


TERRITÓRIO, REDES E GLOBALIZAÇÃO: O CASO DAS EMPRESAS DE PETRÓLEO EM MACAÉ**TERRITORY, NETWORKS AND GLOBALIZATION: THE CASE OF OIL COMPANIES IN MACAÉ****TERRITORIO, REDES Y GLOBALIZACIÓN: EL CASO DE LAS EMPRESAS PETROLERAS EN MACAÉ** <https://doi.org/10.56238/sevened2025.026-021>**Rodrigo Wanderley Gonzalez¹****RESUMO**

O trabalho investiga a dinâmica espacial das grandes corporações offshore em Macaé, no Norte Fluminense (RJ), evidenciando como a indústria do petróleo transformou o município em um dos principais polos econômicos do Brasil, especialmente após a instalação da Petrobras e a abertura para empresas multinacionais como Halliburton e Baker Hughes. A intensa atração de investimentos e empresas provocou acelerado crescimento populacional, urbanização rápida e reorganização do espaço urbano, resultando em profundas mudanças socioeconômicas e ambientais. Fundamentado em autores como Castells, Santos e Corrêa, o estudo discute o papel das redes geográficas e da lógica empresarial global na produção de “espaços luminoso, altamente integrados e tecnológicos e de “espaços opacos”, marcados por desigualdades e precarização. Metodologicamente, utiliza o mapeamento das empresas offshore e a análise da cadeia produtiva do petróleo para mostrar como a internacionalização do capital e a estrutura em rede das corporações reconfiguram a economia, o território e os desafios locais de Macaé, acentuando tanto oportunidades quanto contradições próprias dos grandes complexos petrolíferos contemporâneos.

Palavras-chave: Macaé. Indústria do petróleo. Redes geográficas. Corporações multinacionais.

ABSTRACT

The paper investigates the spatial dynamics of the large offshore corporations in Macaé, in the north of Rio de Janeiro State, showing how the oil industry has transformed the municipality into one of Brazil's main economic hubs, especially after the installation of Petrobras and the opening up to multinational companies such as Halliburton and Baker Hughes. The intense attraction of investments and companies led to accelerated population growth, rapid urbanization and reorganization of the urban space, resulting in profound socio-economic and environmental changes. Based on authors such as Castells, Santos and Corrêa, the study discusses the role of geographical networks and global business logic in the production of “luminous spaces”, highly integrated and technological, and

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“opaque spaces”, marked by inequalities and precariousness. Methodologically, it uses the mapping of offshore companies and the analysis of the oil production chain to show how the internationalization of capital and the networked structure of corporations reconfigure Macaé's economy, territory and local challenges, accentuating both opportunities and contradictions typical of large contemporary oil complexes.

Keywords: Macaé. Oil industry. Geographical networks. Multinational corporations.

RESUMEN

El artículo investiga la dinámica espacial de las grandes corporaciones offshore en Macaé, al norte del estado de Río de Janeiro, destacando cómo la industria petrolera ha transformado el municipio en uno de los principales centros económicos de Brasil, especialmente tras la instalación de Petrobras y la apertura a empresas multinacionales como Halliburton y Baker Hughes. La intensa atracción de inversiones y empresas provocó un crecimiento acelerado de la población, una rápida urbanización y la reorganización del espacio urbano, lo que dio lugar a profundos cambios socioeconómicos y medioambientales. Basándose en autores como Castells, Santos y Corrêa, el estudio discute el papel de las redes geográficas y de la lógica empresarial global en la producción de «espacios luminosos», altamente integrados y tecnológicos, y de «espacios opacos», marcados por las desigualdades y la precariedad. Metodológicamente, utiliza la cartografía de las empresas offshore y el análisis de la cadena de producción de petróleo para mostrar cómo la internacionalización del capital y la estructura en red de las corporaciones reconfiguran la economía, el territorio y los desafíos locales de Macaé, acentuando tanto las oportunidades como las contradicciones típicas de los grandes complejos petroleros contemporáneos.

Palabras clave: Macaé. Industria petrolera. Redes geográficas. Empresas multinacionales.



INTRODUCTION

The oil industry occupies a central position in the global economy, being the main energy source and a strategic sector for most countries, often treated as a matter of state due to its geopolitical and economic weight. The performance of large international oil corporations goes beyond national borders, consolidating a global presence and promoting intense investments in research, technology and infrastructure, which intensifies competition and the need for constant innovation. In Brazil, the city of Macaé, located in the North of Rio de Janeiro, stands out as the epicenter of this process, consolidating itself as one of the main world hubs of the offshore industry and accounting for a significant portion of the national oil production, especially after the opening of the sector to foreign participation from the 1997 Petroleum Law.

The arrival of multinationals such as Halliburton and Baker Hughes, accompanied by hundreds of support and service companies, has driven a new cycle of accelerated urbanization, spatial reorganization and local economic growth, transforming Macaé into a city marked by high dynamism and, at the same time, by strong socio-spatial contrasts. In this context, the concept of geographic network, as discussed by authors such as Castells (1999), Corrêa (1997) and Santos (1999), becomes fundamental to understand the productive specialization of the Macanese territory and its new dynamics, similar to those of other major world oil hubs, such as the North Sea and Texas. The present study analyzes the organizational structure of oil companies in Macaé and their spatial strategies, showing how the logic of networks and the performance of the majors, leading global corporations, shape flows, define "luminous spaces" of innovation and wealth, and generate "opaque spaces" of exclusion and precariousness. Thus, it investigates how the action of these global companies, as geographical actors, contributes to the reconfiguration of the territory, the economic circuits and the local society itself, in a scenario marked by both opportunities and challenges typical of contemporary globalization.

MACAÉ IN THE REGIONAL CONTEXT

The rise of Macaé as one of the most prosperous municipalities in the state of Rio de Janeiro is a direct result of the consolidation of the oil industry and the implementation of a productive complex articulated with the Campos Basin. According to Cruz (2003), the ratio between jobs and population in Macaé is among the best in the state, evidenced, for example, by the 6,900 direct jobs generated by Petrobras alone in 2000, in addition to another 28,000 jobs created by service providers linked to the oil production chain. Such dynamism is reflected in the national rankings: a survey by the Getúlio Vargas Foundation

(2004) highlighted Macaé as the second best city to work in Brazil, while in the ranking of Exame magazine the city jumped from 89th to 39th place among the best for business between 2000 and 2002.

Economic data confirm this vigor. The municipal GDP per capita, which in 1999 was R\$ 7,588.00, reached R\$ 25,921.00 in 2004, becoming the fourth highest in the state. In comparison, the GDP per capita of the North of Rio de Janeiro was R\$ 10,746.00, and that of the state of Rio de Janeiro, R\$ 16,689.00. In social terms, Macaé also stands out: in 2000, its Municipal Human Development Index (HDI-M) was 0.790, the highest in the North Fluminense Region and the 17th in the state, showing significant advances in quality of life.

The foundation of this cycle of prosperity dates back to the choice of Macaé, about three decades ago, as Petrobras' operational base for oil prospecting and production operations on the continental shelf of the Campos Basin. The decision, influenced by logistical and technical factors, such as the proximity of the basin, the sheltered waters and the ease of port construction, definitively inserted Macaé on the strategic map of the national energy industry. It is worth noting that, although the first oil well was found in the region in 1958 (Ribeiro, 1996 apud Nascimento, 1999), it was only with technological advances in the 1970s that exploration gained scale, culminating in the discovery of the Garoupa field in 1974.

At a time when the regional economy, traditionally based on the sugar and alcohol sector, was experiencing stagnation and seasonal unemployment, the installation of Petrobras in 1978 inaugurated a new economic cycle, characterized by strong migratory attraction and new population flows. The transformation of Macaé, from a small city with just over 35 thousand inhabitants in the 1970s to a dynamic urban hub, involved bonuses and burdens typical of accelerated development, such as GDP and HDI growth, but also the overload of public services, housing deficit, slums, pressure on natural resources and increased inequalities.

The North Fluminense Region, where Macaé is located, began, from 1987 onwards, to be treated together with the Northwest of Rio de Janeiro, reflecting a history marked by agriculture and more recently by oil production, responsible for more than 80% of the national oil at the turn of the century. The regional paradox is evident in the contrast between the resources arising from agro-industrial modernization and oil extraction and the permanence of pockets of poverty, exclusion and inequality.

The spatial reorganization caused by the oil industry in Macaé is manifested both in the attraction of complementary activities and in the transformation of demographic, urban and economic patterns. This process is marked by speed, urbanization and population

growth occurred in a few decades, and by the constant challenge to the planning capacity of the public power. Positive effects, such as job and income generation, coexist with negative impacts, such as pressure on infrastructure, socio-spatial segregation, and environmental impacts.

In this context, Macaé has become a reference in the North of Rio de Janeiro, both as a pole of attraction for investments and labor and as an example of accelerated development and the challenges of municipalities heavily dependent on a single productive sector. Thus, the case of Macaé illustrates, in the regional context, both the potential for socioeconomic transformation brought by the oil industry and the contradictions and vulnerabilities that arise from it, requiring reflection on the directions of local and regional development.

METHODOLOGY

The methodology of this work is based on a qualitative approach, supported by theoretical review, documentary survey and analysis of empirical data regarding the municipality of Macaé, focusing on the performance of large offshore corporations in the oil sector and their spatial dynamics. The spatial cut-out adopted is the municipality of Macaé, the main productive center of the Campos Basin, where the largest oil industrial park in Brazil is concentrated. Initially, a literature review was carried out on the concepts of geographic networks and business organization, dialoguing with authors such as Castells, Chesnais, Corrêa and Santos, to understand how global corporations structure their flows, fixed and territorial strategies.

The collection of empirical data included the survey of the commercial registry of offshore companies provided by the Planning Secretariat of Macaé (base year 2006), allowing the mapping of all companies operating in the offshore segment of the municipality. The prospecting and production sectors were selected for detailed analysis, as they demand a higher technological level and a strong presence of multinationals, concentrated in planned neighborhoods with state-of-the-art infrastructure, such as Novo Cavaleiros. The data analyzed included the companies' corporate name, sector of operation within the production chain, year of installation and headquarters of the organizations, making it possible to identify patterns of insertion, expansion and international networks of action of the corporations studied.

As part of the qualitative analysis, the study also distinguished between different management models, network company and network of companies, evaluating the implications of each arrangement for local spatial and economic dynamics. To deepen the

understanding of territorial and productive interactions, case studies were carried out of three companies in the prospecting sector (two multinationals and one national), investigating their organizational models, production strategies and insertion in global chains.

This methodological triangulation, articulating theoretical review, documentary survey and case studies, allowed us to analyze how large offshore corporations transform the Macanese territory, redefining flows, promoting productive specialization, intensifying the internationalization of capital and generating new social and urban dynamics.

THEORETICAL ASPECTS

The analysis of the organizational structure of oil companies in Macaé is based on the understanding that, in the contemporary global economy, the operating model of large corporations is strongly marked by the logic of networks. As Castells (1999) and Chesnais (1996) point out, multinationals operate in articulated global networks, where capital, technology and information flows cross borders and reshape territories. This logic translates into the municipality of Macaé, which has become the largest oil production park in Brazil due to the concentration of deposits in the Campos Basin and logistical advantages that attract global companies.

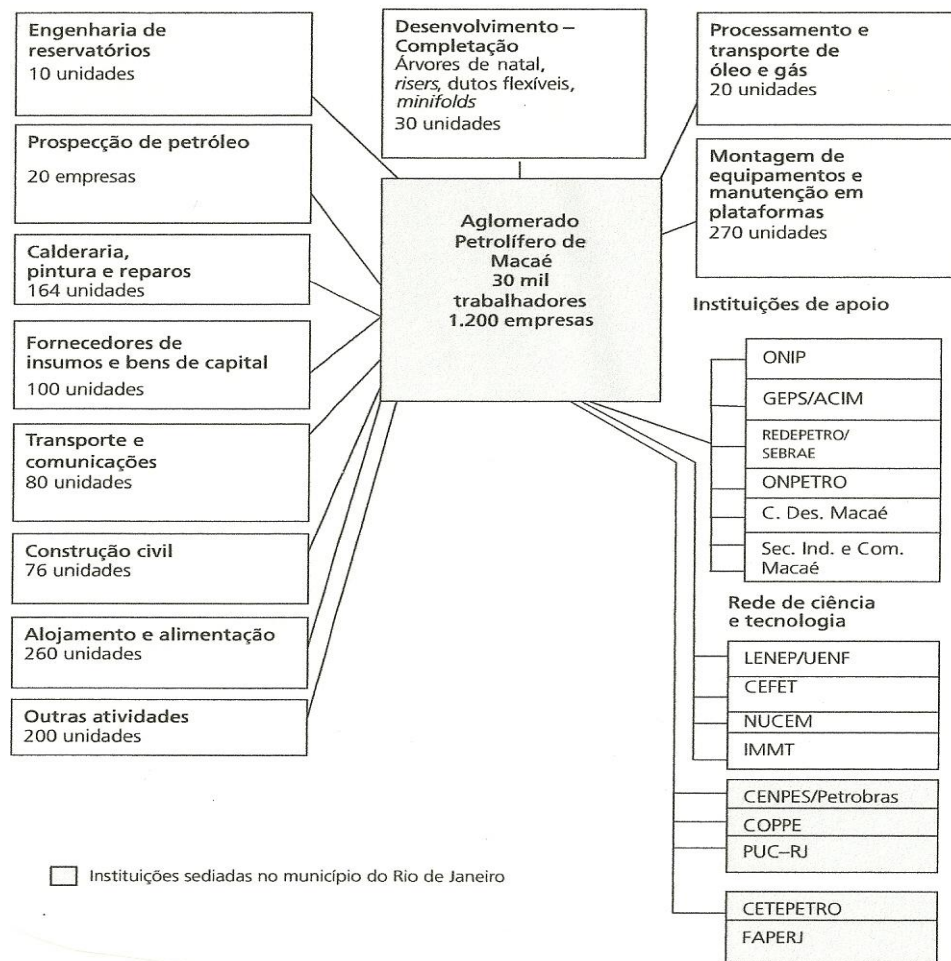
Two fundamental categories guide the understanding of these dynamics: "network company" and "network of companies". The concept of network company, according to Castells (1999), refers to multinational corporations that integrate different productive, administrative and logistical functions on a global scale, becoming central actors in the reorganization of geographic space. On the other hand, the network of companies, as Chesnais (1996) points out, refers to articulations between companies, often national, grouped around large parent corporations, the majors, forming cooperative and hierarchical arrangements in the territory.

The performance of these companies produces direct impacts on the local space, either by the implementation of large fixed facilities (infrastructure, industrial units, ports), or by the ordering of flows (logistics, information, people), profoundly changing the urban and economic configuration of Macaé. The spatial cut of the study, centered on the municipality, allows us to analyze how the global logic of corporations materializes locally, especially in the more technified sectors, such as prospecting, where multinationals represent the majority and are concentrated in planned neighborhoods with high infrastructure, such as Novo Cavaleiros.



The complexity of offshore activity, responsible for most of the national oil production, requires cutting-edge technological knowledge and global integration, characteristic of network companies. Data collected from the 2006 commercial registry reveal the diversity and density of these chains, only in the accommodation and hotel segment there are more than 260 companies, in addition to dozens acting directly in the prospecting and production stages. To illustrate the concentration and spatial organization of this sector in the municipality, the Macaé Oil Agglomeration Model is presented below, as shown in figure 1.

Figure 1 – Macaé Oil Agglomerate Model
 Mapa do Aglomerado Petrolífero de Macaé



Source: prepared by the authors

To understand the logic of insertion and expansion of these corporations, the work also considers the year of installation of the companies in Macaé, allowing to trace the history of the internationalization process and identify periods of greater inflow of foreign capital and local productive reorganization. The presence of multinationals operating globally, including in markets restricted by specific legislation, confirms the trend of international integration of the municipality, inserting it in the main oil production networks.

In addition, it is important to distinguish the management models present in Macaé: while network companies articulate activities at multiple scales, promoting global connections, business networks form cooperative structures that ensure local competitiveness and integration into larger production chains. This differentiation is fundamental to understand the differentiated impacts on the territory, the generation of jobs, the formation of technological enclaves and socio-spatial inequalities.

Finally, the research uses case studies involving three companies in the prospecting sector, two multinationals and one national, to analyze the variations in organizational

models, in productive arrangements and in the forms of insertion in global chains. The intersection between the theoretical concepts and the empirical reality of Macaé reveals how the municipality reflects trends observed in other major world oil hubs, such as the North Sea and the Gulf of Mexico, evidencing the strategic role of business networks in the reconfiguration of space and in local productive specialization.

THEORETICAL ASPECTS OF NETWORKS IN GEOGRAPHY

The concept of network, so popular in the contemporary academic debate, is marked by a polysemy that, according to Milton Santos (1996, p. 208), often leads to imprecision: "The vogue that the word and the idea of network are encountering, both in the exact and social sciences, as well as in practice, pays the price due to popularity. The polysemy of the word everything invades, loosens its meaning and can, therefore, lend itself to inaccuracies and ambiguities, when the term is used to define situations. The same happens with geography". Even so, it is undeniable that the development of the concept of network has transformed the way Geography understands the organization of space, the flows and articulations between places.

Historically, the notion of networks was linked to the analysis of urban networks and to Walter Christaller's (1933) theory of central places, which sought to explain the hierarchical distribution of urban centers based on economic and spatial criteria. For Christaller, cities are organized into different hierarchical levels according to the goods and services they offer, generating a regular and, theoretically, predictable network of centralities over the territory. Lobato Corrêa (1997) explores this development, showing how the central locations form a hierarchy based on the scope of services and the territorial influence of each center, fundamental concepts for the so-called New Geography or Quantitative Geography, which gained strength in the 1950s and 1960s.

This New Geography, under the strong influence of neopositivism, adopted mathematical language and scientific methodology to study the distribution of spatial phenomena. As Christoforetti (1972) points out, the search was for general theories capable of explaining spatial patterns, with a strong emphasis on the use of models imported from Economics, such as those of Von Thünen, Lösch and Weber. However, as Milton Santos (1978) points out, this approach often neglected the specificity of the social production of space, limiting itself to the description of forms and the analysis of the earth's surface as an object in itself, to the detriment of the understanding of networks as dynamic and historical processes.

Even before this quantitative turnaround, Pierre Monbeig had already highlighted, in his classic study on railroad expansion in the interior of São Paulo ("Pioneers and farmers of São Paulo"), the relevance of networks in the conformation of regions. For him, the networks – at that time, mainly railways – were more decisive for the process of territorialization and integration than the traditional regional delimitations, which proved to be volatile in the face of technological changes and the flows of people and goods.

From the critiques of positivism and the emergence of critical and post-structuralist approaches, Geography began to conceive networks no longer only as fixed structures, but as open, plural and multifunctional systems, crossing scales and articulating agents, flows and territories in increasingly complex ways. Corrêa (1997) points out that, at the end of the twentieth century, the earth's surface was covered by multiple geographical networks – of transport, energy, information, capital, people – each with its own logics and scopes. These networks, far from being homogeneous, overlap in an irregular way, expressing the selectivity of human activities and territorial differentiation.

The contemporary debate emphasizes that each individual, social group, institution or company participates in different geographical networks, occupying different positions in each one, according to their interests, capacities and resources. Corrêa (1997) proposes the metaphor of the kaleidoscope to illustrate this multiplicity: networks intersect and reconfigure themselves continuously, according to the demands and dynamics of each moment and place. This view is also reflected in Lösch's (1954) notion of "economic landscape", which conceives space as a mosaic of overlapping networks, making any analysis a selection of overlapping and interacting cutouts.

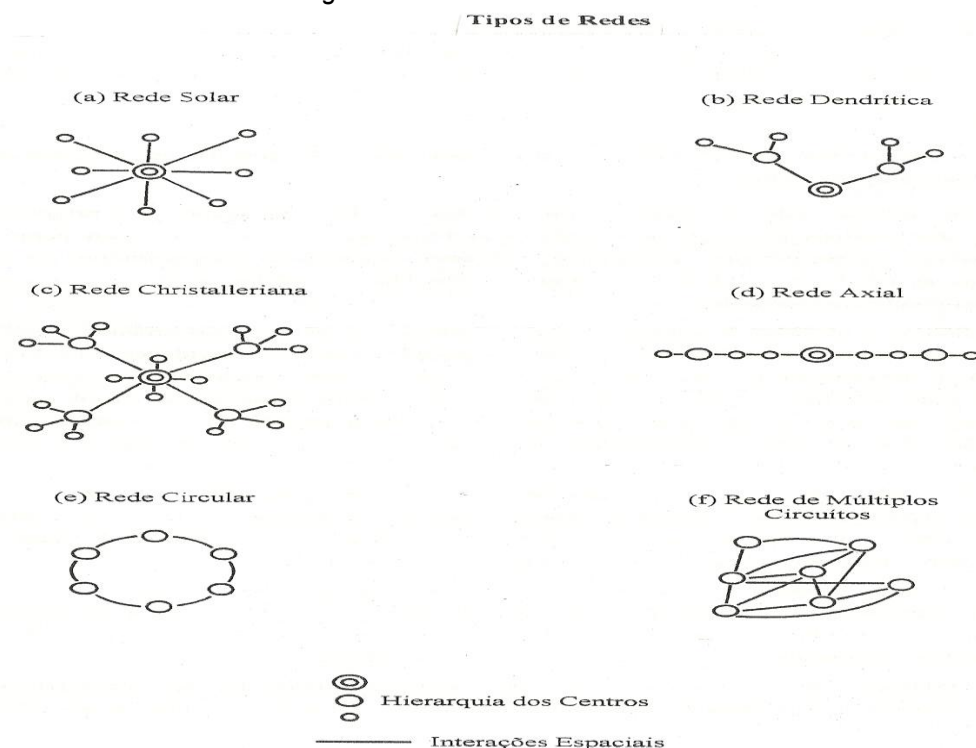
In the context of the global economy and the organization of large corporations, authors such as Manuel Castells (1999) go on to define the "network society" as the dominant paradigm, where flows (of capital, information, technology and people) become more important than the fixed territories themselves. Multinationals, especially in the oil sector, are classic examples of this model, acting on a planetary scale and reorganizing space according to their interests. In this scenario, infrastructure and service networks become central elements in the articulation of places, as observed in the case of Macaé, where offshore companies and their production chains structure the territory based on a network logic that goes far beyond local or national borders.

In contemporary geographic space, each node of a network can simultaneously integrate different networks, playing varied roles: it can be the center in one, the periphery in another, or even assume intermediate functions. This increases the complexity of the analysis and requires a multidimensional approach to understand how these connections

affect regional development, productive specialization, and the formation of luminous and opaque spaces (Santos, 2005).

The understanding of network structures is fundamental for the study of dynamic and globalized territories, such as Macaé, as it allows us to visualize the overlap of economic, social and technical flows, in addition to understanding the differentiated effects of integration into global capitalism.

Figure 2 – The network structures



Source: Corrêa, Roberto L. 1997

The centrality of the concept of network in the human sciences, and especially in Geography, is associated with its ability to express and interpret the growing complexity of spatial interactions in contemporary times. As Milton Santos (1999) has already warned, the ease with which the notion of network is appropriated in various fields of knowledge and social practices results in a wide use of the term, not always accompanied by conceptual precision. However, the very expression of networks in the territory, as observed in multinational companies in networks or in networks of national companies, makes the phenomenon "well defined" in empirical reality, facilitating its visualization and analysis.

In the context of geographic analysis, the emergence of the term network is inseparable from the phenomenon of the acceleration of flows, of information, goods, ideas, energies and people, which characterize what Santos called "contemporary acceleration". This acceleration imposes a revision of the traditional view of space, shifting attention from the analysis of regions, marked by slowness and compartmentalization, to the analysis of networks, which capture mobility, integration and the multiplicity of connections. Moreira (1997) summarizes this displacement when he states that "the region is a look at the slow space", referring to stable landscapes and gradual historical processes, while "the network is the look at the mobile and integrated space", shaped by technique, the market and the intensification of flows.

The emergence of this "new order of space", as Moreira (1997, p. 2) writes, is the result of technical advances and the development of the market, in which networks — especially those of transport and communications — have become central elements of the spatial organization of modern society. According to the author, the architecture of these connections sustains the advanced relations of production, distribution and circulation, enhancing the density and scale of movements in the territory and boosting the globalization process.

Several contemporary authors, such as Souza (1995), Raffestin (1993), Corrêa (1997, 1999) and Castells (2000), understand networks as sets of points or locations interconnected by flows, composing a reticulated design that can be represented cartographically. Milton Santos (1985, p. 67) defines networks as "an articulated set of fixed and flows", emphasizing that flows (movements, information, goods, people) only exist as a function of fixed flows (infrastructures, buildings, equipment), but also that fixed flows themselves are transformed by the flows they attract or emit.

Santos deepens this relationship by proposing that geographic space is formed by "fixed and flows" in continuous interaction, and this dynamic is fundamental to the geographic method: "The fixed ones (house, port, warehouse, plantation, factories) emit flows or receive flows, which are the movements between the fixed ones. Social relations command the flows that need the fixed ones to be realized. The fixed ones are modified, but the flows also change to meet the fixed ones. So, if we consider that the space formed by fixed and flows is a principle of method to analyze space, we can couple this idea to the idea of time. The flows do not have the same speed" (Santos, 1997, p. 164). This reading is pointed out by Moreira (1997, p. 7) as a "magnificent recreation" of Jean Brunhes' notion of "full and empty".

The paradigm of "lines" (flows) and networks, therefore, gradually replaces the paradigm of areas, especially in recent phenomena such as the dissociation between production sites and industrial management (Sposito, 2001). For Sposito, although he does not elaborate a formal definition of network, the consistency of the concept in the interpretation of commodity flows evidences its consolidated role in geographical theory.

The network approach also allows us to rethink the very concept of territory. Souza (1995) presents the notion of "network-territory", a discontinuous territory that does not presuppose spatial contiguity, but articulates "nodes" (locations, groups, organizations) through functional and symbolic relations. This conception is used to understand everything from licit networks — such as logistics or business — to illicit networks, such as those of drug trafficking organizations, which unite discontinuous territories under the logic of complex and dynamic articulations, challenging the exclusivity of power over a continuous space.

To understand networks more completely, Sposito (2008, p. 48) suggests considering "structure, scale, actors, territories and flows", elements that combine in a complex way that is often impossible to measure quantitatively, and it is up to qualitative analysis to identify their articulations and implications.

The concept of network, according to Leila Dias (1995, p. 143), carries its own historicity. The content of the concept, she says, "is its history", requiring the researcher to make an effort to understand its unfolding in thought and reality, especially in the recent changes driven by technology and globalization.

Milton Santos (1996) contributes to a "geohistorical" approach to the concept, proposing two approaches: the genetic one, which analyzes the networks as historical processes (with objects, flows and infrastructures from different eras), and the current one, which takes them as data of the present reality, subject to synchronic description and analysis. Both approaches, according to Santos, cannot be rigidly separated, because the understanding of the present requires consideration of the past, and vice versa.

Santos also proposes a periodization of the development of networks: a long pre-mechanical period, an intermediate mechanical period, and the current phase, marked by the predominance of technical and informational networks. However, he warns that there is no homogeneity in the networks ("not everything is a network") and that there are areas densely covered by networks, coexisting with low-density areas or even without networks. Thus, networks overlap, connect and create inequalities in use, access and control, evidencing multiple levels of solidarity and contradiction: global, national and local.

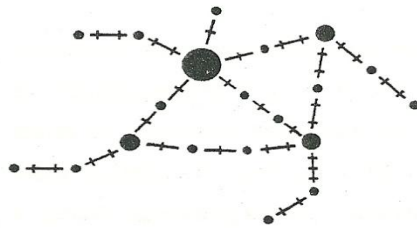


Corrêa (1995, p. 108-109) reinforces this idea by stating that geographic networks are "social products and conditions" and, in the current phase of capitalism, assume a central role in economic, social, political and cultural life, simultaneously including and excluding agents, groups and territories. The author recognizes that geographic networks, defined as "a set of locations on the earth's surface articulated by routes and flows" (Corrêa, 1999, p. 65), are only one type of network, those that manifest themselves spatially in the territory.

Understanding networks as a technique, territorial expression, and instrument to accelerate flows is fundamental to understanding the organization of space in contemporary capitalism, especially in sectors such as oil, where global networks of production, circulation, and command reconfigure scales and borders. Networks are, historically, the result of human efforts to expand communications, exchanges, and control of the territory, serving, since the first civilizations, the organization of power, the economy, and social life.

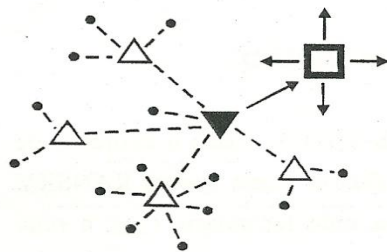
Redes Geográficas - Exemplos Simplificados

(a) Rede ferroviária



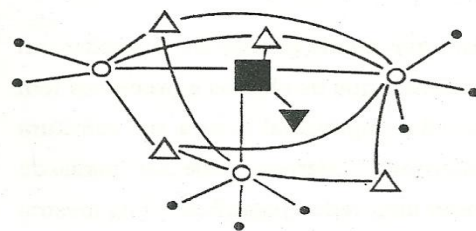
- Estação central
- Entroncamentos
- Paradas
- +++ Trilhos

(b) Bacia leiteira



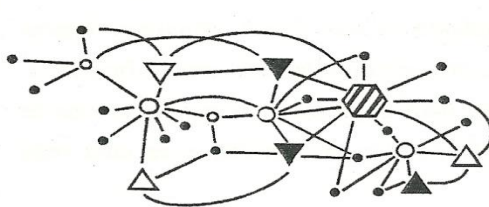
- Metrópole (consumo e distribuição)
- ▼ Fábrica (embalagem, leite em pó, etc.)
- △ Posto de coleta (resfriamento)
- Fazenda (produção de leite)
- Fluxo das fazendas e postos de coleta
- Fluxo de leite e derivados para os consumidores

(c) Corporação



- Sede
- ▼ P e D
- Fábrica
- Unidade de matérias-primas
- △ Filial de vendas
- Fluxo de gestão e de produtos

(d) Rede urbana



- ⬢ Metrópole
- ▼ } Centros especializados
- △ }
- } Lugares centrais
- }
- Principais fluxos de mercadorias, pessoas e informações

Organizado por: **Roberto Lobato Corrêa**

Currently, the consolidation of networks is a condition for the globalization of capital and the advance of capitalism, making them central elements for understanding spatial transformations, globalization processes and inequalities that deepen with the intensification of flows and the selectivity of access to networks.

THE CORPORATION AND THE SPACE ORGANIZATION

According to Lobato (1996, p. 213), "the large corporation became, after the Second World War, the most important agent of capitalist spatial reorganization. Its action was

translated, on a world scale, into a new international division of labor (Cohen, 1981), generating a synchronic specialization (Lipietz, 1977) that involves the simultaneous production in different places of the different component parts of the same product, and in the consequent international trade between subsidiaries of the same corporation. It also translated into the emergence of true world cities (Sachar, 1983), where the headquarters of corporations that act as centers of economic and territorial management of large areas of the globe are located".

The corporation is, perhaps, the largest geographical actor in the modification and reproduction of space. Dunning (apud Chesnais) argues that "the multinational company is increasingly assuming the role of conductor of the orchestra, in relation to various production activities and transactions, which take place within a 'cluster' or 'network' of transnational relations, both internal and external to the companies, and which may or may not include a capital investment, but whose objective is to promote its global interests". This process of capital accumulation imposes on the firm the need for expansion through large-scale and/or highly technological production, mergers and acquisitions, and the expansion of world markets.

Throughout capitalist development, the international expansion of the system became increasingly evident. Souza (1985) points out that "the development and contradictions of the global capitalist system are what gave rise to global corporations and determine their basic characteristics, as well as the tendencies of their evolution". The emergence of large corporations is directly linked to the process of internationalization of capital, widely analyzed by authors such as Palloix (1978), Singer (1977) and Chesnais (1996).

A central characteristic of large corporations is their wide scale of operations, which results in the creation of a complex flow space, demanding the manipulation of large volumes of raw materials, intermediate and final goods. To do this, they build multiple production units — factories, offices, research centers, warehouses — dispersed in different places, connecting scales ranging from local to global.

The size of large corporations has been amplified by successive processes of mergers and acquisitions. Tugendhat (1977) points out that, between 1880 and 1890, more than 5,000 companies were concentrated in about 300 trusts in the United States. Green and Cromley (1982) identify three types of mergers:

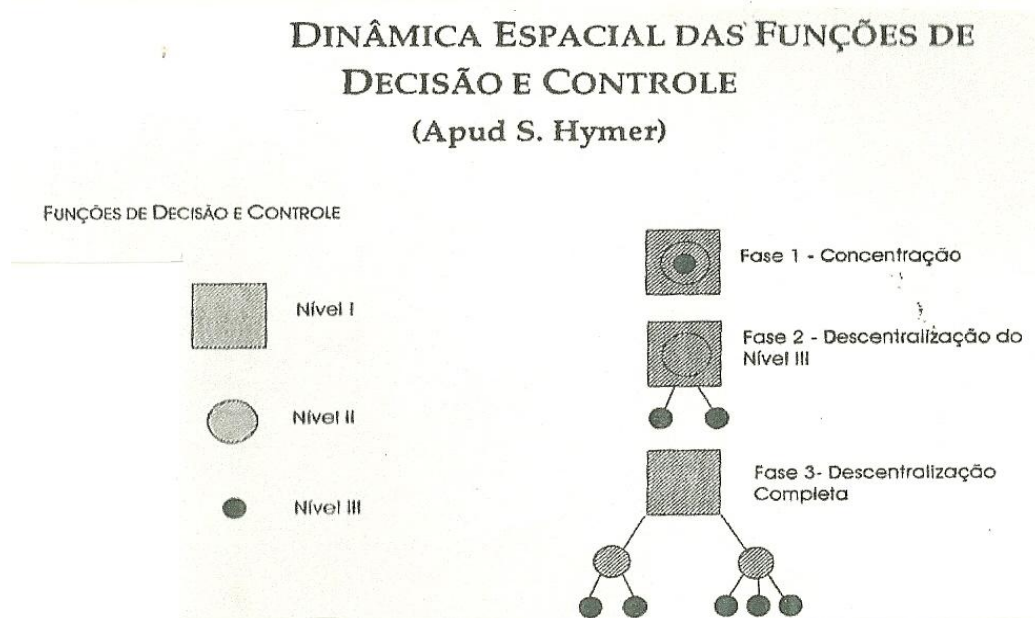
- a) Horizontal merger:** expansion of control in the same product line, aiming to eliminate competitors;
- b) Vertical merger:** control over associated products, from raw materials to distribution;

c) Conglomerate merger: acquisition of companies from different sectors, minimizing risks and diversifying capital gains.

These strategies confer great political and economic power to corporations, creating economic spaces that go beyond the limits of national states. According to Hymer (1978), the emergence of an internationalized economy requires new forms of territorial management, leading to the erosion of the traditional powers of the States and the adoption of policies that favor the internationalization of capital and labor. For Hymer (apud Corrêa, 2001), large corporations have an administrative structure at three hierarchical levels:

- **Level III:** management of daily operations;
- **Level II:** coordination of intermediate managers, with a medium-term horizon;
- **Level I:** definition of strategic objectives and long-term planning.

Figure 3 – Administrative structure of a large corporation



Source: Lobato, 1997.

Becker (1982) states that "the nation-state admits to being limited in its economic sovereignty, but not in its political rights". However, when the government favors the company, contradictions arise in national communities, including the decrease in state influence in the locational decisions of large organizations, which can result in a loss of power over space and over the territorial decision-making process itself.

The spatial practices of large companies, public or private, tend to be similar. In the oil sector, the manipulation of a strategic mineral resource further increases the power of these corporations, which operate in markets marked by oligopolies and are accompanied by a "fringe" of independent companies, whose activities can redefine the industry itself

(Britto). The sector is characterized by vertical integration: from the control of extraction to the processing and commercialization of petroleum products.

Jones (1988) shows that, after the 1973 crisis, oil companies became more competitive, diffuse and outsourced, driving the emergence of service providers and suppliers of specialized equipment. Holmes (1986) identifies that the practice of subcontracting responds to cyclical demands for services, the use of advanced technology in specific phases and the need for indirect control over the workforce. In the case of the North Sea, in 1987, about 98% of the expenses with oil exploration were paid to contractors, a reality similar to that of Macaé, although in a smaller proportion.

The impact of corporations on cities has become the focus of attention in geographic studies due to the strengthening of the local scale in the face of the loss of centrality of the national and regional scales. Becker (1988) emphasizes that the place corresponds to the "lived space of daily activities", where strategic practices and conflicts materialize and where resistance movements arise. For corporations, places with great locational potential become centers of action, replacing the relevance of national and regional scales.

Corrêa (1988) exemplifies the impact of large companies on urban space by analyzing the performance of companies such as General Motors, Standard Oil of California and Firestone, whose presence caused suburbanization, elimination of public transportation, expansion of shopping malls and real estate speculation in North American cities. These transformations reflect the centrality of the corporation in the production of urban space, favoring private investments to the detriment of traditional central areas.

Santos (2005) observes that "the most powerful companies choose the points that they consider instrumental for their productive existence", constituting the so-called "luminous spaces", areas of high productivity and competitiveness, while the rest of the territory is relegated to "opaque spaces", inhabited by less powerful companies. In the Brazilian context, groups such as Bradesco, Unibanco, Brascan, Kelson's and Estaleiro Mauá stand out in the process of speculation, allotment and production of urban space, functioning both as an investment alternative and as an instrument of social control.

According to Corrêa (1988), the control of urban land by capital determines the location of the labor force, intervening in social reproduction and avoiding questions to private property or the capitalist management of the territory. The performance of large corporations can also be analyzed from a geopolitical perspective. Becker (1988) examines the impact of Companhia Vale do Rio Doce in Carajás, characterizing the formation of a "monopoleville", or company city, where the control and organization of urban space reflect the company's power over daily life, security, the labor market, and urban segregation.

Davidovich (1989) points out that large industry builds its own and separate environments, with specific rules and codes to increase efficiency and control over human and material resources, as exemplified in the industrial cities created by Volkswagen, Usiminas and others.

Finally, Santos (2005) points out that the presence of a large global company in a location influences the employment equation, the consumption profile, the use of infrastructures and public budgets, in addition to impacting the image and collective ethics of the place.

THE OIL CHAIN

The oil industry is characterized by specificities that directly impact the configuration of its production chain and the sector's business strategies. Due to the complexity of the processes, the high degree of uncertainty and the significant investments required at all stages, oil and service companies tend to adopt restricted and highly specialized strategies, guided by technical, economic and risk management issues. According to Almeida (2002), the definition of strategies is particularly crucial in this field, as uncertainty is inherent both to the geological characteristics of the reserves and to the volatility of international markets and the political environment of the producing countries.

The oil production chain is traditionally segmented into three major blocks: **upstream**, **middlestream** and **downstream**. The **upstream segment** covers the initial exploration, development, and production phases of the oilfields. Middlestream, on the other hand, involves the transportation, refining and, sometimes, the intermediate distribution of oil and its derivatives, while downstream refers mainly to the distribution, commercialization and final consumption of these products (ANP, 2000b).

The beginning of the chain occurs with exploration, a stage marked by high risks, due to the uncertainty of the existence of oil, the need for large investments in geological and seismic studies and in the drilling of wells. Failure at this stage implies significant financial losses, making this segment restricted to highly capitalized companies with a high degree of self-financing (Almeida, 2002). Once the existence of reserves is confirmed, the development phase of the fields begins, which requires the installation of additional wells, extraction, treatment and storage systems, also requiring robust investments and risk management, especially regarding the productivity and economic viability of the field.

The production stage begins with the extraction of the oil and its preparation for commercialization. At this point, oil is treated as a global commodity, subject to price fluctuations in international markets. Factors such as geographic location, oil quality, and

logistics costs directly impact the cost of production and the profit margin of companies. To guarantee part of the extraordinary income from oil, it is common for national states to impose high tax regimes on production.

In the **middlestream**, the highlight is transportation, which can involve pipelines, ships or other modes, and refining, a fundamental step in the transformation of crude oil into high value-added derivatives, such as gasoline, diesel, lubricants and naphtha. Finally, the **downstream** encompasses the **distribution** and marketing of products, covering networks of service stations, distributors, and industrial consumers.

A key characteristic of the sector is the high risk at almost all stages, whether for geological, technological, market or political reasons. Price volatility, institutional risks in producing countries and barriers to entry create an environment where few companies, usually large and with global capacity, are able to act in an integrated and efficient manner at all stages of the chain (Almeida, 2002).

In the context of the contemporary global economy, the oil chain is part of informational, productive and logistical networks that cross national borders. According to Castells (1999), the informational economy is characterized by the global articulation of information, knowledge and production systems, forming what the author calls a "networked company". In this model, the productivity and competitiveness of companies depend on the efficient management of information flows, technological mastery and the ability to articulate multiple agents on a global scale.

It is important to differentiate the concept of **the network company**, which corresponds to the evolved intra-organizational structure — characterized by the integration of different autonomous segments, but articulated by advanced information and communication technologies — from the concept of **network of companies**, which refers to interorganizational arrangements composed of legally independent but cooperative companies, often integrated by strategic contracts, outsourcing and partnerships (Britto). This distinction is fundamental to analyze how global oil companies organize their production processes and the coordination of their activities in different countries, especially in strategic sectors such as upstream and refining.

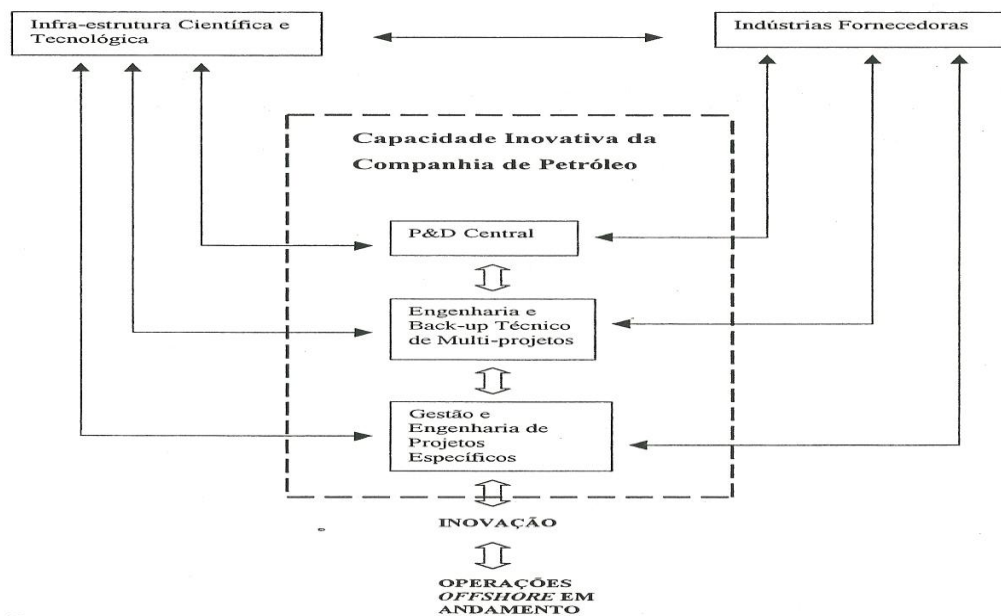
According to Santos (2005), each productive branch — especially in the oil industry — projects its own territorial logic, forming a specific topology in the territory. The points of interest of the oil chain go beyond the firm itself and are projected onto suppliers, buyers and distributors, creating territories of global interest articulated through technical-productive and logistical networks. The use of the national territory then becomes

subordinated to a global logic, dictated by the strategies of international corporations and their networks.

Organizational changes, especially from the 1980s onwards, were motivated by an environment of uncertainty and rapid transformation of global markets. Information technology, especially from the 1990s onwards, played a central role in intensifying these changes, allowing the formation of flexible, decentralized production networks capable of responding quickly to the demands of the international market. Without computer networks, the digitalization of processes and advanced telecommunications, it would not be possible to articulate new strategic alliances, outsourcing contracts, decision-making decentralization and the efficient integration of the global oil chain.

Figure.4

Estrutura Típica da Capacitação Inovativa das Companhias de Petróleo para Operações Offshore⁴⁰



Fonte: Bell & Oldham (1988a, p.82)

Source: Adapted from Castells (1999).

Castells (1999) defines the networked company as "that specific form of company whose system of means is constituted by the intersection of objective autonomous segments. Thus, the components of the network are both autonomous and dependent on the network and can be a part of other networks and thus of other media systems intended for other purposes. So, the performance of a given network will depend on two of its fundamental attributes: connectivity, that is, structural capacity to facilitate noise-free communication between its components; coherence, that is, the extent to which there are shared interests between the objectives of the network and its components".

In this way, the oil chain exemplifies the contemporary functioning of global business networks: companies and their partners are articulated in complex networks, seek flexibility, innovation capacity, adaptation to markets and knowledge management, aiming at competitiveness in a scenario marked by risk, uncertainty and geopolitical disputes.

NETWORK ENTERPRISE

Productive globalization, intensified in recent decades, has profoundly transformed the models of business organization and expanded the possibilities of integration between different economic actors. One of the main results of this process has been the rise of networks of companies, flexible and multifunctional structures that reconfigure competitiveness, the organization of space and the dynamics of global flows of capital, technology and knowledge. As analyzed by authors such as Castells (1999) and Chesnais (1996), the network company and the networks of companies have become the dynamic core of the new informational economy, connecting large corporations, small and medium-sized enterprises, banks, research centers and governments through alliances, contracts and digital platforms.

These networks go beyond national borders and integrate research, production, distribution, marketing and innovation activities on a planetary scale. The advancement of information and communication technologies was decisive for this transformation, as it enabled decentralized management, the integration of partners and the instantaneous circulation of strategic information, making it possible to coordinate operations that were geographically dispersed, but aligned with common objectives and global strategies. According to Cassiolato, these networks not only optimize resources and processes, but also stimulate alliances, knowledge exchanges and the creation of new markets, strengthening the competitiveness of the companies involved.

In the oil industry, networks of companies are essential due to the technological complexity, high risk, and need for scale of operations. Vertical integration is one of the most recurrent strategies in this sector, allowing companies to act in all stages of the production chain, from exploration to the final consumer and reduce uncertainties in intermediate markets. At the same time, the formation of strategic alliances and flexible cooperation networks between companies, including between competitors and service providers, allows for sharing risks, accessing new technologies, innovating and expanding markets, in addition to quickly meeting specific customer demands and variations in the global market.

The network structure, therefore, is not restricted to the relationship between multinationals; It also involves small and medium-sized enterprises, suppliers, distributors and customers, composing interorganizational arrangements based on flexibility, differentiation of functions and cooperation. In strategic sectors, technological cooperation and standardization networks further expand the possibilities of mutual gains, promoting shared access to knowledge, innovations, and new markets.

The consolidation of these networks causes profound transformations in the territory, redefining hierarchies and regional specializations. As authors such as Dupuy (1988) and Paulillo (2000) point out, the network becomes the very instrument of territorial management, articulating different scales, promoting public-private partnerships, stimulating investments in infrastructure, innovation and training of human resources. The territory of the corporation, understood as its spatial organization, becomes, at the same time, a reflection and condition of the process of economic integration of a country in the global system.

In Brazil, the regions associated with the oil chain offer concrete examples of the role of business networks in the internationalization of markets, in the circulation of capital and in the diffusion of technology. However, as Gonçalves et al. (1998) point out, this process is selective and unequal, fully integrating certain territories while others remain on the margins, which contributes to regional and social polarization.

In the face of intensifying competition and advancing technologies, the dominant strategies among global companies include vertical integration, the formation of flexible networks, productive decentralization, the creation of strategic alliances, and inter-firm cooperation. Such practices increase the capacity to respond to crises, accelerate innovation and favor entry into restricted markets, in addition to enhancing the systemic competitiveness of companies.

As Britto (2002, p. 345) summarizes, contemporary competitive performance does not depend only on the individual actions of companies, but mainly on the relationships they maintain among themselves and with other institutions in the productive environment. Thus, business networks are consolidated as the organizational basis of informational and globalized capitalism, an essential condition for innovation, market expansion and strengthening of competitiveness on a planetary scale.

RESULTS

The analysis of the data collected on the presence and performance of large offshore corporations in Macaé revealed a profound and accelerated transformation in the socio-

spatial dynamics of the municipality, establishing it as the main oil production center in the country and one of the largest industrial hubs in Latin America. The results point to a territorial configuration marked by the concentration of multinational companies, the modernization of urban infrastructure and the intensification of economic and migratory flows.

The survey of the commercial registry of offshore companies demonstrated the significant presence of multinationals in the municipality, with emphasis on high-tech sectors such as prospecting, drilling and extraction. Multinationals — notably Halliburton, Baker Hughes, Schlumberger, among others — represent more than half of the companies installed in the most strategic sectors of the oil production chain. This concentration is mainly verified in planned neighborhoods, such as Novo Cavaleiros, endowed with advanced infrastructure, which reveals a clear territorial selectivity of corporations in the appropriation of urban space.

The results also show that the installation of these companies boosted the accelerated demographic growth, migrating the rural population to urban areas, attracting qualified labor from different regions of the country and abroad and profoundly changing the social profile of the municipality. The GDP per capita of Macaé experienced a notable increase, becoming one of the highest in the state of Rio de Janeiro, following the expansion of the services and trade sector, especially linked to the oil industry.

However, the study reveals that this economic dynamism has brought with it considerable challenges: disorderly urbanization, the overload of public services, the increase in social inequality and the precariousness of working conditions, especially in outsourced and support activities. Despite the wealth generated, the benefits are unevenly distributed, with areas of "luminous spaces" — highly integrated and technologized — coexisting with "opaque spaces", marked by exclusion and vulnerability, as proposed by Milton Santos (2005).

In addition, the analysis of business networks confirmed the hypothesis that the structuring of corporations into "network companies" promotes a strong global-local integration, inserting Macaé in international circuits of production, information and capital. This internationalization enhances the local economic dependence on the oil sector, making the municipality vulnerable to fluctuations in the international market and strategic decisions made outside the territory.

Finally, the case studies of the companies Halliburton, Baker Hughes and CBV illustrate how different organizational models, national and multinational, coexist and compete for space, evidencing the complexity of the local productive arrangement.

Multinationals operate with greater investment and innovation capacity, while national companies seek specific niches and integrate into production chains through subcontracting and partnerships.

In summary, the results confirm that the presence of large offshore corporations in Macaé has redesigned the territory, intensified economic and demographic flows, and established new patterns of urbanization and sociability, but also accentuated social contradictions, inequalities and structural challenges that demand articulated public policies and more effective regulation to ensure sustainability and social inclusion in the municipality.

CONCLUSION

The municipality of Macaé evidences, in its territorial configuration and urban dynamics, the predominance of the interests of large oil corporations, which shape the space according to the logic of globalized production and network action. The historical and contemporary analysis of the municipality reveals that the specialization of urban space, especially in neighborhoods such as Novo Cavaleiros, does not result from a spontaneous process, but rather from the presence and articulation of companies, which concentrate their fixed spaces in areas endowed with infrastructure, security and connectivity, enhancing the interaction between productive units. This arrangement highlights the role of large corporations in defining the uses of the territory and reinforces the selectivity of investments, producing contrasting landscapes and deepening intra-urban inequalities, as observed in the comparison between strategic neighborhoods and others of less economic relevance, such as Lagoa de Jurubatiba.

The study shows that, just as society is structured in networks, corporations also adapt their strategies to the relational logic, forming companies in a network or integrating themselves into networks of companies, especially in the competitive oil sector, where the domain of research, development and technology is fundamental and determines the global oligopoly in the prospecting segment. The analysis of the performance of these companies reveals the presence of central elements of the networks: structure, scale, actors, territory and flows, as proposed by classical authors of geography and political economy. In Macaé, corporate networks are, in essence, global, but they are also expressed on national and local scales, as Milton Santos highlights when dealing with the multi-scalarity of network processes and their articulation between territory and technique.

It is evident that the networks composed of corporations reorganize the territory, playing a central role in the advance of global capitalism, and that local spaces, such as



Macaé, acquire strategic importance as nodal points of these networks. The presence of large corporations also mobilizes national service companies and public and private institutions, making the network even more complex, but guided mostly by the interests of multinational oligopolies.

The case studies, which analyzed three companies in the sector, two global majors and one with centralized operations in Macaé, illustrate how large corporations, even though they have decision-making and R&D centers in their national or global bases (such as Houston, Texas), depend on the networks of companies to operationalize their activities locally, forming complementary and complex systems of cooperation and competition. The companies' cartography shows the articulation between the local and the global, showing that, although majors such as Halliburton and Baker Hughes operate worldwide, they maintain strong ties with their bases of origin and use the network structure to enhance their reach and productive efficiency.

Thus, Macaé consolidates itself as a strategic link in the global oil network, revealing how the dynamics of corporations and business networks reorganize the territory, redefine scales and insert the municipality in the heart of the informational and globalized economy.



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