



Review

# The Interaction between Urban and Rural Areas: An Updated Paradigmatic, Methodological and Bibliographic Review

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Abstract: The relationships and interactions between rural and urban spaces have long been of interest in the territorial sciences. However, the approaches taken to these questions have evolved in line with the changing characteristics of the two types of territories, reflecting new relationships and structures. From these premises, we update the concept of rural-urban interaction by means of an extensive bibliographic review, which, among other results, highlights: (1) the profound change that has taken place in recent years in rural-urban interaction through processes such as de-agrarianisation, the tertiarisation of the economy and improvements in transport and communication infrastructures; (2) the resulting obsolescence of earlier typologies and procedures focused on discrimination between rural and urban environments, rather than on the interaction between them; (3) the difficulty of establishing valid, widely applicable typologies, given the profound differences in terms of (a) the scale and content of the statistics available in each country and (b) the territorial background in terms of economic functions and the characteristics, ancient and modern, of human settlement; (4) the predominance of an urban-centric approach, to the detriment of more traditional rural functions, such as agriculture, the importance of which is diluted by its low relative weight in terms of employed population and contribution to GDP. Consideration of these findings leads us to propose a new approach to the question of rural-urban interaction, reflecting the multifunctionality of rural spaces, and we identify useful areas for future research.

**Keywords:** urban sprawl; rural–urban integration; countryside urbanisation; deagrarianisation; land use



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#### 1. Introduction

Any study of rural–urban relations and interactions requires the fundamental assumption that some spaces can be classified as "urban" and others as "rural". Although this is indeed true, urban and rural areas do not constitute two separate territories that can be considered in isolation. On the contrary, they are strongly interrelated in many ways, and their connections must be investigated, theoretically and empirically, in terms of identity, causality and effects.

Terms such as *rural* vs. *urban* and *the country* vs. *the city* are commonly used to identify the main types of geographical spaces, both in academic circles and colloquially. Defining them, in both cases, usually involves a simplifying conceptual approach to address interdependent and complementary realities, focusing on the main features of their interconnections; hence, the numerous and continuing attempts to derive an almost impossible conceptual delimitation that, until recently, and especially in the case of rural spaces, usually lacks completeness and accuracy [1,2].

In recent decades, studies of territorial transformations have mainly focused on urban spaces, an interest that is understandable in the present era of planetary urbanisation. In contrast, rural spaces have been relegated to a subsidiary plane, except for issues related to sustainable development. This division of attention persisted until long-standing problems

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in the rural environment, such as economic recession, falling agricultural potential, population aging and demographic decline, intensified and threatened to become entrenched. In parallel, the rise of globalisation has increased the distance between where food and raw materials are produced and where they are consumed. The great paradox of this situation is that massive urbanisation has led to a world in which 55% of the population lives in urban areas, a proportion as high as 80% in high-income countries (U.N.); moreover, 80% of the land surface is employed for purposes that are fundamental to the biosphere and to human existence.

It is not our intention here to enter into the knotty question of defining rurality and urbanity, a topic that has been addressed in different ways in diverse areas of knowledge. The literature in this respect is comprehensive and well-attested [3–9]. Although the epistemological debate remains open and is of great interest, we believe the present analysis is not the most appropriate context for an in-depth consideration. Accordingly, we adopt the standard spatial definitions of rurality and urbanity, particularly those that are most recent and suited to the current reality, using them pragmatically as a means of addressing the economic, demographic and territorial structures of rural spaces.

The research project from which this article is derived was undertaken to provide reasoned, well-founded answers to the following questions:

- How have epistemological and methodological approaches in territorial sciences, especially geography, evolved in terms of the interactions between rural and urban spaces?
- What factors underlie recent changes in these approaches?
- Have changes in territorial realities modified the approaches taken and methods used to analyse rural-urban interactions?
- Are obsolete perspectives and methods, unrelated to current territorial realities, still encountered?

For the present, our main study aim was to consider the evolution of the various approaches taken to address the increasingly complex relationship between urban and rural areas and the ways in which one type of space—specifically, urban areas—has influenced the transformation of rural spaces. It is not our intention to establish new theories but to synthesise the dynamics of those currently proposed. To do so, we have compiled an extensive selection of the most important published references on this subject, both in general and for each approach and perspective in particular. By these means, we hope to endorse the results obtained and make this validated information available to future researchers in this field

To achieve these objectives, we adopted a qualitative methodological process based on: (1) selecting concepts, notions and terms concerning rural—urban relationships and interactions; (2) reviewing the scientific literature related to these conceptual elements; (3) compiling the main texts from the academic literature on this subject from the mid-20th century to the present day; (4) reading these texts and performing a critical analysis and synthesis of the approaches and perspectives described in the literature, as well as determining a typology of these approaches and of their temporal and special dynamics; and (5) making a critical selection of the methods that are currently being applied most commonly and effectively to analyse and interpret rural—urban relations and interactions.

On the basis of this review, we: (1) explain and clarify this conceptual evolution within the framework and context of real-world territorial dynamics, revealing the coherence between theory and reality at each stage; (2) systematise the main variables and, from this, analyse the features of rural–urban interactions, discussing the advantages and shortcomings of each method used to study them; and (3) propose new forms of analysis appropriate to the greater complexity now presented by this interaction.

# 2. Results

2.1. Interaction between Rural and Urban Spaces: Updating the Theoretical Framework

The terms "rural" and "urban" refer to spatial realities that have often been interpreted as opposed, or even antagonistic and divergent [10,11], from a dichotomous binary

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perspective based on alterity to the urban environment. This approach not only represents a simplification in various respects but also expresses a non-existent homogeneity of rural and urban spaces, as if there were only one model of each category.

The spatial reality is much more complex than the above notion. Moreover, this complexity is increasing, and a complete understanding of the question would require multiple interdisciplinary analyses. This is particularly so today, when hybrid spatial environments [12] and numerous multifunctional rural landscapes are taking shape [13]. Although the most intense interactions are taking place in rural spaces that have become integrated into functional urban and peri-urban areas, rural spaces that are more distant or less well connected with urban ones are also experiencing the impact of cities, albeit indirectly; for example, as falling levels of population caused by rural–urban migration [14].

As regards the first aspect, many rural areas are now witnessing the birth of a distinct spatial reality. The term "new rurality" [15–18] refers to the reconstructed forms of organisation and the functional transformations being observed in spaces that previously had a rural identity and that are now evolving towards a different category of rural space [19,20]. Although the meanings assigned to this term by different theorists do not always coincide—in particular, there are significant conceptual differences between European [21] and Latin American authors [22–28]—it is generally accepted that the essential features of this "new rurality" consist of an increased mobility of people and goods, the diversification of economic activities and a modification of land use [29,30].

A major socioeconomic transformation that has taken place in many areas is that of "deagrarianisation" [31–38], or a reduction in the importance of agrarian activities, in terms of employed population and income and the correspondingly greater weight of non-agrarian forms of occupation. Deagrarianisation leads to a progressive loss of traditional ways of life, such that agrarian activity ceases to constitute the economic base and the main hallmark of rurality. It is a process that responds to the new productive and territorial logics of the globalised economy and has been associated with deruralisation [39] from a perspective based on the premise—quite questionable in our opinion—that the rural environment can be fully identified with agricultural activity. As concerns Spain, deagrarianisation [40–42] has been cited among the structural causes of the rural exodus, with particular reference to the modernisation of agrarian activity [43]. For this reason, it is often viewed as an effect that is generalised and not exclusive to urbanised rural areas.

Another significant change, as a general rule complementary to the above, is the shift in patterns of employment and economic activity towards the services sector, together with the acquisition of a subsidiary residential function with the construction of second homes for the urban population [44–46].

The historical interaction between rural and urban spaces has evolved incessantly, profoundly transforming relations between the countryside and the city [47] and blurring the boundaries between urban and rural environments. Nevertheless, significant differences remain, and few authors question the existence of a rural–urban divide. Moreover, scholars have observed the gradual consolidation of fissures between different types of rural spaces [48–50], although they may be concealed by the regular occupational mobility of a large part of the rural population [51,52].

It is almost universally acknowledged that the main driver of these changes is "rural urbanisation". This process has many consequences, including the physical modification of the territory and changes in its socioeconomic structures [53–55]. This urbanisation is functional, morphological, landscape-based and cultural, and it takes place not only in areas bordering or readily accessible to large cities but also in more remote territories and those bordering medium-sized and even small cities [56–58], which thus configure micropolitan areas [59].

The fact that urbanisation processes are the main factor triggering the territorial mutations that have occurred in many contemporary societies [60–62] explains the primacy of the urban-centric standpoint that has been adopted in most studies of rural areas, both past and present [63,64]. Thus, it is very widely accepted that the revitalisation

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of rural spaces takes place via logics according to which they are modified physically and socially. These logics, moreover, impact the strategies used to obtain the economies of urban agglomeration, such as spatial externalities, from which some rural areas also benefit [65–70]. In contrast, other spaces, generally those in peripheral and marginal locations, may suffer adverse effects from backwash, a process associated with the centreperiphery paradigm [71–81].

The urban-centric notion is also related to numerous concepts and words that have been coined to define the changing relations between rural and urban environments: "suburbanisation" [82,83], "peri-urbanisation" [84,85], "rurbanisation" [86–88], "exurbanisation" [89], "rural urbanity" [90], "rural gentrification" [91–93], "urban countryside", "infiltration of the city into the countryside" [94], etc. In addition, some of these terms are closely related to a process that has been termed "counter-urbanisation" [95–98]. The proliferation of recent studies addressing these concepts highlights their conceptual interest and underlines the presence of a renewed dialogue between rural and urban geographies.

Another relevant consideration is the territorial concept of a sprawltown [99–101], also identified as "città diffusa, campagna urbanizzata" [102–110], characterized by the absence of vertical territorial hierarchies from the centre to the periphery, which are replaced by horizontal connections among population centres and by the dispersion of functions [111,112].

It is now widely accepted that the former elements of differentiation between urban and rural contexts have ceased to be operational and that alternative approaches to spatial realities are required. One such approach involves the functional integration of the two types of geographical space, whose signs of identity, such as agricultural activities, are weakening but have not entirely disappeared [113]. One outcome of these changes is the creation of multifunctional spaces and hybrid landscapes [114–116], ambiguous spaces in which urban and rural characteristics fade or even disappear as clearly legible spatial units within the landscape [117–119].

Recent studies of these questions have adopted a more fully integrated perspective of geographic space, going beyond the dichotomous standpoint, which many believe reflects an anachronistic static perspective [120–132].

Geographical space has long been viewed and analysed as a continuum, containing a gradual transition from urban to rural and vice versa, without remarkable territorial discontinuities [133]. However, this interpretation has been challenged by some authors [134] and updated and reformulated by others [135–137]. Nevertheless, for most experts, the concept of a spatial continuum is accepted as a gradient of levels of urbanity/rurality [138] or as cyclical phases of urbanisation [139].

Some authors even deny the usefulness of traditional terminology for different types of spaces (suburban, peri-urban and rururban), claiming that what has been configured is a new model of the disassociated city that is post-industrial or even post-urban [140–145], which should be viewed as a joined-up mosaic of urban elements within a territorial matrix [146] as the result of "metastatic metropolitanisation" [147–149].

The question of how rural and areas are interrelated has attracted growing interest since the end of the twentieth century [150], and increasing numbers of studies have been undertaken in this regard, influencing socioeconomic and land-use planning policies for rural areas and leading to the adoption of new paradigmatic and methodological approaches. This new standpoint might be seen as a "rejuvenation" of rural geographic studies, based on a scientific and epistemological renewal achieved through dialogue and debate among rural and urban researchers seeking to enhance our understanding of developments in this area [151]. Although the contemporary approach to rural geography maintains some classical criteria, it also reveals new perspectives and takes increasing interest in the diverse practices and representations of the rural environment and its inhabitants [152–154].

This evolving research focus first became apparent in the United States and Europe [155–171] and then later in Latin America [172–179], and it is currently becoming accepted in Asia, especially in China [180–183]. In the latter country, following the ac-

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celerated urbanisation of the countryside under the model of state capitalism applied in China since the late 1970s [184], dramatic changes have taken place in land use, with a large-scale conversion from agrarian to urban practices. This development has attracted the attention of numerous researchers from different areas of knowledge, including geography, economics and the environmental sciences [185–190].

Numerous recent studies have analysed and interpreted the functional territories [191] resulting from rural–urban integration or hybridisation [192–195] in the area termed the "rural-urban fringe", viewed as a space with its own unique characteristics [196,197]. This entity has also been described as the "urban-rural interface" and as being composed of urbanised rural areas, intermediate territories, in-between territories (TiBs), the territories of a new modernity [198,199] or "hybrid geographies".

Most studies of these questions have focused on the territorial transformations arising from economic and technical changes (deagrarianisation and tertiarisation, in particular) in the distribution of services and production centres, in physical and virtual accessibility and, especially, in mobility [200].

On the other hand, some recent analyses of rurality and urbanity [201,202] continue to address quantifiable data such as population size [203–207], population density and/or distances between settlements of different categories [208,209]. However, these indicators are relatively ineffective as a means of describing rurality [210–212], even the multivariate ones incorporating not only population density but also factors such as demographic dynamics, mobility patterns, migrations and distances to major service centres [213–217]. Very few analyses have also used geographic information techniques for territorial measurement [218,219].

It has been observed that the effects of the urbanisation of rural spaces should be considered according to the specific conditions of both the rural and the urban spaces in which the process takes place [220]. The rationale for this is that the dynamics of urbanisation do not occur in the same way or with the same intensity in all territories. In recent times, both the variety and the complexity of rural spaces have intensified; some are evolving dynamically, while others are characterised by stagnation and decline.

# 2.2. Epistemological Results: Systematisation of Sources and Methodological Procedures

According to Nelson et al. [9] (p. 352), "Given that situational contexts of the rural vary across the globe, as well as within individual countries, and that different rurality definitions have different purposes, it is widely acknowledged that there is no single index, set of factors, or scale". Accepting this statement as a premise, in this section we systematise the methods and sources applied in the diverse texts reviewed in the previous section. In the Discussion section, this systematisation is used to analyse the advantages and disadvantages of these methods and sources for studies of the rural–urban interaction. Our analysis then focuses on the approaches based on socioeconomic variables—that is, excluding perceptive and cultural approaches—seeking to achieve the following main goals: (1) a series of tables systematising the indexed variables, thresholds and scales observed; (2) a justification of their analysis in the study of rural–urban interactions. The outcomes of this systematisation are summarised below.

## 2.2.1. When Available Sources Are the Main Conditioning Factor

As shown in Table 1, the sources were systematised into two large blocks, those of a statistical nature (Table 2) and those related to different forms of digitisation.

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**Table 1.** Index of the sources used, based on the literature consulted.

	SUBJECT		
Level 1	Level 2	Level 3	
	Geocoded data -	Microdata [203]	Demographic and economic data
		Population density in raster format [201]	Rural-urban continuum
	Maps .	Road network map [201]	
Georeferenced		Map showing population centres with >50,000 inhabitants [201]	Calculating accessibility
information		Digital terrain map [201]	
		Supervised classification of Landsat images [201]	Rural-urban continuum
		CORINE land cover [9]	"Close to nature" land uses
	Big data	Cell phone and remote imaging data [9]	Movements of goods and people
Statistics	See Table 2		

 Table 2. Concept indices and variables applied, according to our literature review.

Concept Index 1	Concept Index 2	Variable	
		Density [204,211]	
	Settlement and Urban system	Number of inhabitants in the nucleus [202,204]	
	Cibait system	Existence or otherwise of city [204]	
		Urban cluster	
		Being adjacent or otherwise [204]	
Spatial distribution of the population		Commuters [204] Local [203] Intraregional [203] Extraregional [203]	
	Proximity or otherwise to metropolitan areas [204,211]	Mean distance to areas with a large surplus of workplaces in 2004 [203]	
		Accessibility to services, measured in driving time [9,202,203,211]	
		Mean distance to motorway [203]	
		Access to land and maritime infrastructures such as highways, railroads and ports [9]	
		Number of urban centres to be crossed to reach an urban nucleus [203]	
Demographic		Population growth [9,202,203,211]	
dynamics		Migratory movements [202]	
Age structure	[202,203]		

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Table 2. Cont.

Concept Index 1	Concept Index 2	Variable			
		Workplace evolution 1994–2004 [202]			
	Job opportunities [202,203]	Employment/unemployment rates [9]			
		Rate of self-employment (%) [9]			
	01.11	Level of education [9,211]			
	Workplace evolution 1994–2004 [Incomplete the productive fabric	Skilled manpower [203]			
Economic activity  Diversification of the productive fabric  Diversification of the production employed population employed recreation  Population employed Population employed Population employed recreation  Population employed Fopulation employed recreation  Population employed Fopulation employed recreation  Farm ow		Number of workers per sector [203,211]			
		Non-agricultural jobs [9]			
		Population employed in service sector (%) [9]			
Economic activity		Population employed in professional and real estate services [9]			
Economic activity		Population employed in medical and dent professions [9]			
		Population employed in entertainment and recreation services [9]			
		Population employed in public sector [9]			
		Population employed in retail trade [9]			
		Number of establishments per sector [204]			
		Farm owners [204]			
	Agricultural structures	Agricultural production [9]			
		Land area dedicated to agriculture [9,203]			
	Labour productivity [202]				
Land use		Change in use [211]			
		Road conditions [9]			
Infrastructures		Land and maritime infrastructure [9]			
	Income [204]	County [204]; household [9,211]			
	Revenue [204]	come [204] County [204]; household [9,211] evenue [204]			
Other parameters	Number of pensioners [9,211]				
outer parameters	Persistent poverty [9]				

The former, which are detailed in Table 2 below, are the subject of a very useful discussion for our study purposes. Nelson et al. described the dependency between procedures and results, and the characteristics of available sources, as follows [9] (p. 352): "frequently the selection of specific variables for rurality measures is not explicitly grounded in a guiding theory or conceptualization of the rural, and may perhaps be more a reflection of conveniently available data than an actual representation of the nature of rurality for a specific location". This circumstance has various consequences that affect the reliability of the results:

(i) One is the impact of temporality. This aspect is not usually included in typologies or studies of rural-urban interaction, which are predominantly focused on obtaining a representation at a given time. However, according to Johansen et al. [203], the historical perspective, at least in the medium term, is of essential importance to achieve an understanding of the different situational contexts that may arise. Another important consideration is that the most common statistical sources (censuses) are

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usually decennial, which, although very appropriate for monitoring changes in the medium term, are often inadequate for determining the situation at a given moment. It is also important to consider the question of scale, which has various impacts. The first of these is the fact that, in every country, the boundaries established for territorial administration influence the statistical information compiled, meaning that any studies of rural-urban interaction are subject to inconvenience or bias in this respect. Issermann [204] remarked on the problems arising from the combination of different forms of rural-urban interaction within the same spatial unit. Another dimension of this problem concerns the situational context. In this respect, diverse types of identification are applied, such as the county in the USA and the TL3 level in the OECD classification (equivalent to the juxtaposition of several counties). The proposal by Johansen et al. (referring explicitly to the Danish context) is a good example of a typology for characterising territorial construction, identifying the "parish" as the basic element for the analysis of rural-urban relations. Although, strictly speaking, this concept cannot be extended to other countries, since it indiscriminately mixes administrative terms (such as the commune) with customary terms (parish, locality), the following very appropriate observation is made: "the size of the rural unit had, as a starting point, that the size should be sufficient to capture local identity and culture". In contrast, if the question to be identified is the capacity of urban centres to include rural areas in their sphere of influence, the necessary scale must be increased, highlighting radial distances to outlying areas, the corresponding travelling times and the numbers of persons regularly commuting, as shown in Table 2.

The second impact regarding scale is the type of information available. There is a directly proportional relationship between information detail, especially in terms of economic activity, and the spatial concentration of the population—thus, the greater the number of inhabitants, the greater the detail of productive specialisation. It follows, therefore, that for rural populations, which, as discussed below, are associated with low population volumes, there is a lack of detailed information on their economic activity. Consequently, the data sources needed to measure the interactions between rural and urban activities are inadequate or absent. In this regard, too, another limitation should be noted: the type of information available also depends on the corresponding administrative body, which often filters and supplies data according to its own interests and objectives.

Awareness of the above limitations, in parallel with the availability of alternative data sources derived from the application of new information technologies, particularly the possibility of linking data in real time to their georeferencing coordinates (geographic information systems and big data), has fostered the inclusion of these sources among those used to calibrate the rural–urban relationship. As can be seen in Table 1, they can be used in various ways. In chronological order, remote sensing applied to land uses provides a highly detailed view of the degree and morphology of urban land use (including factors such as housing density and complementary facilities) and of agrarian soil use, indexed in such a way as to reveal plant and crop types and their degree of naturalness. Basic mapping is the usual means of measuring urban accessibility, in terms of the hierarchical network of roads and transport infrastructures. However, the incorporation of digital terrain models greatly increases the accuracy of this information. A recent innovation is the georeferencing of statistical data. Organisations that make use of this facility can make their analysis independent of the administrative units concerned. Finally, although it is still at an early stage of development, the analysis of big data referring to the movements both of persons and of goods offers great potential.

#### 2.2.2. Typologies and Thresholds: Interaction or Segmentation?

As described more generically by Nelson et al. [9], the relevant variables can be entered into a procedure for classifying spaces (at a given scale) by means of quantitative systems that may be more or less complex (multivariate analysis vs. the arrangement of criteria in contingency tables, respectively). This categorisation procedure has bene-

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fits that are both practical—for example, spatially identifying where specific corrective measures need to be applied in order to alleviate inequalities between urban and rural spaces—and academic—identifying the spatial distribution of the above-mentioned types of rurality. Closely linked to these typologies are the thresholds corresponding to each of the ranges identified.

- (i) Our literature review corroborates the observation by Nelson et al. [9] that widely varying thresholds are used in discriminating urban from rural areas and leads us to conclude that these typologies have limited validity as an instrument of analysis since the meaning of these thresholds is largely dependent on the context from which they are derived. Moreover, in line with the above observations, both the scale and type of resource considered impact the thresholds and, therefore, the typologies established.
- (ii) Another fundamental application of threshold analysis is to interpret the distributions of the values obtained. A priori, negative extremes, for variables such as employment, demographic dynamics (depopulation), skills levels and accessibility to basic services, are often considered indicative of predominantly rural areas. And that is why US institutions and the OECD focus on these measures to detect spaces where remedial public policies need to be implemented.

Another approach, proposed by Issermann, is to focus on rural—urban interaction rather than rural—urban discrimination [203]. This interaction, too, can be derived from the variables linked to the concepts of centrality and the urban system (see Tables 3 and 4); i.e., adjacency or otherwise to the metropolitan area (or urban core, or the town per se), although with more detailed thresholds and intervals (from >1 million to <2500 inhabitants).

**Table 3.** Classification of counties according to the Rural-Urban Continuum Codes of the US Department of Agriculture. Criteria applied and values obtained.

Adjacent to a Metropolitan Area	Inhabitants (n)							
				Urban Population				
	>1,000,000	250,000 to 1,000,000	<250,000	>20,000 to >250,000	>2500 to 19,999	<2500 or Completely Rural		
	(1) Metropolitan county	(2) Metropolitan county	(3) Metropolitan county					
Adjacent				(4) Non-metropolitan county	(6) Non-metropolitan county	(8) Non-metropolitan county		
Non-adjacent				(5) Non-metropolitan county	(7) Non-metropolitan county	(9) Non-metropolitan county		

# 2.2.3. Variables

Based on Table 2, these are the concept indices and variables applied, according to our literature review:

- (i) The settlements and the urban system. The influence of some of the paradigms of quantitative geography on the measurement of and knowledge about rural—urban interaction has led to the above-mentioned predominance of approaches based on the capacity of urban centres to organise the population and function as a hub for the territory. Many studies in this area construct a hierarchy of population centres in terms of the number of inhabitants, the presence/absence of services, their area of influence (measured by numbers of commuters), whether or not they are adjacent to a metropolitan area and the travelling distance/time involved. However, recent processes of counter-urbanisation and peri-urban diffusion have reduced the value of the above approaches, leading analysts to resort to graphic sources or big data.
- (ii) Accessibility and transport infrastructure. For an urban space to become an activity hub, it must be accessible both to economic activity (resident workforce and commuters) and to services. In turn, this accessibility depends on the amount and type of

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- transport infrastructure available (roads, railways, ports, airports and transport links). When such a hub develops significantly, this can generate urban sprawl, both nearby (by fostering commuting) and at a distance (with the increased presence of second homes related to holiday tourism).
- (iii) Economic activity. This parameter can be studied from various perspectives. One is that of employment opportunities, the number and diversity of which are always assumed to be greater in urban than in rural areas. Another is the composition of the productive fabric, for which two complementary variables may be examined: the activity sectors of the employed population and of the business establishments (classified in Spain by the CNAE code). The above-mentioned concept of commuting refers to the dissociation between the place of residence and that of employment, which is one of the characteristics of the post-productivist evolution highlighted in our literature review, together with the predominance of tertiary activities, even in population centres with relatively few inhabitants. The skills level of the population, considered either as a whole or only as that of the employed population, can also be included among this set of variables, as this factor can be viewed as one of the causes of the lower occupational expectations of the rural population. With respect to employers, Issermann [203] considered their classification as rural or urban according to their location (the population rank), rather than focusing on the activity itself, an approach that warrants further discussion. Brezzi et al. [201] included labour productivity among the OECD parameters but did not specify the measures to be used. In contrast to the generally uniform approach adopted regarding the above variables, agricultural activity has been examined in diverse ways, with studies focusing on different parameters. For example, with respect to the number of farms, some authors measure agricultural production and associated land uses but do not include the interaction between rural and urban environments via the reciprocal supply of food and raw materials. Another approach [202] is based on the presence and/or proximity of natural spaces, defined by their use according to the CORINE classification system, with respect to urban areas. In this case, the agricultural function is expressly excluded under two initial premises. The first is that "understanding ruralurban interdependencies should include the rural ideal, which is the state of being 'close to nature'". The second is the strengthening of the 'feeling for the territorial community and associated social relations'.
- (iv) Changes in land use. This parameter is not considered among the economic variables, since it includes many of the factors and processes discussed above. Its meaning in this respect is clarified in the sources section.
- (v) Natural and spatial demographic dynamics—indices of population aging. Demographic vitality is an indicator that is commonly used to measure the effects of rural depopulation (via natural population decrease and high rates of aging). Other factors considered include the functions of peri-urban municipalities in metropolitan areas, particularly with respect to patterns of immigration among young families (which present high rates of natural growth and a population pyramid biased towards the young). Among the studies consulted in our literature review, the ratios used were limited to those of real population growth (in which respect only Brezzi et al. [201] examined migratory movements, using OECD-recommended parameters), indices of aging and the age structure of the population.
- (vi) Personal incomes. The identification assumed between rural spaces and marginality explains analysts' use of persistent poverty or personal income as an indicator of population imbalances and inequalities. However, wide variations exist in how these parameters are focused (per capita or per household), the scale used (for example, the county or the commune) and the method of calculation (GDP, income or tax information). Other data sources used to analyse this concept are derived from the relation between aging and retirement, such as the ratio of the number of pensioners to the size of the rural population.

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			Inhabitants (n)					
		>1,000,000	250,000 to 1,000,000 <250,000	Settlement				
Adjacent to Metropolitan Counties	Size of Metro Area		Large Metro Area	Small Metro Area	Micropolitan Area	Non-Core	Non-Core with Own Town	Non-Core with No Own Town
			1.	2.				
	Large	Yes			3.	4.		
	Small	Yes			5.		6.	7.
	Any metro	No			8.		11.	12.

**Table 4.** Classification of counties according to the Urban Influence Codes, as modified by Issermann [203] (p. 481): criteria applied and values obtained.

Meanings of the numbers: 1. In large metro area of 1 million residents or more, 2. In small metro area of less than 1 million residents. **Non metropolitan counties:** Micropolitan counties: 3. Adjacent to large metro, 5. Adjacent to small metro, 8. Not adjacent to a metro area, Non core counties: 4. Adjacent to large metro, 6. Adjacent to small metro, with own town, 7. Adjacent to small metro, no own town, 9. Adjacent to micro metro with own town, 10. Adjacent to micro metro, no own town, 11. Not adjacent to a metro or micro area with own town, 12. Not adjacent to a metro or micro area, and no own town.

#### 3. Discussion and Conclusions

Micropolitan area

In recent decades, studies of territorial transformations have mainly focused on urban spaces, an interest that is understandable in the present era of planetary urbanisation. In contrast, rural spaces have been relegated to a subsidiary plane, with the exception of issues related to sustainable development. This division of attention persisted until long-standing problems in the rural environment, such as economic recession, falling agricultural potential, population aging and demographic decline, intensified and threatened to become entrenched.

However, since the 1990s, interrelated social movements defending food sovereignty and proximity agriculture have denounced the climate change effects caused by the long-distance transport of goods and have proposed alternatives based on matching supply and demand between urban populations and their rural surrounds. Very recently, the weaknesses of the current system have been highlighted by two devastating events, first the COVID-19 pandemic and, subsequently, the international instability arising from the Russian invasion of Ukraine.

Thus, virtually all food production is subject to decisions taken in farming establishments located in particular social environments. However, the function and analysis of these environments are diluted within the concept of "rural spaces". These spaces are very often considered to be marginal because of their weak demographic weight. Nevertheless, their productive function is of great strategic importance to other areas, supposedly more dynamic and attractive for population flows and investments.

To summarise our final thoughts on this compilation and review of the scientific literature considered, it seems apparent that numerous research studies of rural spaces have been published, each taking a different approach and addressing specific areas of knowledge, and that some of the perspectives adopted in this field are changing in interesting ways. For example, scholars are increasingly focusing on the transformations produced in rural areas by the impact of urban activities, either nearby or further afield, when good connections exist.

Of course, the changes that have taken place in rural and urban environments have inevitably impacted the conventional paradigms discussed above. For example, the evolution in rural—urban interactions has heightened scientific interest in rural spaces, both the traditional ones and those that have been transformed. In consequence, recent studies in this area have proliferated. Indeed, it has been affirmed that this new outlook may represent a "rejuvenation" of rural studies, based on "scientific and epistemological re-

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newal", thus creating a fruitful dialogue between rural and urban researchers, facilitating an accurate understanding of these transformations. In this respect, several studies have been undertaken to examine and interpret the multifunctional territories resulting from rural—urban integration or hybridisation in "rural-urban functional fringes", interpreted as areas with their own identity.

Likewise, one of the most significant conclusions drawn from our own study is that the epistemological debate has moved on from a binary, antagonistic interpretation of geographical space towards approaches recognising the complementarity and subsidiarity of both types of territory. The former understanding of rural space as the simple negative image of urban space, with a unifunctional character (as a rule, agrarian), has been replaced with a new outlook, in which the rural environment is seen as something complex and multifunctional. Thus, there has been a shift from a uniform and almost invariable conception of rural space, as a paradigmatic spatial category, to the acknowledgment of its mutability, diversity and plurality.

Fresh attention to this type of territory has been further encouraged by the recognition of its potential to resolve some of the severe problems faced by cities, such as human and real-estate congestion, the presence of annoying activities and unwanted infrastructures, the demand for more space for leisure and access to the natural world and the constant need for large quantities of food and raw materials.

However, one aspect of the question remains unshakable; namely, the acceptance, almost always implicit, of the existence of an unquestionably rural specific identity and the explicit conviction that the characteristics and development of this identity are always influenced by the circumstances derived from, or even imposed by, nearby cities.

The urban-centric standpoint has long enjoyed absolute primacy in most studies of rural areas and, in many cases, this situation persists or has even intensified. This is one of the most constant and recurrent features in the different perspectives from which rural-urban territorial interactions have been approached. In other words, studies have focused on a one-way influence, that of how cities impact rural areas, ignoring the possibility of a reciprocal territorial influence. In these studies, a common, albeit obvious, argument is that the intensity of the rural-urban relationship is in direct relation to their physical and temporal proximity. Consequently, special attention is paid to the situation of periurban and rururban spaces and, in particular, to those located in functional metropolitan areas. This focus is apparent in the multiple words and concepts commonly employed in this respect in publications on rural spaces: counter-urbanisation, suburbanisation, peri-urbanisation, ex-urbanisation, urban/urbanised countryside, remote rural, etc.

In any case, there is a growing realisation and acknowledgment of an almost undeniable fact: that the distinctive features of rurality and urbanity are weakening; formerly sharp contrasts are becoming attenuated or even eliminated. Thus, some authors practically deny the existence of rurality, claiming it has been replaced by new forms of post-urban city space as a result of metastatic metropolitanisation.

In the opposite direction, research attention on the changes caused by urban impacts on the rural environment has also led to the emergence of new concepts, such as the paradigm of "new rurality", which has been used (with frequent discrepancies of nuance) to refer to the reconstructed forms of organisation and to the functional transformations taking place within spaces that, from a former rural identity, have evolved towards a different kind of rural area.

Analyses of the emergence of new forms of rurality usually highlight the reduced importance of agricultural activity; the fact of economic, social and cultural deagrarianisation; the diversification of activities; and, especially, the processes of tertiarisation of jobs performed by the rural population, in their place of residence or elsewhere, whether rural or urban. These factors, jointly, have produced an extraordinary increase in physical and labour mobility [221,222]. Moreover, this mobility has been heightened with the growing use of rural spaces for residential functions (with the side effect of decongesting cities),

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either through the construction of main homes for permanent use or as leisure and vacation residences for sporadic use; that is, as secondary homes.

On the other hand, this tendency is expressive of the fact that agriculture, which used to be the essential activity of rural spaces and was considered their hallmark of identity and the main subject of research until quite recently, currently receives almost testimonial attention in academic studies. This scientific indifference has two topics of exception: the reduced productive, economic and social weight of agricultural activities and the impact of deagrarianisation and changing patterns of rural employment. Another question related to rural activity that has attracted considerable interest is that of food security and sovereignty. Thus, many studies, diagnoses and proposals have been published in this respect, especially in certain overpopulated Asian countries where intense rural urbanisation has taken place, as in China. This issue is a subject of growing concern, heightened by the impact of conflicts, such as the Russian invasion of Ukraine and its consequences for territories that are of major importance to global agricultural production.

Based on the much-debated and multifaceted concept of "new rurality", most studies in this field continue to focus on demographic and sociological aspects (such as population dynamics and the transformation of biological structures), rural and local development, changes in economic activities and land uses (in particular, the surge in service-sector activities for the tourism industry) and questions of landscape heritage and the effects of protecting natural spaces. Very recently, published studies have considered the possibility that rural spaces may alleviate the outcomes of major health crises, such as the COVID-19 pandemic, which tend to have more severe effects in urban spaces, which are more densely populated and, hence, more vulnerable to the spread of disease.

## 4. Proposals for Further Research

As has been pointed out, the above aspects are closely related to rural-urban interaction, and especially the impact of urbanisation and the urban reality on rural spaces. In view of these considerations, we propose the following lines of research.

- 1. Reflections on the epistemological foundation and the usefulness of territorial typologies as opposed to analysing the functionality of agrarian-related activities within a specific place. In this regard, and in accordance with [9] (p. 352), the authors of which observed that, "Given that situational contexts of the rural vary across the globe, as well as within individual countries, and that different rurality definitions have different purposes, it is widely acknowledged that there is no single index, set of factors, or scale", we suggest the following epistemological perspectives:
  - 1.1. This "situational context" can be analysed by using the epistemology of regional geographic analysis, applying the paradigm of the construction of geographic spaces and considering questions such as the medium- and long-term processes underlying the creation of agrarian structures (including the size of the property, the exploitation regime applied, the intended purpose and the spatial distribution of uses in relation to the agronomic potential) and the functional relationships with urban areas, in terms both of production and of the human population (for example, the relationship between place of residence and place of work or the way in which the supply radius of food products is determined).
  - 1.2. Time frame. In view of the above literature review, we believe the following sequence of actions would be appropriate:
    - (a) Identify the starting point of the change produced by the rural exodus;
    - (b) Determine whether the 1973 crisis affected mature industrial spaces;
    - (c) Identify the onset of i) dispersed urbanisation and ii) the intensification of tertiarisation, both of which are linked to post-industrial capitalism;
    - (d) Highlight recent changes arising from the Real Estate Bubble Crisis and the Great Recession and the exit processes from these events.

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1.3. Scale. Prior reflection on this question is needed to determine the necessary focus of analysis and the specific characteristics of the settlement systems in each of the territories concerned. Although Johansen's approach ([203], p. 782)—namely, "the size of the rural unit had, as a starting point, that the size should be sufficient to capture local identity and culture"—is suitable as a starting point for strengthening rural communities, taking into account concepts such as local development and the scale of experience, research that is focused on supply functions might wish to address, specifically, the determination of an appropriate scale.

- 1.4. Precise knowledge about the multifunctionality of rural spaces. Do we seek to differentiate rural and urban areas or is our aim to establish gradients between them? Moreover, what are the means and forms of subsistence in the territories that combine rural and urban characteristics, at a certain scale? These questions may usefully be addressed by combining statistical sources on population parameters, land use and construction typologies. In this sense, it would be useful to:
  - (a) Strengthen and diversify the variables that reflect rural—urban interactions in terms of agrarian functionality. In this regard, Johansen's approach [203], focused on the function of "contact with nature", and the gradient of the extent of green spaces within the rural environment could support the proposal that studies of the rural—urban interaction should include variables enabling the measurement of land use on an agrarian-density gradient, ranging from natural protected to natural unprotected and productive, together with a classification of urban uses. In addition, we propose that big data should be used to measure the flows of agricultural products, at different scales, in order to determine the relationship between their distribution and the population of urban areas.
  - (b) Diversify the statistics used to characterise the demographic situation. The use of real growth should be complemented with the growth of its natural or spatial components, which are fundamental to the proper interpretation of indices of youth and aging.
  - (c) Consider the relationship between population range and economic activity regarding both the employed resident population and the productive establishments. This would be a valuable area of analysis as an identifier of rural–urban interaction: the location of industrial or tertiary activities in small population centres should not be masked by the concept of their corresponding population range but should be identified and considered as a manifestation of rural–urban interaction.
  - (d) Obtain more precise knowledge about rural residentialism and identify its functions: the separation of workplace–place of residence as a form of decongestion (with the use of larger and generally cheaper housing); as a means of access to leisure and recreation facilities and of proximity to the natural world; as part of the process of conserving rural settlement and life by the neo-rural population and by temporary residents returning to their territorial and socio-cultural roots; and as second homes and tourist accommodation.
  - (e) Specify the positive and negative effects of the installation of activities and facilities that are rejected by cities but necessary for their survival. These activities may require large spaces, putting the sustainability of rural spaces at risk and threatening heritage, environmental and landscape values, but at the same time they provide employment to the rural population. Greater awareness of these conflicting factors would

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facilitate the formulation of models describing an optimal response to the situation.

- 2. A reflection on the possibility of a "self-fulfilling prophecy" arising from the identification of rural areas as places where agricultural activity is associated with unemployment, poor access to services and an aging population, whilst overlooking other values such as the quality of life enjoyed (in terms of tranquillity and environmental conditions, etc.), a factor that is emphasised in campaigns to promote rural tourism. The emphasis often placed on the negative image of the rural environment contributes to the lack of self-esteem among the population, thus fostering processes of depopulation.
- 3. The incorporation of big data as an alternative, universal and accessible source of information for studying the flows of people and goods aforesaid. Greater use should be made of remote image data to map short-term changes in land use.

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