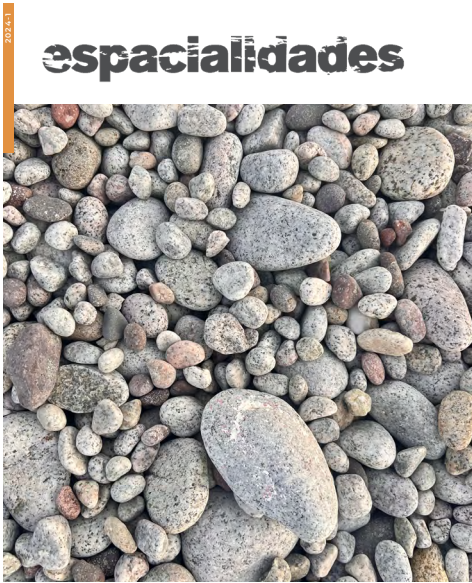


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Metropolization in Brazil. State, Planning, and Infrastructures

Metropolización en Brasil. Estado, Planeamiento y Infraestructuras

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Abstract

The main aim is to show how the Brazilian territorial metropolization process can be defined through a trend towards territorial planning regionalization, which is based on state infrastructure. The analysis is justified by the need to review Brazilian urban-regional planning parameters. It lists evidence of the metropolization process in Brazil, presenting research results about urban and regional public policies implemented between 1990 and 2019. The material and methodology focus on the bibliographic review and the empirical experiences of the federal government. This evidence enabled the conclusion that the territorial restructuring process in progress in Brazil features territorial monopolization and requires urban-regional public policies' planning and formulation practices to be based on an interstellar understanding of territory.

Palabras clave: Metropolization, regionalization, territorial planning, urbanization process, Brazil

Resumen

El principal objetivo es mostrar cómo el proceso brasileño de metropolización puede definirse a través de la tendencia hacia la regionalización de la planificación territorial influenciada por la infraestructura estatal. El análisis se justifica por la necesidad de revisar los parámetros de planificación urbano-regional brasileños. Y enumera evidencias del proceso de metropolización en Brasil, presentando resultados de investigaciones sobre políticas públicas urbanas y regionales implementadas entre 1990 y 2019. El material y la metodología se centran en la revisión bibliográfica y las experiencias empíricas del gobierno federal. Esta evidencia nos permitió concluir que el proceso de reestructuración territorial en marcha en Brasil caracteriza la metropolización y requiere que las prácticas de planificación y la formulación de políticas públicas urbano-regionales se basen en una comprensión interescalar del territorio.

Keywords: Metropolización, regionalización, planificación territorial, proceso de urbanización, Brasil

INTRODUCTION

Recent interpretations of metropolization are based on acknowledging the polycentric regional urbanization process (Soja 2013, 15) deriving from the neoliberal political context that has transformed Latin American metropolises through non-sustainable capitalist accumulation (Cobos and López 2007). Debate on this topic concerns planning practices adopted in the United States since the first half of the 20th century (Friedmann and Weaver 1981 [1979], 48); current discussions held in Europe refer to aspects of extensive, discontinuous, heterogeneous, multipolarized urbanization process featured by flows (Ascher 2010 [2001]).

However, this perspective blurs some Brazilian territorial metropolization aspects and specificities resulting from complex relations guided by the State, mainly by the impact of urban and regional, economic and social infrastructure provision on territorial restructuring. In other words, it is essential to take into consideration the state influence

capillarity to understand the metropolization process in Brazil, which is guaranteed by diffuse and simultaneous actions taken in places that are not interesting to the private capital because they cannot return growing profits to the required investments.

In addition, it is necessary understanding this process' historical dimension and acknowledging that this phenomenon is not isolate or new, since it has been systematically built by federal public policies appropriated by the national and international private capital. These policies remain in constant communication with the market, above all and most recently, with the real estate and construction market.

Overall, it is possible to state that metropolization factors are linked to globalization, productive restructuring, and metropolitan dynamics (Lencioni 2013, 20-24) resulting from work flexibilization, industrial activity dispersion taking place along with capital concentration, and from decisions made

about production. They are also linked to real estate production, which has outspread new property forms based on the condominium model and formed enclaves (residential, industrial agglomerations, services, leisure, monofunctional, or mixed) to meet private capital movements. Capital logic has enabled dispersed morphology due to fragmentation of urban fabric and discontinuities between urban and rural areas. The continuity and integration of these spaces resulted from their networking, a fact that made infrastructure essential to ensure the material and immaterial flow of goods and capital, as well as the daily flow of people. These features enable urban tissue connections that are not limited to local managerial currencies; they form a continuous city through urbanized and fragmented areas that give regional aspects to urbanization.

To understand these phenomena, we opted for a methodology based on the epistemology of urban history (Lepetit 2016) of a multilevel approach (Smith and Voss and Grin 2010) for an analysis of the different scales of spatial transformation. The administrative division (Federal, states, and municipalities), defined by the Brazilian Federal Constitution of 1988, has guided urban analysis. However, this division makes it difficult to observe the interdependencies between municipalities that occur within a state or between municipalities from different states.

The contemporary city and metropolization occur beyond the abstracted lines of municipalities and states and require an approach that takes into account the historical perspective of the evolution of the urbanized spot at different administrative levels. This makes it possible to overcome the idea of a territory exclusively defined by

state action (Gottmann 2012) and begin to understand it by its variants of scale, power, and politics (Elden 2016; Allen and Cochrane 2007). The concept of territory adopted, therefore, is distinct from the concept of space, and this distinction derives from Raffestin's (2015) framework, for which space precedes territory, and the latter results from the design and labor that transform natural conditions based on social demands.

In this sense, we started with an international and national bibliographic review that presented the main conceptualizations on metropolization in order to circumscribe the theoretical references most frequently used in national debates. This was followed by an attempt to prove them through evidence from renowned national case studies. For the discussion, we chose empirical material that resulted from investments in urban (sanitation, mobility, and housing) and regional (transportation, logistics, communication, and energy) infrastructure provided by the federal government between 1990-2019. This material was available by the Ministry of Regional Development.

Through these materials and methods, we can affirm that contemporary Brazilian urbanization is marked by a territorial ordering that involves metropolitan and non-metropolitan regions through the constitution of new centers and by urban dispersion. It seems to match the ongoing productive restructuring (Benko 2002, 19-31) that affects territorial relations. The key to understanding this lies in reading this urbanization through the concept of metropolization. Therefore, this research aims objectively to construct a theoretical reflection that makes it possible to define the concept of metropolization.

DEFINITIONS OF METROPOLITIZATION IN THE EUROPEAN AND LATIN AMERICAN LITERATURE

In an introductory way, it is necessary to problematize metropolization. As a historical phenomenon, one can recover its evidence in the growth, expansion, and disintegration of the European metropolitan fabric since the mid-nineteenth century (Mumford 1998, 567-611); in the disappearance of North American city boundaries throughout the twentieth century (Fishman 1990) and in the configuration of a metropolitan pattern of Latin American cities (Gorelik 2001).

Strictly speaking, the term metropolization refers to a process. As such, it corresponds to a context of post-modernity (Ferrier 2001) that takes into account global aspects, new technological predominance, the influence of services over the industrial economy, and the evolution of means of transport and communication. Ferrier (2001) pointed out that they represent the current state of territorialization of the regions.

Moreover, as a transformation of space, it can be characterized by causing radical changes (qualitatively and quantitatively) in urbanization, acting on the deconstruction and recomposition (or requalification) of the territory through new hierarchies and networks marked by flows that concentrate and radiate in complementary movements. It is strongly identified in the dense corridors of urbanization (in the United States or Asia) or in the margins of Latin American cities, arising from a neoliberal political economy that carries with it the segregation of urban spaces, individuality, and privatization (management) of geographic spaces (Di Méo 2008,). According to Di Méo (2008), spatial fragmentations (essentially fractals) are generated by the clash between scales, techniques, technologies, economies, and society, creating new spaces of segregation

and selection of more privileged social classes.

As materiality, the passage from the idea of a conventional city to a “world city” (Aguitebova 2006), with structures, functions, and forms that refer to the origin of metropolises synthesizes a set of changes that take into account social, economic, and productive issues. And so, it is configured by a new set of cultural references that go beyond the limits of the metropolis itself. Metropolization also became a criterion to characterize spaces with large flows of people, merchandise, and capital (Kayser, 1969), distinguishing them from those not metropolized and, therefore, to the extent of more accentuated economic dynamics that radically transform the landscape with services, centrality functions, and less expressive demographic densities.

Finally, the particularities of metropolization occur through the growth of concentration of people and wealth in urbanized agglomerations in territories with larger extensions, by urban dispersion and centralities, by the increase of mobility and distances to be traveled, and by the concomitant increase of fragmentation and social and spatial segregation. Its definition is close to the place selection movement (Leroy 2000) for urban problems based on new typologies of cities, with less precise physical delimitation of the phenomenon, but with more significant evidence of their structures and functions in the territory. It is, therefore, a transformation of the territorial base.

Despite these introductory notes - and to avoid generalities - it is essential to recover some ideas that predominate and influence the international debate and that radiate from different contexts. Some international definitions of metropolization - mainly the

European and Latin American definitions observed in the last twenty years - have been deepened in the Brazilian debate to help elucidate recent transformations taking place in the national territory organization process. The circulation of ideas allows the highlighting of three recurring aspects in the metropolization definition, namely, its bond to the urban dispersion process, its understanding in the network and system context, and its parallel to transformations in society. Thus, metropolization is no longer understood as an exclusive change in physical space but as an urbanization process transformation linked to changes in individuals' daily lives.

Based on studies about the European - mainly the Italian - metropolitan mosaic, Indovina (2009, 127-146) understands metropolization as the trend to integrate different urban clusters through diffuse urbanization, complex articulation of economic activities, social relations, everyday life and culture, among others. The aforementioned study draws attention to interrelationships and interdependencies capable of transforming metropolitan hierarchies and functionalities. Intertwining the production process, new lifestyle, and income distribution is crucial to generating the phenomenon that was investigated. According to the aforementioned author, its most typical elements comprise the incidence of polarities, significant multidirectional mobility, excessive low-density soil consumption, new technologies used to enable productive factors' mobility, high energy consumption, and natural territory using as urban structure for the population.

Understanding metropolization in Mediterranean Europe (Cuadrado Curaneta 2016, 6-8) reinforces functional specialization and reduction aspects in the complexity of different land uses and activities. Its most evident features comprise the concentration of higher added-value activities and urbanization decentralization, the growing urban outsourcing transforming the city into a space for consumption through marketing and competitiveness, as well as the dispersion

of activities and new centrality forms. These elements lead to a set of changes in metropolitan territory-use patterns based on broader and more diversified social and economic relations, as well as to changes in the form of dwelling due to growing segregation and social fragmentation. The revaluation of certain areas, such as traditional centers and former exclusively industrial zones, contributes to this process.

In light of the prevailing theoretical debate in Southern Europe, Escamilla (2013) describes territory metropolization as the process or sum of actions resulting in new relationships and in constructions different from those of the metropolitan growth observed in the 19th and 20th centuries. Therefore, it is linked to new economic logics observed after the third industrial (post-Fordist) revolution, which reconfigured the functions of the main centers in cities based on new centralities and urban dispersion —i.e., based on new shapes and scales— whose context enables seeing intensification in regional scale interdependencies.

Essentially, metropolization is the transformation of intra- and inter-urban relations that structure, control, and specialize the territory through the formation of functional units. It is based on different scalar relationships that play an essential role in restructuring the labor market, as evidenced in Bordeaux, France, by Gaussier, Lacour, and Puissant (2003).

Thus, the process of understanding metropolization in Latin America goes through several European factors and features; however, metropolization in Latin America comprises territorial units broader than metropolitan areas and presents social and spatial contrasts as structural elements of this process. According to the European perspective, changes in metropolitan areas highlight the metropolis' new territorial structuring, which is aligned with productive restructuring, whereas the Latin American literature emphasizes how these changes, and their specificities, happen beyond metropolitan areas.

Rodriguez and Winchester (2001, 123-126) understand metropolization in Chile based on the prevalence of urban population and demographic clusters, but also on the socioeconomic segregation and public service inequalities worsened by restructuring processes deriving from the global market and by the managerial fragmentation of cities. According to Napadensky and Orellana (2019), the metropolization comprising intermediate urban systems led by average-sized cities in Chile presents some specificities. The implementation of new trading and service centralities, such as shopping malls and new service districts, in medium-sized cities has a different impact on them, mainly due to lower infrastructural development level, close intercity relationships, population concentration, and economic outsourcing.

Similar behavior is observed in Argentina (Lende and Velázquez 2014, 26), whose metropolization process (more clearly identified in metropolises' dispersion) is also associated with the de-metropolization process (more clearly identified in new clusters in medium-sized cities). These conditions can consolidate urban systems based on the territorial division of labor (through macrocephaly, national urban network, among others), key production and circulation nodes, and the attractiveness of national and global capital.

These factors are aligned to metropolization interpretations in the Brazilian territory, which is not just restricted to metropolises but also comprises a set of cities subjected to similar urban dispersion and interdependency enhancement logics. The metropolization topic in Brazil was pioneered to the debate by urban and regional planning, in its different knowledge fields (architecture and urbanism, geography and sociology, among others). In the late 1980s, one of the debates about the Brazilian Federal Capital (Brasília) urbanization process resulted in a book organized by Paviani (1987) that, among other issues, identified the Federal District (the administrative unit comprising the federal capital Brasília) metropolization process.

Lamparelli (1990: 55-59) has analyzed the national issue and highlighted a new form of ongoing urbanization that would require new concepts, theories and methodologies. He pointed out anachronism in the definition of concepts such as city, urban clusters and metropolis, by taking into consideration novelties observed in the urbanization process of that period, as well as the frustrated attempt to explain them based on their generating nuclei, such as the hierarchy of cities, urban networks, city systems, cities and their surroundings, and national or regional metropolises. On the other hand, he highlighted the importance of resuming the concepts of the region (micro, meso, or macro) and territory by taking into consideration restructuring, the conformation of new territories, disputes and new locational advantages, new clustering patterns, and the rearrangement of productive space forces.

In the late 1990s, Santos (1998, 75, 78-79, 81-87) drew a panorama of the Brazilian urbanization process and defined metropolization as a macro-urbanization process "millionaire cities" emerge from, i.e., cities or clusters with more than 1 million inhabitants. This process was featured by demographic concentration, poverty, modern relational activities, means of diffusing ideas, messages, and orders; geographical dispersion of the middle class and of physical production; rural rarefaction; adjustments to the international division of labor, "metropolitan involution" and involution of metropolis-related activities; among other changes in urban production. However, it also pointed towards "de-metropolization", i.e., as the population living in big cities increased, there was a trend towards distributing it in other large urban centers. Years later, this interpretation would be called urban dispersion, which is linked to metropolization processes.

The advance in recent research conducted by groups and networks of scholars focused on investigating metropolization (such as *Observatório das Metrôpoles* [Metropolis Observatory] or *Núcleo de Estudos e Pesquisa em Espaço e Metropolização*

[Center for Studies and Research on Space and Metropolization], among others) enables drawing the picture of what metropolization can be in the national territory. Accordingly, Lencioni (2017) has contributed to the current understanding of this investigation target. According to her, the process of breaking up with traditional urbanization patterns, the hegemonic role played by private capital in space production, and the essentiality of infrastructural networks (material and immaterial) to enable transformations to operate in space appear to be vital for the ongoing monopolization process.

According to Lencioni (2017, 202-203), urbanization happens in cities, whereas metropolization happens in spaces. Therefore, metropolization can be understood as the socio-spatial process that metropolizes spaces inserted in a given urban logic that, in its turn, transforms cities into metropolises and collaborates to the regionalization of these spaces. Strictly speaking, metropolization does not mean creating cities or building urban networks; it refers to building the metropolitan conditions necessary for capital reproduction.

According to the aforementioned geographer (Lencioni 2017, 29-31), metropolization can be featured by 8 pieces of evidence, namely: a transition that goes beyond the rural-to-urban aspect, although without disregarding it; the formation of a large region with dynamic and diffuse limits; regions featured by territorial fragmentation, social segregation, and space homogenization;

redefinition of hierarchies between cities in the region and the network of relationships between them; conurbation, polynucleation and intensification of flows among cities in this region; lower demographic growth in the main city, as well as demographic expansion and development of other municipalities; new integrations among small towns with polynucleated spaces in these regions; and increased commuting among some cities in this region, which enables a regional and networked structure.

Based on this circulation of ideas, it is possible to say that metropolization in Brazil is seen as a transformation in metropolitan dynamics and in the propagation of these transformations to non-metropolitan areas. Metropolitan regions are no longer featured by concentrated, polarized, and monocentric urbanization; they are now acknowledged for aspects such as dispersed urbanization, networks, and different centers. Although these features are clearer within metropolises, they spread to other urbanized areas and shape metropolization as a capillary socio-spatial process. If, on the one hand, metropolization reinforces the idea of the metropolis as a diffuser of the interdependence relation model, on the other hand, it redefines urban hierarchies because it shares attributes and features similar to those of metropolises with other regional organizations such as urban clusters and micro-regions, among others.

METROPOLIZATION IN THE BRAZILIAN SPACE: INTERDEPENDENCES AND NEW HIERARCHICAL RELATIONS

Current interpretations of the metropolization phenomenon in the Brazilian territory have evidenced urbanization process features based on macro-regional, state and municipal

realities. Accordingly, it is possible perceiving the dimension of the territory metropolization process through concrete and material evidence space-production changes.

With respect to the Southeastern region, analyses applied to São Paulo State's reality, which is the most urbanized state in the country, have emphasized the metropolization territory as the one formed by metropolises and by their urban clusters (Grostein 2015: 35). They also enabled understanding metropolization based on the conurbation and consolidation of a given metropolitan center and on its respective periphery in São Paulo Metropolitan Region formation (Meyer et al. 2015: 12 and 26), whose state capital is the host city.

Firkowski and Moura's (2001, 23-46) analyses on the Southern region approached metropolization as new lifestyle and production phenomenon that is not necessarily followed by the institutionalization of metropolitan regions. In other words, metropolization is not restricted to metropolitan regions, but to regions presenting specificities similar to those of metropolises.

By taking into consideration cities in the Northeastern region, metropolization was understood based on the functional interdependence between the main city and the other ones around it (Gurgel 2017, 842 and 858), which have potential to enhance hierarchical relationships and to likely establish new networks or systems of cities.

Based on the analysis applied to Goiânia Metropolitan Region (Pires et al. 2020, 248), metropolization in the Midwestern region was understood based on the ongoing conurbation process and on acknowledging the importance of physical elements associated with the urbanization process and made possible by urban network relationships.

Network relationships in the Northern region were also relevant aspects used to feature metropolization, mainly in the Amazon, where state infrastructure is the guarantee of safe conditions for the advancement of private investments linked to international capital (Santos 2017, 866 and 869). Metropolization was also associated with new capital accumulation patterns, regional labor formation (Amorim 2019, 3 and 7), and the

acknowledgment of the new Macapá (in 2003) and Manaus (in 2007) metropolitan regions. Although the natural conditions are very different from those present in the Southeast, the metropolization process is configured by characteristics very similar to the national set marked by the increase in inequalities proportional to the urbanization process and by the marked presence - often precarious - of the concentration of infrastructure and services in state capitals (Pereira Junior, Trindade Júnior 2021, 163).

Therefore, specificities and convergences observed in each macro-region acknowledge the diversity of interpretations about metropolization and help better understanding the complexity of the process. Added to this diversity, one finds the acknowledgment of macro-metropolis and city regions as new network organization phenomena taking place in urbanized areas.

Metropolization in São Paulo macrometropolis (an area located in Eastern São Paulo State that groups five metropolitan regions, two urban clusters, and one micro-region) was considered (Castro and Santos Júnior 2017, 704-711), an institutional category of centralized governance in metropolitan regions. This reality enables an understanding of regional metropolization (Leopoldo 2020, 85-98) as capital regionalization by the network of metropolitan regions centralizing productive, commercial, and financial activities and dominating the territory.

Commuting and integration between local production arrangements guided by natural resource extraction activities, migration, the presence of general production conditions (infrastructure), the location of industrial plants such as the ones taking place in Vale do Aço region (Minas Gerais State) and in Campos Basin (Espírito Santo and Rio de Janeiro states), were also considered metropolization aspects (Passos 2019, 15). These elements prove the outspread of metropolitan lifestyles (Dota and Ferreira 2020, 893-912) in non-metropolitan areas through environment exploitation.

Relationships between the metropolitan

region and the urban clusters surrounding it (such as Serra Gaúcha, Lajeado-Estrela, Santa Cruz do Sul, Litoral Norte, Gramado-Canela, and Taquara-Parobé-Igrejinha) are intertwined in the so-called “Porto Alegre city-region” or “Porto Alegre urban region” (Soares 2018, 15-34). These relationships repeat the intensity of flows and relationships with the metropolis, but they also lead to the interpretation of metropolization based on the intensification of multidirectional flows that break up with the traditional monocentric model.

This condition is similar to that of metropolitan regions without metropolises, which were formed in the last two decades, wherein horizontal and vertical relationships based on city networks constituted the “city-region of São Paulo” and reinforced the metropolization process based on the territorial displacement of companies towards the state countryside (Ajonas 2015, 16-17). A feature that breaks with the idea of urban hierarchies in large metropolises that concentrate power and findings explain the intensification of relationships between metropolitan and non-metropolitan cities, as well as the power centralization in the capital city (São Paulo) to control this vast network of interrelations that disperses very fast.

The basis of this transformation consists of changes in the downtown-periphery relationship, according to which better-structured downtown areas house high-income classes, whereas peripheries lacking equipment and, therefore, offering cheaper land, house low-income classes. Based on the historical perspective, it is possible to point out three factors forming the overall conditions triggering the trend of changes capable of leading to the metropolization of the Brazilian space.

The first one is in relation to the increase in the creation of metropolitan regions without unified criteria. The nine original metropolitan regions were defined between 1973 and 1974 by federal decrees (Federal Complementary Law 14, of June 8, 1973, and supplements). After the Federal Constitution of 1988,

state governments began to replace the federal government in defining metropolitan regions without unified criteria. In 2019, according to the IBGE, there were 84 regional organizations (76 metropolitan regions, 3 integrated development regions, and 5 urban agglomerations). These regional organizations brought together 1,423 municipalities (25.5% of the 5,570 municipalities) and a population of over 121 million inhabitants (approximately 58.2% of the total Brazilian population) (Blanco Junior 2020). With this increase in metropolitan regions, the average population of this group fell from 6.4 million people in 1975 to 1.3 million people in 2020 (Cazzolato 2005). These metropolitan regions have very different characteristics from each other, but they have a common objective: to explore the institutionality of the definition of a metropolitan region (or a regional organization similar to a metropolitan one), even if the area does not have metropolitan characteristics.

The second factor is associated with the decentralization of productive activities and public services (mainly administrative, transport, education, and health services) that took place in the 1960s and 1970s (Tavares 2021b). Until then, all nine metropolitan regions and some state capitals concentrated all state representation bodies and industrial activities, which attracted political power and public and private investments. This finding led the federal government and some state governments to apply public policies focused on decentralizing public services towards the countryside and on enabling infrastructure improvements capable of influencing the industry to move out of the main urban centers, presenting a strong agglomeration diseconomy scenario at that time.

This initiative has consolidated systems of cities with labor force reserves and conditions to attract productive activities. It resulted in the constitution of medium-sized cities as regional centers, the reinforcement of urban systems articulated by economic productivity, and industrial territory expansion. Since then, the main Brazilian medium-sized cities and their regions of

influence have received federal public funds through urban and regional development policies. However, these policies reproduce metropolitan investment patterns in these regions and highlight similarities in space production through metropolization. This new configuration changes urban hierarchies because it interferes with the centrality role that was previously only attributed to metropolises and that nowadays spreads toward other urban regions.

The third factor is associated with urban dispersion and, more specifically, with the real estate restructuring process that emerges as the key factor for urban fabric sprawl. In this case, metropolis reconfiguration is influenced by global and local factors (Pereira 2013, 97-107) and it becomes the central element of metropolization based on economic and financial factors capable of changing individuals' daily lives. Articulation among large groups of real estate incorporations and the financial capital has configured a new growth pattern in the metropolis due to the deconcentrated form of producing valued spaces beyond the metropolis' downtown area, which expands inequalities and segregation based on condominium properties (Rufino 2013, 137-148), which gives substance to the territory transformation process, through the logic of organization based on private capital.

These three factors are at the origin of the current metropolization process, which does not take place as a government or market project but derives from their performance in territorial planning. In addition, they represent efforts to fight agglomeration diseconomies, expand growing incomes, engage in productive restructuring through technological updating and capital financialization, diversify the product to increase profits, and migrate from primary- and secondary-sector activities to the real estate sector in order to form new markets.

National studies conducted by *Observatório das Metrópoles* (Ribeiro et al. 2012, 40-41) has identified metropolization as a process stemming from the 20th century based on territorial dynamics of concentration

and “diffusion of economic, political, social, and cultural artifacts” in certain “metropolitan clusters”. In this case, the metropolis is confirmed by collaboration in the process to feature metropolization, shape changes in nature, and enable spatial configuration in cities presenting different territorial integration and dynamics levels. This process is featured by the extension of hubs' function towards their surroundings and by featuring high indices capable of indicating the commuting dynamics, mainly in urban realities where the city system is more consolidated.

Based on this evidence, it is possible to see that functions that were previously performed by the metropolis now happen in other parts of the territory due to the repositioning of medium-sized cities or regional organizations by networks or systems of cities. This process led to the definition of metropolitan regions without metropolises since socio-spatial transformations are more visible in regional relationships held by the set of interdependent cities rather than from—or depending on—a national hub-city, as it happened throughout the 20th century. The metropolization process has contributed to—and simultaneously resulted from—the trivialization of the metropolis as a reference of urban hierarchy and of the reproduction of its dynamics in other regional organizations. This reproduction is based on the implementation of public policies in non-metropolitan cities based on the very same standards applied to metropolitan cities (Tavares 2021a).

The regional metropolis conceptually defined for the nine main state capitals (Rocheffort 1967a, 1967b) that fulfilled the function of a central place (Christaller 1966 [1933]) has been replaced by urban and regional networks, which are close to the idea of city-region (Scott 2002 [2001]). Thus, the metropolis seen as a hub loses importance, although it does not disappear, and the network becomes the new topological paradigm used to support metropolization and new lifestyles.

These transformations can be synthesized by intensifying municipal interdependencies and changing urban

hierarchies, which are supported by the following aspects: commuting and multidirectional flows; real estate investments that start in hubs but materialize outside them; urban-regional dynamics generated by the exploitation of natural resources; conurbation; institutionalization of new metropolitan regions without metropolis; governance of networks of regions; new lifestyles and uses of the city; global market influence at a local scale; private market repositioning in space production; administrative and productive decentralization followed by decision-making place concentration; and metropolitan dynamics

reproduction outside the metropolises, with stronger urban fabric segmentation and social-territorial segregation.

Interdependencies and changes in urban hierarchies depend on the integration of goods, people and capital flows; on conditions for private capital propagation through urbanized lands; and on minimal housing and health conditions. These elements are essentially guaranteed by the State in the form of infrastructure provision that has been prioritizing the regional scale of investments since the 1990s.

STATE AND INFRASTRUCTURE IN PLANNING PRACTICES

Once the metropolization of Brazilian space was featured by its particularities, origins, and overall conditions, the current analysis focused on understanding the structuring of the elements and enabling its continuity. Thus, it is possible to see that, despite the hegemony of neoliberal economic policies implemented in the last thirty years, the federal government has guaranteed investments in infrastructure that played an essential role in intensifying the Brazilian territorial metropolization process in a regionalized manner.

The federal government resumed public investments and partnerships with the private sector after the beginning of the political redemocratization process and the approval of the new Federal Constitution in 1988. This process was strengthened by the formulation of urban and regional public policies (from 2003, onwards) capable of ensuring investments' permanence throughout the national territory. Analyses of these investments have proved the key role played by infrastructure in territorial planning and showed how its implementation has shaped territorial planning specificity through the diffusion of regional aspects.

Most of the analyzed investments (68.69% of precarious settlement urbanization actions, 89.12% of sanitation actions, and 94.56% of mobility actions) were concentrated in metropolitan regions, integrated development regions, and urban clusters. This trend is reinforced by investments destined for differentiated mesoregions (regions with high poverty index defined by the National Plan for Regional Development 2007). Mesoregions were served by 17.04% of precarious settlement urbanization actions, 12.45% of sanitation actions, and 5.10% of mobility actions. In other words, the main investments by the federal government between 1990 and 2019 have favored regionally urbanized areas or networks of regions formed according to economic, cultural, or environmental aspects.

The process of metropolization is even clearer when we observe the relationship between the expansion of the urban fabric and its articulation with the surrounding area. Approximately 45% of the infrastructure was implemented in areas of expansion of the cities and had a direct impact on the increase in the urbanized area. Approximately 23% of the infrastructure actions are linked to the

expansion of the urban zone in the master plans, which, in turn, allows the expansion of urbanized land beyond its urbanized limits. In addition, there is a reciprocal attractiveness between urban infrastructure (sanitation, mobility, urbanization of slums and housing), regional infrastructure (highways, railways, ports, and airports), and the expansion of subdivisions and industrial areas by the private market, with 49% of these infrastructures linked to urban sprawl.

These actions were designed based on demands shared by municipalities presenting some integration level among themselves; thus, they reinforced or created urban systems. These actions have influenced the intermunicipal integration of daily activities, mainly through commuting and the establishment of new centralities, by collaborating to the intensification of regional relationships through municipal integration of transport, sanitation, housing and urbanization of precarious peripheral settlements.

These phenomena were common in metropolitan regions up to the 1980s. Nowadays, studies conducted by the Brazilian Institute of Geography and Statistics (IBGE 2016, 19-30) have indicated that more than 50% of the Brazilian population lives under regional integration conditions due to daily commuting for work/study purposes or to inter-municipal continuities in the urban fabric.

Thus, providing infrastructure became necessary since it enabled the integration of urbanized fragments and the formation of new vectors for urban fabric expansion. It happened based on the use of pre-existing networks and the implementation of new networks adapted to technological changes in communication and information systems or networks focused on remedying social deficits such as housing, public transport, water supply, and sewage treatment. Massive investments came from the State; even in the case of partnerships with the private sector, the State guaranteed the conditions to exclude any risks on economic returns to the market.

Based on the perspective of likely state influence on the territory, it is possible to

identify three fundamental aspects, according to which, federal state actions collaborate to metropolization: a) actions took place in a diffuse and simultaneous way in the entire Brazilian space through federal programs, plans and projects focused on guiding the investments; b) actions took place based on urban and regional development policies focused on denser and richer areas featured by regional demographic dynamics and/or on regionally integrated areas; c) actions took place through sectorial investments in mobility, housing, and sanitation.

Based on the third aspect, it is possible to better understand why their actions collaborated to interdependence relationships among and changes in hierarchies that have featured Brazilian territory organization regionalization. Despite the longevity of the definition of meaning regionalization, which can be seen in Lencioni (2009), for the present investigation, we adopted the definition given by Ribeiro (2015) who considers regionalization as a fact and a tool. In other words, respectively derived from economic dynamism, class relations, and the historical evolution of the State apparatus that collaborates in the conformation of a spatial structure and as a form-concept determined by the planning conducted by the State, in relation to hegemonic forces, in disputes and by resistance from social groups.

The mobility infrastructure has favored collective and/or mass transport (Bus Rapid Transit, Light Rail Vehicle, underground or surface subway, bus corridors, integration platforms, walkways and terminals, among others). These solutions helped consolidating inter-municipal relations of labor, consumption and leisure, as well as intensified commuting in dispersed or conurbation cities. Complementarily, they represented an opportunity for new ventures further away from the traditional downtown areas, given the mass transport extension linking traditional downtown areas to new suburban centralities.

Housing production between 2009 and 2019 has delivered 4,096,725 units through

Minha Casa Minha Vida program. Over thirty years (1990-2019), it made it possible to settle people, although not necessarily in their city of origin or in sites close to places offering job opportunities. The profusion of housing projects in cities neighboring regional centers was associated with low land prices and with attractions created by city halls to the real estate market. Of course, this demographic dynamic has reinforced the municipal interdependence on other public services, such as health, education, and leisure, intensified the commuting flow, and collaborated to the formation of new agglomeration economy vectors.

Sanitation provision—which had a direct impact on urbanization— mostly took place in precarious settlements, irregular and peripheral allotments, housing complexes, vulnerable neighborhoods, and in actions articulated by inter-municipal consortia. These actions—which are mostly implemented in peripheral areas— have consolidated these settlements and guaranteed their minimum living conditions; however, they also inserted these settlements in economic and real estate dynamics. These investments took place in poor or low-density areas and showed potential to transform land-use value into exchange value by attracting private investments and, in some cases, by promoting urban fabric dispersion through new ventures around it.

Approximately 45.72% of the 2,986 analyzed actions (of mobility, sanitation, housing, and precarious settlements) were located in the limits of the main urban fabric, in its branches, as well as in villages, districts, and communities separated from it. This feature shows how these actions have created the opportunity to connect peripheral areas to centralities around them, regardless of whether this relationship took place within a single municipality or in the neighboring ones. In addition, it confirms a trend of urban dispersion that features the current territorial metropolization process.

In addition to regionalized investments in infrastructure, partnerships formed by the

articulation between municipalities and states, based on shared claims (of sectoral public services, environmental potential or liabilities, or river basins) have collaborate to new forms of governance at regional level. These relationships recompose hierarchies within urban systems because they redefine regional functions acquired by each municipality through new forms of governance.

In other words, even amid the institutional obsolescence and the disconnection from new urban development theories and references, the State still plays structural role in the urbanization process; mainly, in territorial metropolization through territorial planning regionalization. It mainly happens at federal level, although such occurrences are consolidated at other levels. Solutions for the recent health and hospital crisis caused by COVID-19 were, and continue to be, linked to the regional aspect of infrastructure organization in the territory.

Municipalities organized in Consortia (Consortia are inter-federative arrangements focused on the governance of common public interests and services) and with intense commuting at local level got together to define joint solutions for mobility issues and for commerce and services management among different cities to prevent the virus from spreading (<https://www.socorro.sp.gov.br/noticias/prefeitos-do-circuito-das-aguas-pedem-criacao-de-microrregiao-separada-de-campinas>; <https://g1.globo.com/sp/sao-paulo/noticia/2021/02/24/cidades-do-abc-paulista-farao-lockdown-das-21h-as-4h-apos-alta-das-mortes-e-da-ocupacao-de-leitos-para-covid-19.ghtml>, accessed on July 5th, 2021).

São Paulo State defined its restriction plan at the state level (priority activities, circulation, among others) based on the regionalization of the existing health system (<https://www.seade.gov.br/coronavirus/>, accessed on July 5th, 2021), which is based in 17 development hubs that have been implemented since the 1960s and whose cities concentrate the main public hospital infrastructures. This decision is

consistent with recent studies (<https://coronavirus.unifesp.br/noticias/estudo-sobre-disseminacao-da-covid-19-no-estado-de-sao-paulo-apresenta-resultados-preliminares?fbclid=IwAR3p-pYeN-x7Jl7xXpS2YdwMYkqR3iDoGT0iP9NuY-qdTuT5IMPOSYZ69mts>, accessed on July 5th, 2021), according to which, the urbanization regionalization degree is determining factor in the way the virus spreads.

The Northeastern Consortium, which brings together all nine states in this macro-region and the population of approximately 60 million people (approximately 30% of the Brazilian population), has consolidated an alternative plan to the National Immunization Plan (<http://www.consorcionordeste-ne.com.br/>, accessed on July 5th, 2021) at macro-regional level in response to the precarious vaccination campaign coordinated by the federal government. Based on the organization of public consortia, the Northeastern Consortium is the most recent evidence of a metropolization degree in non-metropolitan areas at a macro-regional scale under the governance focus.

Infrastructure played an essential role in individuals' permanence in urban environments throughout the 20th century; it contributed to the country-city demographic movement and was organized based on

the constitution of central places. However, nowadays, it operates more complex movements between cities due to social, labor, economic, political, administrative, and environmental relationships. The aforementioned aspect reinforces the regionalization of everyday life through interdependencies between cities that are not at the top of urban hierarchy, as well as between secondary regional organizations such as those formed by public consortia. This factor has evidenced a setback in flows oriented by the hub-city or by the economically most important metropolitan regions.

These facts have evidenced that metropolization is directly linked to state infrastructure to urban and regional public policies, as well as that it derives from them as a condition for the successful and effective performance of private initiative actions. Therefore, they prove that the regional specificity reproduced in the form of plans and projects (Brasil 2004; Brasil 2007) is the strong influence radiating from the metropolis to metropolitan centers and to their surroundings, to areas outside them and, mostly, to regional organizations in urbanized areas. The integration process likely takes place through state infrastructure, given the fragmentation of the urban fabric.

CONCLUSION

Based on the above and the hegemonic conditions of urbanization, it is possible to formulate a hypothesis about the definition of metropolization. Metropolization can be defined by the regionalization of territorial planning that occurs due to the intensification of municipal interdependencies and changes in urban hierarchies. This hypothesis allows us to observe the challenges posed to urban and regional planning by demonstrating how metropolization results from the regional diffusion of metropolitan dynamics to urban regions.

Brazil presents a deadlock between planning scales and evidences of the urbanization process. Given the growing trend of regional dynamics in territorial planning, there is the priority to review theoretical and conceptual frameworks guiding the urban, interurban, regional, mesoregional, metropolitan and territorial planning fields. This condition implies building debates based on the perspective of the planning model's limits and possibilities inherited from past and authoritarian political periods.

The urban dispersion (Reis 2006) at the very basis of the Brazilian territorial metropolization process mainly happens due to low-income population removal from job, education, health, commerce, leisure, and housing opportunities. With respect to the high-income population, this regionalization takes place through the constitution of new service, commerce, and leisure centers, whose access is guaranteed by individual transport, whereas these opportunities are scarcer to and physically distant from the low-income population.

Urban plans and projects, as well as regional plans and actions, implemented throughout the 20th century, within federal administrative institutions, were gradually instituted by functional sectorization and administrative hierarchization, and they did not necessarily focus on these specificities. After the redemocratization process (post-1988), urban planning was consolidated by new participatory urbanistic instruments (Brasil 2001), with political character (Villaça 2010) and by local scale revaluation. Regional analyses have acknowledged different urbanization process dimensions (Estado de São Paulo 2014), although planning remained at the municipal level, even in metropolitan realities (Brasil 2015).

At the same time, some metropolitan and regional planning institutions are undergoing the process of being extinguished (Estado de São Paulo 2019); among them, one finds São Paulo Metropolitan Planning Company S.A (EMPLASA - Empresa Paulista de Planejamento Metropolitano S. A.), which is a pioneer in the metropolitan planning field, and the Housing and Urban Development Company (CDHU - Companhia para o Desenvolvimento Habitacional e Urbano), which accounts for regional housing planning in the same state. Conditions that represent

a regression in territorial planning, especially when compared with the advances in institutions and territorial planning strategies in Latin American countries.

Cities' regional functions are getting stronger and their urban fabrics are expanding beyond municipal administrative boundaries. Economic and labor dynamics promote urban-urban demographic movements, whereas productive activities that depend on natural resources are installed in interurban and rural spaces. However, planning instruments and institutions value the local scale without a national territorial development project.

These factors point towards the need of a new institutional planning organization capable of understanding the urbanization process, incorporating new governance expedients for decision-making and responding to urban issues and structure, based on the territory, in a cohesive way.

Finally, it is possible to emphasize the need to understand cities' new forms and functions through interstellar relationships. A possible path towards such an understanding would lie in mapping their regional roles based on their nodal functions within labor relationships and within relationships with the environment; on the economic interdependencies generated by the intensity of flows along the principal axes, and on the framework of regionalizations that guide public and private investments and form territorial weaving. Identifying these elements can influence decisions made about providing resources to a given location, as well as about national development policies, programs, and projects. These elements can help analyze and explain the urbanization process, as pointed out by Lamparelli (1990), in order to intervene in it.

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