different employment opportunities, different organizational and community structures, particular institutional frameworks and so on. At the same time, public policies do not take those particularities into account because they are undifferentiated: in other words, youth policies do not distinguish between urban and rural settings, and rural development policies do not distinguish between adults and young people, and for that reason both are unsuited to rural youth. Currently, the situation of rural youth requires rapid and relevant responses that are comprehensive, intersectoral and sensitive to the territorial contexts in which they live.

C. Indigenous population and territory

In Latin America and the Caribbean, the territories that lag behind the most in terms of development indicators maintain a profile over time and share some characteristics: they have small populations, they are more rural or farther away from urban centres and they have higher percentages

of indigenous or Afrodescendent inhabitants (Latin American Center for Rural Development, 2012a, 2014, 2016a and 2018). Indigenous populations report wide gaps in several dimensions of development compared to non-indigenous people, in both rural and urban areas. Pinol and Leyton (2019) explore the relationship between indigenous peoples and their territories in depth and draw valuable conclusions.

- (i) In the first place, there are evident social and human development gaps between indigenous and non-indigenous people, and they are wider in rural and indigenous territories. The World Bank (2015) estimates that in Latin America and the Caribbean, the indigenous population is 2.7 times more likely to live in poverty than non-indigenous people, and 43% of indigenous households in the region are affected by poverty: twice the level found among non-indigenous households.
- (ii) Second, territorial dynamics underpin those gaps and how they operate in the specific case of indigenous populations. With regard to the productive structure, extractive activities tend to be concentrated in rural areas that include indigenous territories and these have been a recurrent cause of socio- and ethno-territorial conflicts; moreover, considerable differences exist between the idea of development used by States and private actors and indigenous peoples' own ways of understanding development.

In addition to extractivism, which limits indigenous peoples' access to and control over natural resources and causes negative social and environmental externalities that directly affect them, indigenous peoples have historically been in conflict with States over demands for the recognition of their territorial rights and, in more general terms, their self-determination. These are unresolved issues that considerably limit not only the development possibilities—in their own terms—of indigenous peoples, but also their reproduction as peoples associated with a territory (Pinol and Leyton, 2019). Addressing the development of indigenous peoples requires understanding that land and territory are an integral part of their worldviews, identities and material and immaterial existence.

The indigenous population's labour participation tends to be higher in primary sector activities, which generally offer the lowest productivity jobs with the most precarious conditions in terms of income, formality and labour protection (Latin American Center for Rural Development, 2012a and 2014; López Moreno, 2016).] There are also significant income gaps between the indigenous and non-indigenous

populations, in both urban and rural areas, and these cannot be fully explained by the presence or absence of relevant labour market skills among indigenous workers: instead, they may be due to phenomena of ethnic discrimination, exclusion and polarization.⁹

At the same time, indigenous peoples' agency is severely limited by a series of historical gaps in health, education, access to services, work, income, representation and political participation. As a consequence of those gaps, indigenous people have fewer assets than non-indigenous people and, moreover, the assets they have are assigned less value. This situation of disadvantage compared to other actors leaves them less able to form social coalitions to bring about changes in territorial development projects and, at the same time, to improve their conditions or exert greater direct influence on decisions that affect their territories (Pinol and Leyton, 2019).

Finally, the institutional framework in the region is weak and there is a lack of capacity among the States to carry out and promote intercultural dialogue. According to Pinol and Leyton (2019), indigenous peoples have few guarantees for the exercise of their territorial rights, little participation in matters that concern them, scant involvement in the design and implementation of public policies and in decisions on the use of public resources, weak natural resource governance models, a concentration of political and economic power in local elites, and public policies that fail to address discrimination as a factor preventing them from narrowing those gaps.

The intersection of inequalities operates—in this case, as in the two described above— within the framework of specific dynamics that occur in the territories, and more acutely in some than in others. Understanding those territorial dynamics, including them in public policies and ensuring respect for the rights and political and social participation of indigenous peoples are essential factors for advancing towards inclusive development processes and equitable well-being.

V. Territorial approach, public policies and rural development

The territorial approach has been present, at the discourse level at least, in many public policies for the development of relatively lagging areas in Latin America. The design of inter-institutional coordination is

⁹ Celis, Modrego and Berdegué, 2008; Trivelli, 2008; Modrego, Celis and Berdegué, 2008; Latin American Center for Rural Development, 2010 and 2012a; and López Moreno, 2016.

both necessary and difficult, since territorial policy has generally been understood as the concentration in a given geographical location of a series of public policies pursued by different agencies.

Thought should be given to how public policies can contribute to rural territorial development processes. Reflections on that question require two focuses. The first addresses the relevance and timeliness of incorporating elements of the territorial approach into sectoral public policies to support specific aspects of development, such as the fight against poverty, the adoption of new production technologies, job training and other typical goals of sectoral public programmes. The second relates to the way in which public policies can contribute to promoting rural territorial development processes that are, by definition, multi-stakeholder endeavours: i.e. they transcend the specific and exclusive sphere of action of governments and require the presence of a wide range of actors.

In any event, those two lines of thought are intimately related. Although any rural territorial development strategy must be devised in a “bottom up” way, its success demands permanent interactions with extraterritorial processes and dynamics—including public policies—that have an impact on endogenous dynamics and, consequently, on territories’ development possibilities. But no public policy can, on its own, ensure territorial development. What can be done, then, through public policy? One proposal designed for Chile (Berdegué and Fernández, 2014), argued that a development strategy with territorial cohesion can be stimulated and supported by public policies of four types:

- (i) Territorially focused sectoral policies aimed at reducing or closing gaps in well-being, rights or opportunities.
- (ii) Sectoral economic, social and environmental development policies that are sensitive to territorial differences in their design and implementation.
- (iii) Territorial development policies aimed at strengthening the capacities, assets and actions of the territories and their populations, organizations and firms, so they can make a decisive contribution to their progress and well-being.
- (iv) Political, administrative and fiscal decentralization policies, ultimately aimed at empowering social actors in the territories by giving them more power to make decisions and to act.

The emphasis and priority that one type of policy or another will acquire will vary according to different contexts of institutional development and to the countries’ greater or lesser political and social will

for the promotion of territory-based socioeconomic development models. One key point is to reinforce the need for the joint implementation of different types of policies aimed at the development of the territory as a whole. It is not a matter of designing or establishing new public policies, but of doing so in a different way, so that existing public policies are placed at the service of each territory's development objectives.

A. From a sectoral to a territorial approach

The evident difficulties faced by Latin American public policies in overcoming their sectoral bias work against territorial development in two ways: first, because of the persistent blindness of (non-rural) sectoral policies towards the territorial conditions in which they are implemented (Fernández and others, 2013) and, second, because of the difficulty rural development policies face in adopting a territorial approach to agriculture instead of a sectoral one (Berdegué and Favareto, 2019).

1. Sectoral policies that are sensitive to territorial differences

Moving from a sectoral to a territorial approach does not mean eliminating sectoral policies or ceasing to appreciate the strategic role they can play in promoting territorial development processes. Quite the contrary: a territory's development requires the active convergence of several sectoral policies that contribute to levelling initial conditions of access to goods and services and to mitigating processes of social differentiation that may arise as a result of the dynamics of territorial development (Trivelli, 2019) or that define a set of rules and incentives for promoting private investment in the territory, among other possible functions.

However, since these are spatially neutral policies that, by design and explicit definition, are national in scope and not focused on specific territories, they frequently have different impacts in different types of territories. This is because policies that are "spatially blind" in their design are rarely "spatially neutral" in their outcomes. The key element is that these sectoral policies must internalize territorial differences. Fernández and others (2013) propose taking the following differences into account: the social and demographic makeup of the territory, its economic conditions, its geographic characteristics, its opportunities for access to public and private goods and services, and the institutional management capacities present.

Notice should be taken of the scant attention paid by many sectoral programmes to the role played by municipalities and their very unequal technical, human and financial capacities to support the

implementation of territorial development programmes and processes. One constant factor in territorial experiences is the leading role played by local governments through their ability to synthesize or catalyse national policies and local demands and expectations (Latin American Center for Rural Development, 2018).

Thus, the participation of local governments in different phases of the policy cycle strengthens sectoral policies and makes them sustainable over time (Cortínez and others, 2016; Fernández, 2013). In some cases, this situation even influences the willingness of local governments to contribute additional resources to expand the programme's coverage or temporarily extend its duration. On the contrary, there is often a lack of attention or commitment on the part of local governments, which undermines the results of a programme that is national in nature but that bases its capacity for delivery on the actions of municipalities. Documented issues—such as the failure to design for the longer travel times needed by promoters and officials in rural areas, the lack of adequate local infrastructure for organizing meetings or the adverse weather conditions that prevail in certain areas of the country and at given times of the year—often threaten the implementation of programmes that are well-intentioned but, because they do not take account of these and other differences, leave part of the population without access to a series of goods and services.

2. From the agricultural sector to the rural territory

A geographically targeted programme is not a territorial programme. Neither is a local economic development programme nor a programme to promote community participation. A territorial programme addresses those dimensions together with all the others that relate to the dynamics of a rural territory's productive and institutional transformation, which go far beyond agriculture. Berdegué and Favareto (2019) show that the programmes most successful in overcoming sectoral bias are those driven by public agencies whose functions are more political and strategic (such as planning, internal government or finance offices) than sectoral (Fernández L., Fernández and Soloaga, 2019).

B. Coordination between institutions and actors

The issue of intersectoral coordination highlights another of the central challenges facing policies that seek to promote RTD. This involves the inter-institutional coordination activities required to overcome the sectoral logic of how public goods and services are provided, together with the emerging agenda of interconnections between public, private and civil society actors in the promotion of territorial development.

1. Inter-institutional coordination

An analysis of experiences with interconnecting social and productive policies in Latin America and the Caribbean found that the following conditions were necessary to achieve the involvement of different levels of government: a clear definition of the shared objectives, the recognition of interdependencies, alignment between shared objectives and the current regulatory framework, the active and not merely formal commitment of the participants, the existence of permanent venues for both formal and informal interactions, and leaderships that do not hinder operations (Cortínez and others, 2016).

In order to achieve the implementation of a territorial policy through the interconnection of different sectors and levels of government, there must be a shared responsibility for the success of the policy, ideally expressed in clearly defined interagency budgetary commitments. As indicated by the literature on principals and agents, in territorial policy the parties' incentives must be clearly identified and the principal (who wants to develop the territorial policy) must have the budgetary, transparency and execution capacities to ensure that the agent (the different public programmes that must shift their focus towards the territorial approach) acts in accordance with the defined objectives.

Some relatively successful cases of this can be seen in Brazil's public social protection policies. Paradoxically, these are not territorial policies but sectoral policies, but they have a clear territorial focus. The Brazil Without Extreme Poverty Plan (2011–2015) was a strategy for overcoming poverty that encompassed a wide range of previously existing Brazilian social programmes, interconnected them and targeted them on the population living in poverty and extreme poverty. The plan involved the coordination of 22 ministries and was organized around three main lines of operation: (i) minimum income; (ii) productive inclusion; and (iii) access to public services (primarily education, health and social assistance). The central role of the nation's states in the strategy was an innovation in Brazilian social policy.

At the operational level, the role of the individual states (or other federative entities) was formalized through the signing of agreements between the federal and state levels. Within this framework, each state had the power to supplement the benefits guaranteed by the national plan with its own initiatives for each of the three pillars. The state level was responsible for coordinating and executing actions under the plan. Municipal governments assumed a key role in the registration process and in the provision of social services through their health, education and social assistance networks. The organization of a single information

system, with decentralized access, was a decisive factor in the adoption of an interconnected strategy. The single register enabled a shared perspective that facilitated coordination, the setting of common goals and the participation of stakeholders.

2. Coordination of actors

“States and national governments no longer have a monopoly on public action in rural territorial development” (Berdegué, 2019). Territorial development is, by definition, a multi-stakeholder process, since it requires the confluence of efforts in all areas of development and, therefore, of a range of actors. Progress with establishing interconnections among actors means adopting new ways of constructing public policies that can overcome the State-centric approach by cooperating with the private sector, social organizations, academia and all those wishing to participate in their own development processes (Latin American Center for Rural Development, 2018).

Working with others is no easy task for governments. Responsibility for the use of public resources, a lack of trust in the capacities and commitment of other actors and clientelistic and corrupt practices are factors that discourage governments from proactively cooperating with others in territorial development: so much so that on many occasions, the most successful stakeholder coordination efforts are those undertaken by other stakeholders in the territory and not by governments.

There is, however, a fundamental role that governments can play through public policies to encourage stakeholder coordination: the empowerment of the most disadvantaged or excluded among them. The aim is to give a voice, build capacities and create mechanisms that allow those groups to join in the work of building a collective territorial actor. Berdegué and Favareto (2019) identify two examples of mechanisms available to public policies to empower local actors who have traditionally been excluded from the construction of territorial development agendas.

One of them is provided for in the Indigenous Territorial Development Programme (PDTI) of Chile, which has recently adopted a rule that allows indigenous communities to decide on the use and allocation of the resources with which the National Institute for Agricultural Development of Chile (INDAP) supports the productive inclusion of communities. Another more established mechanism involves the implementation nuclei initially promoted by the International Fund for Agricultural Development (IFAD), which assigns those bodies the authority to manage budgetary resources. That initiative was scaled

up by the Government of Peru, where it continues to be implemented through the Haku Wiñay/Noa Jayatai programme of the Ministry of Development and Social Inclusion's Cooperation Fund for Social Development (FONCODES), which is the source of the resources that the implementation nuclei decide how to allocate.

C. Central role of territorial actors in leading RTD

Inclusive territorial dynamics are based on the transformative potential of a coalition. Highlighting the central place of the territorial actor in territorial development means that public policy is necessarily given a subsidiary role as a contributor to a process in which success and sustainability depends on the construction of bottom-up strategies from the territory. Whether coalitions can be created where they do not exist has been a matter of much discussion. The general consensus is that it is only possible to strengthen those that already exist and to promote conditions that facilitate dialogue among stakeholders.

Typically, RTD programmes do not have the time or resources to support coalition building, and they rely almost exclusively on participatory mechanisms that are instrumental to the project's goals.

Experience shows that transformative territorial coalitions with a positive impact on territorial development arise from the agency of actors such as business associations, campesino communities and others, not from governments (Hollenstein and Ospina, 2013; Asensio, 2013). There is, however, a promising initiative in Colombia that arose during the construction of the Peace Accords, the first point of which is the implementation of a comprehensive rural reform process. Within that framework, Development Programmes with a Territorial Approach (PDETs) were created to support the structural transformation of rural areas into a series of prioritized territories, the post-conflict territories.

The PDETs' main tool for achieving comprehensive territorial renewal is the participatory approach, which requires the participation of communities in making decisions that affect their well-being, so that the main conflicts in the territory can be identified and an effective intervention plan can be jointly designed to overcome them. The operational road map for the design of PDETs includes three levels of participatory planning: veredas,¹⁰ which are represented in vereda nuclei; municipalities; and subregions.

¹⁰ A vereda in Colombia is a type of territorial subdivision of a municipality. Veredas mainly cover rural areas, although they may on occasions contain a micro-urban centre. A vereda typically has between 50 and 1,200 inhabitants.

Each level has venues for deliberation, with the participation of representatives of the community, the national government, local authorities and private entities with actions or interests in the territory. The three levels are interconnected an operational road map that covers inputs, actors, outcomes and the adoption of decisions in which participation is fundamental. This participatory process results in a Regional Transformation Action Plan (PATR), to remain in effect for ten years, with a mid-term review after five years of implementation. The design of this initiative entails several elements that are critical in a strategy intended to strengthen the formation of a collective territorial actor, including its extended lifespan (with resources guaranteed for a period of 15 years) and the linking of the participatory process with the construction of a plan that sets out concrete projects and actions.

VI. Conclusions

At the beginning of this millennium, two key statements were made in the territorial development debate: (a) rural is not the same as agricultural, and (b) the promotion of rural development under the new conditions prevailing in Latin America and the Caribbean should be based on a territorial approach rather than a sectoral one. Both remain valid today, but two more equally strong assertions could be added to them: (c) territorial development must include specific groups that have been persistently left behind, even in territories with inclusive growth (women, youth, indigenous people), and (d) development programmes and policies must help empower territorial actors and their interconnection and coordination processes through territorial coalitions.

Although the first two statements are already present in the public debate, much remains to be done before they are internalized and effectively applied in specific public policies. However, even when they are included in policies, they must be accompanied by the two additional postulates. The two are necessary innovations both for a better understanding of rurality and for actions in pursuit of territorial development. A rurality framed by increasingly complex contexts—with rural-urban spaces, different degrees and types of linkages, interdependencies of various kinds and actors with different amounts of power and resources— must be analysed and addressed from a territorial approach at a time when the development of countries and the well-being of their populations go hand in hand with not leaving any territory behind or any social group excluded.

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Chapter IV

The rural and the urban in Mexico: a new categorization based on national statistics

*Isidro Soloaga
Thibaut Plassot
Moisés Reyes*

Introduction

The official criterion for defining urban and rural areas in Mexico is based solely on population size: settlements with 2,500 or more inhabitants are defined as urban localities, as are all municipal seats, while places with populations of below 2,500 are deemed rural. This essentially dichotomous classification fails to take account of the growing pluriactivity of rural households, whereby agriculture is often only one of several sources of income, or of the greater connectivity between localities, which has shortened distances and built interdependence between urban and rural areas.

This definition of rurality has implications for public policy. For example, according to the official definition, 16.7% of Mexico's rural population was living in extreme poverty in 2020, while the corresponding figure for the urban population was 6.1%. The

dichotomous rural/urban definition could erroneously indicate that an urban locality of 2,500 inhabitants had a much lower poverty rate than a rural locality of 2,499 inhabitants, and this would affect budget allocations and other policy decisions.

In Mexico, as in other countries, public agencies commonly implement different actions in urban and rural areas and assess them using different indicators. Thus, the National Council for the Evaluation of Social Development Policy (CONEVAL) calculates multidimensional poverty indicators using both urban and rural poverty lines, based on the fact that the cost of the food and non-food baskets varies between the two types of area. In addition, the PROSPERA programme (since replaced by the Benito Juárez Scholarship programme) had differentiated policies, depending on whether urban or rural areas were being served.

A review of the international literature on the subject reveals the need to redefine rurality, and this can be done by changing the threshold of the dichotomous classification (the literature refers to populations of 5,000, 10,000 or 15,000 inhabitants for deeming a place urban) or by incorporating new dimensions to develop multidimensional composite indices that contain a rurality gradient. In general, the criteria for categorizing places as rural or urban should be redefined in the context of the new rurality and the need to incorporate dynamic criteria that include such factors as distance to urban centres, accessibility to goods and services, labour flows, prevailing employment types and land use.

This chapter summarizes the work carried out in Mexico under the “New narratives for rural transformation in Latin America and the Caribbean” technical cooperation project. As noted in the introduction to this book, the project’s objectives were: (i) to highlight territorial gaps using the concepts of the new rurality, and to contribute to national development strategies in pursuit of the Sustainable Development Goals (SDGs) and general well-being in rural areas; (ii) to produce solid empirical evidence for the formulation of comprehensive rural development policies; and (iii) to assess the impact of a heterogeneous and dynamic definition of rurality on quantifying structural gaps and formulating public policies.

This chapter’s structure follows the stages of the project. The first phase entailed studying the classification of rurality in Mexico based on official statistics and developing, in light of the contributions of the theory of the new rurality, three alternative rurality indices. The second phase involved the preparation of maps presenting the alternative rurality scenarios and Mexico’s socioeconomic categorization based

on those scenarios. Finally, the third phase focused on analysing the contributions the alternative rurality scenarios could make to public policy, with a concrete application in two exercises.

Interactions took place with public agencies in Mexico at all stages of the project in order to seek feedback on the exercises and to publicize the results and their possible impact on the public agenda. The forums provided by the National Institute of Statistics and Geography (INEGI), the Secretariat of Agrarian, Territorial and Urban Development (SEDATU) and the National Population Council (CONAPO) were central to this work.

This chapter identifies the main criticisms of the different definitions of rurality that exist, examines the information available in Mexico for measuring and classifying rural areas and proposes alternative measurement methods. With this, it identifies elements for the design of an alternative methodology for measuring and classifying rural areas in Mexico. Different proposals for redefining rurality are presented and it is argued that the dynamic framework for analysing rurality is an innovative and flexible tool for the study of rural Mexico. The proposals presented take into account the contributions to the analysis of rural areas made by the theory of the new rurality and the territorial approach. The proposals were based on available official information and are therefore relatively easy to implement, and this is shown by using data from 2010. This construction enables a better understanding a range of rural issues and, in addition to other benefits, can inform the design and evaluation of territorial development policies. The chapter also summarizes two examples in which the new definitions of the rural and the urban were used in the design and implementation of public policies in Mexico.

I. Concept and definitions of rurality in Mexico

The classic view of rural areas generally considers them as synonymous with the agricultural sector. Since the twentieth century, several authors have analysed the relationships and interactions between areas and their social, economic, cultural and demographic characteristics (Rieutort, 2012; Christaller, 1935). Specialized literature emerged with the aim of classifying spaces through a territorial and dynamic analysis approach (OECD, 2011 and 2008; Depraz, 2009). In this way, distances between settlements and their demographic and land cover characteristics determine their interactions, and this makes it possible to use composite indices to classify territories for what they are without normative preconceptions (Berdegué and Soloaga, 2018; Waldorf, 2006; Chomitz, Buys and Thomas, 2005).

A. Descriptive analysis of the main concepts defining rurality in Mexico

The official definition of rural areas in Mexico comes from the census definition used by INEGI, which since 1930 has considered settlements with fewer than 2,500 inhabitants that are not municipal seats as rural areas. Likewise, for research purposes, INEGI (2005) uses the category of “extended rural population” for the inhabitants of localities with between 2,500 and 5,000 inhabitants.

The following census categories by locality size are available through the microdata on the INEGI website: (i) fewer than 2,500 inhabitants; (ii) between 2,500 and 14,999; (iii) between 15,000 and 99,999; and (iv) 100,000 or more. Finally, the INEGI website uses the 5,000 population cut-off point to publish information from the 2010 Population and Housing Census at the locality level (and at the level of basic geostatistical areas (AGEBs)¹ and urban blocks). On the one hand, information is provided on the infrastructure and socioeconomic characteristics of localities with fewer than 5,000 inhabitants and, on the other, details regarding the infrastructure and characteristics of urban areas.²

The CONAPO definitions of rural and urban are based on three categories, in which localities of 2,500 inhabitants and below are deemed rural and those of 15,000 inhabitants and more are urban, with an intermediate category that covers semi-urban or mixed areas. Another CONAPO study (2013) uses the 5,000 population threshold to categorize settlements in its analyses. For example, the marginalization index at the municipal level reports the socioeconomic dimensions of education, housing, monetary income and population distribution in terms of population percentages in localities with fewer than 5,000 inhabitants (CONAPO, 2013). CONAPO (2012) also provides analyses that disaggregate rural areas by the following ranges of inhabitant numbers: fewer than 50, between 50 and 99, between 100 and 499, between 500 and 999, between 1,000 and 1,999, and between 2,000 and 2,499. To date, it is unknown whether (and, if so, how) these

¹ The basic geostatistical area (*área geostatística básica*, AGEB) is defined as the territorial extension corresponding to the subdivision of the municipal geostatistical areas. It constitutes the basic unit of the National Geostatistical Framework. Depending on their characteristics, AGEBs are classified into two types: rural or urban (INEGI, n.d.-a).

² A review of the bibliography failed to reveal documentation that would justify the census categories described. Several United Nations documents recommend, for the purposes of international comparability, that census information be presented according to different locality sizes, although with the exception of the 100,000 inhabitant cutoff, the recommended thresholds do not coincide with those used by INEGI (United Nations, 2017, 2008, 1997 and 1969).

broader definitions of rural areas have modified public policies and whether they have moved away from the dichotomy of “fewer than 2,500” and “2,500 or more” to define rural and urban areas, respectively.

INEGI has acknowledged the possibility of updating the method for defining rural areas since at least 2005:

“Our country needs to begin the systematic exploration of the different criteria that exist for the analysis of smaller localities: that is, those located in the countryside or classified as rural... systematic studies of a geographical and functional nature must be undertaken in order to understand rurality based on the proximity or remoteness of these localities with respect to cities and the road network and to produce classifications of concentrated and dispersed rural areas, as is done by the Organisation for Economic Co-operation and Development (OECD)” (INEGI, 2005, pp. XI–XV).

Within official agencies, the former Secretariat of Agriculture, Livestock, Rural Development, Fisheries and Food (SAGARPA; since renamed the Secretariat of Agriculture and Rural Development, SADER) uses the criterion of localities with fewer than 2,500 inhabitants or where agriculture accounts for more than 50% of output. In turn, the National Institute for the Evaluation of Education (INEE) used three categories (INEE, 2005, pp. 71–74): rural for localities with fewer than 2,500 inhabitants, semi-urban for those with between 2,500 and 14,999, and urban for places with 15,000 inhabitants or more. Although the 2,500 inhabitant threshold represents the official standard for defining rurality in Mexico, it can be seen that several definitions of rural localities coexist and vary from one public agency to the next.

B. Critical analysis of the official definition of rurality in Mexico

Unikel (1978, cited in INEGI, 2005) criticizes the dichotomous approach and the 2,500 inhabitant threshold for defining rural areas and proposes a classification where localities with fewer than 5,000 inhabitants are considered rural, those with between 5,000 and 9,999 as mixed-rural, those with between 10,000 and 14,999 as mixed-urban and those with more than 15,000 as urban. A joint project of the Economic Commission for Latin America and the Caribbean (ECLAC) and French cooperation sought to update the definition of rural, to bring it “more in line with the statistical requirements for the formulation of development policies and, at the same time, with the current discussions on the new rurality” (Government of France/ECLAC, 2011, p. 2).

Although a long list of criteria for redefining the rural was identified, the consensus of the consultation was in favour of a measurement along a gradient rather than a dichotomous one. Such a classification could use criteria such as population density and dispersion, access to public services, vegetation cover, infrastructure, primary sector employment or the degree of connectivity and communication. That possibility is an important part of this work.

The Organisation for Economic Co-operation and Development (OECD, 2007) classifies Mexican localities into four categories: (i) dispersed rural (fewer than 2,500 inhabitants); (ii) semi-urban rural (between 2,500 and 15,000); (iii) intermediate urban (between 15,000 and 100,000); and (iv) urban or metropolitan urban (more than 100,000). Mexico’s 2,454 municipalities are classified and grouped into 209 regions according to three population density categories: predominantly rural, intermediate and predominantly urban. Table IV.1 summarizes the scope and limitations of the official definition of rurality in Mexico.

Table IV.1
Mexico: strengths and limitations
of the official definition of rurality

Strengths	Limitations
Continuity in measurements over time	Dichotomous and arbitrary criterion set almost a century ago.
International comparisons with certain countries	One-dimensional criterion (population size) that ignores economic and social factors and population dynamics.
	Developments in the rural world, in Mexico and globally.
	Out of touch with the context of the new rurality.
	Can only be used for localities as the territorial unit, and no municipal, regional or state measurements or thresholds can be established.

Source: Prepared by the authors.

II. Inventory of existing indicators for measuring and classifying rural areas in Mexico

One of Mexico’s statistical strengths in defining the rural and the urban is the availability of plentiful information disaggregated by administrative levels. Demographic and socioeconomic information is obtained primarily from INEGI and CONAPO. Although INEGI has a significant number of representative surveys at the national, rural, urban and state levels, few projects contain disaggregated information at a lower level (locality).

The Population and Housing Census produces significant information on the population in terms of demographic characteristics, place of birth and migration, literacy and education, occupational status and labour characteristics, access to and use of health services, marital status, religion, housing quality and space and access to basic services. It provides information at the municipal, locality, AGEB and urban block levels.³ The projects in question are the following:

- Single Catalogue of State, Municipal and Local Geostatistical Area Keys:⁴ indicates the name, identifier, rural or urban area (for localities), longitude and latitude at each territorial unit level.
- Main results by locality (ITER): database and documentation with observations on all the localities of the Mexican Republic (192,247 places in 2010). For each locality, the following are included: longitude, latitude, altitude, population indicators (demographics, education, health, etc.) and housing indicators (access to services, housing construction characteristics, etc.).⁵
- Results on infrastructure and characteristics of the urban environment: database and documentation on 1,129,728 city blocks in places of 5,000 inhabitants and more. In addition to population numbers and total dwellings per block, information is provided on the availability of paved roads, footpaths, kerbs, ornamental plants, wheelchair ramps, street lighting, street signs, public telephones, storm drainage, public transport, pedestrian and vehicle access, and the presence of semi-fixed and itinerant traders.
- Results on infrastructure and socioeconomic characteristics of localities with fewer than 5,000 inhabitants: database and documentation at the locality level for places with populations below 5,000. Includes information on road connections, availability and type of public transport to the municipal seat, travel times, main economic activities of the population, presence of Indigenous languages, and local conflicts and problems.

³ In intercensal counts and surveys, information is available at the locality level for settlements with more than 50,000 inhabitants.

⁴ See [online] <https://www.inegi.org.mx/app/ageeml/> [updated in 2020].

⁵ Information on accessibility to paved roads calculated by CONEVAL is available for all these localities (see chapter II, section C).

- Main results by AGEB and urban blocks: database and documentation at the level of AGEBs and urban blocks. Includes 190 indicators from the Population and Housing Census.⁶

Another relevant INEGI resource for territorial matters is the Historical Archive of Geostatistical Localities,⁷ which summarizes changes in the names of settlements, newly created municipalities, their disappearances, mergers and changes of status, areas and municipalities. The information for agrarian communities in the National Agrarian Land Register also measures the territorial dynamics of land endowments, expansions and contributions, changes of use, divisions and mergers, and so on. The level of analysis of agrarian nuclei composed of ejidos and communities that have legal status and their own land granted or recognized under Article 27 of the Constitution and the Agrarian Act differs from that used by INEGI. Thus, these agrarian nuclei—which own more than 50% of the land in Mexico—may have parts of their territory in several municipalities or states, and the beneficiaries⁸ may reside in different settlements, inside or outside the communal polygon.

The five-yearly Economic Censuses, Agricultural Censuses (1991, 2007 and framework agricultural census in 2016) and the National Statistical Directory of Economic Units (DENUE) are also useful for obtaining socioeconomic information on settlements. CONAPO generates marginalization indicators for the country's localities and municipalities, while CONEVAL provides multidimensional poverty measures at the municipal level every five years, based on data from the census, the census count, intercensal information and the national household income and expenditure survey (ENIGH).

Geographic resources include the National Geostatistical Framework,⁹ which is updated during INEGI projects and provides the municipal polygons, and AGEB, which covers urban settlements and some rural localities, and points for rural localities not divided into blocks. The INEGI Geographic Information System (SIG) also includes the following tools:

⁶ For this publication, efforts were made to confirm the effective availability of information at lower levels of aggregation (e.g. at the AGEB level).

⁷ See [online] <https://www.inegi.org.mx/app/geo2/ahl/> [updated in 2020].

⁸ Beneficiaries include ejidatarios, comuneros, posesionarios and avecindados.

⁹ See [online] <http://en.www.inegi.org.mx/temas/mg/>.

- Use of soil and vegetation:¹⁰ a vector file, used to identify land use and vegetation. The categories covered are irrigated agriculture, rainfed or wet soil, forest, scrubland, pasture and jungle, with some degrees of disaggregation.
- Highways and roads:¹¹ a vector trace of the country's road infrastructure. Travel times to (for example) cities of different sizes can be assigned to each location.
- Hydrography:¹² e.g. streams, rivers and bodies of water, with data that are useful for hydrological analysis.
- Contour lines:¹³ intended to manage digital elevation and gradient models that are useful for locating areas with steeper slopes.

Other institutions such as the National Commission for the Knowledge and Use of Biodiversity (CONABIO) and the National Forestry Commission (CONAFOR) have useful information on land use, natural resource use and population employment patterns. Finally, a wide range of satellite images¹⁴ —in particular, night-time light patterns— are helpful in estimating economic activity levels and the rate of expansion of built-up areas.

III. Proposed alternatives for redefining rurality in Mexico: estimates using the different alternatives, and comparisons between the alternatives and the current official definition

Four alternative proposals for redefining rurality in Mexico were developed.

A. Relative rurality index (RRI)

The relative rurality index (RRI) is an aggregated index developed by Waldorf (2006). One of its advantages is that it has been used and tested in research in different areas to define degrees of rurality (De Montis,

¹⁰ See [online] <http://en.www.inegi.org.mx/temas/usosuelo/>.

¹¹ See [online] <http://en.www.inegi.org.mx/temas/viascomunicacion/>.

¹² See [online] <http://en.www.inegi.org.mx/temas/hidrografia/default.html#Descargas>.

¹³ See [online] <http://en.www.inegi.org.mx/temas/topografia/default.html#Descargas>.

¹⁴ See satellite images of night-time light intensity: Defense Meteorological Satellite Program (DMSP) Operational Linescan System (OLS) of the United States Air Force [online] <https://data.noaa.gov/metaview/page?xml=NOAA/NESDIS/NGDC/STP/DMSP/iso/xml/G10021.xml&view=getDataView&header=none#> and other satellite images: GeoEye-1, WorldView-1, QuickBird, IKONOS [online] <https://apollomapping.com/imagery/high-resolution-imager>.

Caschili and Trogu, 2012; Gallardo and Scammahorn, 2011; Heflin and Miller, 2012). The index is multidimensional and can be calculated at different scales. The RRI is a continuous and non-dichotomous measure, and it analyses rurality as a relative concept: in other words, each territory is assigned a degree of rurality relative to the degrees given to other territories.

The index uses a multidimensional continuum to measure the rurality level by means of four steps: (i) the dimensions of rurality are identified; (ii) suitable variables for representing each of the dimensions are selected; (iii) the variables are rescaled in order to make them mutually comparable, similar to the method used to calculate the human development index (HDI); and (iv) the data are aggregated with an unweighted geometric mean. The dimensions of rurality chosen by Waldorf (2006) are, at the county level, the size and density of the county's population, because those indicators are used in most typologies; distances or the county's isolation, since this is a useful criterion for rurality classifications; and finally, the percentage of the population living in urban areas.

The resulting index ranges from 0 to 1, where zero is "very urban" and one is "very rural" (Waldorf, 2006). This index makes an important contribution to the debate on what rurality is, as it reflects the multifaceted nature of the rural and is sensitive to changes in each of the dimensions.

Because the variables are at different scales, the logarithmic transformation of population size and density is obtained in order to correct for asymmetric distributions (Waldorf and Kim, 2015). In the absence of theoretical guidance, in her original paper Waldorf (2006) chose the simplest link function: the unweighted arithmetic average of the four rescaled variables.

This formulation follows the old HDI to produce the index (simple average of the rescaled variables), which in the present text is improved by taking into account the new method for calculating the HDI (UNDP, 2010). The index (presented below) thus comprises the geometric average of the rescaled variables. The dimensions on which the RRI is based are population size, population density, percentage of built-up area and distance to the nearest urban centre of at least 50,000 inhabitants. In order to obtain a higher score compared to relatively more rural localities, the "distance to an urban locality of a given size" variable is rescaled as follow:

$$X_{irescaled} = \frac{X_i - X_{min}}{X_{max} - X_{min}} \in [0,1] \quad (\text{equation 1})$$

For the other three variables, the rescaling is calculated as follows:

$$X_{jrescaled} = \frac{X_{max} - X_j}{X_{max} - X_{min}} \in [0,1] \quad (\text{equation 2})$$

Waldorf and Kim (2015) take the logarithm of the variables with the greatest variability (population and population density) and use natural units to express the percentage of built-up area and the distance to the nearest urban centre. In Waldorf and Kim (2015), the RRI is thus defined as:

$$RRI = \frac{X_{Population} + X_{Density} + X_{UrbanPopulation} + X_{Distance}}{4} \quad (\text{equation 3})$$

where $X_$ indicates that the variable was rescaled as shown above in equations 1 and 2.

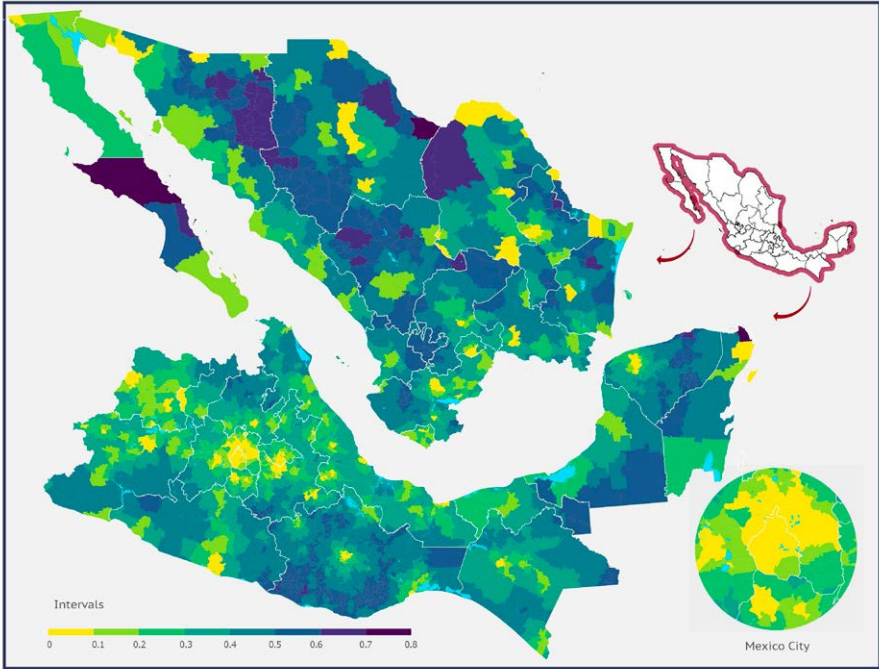
In this publication, the RRI for Mexico was calculated using distances to urban centres of at least 50,000 inhabitants. In order to avoid a circular definition of rurality, the percentage of built-up land use within the total area is included as a third dimension, instead of the percentage of urban population originally proposed by Waldorf (2006). For this purpose, information from the CONABIO MAD-Mex (Monitoring Activity Data for the Mexican REDD+ program) system is used to identify built-up land.

In this application, the RRI aggregation method used by Waldorf and Kim (2015) is modified and the current way of calculating the HDI—which uses the geometric mean of its components and not the arithmetic mean—is followed. The geometric mean is considered more appropriate for the RRI since it penalizes the index when its components do not advance evenly, a desirable property for defining rurality.

$$RRI_{MUNICIPAL} = (X_{Population} * X_{Density} * X_{U\% BuiltArea} * X_{Distance})^{1/4} \quad (\text{equation 4})$$

The results are shown on map IV.1. Less rural areas are shown in yellow and light green and thus indicate Mexico's most familiar urban areas: the centre of the country and some localities in coastal areas and the northern states.

Map IV.1
Mexico: relative rurality index
at the municipal level, 2010

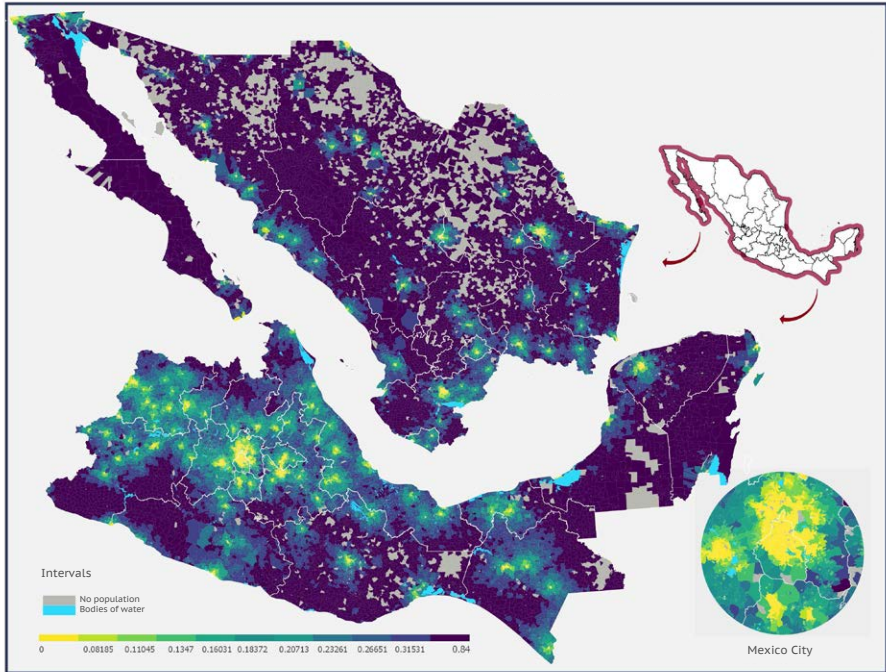


Source: Prepared by the authors, on the basis of data from the National Institute of Statistics and Geography (INEGI) and the National Commission for the Knowledge and Use of Biodiversity (CONABIO).

Map IV.2 shows possible RRI classifications at the AGEB level, ranging from the most rural areas (dark blue) —which have low population numbers, low population densities, low proportions of built-up land and relatively long distances to settlements of at least 50,000 inhabitants— to unquestionably urban areas (yellow on the map).

While 64 million people live in fully urban areas, each RRI colour-cut for non-fully urban areas is associated with a population of 5 million: RRI values between 0 and 0.08185 show the first level of rurality in which 5 million people live, values between 0.08185 and 0.11045 show the second level of rurality where another 5 million people live, and so on until the level of between 0.31531 and 0.845 is reached, which indicates the maximum level of rurality, where 5 million people live.

Map IV.2
**Mexico: relative rurality index
 at the AGEB level, 2010**

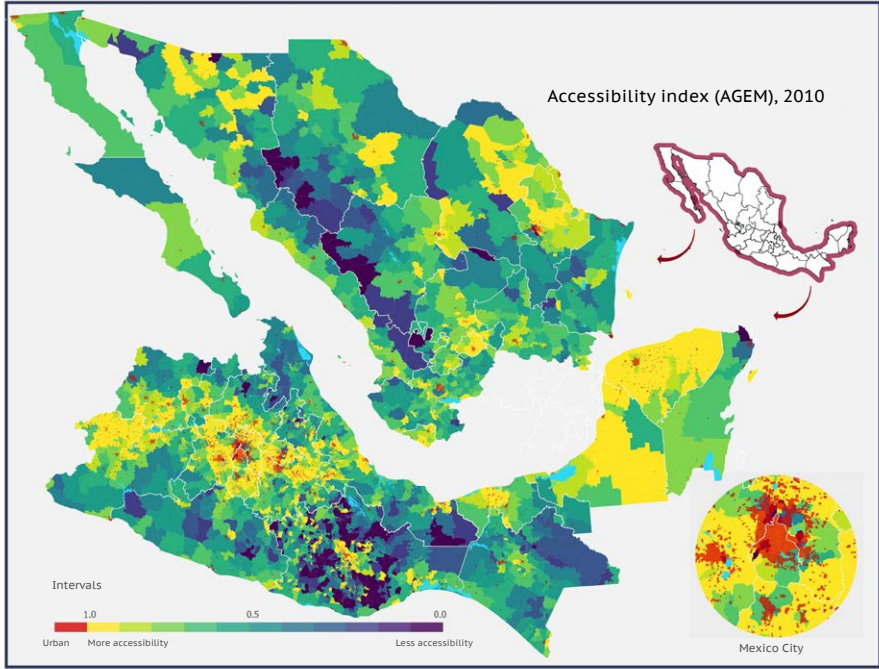


Source: Prepared by the authors, on the basis of data from the National Institute of Statistics and Geography (INEGI) and the National Commission for the Knowledge and Use of Biodiversity (CONABIO).

B. Accessibility index

The World Bank offers a measure of the population’s degree of accessibility to good roads, with the implicit assumption that good communications are a proxy measure of access to well-being or, at least, its economic dimensions (World Bank, 2016). This index has the advantage of including the accessibility dimension by using geographic information systems that allow precise measurements across the road network and the calculation of average travel speeds.

Map IV.3
Mexico: proportion of municipal population with access to paved two-way roads at the municipal level, 2010

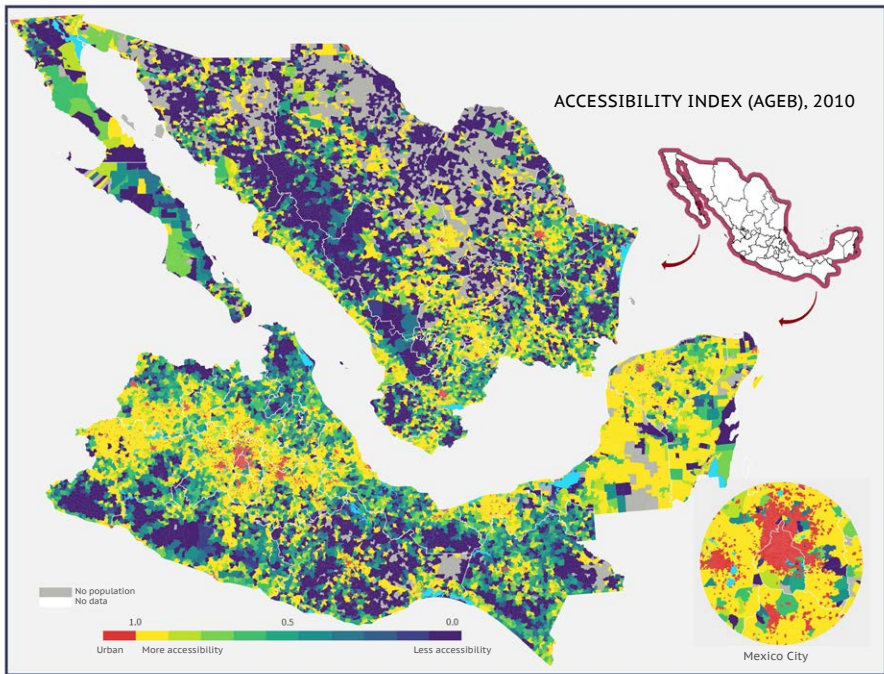


Source: Prepared by the authors, on the basis of data from the National Institute of Statistics and Geography (INEGI) and the Mexican Institute of Transport, and an adaptation of the World Bank methodology in World Bank, *Measuring Rural Access: Using New Technologies*, Washington, D.C., 2016.

The accessibility index is constructed from three variables: population, road network and road condition. It calculates the population located less than 2 km walking distance from the road network. The World Bank calculates the index by dividing the rural population with road access by the total rural population (World Bank, 2016; Roberts, KC and Rastogi, 2006). This yields a gradient for access: the rural accessibility index (RAI). Map IV.4 shows an exercise of this kind for Mexican municipalities and considering the entire population (i.e. without any prior classification of the rural and urban populations), so that the index is a ground-transport accessibility index, AI.¹⁵ The colours segment the AI into ten strata. The calculation of the AI is disaggregated at the AGEb level to show the heterogeneity of access, especially in large municipalities (see map IV.4).

¹⁵ While the World Bank’s objective is to show the degree of accessibility for populations that, according to some criteria, are already considered rural, this publication’s objective is to review the very concept of the rural population based on different metrics.

Map IV.4
Mexico: proportion of population in each AGEB with access to paved two-way roads at the AGEB level, 2010



Source: Prepared by the authors, on the basis of data from the National Institute of Statistics and Geography (INEGI) and the Mexican Institute of Transport, and an adaptation of the World Bank methodology in World Bank, *Measuring Rural Access: Using New Technologies*, Washington, D.C., 2016.

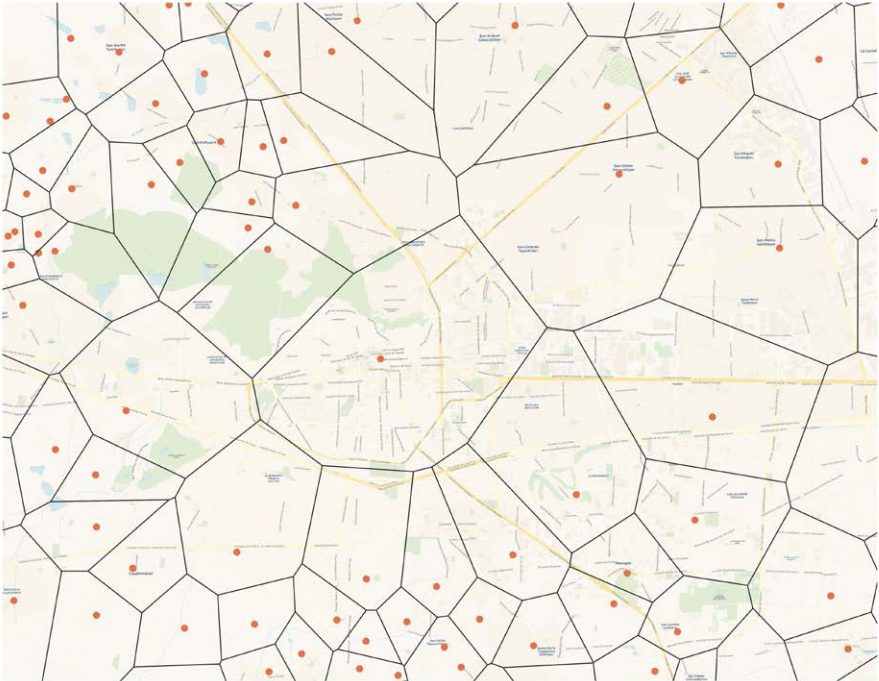
C. Alternative measurement of rurality based on polygons, population and land use

One methodology for producing indicators of rurality at the minimum possible spatial level is found in González Arellano and Larralde Corona (2013). This methodology's contribution is to consider the land use dimension to identify different rural areas and propose classifications that distinguish rural areas that are predominantly agricultural, rural areas with predominantly natural areas and other areas with urban build-up. Another advantage is that it works at a different level from the administrative boundaries by elaborating Thiessen polygons (see below), with which specific buffers can be built around the localities in order to determine their composition in terms of agricultural, natural and built-up areas.

The index offered by González Arellano and Larralde Corona (2013) uses the following variables: population, population density and land use

(construction, agriculture, other uses). This type of analysis presents a solution to the problem of the INEGI information being at the locality level and of locality being indicated by a point on the map: i.e. that it does not specify the area in which each locality's population lives. The authors' solution is to use Thiessen polygons that, by means of a mechanical process, delimit areas for each population.¹⁶ Map IV.5 shows an example made for this book focused on the area surrounding Toluca, in the State of Mexico.

Map IV.5
Mexico: application of Thiessen polygons to delimit zones based on localities,
example using the area around the city of Toluca



Source: Prepared by the authors, on the basis of the National Institute of Statistics and Geography (INEGI) cartography.

Once there is a spatial delimitation for the localities (the local environment), González Arellano and Larralde Corona (2013) calculate the total population contained in the area, the population density and

¹⁶ The method was born from the need to delimit range areas for meteorological stations and is widely used in geography. The method involves connecting the localities' points together and then tracing the perpendicular bisectors of the segments where the localities join. The area is thus divided into polygons of different dimensions according to the localities' spatial configuration. Using this construction method, the entire area contained in each polygon is closer to the locality it encloses (the point within each polygon in map IV.5) than to any of the other neighbouring localities.

the percentage of land used for construction (built-up), agriculture (cultivated) and other uses (natural land). The method applies a principal component analysis (PCA) to these five variables to summarize the five dimensions by components.

The principal component analysis in González Arellano and Larralde Corona (2013) highlights two vectors that together explain almost 80% of the total variation. It should be noted that the vectors have loadings that allow a clear interpretation of the structure of the data. These loadings are presented below to better illustrate the authors' methodology and conclusions (see table IV.2). The first factor has relatively high weights on the population, density and built-up land variables, while the second factor has high relative weights on natural land use (negative) and cultivated land use (positive).

Table IV.2
Mexico: matrix of factor weights

Variable	González and Larralde (2013)		Present authors	
	Factor 1	Factor 2	Factor 1	Factor 2
Total population	0.86	-0.03	0.57	-0.03
Density	0.88	0.04	0.63	0.02
Proportion of natural land	-0.12	-0.99	-0.09	-0.71
Proportion of cultivated land	-0.04	0.99	-0.09	0.71
Proportion of built-up land	0.76	0.08	0.52	0.01

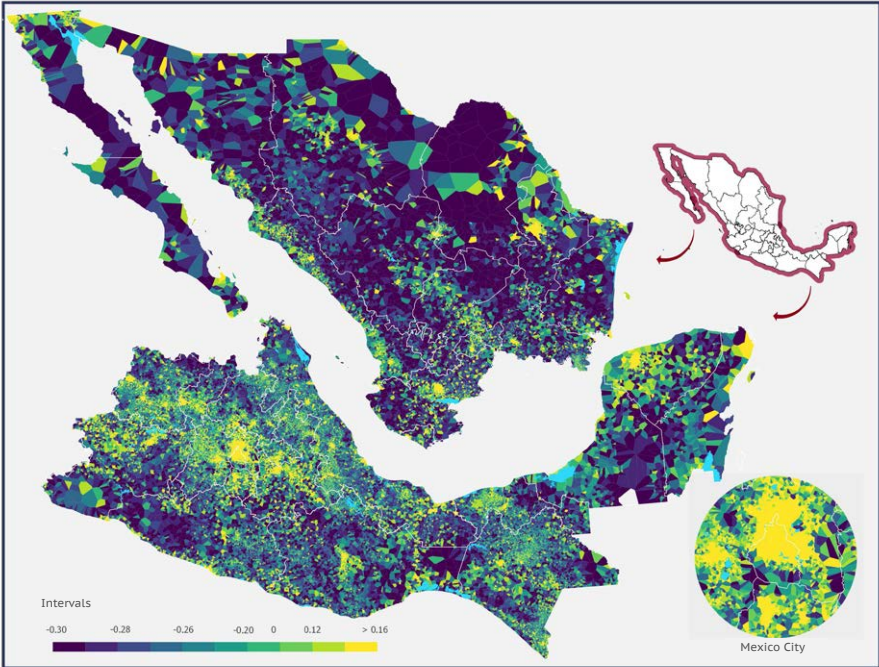
Source: Prepared by the authors, on the basis of S. González Arellano and A. Larralde Corona, "Conceptualización y medición de lo rural: una propuesta para clasificar el espacio rural en México", *La situación demográfica de México 2013*, Mexico City, National Population Council (CONAPO), 2013, table 9.

Map IV.6 contains the indicator that produces the first vector, the weights of which are indicated in the fourth column of table IV.3 and reflect the more urban dimensions of the principal component analysis. The correlation between areas with known high urbanization levels and the value of the indicator can be seen (the more intense the yellow colour, the lower the level of rurality).

Based on the information of the two principal components and the distribution percentiles of the population density and built-up land variables, a typology of territories was produced. For this purpose, the ninety-fifth percentile was chosen for those two variables, which showed that 5% of the polygons have a population density of over 613 inhabitants per square kilometre and a percentage of built-up land greater than 15%. Based on those cut-off points, the typology shown in table IV.3 was drawn up, in which polygons with less than 15% of built-up land and with a population density of below 613 inhabitants

per square kilometre are categorized as non-urban. For these polygons, a cut-off at greater or less than 50% was used to define a hybrid typology that combines the four variables.

Map IV.6
Mexico: principal component analysis applied to Thiessen polygons, principal component 1
(Loaded towards population size, population density and proportion of built-up land)



Source: Prepared by the authors, on the basis of data from the National Institute of Statistics and Geography (INEGI).

Table IV.3
Mexico: definitions of rurality
(Square kilometres and percentages)

Typology	Average density <i>(inhabitants per km²)</i>	Percentage of built-up land	Percentage of agricultural land	Percentage of natural land
Urban	3 498	>15	<50	<50
Urban-Agricultural	1 175	>15	>50	<50
Urban-Natural	668	>15	<50	>50
Rural-Agricultural	157	<15	>50	<50
Rural-Mixed	182	<15	<50	<50
Rural-Natural	47	<15	<50	>50

Source: Prepared by the authors.

D. A classification of rural-urban areas using 1 km² grids

The fourth alternative is based on the proposal contained in the document *Applying the Degree of Urbanisation: A Methodological Manual to Define Cities, Towns and Rural Areas for International Comparisons. 2021 Edition*, produced by the European Commission, the Food and Agriculture Organization of the United Nations (FAO), the United Nations Human Settlements Programme (UN-Habitat), the International Labour Organization (ILO), OECD and the World Bank (2021).

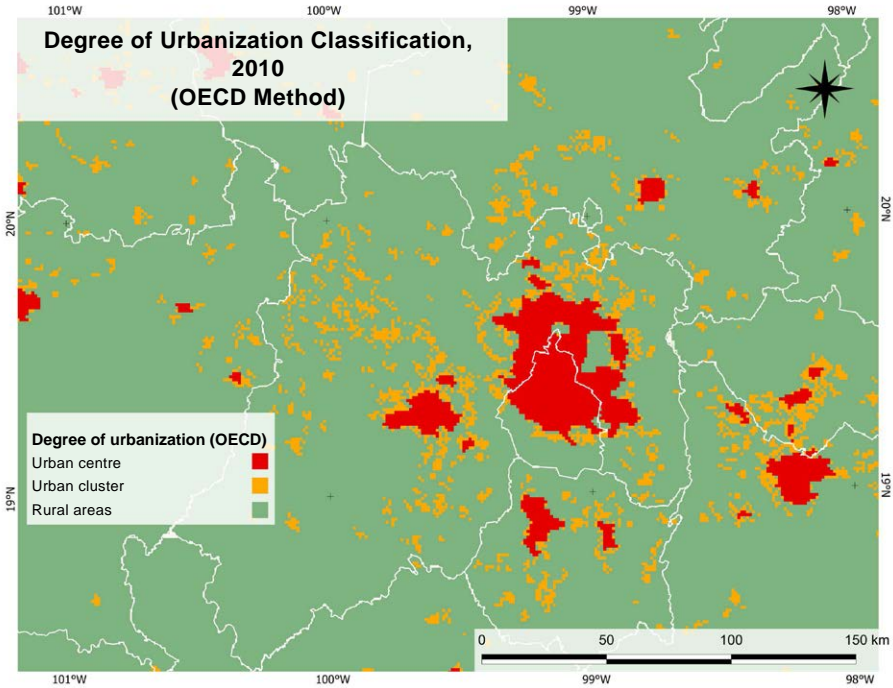
It proposes a harmonized methodology to facilitate international statistical comparisons and to classify a country's entire territory along an urban-rural continuum. The classification by degree of urbanization defines cities, towns and semi-dense areas, and rural areas.

The procedure jointly devised by the European Commission, FAO, UN-Habitat, ILO, OECD and the World Bank ("OECD Method") is based solely on population density and the contiguity of areas of similar densities. It divides the territory into areas of 1 km² (or even 50 m²), thus enabling both international comparison on a standardized basis and comparison over time for the same country.

The implementation of this technique requires three steps.

- (i) First step: identify three levels of spatial units in the 1 km² blocks (can also be calculated for 200, 100 and 50 m grids)² (see map IV.7):
 - urban centres (areas with high population densities)
 - urban clusters (intermediate areas with lower population densities)
 - rural clusters (areas with low population densities)

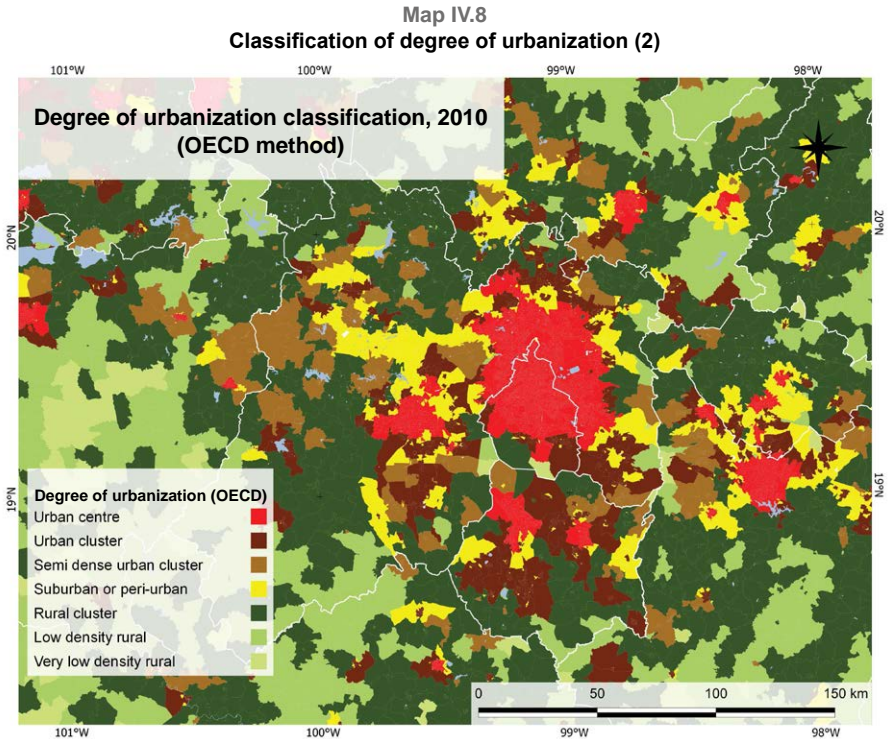
Map IV.7
Classification of degree of urbanization



Source: Prepared by the authors, on the basis of population information from the National Institute of Statistics and Geography (INEGI).

- (ii) Second step: taking administrative units or statistical areas (e.g. AGEBs in the case of Mexico), the 1 km² blocks and their population densities are used to classify those administrative units or statistical areas as shown below (see map IV.8).
 - Cities (areas with high population densities), which are made up of one or more administrative units or statistical areas in which at least 50% of the population belongs to an urban centre.
 - Urban clusters (areas of medium population density), which are formed by one or more administrative units or statistical areas in which less than 50% of the population belongs to an urban centre and no more than 50% of the population belongs to rural clusters. These urban clusters are, in turn, classified into urban, semi-dense urban and suburban or peri-urban.

- Rural clusters (areas with low population densities), which are formed by one or more administrative units or statistical areas in which more than 50% of the population belongs to rural clusters. These rural clusters are further classified as rural, low density rural and very low density rural.



Source: Prepared by the authors, on the basis of population information from the National Institute of Statistics and Geography (INEGI).

The classifications follow the model shown in table IV.4.

There is a degree of arbitrariness in the definition of the thresholds for population densities (first column) and population numbers (columns 2 to 4). In Mexico those thresholds could be defined in terms of —for example— the level of access to basic services (health, education, institutions, markets and so on) provided by each classification type. ECLAC conducted the exercise for the Mexican case with the following results:

Table IV.4
Grid schemes for level 2 of the classification of degrees of urbanization
(Inhabitants per km² and population sizes)

		Grid cluster population thresholds (population size)			No population criterion
		≥ 50 000	5 000–49 999	500–4 999	
Grid population density (inhabitants per km ²)	≥ 1 500	Urban centres	Dense urban clusters		
	≥ 300		Semi-dense urban clusters ^a	Rural clusters	Suburban or peri-urban grids
	≥ 50				Low-density rural grids
	< 50				Very low-density rural grids

Source: Prepared by the authors, on the basis of European Commission and others, *Applying the Degree of Urbanisation: A Methodological Manual to Define Cities, Towns and Rural Areas for International Comparisons*. 2021 Edition, Luxembourg, 2021.

^a Semi-dense clusters may have a population of over 49,999 inhabitants.

Map IV.9
Mexico: first step, degree of urbanization, 2010
(1 km² grids)

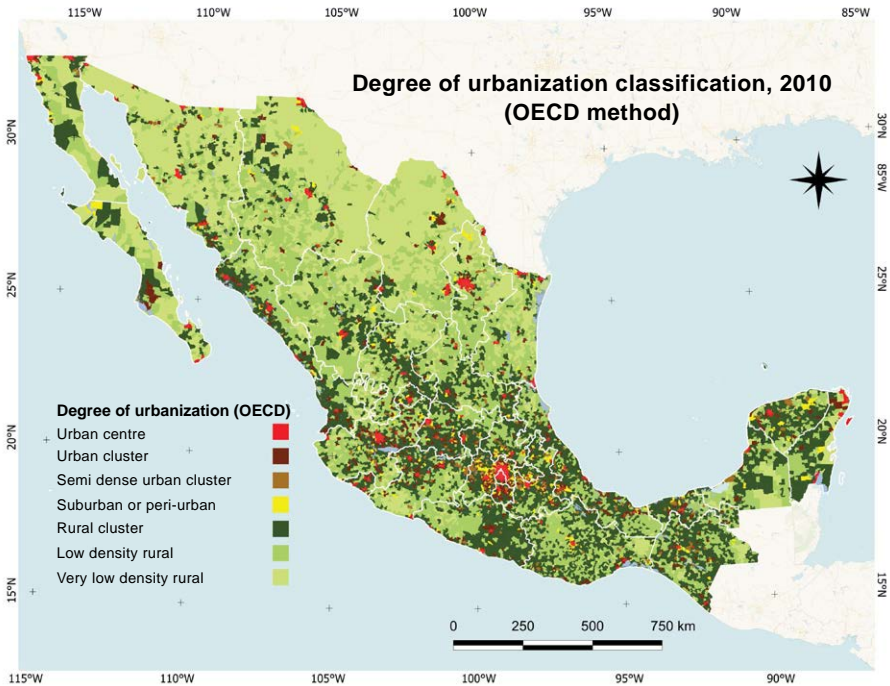


Source: Prepared by the authors, on the basis of population information from the National Institute of Statistics and Geography (INEGI).

Note: 1 km² grids were used. The method also allows the selection of 200 m², 100 m² and 50 m² grids.

In the second step, geographic units defined by AGEBs were used to obtain the following classification.

Map IV.10
Mexico: second step, degree of urbanization, 2010
(1 km² grids)



Source: Prepared by the authors, on the basis of population information from the National Institute of Statistics and Geography (INEGI).

Note: Basic geostatistical areas (AGEBs) were used as the geostatistical areas for delimiting the geographical spaces.

E. Comparative analysis of the indices

This section summarizes the characteristics, advantages and limitations of the four methods (RRI, RAI, Thiessen polygons and classification by 1 km² grids). First, these indicators transcend the rural/urban dichotomy and offer continuous measures that indicate degrees of urbanity and rurality; they are therefore superior to the current dichotomous categorization. Second, the indicators are composite and multidimensional. Their use makes it possible to avoid a classification of territorial units that depends on administrative criteria; while this is an advantage, it can also make hamper certain comparisons with official indicators presented on the basis of administrative units.

The comparison of the four indices leads to the conclusion that the rural accessibility index is of limited use for redefining rural areas, because it considers only one of the main dimensions for measurement. Of the other three proposed indices, the Thiessen polygon involves the most complex construction method. Using density and population calculations over a delimited area based on an algorithm (as is the case with the Thiessen method) produces arbitrary areas that will end up classified—again, using the complexity of cluster analysis—into the six categories ranging from the most urban to the most rural (agricultural or woodland).

The other two indices examined above (the RRI and the method based on 1 km² grids) are less complex than the Thiessen polygon method but they describe Mexico's urban and rural areas in a very similar way. The main characteristic of the RRI is that it is a continuous index, which more closely reflects the rural-urban continuum found in all countries. This continuity is very useful in quantitative analyses of relationships with other continuous variables (GDP, poverty, migration and others), but to achieve any representation it must be made operational and must be divided into segments.¹⁷ Examples of that segmentation were used above on maps IV.1 and IV.2.

Finally, the classification with 1 km² grids offers the advantage of using only two variables (population density and population size) and a contiguity criterion to aggregate the grids. In addition, this method was proposed and is used by a number of international agencies, which have even developed software for its implementation. The thresholds are clearly country-specific and, following the order indicated on table IV.4, the availability of minimum services (health, education, public services, markets for inputs and outputs and so on) should be taken into account in defining each threshold.

1. Information for analysing socioeconomic variables

Socioeconomic indicators of relevance to the analysis have been produced based on the available official information. Information from the 2010 Population and Housing Census was used to produce indicators at the AGEB and municipal levels,¹⁸ depending on the degree of rurality

¹⁷ Statistical programs perform this segmentation by grouping the RRI and defining cut-offs with a cluster-like analysis (which statistically identifies segments with values more similar to each other than to those of other segments), or, alternatively, by defining equal-length segments of the RRI (0–0.1, 0.1–0.2 and so on up to 0.9–1).

¹⁸ As this document was being finalized, INEGI published the 2020 figures. The analysis presented here can be easily replicated for any year for which cartographic and census information is available.

and also in keeping with the official criteria. Thus, the results obtained from a continuous indicator can be compared with those obtained from dichotomous indicators. The selected indicators involve family structures, migratory status, schooling levels, Indigenous languages, access to basic housing services and asset ownership (cars in particular). These eight indicators are shown on table IV.5.

Table IV.5
Mexico: sociodemographic indicators used for the analysis

Dependency ratio ^a
Percentage of population born in another state (or another country)
Percentage of population aged 3 and over that speaks an Indigenous language ^b
Percentage of population aged 6–11 years old not attending school
Percentage of population aged 18 and over with post-secondary education or more
Percentage of inhabited private dwellings without electricity
Percentage of inhabited private dwellings without household deliveries of piped water ^c
Percentage of inhabited private dwellings with a car or truck

Source: Prepared by the authors, on the basis of National Institute of Statistics and Geography (INEGI), 2010 Population and Housing Census.

^a Obtained by dividing the dependent population (population aged 0–14 years and over 64 years) by the non-dependent population (aged 15–64 years).

^b Regardless of whether or not they speak Spanish.

^c That is, no piped water available inside the dwelling or on the plot of the dwelling.

2. Analysis of sociodemographic variables

Table IV.6 shows, for 2010, the population living in multidimensional poverty and the incidence of poverty in each segment of these areas.¹⁹ This information is contrasted with official data in order to highlight the need to redefine the definition of rurality that is officially used in Mexico.

Whereas, according to the RRI, 63.9 million people live in clearly urban settings (RRI=0), according to the official classification of localities with populations of more than 2,500 inhabitants, 88 million people live in urban areas. Table IV.6 also shows that, following the RRI classification it contains, in addition to the totally urban areas (in yellow) and the rurality gradient at population intervals of 5 million people, there is a gradient in the incidence of poverty that goes from 44% in the areas immediately adjacent to the totally urban areas to 71% in the areas identified as more rural according to the RRI. This gradient is completely lost in the official classification, in which the incidence of urban poverty is 40% and that of rural poverty is 65%.

¹⁹ Each AGEb is assigned the poverty rate corresponding to the municipality to which it belongs.

Table IV.6
Population and incidence of multidimensional poverty
in the rural-urban continuum, 2010

Degree of rurality (RRI)	Colour on map IV.2	Number of inhabitants (Millions)	Number of people living in multidimensional poverty (Millions)	Incidence of poverty (Percentages)
Totally urban (RRI=0)		63.9	22	34
Rural-urban continuum				
Level 1 (RRI between 0.001 and 0.082)		5	2.2	44
Level 2 (RRI between 0.082 and 0.110)		5	2.5	51
Level 3 (RRI between 0.110 and 0.1347)		5	2.8	55
Level 4 (RRI between 0.1347 and 0.1603)		5	2.9	59
Level 5 (RRI between 0.1603 and 0.1837)		5	3.1	61
Level 6 (RRI between 0.1837 and 0.2071)		5	3.2	64
Level 7 (RRI between 0.2071 and 0.2326)		5	3.3	66
Level 8 (RRI between 0.2326 and 0.2665)		5	3.4	69
Level 9 (RRI between 0.2665 and 0.3153)		5	3.6	71
Level 10 (RRI over 0.3153)		4.5	3.2	71
Total		112.3	52.2	46
Memo item: population and incidence of poverty based on the official rural/urban classification				
Urban (localities with more than 2,500 inhabitants)		88	35.6	40
Rural (localities with fewer than 2,500 inhabitants)		26.6	17.2	65
National		114.5	52.8	46

Source: Prepared by the authors, on the basis of data from the National Institute of Statistics and Geography (INEGI), the National Commission for the Knowledge and Use of Biodiversity (CONABIO) and the National Council for the Evaluation of Social Development Policy (CONEVAL).

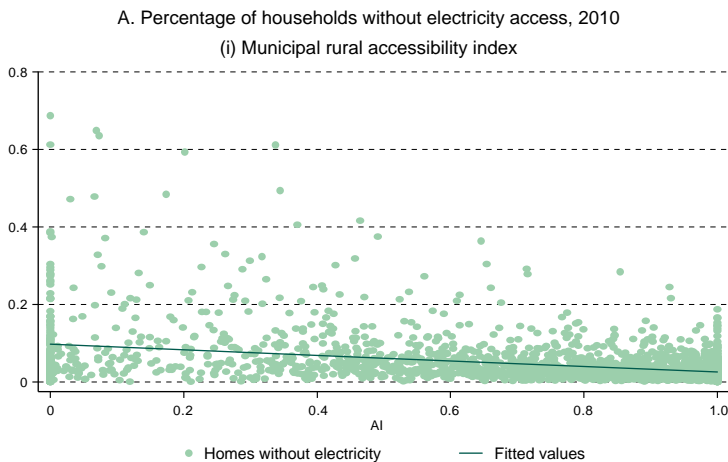
Note: There is a difference of 2.2 million between the official figure (114.5 million inhabitants in 2010) and the one used to calculate the RRI (112.3 million), due to some missing information.

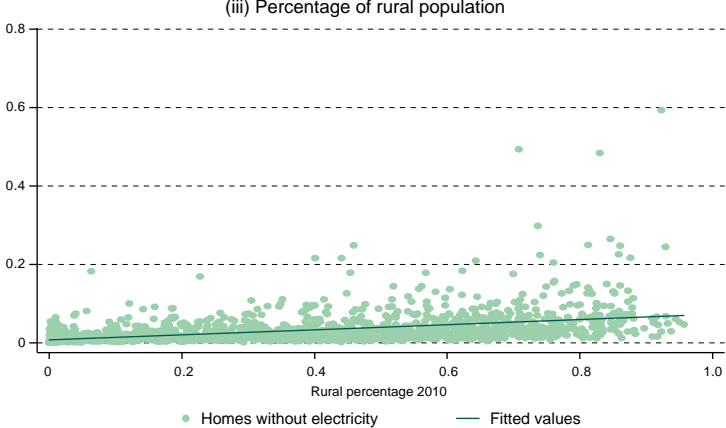
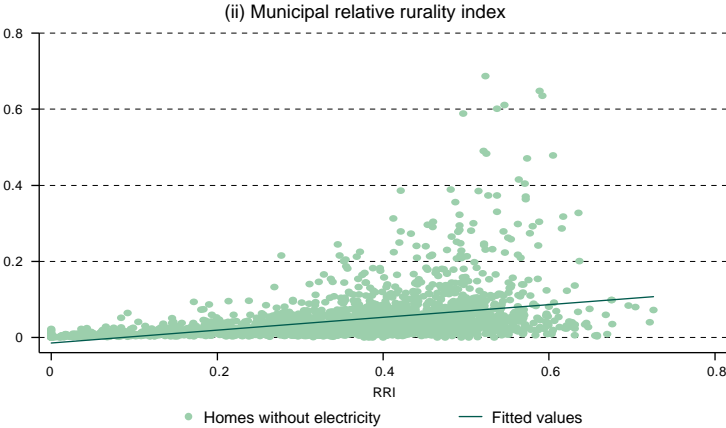
These results further demonstrate the need to change the official definition of rural/urban in Mexico and show that information and methodologies appropriate for the task exist. Thus, this work represents the first step towards undertaking policy dialogue processes on the new rurality and dynamic analysis approaches in order to develop innovative methodologies for measuring and categorizing rural areas.

Similarly, the indicators generated and selected reveal variations across the different methods used to measure degrees of rurality and urbanity. In order to highlight the comparison, information obtained from the official dichotomous disaggregation is also presented.

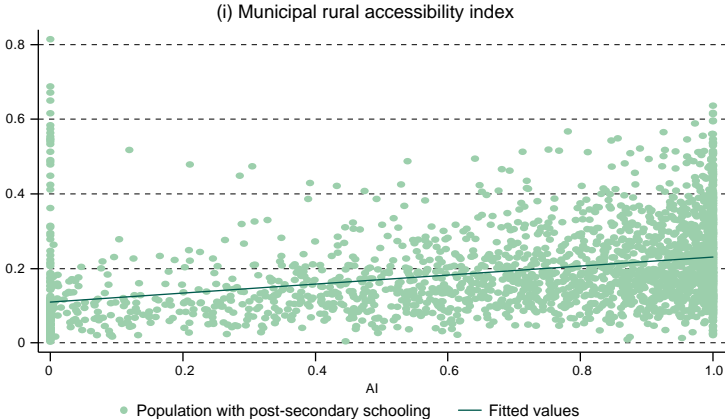
Figure IV.1 shows the relationship of the RRI and AI with various socioeconomic indicators for Mexico’s 2,456 municipalities. A strong correlation can be seen between the gradient shown by these two indices and the percentage of homes without access to electricity in each municipality, where a higher degree of rurality corresponds with restricted access to electricity. Although the relationship is significant with the two indices, the correlation is stronger with the AI than with the RRI. There is a positive correlation between the population’s level of education and the degree of urbanity and accessibility, and a negative correlation between the population’s poverty level and those two same factors. The relationship between the indicators and the percentage of rural population in each municipality (official definition) is also shown, so that the information obtained with the AI (first column) and the RRI (second column) can be compared with the data obtained from the official definition criteria that, starting at the locality level, are aggregated to the municipal level (third column).

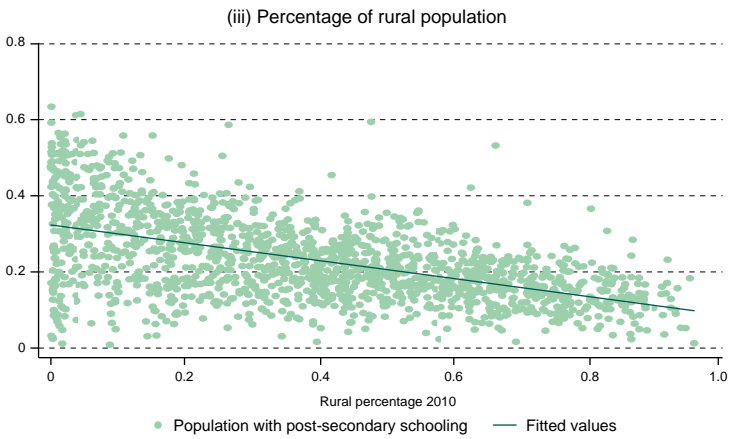
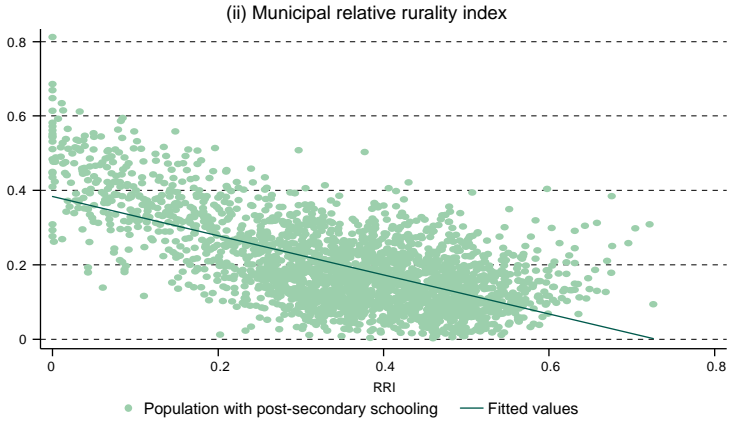
Figure IV.1
Mexico: municipal accessibility index, municipal relative rurality index and percentage of rural population in the municipality, by socioeconomic indicator



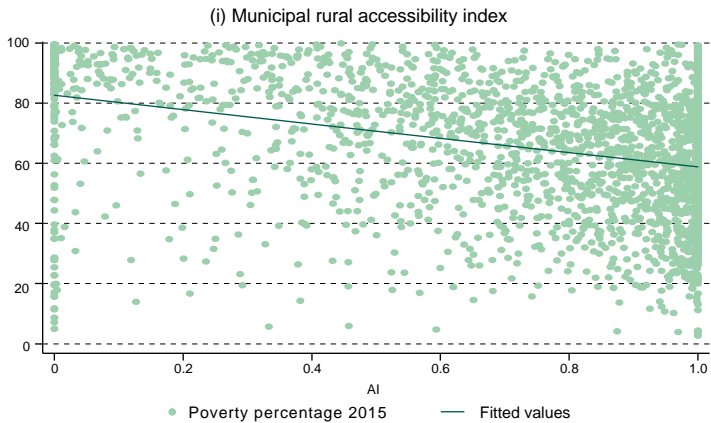


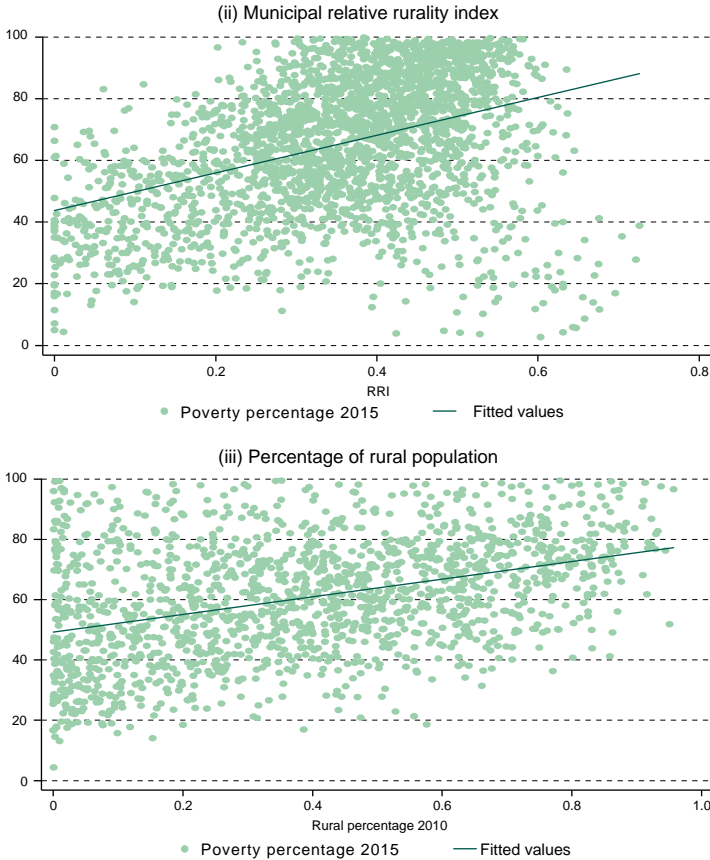
B. Percentage of population aged 18 and over with post-secondary or higher education, 2010





C. Percentage of people living in poverty in the municipality, 2015





Source: Prepared by the authors, on the basis of data from the National Institute of Statistics and Geography (INEGI).

Note: The accessibility index (AI) presents a negative relationship with the degree of rurality since a value of 0 indicates that no one has access to a paved road within two kilometres and therefore represents the lowest level of accessibility. The relative rurality index (RRI) shows a positive relationship with the degree of rurality, since a value of 0 represents totally urban areas, with totally rural areas indicated by a value of 1. To compare the two proposed indicators (AI and RRI) with an official indicator, the same variables are shown against the percentage of rural population in the municipality according to the INEGI classification by locality.

This method can help focus public action on priority areas and apply differentiated actions according to the area in question (very rural, rural-urban, intermediate, urban and so on). The tool enables the identification of those more rural territories with the greatest relative lags.

Disaggregating the RRI calculated at the AGEb level into ten categories shows a correlation in certain indicators of the 2010 Population and Housing Census. Thus, the percentage of the population aged 18 and older with post-secondary or higher education shows an almost linear

relationship, so that a higher level of urbanization correlates to a higher level of education (see table IV.7). The same is true for the percentage of the population aged between 6 and 11 that does not attend school and the percentage of the population that speaks an Indigenous language.

Table IV.7
Mexico: average values of the socioeconomic indicators
in each RRI category, 2010
(Percentages)

Degree of rurality (index at the AGEb level)	Dwellings without electricity	Population aged 18 and over with post- secondary or higher education	Population aged 6–11 not attending school	Population aged 3 years and over that speaks an Indigenous language
Totally urban (RRI=0)	0.3	46.5	2.4	1.7
Rural-urban continuum				
Level 1 (RRI between 0.001 and 0.082)	0.7	36.8	2.8	3.4
Level 2 (RRI between 0.082 and 0.110)	1.2	31.0	3.1	4.8
Level 3 (RRI between 0.110 and 0.1347)	1.5	27.1	3.2	5.7
Level 4 (RRI between 0.1347 and 0.1603)	1.7	24.3	3.2	8.5
Level 5 (RRI between 0.1603 and 0.1837)	2.3	21.7	3.5	8.3
Level 6 (RRI between 0.1837 and 0.2071)	3.0	19.1	3.4	13.4
Level 7 (RRI between 0.2071 and 0.2326)	3.8	17.3	3.3	16.0
Level 8 (RRI between 0.2326 and 0.2665)	4.0	15.8	3.6	21.3
Level 9 (RRI between 0.2665 and 0.3153)	6.2	13.0	3.7	25.3
Level 10 (RRI over 0.3153)	11.2	10.2	4.7	23.3
Memo item: locality level (official definition), with microdata from the 2010 Population and Housing Census				
Urban (localities with 2,500 inhabitants or more)	0.7	35.1	3.0	0.3
Rural (localities with fewer than 2,500 inhabitants)	6.6	8.7	4.1	17.3
National	2.0	33.3	3.3	6.6

Source: Prepared by the authors, on the basis of data from the National Institute of Statistics and Geography (INEGI), the National Commission for the Knowledge and Use of Biodiversity (CONABIO) and the National Council for the Evaluation of Social Development Policy (CONEVAL).

Note: The RRI is defined based by means of four variables at the basic geostatistical area (AGEB) level: population, density, percentage of built-up land and distance from the centroid of each AGEb to a town of at least 50,000 inhabitants. It is aggregated in the same way as the HDI indicator of the United Nations Development Programme (UNDP) (geometric mean of the four components, measured relative to the maximum and minimum values in Mexico). The RRI ranges from 0 (fully urban AGEbs, identified by yellow) to values higher than 0.20 (rural AGEbs, identified by the darker colours).

The dichotomous categorization of urban and rural areas (the official method) indicates that 0.7% of urban dwellings lack electricity, compared to 6.6% of rural dwellings (see table IV.7). The RRI yields different results on the relative situations of rural and urban areas. This index shows that in those AGEBs classified as more urban, 0.7% lack electricity, while for those classified as the most rural (RRI above 0.2) the corresponding figure is more than 3.8%. For any of the socioeconomic indicators, it is particularly interesting to examine the values in intermediate territories and the heterogeneity that characterizes them.

While there is a gradient in the indicators along the RRI, there are also, in general, significant jumps between the first category (fully urban) and the second (rurality level 1). That indicates that this disaggregation of the RRI is useful in identifying fully urban areas and more rural areas, which are distinguished in socioeconomic terms from rural-urban or intermediate territories.

IV. Implications for rural development public policy in Mexico

ECLAC presented the new definitions of rurality to SEDATU, INEGI, SADER, the Secretariat of Economic Affairs (SE), CONAPO and other public institutions. Meetings held with representatives from those institutions confirmed the need to redefine what is understood by rurality in Mexico, as well as the usefulness of undertaking that task in the short term. Two specific exercises in which the alternative definitions of rurality were used are summarized below.

A. Cooperation with the Specialized Technical Committee on Cadastral and Registry Information (CTEICR)

In 2022, an inter-institutional effort was underway to redefine rural and urban areas in Mexico through the Specialized Technical Committee on Cadastral and Registry Information (CTEICR), an agency in which several Mexican institutions participate, including INEGI, SEDATU, the Federal Mortgage Society (SHF) and CONEVAL. ECLAC attended as a guest institution to present proposals and offer comments.

CTEICR has made significant progress in redefining rural and urban areas in Mexico with proposals such as the urban-rural territorial index (ITUR) which, using a 1 km² grid, combines population, land use

and service access variables. ECLAC contributed to this effort to redefine the measurement of rurality in Mexico by presenting the different alternative rurality scenarios and the different methodologies for constructing them. The results of the cooperation represent an important step forward, and a breakthrough in the institutionalization process is expected in 2023.

ECLAC attended the monthly meetings of CTEICR to provide technical support for the committee's work in constructing an alternative index for measuring rurality in Mexico. ECLAC outlined the steps to follow in constructing the four indices described in earlier sections of this chapter. Based on that work by ECLAC, CTEICR developed an alternative index for measuring rural areas: the Urban-Rural Territorial Index (ITUR). The index is largely based on the variables that make up the alternative rural measurement indices proposed by ECLAC. For example, it includes population by locality, population density, distance to settlements of 50,000 inhabitants, land coverage, access to roads and the coverage of and access to public goods and services.

SEDATU and INEGI have carried out simulations for the implementation of the ITUR. The objective is to produce maps that depict alternative rurality scenarios within the framework of a territorial analysis. It also involves statistical analyses of the socioeconomic classification of Mexico's territories. For the institutional validation of the CTEICR technical proposal, 2023 will be a crucial year.

B. Cooperation with the Secretariat of Economic Affairs (SE)

Following discussions with the Secretariat of Economic Affairs, a specific application exercise was carried out to verify the potential of a redefinition of the urban and the rural, both for analysis purposes and for identifying key population variables in Mexico. Although the exercise focused on the relationship between access to information and communication technologies (ICTs) and the density of micro-, small and medium-sized enterprises (MSMEs), it could be used to define the targeting of certain support programmes. One example would be to evaluate the evolution of indicators to meet the SDG targets.

The Secretariat of Economic Affairs suggested conducting pilot projects using the alternative definitions of rurality proposed by ECLAC, given that they can be adapted to different public policy purposes, such as support programmes for MSMEs in rural areas. The Secretariat of Economic Affairs expressed its interest in analysing the possibility of

redefining rural areas in MSME digitization programmes in rural areas. The new socioeconomic mapping of Mexico produced by the project was seen as a useful tool for understanding territorial realities in a non-dichotomous way, including in marginalized areas. It would help define and identify areas for priority attention and fine-tune the services that the Secretariat of Economic Affairs provides in the territories. The Secretariat expressed its interest in developing unique policies to support small rural productive units in the north and south of Mexico, where the geographical areas have very different sociodemographic and connectivity characteristics. In response, ECLAC developed an analysis, at the AGEB level, of the relationship between firm size, firm density by inhabitants and Internet availability.

The first step in the analysis was to identify the firms and to categorize them by employee numbers:

- microenterprises, from 0 to 10 employees
- small, from 10 to 30
- medium-sized, from 31 to 100
- large, 100 employees or more

The second step was to store the geographic location of those firms at the AGEB level. The third step took the variables VIV37 (private inhabited dwellings with Internet access) and VIV37_r (percentage of dwellings with Internet access) and the population for each AGEB from the 2020 Population and Housing Census. In the fourth step, quintiles were calculated for the variable VIV37_r (first quintile: AGEBs in which the percentage of homes with Internet access is 20% or less; second: AGEBs in which the percentage of homes with Internet access is greater than 20%, but less than 40%; and others). For each firm category (micro, small, medium and large), the fifth step calculated their density in each AGEB by dividing each category's total by the AGEB's population size.²⁰

The firm density categories were then grouped into quintiles. This yielded a better grouping of the data and also respected the value 0, indicating that there were no firms in the AGEB. The combination of both classifications (percentage of homes with Internet access and density of firms by size) yielded the identification of 25 typologies. The

²⁰ This density variable may be adjusted or replaced by other(s) according to the needs of the Secretariat of Economic Affairs.

sixth step was to link the variables —(i) quintiles of the variable VIV37 and (ii) firm density— on a map that uses colours to show relationships indicating the different combinations of the two variables.

The example below shows the use of the RRI for a possible targeting exercise in the Puebla-Tlaxcala area. Table IV.8 shows that a clear relationship exists between the increasing gradient of the RRI with, for example, the decreasing gradient of the percentage of households with Internet access. This relationship can be taken as an indicator that reinforces the use of a continuous classification of rurality applied to all localities in Mexico, not only to those with fewer than 2,500 inhabitants that are classified as rural.

Table IV.8
Puebla and Tlaxcala: RRI gradients correlated to gradients
in the percentage of households with Internet access,
localities of more than 2,500 inhabitants, 2010

RRI deciles	RRI values	Percentage of population with Internet access		
		Average (a)	Standard deviation	Coefficient of variation (b/c)
I	0.001–0.01	63.3	7.2	0.11
II	0.01–0.013	45.4	10.0	0.22
III	0.014–0.016	41.7	16.6	0.40
IV	0.016–0.019	34.7	12.5	0.36
V	0.019–0.022	35.3	12.5	0.35
VI	0.022–0.024	32.1	15.7	0.49
VII	0.024–0.027	28.1	11.6	0.41
VIII	0.027–0.031	27.0	12.6	0.47
IX	0.031–0.036	24.1	11.0	0.46
X	0.036–0.078	22.1	11.3	0.51

Source: Prepared by the authors, on the basis of data from the National Institute of Statistics and Geography (INEGI).

Table IV.9 shows the relationship between rising RRI values for localities classified as urban (over 2,500 inhabitants) and the densities of firms of different sizes. While not true for microenterprises, the results for small, medium-sized and large firms show a clear negative relationship between rising RRI levels and decreasing levels of the density of those three firm types.

Table IV.9
Puebla and Tlaxcala: RRI gradients correlated to firm
density gradients per 1,000 inhabitants, localities
of more than 2,500 inhabitants, 2010

RRI deciles	RRI values	Firm density per 1,000 inhabitants			
		Micro	Small	Medium-sized	Large
I	0.001–0.01	56.9	2.6	0.9	0.4
II	0.01–0.013	77.1	2.1	0.6	0.2
III	0.014–0.016	80.5	2.5	0.7	0.2
IV	0.016–0.019	80.0	1.7	0.5	0.2
V	0.019–0.022	72.7	1.6	0.5	0.1
VI	0.022–0.024	69.4	1.5	0.3	0.1
VII	0.024–0.027	68.5	1.4	0.3	0.1
VIII	0.027–0.031	71.8	1.5	0.4	0.1
IX	0.031–0.036	77.3	1.7	0.4	0.1
X	0.036–0.078	75.4	1.4	0.3	0.0
Puebla and Tlaxcala		68.4	2.1	0.7	0.2

Source: Prepared by the authors, on the basis of data from the National Institute of Statistics and Geography (INEGI).

Table IV.10 shows descriptive statistics for the 19 localities that, with a population of more than 2,500 inhabitants, are officially considered urban but are in the tenth decile of the RRI (RRI interval between 0.036 and 0.076; the highest for this estimate at the locality level). The existence of relatively low levels of Internet access can be clearly seen. Average values for localities with more than 2,500 inhabitants in Puebla and Tlaxcala are included in the bottom line of the table in order to provide the average of all localities as a reference point. The table also shows the density levels per 1,000 inhabitants of the different sizes of firms, with medium-sized firms absent in 8 localities and large firms absent in 16.

Tables IV.8, IV.9 and IV.10 provide an example of one of the possible applications in which a redefinition of rurality could improve the targeting of public policy in Mexico. This improvement stems from identifying those places that, even though they have a high relative degree of rurality (as indicated by the RRI), would be left out if the targeting of a given public programme were based solely on the official definition of rurality (fewer than 2,500 inhabitants). That would be the case of 16 of the 19 localities included in table IV.10, which, despite being officially considered urban, have low indicators for Internet access (the exception is the towns of Chiautla de Tapia, Tilapa and Tulcingo de Valle, with a percentage of access similar to that of the State of Puebla) and the absence of medium and large firms (except in Chiautla de Tapia).

Table IV.10
Puebla-Tlaxcala area: population, RRI, Internet access and firm density for the urban localities with the highest RRI rankings

State	Municipality	Locality	2010 population	RRI at the locality level	Percentage of households with Internet access	Number of firms by size				Density of firms per 1,000 inhabitants, by size		
						Micro	Small	Medium-sized	Large			
Puebla	Zoquitián	Zoquitián	2 624	0.049	10.6	267	7	1	1	2.1	0.3	0.3
Puebla	Tecomatlán	Tecomatlán	2 661	0.040	26.5	223	6	5	1	1.6	1.3	0.3
Puebla	Soltepec	Soltepec	2 755	0.037	19.0	404	8	1	0	1.2	0.2	-
Puebla	Tlacotepec de Benito Juárez	Santo Nombre	2 759	0.036	10.3	132	2	0	0	0.6	-	-
Puebla	Chiautla	Tlancualpican	2 806	0.037	9.5	243	3	0	0	0.6	-	-
Puebla	Chiautla	Ciudad de Chiautla de Tapia	2 817	0.037	36.3	1 128	26	5	1	2.2	0.4	0.1
Puebla	Tlatlauquitepec	Ocotlán de Betancourt	2 821	0.040	13.5	190	3	1	0	0.9	0.3	-
Puebla	Santa Inés Ahuatempan	Santa Inés Ahuatempan	2 828	0.043	13.3	695	6	2	0	1.4	0.5	-
Puebla	Tilapa	Tilapa	2 835	0.038	37.0	169	2	3	0	0.7	1.0	-
Puebla	Tehuiztingo	Tehuiztingo	2 865	0.042	24.8	652	7	3	0	1.1	0.5	-
Puebla	Palmar de Bravo	Jesús Nazareno	2 985	0.038	11.7	155	2	0	0	0.6	-	-
Puebla	Palmar de Bravo	La Purísima	3 111	0.044	19.9	149	1	0	0	0.2	-	-
Tlaxcala	Xaltocan	San Simón Tlatlahuquitepec	3 322	0.041	19.6	110	2	1	0	0.6	0.3	-
Tlaxcala	Cuaxomulco	Cuaxomulco	4 024	0.038	22.4	199	6	0	0	1.9	-	-
Puebla	Tochimilco	San Antonio Alpanocan	4 105	0.054	11.4	199	12	1	0	3.7	0.3	-
Puebla	Tulcingo	Tulcingo de Valle	5 249	0.041	46.2	861	15	3	0	2.5	0.5	-
Puebla	San Nicolás Buenos Aires	Emilio Portes Gil	5 456	0.39	19.0	183	1	0	0	0.3	-	-
Puebla	Chignahuapan	Ixtlahuaca Barrio	6 547	0.044	16.8	142	2	0	0	0.6	-	-
Puebla	Acatlán	San Vicente Boquerón	10 320	0.049	6.3	185	3	0	0	1.0	-	-
Puebla and Tlaxcala			5 064 497	0,015	46	386 950	12 093	3 723		2.1	0.7	0.2

Source: Prepared by the authors, on the basis of data from the National Institute of Statistics and Geography (INEGI).

V. Conclusions

This work is part of an analytical framework that is necessary to understand the new rurality and to study persistent structural gaps in order to reduce rural poverty and inequality. The present chapter has offered a review of the state of the art in the categorization of rural areas in Mexico, as well as a comparison of the methodologies used. It also identifies the limitations of the criterion used to define rural and urban areas in Mexico and the criticisms levelled at it, and it argues the need to redefine the classification methodology.

The concept of the new rurality emerged through the need to redefine rurality, on account of the numerous transformations that have occurred in that area. The current categorization of rural areas is outdated and does not take account of the new rural reality or the diversity that exists within rural areas. There is therefore a need to go beyond the dichotomous approach to the rural and the urban and to adopt indicators that reflect a gradient of rurality. Also necessary is a multidimensional approach that can take on board dimensions such as land use, population density, employment patterns and access to certain services, as well as dynamic criteria such as flows and interactions between territories. This study has shown that Mexico has a wealth of available information for different territorial levels, and so several of the methodologies recorded in the literature could be replicated.

Progress should be made towards continuous and non-dichotomous indicators, incorporating new dimensions and going beyond classifications at the level of localities. Several activities are being carried out by official and non-official bodies and within academia in an attempt to propose new ways of characterizing rurality. This chapter sets out and discusses several of them, and it presents ways in which they could be adapted to the Mexican case while at the same time verifying the availability of relevant official information.

The study also included an analysis of socioeconomic variables that show the importance of a continuous measurement of rurality and of abandoning the dichotomous definition based solely on population size. The work emphasizes that socioeconomic indicators reveal a gradient according to the degree of rurality, which provides a very different view from the one given by using the dichotomous separation between the rural and the urban. The analysis of socioeconomic variables covered eight indicators in the areas of education, demographics, access to basic housing services and assets, and the percentage of people living in poverty. A correlation was seen between most of the indicators and the AI and RRI, whereby a higher degree of urbanity correlates with

a lower level of poverty, lower school absenteeism, higher educational achievement and access to basic housing services. Tables with the RRI grouped into ten ranges were presented in order to better portray the usefulness of the gradient.²¹

The chapter offers arguments regarding the need to change the official definition of rural vs. urban in Mexico and it proposes methodologies for undertaking that task. Those methodologies were developed as exercises to encourage policy dialogue processes regarding the new rurality. In order to implement the classification operational and incorporate it into a new official definition of rurality in Mexico, agreements should be reached on the dimensions to be included, the territorial units to be classified and the methodologies to be used to categorize the territory. Important steps in this direction were taken at the seminar-workshop “Bases for the Definition of Urban and Rural,” jointly organized in 2022 by the Specialized Technical Committee on Cadastral and Registry Information (CTEICR) and the Specialized Technical Committee on Regional and Urban Development Information (CTEIDRU). The event was attended by representatives of major Mexican public sector institutions, and the authors of this chapter were invited as part of the ECLAC team.²² At the seminar-workshop’s thirteen sessions, progress was made with defining a new rurality indicator, the Urban-Rural Territorial Index (ITUR), which contains the same elements as the RRI as described above (population, density, built land use and distance to a town of 50,000 inhabitants or more) but adds characteristics related to the urban infrastructure, access to basic services and land use mix. The first version of the ITUR, based on identifying variables for 1 km² grids, was completed at the end of December 2022 and is expected to be further refined during 2023.

As indicated in Soloaga, Plassot and Reyes (2021), the definition of rurality that is ultimately adopted will have implications for public policy. In the case of Mexico, for example, the poverty measurements produced by CONEVAL follow the official definition of rural and urban areas, for which it calculates different consumption baskets to obtain multidimensional poverty indicators based on different urban and rural poverty lines, given that the cost of the food and non-food baskets varies

²¹ Although to save space it was not shown in the text, this correlation was also found in the classification based on 1 km² grids.

²² These specialized technical committees are part of the National System of Statistical and Geographical Information (SNIIEG) and their purpose is to prepare and revise the technical standards, guidelines, methodologies and other projects and processes required for the system’s integration, as well as to promote their knowledge and application among the units (INEGI, 2010). INEGI, SEDATU, the Federal Mortgage Society (SHF), the National Housing Commission (CONAVI), the Secretariat of Economic Affairs (SE), the National Agrarian Land Register (RAN), CONAPO and other Mexican institutions are represented on CTEICR and CTEIDRU.

between the two types of area. Likewise, the PROSPERA programme (now replaced by the Benito Juárez Scholarship programme) was based on different policies depending on whether they were implemented in urban or rural areas. This has implications for the definition of budget allocations and other public policy decisions that are effectively based on the poverty levels thus calculated.²³

In conclusion, this chapter has demonstrated the existence of information and methodologies for redefining the official interpretation of the rural and the urban in Mexico. Taking into account the proposals included above and, above all, the recent developments at the “Bases for the Definition of Urban and Rural” seminar-workshop, it could be thought that Mexico will soon change its current official definition of rural and urban and adopt a continuum-based definition, perhaps with characteristics similar to those of the RRI proposed above. These exercises were therefore the first step in a context of policy dialogue on the new rurality and dynamic approaches to analysis towards developing innovative methodologies to measure and classify rural areas. Cooperating in this task with INEGI, CONAPO, SEDATU, the Secretariat of Finance and Public Credit, SADER, the Secretariat of Welfare, the Secretariat of Economic Affairs, CONEVAL, the central bank and other public institutions was, and continues to be, of particular importance. The objective guiding the work was the successful redefinition of the rural and the urban in Mexico and the application of alternative measurement methods for different public development policy purposes.

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²³ Similarly, rural areas have been eligible to implement projects such as the Integral Rural Development Programme, the Microfinance Fund for Rural Women, the Local Development Programme (*Microrregiones*), the Rural Housing Programme and the Food Security Project for Rural Areas (PSAZR), among others.

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Chapter V

Measurement and characterization of rural areas based on national statistics: a practical application in Panama

*Isidro Soloaga
Thibaut Plassot
Yannick Gaudin
Moisés Reyes
Sara Hess*

Introduction

This chapter analyses the scope and limitations of the current definition of rural areas in Panama and the tools for measuring and characterizing them. The research provides evidence of the need to rethink the methods currently used to categorize rural areas, which tend to favour static and dichotomous approaches and to see rurality as the remainder with respect to the urban. It also presents official statistics for Panama and their sources, and it formulates and applies proposed alternative methodologies for measuring rurality based on existing information, taking into account the socioeconomic and environmental transformations that the country's various territories have undergone.

This chapter summarizes the work carried out in Panama under the aegis of the “New narratives for rural transformation in Latin America and the Caribbean” technical collaboration project. As noted in the introduction to this book, the project's objectives were:

(i) to highlight territorial gaps using the concepts of the new rurality, and to contribute to national development strategies in pursuit of the Sustainable Development Goals (SDGs) and general well-being in rural areas, (ii) to produce solid empirical evidence for the formulation of comprehensive rural development policies, and (iii) to assess the impact of a heterogeneous and dynamic definition of rurality on quantifying structural gaps and formulating public policies.

This chapter's structure follows the stages of the project. The first phase entailed studying how rurality in Panama is classified by the official statistics and developing, in light of the contributions of the theory of the new rurality, three alternative rurality indices. The second phase involved preparing maps to present the alternative rurality scenarios and Panama's socioeconomic categorization based on those scenarios. Finally, in the third phase, the contributions the alternative rurality scenarios could make to public policy were analysed, with a concrete application in two exercises.

Interactions took place with public agencies in Panama at all stages of the project in order to seek feedback on the exercises and to publicize the results and their possible impact on the public agenda. The forums provided by the National Institute of Statistics and Census (INEC) —the entity responsible for official statistics in the Republic of Panama— and the Ministry of Agricultural Development (MIDA) were central to the project's execution. Interactions with the Ministry of Economic Affairs and Finance (MEF) and the Ministry of Social Development (MIDES) also made a major contribution. The study was based on an exploration of official statistics from the National Institute of Statistics and Census, as well as documents and reports on previous studies in the region and in the country from institutions including the University of Panama, the Technological University of Panama and other authors.

Since 1940, the Government of Panama has divided the areas where its population lives into urban and rural areas. As in most of the region's countries, that classification was from the onset dichotomous, so that the concept of rurality was defined in terms of its exclusion from the urban sphere.

This initiative's objective is for the suggested new methodologies to provide the authorities and the private sector with innovative tools for understanding the rural reality based on the contributions of the theory of the new rurality and new approaches to analysis, with a view to promoting rural development and reducing territorial disparities in the country. It also seeks to build a better understanding of rurality for the design of more effective public territorial development policies.

This chapter is divided into seven sections. The first section summarizes the different official tools currently used by the Government of Panama to measure and classify rural areas. Section two describes the

main transformations that have taken place in Panama's rural areas, which reveals the need to adapt the current rural measurement tools to take account of those new dynamics and territorial complexities in analysing those areas. To that end, it provides statistical information on the country from different official sources, such as the 2010 Population and Housing Census, the 2011 Agricultural Census and the 2019 labour market and multipurpose household surveys.

The third section analyses the scope and limitations of the current definitions of rurality and the tools used for its analysis in Panama, through the lens of the contributions made by the new theories and approaches. Section four summarizes the statistics available on rural areas, while the fifth section presents three alternative proposals for measuring rurality in Panama. The sixth section presents methods for constructing a new rurality index in Panama, while section seven summarizes two applications of the new definitions to the Panamanian public agenda. The chapter ends with a series of conclusions.

I. Official definitions and national regulatory framework for rural areas in Panama

The National Institute of Statistics and Census uses a classical dichotomous segmentation between urban and rural areas, and that criterion is used as the country's official definition in the development programmes implemented by other government institutions. In the 2010 Population and Housing Census, the National Institute of Statistics and Census defined rural areas as those places lacking the characteristics of urban areas. Urban areas are defined as localities with 1,500 or more inhabitants and that have electricity and public water networks, sewerage systems and paved roads. Urban locations must also provide facilities for secondary school attendance, commercial establishments, social and recreational centres and paved footpaths. Those features may be found in the entire locality or only in a part of it. However, neighbourhoods or developments that meet most of the requirements, even if they have fewer than 1,500 inhabitants, are classified as urban.

Panama's political and administrative structure comprises three levels.¹ The first level is made up of 10 provinces and four provincial-level Indigenous regions (*comarcas indígenas*). The National Institute of Statistics and Census identifies and defines Indigenous regions as areas where there is a high proportion of Indigenous inhabitants who enjoy a

¹ 1972 Constitution, "Article 5. The territory of the Republic of Panama is divided into provinces, the provinces into districts, and the districts into townships, which constitute the political base of the State" (Republic of Panama, 1972).

certain degree of political and administrative autonomy.² The second level is made up of 81 districts (*distritos*), while the third level comprises 681 townships (*corregimientos*).³ Townships can contain a number of populated places.⁴ Public institutions use this information to design and implement programmes for the population.

The Ministry of Agricultural Development is responsible for promoting and ensuring the economic, social and political development of rural populations and communities. It conducts and coordinates assistance to rural communities living in poverty and extreme poverty, providing them with the opportunity to improve food production within the family and on community gardens and, progressively, to produce surpluses for sale in community markets to bolster family incomes.

Although the Ministry of Agricultural Development works for agricultural development with a sectoral perspective, it can go beyond the traditional sectoral approach and include the promotion of non-agricultural activities in the country's rural areas. For example, one of the most important programmes for transforming rural areas is agritourism, which is undertaken as a value-added activity associated with agricultural production and intended to strengthen rural development through the adaptation of farms across the country so that they are in optimal conditions to offer a quality agritourism product.

The mission of the Ministry of Social Development is to implement the State's social policy, addressing the basic needs of the most vulnerable groups living in poverty and extreme poverty. Its programmes include the Opportunities Network, the purpose of which is to assist the incorporation of poor and extremely poor families into productive activities. Although there is no strictly territorial dimension, infrastructure is an important component of the initiative to facilitate access to public goods and services by marginalized populations.⁵

The Ministry of Agricultural Development and the Ministry of Social Development have begun to adopt a functional and multidimensional

² There are 10 provinces and four Indigenous regions in Panama. The provinces function as administrative and political entities with a governor of the Panamanian State and a provincial council, composed of all the representatives of the province's townships. The Indigenous regions are Guna Yala, Emberá-Wounaan, Naso Tjër Di and Ngäbe-Buglé, whose inhabitants have the possibility of collectively exploiting the land and enjoy some political and administrative autonomy.

³ There are two Indigenous regions at the township (*corregimiento*) level: Guna de Madugandí y Guna de Wargandí.

⁴ A populated place is a locality that is physically separated from others, has a locally recognized name and is inhabited by one or more people. Panama recognizes three types of populated place: urban, rural and Indigenous. They do not constitute political or administrative units, but they do report basic census information for determining their urban or rural characteristics. An Indigenous populated place is a locality that can be inside or outside the territory of an Indigenous region and whose inhabitants belong to the Indigenous ethnic group; therefore, they follow their own laws.

⁵ Government entities focus their resources on townships characterized by extreme poverty, prioritizing investment in the territorial infrastructure required to meet needs for water, sanitation, rural electrification, highways and access roads in Indigenous and rural areas. Although the system is not specifically aimed at rural areas, the poorest and most vulnerable population groups are found in rural and marginalized areas.

approach in their programmes, which represents a step forward for the new criteria for measuring rurality. However, the way the statistics are split into urban and rural areas is based on the country's official definition and, with the changes that have occurred in rural communities, this is now outdated.

The Ministry of Housing and Land Management (MIVIOT) has had a Deputy Minister of Land Management since 2009. This ministry is responsible for improving the quality of housing throughout Panama, as well as for preparing and coordinating land use plans for the country's urban development. It prepares zoning maps of the country to assist urban development and land planning projects. It is therefore a central entity for understanding rural and urban areas and for mapping the country with a view to its territorial planning and management.

In 2019 the Government of Panama introduced its National Land Use Planning Policy. The Ministry of Housing and Land Management, the Ministry of the Presidency, the Ministry of Economic Affairs and Finance, the Ministry of Agricultural Development, the Ministry of the Environment and the National Decentralization Authority are in charge of implementing this initiative, in partnership with the private sector and civil society. The aim is to trigger an inter-institutional dynamic and create synergies between the public and private sectors in favour of land use planning in Panama for the country's competitive and productive development and to reduce its territorial disparities, in accordance with the principles set out in the 2030 Agenda for Sustainable Development and the Paris climate agreement (ECLAC, 2020; United Nations, 2016).

In this way, the foundations are being set for a more comprehensive understanding of Panamanian rurality based on its functional territories, particularly in terms of the dynamics and interactions between urban and rural areas. However, these institutions still need to embrace the importance of presenting statistics that allow for a more accurate categorization and measurement of the transformations under way in rural areas, based on the concepts enshrined in the theory of the new rurality, which is an innovative tool that is congruent with the reality of rural areas in Panama.

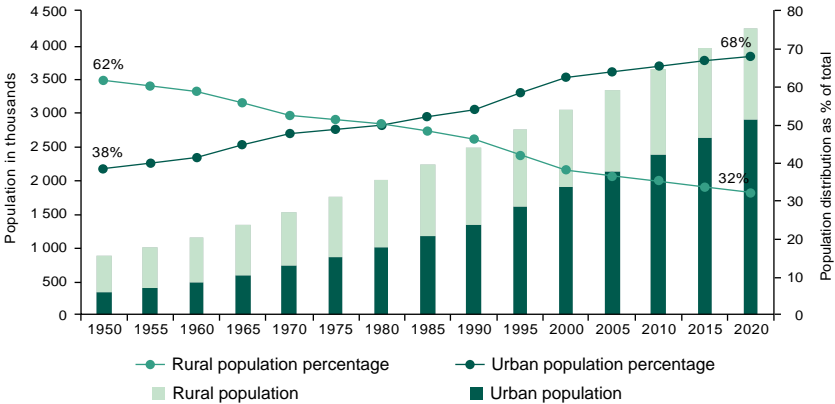
The Panamanian public institutions responsible for rural development have adopted some aspects of the functional approach in that they recognize that rural areas' activities are not exclusively agricultural.

II. General and summarized context of the rural sector in Panama

Rural Panama has undergone important socioeconomic transformations in recent decades. As figure V.1 shows, Panama's population was 860,000 in 1950, with rural dwellers accounting for 62% of the total. Over a period

of 70 years, the country’s population increased almost five-fold, to reach 4.24 million inhabitants in 2020, and both rural and urban populations grew in absolute terms. Based on official statistics, however, the rural population gradually declined to 32% of the total in 2020 (ECLAC, n.d.).

Figure V.1
Panama: rural-urban population distribution, 1950–2020
(Thousands of inhabitants and percentages)



Source: Prepared by the authors, on the basis of data from the Economic Commission for Latin America and the Caribbean (ECLAC), CEPALSTAT [online database] <https://statistics.cepal.org/portal/cepalstat/index.html?lang=en>.

Several factors explain the drop in the rural population, including internal migrations to the cities, driven by economic necessity and the attractiveness of urban lifestyles, and the mechanization and modernization of agricultural production, which resulted in a concentration of land ownership in large-scale farms.

The rural transformation described in the theory of the new rurality can be seen in Panama through the diversification of production, a relative decrease in the share of the population working in the agricultural sector and a growing proportion of the rural population employed in the secondary and service sectors. Figure V.2 shows a constant decline in the rural population employed in the agricultural sector, which by 2019 had fallen to 41.8% of the rural working population.

A growing participation by women in the rural workforce can also be seen. Informal employment in rural areas was traditionally important due to geographic isolation, the curtailed reach of government authorities and the low coverage of public services. Certain informal activities commonly undertaken by women —such as supporting agricultural tasks in family polyculture models and performing household tasks— tended

to translate into a higher rate of informality among female workers. This trend began to decrease with the diversification of rural production and with increased coverage by social security systems, which is evidence of greater participation by rural women in formal work.

Figure V.2
Panama: rural working population by economic activity, 2001, 2008, 2017 and 2019



Source: Prepared by the authors, on the basis of data from the Economic Commission for Latin America and the Caribbean (ECLAC), CEPALSTAT [online database] <https://statistics.cepal.org/portal/cepalstat/index.html?lang=en>.

The proportion of women engaged in agriculture increased. In 2015 the figure was 5.6 percentage points higher than in 1991, while the percentage of men working in the sector fell by 18 percentage points (see table V.1). This phenomenon may be due to the formalization of an activity that previously existed on an informal basis. In the Panamanian context, men generally have more employment opportunities in the primary sector in rural areas, so their weight in the sector is still greater than that of women (Camacho Cárdenas, Cabrera Marrero and Pittí de Rivera, 2015).

Table V.1
Panama: distribution by gender of the population employed in agricultural activities, 1991, 2015 and 2018
(Percentages)

Year	Men	Women
2018	20	9.0
2015	20	8.9
1991	38	3.3

Source: Prepared by the authors, on the basis of A. Chacón and others, *Análisis de políticas agropecuarias en Panamá*, Inter-American Development Bank (IDB), 2019.

Rural areas in Panama report significant developmental lags. For example, average monthly earnings are lower in rural areas than in urban areas, while the Indigenous regions report the lowest monthly earnings, below both the rural and urban averages. Table V.2 shows earning differentials by sex, where it can be seen that men earn more in urban areas, while women in rural areas report higher earnings. The wage gap favouring women is particularly pronounced in the Indigenous regions, which may be the result of women's traditional role as resource managers in a context of collective responsibility and economic activity.

Table V.2
Panama: average monthly earnings by sex and geographic area (2019)
(Balboas per month)

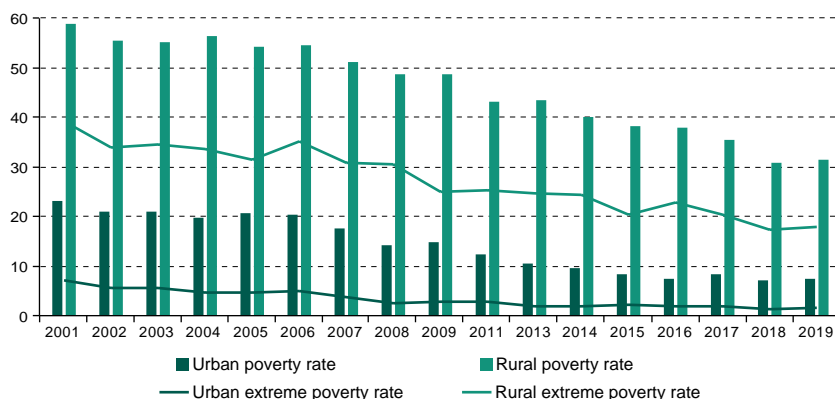
Employed population	Earnings		
	Average monthly earnings	Men	Women
Total	709.8	705.9	715.6
Urban	745.8	751.9	737.1
Rural	513.8	491.4	575.8
Kuna Yala Comarca	349.5	478.1	134.2
Emberá Comarca	234.4	224.1	526.3
Ngäbe-Buglé Comarca	322.8	310.7	377.2

Source: Prepared by the authors, on the basis of data from the National Institute of Statistics and Census.

Rates of poverty and extreme poverty are much higher in Panama's rural areas than in its urban areas. As shown by figure V.3, poverty and extreme poverty rates are falling in both urban and rural areas. Although a progressive decline can be seen in poverty and extreme poverty rates across the board, the disparities between urban and rural areas remain substantial. In 2001, there was a 35.7 percentage point difference between the poverty rates in urban and rural areas, and a differential of 32.0 points between their extreme poverty rates. In 2018, those figures had fallen to 23.7 and 16 percentage points, respectively. Therefore, although they have decreased, territorial gaps in terms of poverty remain significant.

Table V.3 presents data indicating disparities in the quality of and access to public infrastructure and services between urban and rural areas. The urban-rural differential for water access is 10 percentage points, and the figure for sanitation facilities is much higher.

Figure V.3
Panama: population living in poverty and extreme poverty
by geographic area, 2001–2019
(Percentages)



Source: Prepared by the authors, on the basis of data from the Economic Commission for Latin America and the Caribbean (ECLAC), CEPALSTAT [online database] <https://statistics.cepal.org/portal/cepalstat/index.html?lang=en>.

Table V.3
Panama: infrastructure disparities between geographic areas
(Percentage of households)

Indicator	Total average	Urban	Rural
Access to an improved water supply	94	97	87
Improved sanitary installation	73	80	53

Source: Prepared by the authors, on the basis of T. Z. Villalobos, *Análisis y diagnóstico de políticas agroambientales en Panamá*, Panama, Food and Agriculture Organization of the United Nations (FAO), 2015.

As in other countries across the region, migratory movements in Panama tend to be towards the country's capital and other urban centres, in search of employment that can provide the rural population with better incomes, access to social security, higher levels of education for their young people, access to health services and a better quality of life.

With daily commuting to urban centres and nearby settlements, dormitory cities have emerged organically because of long commuting times between work and home, caused by either excess numbers of cars on the streets or weaknesses in the public transit infrastructure.

Over the calendar year, at harvest times, a portion of the Indigenous and rural population generally carries out two migratory movements, along with their entire families. They temporarily leave their permanent residences to live in workers' housing for the duration of the harvest on

the farms that require their services. This occurs among the Indigenous communities of the Ngäbe-Buglé region and rural dwellers in the provinces of Bocas del Toro, Chiriquí and Veraguas. Understanding these territorial dynamics and taking them into account for the implementation of public policies and for the political and social participation of rural and Indigenous populations is essential for advancing towards inclusive development and equitable well-being.

Environmental factors also come into play in analysing rurality in Panama. As stated in the National Land Management Policy (PNOT), land use changes such as deforestation, desertification, and land and water pollution have posed serious challenges. For example, according to estimates, only 25% of the country’s territory is suitable for agriculture; in reality, however, more than 40% of the land is turned over to agricultural activities, which has resulted in 28% of the mainland territory experiencing a process of desertification, especially in the dry arc and the Indigenous regions (Ministry of Housing and Land Management, 2019). Table V.4 summarizes the main recent changes in rural Panama.

Table V.4
Panama: main recent changes in Panamanian rurality

Demographic and migratory	<ul style="list-style-type: none"> • Absolute growth of the rural population, but a drop in relative terms • Higher male population in rural areas • Temporary and permanent migration to cities
Economic	<ul style="list-style-type: none"> • Diversification of production and of the rural economically active population • Decrease in the relative weight of the primary sector in GDP • Increased integration of rural areas into international trade networks
Social	<ul style="list-style-type: none"> • Growing participation of women in the formal rural economically active population • Rising formal earnings of rural women • High levels of poverty and extreme poverty in rural areas
Environmental	<ul style="list-style-type: none"> • Deforestation • Desertification • Land and water pollution

Source: Prepared by the authors.

III. Analysis of the scope and limitations of the official Panamanian definitions of rurality

The Ministry of Agricultural Development has expressed concerns about the current definition of rurality used in Panama, arguing that the official figures underestimate the population living in rural areas (Ministry of Agricultural Development, 2014). Although the current definition includes a range of dynamic factors —such as socioeconomic indicators of access to public services and commercial activities— its primary criterion is population size. If a settlement has more than 1,500 inhabitants, it is deemed urban, even if its access to services is severely limited.

Environmental challenges and sociodemographic changes are two of the factors changing Panamanian rurality and they are not adequately indicated by the size of the population and the lack or presence of public services and private businesses (the main elements in the current official definition of rurality). The current definition fails to take account of land use and therefore prevents an understanding of how the evolution of that variable could be impacting some of the country's most vulnerable populations.

In its *Bulletin* No. 11, the Statistics and Census Office (2007, p. IV) describes the national territory as “two very different types of areas, home to two types of populations with totally different sociodemographic characteristics: the urban and the rural”. These definitions reflect a traditional dichotomous categorization. The theories of the new rurality, together with the country's own characteristics, show that the differences between the rural and the urban are dynamic and constantly evolving, and this highlights the need for new measurement methods to better understand the contributions and challenges of the country's rural areas. Table V.5 summarizes the strengths and limitations of the official definition of rurality.

Table V.5
Panama: strengths and limitations of the official definition of rurality

Strengths	Limitations
<ul style="list-style-type: none"> It includes a variety of factors, such as the availability of public services, commerce and infrastructure. 	<ul style="list-style-type: none"> It is dichotomous, so it fails to measure or categorize intermediate spaces. It defines rural as the remainder and not on the basis of its own characteristics.
<ul style="list-style-type: none"> It allows comparisons over time since the 1940s. Some data on the measurement and classification of territorial flows are available. 	<ul style="list-style-type: none"> The emphasis on population numbers may lead to an underestimation of the population living in rural areas. It fails to adequately reflect the changing reality of rural areas, especially environmental challenges and sociodemographic dynamics.

Source: Prepared by the authors.

IV. Inventory of indicators available in Panamanian statistics for measuring and categorizing rurality

The National Institute of Statistics and Census, which monitors a wide range of demographic, social and economic variables, is the main source of data for measuring rurality. Demographic and socioeconomic data are available from the Population and Housing Census, the Labour Market Survey and the Multipurpose Survey. For information on the primary sector, the National Institute of Statistics and Census conducts the Agricultural Census and the Population and Housing Census. Data are disaggregated at the provincial, district and township levels. The Ministry of the Environment (2017) also has geographic land cover and land use products developed under the

United Nations Collaborative Programme on Reducing Emissions from Deforestation and Forest Degradation in Developing Countries (UN-REDD) and with financial support from the Food and Agriculture Organization of the United Nations (FAO). This product provides information on land use and forest cover for the year 2012.

Also available is the user-accessible on-line data generation system that was developed using the Retrieval of Data for Small Areas by Microcomputer application (REDATAM). This system allows the quick and easy construction of frequencies, cross-references of variables and other data tables to complement the last three population censuses conducted (1990, 2000 and 2010).⁶ At the same time, the coverage of the household-based labour market survey has gradually improved. Since 2012, it includes the population living in the Indigenous regions, who account for 6% of the country’s total. The survey includes information on more than 15,300 households, 42% of which are located in rural areas, but published information is not available for all the study variables across all the provinces. Tables V.6, V.7 and V.8 show indicators that are used to measure the economic, social and environmental dimensions of rurality in Panama.

Table V.6
Panama: economic variables available for measuring rurality

Variable	Category and dimensions	Administrative level	Source	
Employment	<ul style="list-style-type: none"> • Economically active population (EAP) • Working population • Unemployed population • Non-economically active population (NEAP) 	<ul style="list-style-type: none"> • Gender • Age group • Employment type (formal or informal) • Schooling • Average number of schooling years of the population employed in the non-agricultural workforce • Marital status • Social security • Category of economic activity • Occupational category • Monthly household income • Median monthly earnings of the employed working population • Hours worked 	Province, district, township, census segment	<ul style="list-style-type: none"> • National Institute of Statistics and Census • 2010 Housing and Population Census • 2019 Labour Market Survey • 2019 Multipurpose Survey
	Producers	<ul style="list-style-type: none"> • Sex • Age group • Farm size 	Province, district, township, census segment	<ul style="list-style-type: none"> • National Institute of Statistics and Census • 2011 Agricultural Census

Source: Prepared by the authors, on the basis of information from the National Institute of Statistics and Census.

⁶ Because of the health crisis caused by the COVID-19 pandemic, the 2020 census was postponed. In March 2021, the National Institute of Statistics and Census updated the maps it will use after the first quarter of 2023 to conduct the new census.

Table V.7
Panama: social variables available for measuring rurality

Variable	Categories and dimensions		Administrative level	Source
Population	<ul style="list-style-type: none"> • Indigenous within comarca • Indigenous outside comarca • Non-indigenous • Afrodescendent 	<ul style="list-style-type: none"> • Ethnic group • Gender • Age group • Schooling • Marital status • Social security 	Province, district or township, census segment	<ul style="list-style-type: none"> • National Institute of Statistics and Census • 2010 Housing and Population Census • 2019 Labour Market Survey • 2019 Multipurpose Survey
Occupied private dwellings	<ul style="list-style-type: none"> • Housing and households 	<ul style="list-style-type: none"> • Use and type of sanitation service • Household equipment • Dwelling construction materials (roof, walls, floor) • Dwelling type • Lighting type • Number of rooms • Tenure • Kinship • Household type • Household size (number of persons) • Number of children in the household 	Province, district, township, census segment	<ul style="list-style-type: none"> • National Institute of Statistics and Census • 2010 Housing and Population Census • 2019 Multipurpose Survey

Source: Prepared by the authors, on the basis of information from the National Institute of Statistics and Census.

Table V.8
Panama: environmental variables available for measuring rurality

Variable	Category and dimensions		Administrative level	Source
Land occupation	Occupation type	Extent of forests, extent of grasslands, production	Province, district, township, census segment	<ul style="list-style-type: none"> • Ministry of Agricultural Development • Ministry of the Environment
Housing	Refuse disposal	River, stream, sea or lake, wasteland, burial, burning	Province, district, township, census segment	<ul style="list-style-type: none"> • National Institute of Statistics and Census • 2010 Housing and Population Census

Source: Prepared by the authors, on the basis of information from the National Institute of Statistics and Census.

V. Proposed alternative methodologies for measuring rurality in Panama

Based on the demographic, economic, labour and environmental indicators available in the country's official statistics, three alternative proposed methodologies for measuring rural Panama have been prepared. The proposals incorporate the changes in the dynamics of rural territories

and their populations described above, as a result of which rural no longer means agricultural alone and there is a constant evolution in the characteristics of the inhabitants and the land itself.

The proposed indices are based on the functional approach, which measures the rural population primarily through its demographic, labour, economic and environmental dimensions. The variables included in the proposed indices are not exhaustive: future exercises could add the availability of public services and infrastructure, for example, among other variables available in the country’s current official statistics.

The variables used for the construction of the three rurality indices applied in the Panamanian case are listed below. They are calculated for townships, districts and provinces (see table V.9). The construction of each is discussed in detail further below.

Table V.9
Panama: proposed indices for alternative measurements of rurality in the country

	Indicator		
	Environmental rurality index (ERI)	Relative rurality index (RRI)	Demographic rurality index (DRI)
Variables	Population density	Total population	Population density
	Forests by township (<i>percentages</i>)	Population density	Land turned over to agriculture by township (<i>percentages</i>)
	Agriculture by township (<i>percentages</i>)	Urban land by township (<i>percentages</i>)	Population born in another district (<i>percentages</i>)
		Distance to settlements of over 10,000 inhabitants	

Source: Prepared by the authors, on the basis of A. Pitti, Y. Gaudin and S. Hess, “Caracterización de los espacios rurales en Panamá a partir de estadísticas nacionales: enfoque social, económico y demográfico”, *Project Documents* (LC/TS.2021/40-LC/MEX/TS.2021/6), Mexico City, Economic Commission for Latin America and the Caribbean (ECLAC), 2021.

The main sources of information used to construct the indices are the 2010 Population Census data from Panama’s National Institute of Statistics and Census and the 2012 land use data provided by the Ministry of the Environment.⁷

The available information defines urban localities mainly as those with populations of at least 1,500 inhabitants and that meet certain requirements of urban layout and access to services.⁸ The work presented here also uses information on land use from the physical monitoring

⁷ The forest cover and land use data available from the Ministry of the Environment are a product of the UN-REDD Programme, which receives technical and financial support from the Food and Agriculture Organization of the United Nations (FAO). For more information, see [online] <https://stridata-si.opendata.arcgis.com/maps/9331485ecbc9400a9059ce15a88136ce/about>.

⁸ As indicated above, inhabited places, neighbourhoods or developments that meet most of the aforementioned characteristics, even though they fall short of the number of inhabitants, are in some cases considered urban populated places (National Institute of Statistics and Census, n.d.-a).

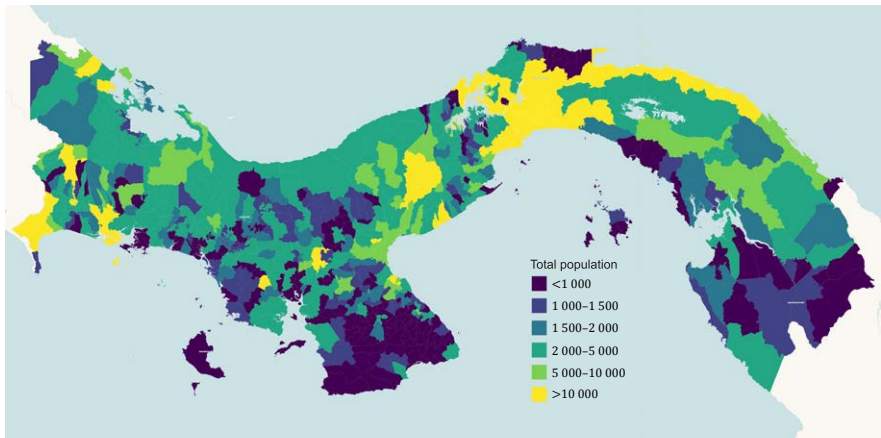
work of the Smithsonian Tropical Research Institute (STRI) and on the road network from the Tommy Guardia National Geographic Institute (IGNTG), while the distances to urban centres were calculated using Google Maps.

A. Sources of information and methods

1. Total population

Information for each township, district and province is added to data from the 2010 Population Census indicating the resident population of each populated place⁹ (see map V.1).

Map V.1
Panama: total population in the townships, 2010



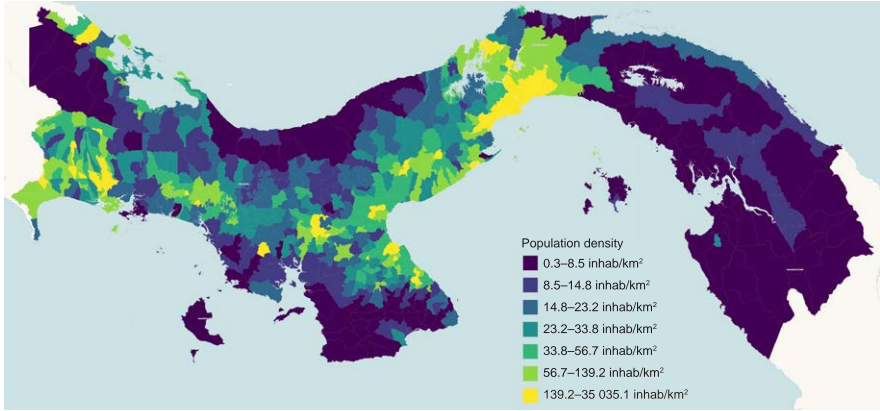
Source: Prepared by the authors, on the basis of data from the National Institute of Statistics and Census, the Smithsonian Tropical Research Institute and the Tommy Guardia National Geographic Institute (IGNTG).

2. Population density

The area in square kilometres of each township, district and province is calculated based on geospatial inputs provided by the National Institute of Statistics and Census. Population density is obtained by dividing the total population of each township by its area in km² (see map V.2).

⁹ A populated place is defined as any urban or rural locality that is physically separated from another and inhabited by one or more persons (National Institute of Statistics and Census, n.d.-b).

Map V.2
Panama: population density, 2010

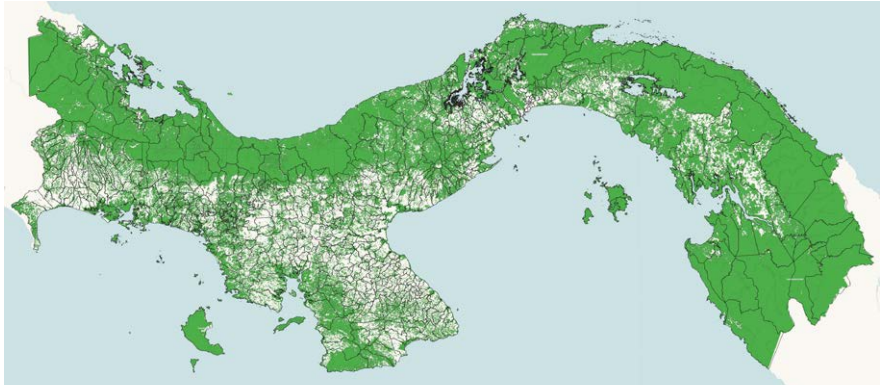


Source: Prepared by the authors, on the basis of data from the National Institute of Statistics and Census, the Smithsonian Tropical Research Institute and the Tommy Guardia National Geographic Institute (IGNTG).

3. Land use

Using the 2012 land cover and land use map, land use is classified into three categories: forest, populated area and infrastructure, and agriculture.¹⁰ Each category’s area in square kilometres is obtained and then divided by the area of the township, district and province to obtain the percentage of each land use type (see maps V.3, V.4 and V.5).

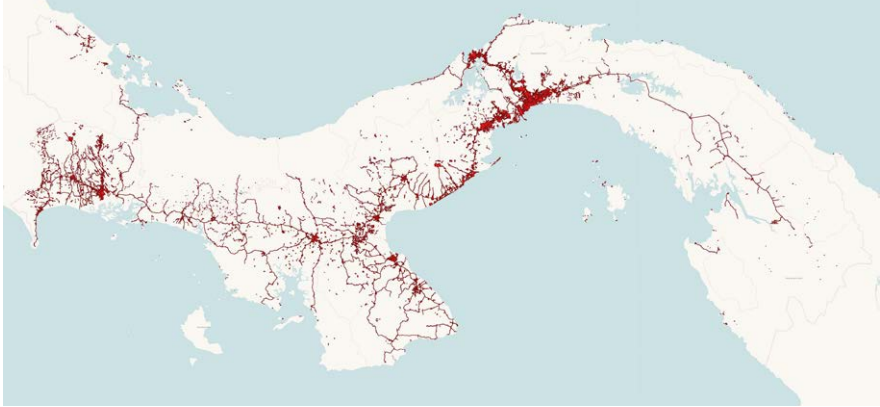
Map V.3
Panama: forest cover by township, 2010



Source: Prepared by the authors, on the basis of data from the National Institute of Statistics and Census, the Smithsonian Tropical Research Institute and the Tommy Guardia National Geographic Institute (IGNTG).

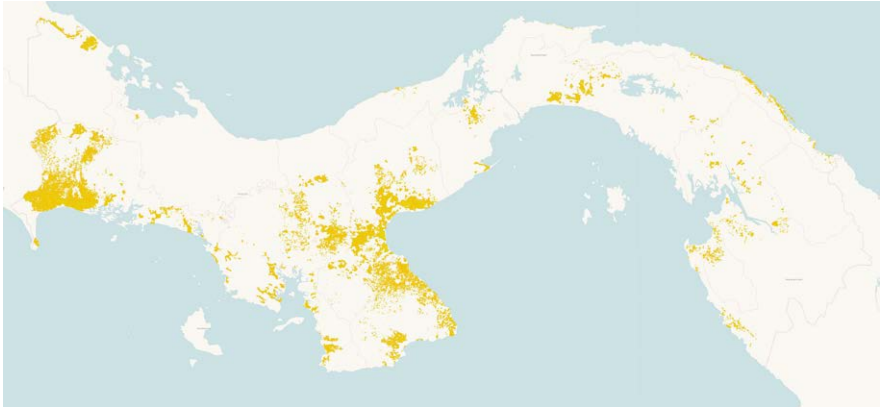
¹⁰ The following categories were used for the agriculture dimension: rice, coffee, sugar cane, citrus fruits, aquaculture ponds, mixed horticulture, maize, other annual crops, other perennial crops, oil palm, pineapple and banana.

Map V.4
Panama: urban land use by township, 2010



Source: Prepared by the authors, on the basis of data from the National Institute of Statistics and Census, the Smithsonian Tropical Research Institute and the Tommy Guardia National Geographic Institute (IGNTG).

Map V.5
Panama: land used in agriculture, 2010



Source: Prepared by the authors, on the basis of data from the National Institute of Statistics and Census, the Smithsonian Tropical Research Institute and the Tommy Guardia National Geographic Institute (IGNTG).

4. Distance to settlements of 10,000 inhabitants or more

The first step in the construction of this indicator was to identify the road network so that distances by road and highway could be calculated. The 2011 version of Panama's road network, created by the Tommy Guardia National Geographic Institute, was used (see map V.6). Based on the categories of the road network, only those roads composed of asphalt, concrete and brick were considered: i.e. roads that are passable all year

round. For the districts of Balboa and Bocas del Toro and the township (corregimiento) of Gobernadora, ferry routes were constructed based on data available on Google, since no official information was available. These routes were integrated into Panama's road network, and thus the first input was obtained. The centroid of localities with 10,000 or more inhabitants was obtained using geospatial inputs that define populated places.

Map V.6
Panama: road network and populated places of 10,000 inhabitants or more



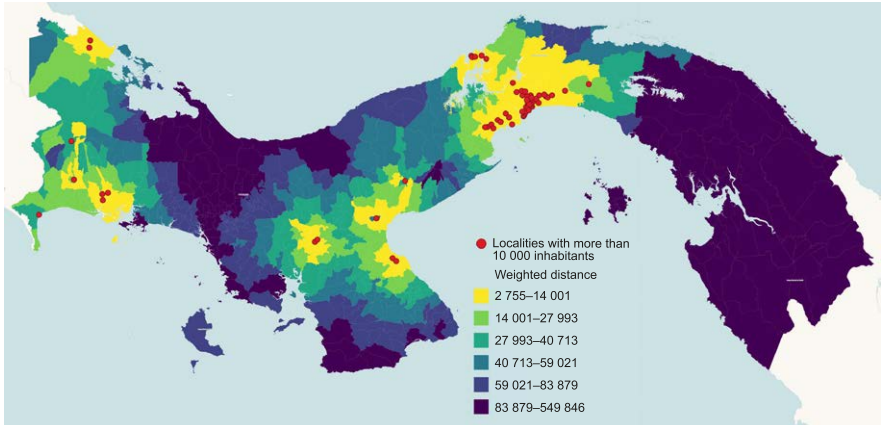
Source: Prepared by the authors, on the basis of data from the National Institute of Statistics and Census, the Smithsonian Tropical Research Institute and the Tommy Guardia National Geographic Institute (IGNTG).

Using the above inputs, and with the QNEAT3 plug-in¹¹ included in QGIS (an open-source geographic information system software package), a distance matrix along the road network was obtained from the populated places to localities with 10,000 inhabitants or more. In order to obtain an indicator for the townships, the distance from each populated place to the locality with 10,000 inhabitants or more was weighted based on the relative population weight of the populated place within the township (see map V.7).

A certain population threshold is chosen—in this case, 10,000 inhabitants—to indicate the distance to a locality with a minimum supply of services (primary and secondary schools, sizable market for products and inputs, minimum medical care and so on). The threshold can be modified based on additional information on the quality and quantity of services that are effectively available or based on specific requirements, which may be linked to a minimum market size for products or inputs or other factors.

¹¹ QNEAT3 is a QGIS plug-in that allows network analysis by processing data to identify, for example, the shortest paths and isochrones from each point.

Map V.7
Panama: weighted distance at the township level

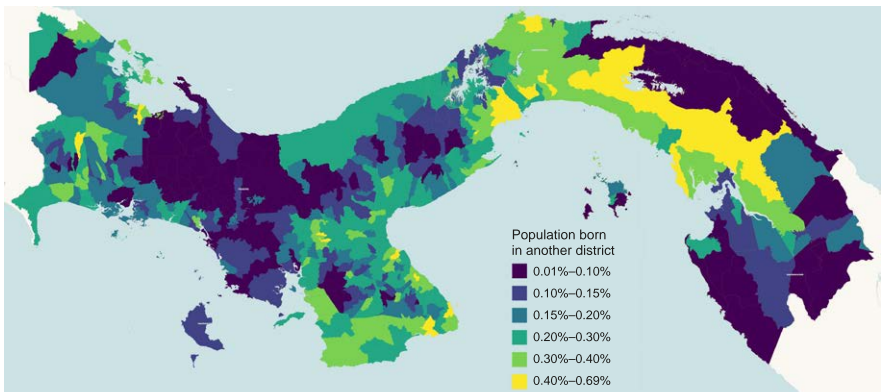


Source: Prepared by the authors, on the basis of data from the National Institute of Statistics and Census, the Smithsonian Tropical Research Institute and the Tommy Guardia National Geographic Institute (IGNTG).

5. Percentage of population born in another district

This variable is used to indicate the labour mobility of people and a given area’s likely attractiveness as a migration destination. The number of people born in another district was calculated using the 2010 Census data for populated places. The result was used to calculate the percentage within the total population of the township, district or province (see map V.8).

Map V.8
Panama: population born in another district, 2010



Source: Prepared by the authors, on the basis of data from the National Institute of Statistics and Census, the Smithsonian Tropical Research Institute and the Tommy Guardia National Geographic Institute (IGNTG).

VI. Construction of indices

The indices presented below belong to the family of relative indices based on an aggregate index originally developed by Waldorf (2006) and applied, with significant modifications, to the analysis of Mexican rurality (see chapter IV of this book and Soloaga, Plassot and Reyes, 2021). These indices are multidimensional and can be calculated at different geographic scales, subject to data availability. They produce a continuous, non-dichotomous measurement, and the indicator (of rurality, for example) is a relative concept: in other words, each territory is associated with a degree of the index, which in turn is relative to the degree of that index reported in other territories.

An index of this type uses four steps to create a multidimensional continuum: (i) the dimensions to be used in the index are identified, (ii) appropriate variables to represent each of those dimensions are selected, (iii) the variables are rescaled to make them mutually comparable, in a way similar to how the human development index (HDI) is calculated, and (iv) aggregation is performed with the HDI methodology used by the United Nations Development Programme (UNDP) since 2010.

A. Environmental rurality index (ERI)

The index covers three dimensions and follows the same methodology as the one presented in this book's previous chapter on Mexico. The first dimension is population, the second dimension is proximity to forests or woodland areas (1 means localities farthest from forested or wooded areas, and 0 indicates the closest localities), while the third dimension reports agricultural land use in the locality (0 is a locality with less agricultural land use, and 1 is a locality with more agricultural land use). This methodology was applied with continuous subindicators instead of dichotomous indicators to obtain an index gradient. Therefore, the two dimensions of land use were used: the variable of percentage of land with forest cover, and the variable of agricultural land cover.

The subindicators are rescaled so that higher agricultural and urban land use indicates a lower level of the natural environment.¹² Thus, the forest cover density dimension is rescaled by means of the following formula:

¹² Since the index will use indicators with different dimensions (population, percentage of forest or woodland and agricultural land use), they must be rescaled to accommodate the range of values that each indicator can assume, which is very different for the three variables. This rescaling follows the methodology used for the HDI by UNDP, which combines measurements of life expectancy, income and education: three variables that also have very different dimensions, before they are rescaled. The numerator indicates the distance of a variable from the maximum value (or the minimum value, as appropriate) of that variable in the country under study, which when divided by the maximum range that the variable can have ($X_{maximum} - X_{minimum}$) creates a rescaled indicator that always falls within the interval (0,1). This rescaling makes it possible to combine the variables into one index, such as the environmental rurality index, as well as the other two proposed below.

$$X_{i_{rescaled}} = \frac{X_i - X_{min}}{X_{max} - X_{min}} \in [0,1] \quad \in [0,1] \text{ (Equation 1)}$$

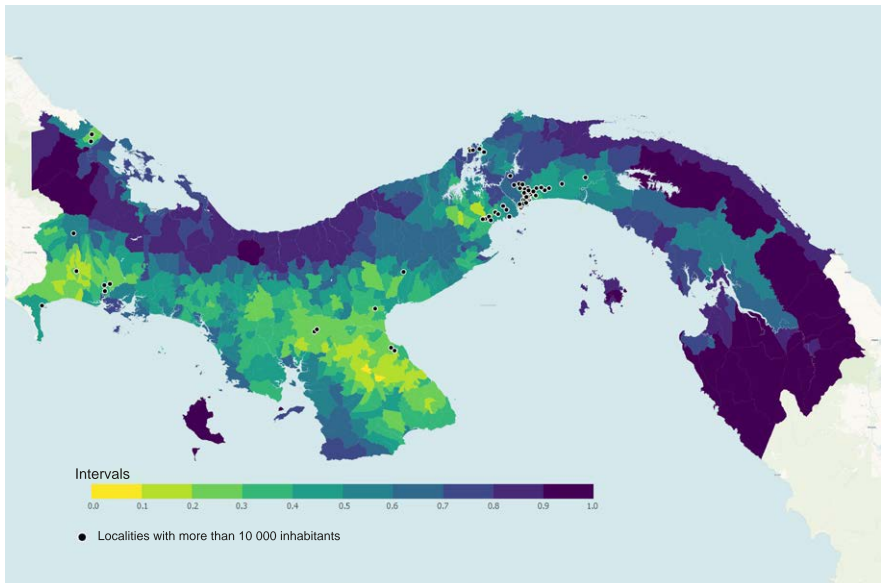
This subindicator tends to 1 as woodland covers a greater area. For the same purpose, the population density and agricultural land cover variables are rescaled in a way so that a lower value of the subindicator indicates less natural environments: either heavily populated places, or locations where a high percentage of the land is used for agriculture. This is calculated as follows:

$$X_{j_{rescaled}} = \frac{X_{max} - X_j}{X_{max} - X_{min}} \in [0,1] \quad \in [0,1] \text{ (Equation 2)}$$

As argued in the work of Soloaga, Plassot and Reyes (2021), and following the method used with the HDI and its indicators, it was also decided to express density in logarithms and to add the subindicators using the geometric mean:

$$ERI_{Township} = (X_{ln(density)} * X_{perforest} * X_{peragric})^{1/3} \quad \text{(Equation 3)}$$

Map V.9
Panama: environmental rurality index (ERI) at the township level



Source: Prepared by the authors, on the basis of data from the National Institute of Statistics and Census.

B. Relative rurality index (RRI)

The relative rurality index (RRI) covers four dimensions: (i) total population, (ii) population density, (iii) percentage of urban land, and (iv) distance to settlements of over 10,000 inhabitants. Logarithmic transformations of the first two variables (total population and population density) are used to correct for asymmetric distributions (Waldorf and Kim, 2015).¹³

The first three dimensions are rescaled using the method in equation 2 (lower values indicate lower rurality), while the fourth dimension is rescaled using equation 1 (greater distances indicate greater rurality). Thus, the index takes values between 0 and 1, where 0 indicates more urban areas and 1 indicates more rural areas.

As with the other proposed indices, logarithms values are used for population and density, and the dimensions are added as a geometric mean:

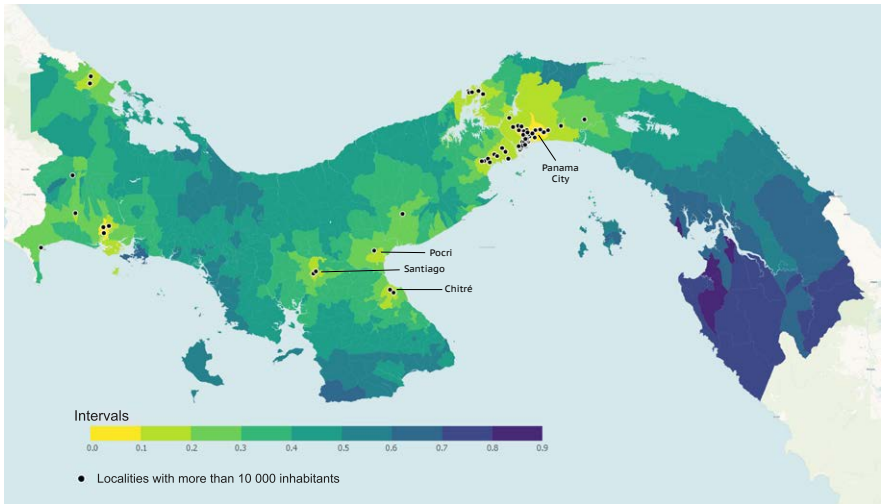
$$RRI_{Township} = (X_{\ln(population)} * X_{\ln(density)} * X_{per\ Urban} * X_{DistanceLoc\ 10,000})^{1/4}$$

(Equation 4)

Although the RRI is a continuous index, it is useful to present it in segments, which can follow an arbitrary criterion of equal interval values or, alternatively, intervals that to some extent reflect institutional realities. To portray the rurality of Panama through different exercises, map V.10 shows the RRI for townships using equal intervals of 0.1, while map V.11 shows the same indicator but classifies the townships into deciles, with each interval having the same number of observations. Obviously, the two exercises provide different information on the classification of the areas: while map V.10 shows that there are very few townships with the highest levels of rurality (between 0.8 and 0.9), map V.11 forces 63 townships to be included in the interval with the highest value and, to achieve this, the map groups together those townships with RRIs of between 0.52 and 0.89. It can therefore be said that the 63 most rural townships in Panama have an RRI of between 0.52 and 0.89.

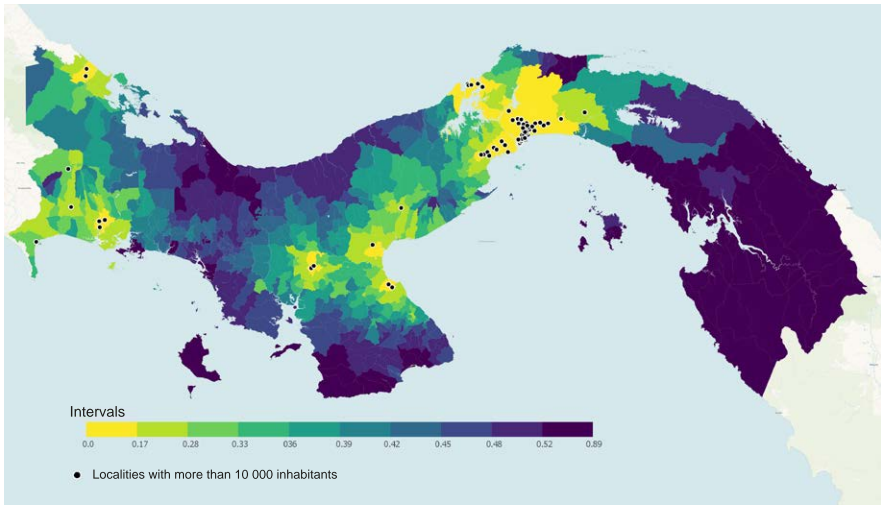
¹³ That some dimensions without a normal distribution in their original values adopt this type of distribution when transformed into logarithms is a known phenomenon.

Map V.10
Panama: relative rurality index (RRI) at the township level
(At intervals of 0.1 units)



Source: Prepared by the authors, on the basis of data from the National Institute of Statistics and Census.

Map V.11
Panama: relative rurality index (RRI) at the township level
(By deciles of the number of townships)



Source: Prepared by the authors, on the basis of data from the National Institute of Statistics and Census.

C. Demographic rurality index (DRI)

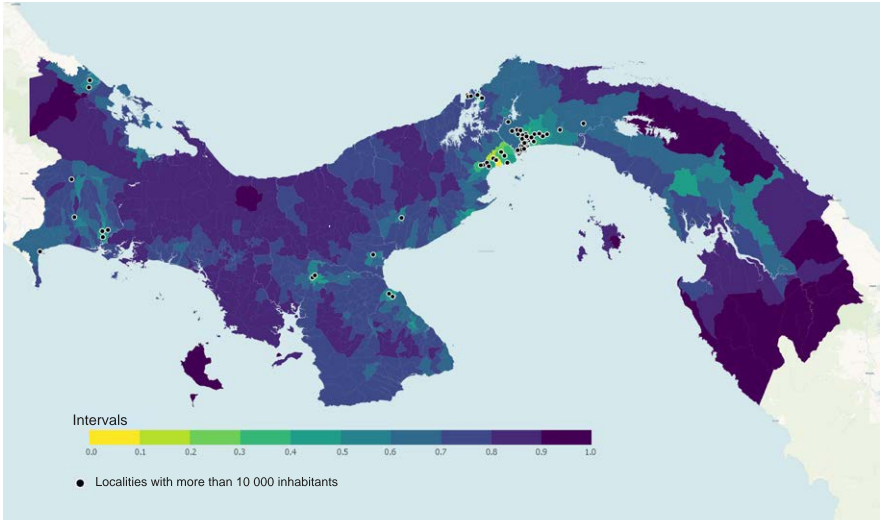
The demographic rurality index comprises three dimensions: (i) population density, (ii) percentage of urban land, and (iii) labour mobility. Since the population censuses only collect labour mobility information for districts, but not for townships, this dimension of the demographic rurality index was calculated from the percentage of people in each township, district and province who were born elsewhere. This argument is based on the assumption that territories with larger non-native populations have more attractive job markets.

The three dimensions are rescaled in accordance with equation 2 and the addition is performed using the geometric mean:

$$DRI_{Township} = (X_{Density} * X_{per\ Urban} * X_{Labour\ Mobility})^{1/3} \quad \text{(Equation 5)}$$

The DRI is shown on map V.12.

Map V.12
Panama: demographic rurality index (DRI) by township
(In equal intervals of the DRI)

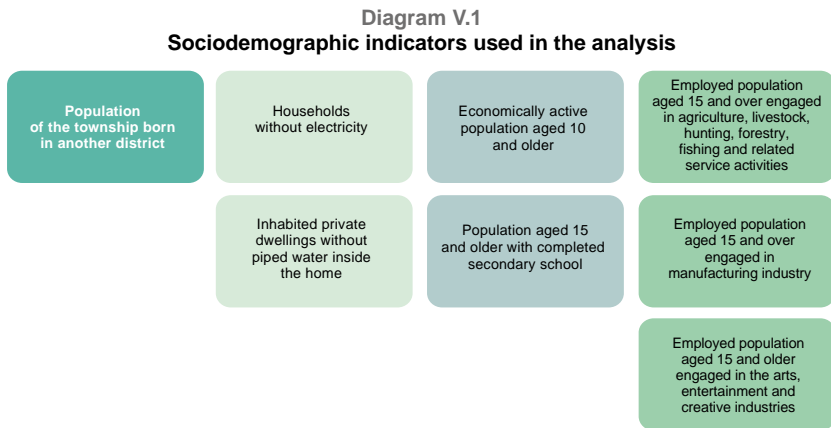


Source: Prepared by the authors, on the basis of data from the National Institute of Statistics and Census.

From the results shown on map V.12, an overlap can be seen between places with settlements of more than 10,000 inhabitants and the lowest DRI values, linked to high density, high percentages of built-up land and a high capacity to attract population.

D. Information for analysing sociodemographic variables

Information from the 2010 INEC Population Census was used, and indicators were constructed at different levels: populated places, townships, districts and provinces. The selected indicators cover the population's level of schooling, access to basic housing services, the sectors in which the population is employed and the proportion of the population born in another district as a proxy for the relative attractiveness of the locality. Diagram V.1 shows the eight indicators selected for analysis.



Source: Prepared by the authors, on the basis of data from the National Institute of Statistics and Census.

E. Analysis of sociodemographic variables

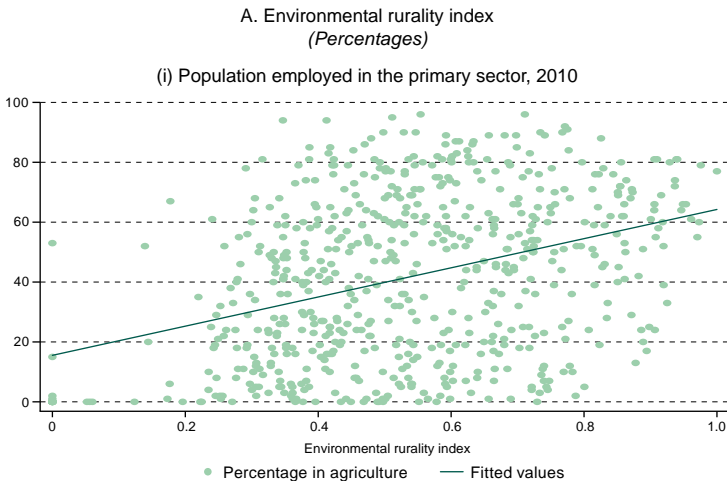
The indicators used report differing results across the various methods used to measure levels of rurality and urbanity. To provide a contrast with the official view, information obtained from Panama's dichotomous disaggregation is also presented. The text analyses three indicators for 2010: (i) percentage of employment in the primary sector, (ii) percentage of population aged 15 and over with post-secondary or higher education, and (iii) percentage of households without access to electricity.

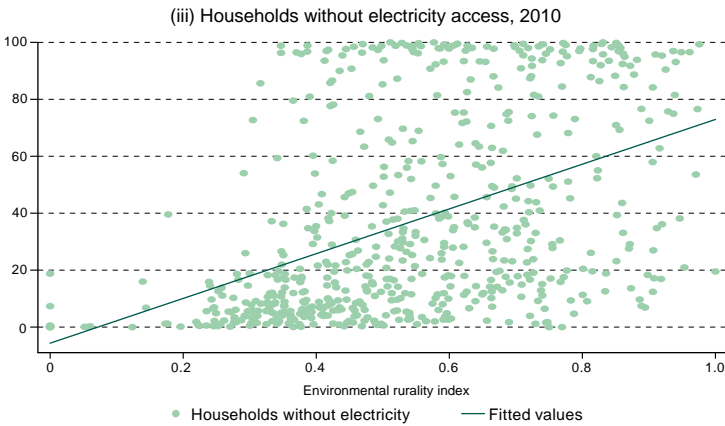
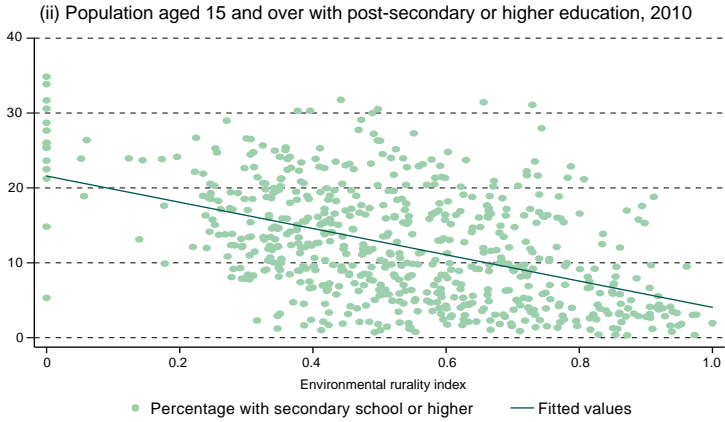
As figure V.4 shows, increasing rurality values (when the ERI, RRI or DRI indices move away from zero) are positively associated with a greater presence of agricultural activities (as expected) and negatively associated with the percentage of the population with secondary schooling or higher education and with access to electricity. There is a statistically significant correlation between the rurality indicators (ERI, RRI, or DRI and the index based on the official definition) and the three socioeconomic indicators presented on figure V.4.

The different components of figures V.4A to V.4C show the relationship between the indicators and the results of the indices calculated above to allow comparisons of the information obtained with the ERI (first panel, figures marked with the letter A), with the RRI (second panel, indicated with the letter B) and with the DRI (third panel, indicated with the letter C). The fourth panel shows the relationship between the indicators and the classification based on official criteria (indicated by the letter D). The indices enable the identification of territories that, in addition to being relatively more rural, lack access to electricity. This method helps focus public action on priority areas and to plan actions that are differentiated by area type: very rural, rural-urban, intermediate, urban and so on, determined by appropriate cut-off points in the proposed indices.

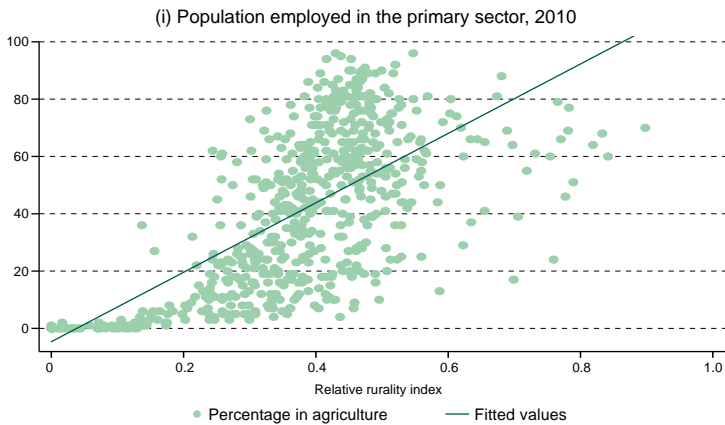
As seen on figure V.4A.i, those townships where the entire population lives in rural areas (according to the official criteria, and indicated as 100% rural population in figure V.4.D.i on the fourth panel) report great heterogeneity in terms of occupations (with the population engaged in agriculture ranging from zero to 100%), in terms of schooling (the population with secondary education or more can range from zero to almost 30%) and in terms of access to electricity (ranging from zero to 100%). This does not allow the determination —within those townships officially defined as rural— of which are the most marginalized in terms of, for example, access to electricity or education. As a result, a policy that allocates funds solely on the basis of the current dichotomous classification of the rural and the urban may not achieve the full expected impact.

Figure V.4
Panama: demographic rurality index (DRI) and percentage of rural population in the township, by socioeconomic indicator, 2010

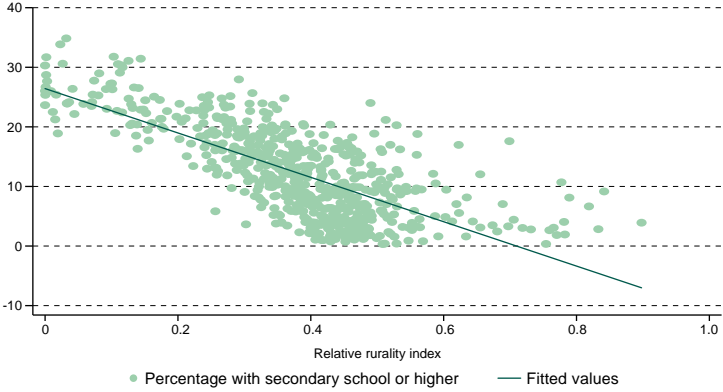




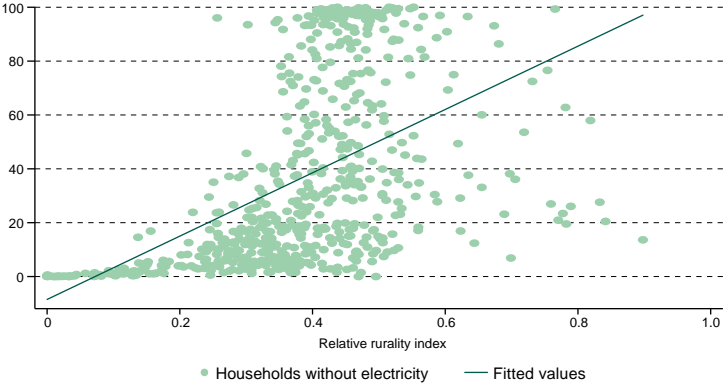
**B. Relative rurality index
(Percentages)**



(ii) Population aged 15 and over with post-secondary or higher education, 2010

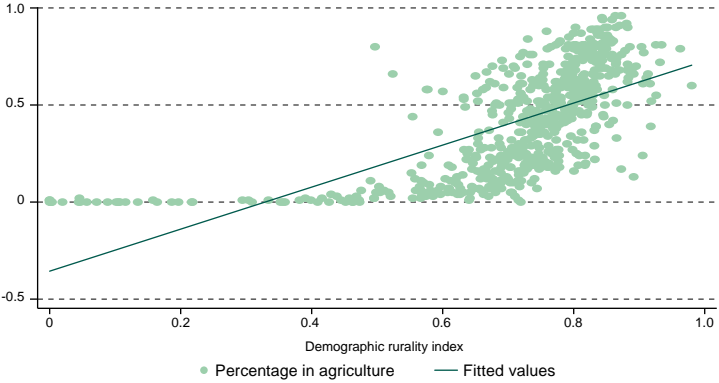


(iii) Households without electricity access, 2010

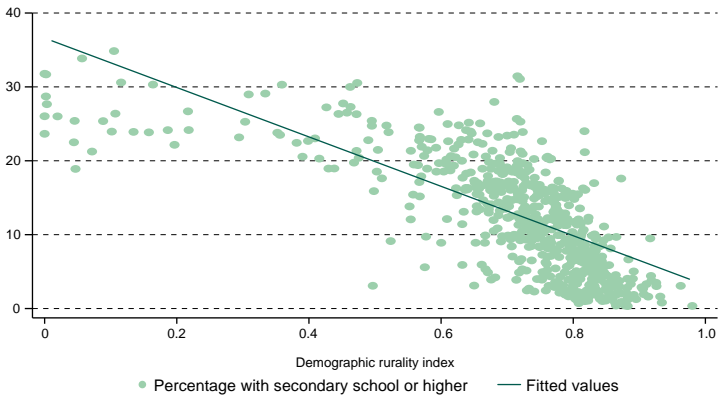


C. Demographic rurality index
(Percentages)

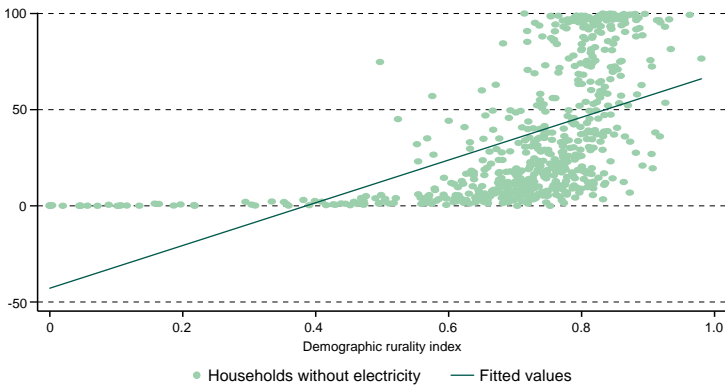
(i) Population employed in the primary sector, 2010



(ii) Population aged 15 and over with post-secondary or higher education, 2010

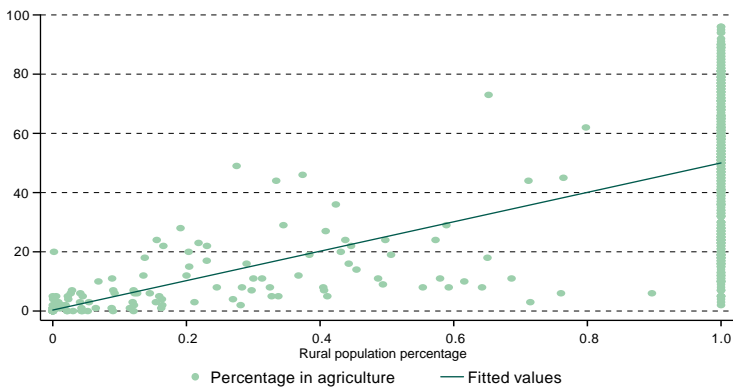


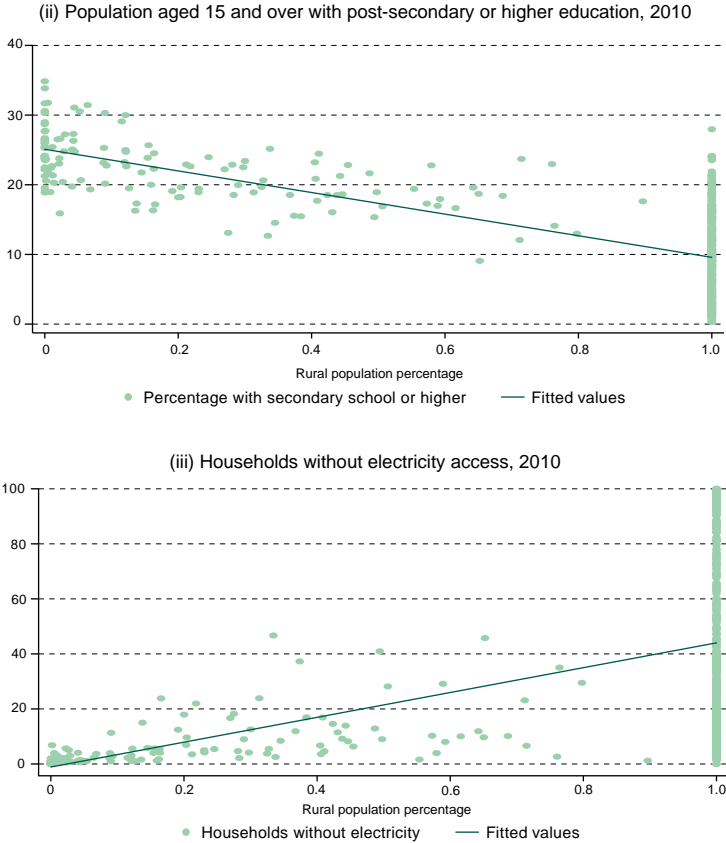
(iii) Households without electricity access, 2010



D. Rural population percentage
(Percentages)

(i) Population employed in the primary sector, 2010





Source: Prepared by the authors, on the basis of data from the National Institute of Statistics and Census.
Note: The horizontal axis on the official definition indicates the rural population percentage in the township according to the INEC classification of populated places in each township. A concentration of townships where INEC classifies all the localities as rural can be seen, which accordingly report a rural population percentage of 100% (shown as 100 in figures D (i), (ii) and (iii)).

Once the RRI has been calculated, useful information can be obtained from comparing the averages of the three indicators from the 2010 Population Census used in the text for different levels of rurality with the results given by using the official definition. This is done by examining intervals that contain the same numbers of townships (see table V.10). Since the dichotomous classification of the official INEC definition also includes access to services in addition to the population of populated places, it can be concluded that 99% of urban households have electricity (see the last three rows on table V.10). The result is different if, for example, the rurality gradient obtained by means of the RRI is used: there, the percentage of the population living in the most rural areas (levels 5 to 9 of the RRI categories in table V.10) and who do not have access to electricity is much higher (over 53%).

Table V.10
Average of the socioeconomic indicators in each RRI category, 2010
(RRI classification in deciles by number of townships)

Degree of rurality of township (RRI)	Number of townships	Total population (Percentages)	Population employed in the primary sector (Percentages)	Population aged 15 and older with completed secondary education in 2010 (Percentages)	Households without access to electricity (Percentages)
Rural-urban continuum					
RRI level 0: [0–0.176]	64	59	1	54	2
RRI level 1: [0.176–0.282]	63	12	15	20	10
RRI level 2: [0.282–0.331]	63	7	23	17	15
RRI level 3: [0.331–0.367]	63	4	32	14	27
RRI level 4: [0.367–0.394]	63	4	43	10	39
RRI level 5: [0.394–0.427]	63	3	51	9	53
RRI level 6: [0.427–0.454]	63	3	61	7	66
RRI level 7: [0.454–0.480]	63	3	59	8	56
RRI level 8: [0.480–0.526]	63	3	59	6	65
RRI level 9: [0.526–0.898]	63	2	58	7	51
Official definition					
Urban		65	2	25	1
Rural		35	41	11	38
National			12	21	14

Source: Prepared by the authors, on the basis of data from the National Institute of Statistics and Census, the Ministry of the Environment and the Tommy Guardia National Geographic Institute (IGNTG).

Note: The township RRI is defined by means of four variables: population, density, percentage of urban land and distance from each township's centroid to a populated place of at least 10,000 inhabitants. It is aggregated in the same way as the human development index (HDI) of the United Nations Development Programme (UNDP) (geometric mean of the four components, measured relative to the maximum and minimum values in Panama). The RRI ranges from 0 (totally urban townships, identified by yellow) to values higher than 0.526 (rural townships, identified by the darkest colours on this chapter's maps).

VII. Implications for public rural development policies in Panama

The Economic Commission for Latin America and the Caribbean (ECLAC) presented the new definitions and methodologies for constructing rurality indices to the National Institute of Statistics and Census, the Ministry of Social Development, the Ministry of Agricultural Development and the Ministry of Economic Affairs and Finance. Its contacts with those institutions' representatives confirmed the need to redefine what is understood by rurality in Panama, as well as the timeliness of resolving that shortcoming in the short term. The following sections summarize two specific exercises in which the alternative definitions of rurality were used to illustrate their usefulness to the agencies that design and implement public policies in Panama.

A. Cooperation with the Ministry of Social Development (MIDES)

The Government of Panama's main social policy strategy, the Colmena Plan,¹⁴ focuses on the 300 townships with the greatest lags in well-being indicators.¹⁵ Within the framework of the technical assistance project conducted by ECLAC and the International Fund for Agricultural Development (IFAD), classifications and analyses based on the concepts of the new rurality have been developed that can help strengthen the targeting of this programme and better monitor the actions carried out.

ECLAC prepared an analysis for the Technical Secretariat of the Ministry of Social Development that lays the groundwork for the socioeconomic categorization of the 300 townships targeted by the Colmena Plan, with the aim of highlighting and defining the development gaps that exist among Panama's different territories. Thus, the ECLAC/IFAD project created maps to show those gaps using the 14 indicators used by the Technical Secretariat and UNDP to calculate the multidimensional poverty index (MPI) at the district and township level, based on Panama's Population and Housing Census.

The first phase of the Colmena Plan, which has national coverage, identified the 300 townships in terms of multidimensional poverty, complemented by income measurements and other qualitative techniques.

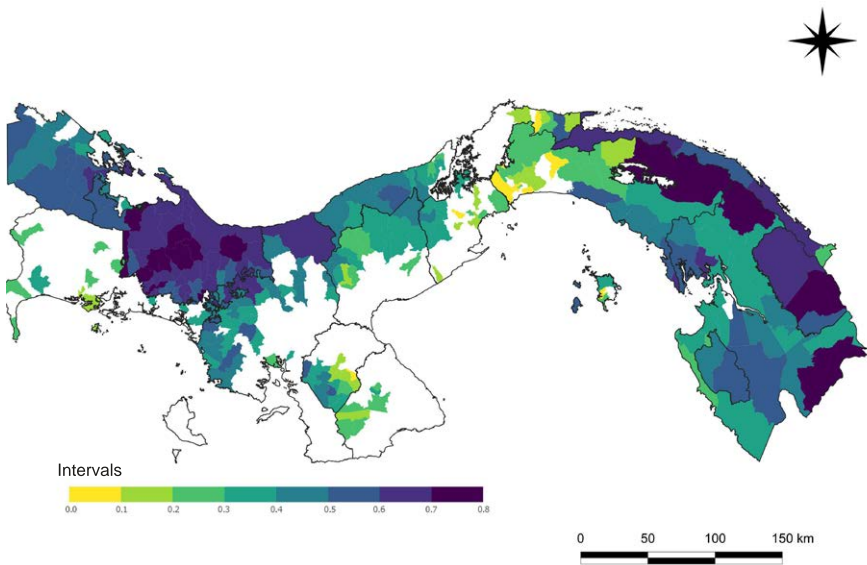
Multidimensional poverty in Panama is measured by estimating the incidence of poverty H (i.e. the percentage of the population with deprivations), the intensity of poverty A (i.e. the average number of deprivations for the deprived population) and the multidimensional poverty index (MPI), which is the adjusted incidence and is obtained by multiplying H by A : $MPI=H*A$. Map V.13 shows multidimensional poverty levels in the 300 Panamanian townships where the Colmena Plan is in force.

It can be seen that although the plan operates in the townships with the highest levels of poverty (shown in darker colours), it is also implemented in townships with relatively low average levels of multidimensional poverty (light green and yellow).

¹⁴ The Colmena Plan is a multisectoral strategy to promote territorial development processes by strengthening the State's policies and institutions in places with high levels of poverty and vulnerability and, at the same time, by structuring a series of services to satisfy fundamental human needs within the community, at the local and territorial levels. Those areas are affected by the consequences of the centralized State and by constantly changing political correlations that curtail the scope and form of participation and sociopolitical interaction (Republic of Panama, n.d.).

¹⁵ As will be seen below, however, not all of the townships covered by the Colmena Plan share those characteristics.

Map V.13
Multidimensional poverty index in Colmena Plan townships, 2010



Source: Prepared by the authors, on the basis of data from the United Nations Development Programme (UNDP) and the Social Cabinet, 2021.

Table V.11 shows the percentage of townships included in the Colmena Plan ranked, alternatively, by increasing deciles of incidence (second column), intensity (third column), the MPI as the product of those two factors (fourth column) and the RRI (last column). In all of the first three classifications, deciles 8, 9 and 10 were included almost in their entirety (shown by grey shading on table V.11). Beyond those deciles, the percentage of inclusion of townships in each decile decreases (between 48% and 53% for decile 7 of the different rankings) and lower percentages thereafter.

In terms of rurality, as measured by the relative rurality index (RRI), it can be seen that the townships with the highest levels of poverty covered by the Colmena Plan are mostly located in highly rural areas. Thus, table V.11 shows that the Colmena Plan covers 77% of the 63 most rural townships (those with the highest RRI results), 66% of the 63 townships in the second highest RRI decile, and 59% of those in the 8th decile. It should be noted that when the townships are classified by their level of rurality, even 38% of the 63 townships in the least rural decile were covered by the plan. Possible combinations of the degree of rurality (RRI) and multidimensional poverty levels (MPI) are shown on table V.12 and map V.14.

Table V.11
Percentage of townships included in the Colmena Plan, following different increasing orderings of poverty and rurality levels

Decile (each decile comprises 63 townships)	Poverty incidence deciles (H)	Poverty intensity deciles (A)	Multidimensional poverty deciles (MPI)	Rurality indicator deciles (RRI)
I	14	5	14	38
II	16	13	8	17
III	14	23	21	9
IV	10	17	8	22
V	18	21	22	28
VI	32	29	25	56
VII	49	53	48	66
VIII	95	88	98	59
IX	98	98	98	66
X	100	100	100	77

Source: Prepared by the authors, on the basis of data from the United Nations Development Programme (UNDP) and the Social Cabinet, 2021.

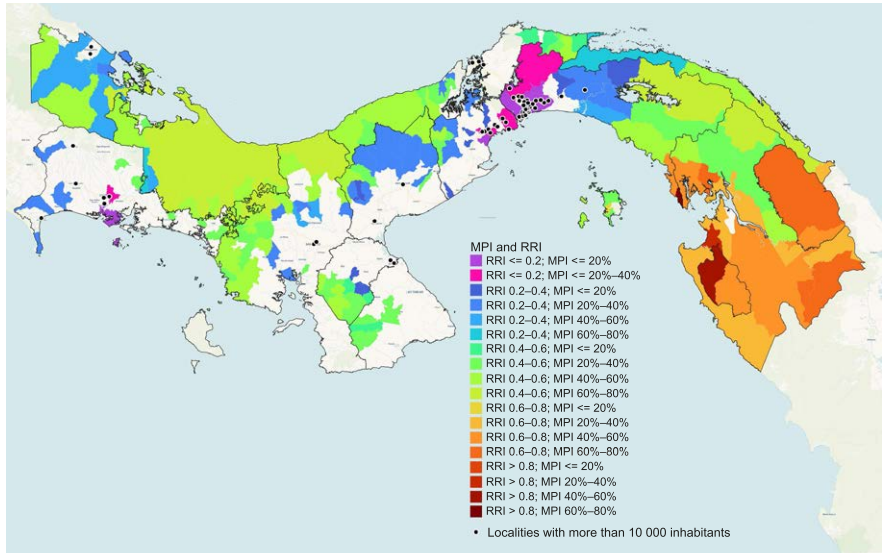
Note: The percentages indicate the participation of the townships in the Colmena Plan following, alternatively, an increasing ordering of H, A, MPI and RRI poverty levels. For example, while 14% of the 63 townships with the lowest levels of poverty incidence (H) and MPI poverty participate in the Colmena Plan, only 5% of the 63 townships with the lowest levels of poverty intensity (A) are covered. Among the highest poverty levels of the 10th decile, 100% of the townships participate in the plan, but only 77% of them belong to the highest rurality category as indicated by the RRI (last column).

Table V.12
Increasing levels of rurality (RRI) with increasing levels of multidimensional poverty (MPI)

Relative rurality index and multidimensional poverty index	
	RRI <= 0.2; MPI <= 20%
	RRI <= 0.2; MPI 20%–40%
	RRI 0.2–0.4; MPI <= 20%
	RRI 0.2–0.4; MPI 20%–40%
	RRI 0.2–0.4; MPI 40%–60%
	RRI 0.2–0.4; MPI 60%–80%
	RRI 0.4–0.6; MPI <= 20%
	RRI 0.4–0.6; MPI 20%–40%
	RRI 0.4–0.6; MPI 40%–60%
	RRI 0.4–0.6; MPI 60%–80%
	RRI 0.6–0.8; MPI <= 20%
	RRI 0.6–0.8; MPI 20%–40%
	RRI 0.6–0.8; MPI 40%–60%
	RRI 0.6–0.8; MPI 60%–80%
	RRI > 0.8; MPI <= 20%
	RRI > 0.8; MPI 20%–40%
	RRI > 0.8; MPI 40%–60%
	RRI > 0.8; MPI 60%–80%

Source: Prepared by the authors.

Map V.14
Combinations of rurality (RRI) and poverty (MPI) for Colmena Plan townships



Source: Prepared by the authors, on the basis of I. Soloaga, T. Plassot and M. Reyes, "Caracterización de los espacios rurales en México a partir de estadísticas nacionales", *Project Documents* (LC/TS.2020/130/Rev.1; LC/MEX/TS.2020/32/Rev.1), Mexico City, Economic Commission for Latin America and the Caribbean (ECLAC), 2021; and data from the United Nations Development Programme (UNDP) and the Social Cabinet, 2020.

The correlation coefficient of RRI with MPI is 0.50, so it is not surprising to see townships that combine high RRI levels with high MPI levels (shaded brown and orange), as well as others with low RRI levels and low MPI levels (violet and dark pink), high RRI levels with low MPI levels (light orange), low RRI levels with high MPI levels (light blue, map V.11) and, finally, with intermediate levels (between 20% and 60% of MPI and between 0.2 and 0.6 of RRI, shown in green and blue). Although almost all possible combinations can be found among the townships that are part of the Colmena Plan, there is a greater presence of townships with relatively high levels of rurality (RRI results above 0.4) combined with poverty levels of generally 20% and more (light green and several shades between brown and orange).

B. Cooperation with the Ministry of Agricultural Development (MIDA)

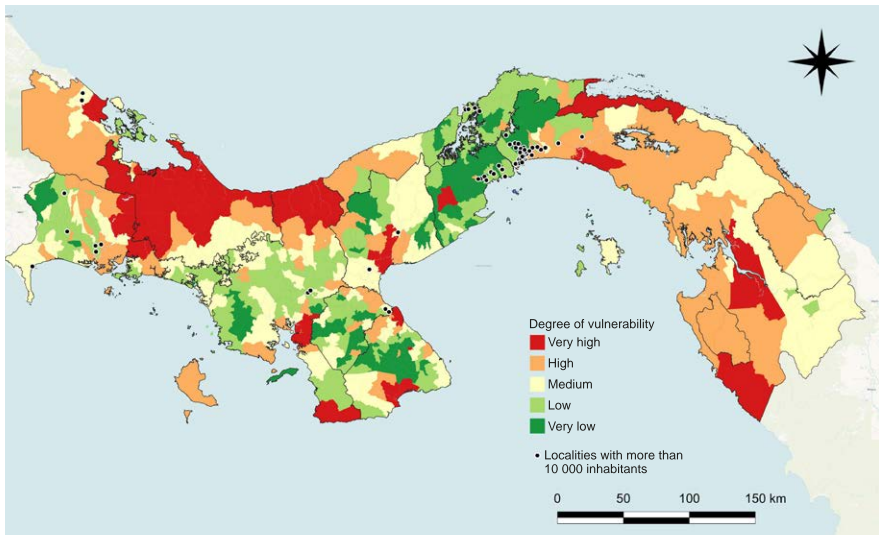
The cooperation with the Ministry of Agricultural Development focused on producing an instrument to portray the targeting of the ministry's programmes, in particular the Family Farming Policy, and which could later be used to perform specific geospatial analyses for following up on actions

from a spatial perspective. Thus, the ECLAC-coordinated project created a tool that allows the easy identification of the places where the ministry’s programmes operate, together with their correlation with other key variables for the analysis (climate vulnerability, multidimensional poverty, etc.).

Using the QGIS open access software, different maps were prepared for the georeferenced identification of the townships with the greatest climate vulnerability (map V.15), enrolment in the schools of the “Study without Hunger” programme, the presence of farming families by type of agriculture, the geographic distribution of different crops across Panama and so on.

The preparation of rurality maps is useful for various public policy purposes, especially for the allocation of public funds to support family farming, and for supporting the regions most affected by climate change and natural disasters. Putting this methodology into practice requires specific training on the construction of different rurality scenarios, with cartographic inputs and statistical analyses derived from the socioeconomic categorization of the territories. A national debate—led by the Ministry of Agricultural Development in conjunction with the National Institute of Statistics and Census— would be invaluable in developing the methodology for measuring and classifying rural areas in Panama and in advancing towards a territorial understanding of rurality, with possible applications for different public policy purposes.

Map V.15
Climate vulnerability



Source: Prepared by the authors, on the basis of information from the Ministry of Agricultural Development and the National Institute of Statistics and Census.

The ECLAC-IFAD project has already had a significant impact on the public agenda for rural development in Panama: the relative rurality index (RRI), prepared as part of the project and presented to the Panamanian authorities, was included in the Act Establishing the State Agrifood Policy and Other Provisions (Law No. 855, article 4.24).¹⁶ The act identifies as rural territories “those territories that are included in the areas defined according to the map of the Relative Rurality Index of Panama, prepared with sociodemographic and economic statistics produced by the National Institute of Statistics and Census of the Office of the Comptroller General of the Republic”.

ECLAC provided the Ministry of Agricultural Development and the National Institute of Statistics and Census with technical assistance, training their staff on the usefulness of georeferencing tools for analysing and targeting efforts, through different approaches to understanding and measuring rurality. It is hoped that its deployment in the implementation of specific public programmes will be the first step towards institutionalizing this new approach to Panamanian rural areas.

VIII. Conclusions and recommendations

This chapter posits the need to measure rurality in Panama by means of new variables that define the country’s territories according to the demographic, productive, labour and environmental changes they have undergone and that reflect the current dynamism in their activities and their continuous changes and transformations.

In pursuit of that objective, a classification of territorial units is proposed, ranging from the most rural to the most urban and based on a gradient with composite indices. This undertaking constructs continuous and multidimensional indices of relative rurality, calculated for each territorial unit based on the values of the other units. Those indices are based on combinations of variables such as population, population density, land use and migration, and, as a result, they produce gradients in socioeconomic indicators that provide a very different view from that obtained using the dichotomous rural/urban division currently employed by the National Institute of Statistics and Census. An analysis of socioeconomic variables was performed in the text for indicators covering employment, education and access to basic services.

It was shown that using a gradient of rurality leads to a more detailed portrayal of socioeconomic indicators than using the official dichotomous characterization of the rural and the urban. As an example, it was shown

¹⁶ For more information, see [online] https://www.asamblea.gob.pa/APPS/SEG_LEGIS/PDF_SEG/PDF_SEG_2020/PDF_SEG_2022/2022_P_855.pdf.

those townships where the entire population is classified as living in rural areas reported high levels of heterogeneity in terms of employment (the population dedicated to agriculture can range from 0% to 100%), in terms of schooling (the population with secondary education or more varies from 0% to almost 30%) and in terms of access to electricity (the proportion of households without access fluctuates between 0% and 100%). The levels of these variables are much narrower when the rurality gradients developed by the project are used, which provides useful information for public policies. Finally, the RRI was disaggregated into ten ranges in order to better demonstrate the usefulness of the gradient in analysing rurality.

These efforts provide arguments on the need to change the official definition of the rural and the urban in Panama, beyond the adoption of the RRI in the Act Establishing the State Agrifood Policy and Other Provisions (Law No. 855). This chapter proposes appropriate methodologies for the task based on the literature and the available official information. Although these methodologies were developed as empirical exercises and to promote new ideas and ways of measuring rurality, they are only a first step towards a policy dialogue process on the new rurality. Agreements will be needed on the dimensions to be included, the territorial units to be classified and the methods to be used to categorize the territory. As noted above, this approach is helpful for focusing public action on priority areas and for pursuing differentiated actions in various kinds of area (very rural, rural-urban, intermediate, urban and so on). This tool allows the more precise identification of those territories that are lagging behind and, therefore, provides information on where efforts should be targeted.

Although it is beyond the scope of this work to offer concrete public policy recommendations —beyond the emphasis placed on using different non-dichotomous classifications of rural areas— it should be noted that the presence of gradients of rurality around Panama's most populated localities suggests the existence of rural-urban interrelationships of varying intensities. These appear to be more urban in the Panama City area (the RRI reports a large area of minimal rurality, followed by a sizable area classified at the second level of the RRI) and more rural in the vicinity of, for example, Chitré, Pocrí or Santiago de Veraguas, in the central west of the country (which start from the RRI's second level and rapidly evolve to higher levels of rurality). With a further classification effort, these elements would be useful in defining regions in the country with a view to designing the most appropriate type of public actions, taking into account the need for different types of investments and technical support, which in turn take on board the interactions and synergies between urban and rural territories.

Because of a series of factors, Panama's rural areas, like other rural areas in Latin America and the Caribbean, are constantly losing population through migration to urban areas, although those areas also

have a rooted population with low schooling, lower physical accessibility, where women have less workforce participation than men and than women in the rest of the country, and with Indigenous populations that face great shortages and inequalities. Those populations need effective policies to help them develop their capabilities, taking into account their distinctive socioeconomic characteristics.

The alternative methodologies presented in this chapter, which offer a more exact way of measuring rural areas through indicators that show the population's evolution and transformations, are intended to be a useful tool for the authorities in charge of implementing rural development programmes and policies focused on the productive and functional diversity of the countryside. With a view to the next steps, it should be emphasized that the methodologies for measuring rurality proposed in this chapter are suggestions to be discussed and adapted to the country's needs.

The work carried out in cooperation with the Ministry of Social Development and the Ministry of Agricultural Development revealed the need to move towards new ways of understanding and measuring rural life in Panama. Using the methodology presented herein, different exercises for the country's socioeconomic and georeferenced categorization can be carried out, in pursuit of different public policy goals. Cooperation of both institutions with the National Institute of Statistics and Census, the agency in charge of providing national and territorial statistics, would be of strategic importance in providing the institutions in charge of designing and implementing rural development public policies with innovative tools.

The suggestion is therefore to establish and maintain constant relations between ministries, international organizations, the Panamanian population—especially those living in rural areas—and other stakeholders regarding the best measures for better understanding the country's territorial gaps and to collect the evidence necessary to design public policies to close those gaps. On this last point, once the best measures for Panama's rural areas have been identified, the empirical evidence must be connected through data and the development of public policies and actions, which will require cooperation and inter-institutional commitment.

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Chapter VI

Measurement and characterization of rural areas in Costa Rica based on national statistics: methodology used and main results

*Mario Samper
Marco Martínez
Hernán González
Jorge León*

Introduction

This chapter assesses the scope and limitations of the official definition of rural areas in Costa Rica and the methodology for measuring them. It also explores the usefulness of alternative methodologies, taking into account the contributions of the theory of the new rurality and the territorial approach to understanding rural areas. The aim is to work towards a redefinition of rural areas and a new way to measure and characterize those areas, with a view to analysing the implications of this for rural development public policies. The results are presented at the levels of districts and cantons or municipalities, and a socioeconomic characterization of the non-dichotomous rural classifications obtained is tested.

In addition, some elements of its application to the country's six planning regions and 29 rural territories are shared as inputs for multi-scale development planning and management processes.¹

Normal practice in Costa Rica is to define “rural” in residual terms, as the non-urban remainder of the population or country. Historically, the main cities, provincial capitals, central districts and municipal head towns were defined as urban areas, and the remaining areas and the population residing in them were classified as rural. Later, census segments with larger clusters of dwellings or other criteria such as quadrants or access to certain services were defined as urban, with the remainder classified as rural. The major changes in Costa Rica's rural areas over recent decades—including population, socioeconomic and environmental issues—demand a much-needed review of the ways they are measured and classified in order to guide public policies and investments, institutional programmes and actions in support of development initiatives in rural or rural-urban territories, from the local to the regional and national levels.

This chapter proposes the adoption of a systemic and comprehensive, multidimensional, relational and multi-scale territorial approach to measure and characterize rurality in Costa Rica. Its comprehensiveness and multidimensionality, as a complex system, involves the interweaving of socioenvironmental, socioeconomic, sociopolitical and sociocultural processes in rural territories. Its relational nature refers to the interactions between social, private and institutional actors, groups and individuals participating in territorial networks, and to governance methods involving the public sector, local governments and civil society in a broad sense. And the multi-scale approach, from the local to the regional spheres, entails different meanings, at different scales, both of rurality and of its relationship with the urban.

The construction of a general concept of territory and of the elements that differentiate rural, urban and rural-urban territorialities, in accordance with their characteristics in Costa Rica, facilitates an understanding of the contrasts, overlaps and synergies between the rural and the urban in the country, its regions and rural territories.² The definition of rurality in its own terms—through the special relationship between society and nature,

¹ This chapter selectively summarizes key elements of two previous publications (Samper, Martínez and González, 2022 and 2023), which cover the first and second phases, together with activities and outcomes of the third phase and ongoing processes during the current phase. The authors are grateful for the active collaboration at an earlier stage of the economist Milagro Saborío Rodríguez.

² This general concept of territory and the specificity of rural areas are addressed in the first work cited (Samper, Martínez and González, 2022), and the conceptual differentiation for rural, urban or rural-urban classifications in the second (Samper, Martínez and González, 2023). It is also discussed in chapter III of this book.

and through the means and ways of life directly or indirectly related to the local stock of natural resources, and not as a residual category with respect to the urban— facilitates the visibility, understanding and appraisal of the country's rurality as it currently exists.

The alternative measurement proposals developed in this chapter combine multiple criteria and facets of rurality, defined in its own terms and not as a remainder with respect to the urban. It establishes that the rural population in 2011, by districts, was close to 37% of the total, an estimate that contrasts with the 27% recorded in the official data obtained using the current methodology for measuring rural areas.

This chapter summarizes the work carried out in Costa Rica under the technical collaboration project "New narratives for rural transformation in Latin America and the Caribbean", coordinated by the Economic Commission for Latin America and the Caribbean (ECLAC), with financing from the International Fund for Agricultural Development (IFAD). As stated in the introduction to this book, the objectives of that project were: (i) to highlight territorial gaps, using the concepts of the new rurality, and to contribute to national development strategies for the pursuit of the Sustainable Development Goals (SDGs) and well-being in rural areas, (ii) to produce solid empirical evidence for the formulation of comprehensive rural development policies, and (iii) to assess the impact of a heterogeneous and dynamic definition of rurality in quantifying structural gaps and formulating public policies.

This chapter's structure follows the stages of the project. The first phase entailed studying the categorization of rurality in Costa Rica based on official statistics and, using the contributions of the theory of new rurality, developing four alternative rurality indices. The second phase involved the construction of a rural-urban gradient and categorizations at the district and municipal scales, together with the preparation of maps showing alternative rurality scenarios and the spatially differentiated socioeconomic characterization of Costa Rica based on those scenarios. The third phase focused on analysing the contributions of the alternative rurality scenarios to public policy, with concrete examples of their use in the six planning regions and 29 rural territories. The main institutional partners in Costa Rica were the National Institute of Statistics and Censuses (INEC), the Ministry of National Planning and Economic Policy (MIDEPLAN), the Ministry of Finance and the Rural Development Institute (INDER).³

³ ECLAC is currently supporting the National Institute of Statistics and Censuses in the construction of a non-dichotomous urban-rural indicator for processing and publishing the 2022 Population and Housing Census data; it is also assisting MIDEPLAN and INDER with several activities and products in response to requests from their authorities.

The first section of the chapter sets out the main changes in Costa Rican rural areas that led to talk of a new rurality, and it reflects on the need to rethink the way rurality is measured. The second section offers alternative proposals for measuring rurality in Costa Rica, with methodological tools for their design and implementation, in order to go beyond dichotomous and static approaches to rurality. The third section uses a series of maps to present the different rurality scenarios developed. The following section presents various contributions to understanding the country's socioeconomic characteristics at various geographical levels, based on the proposed new rurality scenarios. Section five summarizes the main steps in and results of the cooperation carried out with the project's institutional partners in Costa Rica. The sixth section contains some final reflections and conclusions.

I. Recent changes in Costa Rican rurality and preliminary proposals for improving its measurement methodology

A. Recent transformations in Costa Rica's rural areas

Costa Rica has experienced profound transformations in rural areas, and those changes are in alignment with the theory of new rurality. They involve the aforementioned diversification, together with important sociocultural changes in the social fabric and the emergence of distinct, changing and intertwined relationships and manifestations of the urban and the rural (see table VI.1). Thus, a new urban-rural reality has arisen, one that requires a renewed understanding and appropriate tools to measure and characterize those areas.

One important change has been the modernization and technification of agriculture and agro-industrial processing, on both small and medium scales and within large corporate or cooperative enterprises. Another has been the emergence of new occupations in rural areas, including tertiary-sector jobs, particularly in the tourism sector and others linked to territorial natural resource bases. There is also greater rural-urban interaction and daily, weekly or seasonal commuting. This, in turn, is part of the growing integration of new rural productive links in Costa Rica into national, Central American and global value chains. At the same time, the relative weight of the rural population in the country has decreased, partly because of permanent migration from the countryside to the main cities, particularly the Greater Metropolitan Area, or to secondary cities. The most recent

phase of this process can be seen in the national statistics, with the official measurement method indicating that the rural population fell from 41% of the total in 2000 to only 27% in 2011.

Table VI.1
Costa Rica: main recent transformations
in the country's rurality

Area	Type of transformation	New rurality
Development model based on the opening up of the economy	<p>New investments in export-oriented agriculture.</p> <p>Increased foreign investment in high-tech firms.</p> <p>Rising investment in the education and training of skilled workers.</p> <p>Positioning as an environmentally friendly country.</p> <p>Trade agreements and lower tariffs on certain agricultural imports.</p>	<p>Decrease in the weight of agriculture within the national economy (trending downwards from 25% of GDP in 1982 to 4.2% in 2019).^a</p> <p>Diversification of foreign trade and declining share of agriculture in Costa Rican exports.</p> <p>Worker training and employment in non-agricultural activities in rural areas.</p> <p>Diversification of agricultural output.</p> <p>Increase in medium- and large-scale corporate agriculture; reduction of very large farms (over 1000 ha).</p> <p>Smallholder farmers producing food staples with different levels of technological innovation according to their scale, access to arable land, historical accumulation of assets (mainly land) and government supports through agricultural credits, crop insurance, technical assistance, training and access to public marketing channels.</p>
Demographics	<p>Demographic transition with an initial increase in the number of people of working age and subsequent ageing of the population.</p> <p>Increased immigration, both for farm work and for sundry services and construction.</p> <p>High concentration of urban population in the Greater Metropolitan Area and of rural population in the Central Region.</p> <p>Growth of urban areas in the intermediate cities of the country's coastal and border regions, chiefly San Carlos, Liberia, San Isidro de El General, Limón and Puntarenas.</p>	<p>Decreasing weight of the rural population in the country.</p> <p>Progressive changes in the age pyramids of both urban and rural populations, resulting in a rising proportion of people aged 60 and over.</p> <p>Migration to urban areas and abroad by young rural dwellers.</p> <p>Partial substitution of the domestic workforce for major crops by foreign migrant labour.</p> <p>Progressive decline in the population growth rate.</p> <p>Gradual slowdown in the increase of national population density (61.1 per km² in 1990, 77.6 in 2000, 89.6 in 2010 and 97.9 in 2018);^b more pronounced in rural areas.</p> <p>Significant economic and demographic changes in rural areas surrounding the Greater Metropolitan Area, with greater rural-urban linkages and more frequent commuting within the Greater Metropolitan Area.</p> <p>Expanding residential and commercial use of rural land and the relocation of industrial zones, particularly with the creation of free trade zones through industrial and service parks.</p> <p>New relations between urban and rural areas, with major urban elements in the countryside and cities that are highly dependent on near rural areas.</p>

Area	Type of transformation	New rurality
Natural resources and tourism in rural areas.	Recovery of the country's forests ^c and protected wilderness areas (25% of the mainland by 2019 ^d and an increase from 2.7% to about 30% of coastal waters since 2022 ^e). Progressive growth of tourism in rural areas, parallel to the progressive increase of tourism's relative weight in national GDP up to 2019. ^f	Reassessment of the contribution to the national economy made by reforested areas and protected wilderness areas. Economic, social and cultural diversification of major rural territories with an increase in tourism in rural areas (including, among others, sun and sand tourism, agro/ecotourism, rural/community tourism, adventure tourism and wellness tourism).
Education and communication	Increased coverage of education services in all rural areas. Increased geographic reach of media and growing Internet connectivity in rural areas.	Increased access by the rural population to information and communication technologies (ICTs) and to national and international information (Internet use by 5.8% of the population in 2000, 36.5% in 2010 and 74.1% in 2018). Changes in consumption habits and cultural expressions in various rural areas.

Source: Prepared by the authors.

- ^a World Bank, "Agriculture, forestry, and fishing, value added (% of GDP): Costa Rica" [online] <https://data.worldbank.org/indicator/NV.AGR.TOTL.ZS?locations=CR> [accessed on 18 August 2020].
- ^b World Bank, "Costa Rica: country profile" [online] https://databank.worldbank.org/views/reports/reportwidget.aspx?Report_Name=CountryProfile&Id=b450fd57&tbar=y&dd=y&inf=n&zm=n&country=CRI [accessed on 18 August 2020].
- ^c According to data from the National System of Conservation Areas (SINAC) and the World Bank included in *Sexto Estado de la Región 2021: versión completa* (National Council of Rectors/PEN, 2021), forest cover fell from 50.7% to 34.9% between 1986 and 1996; it then increased to 44.7% in 2006, surpassed 50% again around 2014, and had risen to 59% by 2020.
- ^d N. Genta and others, "Políticas nacionales de desarrollo regional en Costa Rica: un análisis comparativo entre experiencias europeas y latinoamericanas", *Project Documents* (LC/TS.2022/180), Santiago, Economic Commission for Latin America and the Caribbean (ECLAC), 2022, table 103.
- ^e In December 2021, Costa Rica agreed to expand its marine protection areas to 30% of the total. See "Costa Rica amplía Parque Nacional Isla del Coco y Área Marina de Manejo del Bicentenario", 17 December 2021 [online] <https://www.presidencia.go.cr/comunicados/2021/12/costa-rica-amplia-parque-nacional-isla-del-coco-y-area-marina-de-manejo-del-bicentenario/#:~:text=La%20Isla%20del%20Coco%20y,del%20pais%20y%20del%20mundo>.
- ^f From 2012 to 2016; data from the tourism input-output matrix <https://www.bccr.fi.cr/indicadores-economicos/cuenta-sat%C3%A9lite-de-turismo> and the Central Bank Tourism Satellite Account (See K. Meneses, G. Córdova and K. Oleas, *Investigación de base: aporte del sector turístico como eje estratégico de encadenamientos productivos*, San José, State of the Nation Programme (PEN), 2019. With the outbreak of the health and economic crisis in 2020, tourist and foreign exchange inflows dropped sharply; they recovered partially in 2021 and almost completely in 2022.

B. Proposals for improving the methodology for measuring rural areas in Costa Rica

For the 2011 Population and Housing Census, the National Institute of Statistics and Censuses created a national geostatistical framework as a single, nationwide system designed to correctly cross-reference statistical information from censuses and surveys with their corresponding geographic locations. Thus, the geostatistical unit—necessary to reveal social and geographic trends in both urban and rural areas—was

defined as a geographic area demarcated according to natural physical as well as cultural features that distinguish it as unique and different.

The minimum geostatistical unit (UGM, its Spanish initials) is defined by the National Institute of Statistics and Censuses as a polygonal geographic area with physical boundaries defined by streets, footpaths, fences, streams, crop areas and other elements. The UGM is the smallest minimum unit of the statistical framework used to implement censuses and surveys.

Other methods to measure rural areas exist in Costa Rica. For example, between 2016 and 2017, the National Institute of Statistics and Censuses developed a weighted composite urbanization index (using factor analysis) to characterize districts as urban, predominantly urban, predominantly rural and rural. The indicators this index used were the urban population percentage, population density, occupied individual dwellings and the percentage of the population employed outside the primary sector (National Institute of Statistics and Censuses, 2016 and 2018).

Expressions of rurality and its relationship with the urban vary according to scale, and they should be approached flexibly with adjustable measurement and characterization methods.⁴ A multi-scale territorial approach to rurality allows the interrelationships between its local expressions to be explored and understood. The analysis of rurality at different scales requires a flexible definition, in keeping with the different degrees of complexity of rural areas.

Interactions between the urban and the rural, as well as the differentiation between urban and rural locations, vary widely according to the scale of analysis. Certain types of analysis, such as examinations of the economic functionality of territories and regions, or of the interactions between major or secondary cities and their surrounding rural areas, are only feasible at intermediate scales. A systemic and multi-scale understanding of rurality and, in a broader sense, of urban and rural territorial development, allows the integration of statistical measurements of both rural and urban areas, with their respective gradations or subcategories, as well as the categorization of territories with diverse characteristics in terms of the relative weight of both and their rural-urban interactions.

The multi-scale measurement of the current state of rurality in Costa Rica has to take into account a series of basic elements.

⁴ Relevant in this regard are various reflections, experiences and guidelines expressed at a recent Latin American meeting organized by ECLAC (Cuervo and Délano, 2019a, 2019b and 2019c). The multi-scale nature of territories and the need for a multi-scale approach to territorial development has been recognized in numerous works on the subject, but the implications of territorial multi-scalarity for the analysis of rurality and rural-urban interactions have received less attention in Latin America.

- Population issues need to be considered first: the characteristics and dynamics of the population, its density and spatial distribution, its breakdown by age and sex, settlement patterns, temporary displacements and migratory movements. The relationship between population concentration or dispersion, transport facilities and access to public services must also be addressed.
- The second issue is economic, covering production systems and value chains that require the use of natural resources; rural goods and services; markets for labour, land, credit and products; the population's employment and income; consumption and local or external marketing, and territorial competitiveness; the preponderance of certain types of family farming or corporate productive units and associative processes; the addition of value; and linkages between primary, secondary and tertiary activities.
- Third comes the environmental aspect, which relates to the transformation of the natural environment by human action, the management and use of natural resources, their conservation and sustainable management or intensive exploitation and progressive degradation, and the enduring or changing physical, geographical, edaphological and climatological conditions of the environment. Both the environmental services provided to society and the potential of the natural resource pool for sustainable territorial development are of interest.

The starting point for the construction of alternative rurality indices is the statistical or quantifiable information that is publicly available or that can be created at the desired scale. At the same time, certain fundamental aspects of rurality and its transformations can only be appreciated qualitatively and by resorting to local knowledge; it is therefore useful to combine both types of analysis, in varying proportions and creatively, and to integrate them in a convergent manner.

II. Methodology used in the alternative local measurement of rurality and local socioeconomic characterization

Based on the elements identified in the previous section, this section presents an alternative measurement method and elements for a multi-scale socioeconomic characterization of rural areas in Costa Rica. It also explains how the proposed alternative rurality indices were applied at the district and municipal (cantonal) scales, a procedure in which rurality gradients and categories were obtained.

A. Methodology and sources for the alternative measurement of rural areas in Costa Rica

Three index options —different in terms of the dimensions or issues addressed and the variables and indicators used— were designed and applied: the three-dimensional rurality index (3DRI), the functional rurality index (FRI) and the multivariate rurality index (MRI). Each of these offers different advantages for certain purposes in measuring and characterizing Costa Rica’s new rurality. Their integration into a combined rurality index (CRI) yields a comprehensive approximation of several interrelated facets of the current state of the country’s rural areas.

1. Three-dimensional rurality index (3DRI)

(a) Definition of the 3DRI proposal

This index combines three major aspects of rurality: population, pertaining to the different demographic densities and the number of inhabitants in given territorial areas; economics, as regards occupations or activities related in one way or another to the natural resource base of the territory at the corresponding scale; and the environment, linked to the conservation of natural forests and, with it, of their biodiversity (see table VI.2).⁵ The design of the three-dimensional rurality index should take account of activities related to the processing of agro-industrial and other primary goods, tourism in rural areas and other services linked to the local natural resource pool.

Table VI.2
Variables, indicators and sources of the three-dimensional rurality index

Dimensions	Main variables	Specific indicators	Source options
Population	Demographic density.	Number of inhabitants per km ² . Absolute population by canton.	Population censuses, vital statistics and population projections (National Institute of Statistics and Censuses).
Economics	Population employed in activities directly or indirectly related to the natural resource pool at the corresponding territorial scale.	Percentage of population employed in the primary sector, agribusiness or processing of primary goods, and tourism in rural areas.	Population and agricultural censuses (National Institute of Statistics and Censuses), with the option of adding other official data on employment in agribusiness and the tourism sector.

⁵ A recent study into the relationship between forest cover and biodiversity (Montero and others, 2021) highlights the importance of forest cover restoration over the last 20 years for conservation of biodiversity, primarily located in the country’s natural forests.

Dimensions	Main variables	Specific indicators	Source options
Environment	Remaining or regenerated natural forest as a proportion of the area of the corresponding territorial entity.	Percentage of natural forest cover (primary and secondary forest) within total area. Hectares of forest.	Forest cover maps, remote sensing and official geospatial repositories (National Geographic Institute (IGN), National System of Conservation Areas (SINAC), Ministry of Agriculture and Livestock), if necessary supplemented with data from the Central Bank on Costa Rica's Forestry and Environmental Accounts, and with data on payments for environmental services.

Source: Prepared by the authors.

(b) Calculation of the 3DRI for 2011

In the 3DRI, calculated using official data from the 2011 Population and Housing Census, the strictly demographic aspects—absolute population and density—are based on the results published at the district level.

The economic dimension focuses on the employed people living in the district who work in activities related to its stock of natural resources. Two groups of such activities are measured. The first covers agriculture, livestock activities, fishing, forestry, mining and agribusiness, and has been called the expanded primary sector. The second group comprises tourism activities associated with natural resources. The number of people employed in the expanded primary sector across Costa Rica in 2011 was 274,435 people, or 16.4% of the total.

For the environmental dimension, information on forests was obtained from the *Inventario forestal nacional de Costa Rica 2014–2015: resultados y caracterización de los recursos forestales* (Emanueli and others, 2015) or national forest inventory, which reports layers of mature forest, secondary forest, deciduous forest and palms. Remaining natural forest represents the lowest degree of environmental artificialization or transformation, and its preponderance in land use is one of the characteristics of deeply rural areas.

The updating of the three-dimensional index's indicators from the district population data contained in the 2011 census can be performed with the population growth projections that the National Institute of Statistics and Censuses regularly prepares; these are based on historical trends that are susceptible to change, mainly on account of migratory processes. The data for people engaged in natural resource activities can be approximated at larger scales by using other sources, but their precise determination at the district level would be performed with the next population and housing census.⁶ Forest cover can be updated by interpreting products derived from recent satellite imagery.

⁶ This would require the inclusion in the census of specific questions on activities and workplaces directly related to national and international tourism. Alternatively, locally detailed information would have to be collected from chambers of tourism or the Costa Rican Institute of Tourism.

2. Functional rurality index (FRI)

(a) Definition of the FRI proposal

This rurality index combines the labour market structure, using worker commuting as an indicator, and urban sprawl demarcated by maps based on day-time satellite imaging.

Daily commutes between places of residence and workplaces serve to differentiate rural territories in the strictest sense —self-contained in terms of labour— from others that are, to a greater or lesser degree, connected to secondary or main cities and other strictly urban workplaces. Urban sprawl is, in turn, indicative of a high degree of soil artificialization. Correlating it with labour flows allows an approximation of the interconnections and functional relations between the countryside and the city (see table VI.3).

Table VI.3
Variables, indicators and sources of the functional rurality index

Variable	Indicator	Source
Labour commuting	Percentage of the employed population that commutes from one canton to another to go from their homes to their workplaces.	Inter-cantonal labour commuting data in population censuses (2011 and 2022) (National Institute of Statistics and Censuses [online] https://inec.cr/estadisticas-fuentes/censos).
Urban sprawl	Urban area detected using maps derived from day-time satellite imaging.	For maps derived from satellite imaging: P. Wang and others, Global Human Built-up and Settlement Extent (HBASE) Dataset from Landsat, New York, NASA Socioeconomic Data and Applications Center (SEDAC), 2017 [online] https://doi.org/10.7927/H4DN434S .

Source: Prepared by the authors.

(b) Calculation of the FRI for 2011

Two groups of indicators were used to calculate the 2011 functional rurality index.

- (i) The first group measures the number of employed persons in the district who regularly travel to another canton for work reasons. Those journeys are quantified using a question in the 2011 Population and Housing Census (National Institute of Statistics and Censuses, n.d.) that identifies employed persons who travel to a canton other than the one where they live —or to several such cantons— to work.
- (ii) The other set of indicators was calculated using urban sprawl data, as done by Wang and others (2017), who processed

Landsat 7 satellite mission data with a resolution of 30 metres per cell and using 2010 as the reference year. Based on the raster cells, the area covered by polygons of urban sprawl was calculated for each district, along with the proportion of the total area represented by those polygons.⁷

3. Multivariate rurality index (MRI)

(a) Definition of the MRI proposal

The third alternative rurality index uses variables related to the conditions of access to certain public services and to the protected natural resources in the respective territorial analysis unit (TAU). The aim of this is to portray two aspects of deep rurality, rather than focusing only on its shortcomings: first, the greater distances or other difficulties involved in accessing the services in question, and second, the potential that the natural resource stock in more rural territories offers for sustainable development, including ecotourism.

The former are associated with the population's effective exercise of certain rights to access centres or networks that provide such services. Accordingly, the proposal addresses two facets of access to public services: distances to secondary schools and to clinics or hospitals, and the effective provision of electricity, drinking water and the Internet to their places of residence.

The latter relate to the legal protection of the local wild flora and fauna and the existence of certain ecosystem services.⁸ It was decided to take the extension —as a proportion of the district area— of the protected wilderness areas and the biological corridors established to interconnect them as the reference point (see table VI.4).⁹

⁷ Because of the cost of acquiring high-quality imagery for the entire country and the pre- and post-processing work required, and in consideration of normal rates of horizontal urban growth, the urban sprawl layer could be updated every ten years or, at the most, every five years.

⁸ A recent study into the impact of land use changes on biodiversity in Costa Rica (Montero and others, 2021) combined the study of land cover and landscape ecology maps with records of plant and bird species; it found that although reforestation has been partially reversed and forests host most of the biodiversity, the expansion of monoculture export crops and urban areas has fragmented and isolated the remaining natural forests. It also emphasized the importance of ecological connectivity for the conservation of the country's biodiversity.

⁹ Originally, banking services were also included, but their increasing diversity and digitization would limit their comparability over time as an indicator of rurality. A direct indicator of biodiversity would have been desirable, but the current levels of precision and completeness in the inventories and georeferencing make obtaining homogeneous and comparable local data for the entire country impossible.

Table VI.4
Variables, indicators and sources of the multivariate rurality index

Aspect	Variable	Indicator	Source
Access to education	Proximity to a rural school	Distance (kilometres) to a secondary school.	Maps and databases from the Ministry of Public Education.
Access to health	Proximity to clinics and hospitals	Distance (kilometres) from the district head town to the nearest second- or first-level health centre.	Information on national, regional and peripheral hospitals and health areas by region and canton in institutional reports and databases of the Costa Rican Social Insurance Institute. Institutional reports [online] https://repositorio.binasss.sa.cr/repositorio/handle/20.500.11764/315 .
Access to drinking water	Institutional provision of drinking water	Percentage of population covered by public water supply services.	Information from the Population and Housing Census.
Access to electricity	Institutional provision of electricity	Percentage of the population with public electricity service.	Information from the Population and Housing Census.
Access to ICTs	Internet connectivity	Percentage of the area of the TAUs with Internet services.	Internet coverage and download speed maps and data from telephone operators. See Superintendency of Telecommunications (SUTEL) [online] https://mapas.sutel.go.cr .
Protection of the natural resource pool	Coverage by conservation areas and biological corridors	Percentage of the district's area in protected wilderness areas and biological corridors.	Information on the different conservation areas. See National System of Conservation Areas (SINAC) [online] https://www.sinac.go.cr/EN-US/Pages/default.aspx .

Source: Prepared by the authors.

(b) Calculation of the MRI for 2011

The sources and methodologies for the MRI required the 2011 indicators to be divided into two groups: access to services, and conservation of the natural resource base. For the service access data, two methods were used: calculation of average distance to the place where that service is provided, and calculation of the number of people with access.

Several distance indicators to specific education and health services were calculated. For the education data, information from the Ministry of Public Education's Geographic Information System (SIGMEP), with 2021 as the reference year, was used. For health services, data were obtained from the Health Geoinformation System (SGIS), with 2020 as the reference year. It was decided to use the distance to hospitals as an indicator, as these are the health facilities to which patients are referred from primary health care units. Information on the distance to basic integrated health care teams (called EBAIS, their Spanish acronym) was also calculated. The indicator is calculated using ArcGIS Desktop's "Near" algorithm, which estimates a linear distance to the selected service provision centres.¹⁰

¹⁰ The distance is calculated in a direct line, ignoring roads and the irregularities of the terrain (geoid).

In addition, using the 2011 Population and Housing Census (National Institute of Statistics and Censuses, n.d.), indicators of access to networks providing certain services to homes were calculated, such as the number of people with access to

- a home Internet connection,
- water from an institutional source (in this case, the Costa Rican Water Supply and Sanitation Institute, municipalities and rural water supply systems)¹¹ and electricity.

For the environmental protection data, the size of the protected wilderness areas and biological corridors was calculated. The National System of Conservation Areas (SINAC) was used as the source of geographical information, with 2020 as the reference year.

4. Use of cluster analysis to obtain rurality indices

The objective of each of the aforementioned indices is to statistically combine a set of indicators in order to create an index that describes the districts' degree of rurality. Cluster analysis is used in this undertaking to create stable groups of similar districts and to generate a statistical and spatial description of them, based on the indicators that make up the rurality indices.

The optimal strategy is to conduct two cluster analyses for each index, to identify a number of stable groups of districts, and then to use that information to construct the index by means of a combined analysis, integrating the results of the cluster analyses with the data from the maps and the groups' characteristics, based on the calculation of averages for the variables of interest.

Cluster analysis is an iterative technique used to create groups comprising members that are similar to each other in terms of the indicators used to perform the analysis. This allows for a statistical and spatial description of the districts to be generated, based on the indicators that make up the rurality indices. Cluster analysis is performed by means of an iterative process, which starts with the number of groups to be formed, based on a set of indicators of interest; for example, four groups and two indicators. Initial centroids of the indicators are assigned; i.e. for group 1, values are assigned for indicator 1 and indicator 2, and the same process is repeated for the other groups.

¹¹ There is no indication of the quality or quantity of the water, so it is possible that in some cases the water may not have been treated and may be cloudy or contain sediment; moreover, its supply may be limited (a small quantity all day long) or suffer from daily or seasonal interruptions.

In the first iteration all the observations are assigned to the group to which they are most similar, as revealed by comparing the value of their indicators with the centroids. In this way, all observations are assigned to one group or another. In the next iteration, the centroids are recalculated within each group, using the indicators of the group members, and then the observations are re-assigned to the most similar groups. The process continues until the observations no longer change group between one iteration and the next.

Taking into account these characteristics of cluster analysis, two issues are taken into consideration in each analysis performed.

- (i) First, given that n groups are to be formed, six successive cluster analysis estimates are made. To determine whether or not the analysis is stable, the six different results are compared with each other; if any one of the results is different, the analysis is not stable.
- (ii) Second, for the number of groups n , tests are performed using values from 3 to 8. The process is as follows: three is used as the number of groups; six different estimations are made; and it is determined if the analysis with three groups is stable or not. This is then repeated using four as the number of groups with six repetitions, and so on until eight groups have been tested.

The next step is to perform a combined cluster analysis. For the three-dimensional index, the combination of the two clusters forms 25 groups into which the index could be divided. By combining some of these groups and through an analysis of the maps and of the groups' characteristics, based on the calculation of averages for the variables of interest, it was decided that the three-dimensional index of rurality required the creation of five groups. For the functional index, the combination of the two cluster analyses produced 12 possible groups. In addition, certain groups are combined and the results are explored through their cartographic representation and tables showing the averages of the variables of interest. This led to the creation of six groups that make up the functional rurality index. For the multivariate index, the combination of the two cluster analyses formed 16 possible groups. The results are explored by calculating the average of the variables of interest and using maps, for different ways of grouping the 16 possible clusters. These results are explored by calculating the average of the relevant variables and by use of maps, for various regroupings of the 16 possible groups. This led to the creation of five groups that make up the multivariate rurality index.

5. Proposed combined rurality index (CRI)

The characterization of the rural-urban gradient was derived from the results of applying the three alternative indices at the district scale and the construction of a combined rurality index (CRI) based on them.

Thus, using the cluster analysis procedure described above, the three indices were calculated for each district j , where $j = 1, 2, \dots, 472$. The indices are identified as follows:

- $3dri_j$ is the three-dimensional rurality index
- fri_j is the functional rurality index
- mri_j is the multivariate rurality index

The combined rurality index for each district is calculated as a simple average of the three indices as follows:

$$cri_dis_j = \frac{1}{3} (3dri_j + fri_j + mri_j)$$

To construct the combined rurality index, each index can be weighted according to the goal of the research project or public policy. In the case at hand, it was decided to use the simple average.

The combined rurality index, cri_dis_j is a continuous variable with values ranging from 1 to 5.33 that indicates a progression of rurality. The higher the index value, the greater the degree of rurality. The combined district rurality index, cri_dis_j can be used to create rurality gradient categories. To choose the ranges and name the categories, different tests are conducted with the cartographic representation of cri_dis_j , descriptive tables of the variables of interest, and contrasts with the rurality index maps and cluster analyses. The district rurality gradient is defined according to the following six categories:

- (i) **Central urban:** districts with a combined district rurality index less than or equal to 1.33.
- (ii) **Peripheral urban:** districts with a combined district rurality index greater than 1.33 and less than or equal to 2.33.
- (iii) **Urban with rural elements:** districts with a combined district rurality index greater than 2.33 and less than or equal to 3.33.
- (iv) **Rural with urban elements:** districts with a combined district rurality index greater than 3.33 and less than or equal to 4.

- (v) **Near rural:** districts with a combined district rurality index greater than 4 and less than or equal to 4.67.
- (vi) **Deep rural:** districts with a combined district rurality index greater than 4.67.

Next, for each canton, a combined cantonal rurality index is calculated, which is a simple average of the combined district rurality index (cri_dis_j) calculated with the districts belonging to the canton. The following formula is used:

$$cri_cant_c = \frac{1}{n_c} \sum_{j \in c} cri_dis_j$$

where n_c is the number of districts in canton c , and the sum is performed for the districts j that belong to the canton c .

Then, the combined cantonal rurality index (cri_cant_c) is used to create categories for the cantons' rurality gradient. The procedure is similar to that used to select the district categories. The cantonal rurality gradient is defined as follows:

- **Urban:** cantons with a combined cantonal rurality index of 2.93 or less.
- **Rural-urban:** cantons with a combined cantonal rurality index between 2.93 and 4.
- **Rural:** cantons with a combined cantonal rurality index greater than 4.

B. Methodology and sources for local socioeconomic characterization

To characterize the territorial analysis units (TAUs) -which can be districts or cantons- by different degrees and types of rurality, indicators describing certain economic and social aspects relevant to the planning and management of development processes were selected. The general aim is to develop inputs for the differentiated characterization of Costa Rican rurality and TAUs at multiple scales.

Three main criteria were established to select the socioeconomic indicators:

- (i) their thematic relevance to the issues of interest for territorial development processes, at different scales
- (ii) their availability and comparability over time and the regular or non-regular updating of the indices or indicators
- (iii) their spatial disaggregation to the scales corresponding to the TAUs (in this case, cantons) and, in particular, to the cantonal scale, since they are the local entities with autonomy of management, budgeting and government

In addition to the National Institute of Statistics and Censuses, MIDEPLAN and INDER, various ministries and autonomous institutions produce socioeconomic information. The main composite indices and other indices and indicators draw on data, particularly from the Ministries of Education; Health; Public Works and Transport; Economic Affairs, Industry and Commerce; Agriculture and Livestock; Labour and Social Security; Tourism; Finance, and Public Security. They also use information from the Costa Rican Social Insurance Institute, the Institute for Municipal Development and Consulting, the National Geographic Institute (IGN), the Costa Rican Electricity Institute, and the Costa Rican Water Supply and Sanitation Institute. In addition, remote sensing and of its cartographic products may be useful.

In characterizing the cantons in socioeconomic terms, three composite indices that focus on different, complementary aspects were selected: (i) the municipal human development index (HDIc), prepared annually by the United Nations Development Programme (UNDP) and the University of Costa Rica; (ii) the municipal social development index (SDIc), constructed by MIDEPLAN for 2013 and 2017; and (iii) the annual municipal competitiveness index (CCI), produced and periodically updated by the University of Costa Rica's School of Economics.

III. Results of applying the alternative rurality indices and statistical-spatial analysis at the district and municipal levels

This section presents the results of the alternative rurality indices for the districts, as well as the district and cantonal rurality gradients. For each of the rurality indices, the cluster analyses are shown and the results obtained are described geographically.

A. Three-dimensional rurality index (3DRI)

Table VI.5 describes the variables used to construct this index.

Table VI.5

Costa Rica: indicators of population, density, percentage of employment in the primary sector, percentage of employment in lodging and food services, area and percentage of forest, averages and standard deviation per district

Indicators	Average	Standard deviation	Minimum	Maximum
Population (<i>Number of inhabitants</i>)	9 114.0	9 601.0	273.0	71 384.0
Density (<i>Per km²</i>)	1 190.0	2 364.0	3.0	17 292.0
Percentage of employment in the expanded primary sector (<i>Percentages</i>)	28.9	22.9	1.2	87.4
Percentage of employment in the food and lodging sector (<i>Percentages</i>)	5.1	5.2	0.0	35.0
Forest cover (<i>km²</i>)	50.0	126.0	0.0	1 856.0
Percentage of forest cover (<i>Percentages</i>)	31.1	21.6	0.0	90.1
Total area (<i>km²</i>)	108.0	188.0	1.0	2 223.0

Source: Prepared by the authors.

The cluster analysis using the population size and population density indicators yielded five groups of districts (see table VI.6A). Variability within the groups of districts tends to increase in groups with higher populations and densities. In addition, there is an approximately inverse relationship between those two factors and the area of the districts. The results for population size and population density follow one pattern in the interior of the central region and another in the coastal and border regions. There is clearly a centrifugal spatial gradation of the population dimension of this index, which can be seen at different scales: from the centre of the country to its coasts and borders.

By combining employment in the expanded primary sector with area and percentage of forest cover in the cluster analysis (see table VI.6B), five groups of districts with increasing areas and proportions of forest were formed; however, only in the first and last groups is there a clear correlation with the expanded primary employment percentage. The district groups formed by the combined cluster analysis of expanded primary sector employment, forest area and percentage of forest cover by district show a contrast between a large set of districts with low expanded primary employment and very little forest, and a few large districts with high expanded primary employment and a great deal of forest. Using these two cluster analyses, 25 possible district clusters could be formed (see table VI.6C). After a descriptive exploration of the groups and their geographical location using maps, the three-dimensional rurality index is constructed with five groups (see table VI.6D).

Table VI.6
Costa Rica: three-dimensional rurality index results, 2011

A. Population and density cluster				B. Percentage of expanded primary sector employment, forest area (km ²) and percentage cluster					
n3	Centroids (averages)			n4	Centroids (averages)				
	Population	Density		Expanded primary employment percentage	Forest area (km ²)	Forest percentage			
1	49 764	4 656		11.4	3	17.4			
2	28 352	3 441		46.1	33	37.3			
3	17 038	3 196		42.3	131	54.1			
4	8 167	1 014		39.4	295	60.6			
5	2 695	211		59.7	1 109	81.1			
Totals				Total			Average		
	Districts	Population	Area (km ²)	Districts	Population	Area (km ²)	Population	Area (km ²)	Density
1	10	497 641	1 011	226	2 666 812	3 659	11 800.1	16.2	2 426.5
2	30	850 574	2 643	165	884 249	16 874	5 359.1	102.3	65.9
3	66	1 124 515	7 412	59	507 050	15 521	8 594.1	263.1	33.3
4	154	1 257 734	19 835	18	211 283	9 434	11 737.9	524.1	24.5
5	212	571 248	20 174	4	32 318	5 588	8 079.5	1 397.0	6.3

C. Combination of clusters						
n3						
n4	1	2	3	4	5	Total
1	7	23	24	87	65	226
2	2	2	11	33	117	165
3	0	4	10	19	26	59
4	1	1	0	14	2	18
5	0	0	1	1	2	4
Total	10	30	66	154	212	472

D. Three-dimensional rurality index							
District averages		Population	Density	Expanded primary employment percentage	Forest area (km ²)	Forest percentage	Area (km ²)
1	Urban clusters	23 353.4	4 817.7	4.7	1.9	14.4	12.1
2	Dense rural	6 175.4	1 262.4	14.7	3.6	18.9	18.2
3	Semi-dispersed rural	23 441.1	137.0	30.3	100.4	37.6	288.4
4	Dispersed rural	3 526.9	51.2	48.1	32.2	37.8	94.1
5	Highly dispersed rural	5 833.6	21.1	44.5	230.8	60.3	374.8
Total indicators		Districts	Population	Area (km ²)			
1	Urban clusters	74	1 728 149	892			
2	Dense rural	152	938 663	2 767			
3	Semi-dispersed rural	31	726 673	8 942			
4	Dispersed rural	150	529 041	14 112			
5	Highly dispersed rural	65	379 186	24 363			

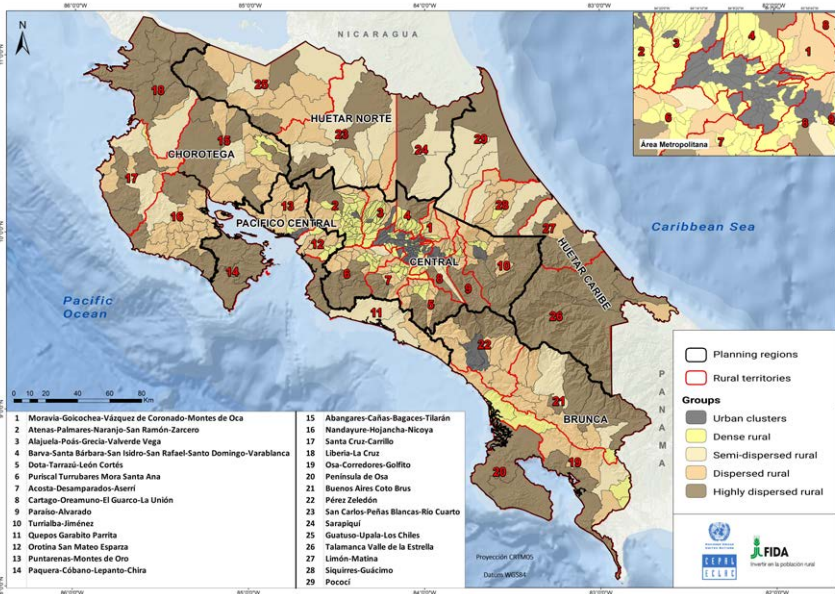
Source: Prepared by the authors.

For the five 3DRI groups, which are shown on map VI.1, the following names were chosen with the corresponding characteristics.

- **Urban clusters with highly artificialized soil:** 74 districts, densely populated, with low expanded primary sector employment and little forest.
- **Rural, densely populated, occupationally diverse and artificialized:** 152 districts, with intermediate densities, low expanded primary employment and little forest.
- **Semi-dispersed rural, partially artificialized:** 31 districts, with medium to low densities, intermediate expanded primary employment and intermediate forest cover.
- **Dispersed rural, partially artificialized:** 150 districts, with low densities, high expanded primary employment and intermediate forest cover.
- **Highly dispersed rural, low artificialization:** 65 districts, with very low densities, high expanded primary employment and a great deal of forest.

Map VI.1

Costa Rica: district groups formed by combining clusters of the population, economic and environmental variables of the three-dimensional rurality index, by districts, according to rural territories and planning regions



Source: Prepared by the authors, on the basis of geospatial data from Rural Development Institute (INDER), 2020; Ministry of National Planning and Economic Policy (MIDEPLAN), 2020; P. Emanuelli and others, *Inventario nacional forestal de Costa Rica 2014–2015: resultados y caracterización de los recursos forestales*, San José, Reducing Emissions from Deforestation and Forest Degradation in Central America and Dominican Republic (REDD/CCAD/GIZ)/National System of Conservation Areas (SINAC), 2015; and National Institute of Statistics and Censuses, *Censo de Población y Vivienda*, 2011 [online] <https://inec.cr/estadisticas-fuentes/censos/censo-2011>; data processing by M. Saborío Rodríguez, M. Martínez and M. Samper; cartographic design by M. Martínez.

A rural territory (as defined by INDER) is a geographic unit dedicated mainly to the pursuit of agricultural and non-agricultural activities. It comprises one or more cantons, or some of their districts, that have common characteristics in terms of their natural resources, forms of organization, ecology, economic, cultural, institutional, political activities and their inhabitants' forms of income generation. Rural territories are areas that predominantly depend, both economically and socially, on activities derived from the use of soils, water and forests, which translate into the economic value they produce, including employment and activities related to trade and the provision of services.

B. Functional rurality index (FRI)

Table VI.7 shows the variables used. The percentage of employed people who commute to work in another canton varies considerably; in many districts, there is practically no commuting.

Table VI.7
Costa Rica: averages and standard deviation of the percentage of the employed population of each district that commutes to another canton and of the urban sprawl area and the percentage of the district's area covered by it

Variable	Average	Standard deviation	Minimum	Maximum
Commuting percentage	29.5	19.2	1.2	75.0
Urban sprawl area	2.4	3.4	0	25.1
Urban sprawl area percentage	26.5	38.5	0	100

Source: Prepared by the authors.

The cluster analysis of the percentage of employed persons per district who regularly commute to work in another canton (table VI.8A) produced three clusters of districts: the first, with small, densely populated districts and high rates of commuting (58%); the second, with intermediate districts; and the third, with much larger districts, much lower densities and little commuting.

Using cluster analyses to study the area and percentage of urban sprawl by district (see table VI.8B) identified four groups with progressively larger districts, successively lower population densities and decreasing percentages of urban sprawl. The districts in the first group, with very high levels of urban sprawl, correspond basically to the Greater Metropolitan Area, and those in the fourth group occupy the periphery of the central region and the five coastal or border regions.

Using the two cluster analyses referred to above (see table VI.8C), the FRI was constructed with six groups, as shown on table VI.8. The district groups have the following names and main identifying features.

- **Urban high emitters:** 84 districts, with a high percentage of commuting and a high or medium percentage of urban sprawl.
- **Urban medium emitters:** 39 districts, with moderate commuting and a high or medium percentage of urban sprawl.
- **Urban low emitters:** 11 districts, with low commuting and a high or medium percentage of urban sprawl.
- **Rurban high emitters:** 26 districts, with a high percentage of commuting and a medium or low percentage of urban sprawl.
- **Rural medium emitters:** 108 districts, with medium levels of commuting and low or very low percentages of urban sprawl.
- **Rural low emitters:** 204 districts, with low commuting rates and very low percentages of urban sprawl.

The geographical distribution of these six groups reveals a marked concentration of the first two in the Greater Metropolitan Area or adjacent areas, while the urban districts with low commuting rates are located at the extremes of the Greater Metropolitan Area or are associated with secondary cities (see map VI.2). The rurban districts with substantial commuting rates are mostly located within the Central Region and relatively close to the Greater Metropolitan Area. Most of the country is covered by rural districts with self-contained workforces.

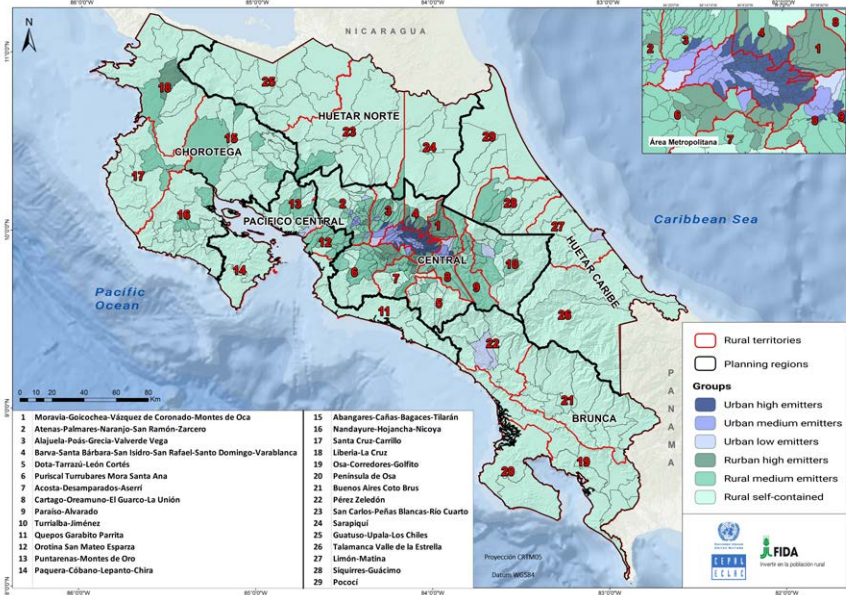
Table VI.8
Costa Rica: results of the functional rurality index, 2011

A. Percentages of commuting cluster							B. Area (km ²) and percentage of urban sprawl cluster						
v5	Centroids (averages)						n5	Centroids (averages)					
	Commuting percentage							Urban sprawl area percentage					
1	58.6						1	4.2		96.2			
2	33.0						2	5.3		58.0			
3	12.3						3	5.2		22.2			
							4	1.0		1.2			
Totals			Average				Totals			Average			
Districts	Population	Area (km ²)	Population	Area	Density		Districts	Population	Area (km ²)	Population	Area (km ²)	Density	
1	110	1 401 676	1 213	12 743	11	3 557	1	97	1 588 172	424	16 373	4	4 852
2	147	1 267 549	6 583	8 623	45	1 023	2	28	313 891	262	11 210	9	1 508
3	215	1 632 487	43 280	7 593	201	93	3	54	617 933	1 379	11 443	26	494
							4	293	1 781 716	49 010	6 081	167	76

C. Combination of clusters						D. Functional rurality index							
n5						Averages	Commuting percentage	Urban sprawl area (km ²)	Urban sprawl percentage	Population	Area (km ²)	Density	
v5	1	2	3	4	Total								
1	67	17	13	13	110	1	Urban high emitters	59.9	3.4	88.5	14 010	4	4 513
2	29	10	32	76	147	2	Urban medium emitters	36.4	6.6	85.9	17 745	8	3 287
3	1	1	9	204	215	3	Urban low emitters	15.5	10.0	34.7	22 867	47	892
Total	97	28	54	293	472	4	Rurban high emitters	54.4	2.5	13.6	8 648	33	471
						5	Rural medium emitters	31.8	1.8	7.6	5 329	58	206
						6	Rural low emitters	12.1	1.0	0.7	6 769	210	50
							Total indicators	Districts	Population	Area (km ²)			
						1	Urban high emitters	84	1 176 816	350			
						2	Urban medium emitters	39	692 054	324			
						3	Urban low emitters	11	251 538	514			
						4	Rurban high emitters	26	224 860	863			
						5	Rural medium emitters	108	575 495	6 259			
						6	Rural low emitters	204	1 380 949	42 766			

Source: Prepared by the authors.

Map VI.2
Costa Rica: district groups formed by combining clusters
of commuting and urban sprawl by district, from the functional
rurality index, according to rural territories
and planning regions, around 2011



Source: Prepared by the authors, on the basis of geospatial data from Rural Development Institute (INDER), 2020; Ministry of National Planning and Economic Policy (MIDEPLAN), 2020; P. Emanuelli and others, *Inventario nacional forestal de Costa Rica 2014–2015: resultados y caracterización de los recursos forestales*, San José, Reducing Emissions from Deforestation and Forest Degradation in Central America and Dominican Republic (REDD/CCAD/GIZ)/National System of Conservation Areas (SINAC), 2015; and National Institute of Statistics and Censuses, Censo 2011 [online] <https://inec.cr/estadisticas-fuentes/censos/censo-2011>; data processing by M. Saborío Rodríguez, M. Martínez and M. Samper; cartographic design by M. Martínez.

C. Multivariate rurality index (MRI)

The descriptive data for the variables in this index (see table VI.9) show great variance in the distances to both schools and hospitals. Lack of institutional water supply, which on average affected only 10% of the country’s population, was non-existent in some cases, while in other districts almost 90% of households suffered from it. A similar pattern can be seen with lack of electricity access. Internet access in the home around 2011 was generally very low, as in some districts connectivity was almost non-existent. Protected wilderness

areas¹² and biological corridors¹³ were absent in some districts while in others, they were of considerable size, to the point of encompassing entire districts.

Table VI.9
Costa Rica: indicators of distance to schools or hospitals,
access to services and protected wilderness areas
(Averages and standard deviation by district)

Indicators	Average	Standard deviation	Minimum	Maximum
Distance to school (metres)	3 171.2	2 266.6	61.5	12 326.6
Distance to hospital (metres)	15 381.1	12 547.0	365.7	63 631.5
Population without institutional access to water (percentages)	10.6	14.6	0.0	88.9
Population without home Internet access (percentages)	73.1	18.4	6.1	99.6
Population without access to electricity (percentages)	1.8	5.5	0.0	64.7
Protected wilderness areas (km ²)	32.7	135.5	0.0	2 196.1
Protected wilderness areas (percentages)	12.8	21.2	0.0	100.0
Length of biological corridors (km ²)	40.6	66.7	0.0	537.9
Coverage of biological corridors (percentages)	43.3	39.5	0.0	100.0

Source: Prepared by the authors.

The combined services cluster analysis yielded four groups (see table VI.10A). The group of districts with the shortest distances to hospitals and secondary schools and with the greatest access to the three services includes the Greater Metropolitan Area and its surroundings, and areas close to intermediate cities in all regions.

An analysis of the clusters combining the extent of protected wilderness areas and biological corridors by district (see table VI.10B) yields four groups of districts. The combined analysis of protected wilderness

¹² Protected wilderness areas are defined by SINAC, and include (a) forest reserves, (b) protective zones, (c) national parks, (d) biological reserves, (e) national wildlife refuges, (f) publicly owned national wildlife refuges, (g) privately owned national wildlife refuges, (h) mixed-ownership national wildlife refuges, (i) wetlands, (j) natural monuments, (k) marine reserves, and (l) marine management areas (SINAC, n.d.a).

¹³ The SINAC defines a biological corridor as a “continental, coastal-marine and insular delimited territory with the primary purpose of providing connectivity between protected wilderness areas, as well as between landscapes, ecosystems and habitats, either natural or modified and rural or urban, to ensure the maintenance of biodiversity and ecological and evolutionary processes, and which provide venues for society to come together to promote investment in the conservation and sustainable use of biodiversity in those areas” (SINAC, n.d.b).

area and biological corridor clusters shows a clear preponderance of the first group in the central region and in large areas of the other regions: mainly in the vicinity of intermediate cities, in places with relatively dense populations or in areas where forest cover is considerably less than agricultural land uses.

Using the two cluster analyses indicated above, 16 clusters of districts could be formed (see table VI.10C). After a descriptive exploration of the groups and their geographical location using maps, the MRI is constructed with five groups, which are shown on table VI.10. The groups that make up this index have the following descriptive names:

- **Group 1:** Good access to services with few natural protected areas¹⁴
- **Group 2:** Intermediate access to services with few natural protected areas
- **Group 3:** Low access to services with few natural protected areas
- **Group 4:** Extensive natural protected areas with intermediate access to services
- **Group 5:** Extensive natural protected areas with low access to services

Table VI.10D shows the defining characteristics of these groups.

¹⁴ In this document, the extension of natural protected areas indicates the combined area of protected wilderness areas and biological corridors in the corresponding territorial analysis unit.

Table VI.10
Costa Rica: results of the multivariate rurality index, 2011

A. Access to services cluster						B. Extension (km ²) of protected wilderness areas and biological corridors cluster							
Centroids (averages)						Centroids (average)							
n6	Distances (metres)		Percentage without access			cp7	Protected wilderness areas	Biological corridors					
	Schools	Hospitals	Water	Electricity	Internet				Totals	Average			
	Districts	Population	Area (km ²)	Population	Area (km ²)	Density	Districts	Population	Area	Population	Area (km ²)	Density	
1	1 771	5 358	3.0	0.4	60.6	1	8	17					
2	3 946	15 929	13.7	1.5	82.2	2	41	171					
3	4 827	27 535	19.9	3.9	87.0	3	239	39					
4	5 100	44 317	24.2	6.3	84.8	4	1 086	120					
	Totals		Average										
	Districts	Population	Area (km ²)	Population	Area (km ²)	Density	Districts	Population	Area	Population	Area (km ²)	Density	
1	223	2 935 556	7 083	13 164	32	2 438	1	382	3 544 049	19 808	9 278	52	1 464
2	126	642 734	14 151	5 101	112	104	2	67	558 957	18 201	8 343	272	31
3	83	505 970	18 576	6 096	224	46	3	18	162 183	6 458	9 010	359	30
4	40	217 452	11 266	5 436	282	29	4	5	36 523	6 609	7 305	1 322	6

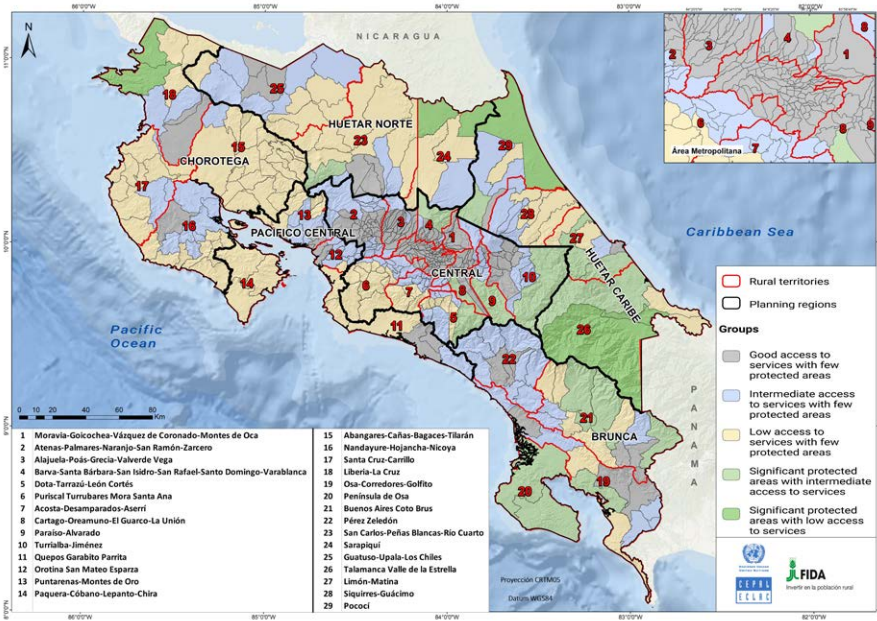
C. Combination of clusters						D. Multivariate rurality index								
cp7						Averages	Distances			Percentage without access				
n6	1	2	3	4	Total		Schools	Hospitals	Water	Electricity	Internet	Protected wilderness areas	Biological corridors	
1	211	11	1	0	223	1	High services, low natural protected areas ^a	1 766	5 360	3.0	0.3	60.6	3	14
2	98	22	6	0	126	2	Intermediate services, low natural protected areas	3 883	16 056	13.7	1.5	82.2	19	47
3	52	22	6	3	83	3	Low services, low natural protected areas	4 845	32 252	17.9	2.5	85.6	25	85
4	21	12	5	2	40	4	Medium-high services, high natural protected areas	4 883	20 953	28.4	9.9	85.1	347	61
Total	382	67	18	5	472	5	Low services, high natural protected areas	6 041	51 002	47.8	23.5	94.1	599	45
						Total indicators			Average					
						Districts	Population	Area (km ²)	Population	Area (km ²)	Density			
1	Servicios alto, APN baja					222	2 899 087	6 823	13 059	31	2 449			
2	Servicios medio, APN baja					120	593 726	12 406	4 948	103	107			
3	Servicios bajo, APN baja					107	610 193	18 780	5 703	176	44			
4	Servicios alto-medio, APN alta					16	167 817	8 012	10 489	501	30			
5	Servicios bajo, APN alta					7	30 889	5 055	4 413	722	12			

Source: Prepared by the authors.

^a Natural protected area, the area of which is the total of protected wilderness areas and biological corridors.

The geographical distribution of these groups of districts (see map VI.3) shows that the first, with good access to public services but few natural protected areas, covered the entire Greater Metropolitan Area and areas close to it in the central region, and areas related to intermediate cities in other regions of the country and also in the vicinity of two of the three main border crossings. The second group of districts, with intermediate access to services but with few protected wilderness areas, generally surrounded those of the first group. The fifth group districts, with more protected natural assets but with low access to services, included Talamanca, Tortuguero and the Santa Elena peninsula.

Map VI.3
Costa Rica: district groups formed by combining access to services and protected wilderness areas clusters from the multivariate rurality index, by district, according to rural territories and planning regions



Source: Prepared by the authors, on the basis of geospatial data from Rural Development Institute (INDER), 2020; Ministry of National Planning and Economic Policy (MIDEPLAN), 2020; P. Emanuelli and others, *Inventario nacional forestal de Costa Rica 2014–2015: resultados y caracterización de los recursos forestales*, San José, Reducing Emissions from Deforestation and Forest Degradation in Central America and Dominican Republic (REDD/CCAD/GIZ)/National System of Conservation Areas (SINAC), 2015; and National Institute of Statistics and Censuses, Censo 2011 [online] <https://inec.cr/estadisticas-fuentes/censos/censo-2011>; data processing by M. Saborio Rodríguez, M. Martínez and M. Samper; cartographic design by M. Martínez.

D. Rural-urban gradients with the CRI

1. District gradient

Table VI.11 shows the general results of the classification of Costa Rica's 472 districts into categories along the rural-urban gradient, using the combined rurality index. Using the CRI, value ranges are established to create six categories into which the districts are classified. These categories make up the district rural-urban gradient.

Table VI.11

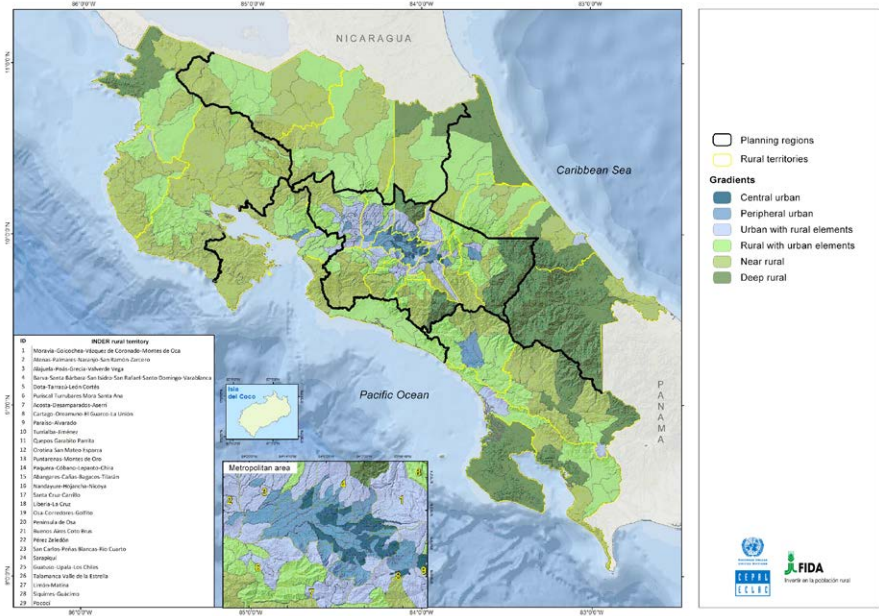
Costa Rica: classification of districts by rurality categories around 2011, and average three-dimensional, functional and multivariate rurality indices, by district rurality categories, around 2011

Rurality category	Number of districts	Totals		Averages		
		Population	Area (km ²)	Three-dimensional index (3DRI)	Functional index (FRI)	Multivariate index (MRI)
1. Central urban	41	874 970	193	1.00	1.00	1.00
2. Peripheral urban	92	1 257 560	922	1.66	1.68	1.02
3. Urban with rural elements	86	589 436	2 172	2.12	4.73	1.30
4. Rural with urban elements	138	977 099	17 380	3.62	5.62	1.97
5. Near rural	97	489 674	18 849	4.43	5.94	2.93
6. Deep rural	18	112 973	11 559	5.00	6.00	4.39

Source: Prepared by the authors.

A clear progression can be seen in the gradient, from less to more rural. It can also be seen that the 133 districts classified as central urban and peripheral urban accounted for more than half the country's population, concentrated in 2% of the national territorial area. In turn, the 115 districts classified as near rural and deep rural covered almost 60% of the national territory, but were home to only 14% of the country's population. The spatial distribution of the districts classified by the combined rurality index is shown in map VI.4.

Map VI.4
Costa Rica: district rurality gradient, by rural territory
and planning region



2. Canton gradient

The next step was to calculate the simple average of the combined rurality index of the districts comprising a canton, in order to obtain the cantonal CRI. This cantonal index establishes ranges that allow the identification of three groups that constitute the cantonal rural-urban gradient. Table VI.12 summarizes general information on the cantons in each of the categories that make up the gradient.

Table VI.12
Costa Rica: classification of cantons by rurality categories around 2011,
and average three-dimensional, functional and multivariate rurality indices,
by canton rurality categories, around 2011

Cantonal rurality category	Totals			Averages		
	Number of cantons	Population	Area (km ²)	Three-dimensional index (3DRI)	Functional index (FRI)	Multivariate index (MRI)
1. Urban	31	2 324 226	3 138	1.85	2.41	1.16
2. Rural-urban	29	1 201 770	21 934	3.49	5.42	2.00
3. Rural	21	775 716	26 005	4.26	5.89	3.00

Source: Prepared by the authors.

The urban-rural classification of Costa Rican cantons is important because they are the smallest territorial units with their own governments, they enjoy growing autonomy thanks to an ongoing process of functional and budgetary decentralization to municipal corporations, and they are represented on regional and territorial development planning bodies.

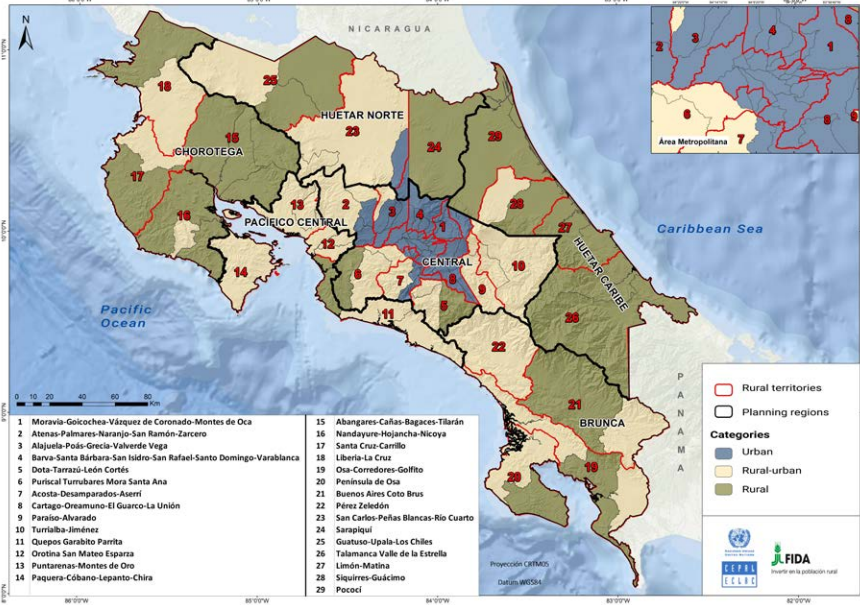
The 31 cantons classified here as urban in 2011 accounted for 56% of the country's population on a total area of just over 3,000 km² (equal to 6% of the nation's territory). In contrast, the 21 cantons categorized as rural accounted for only 18% of the population but covered slightly more than half of the country's total area. Logically, since there are only three categories, there are significant variations within each.

The geographical distribution of the cantons by category on the rural-urban gradient (see map VI.5) indicates that those classified as urban when the three alternative rurality indices are combined cover the entire middle part of the central region. As the cantons are relatively large, they are quite heterogeneous in their rural-urban composition. Cantons usually have urban head towns and, in some cases, intermediate or main cities. There is considerable variability both within and between cantons and within groups of cantons classified as rural, rural-urban or urban.

District rurality gradient maps were also prepared for each planning region and its rural territories, as well as regional maps of night-time light patterns and main road networks, with the corresponding analysis.¹⁵

¹⁵ The former in the main body text of the report prepared for MIDEPLAN and INDER, *Ruralidad e interacciones rural-urbanas en regiones de planificación y territorios rurales: aportes para su caracterización a partir de una reconceptualización y remediación de lo rural en Costa Rica*, while the latter appear in its annexes (Samper, Martínez and González, 2023). The district data, included as annexes, can be downloaded from the geoportal of the project "New narratives for rural transformation in Latin America and the Caribbean" for Costa Rica: see [online] https://geo.cepal.org/geo-fida/costa_rica/?lang=es&country=cri.

Map VI.5
Costa Rica: cantonal rurality gradient, by rural territories and planning regions



Source: Prepared by the authors, on the basis of geospatial data from Rural Development Institute (INDER), 2020; Ministry of National Planning and Economic Policy (MIDEPLAN), 2020; P. Emanuelli and others, *Inventario nacional forestal de Costa Rica 2014–2015: resultados y caracterización de los recursos forestales*, San José, Reducing Emissions from Deforestation and Forest Degradation in Central America and Dominican Republic (REDD/CCAD/GIZ)/National System of Conservation Areas (SINAC), 2015; and National Institute of Statistics and Censuses, Censo 2011 [online] <https://inec.cr/estadisticas-fuentes/censos/censo-2011>; data processing by M. Saborío Rodríguez, M. Martínez and M. Samper; cartographic design by M. Martínez.

IV. Socioeconomic indicator analysis results

This section presents the results of an initial exploration of the relationships between the clustering of cantons into different categories of rurality and a number of socioeconomic indices and indicators. To that end, an exercise focused on three main composite indices and the construction of an integrated cantonal socioeconomic index (ISIC) was carried out, with the aim of contributing to an alternative socioeconomic characterization of the country based on the different proposed rurality scenarios.

A. Contrasting three composite socioeconomic indices (2011 HDIc, 2013 SDIc and 2011 CCI) by cantonal rurality classification

As a whole (see table VI.13), rural cantons had significantly lower scores than the national average and than the other two classifications in the 2011 municipal human development index (HDIc) and the 2013 social

development index (SDIc). They also scored notably lower in the cantonal competitiveness index (CCI), which ranks them from the most to the least competitive (1 to 81).

Table VI.13
Costa Rica: average values of the three main socioeconomic indices according to cantonal rurality levels around 2011

Degrees of rurality	Average values		
	2011 HDIc	2013 SDIc	Rank in the 2011 CCI
Rural cantons	0.729	32.5	58
Rural-urban cantons	0.765	46.6	47
Urban cantons	0.834	75.1	24
National averages	0.782	53.8	41

Source: Prepared by the authors.

It should be noted that each category or degree of rurality encompasses cantons that are very different in terms of their socioeconomic development.

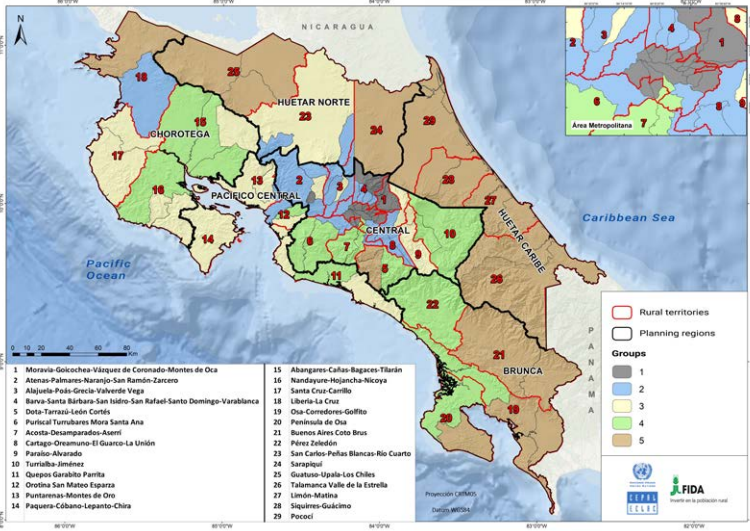
B. Integrated cantonal socioeconomic index (ISIc)

The combination of information on the positions of the country's 82 cantons between the HDIc, SDIc and CCI in the ISIc provides a synthetic measure of relative human, social and economic development in the smallest self-governing territorial units and facilitates their comparison over time. The geographical distribution of the ISIc in 2011-2013 (see map VI.6) reveals that the cantons with the lowest integrated socioeconomic indices cover the entire Caribbean coast, the border area with Panama and almost all the municipalities bordering Nicaragua. In contrast, the cantons of the Greater Metropolitan Area have very high or high ISIc scores. Around 2017-2018, there is a continuity in the general patterns of the cantons' geographical distribution by ISIc quintiles, with certain variations primarily in specific cantons along the Caribbean and Pacific coasts (see map VI.7).

Integrated socioeconomic index quintile maps were also produced and published for each planning region and its rural territories, for 2011-2013 and 2017-2018.¹⁶

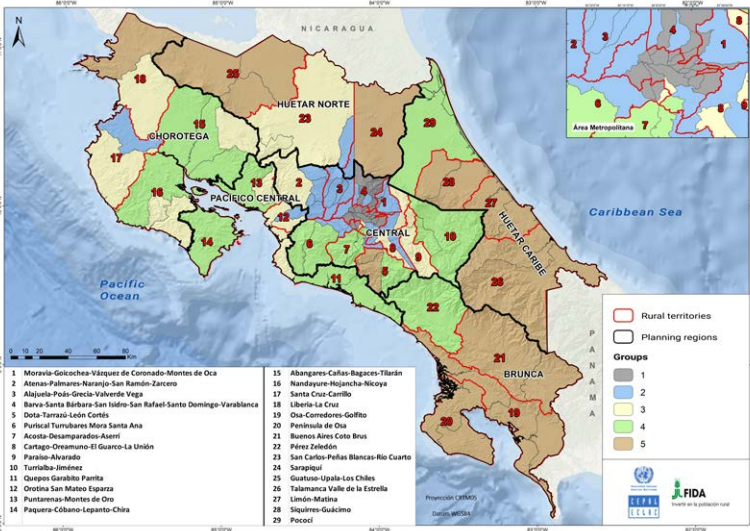
¹⁶ Those maps were included as annexes to the report prepared for MIDEPLAN and INDER, *Ruralidad e interacciones rural-urbanas en regiones de planificación y territorios rurales: aportes para su caracterización a partir de una reconceptualización y remediación de lo rural en Costa Rica* (Samper, Martínez and González, 2023). The corresponding data, also included as annexes, can be downloaded from the geoportal of the project "New narratives for rural transformation in Latin America and the Caribbean" for Costa Rica: see [online] <https://geo.cepal.org/geo-fida/costa-rica/?lang=es&country=cri>.

Map VI.6
Costa Rica: quintiles of the average of three cantonal socioeconomic indices, by rural territories and planning regions, around 2011–2013



Source: Prepared by the authors, on the basis of geospatial data from Rural Development Institute (INDER), 2020; Ministry of National Planning and Economic Policy (MIDEPLAN), 2020; and National Institute of Statistics and Censuses, Censo 2011 [online] <https://inec.cr/estadisticas-fuentes/censos/censo-2011>; data processing by M. Martínez and M. Samper; cartographic design by M. Martínez.

Map VI.7
Costa Rica: quintiles of the average of three cantonal socioeconomic indices, by rural territories and planning regions, around 2017–2018



Source: Prepared by the authors, on the basis of Rural Development Institute (INDER), 2020; Ministry of National Planning and Economic Policy (MIDEPLAN), 2020; and National Institute of Statistics and Censuses, Censo 2011 [online] <https://inec.cr/estadisticas-fuentes/censos/censo-2011>; data processing by M. Martínez and M. Samper; cartographic design by M. Martínez.

V. Implications for rural development public policy in Costa Rica

The new definitions and the methodology for constructing the rurality indices presented in this chapter were submitted by ECLAC to the National Institute of Statistics and Censuses, MIDEPLAN and INDER. The exchange of opinions and information with the representatives of those institutions corroborated the need to redefine what is understood by rural in Costa Rica and the interest in embarking on that undertaking. The following sections summarize two specific exercises in which the alternative definitions of rurality were used to inform public policy in Costa Rica.

A. Cooperation with the Ministry of National Planning and Economic Policy (MIDEPLAN)

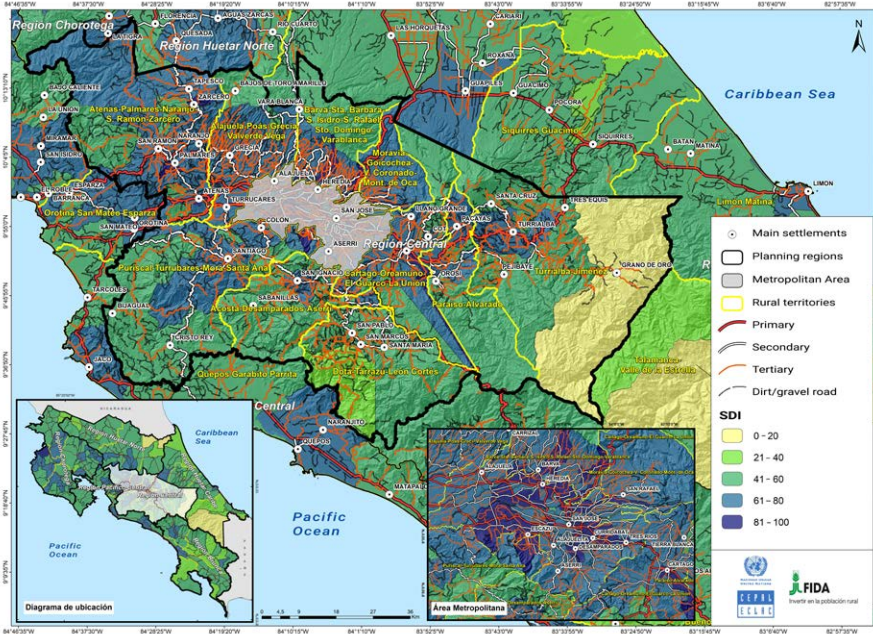
The technical collaboration between ECLAC and MIDEPLAN focused on the contribution that the new methodology for constructing of alternative rurality scenarios and different socioeconomic characterizations could make to regional development planning processes and their implications for public policies and investments.

The work programme with the MIDEPLAN Regional Planning Area focused on analysing the country's six planning regions. Based on the different rurality scenarios proposed in the first phase of the project, statistical and spatial analyses, maps and interpretative summaries were produced for the socioeconomic characterization of each planning region and its rural territories. In particular, regional maps were prepared using the district social development index (SDI), the territorial rural development index (TRDI) and the integrated socioeconomic index (ISI) at the canton level. As an example, see map VI.8.

The "New narratives for rural transformation in Latin America and the Caribbean" project has also supported MIDEPLAN by providing inputs for the design of the Regional Development Observatory, which is mandated by the Regional Development Law to provide information for diagnostics, analyses, the preparation of proposals and decision-making. Six documents with structured data sets, maps and other products and results generated by the project are also being prepared as inputs for the Regional Development Observatory: one for each of the planning regions with their rural territories, including statistical and cartographic annexes, the associated data files and explanatory texts. The capacity-building process for managing databases and thematic Geographical Information System (GIS) layers created by the project is also being monitored

to support the Regional Development Observatory’s management of georeferenced information. This includes two methodological workshops and training manuals for MIDEPLAN technical teams.

Map VI.8
Costa Rica: Central Region, social development index (SDI) by district, 2017

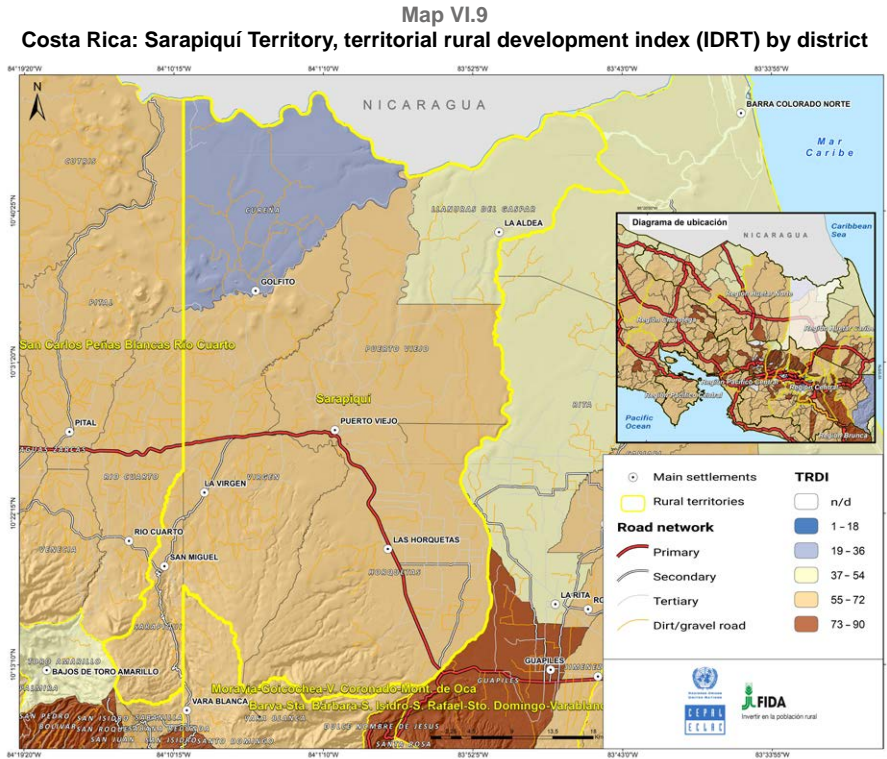


Source: Prepared by the authors, on the basis of Ministry of National Planning and Economic Policy (MIDEPLAN), *Índice de Desarrollo Social 2017*, San José, 2018; geospatial data from MIDEPLAN, 2020; Rural Development Institute (INDER), 2020; and National Institute of Statistics and Censuses, Censo 2011 [online] <https://inec.cr/estadisticas-fuentes/censos/censo-2011>; cartographic design by M. Martínez.

B. Cooperation with the Rural Development Institute (INDER)

Another ECLAC cooperation exercise with Costa Rican public agencies involved INDER and its Technical Secretariat for Rural Development (SETEDER). This second experience involved the presentation of the project’s methodological contributions for the characterization of the different rural territories defined by the Rural Development Institute. In addition to providing training on the steps needed to characterize the territories in socioeconomic terms using the different alternative rurality scenarios proposed by the project —including two methodological

workshops and training manuals on the use of GIS and georeferenced databases— ECLAC prepared a set of 29 interpretative summaries of the categorization of the rural territories, with maps and district statistics, produced in conjunction with the territorial rural development index (TRDI) and the district social development index (SDI) and explanatory texts, presenting the results in the corresponding regional contexts. As an example, see map VI.9.



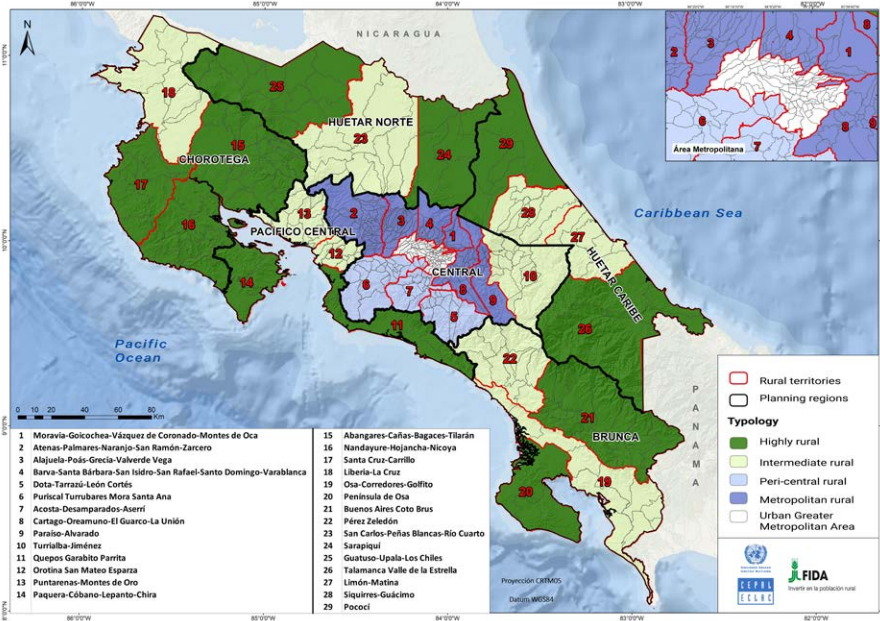
Source: Prepared by the authors, on the basis of Rural Development Institute (INDER), *Aplicación y resultados de la metodología para el cálculo del Índice de Desarrollo Rural Territorial*, San José, 2021; geospatial data from INDER, 2020 y 2021; National Institute of Statistics and Censuses, Censo 2011 [online] <https://inec.cr/estadisticas-fuentes/censos/censo-2011>; data processing by M. Martínez and M. Samper; cartographic design by M. Martínez.

The interpretative summaries for each of the rural territories were expanded with contributions from INDER regional and territorial managers and with the development plans of the corresponding Territorial Rural Development Councils (CTDRs) in order to identify challenges, opportunities and implications for public policies and development management processes in the territories. The INDER territorial advisors will use these Technical Notes on Rurality and Multi-scale Development,

supplemented by a technical guide, to provide the CTDRs with technical support. Preliminary versions are currently serving as inputs in the process of updating or preparing new territorial development plans.

In addition, through discussions with the SETEDER technical team that involved successive criticisms and validations by the Technical Secretariat, a proposal for the typological classification of the 29 rural territories was constructed, based on three main criteria: degrees of rurality, TRDI scores by territory, and location factors according to greater or lesser rural-urban proximity. The final ranking (Samper, Martínez and León, 2023) identified and classified four main types of rural territories: metropolitan, peri-central, intermediate and highly rural areas. Their geographical distribution is shown on map VI.10. This typology of Costa Rican rural territories and its interpretative summary allow the implications for public institutions to be explored and the development of each type of territory to be managed in conjunction with social stakeholders. This typological classification will enable public policies and investments to be channelled differently for groups of rural territories.

Map VI.10
Costa Rica: typology of rurality, by rural territories and planning regions



Source: Prepared by the authors, on the basis of Rural Development Institute (INDER), *Aplicación y resultados de la metodología para el cálculo del Índice de Desarrollo Rural Territorial*, San José, 2021; geospatial data from National Institute of Statistics and Censuses, Censo 2011 [online] <https://inec.cr/estadisticas-fuentes/censos/censo-2011>, and INDER, 2022, and authors' databases; cartographic design by M. Martínez.

The tools developed through the “New narratives for rural transformation in Latin America and the Caribbean” project have enabled the expansion of collaboration with INDER in areas including the incorporation, on the project’s geoportal, of a data set of special institutional interest, jointly prepared by the project and INDER at the district, cantonal and rural territory levels, with the data available for consultation and downloading on the ECLAC website. The process of capacity-building for the management of GIS databases and thematic layers created by the project also remains ongoing, to support the management of georeferenced information and the updating and deployment of the TRDI.

At the same time, an interpretative and proactive summary of recent development processes at the national, regional and territorial levels has been developed, incorporating results from the alternative conceptualization and non-dichotomous measurement of Costa Rica’s current rurality and the socioeconomic characterization of planning regions and rural territories.

One of the contributions of the project’s statistical, cartographic, interpretative and propositional results, in its relations with MIDEPLAN and INDER, is the strengthening of the multi-scale approach to development and the necessary complementarity between planning and management processes at the regional and territorial levels.

This work led to the formulation of public policy recommendations, in line with the non-dichotomous, multi-scale and dynamic method of measuring and characterizing rural areas in Costa Rica, and for specific purposes such as the preservation of natural areas, support for rural employment and the reduction of structural gaps in coverage and access to public goods and services. In addition, an inter-institutional dialogue process was carried out to strengthen public rural development strategies and decentralized institutions.

The work carried out in collaboration with MIDEPLAN and INDER highlighted the need to move towards new ways of understanding and measuring rurality in Costa Rica. Based on the different methodologies presented, the exercise showed officials from both institutions the usefulness of georeferencing tools for analyses and the targeting of efforts, through different approaches to understanding and measuring rurality. Different socioeconomic and georeferenced classification exercises can be carried out for different public policy purposes in the country. This opens up opportunities for decision-makers in the design of innovative rural development policies. The cooperation of both institutions with the National Institute of Statistics and Censuses, the body responsible for generating national, regional and local statistics, is strategically important for the agencies in charge of designing and

implementing public policies in the area of rural development. And the National Institute of Statistics and Censuses has taken the decision —of great importance for Costa Rican public institutions— to process and publish the 2022 National Population and Housing Census data in a non-dichotomous way, with support from this project.¹⁷

VI. Final thoughts and conclusions

The development and application of the three-dimensional, functional and multivariate rurality indices underscored the importance of producing alternative, non-dichotomous measurements of Costa Rican rurality. This, in turn, suggested that it would be useful to create a new index integrating those three, which would later be applied to characterize the territorial analysis units along the rural-urban gradient. The statistical and geographic analysis at the district and then cantonal levels corroborated its usefulness in generating a rural-urban gradient that could be consistently categorized at the district and cantonal scales. The subsequent process showed the ability of the proposed categories to offer explanations at one scale and the other in dealing with different types of rurality and rural-urban interactions.

The results of this alternative measurement of rurality at the district level in Costa Rica contrast with the commonly published dichotomous data on rural and urban populations. Those results indicate a greater differentiation between different degrees and types of rurality, as well as a greater proportion of the national population in the set of predominantly rural districts than in the data published on the basis of the official definition (36.7% and 27%, respectively).

At the cantonal scale, three categories could be consistently formed along the gradient: rural, urban and rural-urban. Some degree of variance exists within each of them, but as a whole the three groups of cantons present characteristics that are clearly differentiated from each other. This made it possible to compare the socioeconomic indicators and indices of these political-administrative units that have their own governments and budgets, for the year closest to the last population and housing census, and for the most recent year with available information. The selection and subsequent application of different complementary socioeconomic indices and indicators enriched the descriptive and interpretative analysis of the cantons' economic and social characteristics according to their placement on the rurality gradient.

¹⁷ This component of the project in its current phase is led by Dr. Arodys Robles, a demographer from the Central American Population Centre, with active support from geographer Marco Martínez and collaboration from other members of the team.

Rural lags with respect to average urban socioeconomic indicators and indices are significant and persistent, and clear inverse correlations can be observed along the rural-urban gradient. These are sharper and more consistent between territorial units at both ends of the gradient, while in intermediate ranges, some socioeconomic variability can be seen between districts or cantons with the same degree of rurality; this underscores the importance of also considering the types of rurality, location factors and, in particular, distances to and linkages with major or intermediate cities. Also apparent is the need to differentiate between strictly rural areas and rural-urban areas, and also within rural areas in general: between deep rural, near rural and rural districts with urban elements.

The redefinition of Costa Rica's rurality on its own terms, based on its current characteristics and not as a mere remainder with respect to the urban, makes it possible to focus and territorialize public policies, institutional programmes and investments of technical or financial resources to support development initiatives in light of the very diverse realities, requirements and potential of the different territorial analysis units. The reconceptualization of rurality and its relationship with urban areas, as well as of rural, urban and rural-urban territories, is necessary and relevant for the design and implementation of differentiated and complementary public policies. These concern both rural and urban development and the development of regions or subregions in which major, intermediate or small cities interact with the rural areas that are functionally related to them.

A systemic, comprehensive, territorial and multi-scale approach to the socioeconomic categorization of rural areas and rural-urban interactions —both within them and in their relations to central urban areas— is needed. Its results will contribute to the revision of national regionalization and territorial development planning, at different scales, and in particular to the convergence between national and regional strategies or plans and initiatives arising from local territories with different degrees and types of rurality.

Methodological contributions in the framework of the “New narratives for rural transformation in Latin America and the Caribbean” project were made available to Costa Rican public institutions. Those contributions can be applied for different public policy purposes, and can also enhance inter-institutional interactions in pursuit of rural, territorial and regional development planning in Costa Rica.

As stated by the Urban-Rural Working Group of the National Institute of Statistics and Censuses, and consistent with the conceptual and methodological approach of this project, a classification of the different types of rural areas and their population, now based on minimum geostatistical units, is currently being carried out with the support of this project after

the 2022 Population and Housing Census. This entails a more comprehensive paradigm and a more geographic approach that will allow comparisons to be made in different places, districts, cantons, territories or regions and at different historical moments.

The work carried out under the “New narratives for rural transformation in Latin America and the Caribbean” project offers inputs for MIDEPLAN, INDER and other public entities involved with regional or territorial development, to assist them in the design and implementation of differentiated public policies and investments that focus on the requirements and potential of the regions or territories. Similarly, the methodologies and knowledge developed here will provide guidance to subnational coordination bodies such as the recently created Regional Development Agencies (AREDEs) and Territorial Rural Development Councils (CTDRs) in preparing or updating subnational development plans. These data and knowledge generated are made available to public agencies, public-private entities and territorial management organizations.¹⁸

The rural-urban paradigm must be reconstructed, with community participation, through horizontal interactions, understanding and incorporating the social actors’ vision of rurality based on their daily interactions in the territory, who through their personal, collective and historical experiences, generate a unique kind of perception and sense of belonging that will support and complement the new concept.

¹⁸ The main publications and databases can be downloaded from the project page for Costa Rica on the ECLAC website: see [online] <https://www.cepal.org/es/fida-nuevas-narrativas/costa-rica>. High-resolution map images, as well as statistical tables and other digital files are available for public institutions and researchers, and will be uploaded to institutional websites. Information organized by region may be consulted at the MIDEPLAN Regional Development Observatory, and information on specific rural territories will be provided to INDER. GIS thematic layers will also be made accessible through a University of Costa Rica geoviewer linked to the National Territorial Information System (SNIT).

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Chapter VII

Categorization of rural areas in El Salvador based on national statistics: implications for a new public agenda for rural development policies

*César Sánchez
Andrew Roberts Cummings
David López
Astrid González
Marielos García
Celeste Molina*

Introduction

In recent decades, rural areas in El Salvador have undergone far-reaching transformations. Those changes include, in particular, a diversification of production and the ageing and feminization of the population. First, they have taken place against a backdrop of persistent marginalization among the rural population, accompanied by the presence of socioeconomic gaps. Second, these transformations have fuelled the emergence of new narratives and frameworks for interpretation, vis-à-vis both the lifestyles and socioeconomic situation of rural inhabitants and their implications for public policy.

This chapter summarizes the work carried out in El Salvador under the “New narratives for rural transformation in Latin America and the Caribbean” technical collaboration project, coordinated by the Economic Commission for Latin America and the Caribbean (ECLAC) with financing from the International Fund for Agricultural Development (IFAD). As noted in this book’s introduction, the project’s objectives were the following: (i) to highlight territorial gaps using the concepts of the new rurality, and to contribute to national development strategies in pursuit of the Sustainable Development Goals (SDGs) and general well-being in rural areas, (ii) to produce solid empirical evidence for the formulation of comprehensive rural development policies, and (iii) to assess the impact of a heterogeneous and dynamic definition of rurality on quantifying structural gaps and formulating public policies.

This chapter’s structure follows the stages of the project. The first phase involved studying how the official statistics define rurality in El Salvador and developing three alternative indices of rurality based on the theory of the new rurality. In the second phase, maps were prepared to portray the socioeconomic categorization of El Salvador under those alternative rurality scenarios. Finally, the third phase focused on analysing the contributions to public policy that the different rurality scenarios could make.

Interactions with Salvadoran public agencies took place at all stages of the project, in order to seek feedback on the exercises carried out and to disseminate the results and their possible impact on the public agenda. The venues provided by the San Salvador Metropolitan Area Planning Office (OPAMSS), the Ministry of Economic Affairs (MINEC), the General Directorate of Statistics and Censuses (DIGESTYC) and the Central Reserve Bank (BCR) played a key role in the project’s execution. The research work carried out was based on official statistics, as well as on documents and reports from different institutions and entities.

Efforts to typify and categorize rural areas in Latin America and the Caribbean have given rise to a variety of alternative methodologies that take other criteria into account in addition to demographics: distances between rural areas and urban centres, the provision of public services, political and administrative structures and prevailing land uses and functions, as can be seen in this book’s previous chapters. The territorial approach has proven its relevance for understanding rural transformations, in that it recognizes the sectoral diversity of the rural economy, values the interdependence and interaction of rural-urban spaces, strengthens dialogue between development strategies and contributes to the construction of a dynamic that promotes territorial development (see chapter III of this book).

The first section of this chapter analyses the concept of rural territory as understood in El Salvador. It categorizes and identifies the strengths and weaknesses of the definitions of rural and urban areas that are used in the Government of El Salvador's main official statistical instruments. In the second section, the official definition of urban and rural populations is applied to the territory of the country's 262 municipalities, which is followed by an attempt to categorize all its rural municipalities.

The third section reviews the elements of the regional debate that are of particular relevance in El Salvador. The aim is to propose alternative definitions that go beyond the merely dichotomous, based on three scenarios intended to allow gradual progress towards more complex conceptualizations of the territorial reality while maintaining comparability with current statistics. The fourth section summarizes the proposed methodology for defining functional territories, conceptualized as clusters of functionally integrated municipalities, as well as the criteria adopted for their definition. The fifth and sixth sections present the main results of the measurements —at the municipal and functional territory levels— yielded by each of the scenarios. Section seven explores the public policy implications of the new methodological proposal and, finally, the chapter closes with a series of conclusions and recommendations.

I. Definition of rurality in El Salvador

This section examines how the Government of El Salvador defines and measures rural areas for their socioeconomic categorization. The definitions used in various national statistical tools developed by DIGESTYC and other ministries and autonomous institutions in a continuous way with sectoral remits are identified below. One noteworthy effort to produce a typology of municipalities is also described.

In the 2007 Population and Housing Census, DIGESTYC defines an urban area of residence as "the area comprised by the population centres that surround, in a continuous way, the municipal offices, which is known as the urban centre of the municipality". Also deemed urban are those housing clusters that, despite their remoteness from the municipality's urban centre, have a population density equal to or greater than 1,000 inhabitants per square kilometre and that have a minimum of "500 dwellings continuously grouped together forming blocks" (DIGESTYC, 2009, p. XIV).

In the results of that census, the following settlements were added to the definition of urban residence areas: "those that meet the following characteristics: a minimum of 500 dwellings continuously grouped together, which have street lighting, a school for basic education, regular

transport services, paved or cobblestone streets and a public telephone service” (DIGESTYC, 2008, p. 15). This definition of the urban therefore combines several types of inclusion criteria: a historical consideration of the area known as the urban centre around the building where the municipal offices are located, a determination based on population density, a minimum number of spatially clustered dwellings and other indicators of access to basic public services for human development.

In turn, rural areas are defined as “the remaining area after urban areas are classified. Additionally, a municipality with a rural population of 5% or less is considered totally urban. Rurality covers the rest of the municipality, made up of cantons and hamlets” (DIGESTYC, 2009, p. XIV). Thus, rural areas are defined as the remnant, differentiated from the urban.

According to DIGESTYC, based on the cartography of the 2007 Population and Housing Census, work has been under way on “a cartographic framework adjusted to the needs of the household surveys, which requires adjusting the size of the segments depending on whether they are urban or rural. For sampling dwellings in rural areas, the segments are adjusted to a size of 50 to 70 dwellings, compared to between 120 and 150 dwellings for urban areas” (DIGESTYC, 2019).

The urban area is made up of a grouping of census segments resulting from the application of the following criteria (DIGESTYC, 2019, pp. 493–494).

- The census segment where the municipal offices are located; i.e. the urban centre origin (OCU) segment.
- The cluster of segments that meet the characteristics of population centres (NP), housing centres (NH) or conglomerate housing in blocks (CVM) that adjoin or enclose the urban centre origin segment.
- Two or more segments that meet the characteristics of a population centre (NP), housing centre (NH) or because they contain dwellings grouped in blocks (CVM) that are adjacent to each other and that total 500 continuously grouped dwellings or more.
- Segments classified as NPs, NHs or CVMs that adjoin the urban area of another municipality.
- Segments that do not meet any of the criteria, but are completely contained within a defined urban area.
- The rural area of a municipality is the area comprising the set of segments other than those classified as urban areas.

Applying the above criteria, a municipality with a rural population of 5% or less is classified as totally urban, which means that the municipalities of the San Salvador metropolitan area are considered totally urban, rendering the more rural peripheral or peri-urban areas invisible.

In addition to the official statistics produced by DIGESTYC, other government entities have made significant efforts to generate statistics on El Salvador's territorial reality. Of particular importance —on account of the progress made in the definition of rural and urban areas and in the adoption of a statistical approach— are the actions taken to map multidimensional and income poverty, as well as to identify individuals and households for the design, targeting and subsequent evaluation of programmes of the emerging Universal Social Protection System of El Salvador.

The *Map of urban poverty and social exclusion* (Ministry of Economic Affairs/FLACSO/UNDP, 2010) represents a significant step forward in the precise delimitation of territories on the submunicipal scale, with a designation of “precarious urban settlements” and a description of the living conditions of the families that inhabit them. Of particular relevance is the rigorous way in which urban areas in general are defined conceptually and operationally and how this particular type of settlement is differentiated and spatially delimited. The definition of urban and its delimitation with respect to rural areas is done at the level of census segments to define a municipality's urban and rural areas.¹

An effort was also undertaken to quantify multidimensional poverty in El Salvador based on a modification of the 2014 Multipurpose Household Survey. The results of this analysis reveal wide disparities in deprivation between rural and urban areas and demonstrate that multidimensional poverty is not experienced in the same way in these two types of areas. Unlike other planning and targeting instruments for poverty policies designed in previous years in El Salvador, in the measurement of multidimensional poverty (and well-being) “the thresholds established to determine the existence of deprivation do not distinguish between urban and rural households. This is an important qualitative leap in measuring poverty because it acknowledges that there should be no discrimination in standards of living associated with supposedly universal rights” (SETEPLAN/DIGESTYC, 2015, p. 34). In this sense, it also reinforces the argument for eliminating the current distortions in the measurement of income poverty. These efforts allow progress to be made towards a dynamic and non-dichotomous conception of rurality in El Salvador.

¹ “The census segment represents the basic statistical unit established as a census area, comprising a geographical area made up of one or more blocks or other scattered areas, and which meets the criterion of containing a specific number of dwellings” (Ministry of Economic Affairs/FLACSO/UNDP, 2010, p. 134).

The typology of municipalities in El Salvador produced in 2007 delimits urban and rural areas with a more robust classification that reflects the real continuum of diversity existing among the country's territories. Carried out by the Dr. Guillermo Manuel Ungo Foundation (FUNDAUNGO) in collaboration with GTZ (since renamed Deutsche Gesellschaft für Internationale Zusammenarbeit, GIZ), its rigorous approach offers lessons that are directly relevant to the work at hand. Five structural variables associated with the development of a municipality were used in its construction: the municipality's population, its degree of urbanization, its unsatisfied basic needs index (UBNI), the number of value added tax (VAT) payers per 10,000 inhabitants in the municipality and a variable through which formal economic activity can be measured as a proxy for the economic dimension.²

This study used the statistical information available up to 2007 to examine the prevailing socioeconomic and population data of the municipalities, but it had the limitation of requiring new census data for it to be repeated in exactly the same form (FUNDAUNGO, 2009). One aspect of particular importance for the present research was the use of a 2007 urban population percentage indicator to determine the urban or rural nature of the municipality. That indicator was used to classify the country's 262 municipalities into five categories according to the percentage of urban population in each of the municipalities (FUNDAUNGO, 2009, p. 9):

- (i) Rural, with less than 19.99% urban population.
- (ii) Semi-rural, with urban population rates of between 20% and 39.99%.
- (iii) Urban/rural, with urban populations of between 40% and 59.99%.
- (iv) Urban, with populations that are between 60% and 79.99% urban.
- (v) Predominantly urban, where the urban population represents more than 80% of the total.

This typology of municipalities offers a possible way to categorize them by the relative percentages of the population classified *a priori* as urban or rural. The relationship between urban and rural population is important for differentiating between the five types of municipalities; it does not, however, challenge the conceptualization of urban and rural as dichotomous categories. The definition of rural used in El Salvador does not take into account territorial dynamics and interactions or the heterogeneous character of rural areas. The current definition should

² The Ministry of Finance maintains a register of individuals and legal entities that are registered for VAT in El Salvador.

consider other criteria: access to certain services, for example, or the construction materials used in most homes. Moreover, the lack of a standard definition of rural areas among different government institutions represents a problem.

The official definition proposed by DIGESTYC, which serves as a model for other definitions used to analyse and design development strategies, has strengths and weaknesses in statistical terms and for the design, implementation and evaluation of public policies, and these are highlighted below. Table VII.1 offers an analytical summary of the main scope and limitations identified through a review of the different approaches to rurality used in national statistical instruments.

Table VII.1
Scope and limitations of the current instruments for defining rurality

Scope	Limitations
<p>The cartographic base of the 2007 Population and Housing Census and subsequent economic censuses and directories created a large georeferenced database for the delimitation and classification of rural territories at the submunicipal scale.</p> <p>Cooperation between the Technical and Planning Secretariat of the Office of the President (SETEPLAN) and the Ministry of Health (MINSAL) produced a mechanism for regular collections of information on households, which serves as the basis for the quantification of 21 multidimensional well-being indicators. Although data are not collected nationwide, nor in all the country's territories, nor do they cover the entire population of the included territories, this is an important step forward in overcoming the limitations of the periodicity of census statistics.</p> <p>By extending the Multipurpose Household Survey to measure, on the one hand, income poverty and the human development index (HDI) —among others— at the municipal level and, on the other, to record multidimensional poverty, albeit only at the departmental level, this key statistical instrument could be strengthened to cover intercensal periods.</p> <p>The statistical methodologies for determining clusters of municipalities or submunicipal territorial areas (such as those used in the two exercises carried out to create poverty maps, as well as the two carried out to delimit functionally integrated territories, measured through commuting data and night-time luminosity) represent a major step forward for analyses. When consolidated, this progress would be useful in overcoming the limitations of the political-administrative, municipal and departmental configuration, which at present does not accurately reflect the real territorial configurations of the diversity of rural areas in their relationships with urban areas.</p>	<p>The cartography of the General Directorate of Statistics and Censuses (DIGESTYC) has not been thoroughly updated since its release in 2007 and is therefore outdated. This poses severe limitations for the delimitation and classification of rural territories based on current definitions of population and housing density.</p> <p>The only statistics that are collected across the country on a regular and systematic basis at the municipal or smaller scale are the outdated censuses, which makes it structurally difficult to secure the information needed to classify the diversity of rural territories correctly and with up-to-date figures.</p> <p>Statistics on economic activities —both agricultural and non-agricultural— do not comprehensively portray the national economy with the necessary regularity and completeness. They are limited by the differences between the instruments used to measure the agricultural and non-agricultural sectors based on the currently outdated censuses, and by the lack of territorial representativeness at the municipal or submunicipal level of the data from the surveys conducted.</p> <p>The diversity of rural territories cannot be adequately represented through the current national statistical instruments because of the dichotomous approach to the urban and the rural, based solely on the measurement of demographic indicators. The outdated, fragmented and poorly territorialized nature of the existing instruments is a factor that prevents adequate representation.</p>

Source: Prepared by the authors.

II. Classification of rurality in El Salvador based on the current definition

This section presents a summary of the socioeconomic categorization of the municipalities defined as rural and urban by DIGESTYC.

DIGESTYC differentiates urban households from rural households. This information can be extracted for each of the 262 municipalities and, from it, the proportion of urban households in each municipality can be deduced. This statistic reflects the institution's criteria for defining a household as rural or urban. In keeping with the purposes of this study regarding the weight of urban households in a municipality's total household numbers, it was decided that the most appropriate threshold for defining municipalities as urban was an urban household rate of 70%. That decision was based on two arguments: (1) the characteristics of the particular distribution of this variable by means of its histogram, and (2) the 70% threshold allows the clear representation of the large San Salvador metropolitan area on the map.

Although there is no official classification of rural and urban territories, these criteria can be used to estimate that the country has 230 rural and 32 urban municipalities. The profiles of these two large zones are analysed below, emphasizing the characteristics of Salvadoran rurality.

Table VII.2
Population characteristics of rural and urban municipalities
in El Salvador, several years

	Total population (millions of inhabitants)	Land area (km ²)	Number of departmental capitals	Population density 1992 (inhab./km ²)	Population density 2007 (inhab./km ²)	Population density 2015 (inhab./km ²)
Rural	3 439 093	18 929.0	11	249.7	289.2	317.9
Urban	2 305 020	2 147.5	3	1 557.8	1 723.6	1 929.6
Total or national average	5 744 113	21 076.5	14	419.5	475.4	527.1

Source: Prepared by the authors, on the basis of data from the General Directorate of Statistics and Censuses (DIGESTYC), 2007 Population and Housing Census.

As an example of the categorization of rural areas, information on activity types and business sizes in rural and urban areas can be analysed by means of the Herfindahl index. This index usually measures concentration, but this has been modified for convenience in this application, so that a value of 0% indicates maximum concentration and 100% indicates maximum equality. Thus, a degree of equality in the presence of business activities at the national level for rural and urban areas can be seen (results of 57.0% and 60.0%, respectively), with a prevalence of microenterprises in the two regions (2.1% and 6.7% in rural and urban areas, respectively).

Table VII.3
Concentration of firms in rural and urban areas
by activity and size, modified Herfindahl index

	Herfindahl index by activity	Herfindahl index by size
Rural	57.0%	2.1%
Urban	60.0%	6.7%
Total	57.4%	2.7%

Source: Prepared by the authors, on the basis of General Directorate of Statistics and Censuses (DIGESTYC), *Directorio de unidades económicas 2011–2012*, Delgado, 2012.

This study considers light patterns as a proxy variable for population and economic activity, as indicated by information on illumination provided by night-time satellite photography. Regarding the situation in terms of light intensity in rural areas compared to urban areas, table VII.4 shows that of the nearly 33,000 pixels that make up the country, 30,000 correspond to rural areas and only 3,000 to urban areas. El Salvador's territory has a range of luminosity from 1 to 63 scales, with an average of around level 5.³ Only 31% of rural areas exceed an average of level 5, while 88% of urban areas surpass that threshold.

A threshold of 10 light scales has been established for this study, because it portrays the large metropolitan area more clearly. Applying that threshold, only 9% of the rural area's territory has that level of light or more, while the urban area has 63% of its territory with that light level.

Table VII.4
Amount of light and average percentage of territory covered,
rural and urban regions of El Salvador, 2005

	Pixels	Light scale 5	Light scale 10
Rural	29 472	30.9%	9%
Urban	3 456	88.3%	63%
Total	32 928	38.4%	16%
Rural/urban (times)	8.5	0.4	0.1

Source: Prepared by the authors, on the basis of General Directorate of Statistics and Censuses (DIGESTYC), National Center of Records (CNR) and National Oceanic and Atmospheric Administration (NOAA).

³ The intensity of night-time illumination indicates densely populated urban areas or places with high levels of economic activity (free trade zones, ports, airports and so on). Satellite photographs of night-time illumination are raster format images where each pixel has a digital number (DN) value ranging from 0 to 63, which is a positive integer assigned to the response of a sensor to the signal strength received. The number 0 indicates the lowest luminosity level, while 63 is the highest. The selection of the night-time illumination threshold adopted required preprocessing with a geographical information system (GIS) by means of the following steps: (i) reprojecting the satellite image from the WGS84 universal system to the NAD27 local Lambert conformal conic projection and obtaining the pixel resolution, which is 1.4 x 1.4 km for the selected year, (ii) delimiting the pixels at the national level, (iii) converting the raster image to point vector geometry with its corresponding DNs, (iv) converting the raster image to a grid with polygon geometry, and (v) a spatial join of the grid with the DN values of the point geometry (Aguilar, 2018).

Rural areas have lower luminosity levels than the cities. This is because of lower population density in rural areas, lower levels of soil artificialization and a greater dispersion of economic activity and human occupation. In comparison, urban areas are characterized by higher population densities and a higher concentration of economic activity, as well as by better access to public goods and services such as electricity and street lighting. The rural light intensity is one tenth that of the urban area.

III. Towards a new definition of rurality in El Salvador

This section sets out a proposal for redefining rurality in El Salvador, based on three alternative scenarios. In order to construct the three alternative definitions of the rural in contrast to the urban, the territory was adopted as the unit of analysis: i.e. the unit of land area where the real continuum between rural and urban is drawn, at the level of municipalities and functionally integrated territories. This clarification is important because, as already noted, the official dichotomous definition of urban and rural in El Salvador does not refer to territories, but to the population and households living in (submunicipal) census segments classified as either urban or rural.

In delimiting different types of rural and urban territories, the territorial scale must be taken into account. Although the first part of the analysis is conducted at the municipal level because of the limited data available, the aim is to extend the scope of the analysis to the definition and categorization of new groupings at the level of functional territories (FTs).

A. Scenario 1

The first scenario involves the definition of new territorial typologies that include the population density and night-time luminosity dimensions, with respect to both municipalities and functional territories determined on the basis of the dynamics of worker commuting and the linking of municipal territories by corridors of night-time illumination. This approach reveals localized dynamics of conurbation and economic activity corridors, given that those phenomena generate luminosity.

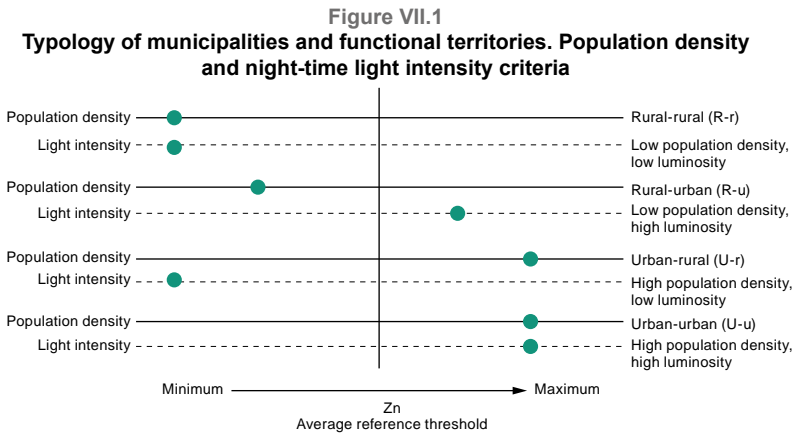
Based on population density, the first definition allows for comparison and continuity with previous studies in El Salvador that use the classic dichotomous rural/urban distinction. First, the municipalities are categorized by the percentage of households classified as urban or rural, according to the current definitions based on population density and whether or not the municipality is a departmental capital. Second, rural areas are defined according to whether or not they have a density of

1,000 inhabitants per square kilometre or more —while respecting the official criterion of whether or not the municipality is a departmental capital— as a way of maintaining a degree of comparability.

A second definition is also proposed, which adds the dimension of night-time luminosity, as measured by satellite imaging, with which the definition is expanded to four types of territories: rural-rural, rural-urban, urban-rural and urban-urban.

The average municipal population density is 5079 inhabitants per square kilometre. However, it was decided to maintain the official threshold of 1,000 inhabitants/km². The light intensity dimension uses light scales per pixel, and the national average is 7.04 scales per pixel (i.e. approximately per square kilometre). Given that detailed information is available for 33,316 records from the 262 municipalities, the following threshold was chosen: at least 30% of the pixels of each municipality must surpass 10 scales. When tested empirically, both the population and illumination criteria clearly portray the outline of the San Salvador metropolitan area.

Figure VII.1 shows the conceptualization of the typology of municipalities and functional territories produced by applying the scenario 1 methodology.



Source: Prepared by the authors.

B. Scenario 2

The second scenario is based on the categorization developed in scenario 1. It also weighs the territorial functionality dimension with economic variables to construct the territorial economic functionality index (TEFI). With this, scenario 2 creates a composite index between the TEFI and the variables associated with the criteria of night-time luminosity,

population density and —for the municipalities— whether or not they are departmental capitals according to El Salvador’s political and administrative structure. The eight variables that make up the TEFI are detailed below. Further details on the construction of those variables are given in Sánchez and others (2023).

(i) Herfindahl index by type of firms’ economic activity

A concentration of firms in one activity would be an indication of a tendency towards monoactivity, with the possibility that the municipality in question is less regionally integrated and therefore less likely to develop urban density. One good option for measuring the concentration of economic activities is the Herfindahl index. The definition of this concentration index is shown in equation 1.

$$HHI = \sum_{i=1}^8 S^2 \quad (\text{equation 1})$$

Where S indicates the weight of the firms involved in activity *i* in the total number of firms in the municipality. This then gives percentages for the participation of each type of activity. Thus, a Herfindahl index by activity is constructed for each municipality in which the standardized index is limited to a range from 0 to 1, where 0 indicates monoactivity and 1 means a distribution of economic activity in the municipality.

(ii) Herfindahl index by type of firm size

Firms may be one of four sizes: large, medium, small and micro. A similar exercise is carried out to determine whether or not firms of a certain size account for a concentration of the businesses and economies of each municipality. This yields the following:

$$HHI_c = \frac{\sum_{i=1}^8 \left(s^2 - \frac{1}{n} \right)}{1 - \frac{1}{n}} \quad (\text{equation 2})$$

Where S is now the weight of each of the four sizes in the municipality. If the index is close to 1 or 100%, then equilibrium exists in the coexistence of firms of all sizes; but if it is close to 0 or 0%, then one firm size has a monopoly. Concentrations of large firms tend to be more characteristic of urban areas.

(iii) Municipal per capita electricity consumption

The amount of electricity consumed is related to the demand for productive services. Herfindahl indices range naturally from 0 to 1, but in this case, as in the following variables, they were standardized as follows:

- The maximum and minimum values for each municipality were investigated.

- Natural logarithms were applied to per capita electricity consumption.

Once the range of the distribution was obtained, the distribution was divided into quartiles. Higher per capita electricity consumption tends to denote more urbanized areas.

(iv) Non-agricultural economically active population

The agricultural economically active population (EAP) variable indicates the population of working age dedicated to farming activities. Higher levels in the distribution indicate a lower degree of urbanization. One was subtracted from the agricultural EAP variable to obtain the non-agricultural EAP, higher levels of which would indicate greater urbanization. The same type of standardization as for the previous variable was used.

(v) Number of street lamps per person in the municipality

Street lamps are not only a proxy variable for a municipality's basic services, but also indirectly show the number of households and public spaces with lighting; thus, as the number of street lamps increases, greater urbanization can be expected in the municipality.

(vi) Amount of capital per worker

This variable estimates the capital density per worker and per municipality. One way of using a proxy variable is to represent the per-worker capital stock of a sector (or region) by the ratio of its GDP share to its employment share. Thus, if y represents the income weight of municipality i in the national total and l is the employment weight of municipality i in the national total, y/l would then be a proxy indicator of each municipality's per-worker capital intensity. In addition, if y_i indicates municipal GDP and l_i indicates municipal employment, the quotient y/l is also a comparison of municipal GDP per worker in the municipality (y_i/l_i) with respect to national per-worker GDP (Y_n/L_n). Thus, $y/l = ((y_i/l_i) / (Y_n/L_n))$. For y/l to be a proxy of capital per worker, the GDP figures used must be given at current prices.

If the indicator is below 1, production has a density of technology and capital that is below the national average. Income information is available, which can be rescaled to the levels of GDP recorded by the Central Reserve Bank in order to obtain the required proportions. A demonstration of this proposal can be found in Valle Baeza (1994). It should be noted that, unfortunately for El Salvador, the representation of employment and income data still needs to be better adjusted, in terms of both sampling and conceptually. The amount of income in each municipality is estimated from the statements made by respondents, which could represent a limitation. A study was carried out in Spain in which these per-worker

capital endowments were linked in a statistically significant way to the ratio of GDP share to employment share in 52 provinces from 1963 to 2000 (Sánchez Pérez, 2006).

Of course, this *y/l* index assumes that higher results indicate higher levels of urbanization. The intention of this indicator is clear. A higher *y/l* level indicates a higher amount of capital per worker (with respect to the national average). A higher use of capital per worker implies higher levels of investment and, additionally, a region's accumulated investment (capital) implies a higher demand for employment. More employment and capital intrinsically demand more public and private services: in other words, greater urbanization. A given amount of employment forces the inhabitants to settle in satellite communities around centres of work, with an average maximum travelling time of a couple of hours.

(vii) Number of jobs per municipality

This variable indicates the degree of urbanization in that people tend to concentrate in regions that offer them conditions for settling there, within which one of the key variables is the availability of employment. In more densely populated regions—where there is also more employment—wage levels tend to be higher (see Bettencourt and others, 2007).

(viii) Municipal productivity index (MPI)

This composite index involves the weighting of different variables, such as the number of jobs in firms, the number of economic units, the volume of sales in the municipality, and the diversification and linkages of the municipality.⁴ Its values range from 4 to 15, with higher results indicating that the municipality has a higher productivity index.

With these variables, and in keeping with the original proposed methodology, the territorial economic functionality index (TEFI) was obtained:

⁴ The municipal productivity index was created by a team of analysts from El Salvador's Ministry of Economic Affairs (MINEC) in order to better understand the density and complexity of the municipal economic fabric. The following information sources are used: Digestyc (2012) (for data on sales, employment and number of economic units), the 2005 Economic Census and the Economic Intelligence Unit's chaining ranking. This index maps each municipality's economic activities in accordance with their International Standard Industrial Classification (ISIC) and their contribution to municipal economic dynamics by cross-referencing variables such as effective economic units (sector robustness), average employment, average export volume, average income per economic unit, sector diversification and linkages. The following equation was used to define each municipality's productive potential:

$$\text{MPI} = 0.5(\text{PAE} + \text{PAGS}) + (\text{EEU} + \text{DIVER} + \text{Lnk})$$

Where: MPI: municipal productivity index; PAE: proportion of average employment by effective economic units, adjusted for population; PAGS: proportion of average gross sales for each firm in the policy; EEU: score for effective economic units per municipality, i.e. firms belonging to the sectors of the policy; DIVER: score for number of sectors of the policy present in the municipality; Lnk: level of linkage of economic activities within the municipality. The per-product linkages ranking calculated by the Economic Intelligence Unit of the Ministry of Economic Affairs is used. See Ministry of Economic Affairs, Directorate for the Coordination of Productive Policies, "Índice de productividad municipal", El Salvador, unpublished, 2015.

$$ZTEFI = (Z_{Ha} + Z_{Ht} + Z_{ECPC} + Z_{EAPnonagri} + Z_{lamps} + Z_{yl} + Z_{employment} + Z_{MPI})/8 \quad (\text{equation 3})$$

Where Z_{Ha} indicates the Herfindahl index by type of economic activity of the firm; Z_{Ht} is the Herfindahl index by type of firm size; Z_{ECPC} is municipal electricity consumption per capita; $Z_{EAPnonagri}$ is the non-agricultural EAP; Z_{lamps} is the number of street lamps per person in the municipality; Z_{yl} is the amount of capital per worker; $Z_{employment}$ is the number of jobs per municipality; and Z_{MPI} is the municipal productivity index.

One way to standardize would be to remove the minimum value observed in the sample from the value of municipality “i” and then divide the result by the difference between the maximum value minus the minimum. In other words, and for any variable:

$$\text{Standardization} = \frac{\text{municipal value } i - \text{minimum value}}{\text{maximum value} - \text{minimum value}} \quad (\text{equation 4})$$

This ensures that the original variable is transformed and that its values are now restricted to between 0 and 1. This yields a variable that is easier to read. Standardized variables will be calculated in this chapter, as opposed to the original ones. Thus, the territorial economic functionality index (TEFI) is the original variable and, when standardized using the method in equation 4, it becomes ZTEFI. These designations are extended to the other variables by prefixing them with the letter “z”.

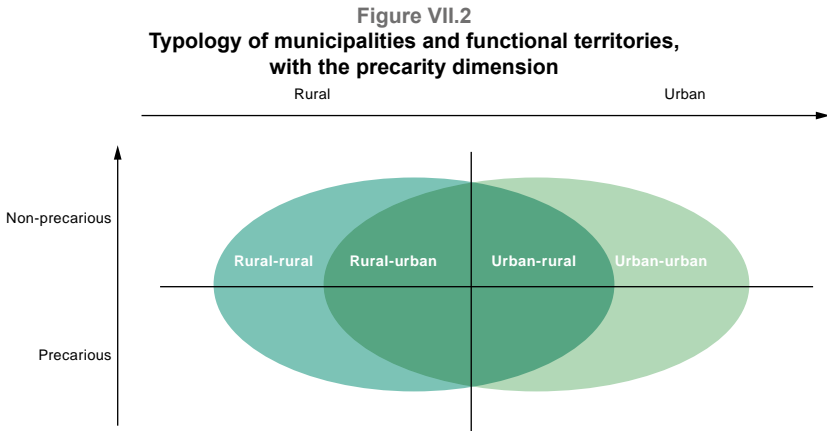
C. Scenario 3

The third scenario adds value to the previous one by means of a novel territorial categorization at both the municipal and functional territory levels. The focus is on the dynamics of social exclusion and the dimension of precarity. The exercise takes up essential elements of the social exclusion analysis tested in the *Map of urban poverty and social exclusion*. This socioeconomic categorization effort focuses on dimensions of habitat precarity and the life trajectories of the territory’s population, as determined by historical and spatial dynamics of social exclusion. Its categories can be used to construct a new typology of the territorial context, with up to eight types of territories, at both the municipal and functional territory levels.

First, the proposed residential marginality index (IMARES) is taken up from that work, in order to classify the 262 municipalities and the functional territories. Secondly, elements of the social exclusion index (IEXSC) are taken up and disaggregated work is performed to identify

the dynamics of labour exclusion, gaps in female workforce participation, youth outside the education system and the workforce, household income poverty, income inequality as measured by the Gini coefficient and violence in the territorial context as measured by the homicide rate. Finally, using this broad set of indicators of habitat precarity and the socioeconomic situation of each territory’s population, a composite precarity index is constructed for both municipalities and functional territories. A more exact instrument for targeting territorial socioeconomic development programmes can thus be developed, albeit one that complements the National Extreme Poverty Map and that has a broader scope than the *Map of urban poverty and social exclusion*.

Figure VII.2 depicts the expected results of scenario 3, which is applicable both at the municipal level and at the level of the defined and categorized functional territories. Thus, scenario 3 yields eight types of municipalities and eight types of functional territories (see table VII.6).



Source: Prepared by the authors.

Table VII.6
Municipalities with a threshold of 1,000 inhabitants per km² and night-time illumination intensity

Category	Number of municipalities	Criteria
R-r category	218	Density below 1,000 inhabitants per km ² and with less than 30% of the territory with a light intensity of 10.
R-u category	26	Density below 1,000 inhabitants per km ² and with more than 30% of the territory with a light intensity of 10.
U-r category	5	Density above 1,000 inhabitants per km ² and with less than 30% of the territory with a light intensity of 10.
U-u category	13	Density above 1,000 inhabitants per km ² and with more than 30% of the territory with a light intensity of 10.
Total	262	

Source: Prepared by the authors.

One essential element of the proposed methodology is the definition of functional territories, conceptualized as groupings or clusters of municipalities that are functionally integrated by two criteria: the intensity of commuting between their territories, and the existence of corridors of night-time luminosity produced by conurbation dynamics and activities taking place in corridors linking one municipality to another.

IV. Proposals for an alternative measurement of rurality in El Salvador: methodology applied in the pilot exercise

A. Definition of functional territories

One essential element of the proposed methodology is the definition of functional territories, conceptualized as groupings or clusters of municipalities that are functionally integrated by two criteria: the intensity of commuting between municipal territories, and the existence of corridors of night-time lighting produced by conurbation dynamics and activities taking place in corridors linking one municipality to another.

The first step in this process is the initial definition of functionally integrated territories by workplace commuting. The starting point is a level equal to or greater than 0.95.^{5,6} Using this threshold, 31 different functional territories can be defined. The next step is to integrate the night-time luminosity criterion. The map of the 31 functional territories determining

⁵ Data from the study by Amaya and Cabrera Melgar (2012), together with statistics from the 2007 Population and Housing Census, were used to identify levels of inter-municipal commuting among the economically active population (EAP). The Tolbert and Sizer (1996) method was used to identify local work areas, based on training from the Latin American Center for Rural Development (RIMISP) and with the support of the Stata statistical software. The cluster analysis technique was applied, with an estimated dissimilarity threshold adequate to produce a grouping of municipalities that could complement the (first) grouping performed with the night-time illumination method. Cluster analysis allows for various possible groupings, so researchers must define a threshold of dissimilarity. This method uses a dissimilarity matrix created on the basis of commuting. Each value in the matrix weighs the flow of the employed residing in municipality "A" who travel to municipality "B" to work, plus the employed residing in "B" and working in "A", dividing the total by the economically active population (EAP) available in either A or B, whichever is lower. This matrix is used to apply the clustering method (hierarchical clustering, disjoint groups) (Berdegué and others, 2011). Cluster analysis allows for many possible groupings, so researchers must define a threshold of dissimilarity. As explained, in this case the value of 0.95 was used, which indicates that the total commuters between one municipality and another is equal to 5% of the minimum workforce of one of the municipalities.

⁶ A threshold of 0.94 is used by Cummings and others (2019) and Amaya and Cabrera Melgar (2012). In keeping with the experimental ethos adopted in the methodology, a proposal was made to extend the commuting threshold by one degree to be equal to or greater than 0.95, since this generates interesting results that add value because of what is known about the reality of socioeconomic linkages between territories of different kinds in the urban-rural continuum. The proposal would be to use that threshold for all functional territories, regardless of their classification.

by the commuting threshold of 0.95 or more is expanded with those municipalities that, while they do not have that amount of commuting, are interconnected by light corridors. This process is carried out by means of a methodology with criteria for the definition of functional territories similar to those used in an earlier exercise conducted by Cummings and others (2019).

This process is performed by using the geographical information system (GIS) to analyse the relationship between a layer indicating light intensity and the set of the 31 functionally integrated territories formed by commuting at levels equal to or greater than the 0.95 threshold. Taking into account the interconnections along shared pixel corridors of maximum intensity luminosity, the resulting municipalities were added and the FTs with 0.95 commuting were reconfigured. Subsequently, and following a similar logic of integrating new municipalities, new municipalities were incorporated into the existing functional territories according to the criterion of being interconnected along pixel corridors of medium-high intensity illumination, albeit not by maximum intensity corridors or 0.95 level commuting. Finally, the process of defining El Salvador's functional territories was completed with the incorporation of the next municipalities into the existing functional territories according to the criterion of interconnection along light pixel corridors of medium intensity.

The process of determining the 31 functional territories is complemented by the definition of what is seen as a special functional territory in the metropolitan macro-region; this is intended to reflect the reality of this great regional cluster of demographic and economic dynamics while not losing sight of the logic of functionality of the functional territories it comprises. Municipalities without commuters, regardless of their luminosity levels, were not included this set of functional territories.

B. Definition of rurality and its characteristics in El Salvador

1. Scenario 1. Population density with a threshold of 1,000 inhabitants per km² and intensity of night-time illumination

(a) Municipalities

The population density of each municipality was calculated to determine how many met the threshold of 1,000 inhabitants per km², one of the basic criteria used to define rural settlements in Salvadoran

statistics: if the municipality is below this threshold, it is defined as rural. The results were as follows:

Urban municipalities	18
Rural municipalities	244
Total municipalities	262

If the municipal seat criterion is added to the above calculation, the number of rural municipalities defined drops to:

Urban municipalities	32
Rural municipalities	230
Total municipalities	262

It was decided that this empirical aspect should be taken into account in defining the FTs: i.e. the administrative variable of whether or not the municipality was a departmental capital was not considered. El Salvador is divided into 14 departments and these in turn are divided into 262 municipalities, which means that there are 14 departmental capitals. Thus, according to that administrative criterion, 14 municipalities are automatically classified as urban.

The next step is to add the light dimension, with its corresponding intensity, obtained from the light intensity of the satellite image pixels, as a proxy of population and economic activity.

The light intensity dimension from the satellite photographs yields two variables: number of pixels and light intensity per pixel. As stated above, each pixel is assigned an amount of light within a range of 1 to 63 scales of light intensity. With this, the average amount of light in each municipality can be calculated. Experimentation indicated that the scale of 10 was the most appropriate, since it represents the threshold that most reliably defines the country's main metropolitan area. It was found that, for example, taking the country's average level of 7.04 scales as the reference yielded large disperse areas of urban sprawl, which overestimated what is recognized as the metropolitan area.

For each municipality, it was determined whether at least 30% of its territory had a light intensity of at least 10 scales. If the municipality failed to reach that threshold, it was defined as low in luminosity—in other words, low in population intensity and in economic activity—and was deemed rural. Municipalities with a result of over 30% of the territory were deemed urban.

The municipal territorialization yielded the categories shown on table VII.6.

(a) Functional territories

The same method was applied to the 31 previously identified functional territories. The population density calculations show that only four functional territories have more than 1,000 inhabitants per km², while the remaining 27 fall short of the threshold.

The departmental capital variable is not taken into account for the functional territories, so only light intensity is added.

This gives the results shown on table VII.7.

Table VII.7
Functional territories with a threshold of 1,000 inhabitants per km² and night-time luminosity intensity

Category	Number of functional territories	Criteria
Type R-r functional territory	21	Density below 1,000 inhabitants per km ² and with less than 30% of the territory with a light intensity of 10.
Type R-u functional territory	6	Density below 1,000 inhabitants per km ² and with more than 30% of the territory with a light intensity of 10.
Type U-r functional territory	2	Density above 1,000 inhabitants per km ² and with less than 30% of the territory with a light intensity of 10.
Type U-u functional territory	2	Density above 1,000 inhabitants per km ² and with more than 30% of the territory with a light intensity of 10.
Total	31	

Source: Prepared by the authors.

Note: The functional territories (FT) were classified according to these two criteria, so that each FT included a certain number of municipalities, which required obtaining their average level of population density and luminosity as each particular municipality was added. For the particular case of light intensity, a weighted average was obtained, where the weighting factor is each municipality's population weight in the national total.

This municipal and territorial categorization exercise allows intermediate territories to be defined, in an attempt to overcome the dichotomous approach to understanding and measuring rurality used in El Salvador. It reveals that there are different types of ruralities and that, depending on how they are classified, different types of municipalities and functional territories will have different socioeconomic characteristics, as will be seen below.

2. Scenario 2. Criteria: threshold of 1000 inhabitants/km², light intensity criterion and territorial economic functionality index (TEFI) criterion

(a) Municipalities

Territorial economic functionality was added to the population density and light intensity dimensions to produce a new territorial categorization.

The classification under scenario 2 is as follows. The population density and light dimensions are added to the scenario 1 categorization, and this yields four typologies. The TEFI is then calculated for each municipality. The TEFI is defined by eight indicators, as described above, and is obtained through equation 3. Each variable included in the TEFI was standardized in accordance with equation 4, resulting in what this chapter calls ZTEFI, where the initial “z” denotes a standardized variable.

This establishes a gradient from deeply rural to intensely urban. Any dimension or variable added to the analysis always moves in that direction: the greater the intensity in the variable or dimension, the more elements are added, so that the territory is categorized as more urban.

Each qualitative value of R-r, R-u, U-r and U-u indicates a scale from rural to urban. Thus, the value of each type of territory is considered as a magnitude in itself: 1, 2, 3 and 4, respectively. With these urban or rural magnitudes, the TEFI—which follows the same pattern: i.e. the greater its magnitude, the greater the degree of urbanization—is taken into account.

The municipal TEFI to four decimal places ranges from 0.1507 to 0.5651; thus, there is a range of 0.4145 between the minimum and maximum values. The average TEFI value is 0.2906 and the threshold value for the first quartile (which covers the 25% of municipalities with the lowest values) is 0.2339. If this last value is considered as an average threshold, the TEFI of each municipality can be obtained and it can be determined whether the municipality in question is below, equal to or above this “average value”. If the municipality’s result exceeds this average value by 0.1034 (a quarter of the TEFI range), its previous level of urbanization changes; the same occurs if it is below: that is, by -0.1034. This reclassification does not change whether TEFI or ZTEFI is used; thus, it was decided to provide the explanation using the former.

One example of this re-stratification is the municipality of Coatepeque, which under scenario 1 was classified as a rural-rural territory: i.e. a level of urbanization of 1. Its TEFI result was 0.3708, which is 0.137 higher than the average value of 0.2339. This enabled it to shift from urbanization level 1 to level 2: in other words, from rural-rural to rural-urban. The territory of Coatepeque contains an extensive area of flora, including a lake. Its population density is low, as is its light intensity, but significantly it has several small tourism businesses, many of them around the lake.

The procedure, applied to all the municipalities, yielded the results shown on table VII.8.

Table VII.8
Municipalities with a threshold of more than 1000 inhabitants/km², plus the light intensity criterion and the territorial economic functionality index (TEFI)

Category	Number of municipalities
R-r category	202
R-u category	20
U-r category	24
U-u category	16
Total	262

Source: Prepared by the authors.

This produced a reordering that allowed shifts in some intermediate territories. Between scenarios 1 and 2, the municipalities in the rural-rural category decreased from 218 to 202; the intermediate rural-urban municipalities fell from 26 to 20; and there was a rise from 5 to 24 in the urban-rural municipalities. Urban-urban municipalities increased to a lesser extent: from 13 in scenario 1 to 16 in scenario 2.

(b) Functional territories

The population and light density criteria are applied to each functional territory, and then the ZTEFI is added, following the process described above (see table VII.9).

This second scenario includes a territorial functionality analysis based on the categorization of municipalities and territories performed in the previous scenario. It offers a different rurality scenario based on criteria such as night-time light intensity and the socioeconomic criteria that make up the TEFI. It should be noted that this is one of several possible rurality scenarios, depending on the measurement criteria selected.

Table VII.9
Functional territories with a threshold of more than 1,000 inhabitants/km², plus the light intensity criterion and the territorial economic functionality index (TEFI)

Category	Number of functional territories
Type R-r functional territory	17
Type R-u functional territory	6
Type U-r functional territory	6
Type U-u functional territory	3
Total	31

Source: Prepared by the authors.

3. Scenario 3. Construction of the precarity index for municipalities and functional territories in El Salvador

As explained above, the residential marginality index (IMARES) is used to classify territories in terms of the precarity of their socioeconomic conditions. In addition to data from the *Map of urban poverty and social exclusion*, use was made of poverty and inequality data from Damianovic, Valenzuela and Vera (2009), which were constructed for El Salvador using small area estimates (SAEs) as part of the Latin American Center for Rural Development's rural territorial dynamics programme. The following indicators were selected to create the precarity index:

- Residential marginality index (IMARES)
- Labour exclusion index
- Gender gap in labour participation
- Percentage of youth outside education or outside the workforce
- Monetary poverty rate
- Gini coefficient
- Murder rate per 100,000 inhabitants

The selected indicators denote a situation of greater precarity or greater exclusion as their values increase; they can therefore be combined to obtain a single index, which will be called the precarity index. Aggregating them requires that they first be standardized. The results of the exercise can be seen on tables VII.10 and VII.11.

Table VII.10
Descriptive statistics: variables for constructing the municipal precarity index

Variable	Observations	Average	Standard deviation
IMARES	262	44.8%	12.2%
Labour exclusion	262	44.9%	5.5%
Gender participation gap	262	19.1 pp	6.6 pp
Percentage of young people outside both formal education and the workforce	262	9.74%	2.4%
Monetary poverty rate	261	58.45%	10.1%
Gini coefficient	261	0.46	0.03
Murder rate per 100,000 inhabitants	262	42.8	62.0
Precarity index	262	0.0	0.6

Source: Prepared by the authors.

Table VII.11
Descriptive statistics: variables for constructing the functional territory precarity index

Variable	Observations	Average	Standard deviation
IMARES	31	37.0%	11.1%
Labour exclusion	31	41.5%	4.5%
Gender participation gap	31	17.5 pp	3.5 pp
Percentage of young people outside both formal education and the workforce	31	17.5%	3.5%
Poverty rate	31	53.5%	8.4%
Gini coefficient	31	0.464	0.032
Murder rate per 100,000 inhabitants	31	8.5	1.8
Precarity index	31	0.3	0.7

Source: Prepared by the authors.

Scenario 3 also allows the municipalities and functional territories to be classified into types, as do the first two scenarios. This exercise enables comparisons among all the country's municipalities and functional territories, and it offers the possibility of analysing them according to their own characteristics, without the need to assign them a specific category. A comparative analysis of the third scenario's results is of particular interest in understanding the diversity of the socioeconomic analyses, depending on whether the municipalities or functional territories are the focus of study.

(a) Territorial categorization incorporating precarity: municipalities

The categorization under scenario 3 takes into account the territories defined in scenario 2 and, as already explained, estimates a precarity index. This classifies each territory as precarious and non-precarious: i.e. there are now eight types of territories, which the initial four (rural-rural, rural-urban, urban-rural, urban-urban) expanded to the current eight:

R-r precarious = 1

R-r non-precarious = 2

R-u precarious = 3

R-u non-precarious = 4

U-r precarious = 5

U-r non-precarious = 6

U-u precarious = 7

U-u non-precarious = 8

The following table shows the influence of the index's underlying variables on its variance through the Shorrock-Shapley index, which measures the relative contribution of each variable to R², after performing a constant-less multiple linear regression of the precariousness indicator on the variables used to construct it. In other words, it shows how much of the variance seen in the index is on account of each particular variable used in its construction.

The results reveal that, at the municipal level, poverty is the variable that most influences R², followed by IMARES and labour exclusion. In contrast, at the territorial level, the Gini coefficient, poverty and labour exclusion are the variables that best explain the variance detected.

Table VII.12
Weight of each variable on the precarity index, at the municipal and integrated territorial level

Variable	Municipal level		Functional territory level	
	Shapley value on R ²	Percentage value	Shapley value on R ²	Percentage value
IMARES	0.212	30.4%	0.071	20.2%
Labour exclusion	0.207	29.6%	0.093	26.6%
Female labour participation gap	0.066	9.5%	0.033	9.4%
Percentage of young people outside both education and the workforce	0.149	21.4%	0.092	26.2%
Income poverty rate	0.220	31.4%	0.138	39.3%
Gini coefficient	0.090	12.9%	0.179	51.1%
Murder rate per 100,000 inhabitants	0.056	8.0%	0.006	1.6%
Total	R ²	%	R ²	%
	0.699	100.0%	0.350	100.0%

Source: Prepared by the authors.

These elements should be considered when analysing the precarity index, since they identify the dimensions that most affect the variance in each calculation.

Thus, for example, they explain the differences presented on the following table, which summarizes the categorization of the eight types of territories according to the number of municipalities that each category contains.

This categorization breaks down the rural-rural territorial cluster into precarious and non-precarious. Examining that breakdown in terms of integration by commuting and luminosity —i.e. the criteria that define the FTs— the precarious R-r territory is composed of 173 municipalities. If that

integration is not taken into account, this cluster contains 124 municipalities: i.e. 49 fewer. The reasons behind this change may be due to statistical reasons involving the composition of the indicators. However, they could also be because of more weighty issues: for example, the importance of regional commuting, which must be considered in any such analysis. A deep rural territory integrated with other types of territories is not the same as an isolated deep rural territory.

Table VII.13

Categorization 3. Distribution of the 262 municipalities into the eight territory types, according to categorization with population density + light intensity + TEFI and including the precarity dimension. El Salvador 2007–2015

	Municipalities	Municipalities integrated into FTs
R-r precarious = 1	124	173
R-r non-precarious = 2	78	29
R-u precarious = 3	6	2
R-u non-precarious = 4	14	18
U-r precarious = 5	1	0
U-r non-precarious = 6	23	24
U-u precarious = 7	0	0
U-u non-precarious = 8	16	16
	262	262

Source: Prepared by the authors.

Another notable change is the redefinition of the non-precarious rural-rural territory: without integration it contains 78 municipalities, while with integration the number drops to 29. This exercise highlights the existence of this cluster, which shows that rurality is not necessarily synonymous with precarity. Those municipalities represent between 11% and 30% of the total number.

(b) Territorial categorization incorporating precarity: functional territories

The following table shows how each functional territory is defined when the precarity dimension is included, based on the categorization produced by the scenario 2 definition. The departmental capital variable is not taken into account since it was previously seen to have the effect of skewing urbanization.

Table VII.14
Categorization incorporating precarity at the level of functional territories, El Salvador, 2007–2015

Functional territory	Average precarity	Municipalities in the FT	Degree of precarity (1 = not precarious; 4 = very precarious)	Precarious (yes=1, no=0)	Territorial categorization according to population density, luminosity and TEFI	Territorial categorization according to population density, luminosity, TEFI and precarity (odd numbers indicate precarious; even numbers indicate not precarious)
0	0.2295	160	3	1	1	1
1	-0.0150	2	2	0	1	2
2	-0.3857	3	1	0	1	2
3	-0.1913	2	2	0	1	2
4	0.2286	2	3	1	2	3
5	0.3608	2	3	1	1	1
6	0.3274	2	3	1	1	1
7	-0.2245	4	2	0	1	2
8	0.0319	2	2	0	1	2
9	0.1319	2	3	1	1	1
10	-0.1093	7	2	0	2	4
11	0.0828	6	2	0	1	2
12	0.3806	3	3	1	1	1
13	0.2184	2	3	1	1	1
14	-0.0614	2	2	0	1	2
15	-0.0858	2	2	0	2	4
16	-0.2527	2	1	0	3	6

Functional territory	Average precariousity	Municipalities in the FT	Degree of precariousity (1 = not precarious; 4 = very precarious)	Precarious (yes=1, no=0)	Territorial categorization according to population density, luminosity and TEFI	Territorial categorization according to population density, luminosity, TEFI and precariousity (odd numbers indicate precarious; even numbers indicate not precarious)
17	-0.3985	4	1	0	3	6
18	-0.2357	2	1	0	1	2
19	-1.3671	8	1	0	3	6
20	-0.3839	3	1	0	2	4
21	-0.8490	4	1	0	3	6
22	-0.2422	4	1	0	3	6
23	-1.2759	5	1	0	4	8
24	-0.2899	4	1	0	2	4
25	-1.2012	8	1	0	4	8
26	-0.3055	2	1	0	2	4
27	-0.0424	2	2	0	1	2
28	0.5216	2	4	1	1	1
29	-0.2916	3	1	0	4	8
30	-0.2730	2	1	0	3	6
31	-0.0136	4	2	0	1	2
Total		262				

Source: Prepared by the authors.

As a result of the above:

R-r precarious	=	1	6	functional territories
R-r non-precarious	=	2	10	functional territories
R-u precarious	=	3	1	functional territory
R-u non-precarious	=	4	5	functional territories
U-r precarious	=	5	0	functional territories
U-r non-precarious	=	6	6	functional territories
U-u precarious	=	7	0	functional territories
U-u non-precarious	=	8	3	functional territories
Total functional territories			31	

Of the 31 functional territories, only six are both deeply rural and precarious. There are territories that deserve special attention as they can allow not only transitions from rural to urban, but also transitions from precarity to non-precarity. The rural-urban and urban-rural functional territories should be seen in that light. Among the rural-urban functional territories —i.e. those with low population density, and high luminosity and economic density— one is precarious and five are non-precarious.

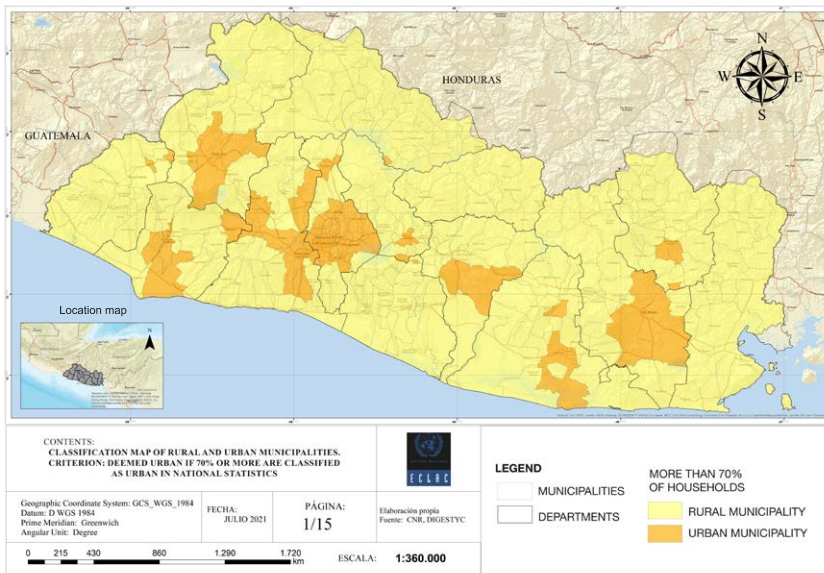
V. Results at the municipal level: discussion of evidence and findings

A. Scenario 1: a new definition of the rural and the urban

As noted above, rural areas were defined as those municipalities with fewer than 70% of their households classified as urban in national statistics. Map VI.1 shows the division of the national territory according to that criterion. The urban settlements are clustered around the San Salvador metropolitan area, with areas expanding towards the west.

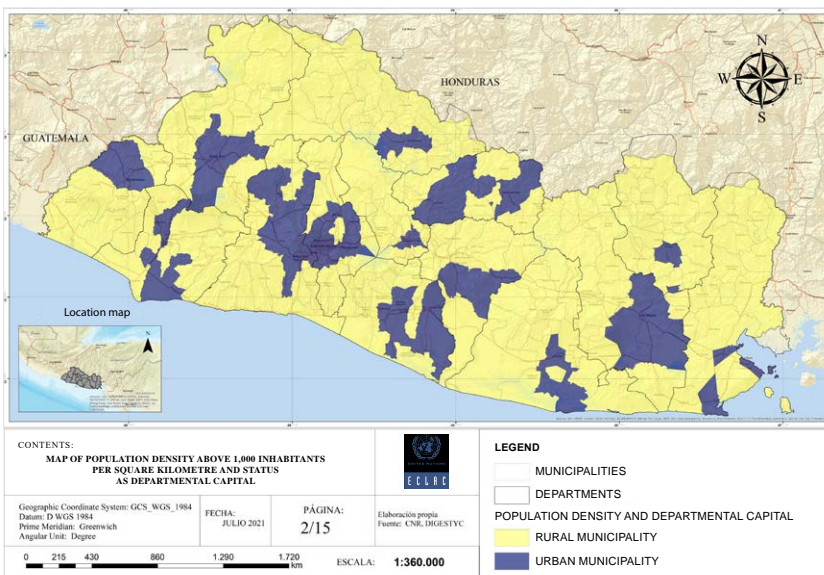
A complementary way of using the official definition to establish a dichotomous relationship between the rural and the urban involves the population density criterion of 1,000 inhabitants per km², together with the criterion of whether the municipality serves as a departmental capital within the country's political and administrative structure. Map VII.2 shows that the municipalities defined as urban under this criterion are clustered around the San Salvador metropolitan area, in the special functional territory of the metropolitan region, expanded by the dynamics of conurbation and greater economic activity (economic fabric and labour market). This cluster of more urban municipalities extends towards the centre and south of the country's western portion.

Map VII.1
Categorization of rural and urban municipalities. Criterion: 70% of households or more are classified as urban in national statistics



Source: Prepared by the authors, on the basis of data from the National Center of Records (CNR) and the General Directorate of Statistics and Censuses (DIGESTYC), 2007 Population and Housing Census.

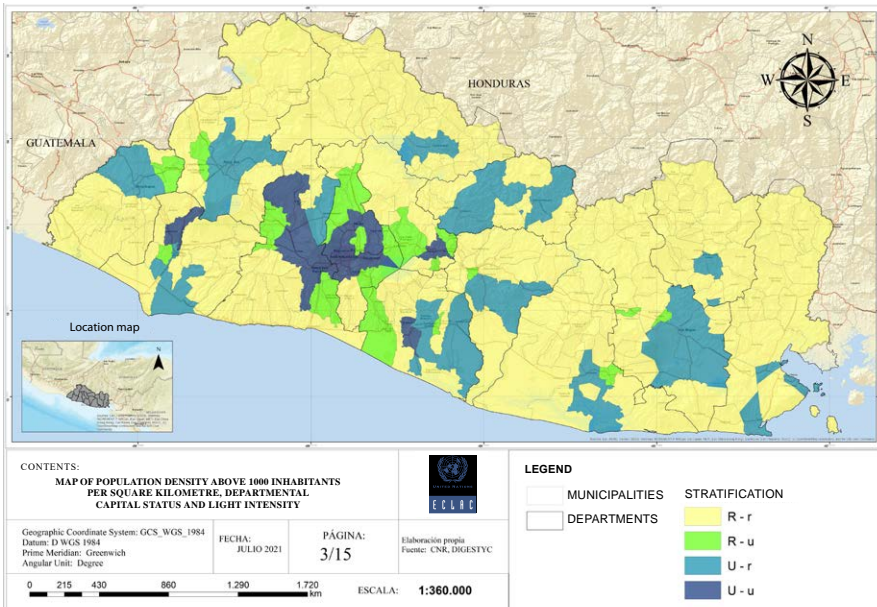
Map VII.2
Rural and urban municipalities. Criteria: population density and departmental capital



Source: Prepared by the authors, on the basis of data from the National Center of Records (CNR) and the General Directorate of Statistics and Censuses (DIGESTYC).

In order to overcome the limitations of the dichotomous classification based solely on demographic indicators, the scenarios proposed above—constructed to depict the real continuum that exists between rural and urban areas— cover four combinations of rural and urban. In scenario 1, which combines population density, departmental capital status and light intensity as indicated by satellite imaging, a typology of four categories is obtained. This provides a more nuanced understanding of the real diversity of the country’s territories (see map VII.3). By adding the night-time luminosity variable, population density is complemented with an approximation of the intensity of economic and building dynamics to indicate a greater degree of urbanization in the territory.

Map VII.3
Typology of municipalities. Criteria: population density, luminosity and departmental capital status



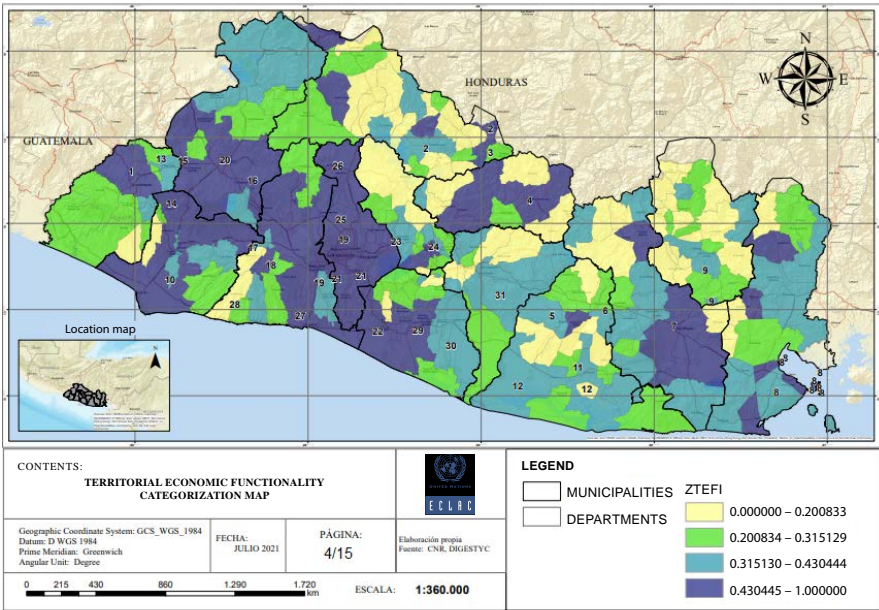
Source: Prepared by the authors, on the basis of General Directorate of Statistics and Censuses (DIGESTYC), National Center of Records (CNR) and National Oceanic and Atmospheric Administration (NOAA).

B. Scenario 2: categorization of the socioeconomic functionality of the territories

Map VII.4 shows the results of including TEFI variables at the municipal level in the analysis (scenario 2). The municipalities categorized in the quartile with the highest TEFI scores are primarily clustered in the functional territories of the metropolitan region; they also extend into peripheral areas in the north, east and south, towards the centre of the Pacific coastal strip and towards the west, where there are also a significant number of municipalities with this classification. Map VII.5 shows the results of scenario 2 at the functional territory level.

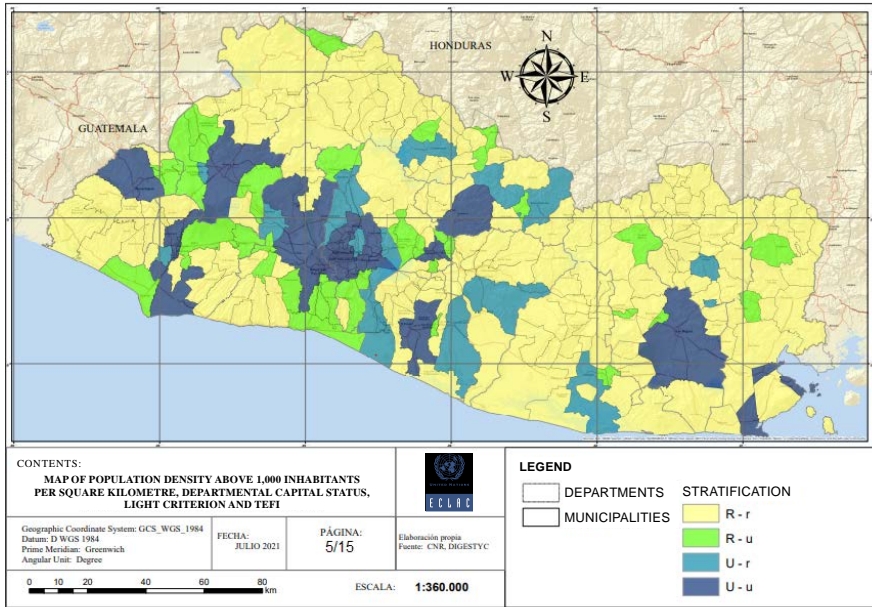
Map VII.4

Stratification of municipalities according to the territorial economic functionality index, combining the criteria of night-time luminosity, population density, departmental capital status, and the territorial economic functionality index



Source: Prepared by the authors, on the basis of data from the General Directorate of Statistics and Censuses (DIGESTYC) and the Ministry of Economic Affairs.

Map VII.5
Typology of municipalities, composite territorial index functionality, combining the criteria of night-time luminosity, population density, departmental capital status, and the territorial economic functionality index



Source: Prepared by the authors, on the basis of General Directorate of Statistics and Censuses (DIGESTYC), 2007 Population and Housing Census, 2011-2012 Directory, for sales, DIGESTYC solvency database, 2017 and data from the Chains Index of the Economic Intelligence Unit of the Ministry of Economic Affairs, 2015.

C. Scenario 3: socioeconomic categorization of municipalities according to precarity indices

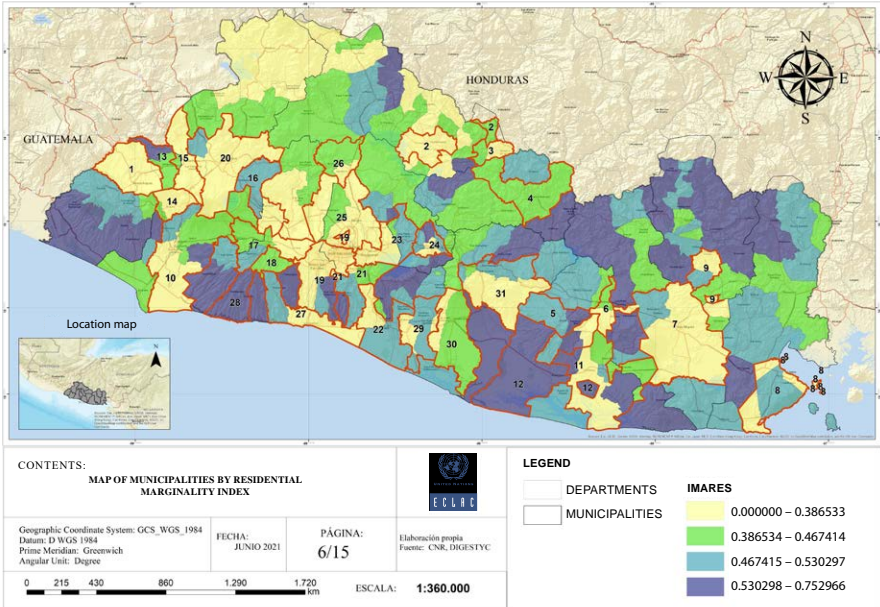
While the results of the first two scenarios provide an innovative classification of rural and urban areas, scenario 3 offers indices related to the precarity of the population that can be used to categorize the municipalities' socioeconomic and environmental realities.

Map VII.6 shows the results of the methodology used to construct the residential marginality index (IMARES). The municipalities with the lowest IMARES scores are clustered in the San Salvador metropolitan area and, more broadly, in the FTs of the metropolitan region. In addition, there are important clusters of municipalities with low levels of residential marginalization in the centre, north and south of the western region, in the

centre of the northern zone and, to a greater degree, in municipalities that are departmental capitals with major intermediate cities in the paracentral and eastern regions.

A second trend visible on the map is that the municipalities with the highest IMARES scores are concentrated in the eastern region, and especially along that region’s northern strip, but also in the eastern portion of the Pacific coast and along it towards the centre and west of the country. This trend is also observed in the municipalities ranked in the third-highest IMARES category, which are generally located in the eastern region, along the coastline and in specific areas of the paracentral zone and centre and west of the northern zone.

Map VII.6
Stratification of municipalities, according to the residential marginality index (IMARES)

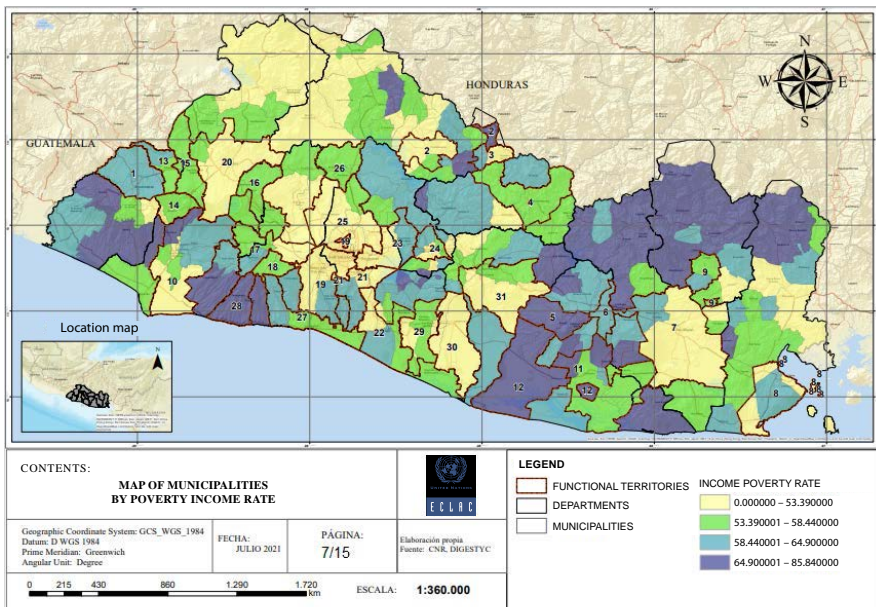


Source: Prepared by the authors, on the basis of data from the National Center of Records (CNR) and the General Directorate of Statistics and Censuses (DIGESTYC).

As an additional example, map VII.7 shows the municipalities with the highest levels of income poverty. These are clearly concentrated in a strip along the entire northern part of the eastern region, as well as the municipalities of its coastal strip that are not departmental capitals with

major intermediate cities. The other concentration of municipalities with the highest levels of poverty is in the two zones of the coastal strip of the western region, on both sides of the port of Acajutla. In contrast, the municipalities with lower income poverty rates are located in the functional territories of the metropolitan region and in functional territories peripheral to it, as well as in functional territories clustered around the departmental capitals with the most important intermediate cities of the western and eastern regions, and the centre of the northern zone.

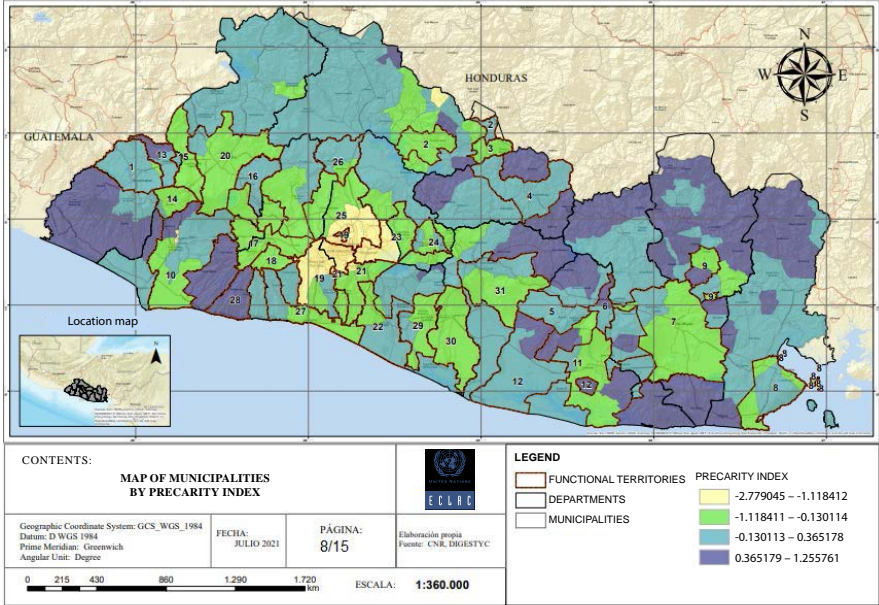
Map VII.7
Income poverty rate



Source: Prepared by the authors, on the basis of data from the National Center of Records (CNR) and the General Directorate of Statistics and Censuses (DIGESTYC).

Map VII.8 shows the results of the composite precarity index. The municipalities with the highest precarity rates are clearly clustered in the eastern region, outside the departmental capitals with the four largest intermediate cities. In contrast, the municipalities with the lowest precarity levels are concentrated in the FTs of the metropolitan region and its periphery, and extending in a corridor towards the FTs of the centre of the western region, and through the FTs with departmental capitals towards the paracentral and eastern region.

Map VII.8
Precarity index



Source: Prepared by the authors, on the basis of data from the National Centre of Records (CNR) and the General Directorate of Statistics and Censuses (DIGESTYC).

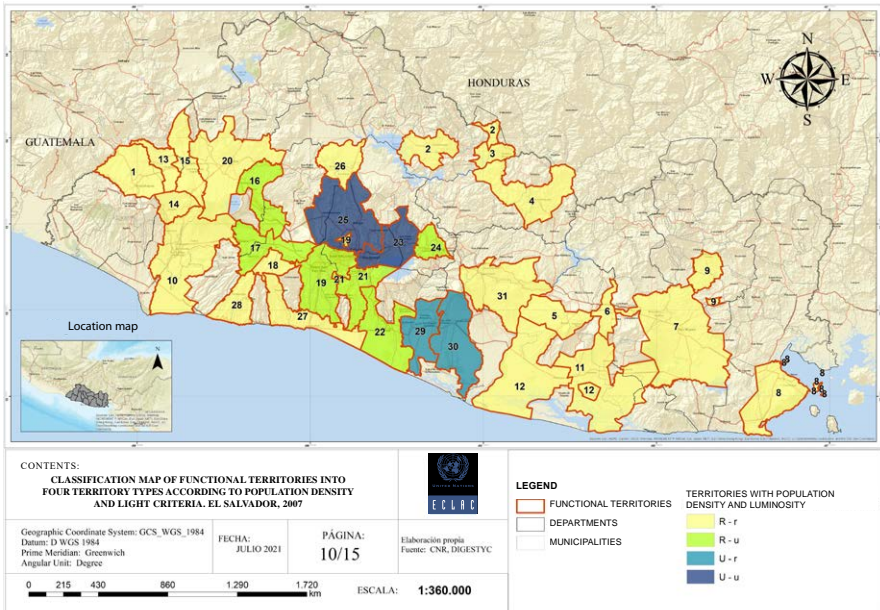
The proposed methodology for measuring precarity adds value to the analyses carried out with the variables used to categorize the municipalities as rural or urban. There are clear trends that show structural social exclusion problems in the different territory types, but it can also be seen that different variables manifest themselves differently in different types of territories; public policies for national development therefore require flexible and properly territorialized approaches.

VI. Results at the functional territory level: discussion of evidence and findings

A. Scenario 1: density and intensity of night-time luminosity

Map VII.9 shows the categorization of functional territories, where 21 are classified as rural-rural, six as rural-urban, two as urban-rural and two as urban-urban. The urban-urban FTs are part of the metropolitan area, while the east is exclusively rural-rural.

Map VII.9
Typology of functional territories, by the criteria of population density
and night-time luminosity



Source: Prepared by the authors, on the basis of data from the National Center of Records (CNR) and the General Directorate of Statistics and Censuses (DIGESTYC).

B. Scenario 2: typology of functional territories, by the criterion of more than 1,000 inhabitants/km² plus the light intensity criterion and the territorial economic functionality index (TEFI)

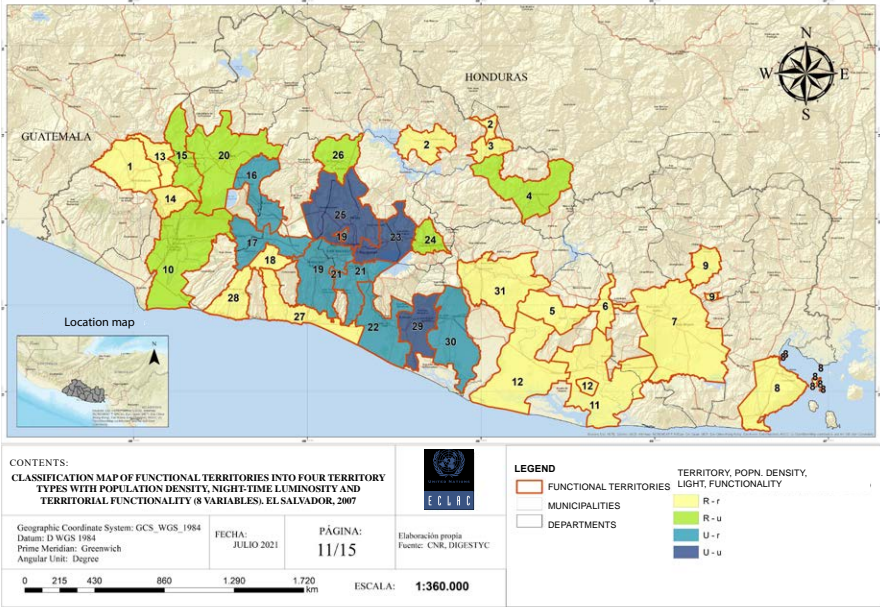
In keeping with the process carried out at the municipal level, map VII.10 presents the results of the classification of the functional territories into four categories and incorporates population density, night-time luminosity and the TEFI to produce a composite index.

Scenario 2 reveals that 17 of the FTs are R-r, 6 are R-u, 6 are U-r and 3 are U-u. It should be noted that when the TEFI is added, the geographic scope of the functional territories deemed urban extends beyond the special functional territory of the metropolitan region.

Adding the TEFI produces a more balanced distribution of the functional territory typology. Of relevance for public policy is the presence of more rural economic dynamics in the FTs of the eastern region, a strip in the northern zone and the border region with Guatemala; this is in contrast to more intense and urban economic dynamics in the special FT

of the metropolitan region and in scattered areas towards the centre of the western region. The urban dynamism of FT (4) around Sensuntepeque is a notable exception in the northern strip.

Map VII.10
Typology of functional territories, by criteria of population density, night-time luminosity and territorial economic functionality



Source: Prepared by the authors, on the basis of data from the National Center of Records (CNR) and the General Directorate of Statistics and Censuses (DIGESTYC).

C. Scenario 3: categorization of precarity in the functional territories

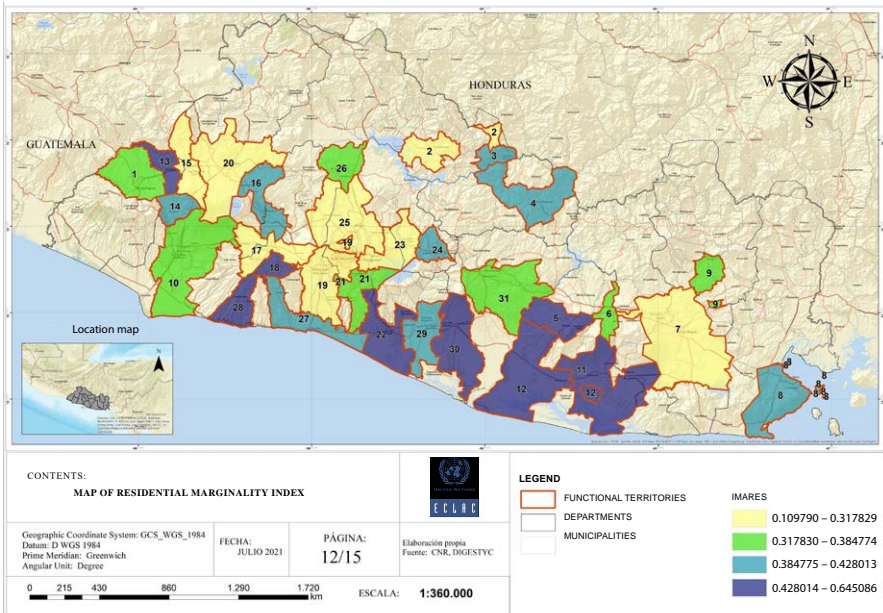
A calculation of the IMARES at the functional territory level, with the FTs classified into quartiles, reveals eight FTs in the lowest marginalization category and five in the second lowest, while there are eight in the second highest marginalization category and eight in the highest (see map VII.11).

The FTs with the lowest rates of marginalization are San Salvador (marked as territory 19), Apopa-Nejapa (25) and Soyapango-Ilopango (23) in the metropolitan macro-region; to the west, Lourdes-Colón (17), Santa Ana (20) and Chalchuapa (15), and also Chalatenango-Arcatao in the northern zone and San Miguel (7) in the eastern region.

The income poverty situation among the functional territories' inhabitants is similar to that revealed by the residential marginality index. The FTs categorized in the first quartile (with the lowest

poverty rates) are San Salvador (19), Apopa-Nejapa-Mejicanos (25), Soyapango-Ilopango-San Martín (23), San Marcos (21), all clustered in the metropolitan macro-region; also included are the FTs of Santa Ana (20) in the western region, Chalatenango-Arcatao (2) in the north and San Miguel in the east (see map VII.12).

Map VII.11
Categorization of functional territories by the residential marginality index (IMARES)

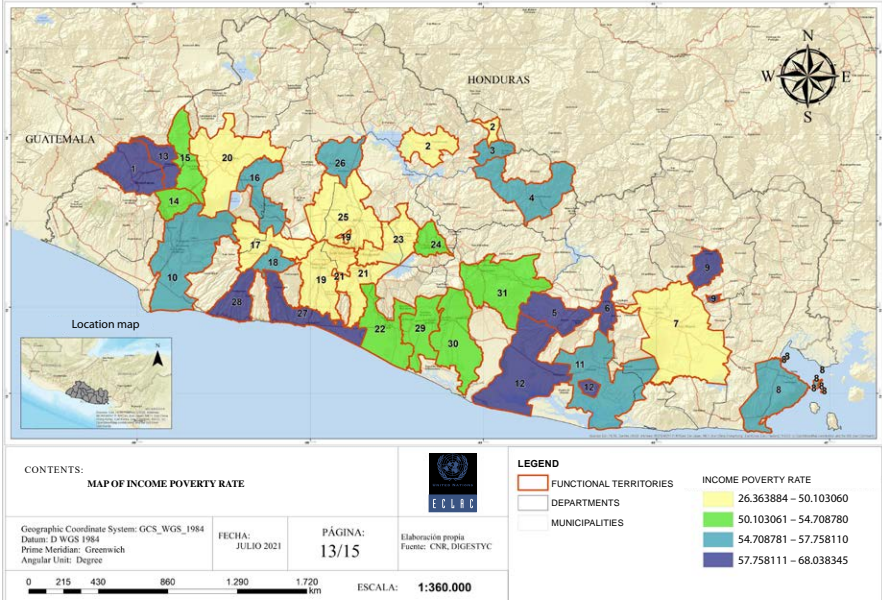


Source: Prepared by the authors, on the basis of data from the 2007 Population and Housing Census in Ministry of Economic Affairs/Latin American Faculty of Social Sciences (FLACSO)/United Nations Development Programme (UNDP), *Mapa de pobreza urbana y exclusión social. El Salvador. Volumen 1: conceptos y metodología*, San Salvador, 2010.

Finally, the results of the composite precarity index indicate that the lowest rates of precarity are found in three of the FTs in the metropolitan macro-region (19, 23 and 25). The second least precarious FTs are San Marcos in the metropolitan macro-region, Cojutepeque (26) and Lourdes Colón (17) in the periphery of the metropolitan macro-region, and Santa Ana (20) in the western region, San Miguel in the east and Chalatenango-Arcatao (2) in the northern zone.

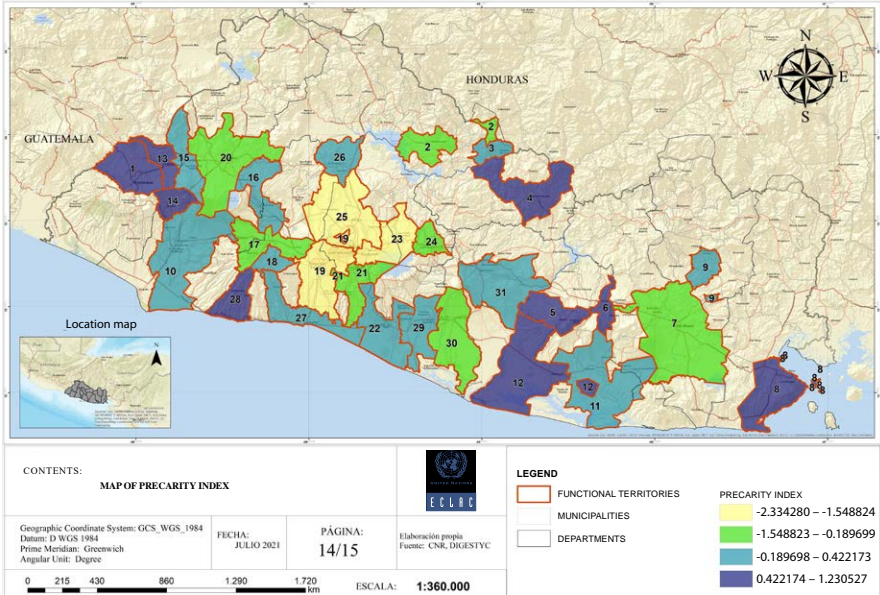
In contrast, there are 9 FTs in the highest precarity index quartile: one in the northern zone (4), four in the eastern region (8, 12, 5, 6), four in the western region (28, 13, 14 and 1) and one on the western coastal strip. In the next highest precarity category are two FTs in the eastern region (9 and 11), one in the paracentral region (31), four in the central coastal strip (29, 22, 27 and 18), three in the western region (1, 13 and 14) and one in the northern region (4) (see map VII.13).

Map VII.12 Stratification of functional territories by income poverty rate



Source: Prepared by the authors, on the basis of N. Damianović, R. Valenzuela y S. Vera, "Dinámicas de la desigualdad en El Salvador: hogares y pobreza en cifras en el período 1992 / 2007", Documento de Trabajo, No. 52, Rural Territorial Dynamics Programme, Latin American Centre for Rural Development (RIMISP), Santiago, 2009.

Map VII.13 Precarity index



Source: Prepared by the authors, on the basis of data from the National Center of Records (CNR) and the General Directorate of Statistics and Censuses (DIGESTYC).

VII. Implications for rural development policy in El Salvador

To analyse the implications of a territorial-based redefinition of rural areas with a more complex understanding of the relationship between rural and urban areas, and to formulate proposals in pursuit of a new public agenda for territorial development in El Salvador, a partnership was established with the San Salvador Metropolitan Area Mayors Council (COAMSS) and the San Salvador Metropolitan Area Planning Office (OPAMSS). COAMSS is an autonomous and decentralized entity composed of fourteen municipal governments from the departments of San Salvador and La Libertad.⁷ It is responsible for formulating, regulating, coordinating and directing policies and programmes for the comprehensive development of the territory and inhabitants of the San Salvador metropolitan area. OPAMSS is an eminently technical, decentralized and autonomous entity within COAMSS that functions as its technical secretariat and is in charge of investigating and analysing urban development problems, territorial planning and oversight, and promoting inclusive and sustainable territorial development with a strategic and unified vision of the metropolitan area.⁸ To perform its functions, it is equipped with a metropolitan observatory, a geoportal, an open-data platform and a multidisciplinary technical team.

OPAMSS is currently reviewing its Metropolitan Guiding Plan and updating its metropolitan public policies. As part of the strategic partnership between COAMSS-OPAMSS and ECLAC, OPAMSS has expressed interest in using the methodology proposed in this chapter in a joint effort with its technical team to produce new knowledge on the complex dynamics between urban and rural areas in the metropolitan region. The aim of that process is to propose a redesign of the characteristics that define rural and urban territories in the San Salvador metropolitan area and use it to inform the implementation of policies.

In order to exchange approaches and learn in depth about the technical support needs of OPAMSS, a workshop was held to explain the methodology to the entire technical team, during which the OPAMSS methodological and technical processes for territorial analysis were explored in greater detail. Following the workshop, it was agreed to cooperate in applying the proposed methodology and to carry out an exploratory exercise for two specific questions: economic functionality, and a gender-based diagnosis for the creation of an integrated care system.

Using the TEFI and a functional framework for understanding territorial dynamics, ECLAC conducted an analysis of the existing territorial characteristics within the San Salvador metropolitan area with the aim of

⁷ Antiguo Cuscatlán, Apopa, Ayutuxtepeque, Cuscatancingo, Delgado, Ilopango, Mejicanos, Nejapa, San Marcos, San Martín, San Salvador, Santa Tecla, Soyapango and Tonacatepeque.

⁸ See [online] <https://opamss.org.sv/>.

promoting the territories' economic development. The work focused in particular on the various factors behind the population's precarity, with the aim of designing better targeted economic development policies based on each territory's characteristics. The objective of this effort is to reduce the gaps and fractures that exist between territories. These actions are also intended to set the foundations for the construction of a comprehensive care system, based on a sociodemographic diagnosis of both those who need care and those who provide it, as well as of the network of relevant public and private goods and services available, across all the metropolitan territories. The aim is to identify marginalized areas and the dynamics of mobility and proximity that exist between areas, and to design public policy programmes that guarantee the availability, access, affordability and quality of care-economy services for metropolitan area's population.

The preliminary results of the collaboration with OPAMSS⁹ indicate the need to incorporate a multi-scale dimension, both in the analysis and diagnosis phase and in the efforts undertaken to strengthen public institutions. This work also calls for a new perspective for analysing metropolitan territories, to modify the way the most rural areas of the metropolitan region are measured, including a dynamic dimension to take into account mobility and socioeconomic functionality. Finally, the exercise focused on the metropolitan area could be extended to the nationwide level or to other territories with metropolitan dynamics and major intermediate cities, for different public policy purposes. The generation of updated statistical information at the municipal and sub-municipal level is fundamental to exercises of this kind.

VIII. Conclusions and recommendations

The main contribution of this territorial categorization is that it breaks free from the simple official dichotomy of urban and rural based solely on the population criterion. It reveals intermediate territories by using such dimensions as luminosity from satellite imaging and the density of economic interactions (TEFI). Once the classification has been defined at the municipal and functional territory levels, a determination is made as to whether or not the territories are precarious.

The preliminary exercise carried out to develop and apply the proposed methodology for understanding and measuring the dynamics of rural areas in their complex relationship with urban areas in El Salvador has demonstrated its usefulness and potential for the design, implementation and evaluation of public territorial development policies.

⁹ At the time of writing this chapter, the final results had not been delivered to or discussed with OPAMSS.

The current official methodology for categorizing rural areas in El Salvador does not consider the influence of variables other than population and housing density. This leads to a restricted and remainder-based definition of rurality that fails to take account of the complex and changing reality of rural areas: a situation that is not exclusive to El Salvador and that, as rural territories and their conditions are not clearly identified, has implications for the design and implementation of public policies. There is no approach to rurality that comprehensively guides the actions of the various public institutions directly involved in the analysis of rural areas.

The limited availability of updated statistics at the territorial level limits the possibilities of better identifying rural areas and the living conditions of those areas' inhabitants. The recommendations therefore include strengthening the national statistical system, conducting a new census and updating and improving the instruments used for the population, housing, economic and agricultural censuses, the multipurpose household survey and others. The work carried out represents, to a certain extent, a baseline based on the results of a preliminary implementation of the methodology, which, in this sense, reflect recent history and the evolution of rural-urban territorial dynamics after the Peace Accords in El Salvador. An update based on new statistics would allow a comparative analysis to identify current trends and make projections for the future.

This chapter offers a territorial classification of El Salvador based on the conceptual and methodological contributions of the theory of the new rurality, incorporating lessons from the analysis of the state of the art as well as from the successes and limitations of recent exercises to characterize rural and urban territories and their development dynamics. The work carried out assumed the challenge of maintaining comparability over time with official statistical sources. The definition of functional territories allows the static perspective based on the political and administrative configuration of the territory to be overcome and the economic and social interactions between municipalities to be studied. It also supersedes the view of rural areas as the non-urban remainder and presents an analytical framework that incorporates the variables that characterize them.

This study analysed the country's 262 municipalities and regrouped them into 31 functional territories, whose classification—in terms of being rural, urban or intermediate—changed as a range of variables in addition to the traditional ones were adopted:

- When solely the population density criterion is considered, more municipalities and functional territories are classified as rural than when, as in scenario 1, the dimension of night-time

light intensity is included. The inclusion of this variable also enables the dichotomous view of the rural and the urban to be reframed in terms of four gradients: R-r, R-u, U-r and U-u.

- In the second scenario—in which the TEFI and whether the territory is a departmental capital or not are added to the population density and light intensity criteria—the presence of rural-rural territories prevails, but a wide range of intermediate territories emerge and a greater diversity in the country's rurality can be seen.
- In the third scenario, in which the precarity index is added to the scenario 2 definition, each territory is identified as either precarious and non-precarious, resulting in eight gradients: R-r precarious, R-r non-precarious, R-u precarious, R-u non-precarious, U-r precarious, U-r non-precarious, U-u precarious and U-u non-precarious. The analysis of the different variables of housing and socioeconomic precarity revealed structural social exclusion problems that produce a disconnection between the country's western and eastern regions.
- One significant finding is the existence of a strip of precarity that divides the country into west and east. This strip represents an authentic belt of marginalization, poverty and precarity (see FTs 5 and 12 on maps VII.6, VII.7 and VII.8). This precarity is doubtless associated territorially with the relatively low density of economic activity indicated by the TEFI in the same strip (map VII.4). Findings such as these indicate territorial priorities for the implementation of development policies.
- Applying the various criteria produces different classifications of rurality. If solely the criterion of 1,000 inhabitants per square kilometre is used, 244 municipalities are classified as rural and 18 as urban. On the other hand, the second scenario's categorization—with four territorial classifications—reveals 202 rural and 16 urban municipalities and classifies a further 44 as intermediate territories. The third scenario identifies 124 precarious and 78 non-precarious rural municipalities, thus challenging the idea that all rural territories are precarious.

This new multi-criteria classification allows a territorial diagnosis of the country's fragmentation. The municipalities included in the urban-rural category complete the metropolitan region as it extends further to other peripheral municipalities to the west, to the south towards the international airport, to the centre of the coastal strip and a little to the north. The municipalities classified as rural-urban are located in the peripheries of the municipal clusters classified as the two types of urban, around the extended San Salvador metropolitan region.

By working beyond the municipal scale to define functional territories, the static perspective of the political and administrative configuration of the territory can be overcome and the economic and social interactions between municipalities can be studied. The inclusion of this concept allows an introspection that is of interest for territorial diagnosis, since it distinguishes intermediate or hinge municipalities that can facilitate the implementation of public policies by revealing economic, commuting, functional and other forms of inter-municipal links. Thus, the territorial analyses carried out, at the municipal and FT levels, reveal that they are strategic and a priority for the execution of territorial public policies integrated with multilevel planning and governance of territorial development, to allow and fully recognize the heterogeneity of national territories. The analyses performed offer empirical evidence and technical criteria—based on the available statistics—for the design of a public territorial policy that will allow better decision-making with a territorial approach. However, their relevance would increase greatly with updated data and fresh analyses, using historical comparisons to clarify trends.

With the analysis of the territorial economic functionality variables, it is possible to determine which specific components would improve the state of precarity of each municipality or functional territory. Those regions capable of evolving more rapidly from a state of relatively high precarity to one of low precarity can be identified. This new analysis of territorial economic dynamics has public policy implications in the areas of employment, entrepreneurship and the promotion of micro-, small and medium-sized enterprises (MSMEs). Active employment policies should adjust their proactive management strategies to the various labour markets that exist across the 31 functional territories and different rural areas found in the rest of the country. Likewise, the provision of job training and employment intermediation services must be adjusted to the reality of demand in those markets: industry or high value-added services are concentrated in the San Salvador macro-region, the clusters of maquila industries, tourism and financial services are in the cities and in the urban-rural FTs, while the most dynamic agro-industry and commercial agriculture is found in rural areas. Territorial strategies for catalysing MSMEs and entrepreneurship in different areas could encourage progress with the regional deconcentration of services to meet the differentiated potential and opportunities of the FTs and different rural areas.

As for potential next steps to expand the present research tasks, the proposal is to take up the work done by Cummings and others (2019) and Romero and others (2020) and conduct econometric analyses of the 262 municipalities and the FTs, classified into the four types of territories, linking their categorizations within those four types of territories with

their degrees of precarity and with other relevant variables (e.g. their economic strength, their relative level of human development (HDI) or indicators of migratory dynamics or patterns of violence).

It is hoped that the results derived from the collaboration with the Government of El Salvador will serve as pilot exercises to be replicated in other areas of the public agenda. The exploratory exercise on territorial economic functionality includes a statistical analysis of the main components to understand the relationship between structural gaps and how territories are characterized, in order to, for example, identify public policy opportunities around issues such as employment and access to public goods and services. The diagnosis for an integrated care system will produce a classification of the territories that make up the metropolitan area according to the demographic and socioeconomic structure of those who need care and those who provide it, along with the public and private supply of care services, from a gender perspective.

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Chapter VIII

Summary and conclusions

*Ramón Padilla Pérez
Yannick Gaudin*

The central aim of this book has been to revise the limits and scope of the classic definitions of rurality in Latin America and the Caribbean, with a view to developing new technical tools that can help strengthen rural development policies from a new perspective. To that end, it systematizes and summarizes the work carried out under the “New narratives for rural transformation in Latin America and the Caribbean” project by the Economic Commission for Latin America and the Caribbean (ECLAC), with financing from the International Fund for Agricultural Development (IFAD). The methodology developed was applied to four countries —Costa Rica, El Salvador, Mexico and Panama— as a starting point for drawing lessons and developing similar methodologies that could be applied in other countries of the region. As mentioned in the introduction, the results of the exercise in the Dominican Republic will be summarized in a separate publication owing to the differences in project time frames.

The project’s results are grouped into four areas: (i) the creation of new technical instruments; (ii) analysis of their implications for the design and implementation of public policies; (iii) promotion of inter-institutional dialogue; and (iv) strengthening national and regional capacities.

As for technical instruments, three or four alternative proposals for defining rural, urban and intermediate areas were developed in each country. The starting point was to analyse the current definitions of rural

and urban in each of the four selected countries. As noted by Dirven and Candia in chapter II of this book, various official definitions of rurality are used in Latin America and the Caribbean and, at present, a dichotomous, static approach continues to prevail. The definition of the rural and the urban in Mexico, which dates back to 1936, defines urban localities as municipal seats or settlements with 2,500 inhabitants or more, while places with a population of fewer than 2,500 inhabitants are deemed rural. In Panama, the census framework determines rural areas as a remainder: i.e. they are defined as those places that do not have the characteristics of urban areas. Urban areas are defined as those spaces with 1,500 inhabitants or more and that are equipped with electricity, public water supplies, sewer systems and paved roads.

In El Salvador's 2007 Population and Housing Census, the General Directorate of Statistics and Censuses (DIGESTYC) states that the area of urban residence is the area comprised by the population centres that surround, in a continuous way, the municipal offices and which is known as the urban centre of the municipality (DIGESTYC, 2009, p. XIV). Also included as urban are those housing clusters that, despite their remoteness from the urban centre of the municipality, have a population density value equal to or greater than 1,000 inhabitants per square kilometre and a minimum of 500 dwellings continuously grouped together forming blocks (DIGESTYC, 2009, p. XIV). In Costa Rica, in turn, the methodological guidelines prepared by the National Institute of Statistics and Censuses (INEC) for the 2011 census follow a dichotomous definition, in which urban areas are defined as the administrative centres of each canton or district, with other places included according to certain physical and functional criteria such as streets, pathways, urban services (refuse collection, public lighting) and economic activities, with all remaining areas deemed rural (National Institute of Statistics and Censuses, 2012).

The common element in these four definitions is that they define the rural as the remainder, as what is not urban: they include only two types of territories (urban and rural), without recognizing the existence of a wide range of intermediate spaces, and they are static in nature, as they do not reflect growing interactions between territories.

The new proposals for defining rurality were based on the conceptual framework of the new rurality presented by Gaudin in chapter I of this book, with the addition of aspects specific to each country that were considered central for the new definitions. The exercise did not involve starting from pre-established criteria in order to produce common indices for the four countries. Instead, the teams of experts working in each country, in consultation with national public agencies, selected their own approach and variables for constructing the alternative indicators, reflecting national characteristics and interests. Table VIII.1 summarizes the alternatives proposed for each country.

Table VIII.1
Alternative indicators for defining rural and urban in the “New narratives for rural transformation in Latin America and the Caribbean” project

Costa Rica	El Salvador	Mexico	Panama
Three-dimensional rurality index (population density, population employed in primary activities, economic activities in the territory, natural forest conservation).	Scenario 1. Population density with a threshold of 1,000 inhabitants per km ² and intensity of night-time illumination. For municipalities and functional territories.	Relative rurality index (RRI) (population, population density, percentage of built-up area, distance to an urban locality).	Environmental rurality index (population density, forests per township, agriculture per township).
Functional rurality index (worker commuting, urban area detected using day-time satellite imagery).	Scenario 2. Threshold of 1,000 inhabitants per km ² , light intensity and territorial economic functionality index (an index constructed from concentration by firm size, concentration by firms' economic activity, electricity consumption per capita, economically active non-agricultural population, number of streetlamps per person, amount of capital per worker, employment per municipality and a municipal productivity index). For municipalities and functional territories.	Accessibility index (population, road network coverage and condition).	Relative rurality index (population, population density, percentage of built-up area, distance to an urban locality).
Multivariate rurality index (access to education, health, drinking water, electricity, information and communication technologies, protection of the natural resource base).	Scenario 3. Precarity index (constructed from the following variables: residential marginality index, labour exclusion index, gender labour participation gap, percentage of young people outside education and the workforce, monetary poverty rate, Gini coefficient and homicide rate per 100,000 inhabitants). For municipalities and functional territories.	Thiessen polygons to delimit zones based on localities' population (population density and land use: construction, agriculture, other uses).	Demographic rurality index (population density, land devoted to agriculture by township, population born in another district).
Combined rurality index (three-dimensional rurality index, functional rurality index, multivariate rurality index).		Categorization of rural-urban areas based on 1 km ² grids (population density and contiguity of areas with similar densities).	

Source: Prepared by the authors, on the basis of chapters IV, V, VI and VII of this publication.

Population and housing censuses are the main information source for the alternative indicators, complemented —depending on the index— with data on land use, natural resources, the road network, distances between localities, day-time satellite imaging and night-time satellite images of light patterns. Complex indices were also included, such as El Salvador's precarity index, which contains socioeconomic, infrastructure and business variables from various sources. Different methods were used to construct the composite indices and indicators, such as geometric means and cluster analyses. Chapters IV, V, VI and VII of this book contain detailed descriptions of each of the indicators.

The following reflections arise from an overall review of the four cases:

- The indicators proposed for the four countries go far beyond the dichotomous approach to the urban and the rural. Some offer continuous measurements that portray a gradient of urbanity and rurality, while others recognize the existence of a range of intermediate territories between metropolitan and deeply rural areas.
- As for composite indicators, they include dimensions of particular relevance to each country: the protection of forested areas, for example.
- The classification of the territories produced by using the indices goes beyond the administrative demarcations used in each country (such as municipalities, cantons or townships).
- Indicators such as Costa Rica's functional rurality index and scenarios 1 and 2 in El Salvador use a dynamic approach, recognizing that interactions between geographic spaces are key to defining territories and their characteristics. In the case of Mexico, the accessibility index includes a dynamic analysis of those territories that have access to road networks and the state of those roads.
- The range of proposed indicators includes simple indices that give major weight to the number of inhabitants and population density and that do not use normative preconceptions of rurality: in other words, they do not *a priori* associate rural areas with such socioeconomic characteristics as income level

or access to public services (health, education, electricity and so on). Complex indices were also developed that, in addition to distinguishing the urban from the rural, categorize different types of rurality according to socioeconomic or environmental indicators.

- Population density was the most commonly used variable in the four case studies, but a wide range of additional variables were also deployed.

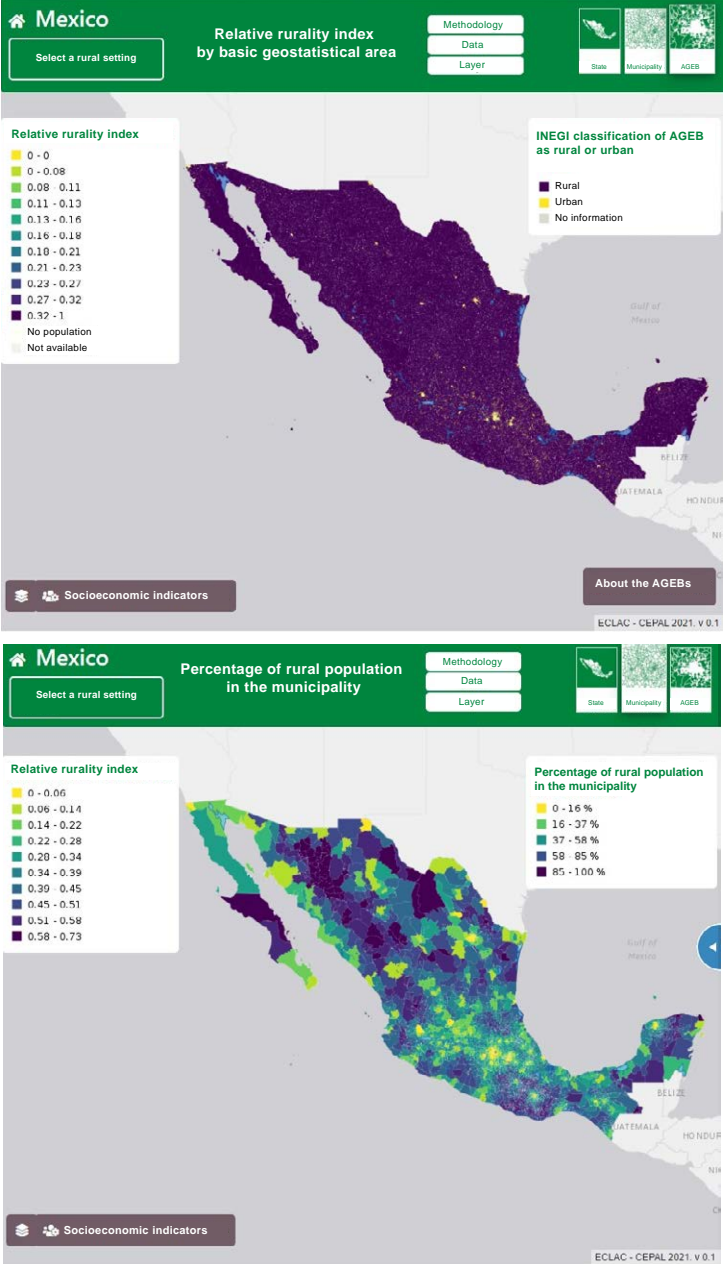
Map VIII.1 shows, as an example, the difference in Mexico's rural-urban territorial division between the official definition and the results of the RRI. In the top map, the country's territory is distributed between two colours, in keeping with the dichotomous official definition. In contrast, the bottom map, which follows a gradient approach, shows 10 colours indicating different values in the RRI. The darkest areas, which have the highest RRI scores, indicate the most deeply rural territories.

According to the official definition, 22% of Mexico's population lives in rural areas, while the RRI indicates that 44% of the population live in territories that are, to a lesser or greater extent, rural. As explained by Dirven and Candia in chapter II, official definitions in Latin America and the Caribbean tend to underestimate the rural population.

Map VIII.2 illustrates another alternative approach, based on functional territories, which was used for El Salvador. Based on scenario 1, using population density and satellite images of night-time luminosity, a number of what can be considered functional territories were identified and categorized into four types: urban-urban, urban-rural, rural-urban and rural-rural.

These new definitions of rurality have significant implications for territorial socioeconomic analyses. Table VIII.2 takes the example of Panama, presented in chapter V of this book. The last column shows the percentage of households without electricity. According to the official criteria, 38% of rural households do not have electricity. If a non-dichotomous criterion is followed, such as the one proposed by the RRI, that figure stands at 66% in territories with an RRI of level 6 but drops to 10% in level 2 territories, providing a much more realistic and specific identification of rural conditions to guide public policy.

Map VIII.1
Mexico: territorial categorization by the official definition
and the relative development index



Source: Prepared by the authors, on the basis of Economic Commission for Latin America and the Caribbean (ECLAC)/International Fund for Agricultural Development (IFAD), "Nuevas narrativas para una transformación rural en América Latina y el Caribe" [online] <https://www.cepal.org/es/proyectos/fida-nuevas-narrativas>.

Degree of rurality township (RRI)	Number of townships	Total population (Percentages)	Population employed in the primary sector (Percentages)	Population 15 years and older with completed secondary school in 2010 (Percentages)	Households without electricity access (Percentages)
RRI level 5: [0.394 and 0.427]	63	3	51	9	53
RRI level 6: [0.427 and 0.454]	63	3	61	7	66
RRI level 7: [0.454 and 0.480]	63	3	59	8	56
RRI level 8: [0.480 and 0.526]	63	3	59	6	65
RRI level 9: [0.526 and 0.898]	63	2	58	7	51
Official definition					
Urban		65	2	25	1
Rural		35	41	11	38
National			12	21	14

Source: I. Soloaga and others, chapter V of this publication.

The project's second outcome involved the analysis of the effects of redefining rurality on public policy, based on the understanding that how it is defined is not neutral for policy design and implementation. Interactions with public officials and experts allowed the identification of several areas in which the new approach to rurality has the potential to impact public policies, which are summarized in table VIII.3.

Table VIII.3
Public policy areas where the new definition of the rural and the urban has a potential impact

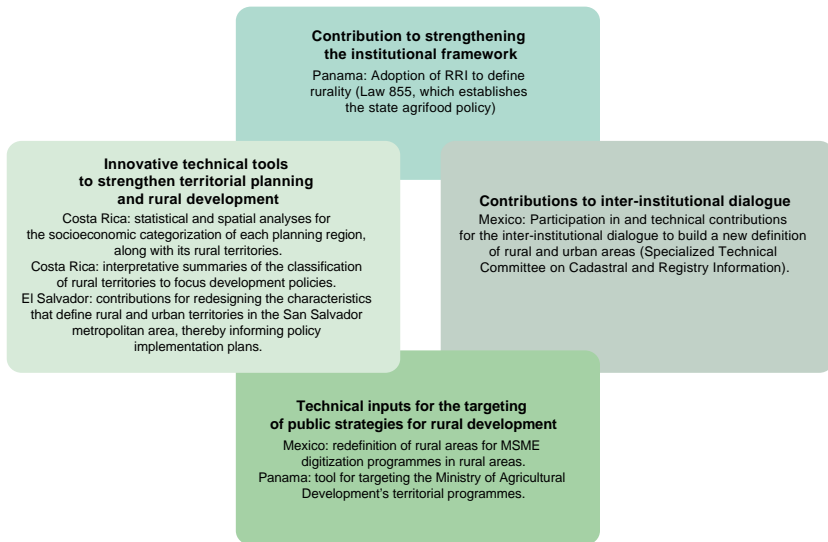
- Allocation of public funds to investment projects.
- Social transfers for population segments.
- Strengthening the institutional framework (laws, regulations, structure of public organizations).
- Subsidies for activities or the setting of public salaries and/or minimum wages.
- Territorial planning and development policies.
- Defining the rules for democratic representation.
- Defining public security policies.
- Designing strategies to support specific territories.
- Defining a national cohesion policy to strengthen the social compact.
- New definitions of rural areas for constructing the census framework and administering agricultural censuses and economic surveys.

Source: Prepared by the authors.

Over the course of the project, interactions with the selected countries' institutions focused on four areas in particular, as shown on figure VIII.1: (i) contributions to strengthening the institutional framework; (ii) development of innovative technical tools to strengthen

territorial planning and rural development; (iii) contributions to the inter-institutional dialogue; and (iv) technical inputs for the targeting of public rural development strategies. Diagram VIII.1 also summarizes the areas of collaboration with the four selected countries. In addition to the wide range of areas in which the new definitions can be deployed, the exercise also illustrates their importance for the analysis and design of public policies at different administrative levels. For example, in Panama the exercise was conducted at the national scale; in Costa Rica it concentrated on subnational planning regions and rural territories; and in El Salvador the focus was on the San Salvador metropolitan area.

Diagram VIII.1
Examples of practical applications of the new definitions of rurality
in the four selected countries' public policies



Source: Prepared by the authors, on the basis of chapters IV, V, VI and VII of this publication.

The third outcome was the promotion of an inter-institutional dialogue. The results of the different stages—starting with the first proposals for indicators to redefine rural areas up to the public policy implications—were presented to and validated with various public agencies involved in the design and implementation of rural and territorial development policies and the regional distribution of public funds. The organization of national and regional seminars and technical workshops allowed a public-public dialogue to take place on the redefinition of rurality and its implications for public policy. The participants in this dialogue included ministries and agencies traditionally responsible for rural development,

such as Panama's Ministry of Agricultural Development (MIDA) and Costa Rica's Rural Development Institute (INDER), as well as ministries in charge of national planning, productive development, public finances, among others. In addition, the seminar "Towards a Regional Agenda on Public Policies for Rural Development," held in Panama City on 29 and 30 March 2023 and attended by representatives of more than 10 countries, made it possible, based on the project's findings, to organize a regional dialogue on public strategies for rural development.

The fourth result was the strengthening of national capacities. The interactions with the public organizations identified in the previous paragraph were also intended to build national capacities through the transfer of the methodologies developed and by providing training in the technological tools used. Interactions at all project stages were complemented with face-to-face and virtual workshops to provide training in the use of the technical tools developed. These activities were also aimed at building ownership of the outcomes and the project's long-term sustainability.

The availability of public statistics on population, housing, geography, socioeconomic conditions, infrastructure and other information was a key input for this exercise in the four pilot countries. With a view to replication in the rest of the region, however, it should be noted that not all Latin American and Caribbean countries have the information required for these analyses.

The main source of information was the population and housing census, which is usually conducted every 10 years. The construction of a rural-urban gradient is a structural exercise that portrays slow and gradual changes over time. The analysis resulting from the redefinition of rurality does not undergo fundamental alterations in the short term. In El Salvador, the most recent census was taken in 2007, which further highlights the need for updated data. One first opportunity identified for future exercises is the incorporation of data and statistics that will allow for intermediate or intercensal updates. Innovative information sources, such as night-time satellite imaging for illumination patterns, enable the publication of complementary information.

A second area for future work would be to use the experience of the four countries covered by the "New narratives to replicate the exercise in other countries in Latin America and the Caribbean" project to carry out exercises in other countries in the region that have the necessary information. This book, which systematizes the work carried out in Costa Rica, El Salvador, Mexico and Panama, could be a useful tool for organizing future work. As noted in the introduction, at the time this book went to press, ECLAC was working with the Dominican Republic on the construction of alternative definitions of rurality.

A third possible area for future efforts is the construction of a common index for all the countries of Latin America and the Caribbean to facilitate intra-regional comparisons. In other words, alongside national efforts to redefine rurality—which should take the specific characteristics of each country into account—it would be advisable to have a common index for the region. In that regard, at the regional seminar held in March 2023, the participants agreed on the importance of establishing two complementary indicators: (i) one index in line with each country's characteristics and needs; and (ii) another index that uses a common or comparable methodology for all the region's countries. The RRI, which was developed for Mexico and Panama, or the one-km² grid proposal presented in the case of Mexico are alternatives that use a limited number of variables that are generally available in all countries. Regional discussions, in the case of Central America, could be strengthened with the participation of regional institutions such as the Secretariat for Central American Economic Integration (SIECA) and the Central American Statistical Commission of the Central American Integration System (CENTROESTAD).

The countries of Latin America and the Caribbean face wide and persistent development gaps between urban and rural areas. Climate change is transforming the livelihoods of the region's people. Food security and food sovereignty are also becoming increasingly important because of the growing environmental vulnerability of territories and the volatility of basic grain prices. This book calls for greater cooperation among the countries of Latin America and the Caribbean to build a shared agenda for the design and implementation of an inclusive territorial development agenda in pursuit of the 2030 Agenda's Sustainable Development Goals. In addition, the work carried out by this project in Mexico, Central America and the Caribbean could contribute to actions under way in other regions of the world to strengthen their territorial development policies and to reduce rural poverty and inequality with a view to achieving the SDGs. The exercise conducted in the San Salvador metropolitan area revealed the large socioeconomic gaps that separate different urban and rural territories. A clear understanding of those gaps and their correct measurement are essential in designing policies to close them.

The study of the new rurality in Latin America and the Caribbean, the revision of official definitions and the analysis of the public policy implications provide important lessons for attaining the 2030 Agenda. First, it confirms that the official statistics underestimate rural areas. Efforts to combat lags in rural areas—the territories that, as noted above, pose the greatest challenges for the fulfilment of the SDGs—must be stepped up to address populations and territories that are larger than initially thought. Second, it reaffirms that rural areas are diverse and that their development demands targeted policies. Rural development

strategies must be differentiated, taking account of the wide range of capacities, vocations and needs found in rural areas. Third, rural areas are dynamic, and so those strategies must also consider integration between rural territories, as well as between rural and urban areas.

Rural areas offer an opportunity to promote new forms of growth and inclusive development in Latin America and the Caribbean. The concentration of the population and economic activities in metropolitan areas is coming up against constraints, seen in problems of pollution, natural resource depletion and production costs. Decision-makers must define a new paradigm for territorial growth, taking advantage of and preserving the advantages and opportunities offered by rural areas, in all their diversity, for pursuing activities that can provide quality jobs and well-being, following a sustainable approach.

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Rural areas have experienced major economic, social, demographic and cultural transformations in recent decades. Rurality is no longer synonymous with agriculture, and heightened interactions between rural and urban areas have had a significant impact on the identities of their populations and the characteristics that define those territories. In Latin America and the Caribbean, however, these transformations have remained relatively invisible to statistics and public policy because of the prevalence of dichotomous and static approaches to the measurement and characterization of rural areas.

This study presents new methods for defining and categorizing rurality and analyses their public policy implications. A redefinition that recognizes the diversity and wealth of rural areas offers opportunities for the design of innovative rural development public policies that could accelerate the attainment of the Sustainable Development Goals.