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Integrated planning, environment, and management: the French and Brazilian experiences of integration through the Blue-Green Network

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Abstract

Objective: To discuss the interdependence of mechanisms, instruments and management instances in territorial planning and inter-municipal multi-sectorial integrated planning, based on the environment and in voluntary collaborative arrangements. Management of the integration: from local to regional, and to national sphere. Availability of multi-scalar, and cross-sectorial Brazilian collaborative arrangements.
Methodology and approach: Concepts - link between planning a complex territory and socioeconomic factors based on the green elements (vegetated masses and ecological corridors) and blue (waters) – Green and Blue Network (GBN). French practices; coordination and management instruments; collaborative territorial arrangements at different scales. Cases: France and the Inter-municipal Consortium of the Greater ABC and Coastal Management. North Coast plan (state of São Paulo). Emphasis and hierarchy of treatment of biophysical systems: economic, social, historical and cultural factors, in the cases.
Originality and relevance: Debate on integrated planning at an inter-municipal, flexible and multi-scale level; relevance of voluntary collaborative territorial arrangements (Inter-municipal Consortium), or linked to Coastal Management, with preservation of the environment and ecological connectivity. Green and Blue Network (GBN) like a basis for planning. Scalar connections, suitable for land use planning; and like a biophysical basis and guarantee of territorial consistency and coherence.
Main Results: Positive example of territorial arrangements; preservation of the environment and ecological connectivity; opportunity of Green and Blue Network (GBN), for the multi-sectorial planning of the territory.
Conclusions: The French model and the Brazilian experiences represent flexible models of institutional and territorial nature for metropolitan governance, in the midst of a wide range of possibilities.

Keywords: Territorial integrated planning. Green and blue weft. French and Brazilian experiences.

Planejamento integrado, meio ambiente e gestão: as experiências francesa e brasileira de integração pela trama Verde e Azul

Resumo

Objetivo do estudo: Discutir a interdependência de mecanismos, instrumentos e instâncias de gestão no ordenamento territorial e planejamento integrado multissetorial intermunicipal, com fundamento meioambiental e em arranjos colaborativos voluntários. Gestão da integração do local ao regional, e à esfera nacional; presença de uma prática positiva de arranjos colaborativos multiescalares e intersetoriais no Brasil.
Metodologia e abordagem: Conceitos - vínculo entre planejar um território complexo e fatores socioeconômicos alicerçados nos elementos verde (massas vegetadas e corredores ecológicos) e azul (águas) – Trama Verde e Azul (TVA). Experiência francesa; instrumentos de coordenação e gestão; arranjos territoriais colaborativos em distintas escalas; casos - França e Consórcio Intermunicipal do Grande ABC e Plano de Gerenciamento Costeiro do Litoral Norte (estado de São Paulo). Ênfase e

hierarquia de tratamento dos sistemas biofísicos, e fatores econômico e social, histórico e cultural nos casos.
Originalidade e relevância: Debate do planejamento integrado em nível intermunicipal, flexível e multiescalar; relevância de arranjos territoriais colaborativos voluntários (Consórcios Intermuncipais), ou atrelados ao Gerenciamento Costeiro, com preservação do meioambiente e da conectividade ecológica. Importância da Trama Verde Azul (TVA) como base do planejamento; conexão escalar adequada ao ordenamento do território; fundamento biofísico e garantia da consistência e coerência territoriais.
Principais Resultados: Exemplo positivo de arranjos territoriais; preservação do meioambiente e da conectividade ecológica; oportunidade da Trama Verde Azul (TVA), para o ordenamento multissetorial do território.
Conclusões: O modelo francês e as experiências brasileiras representam modelos flexíveis de natureza institucional e territorial para a governança metropolitana, em meio a uma vasta gama de possibilidades.

Palavras-chave: Ordenamento territorial. Planejamento integrado. Trama verde e azul. Experiências francesa e brasileira.

Planificación, medio ambiente y gestión integrados: las experiencias francesa y brasileña de integración a través de la Malla Verde y Azul

Resumen
Objetivo del estudio: Discutir la interdependencia de los mecanismos, instrumentos e instancias de gestión en la planificación territorial y la planificación integrada multisectorial intermunicipal, con base en el medio ambiente y en acuerdos de colaboración voluntaria. Gestión de la integración desde lo local a lo regional, y al ámbito nacional; presencia de una práctica positiva de arreglos colaborativos multi-escalares e intersectoriales en Brasil.
Metodología y enfoque: Conceptos - vínculo entre la planificación de un territorio complejo y los factores socioeconómicos a partir de los elementos verde (masas vegetales y corredores ecológicos) y azul (aguas) – Green and Blue Trama (TVA). Experiencia francesa; instrumentos de coordinación y gestión; arreglos territoriales colaborativos a diferentes escalas; casos - Francia y el Consorcio Intermunicipal del Gran ABC y Plan de Ordenación del Litoral del Litoral Norte (estado de São Paulo). Énfasis y jerarquía de tratamiento de los sistemas biofísicos, y factores económicos y sociales, históricos y culturales en los casos.
Originalidad y pertinencia: Debate sobre la planificación integrada a nivel intermunicipal, flexible y multi-escalar; relevancia de los arreglos territoriales colaborativos voluntarios (Consorcios Intermunicipales), o vinculados a la Gestión Costera, con la preservación del medio ambiente y la conectividad ecológica. Importancia de Trama Verde Azul (TVA) como base para la planificación; conexión escalar adecuada para la planificación del uso del suelo; fundamento biofísico y garantía de consistencia y coherencia territorial.
Resultados principales: Ejemplo positivo de arreglos territoriales; preservación del medio ambiente y conectividad ecológica; oportunidad de Trama Verde Azul (TVA), para la planificación multi-sectorial del territorio.
Conclusiones: El modelo francés y las experiencias brasileñas representan modelos flexibles de carácter institucional y territorial para la gobernanza metropolitana, en medio de un amplio abanico de posibilidades.

Palabras clave: Planificación territorial. Planificación integrada. Trama verde y azul. Experiencias francesas y brasileñas.

Introduction

This paper discusses the relevance and interdependence of coordination mechanisms, instruments, and instances for territorial planning and integrated inter-municipal and multisectoral planning, whose limits go beyond administrative divisions and are grounded on the environment, around voluntary collaborative arrangements. It describes how this management process can facilitate multi-scale relations, articulating local and regional aspects

in their connections with the national government sphere. The French experience, which has prepared in the last thirty years instruments for coordination and management of collaborative territorial arrangements on different scales, is presented as a reference, as well as two cases inspired by this debate in Brazil (São Paulo state) – ABC Region Intermunicipal Consortium, and North Coast Coastal Management Plan.

The processes towards multisectoral coordination and territory planning based on an organic relation of different decision levels, and the establishment of specific spatial divisions – collaborative territorial arrangements in network -, are described in the cases, incorporating the debate on countryside and city balance and inclusion of multiple socio-economic and environmental factors, under sustainable economy, aiming at the compact city and coping of ecological, energetic and climate transitions.

Though these premises seem to outline an ambitious and utopian scope for territorial planning, the paper's objective is to describe experiences that procedurally and historically have prepared this type of planning. Far from being fully resolved, it requires constant improvement of its instruments, forms of coordination, and relations with different government levels and spheres, in the Eurocentric world and Brazil. In light of the French path around the theme and its planning experience, another objective is to show that there is, in Brazil, a practice of formation and management of multi-scale and intersectoral collaborative arrangements with positive results, which does not dispense with critical considerations. We show that multi-scale and intersectoral planning is not only possible in the scope of our administrative and political structure, however different from the French one, but coordination instruments improved in the European world, particularly France, can potentiate these practices in Brazil, enabling their replication, when appropriate.

The methodology first addresses concepts that are fundamental to understanding the close connection between complex territory planning and adoption of socio-economic factors grounded on environmental components, represented by the elements green (mass of vegetation and ecological corridors) and blue (waterways) – The Blue-Green Network (BGN).

Next, it presents the cases, starting with the French reference followed by Brazilian examples, to emphasize its procedural and open nature, liable to continued improvement of instruments, regulation, and management.

The Brazilian experiences addressed were selected because they show planning processes based on biophysical systems acting along with economic and social, historical and cultural factors, with distinct emphases, hierarchies, and priorities, and demonstrate the procedural effort to connect territorial planning to the environment, including in its scope this critical sphere of knowledge.

To achieve these objectives and guide the arguments, the cases are presented, each in its specificities, and compared, showing not only approximations, but, mainly, the

singularities of plans and coordinated management, based on the French experience. Each case received thematic block treatment, presenting dynamics, institutional structure, and decision-making power for better presentation and record as a multi-scale articulation system.

The French case is outstanding for adopting the river water and green system, under the Blue-Green Network, as the European country legislation calls it. It is a reference to producing urban-regional integration of other socio-economic, cultural, and historical dynamics, based on a hierarchy of principles and decisions.

The following Brazilian cases integrate the debate on the reach of this policy and its instruments, besides the importance of critically analyzing the experience in our country:

- ABC Region Consortium and respective ABC Region Master Plan (PDR-ABC), with support from ABC Region Economic Development Agency - ABC (ADE-GABC) – voluntary collaborative arrangement seeking to implement conditions for a new economy based on technology and information activities, which also include a Technology Park – a network-park. Though the Consortium principle is a strong action in the economic sphere, it is articulated in a complex regional plan, with socioenvironmental agenda (adoption of Billings Reservoir and Tamanduatehy basin as milestone), and regulation of land occupation, mitigating the population vulnerable conditions and environmental damages;
- North Coast Coastal Management Plan (São Paulo state) – priority region in Brazilian and São Paulo legislation for the development of an integrated plan, for being a coastal area. Protection of the environmental heritage and explorations of coastal and marine resources are the primary motivation for integrated planning to compensate for the Atlantic Forest deforestation and expansion of urbanization in permanent preservation areas (PPAs). In this case, the priority is biome preservation, supported by the Coastal Management legislation. Processes, advances, and obstacles associated with management and coordination are presented, and efforts are made to include economic, social, and urbanistic spheres in the plan.

The hypothesis is that France and Brazil operate, from their specificities, local and regional collaboration arrangements with successes and difficulties. Such arrangements seek renewed complexity to provide coherence and consistency to the territory, anchored by biophysical elements (agenda stated in respective regulations), making the creation of intermunicipal collaborations flexible. The basis adopted for the inclusion of the environment in the Brazilian planning process is the previous experience with the debate and articulation of river basins, sub-basins, and masses of vegetation. These elements confer natural identity to

the territory, overcoming administrative and political limits and defining scales of operation with an environmental approach.

The administrative-political organization differences between France and Brazil should be considered as the starting point of this debate. This European country is a Unitary State, with political power centralization and control of the whole national territory; however, since the 1980s, it has been working on administrative decentralization, which is still proceeding despite the tensions (Qualidade da Democracia, 2015). Over three decades, three essential reforms enabled a new type of relationship of the State with the French society territory, and an organic articulation across different power and spatiality levels and spheres, changing its unitary organization towards a greater bond with local communities, municipalities, and regions.

The decentralization occurred through territorial public agencies (French collectivities, departments, and regions)[1], applying the principles of subsidiarity, proximity, and modulation, limiting and advocating a subsidiary and regulatory State, and re-organizing the competencies of the State and society. New institutions in regional level and procedures were created to manage collectivities, proposing possible arrangements and networks of cities that gained autonomy without losing their bonds with the national government. Since 2010, the country has invested in inter-communal cooperation, creating metropolitan hubs, and regrouping cities and regions, with growing decentralization and countering unitarism to the protagonism of territorially expressed collectivities (Qualidade da Democracia, 2015).

In Brazil, the administrative structure is Federative, with political and administrative decentralization, and entities with political and organizational autonomy, besides having their own Constitutions. Member states' financial and budgetary autonomy marks a crucial difference from the unitary State. However, the promotion of collective well-being and public interest in the different Brazilian urban and regional environments cannot dispense with inter-government cooperation, processes, and instruments for coordinating the different administrative entities and territorial divisions on several scales, thus potentiating public administrations and territory planning (Dias, 2012).

Such coordination and multi-sector processes, both in Unitary regime countries like France and in the Brazilian Federative environment, enable a desired control and planning of the territory that potentially include a variety of territorial arrangements, articulating a complex series of demands. These arrangements are based on the use of the environment as a reference for what the French literature calls "Trame Verte et Bleu" (Blue-Green Network), expressed in our reality for the role and regulation of elements of river basins and sub-basins

[1] The French Republic is divided into 18 regions (*régions*), 13 in Metropolitan France, and 5 in Overseas France. These are divided in 101 Departments (*départements*): 96 metropolitan departments and five overseas departments (*départements d'outre-mer*); each department operates as administrative division and territorial collectivity (*collectivité territoriale*) (INSEE, Géographie administrative et d'étude, 2022). Available on: https://www.insee.fr/fr/information/2016807.

[2] and biomes. In the Brazilian case, a multi-scale territorial planning based on this network and flexible arrangements allow us to consider that, though many times included in metropolitan regions[3], territories based on BGN can delimit the scale and inter-municipal collaboration most appropriate to meet regional and local needs, uniting municipalities in voluntary arrangements for planning purposes.

BGN addresses the green element as a "(...) set of natural and semi-natural land environments" (Dias, 2012, s. p.) (our translation), while the blue element represents the network of waters (rivers, streams, channels, ponds, swamps). In the Brazilian environmental planning, BGN directly corresponds to water resources, reservoirs, river basins, and sub-basins, because they are understood as the primary environmental management unit, as defined by PNHR (National Water Resources Policy) and PNMA (National Environmental Policy). Garcia (2016) states that River Basin is the environmental unit appropriate to address inter-relations affecting planning and development management on local and regional scales.

While the French experience incorporated the Blue-Green Network, Brazil recognized and regulated river basins and sub-basins as natural systems with the potential to be integrated into land use planning and economic and anthropic activities (Federal Law nº 9.433, of January 8, 1997, instituted the National Water Resources Policy). These are seminal elements to plan incorporating the environment, since their geophysical characteristics are defined by the relations between ecological and water systems, with relative cohesion (Dias, 2012, s. p.).

River basins and ecological systems are a means of knowledge and control of agents and factors related to space production and organization (id, ibid.). Their planning and management should include environmental resources of drainage areas, PPA (Permanent Protection Areas), LR (Legal Reserve Areas), and ecological corridors, and not only water resources, with an environmental, social, economic, and political integrated approach. They contribute to assessing the impacts of the anthropic activity, reducing the damaging outcome of floods, grounding the localization and distribution of economic activities and localization of housing, thus assisting in the fight against natural disasters (data from a flowing basin plus climatic indices are essential for ethically responsible planning). Basins help preserve and

[2] According to Barrella *et al.* (2001), a river basin is a set of lands drained by a river and tributaries, with contour limited by the higher portion of the relief, which are their water dividers. So, the river basin is a synonym for a drainage basin. Therefore, it is evident that a basin implies drainage or water flow, which makes them a fundamental element to be coordinated with land use.

[3] There are 78 MRs distributed across large regions of the country, regulated by federal or state laws. In 1974, Brazil developed a law that created Metropolitan Regions, creating, at that time, 9 Metropolitan Regions. Today, IBGE acknowledges 12 Metropolitan Regins in the country, with hots-cities considered as first level: Belém, Belo Horizonte, Curitiba, Fortaleza, Goiânia, Manaus, Porto Alegre, Recife, Rio de Janeiro, Salvador and São Paulo, and Federal District and surroundings integrated region (RIDE). There are also economic development integrated regions constituted as metropolitan regions where there is conurbation between cities of two or more states. In MRs, urban agglomerations, continuous urban space resulting from incipient conurbation, urban space of sub-metropolitan level, or smaller metropolitan regions where the urban areas are weakly conurbated, are outstanding. After 2017, intermediary and immediate geographical regions were introduced, according to composition by the Brazilian Institute of Geography and Statistics (IBGE). Immediate geographical regions are groupings of municipalities whose main reference is the urban network, and have a local urban center as the base, upon analysis by IBGE, considering the connection of nearby cities by dependence relations and population displacement in search of goods, services, and work. In their turn, Intermediary regions are groupings of immediate regions.

restore ecological connectivity and systematically manage urban and rural areas, including their borders. Planning BGN and urban joint scale is a means to fight socio-spatial fragmentation, contain urbanization, include natural environments, and preserve biodiversity.

The multi-scale and environmental planning was regulated in France by Laws Grenelle 1 and Grenelle 2 (République Française, Vie Publique, 2022). This legislation regulated the SCoT – 2017 Schéma de Coherence Territorial, and more recently, in 2017, the Schémas Régionaux d'Aménagement, de Développement Durable et d'Égalité des Territoires - SRADDET (Ministère de la Transition Écologique, 2022), which include, in their principles, the coordination, with opposability, of urban, regional and environmental articulation, acting as strategic and prescriptive scheme. They are instruments that spatialize and coordinate in several levels the territory development, contributing to reverse climate changes and preventing floods and environmentally predatory actions.

This evolution of instruments demonstrates the processual nature of their preparation and applicability, indicating that in territorial planning nothing is pre-determined or finished, and the improvement of means proves to be central to the outcomes. SRADDET is not an urbanistic document like SCoT, but the manager of a prescriptive network for collectivities and infra-regional groupings, and its provisions are opposable to urbanistic documents prepared by municipalities and other public instances (France et Urbaine, 2016).

The Blue-Green Network-oriented integrated planning can articulate territorial scales and divisions with flexible borders, reviewing technical-political borders established and potentiating the production of immediate and intermediary regions, with support by Intermunicipal Consortiums and Coastal Management Plans. BGN is a central element in building a methodology for creating collaborative arrangements and justifies its proposition, which applies to territorial planning in unitary or federative states because it outlines a set of strategies and instruments common to both systems. This idea enlightens the question of whether Brazil's Metropolitan Regions can be complemented by other network arrangements, strategically integrating municipalities. As a result, it is expected to outline ways of collaborative governance and integrated planning with examples of multiple territorial arrangements, without relying on the dichotomy "Metropolitan Regions, or consortiums, or coastal management," but by discussing diversified mechanisms and territorial structures that aim to integrate municipalities in networks (Klink, 2010). Empirical cases present positive experiences and gaps in metropolitan and regional management, identifying elements like multi-sector articulation, environment-related collaborative arrangements, planning, and management of the sustainable economy with environmental integration, based on water (blue) and green resources – the Blue-Green Network.

Also, as an outcome, the offer of elements for territorial planning policies is included, with flexible arrangements in Brazil, presenting possibilities in public inter-municipal

consortiums and coastal management plans in a broad range of possible arrangements (Klink, 2010). Positive aspects and weaknesses of this flexible structure are exposed as they foment the debate on scales, understood not as processes of non-neutral territorial delimitation or just a technical element (Vainer, 2002), but as representing the public sphere that results from the negotiation between conflicting actors and the action of multiple forces under pressure. The term *territory* in this context is defined not only as a neutral space for technical objects and legal norms, or a "territorial configuration," but "(...) where different strategies are confronted for use and control of natural resources" (Dias & Santos, 2003, p. 53; our translation).

Brandão *et al.* (2018: p. 8) emphasize that "[it aims at] dialoguing with the critical (and practical) thinking created in academic spaces of developed countries, seeking the refreshing re-appropriation of Latin American original and creative reflections on spatial transformations in process in several spatial scales" (our translation). All this is to understand the efforts toward territorial planning on multiple scales, with environmental grounding, by analyzing practices, instruments, and results.

Ecological connectivity, scale(s), and territory planning

The theoretical foundation for the previously presented reasoning is reflected in the territory Landscape Ecology (Metzger, 2001), eco-environmental connectivity and continuity, and consideration of the Blue-Green Network as a base to achieve ecological integration and as a unit that provides coordination of scales.

Ecology is an approach to systemic thinking, focusing on communities of organisms and their connections (Gomes et al., 2014). Systems are governed by patterns of probability, similar to waves, and such patterns do not represent the probability of things, but their interconnections and localizations. Breaking down a whole into independent elementary units leads to inter-relations, which play an aggregating role in governing the parties (Gomes et al., 2014). A systemic approach to the territory assumes that this is a whole that can only be known and organized relationally or multisectorally.

The notion of ecosystem reflects in BGN and systemic planning. A complex of elements in interaction, basins, and sub-basins contain the water and green system as a whole, in scale suitable to connect pars – one management unit, a cohesive whole that is not the sum of its parts. A system is a complex unit, and changes in one of the parts change the whole. Basins and sub-basins integrate the blue and green components, acting in interface and suggesting an integrated view of planning, because humid and green zones meet each other along rivers and streams, forming a system to ensure a good ecological State to the territory, its consistency, and cohesion.

In its physical or geographical expression, ecological continuity or connectivity was defined by Landscape Ecology, getting close to territorial planning for focusing on the human action and landscape (Metzger, 2001). This same author (ibid.) defines landscape as a complex domain, where action and perception are central, integrating space of the heterogeneous set of interactive units or spatial elements. Heterogeneity makes sense to a given observer in a given observation scale, suggesting that landscape defines an identity that depends on the context, the observer, and the relations of man with the environment, from the dependence on the space and its perception.

The notion of landscape is associated with the notion of extensive, continuous space perceived from a distance and in amplitude, which, to be understood, admits limits and divisions, defining transition areas between landscape units by the observer's action. The humanistic landscape ecology in the Troll (Metzger, 2001) line starts from social and individual interaction with the environment and the product of intentions and needs, acquiring expression in territory planning. Social action happens in time-space, because the place presupposes event (Abascal & Bilbao, 2021), and Landscape Ecology with geographical bias reveals to be inter- and multi-scale when it includes the local level, inferred from the intentional look at connected scales not immediately perceived.

Far from meaning a scale only identifiable with cartography, this scale is identified as a system: it is not the isolated scale that determines the system of a clipping or complex of meaning, but rather, the system and the clipping define the scale (Abascal & Bilbao, 2021). The answer, Boudon (1999) reminds us, is the acknowledgment that different models, where the measure is operationalized, are imposed on the plan and project and are translated not only with distinct incorporated meaning, but as oppositions, connectivities, and scale relations.

The definition of scales in natural and artificial territories (cities, regions) depends on systems and elements (id., ibid.) that must be represented, such as soil types, relief, vegetation mass, river basins, and sub-basins. It depends on the knowledge of territorial fragmentation imposed by urbanization and positive and adverse events to environment preservation – deforestations, infrastructures, buildings, and urban expansion.

With favorable or predatory outcomes, anthropic action on the territory occurs in the interconnection of scales, because human activities require time-space flexibility. In the face of continuities or fragmentations of space, planning acts in different biomes and their preservation, assuming ecological continuity. For this, blue (water) and green (vegetation) systems represent immediate possibility, due to their natural integration into the anthropically changed territory.

In a geographical sense, Landscape Ecology integrated landscape implies not only management of a scale, but macro- and micro-scales generated by species displacement, according to conformations of patches, corridors, and matrices. Spatial perception as

homogeneous or heterogeneous depends on the observation scale, and a portion can seem homogeneous on a distant or lower resolution scale, and heterogeneous when proximity details it. The consciousness of this complex integration of cultural and economic activities, social and political action on the environment, and Landscape Ecology reflection to conserve biodiversity has conducted to new territorial planning policies and tools. The fight against fragmentation of landscapes and natural space, as well as against the deforestation of large forest masses, contributed to the sustainability of ecosystems, reducing their fragility and allowing the preservation of biodiversity (Moscarelli, 2016).

Natural matrix integrated systems like blue and green are not related only to the conservation of biodiversity, but are articulated according to the landscape logic (Moscarelli, 2016) and are directly linked to the citizen management and aspiration for green and water, potentiating ecological connections and sustainability. They presuppose the definition of coherent scales, territorial arrangements integrating the environment to society and economy, and territorial planning can be a means to promote inter-scale relations with the environment, and several territorial and institutional arrangements can facilitate such integration.

Integrated multi-scale planning: instruments, policies, and challenges – France and Brazil

Multi-scale planning instruments, integrating actors, scales, and sectoral policies, are a challenge to Eurocentric and Latin-American countries. In Brazil, territorial planning used legal provisions advances, City Statute (Federal Law 10.257 – 2001) and, more recently, the Statute of the Metropolis (Federal Law n° 13.089, of January 12, 2015), which regulated local and urban planning to the regional level, including inter-federative actions.

The Brazilian legal system highlights Metropolitan Regions and includes the preparation of PDUIs – Integrated Urbanistic Development Plan (Governo do Estado de São Paulo, 2022), an instrument proposed in the Statute of the Metropolis for inter-federative governance. Responsibilities and actions are shared across different entities of the federation for the execution of Common Interest Public Functions (FPICs) - services or needs that go beyond municipal administrative limits, with regional scale, urging collective management solutions.

PDUIs[4] are intended to articulate social, environmental, economic, and institutional demands. Along with PDUIs, ZEE – Ecological and Economic Zoning (Decree nº 99.193/90) is used for diagnosis and systematization because it unifies economic and environmental

[4] "Milestone of regional planning retake in Brazil, the PDUI defines guidelines and means necessary to guide government and private actions in Metropolitan Regions (MRs), Urban Agglomerations (UAs), and Micro-regions (MRs) aiming sustainable development and reduction in regional inequalities" (GOVERNO DO ESTADO DE SÃO PAULO, PDUI, Integrated Urban Development Plan, 2022). Available on: https://rmsp.pdui.sp.gov.br/?page_id=125.

development, and can precede, according to legislation in force, regional or inter-federative plans.

ZEE is one of the National Environmental Policy (PNMA) instruments to learn, register, and plan territorial occupation. During the 1980s, the country's goal was the development of Brazil's Legal Amazon with methods less aggressive to the environment, instituting the National Environmental Policy – PNMA, - Law 6938/81, and Law 7.437/85 (Santos & Ranieri, 2013), and Environmental Zoning as an instrument. In 1990, the Ecological-Economic Zoning Program (PZEE) was regulated. As of 1992 (Acselrad, 2002), PZEE became a federal planning tool as part of the Multi-year Plan (PPA, 2000-2003), receiving resources from it.

ZEE provides a diagnosis to achieve standard models of productivity for the territory, as well as full space occupation, fully rationalizing the use of natural resources according to environmental policies, and planning works and infrastructure not only as a "knowledge" tool, but rather with political and discretionary bias (Acselrad, 2002). It was created to address the inescapable competitiveness of the supposedly neutral territory, being presented to the market on a global scale. For domesticating social practices, keeping what is "economic" away from other levels, like the social, ZEE was reduced to the technical-productive bias of the territory, becoming a ripped-apart instrument, disconnected from the environmental and economic vision, distant from communities and their needs.

To implement public policies at their different levels – municipal, State, and regional – and for this "zoning" not to be the simple partitioning of land, or a set of maps, without effectiveness (Farias et al., 2016), ZEE presupposes assessment criteria and prognosis of productive potentials, and is linked to land registration and use as an integral part of the ecosystem, and social, climatic variables, and biomes. As a dynamic environmental instrument, this zoning is not, by definition, a static and finished document, but a means for information on a territory's continuously updated socio-economic and environmental flows, to guide a regional transformation with the prognosis of potentials and trends. One criticism of ZEE is its link to regions' and municipalities' scales. There are often no relations with regional and metropolitan plans, or municipal Master Plans, besides its lack of definition of divisions to enable the management of these territories in a connected way. In a seminal text on this new instrument, Aziz Ab'Saber (1989) considers that appropriate planning requires a detailed ZEE for the subspaces of each region defined, and demands a previous understanding of their problems and emergencies. It demands geo-cartographic studies and operations capable of producing intermediary documents to be used by public administration, overcoming an "empty cartography" (Ab'Saber, 1989, p. 8). The debate proves to be mature because executing a ZEE depends on the study of the territory's vocation and a precise survey of economic potentials, not only to satisfy the market, but also to guide eco-developmental objectives (Ab'Saber, 1989). Registering a "letter of classes of land use capacity" (Ab'Saber, 1989, p. 2)

could only facilitate the action of speculators, constituting a faulty instrument and method in the face of the region's own ecological and physiographical conditions.

An extensive cartography, applied to programs for registration and categorization of lands, was proposed in the RADAM Project (Radar Project in Amazon, started in 1964, and operated from 1970 to 1985), but proved to be inefficient and rigid because this registration homogeneity could only be broken with a multi-scale exercise based on existing urban and environmental network. It indicated that urban and regional planning requires integrated socio-economic and environmental factors to overcome obstacles of rigid territorial delimitations with an exclusive technical-political nature.

Another central issue favoring systemic planning is territorial arrangements and their scale. The Statute of the Metropolis (2015) emphasized the standardization of common interest public function with inter-federative governance. However, the law formulation and its applicability cannot cope with the complexity of planning and the diversity of the Brazilian urban network (Queiroz, 2015). In addition to Metropolitan Regions, Brazil counts on other modalities of collaborative territorial arrangements with micro-regional reach to face urban and peri-urban diversity, like Intermunicipal Public Consortiums (for example, the ABC Region Intermunicipal Consortium), and Coastal Plans (for example, the North Coast Coastal Plan (SP).

In the second case, though the coastal region is included in Vale do Paraíba and the North Coast Metropolitan Region (Complementary State Law 1.166, of January 09, 2012), the Coastal Plan is an example of inter-municipal arrangement where inter-sectoral outcomes are the fruit of broad coordination, considering the biome and its diversity as a foundation for integrated planning.

Queiroz (2015, p. 1) pointed out that the Statute of the Metropolis strives to define 'metropolis' and acknowledges that its nature involves not only technical-political common interests. He defines it as "(...) urban space with territorial continuity that, given its population and political and socio-economic relevance, has national influence or, at least, configures the area of influence of a regional capital" (our translation). This federal law provides that "criteria for delimiting the region of influence of a regional capital […] will consider the goods and services provided by the city to the region, comprehending industrial products, education, health, bank services, trade, jobs, and other relevant items" (Queiroz, 2015, p. 1), linking the Brazilian metropolitan and regional planning to the influence of a primal capital-city.

Arrangements not based on the primacy of a capital can be appropriate to integrated planning if they are articulated by environmental and socio-economic systems that justify them. The French planning provides examples of arrangements not necessarily articulated by a metropolitan region around a primal capital with a high influence over the others. While describing transformations in Metropolitan Regions and region-cities, Salet (2007) points out that new forms of productive specialization and consumption emerged after the 1980s, leading

municipalities' association to potentiate social control, increasing the dependence on rationalization and planning norms and instruments.

The territory depends increasingly on scales on a global level, making the local level increasingly more relevant. However, an intense "pressure" for a clear concept of "local scale" is imposed, thus making it dynamic (Salet, 2007). This author identifies radical transformations in productive urban conditions, the need for social and economic indicators, labor market indicators, the cultural identity of places, social diversity, and the trans-scale complexity of urban activities. We face the differentiation of specialized spaces, dispersed in regions beyond urban limits, in accessible and complex locations, involving logistics and distribution, which has transformed the "urban," resulting in new metropolitan arrangements. Its control occurs in network and regional specialization centers, with an adequate opposition between "urban and rural", extended borders, which makes the urban move towards regions and polycentrality, or urban networks (Salet, 2007).

Many Brazilian municipalities present low integration indicators and low representativeness of GDP and income at the state level, reflecting a "very nice example of the metropolization process" (Salet, 2007, p. 1). They can integrate networks with other municipalities, but need management and planning instruments appropriate to their reality. IBGE studies about urban networks in Brazil (IBGE, Region of Influence of Cities, 2008) indicated that the country has very distinct "metropolises" in terms of extension and socio-demographic composition, according to definitions of state laws responsible for creating Metropolitan Regions. The official position on Brazilian metropolises includes São Paulo, with around 21.5 million inhabitants, and the Roraima State South metropolitan region, with a population of little more than 21 thousand inhabitants (IBGE, Region of Influence of Cities, 2008).

Even though it represents advances that contributed to functionally justifying the condition of metropolitan urban agglomerates, though indispensable, the legal provision is insufficient to identify the functional territory suitable for integrated management (Queiroz et al., 2015). The best criteria are founded on the adequacy and objectives of territorial arrangements, and the elements that justify the formation of networks of municipalities to collaborate, in terms of demography, landscape, geography, economy, politics, and environment. To represent this set of factors forming the territory in its systemic whole, it is necessary to count on a refined set of integration instruments involving appropriate cartographies for a multi-scale approach.

The inordinate use of energy sources and natural resources, intensifying the environment depredatory process, and the fragmenting territorial occupation made city-field limits fluid and complex. River basins and vegetation masses represent a concrete base to establish an ecological network articulated with other networks, urban and inter-urban.

In Brazil, PNMA (National Environment Policy – Law nº 6938/81) and the most recent Law of Springs (State Law 9.866, of November 28, 1997)5 defined an Area of Protection and Recovery of Springs (APRM) as one or more river sub-basins of regional interest, serving to public supply, providing that APRMs, their intervention areas, and respective environmental and urbanistic guidelines and norms of regional interest are regulated by state law (Governo do Estado de São Paulo, 2022), indicating instruments and norms for the BGN to become the foundation for integrated planning.

The fragmentation of the natural landscape and the rural-urban environment, accelerated by the low efficacy of multi-scale planning, sectorization, and lack of coordination of planning instruments, encourage deforestation and attacks on the biome, and the Legal Amazon today is an example. Legal security and formulation of laws to create civil rights for populations affected by urbanization and predatory anthropic actions involving territory planning create a critical question to be developed in the coming sections.

The interconnectivity of Blue and Green systems, river basins, and green mass corresponds to the ecological planning and connection of the space ground plans and projects using multiple articulations, which include constant dialogue of scales and languages – from the norm to the plan, the project and cartographies – while integrating territory, society, and landscape. This theoretical guideline will be presented in the following sections, including three empirical cases, highlighting the decision process, hierarchies, and proposals of flexible, collaborative arrangements and their instruments.

The French experience with regional planning and multi-scale coordination, and territory integration instruments

France has historical experience in integrated territorial planning, gathering environmental, economic, and social agendas, and proposing spatial divisions based on natural and/or human elements and their multiple inter-relations (Franchi et al., n.d.). Considering the landscape resulted in the formulation of an Atlas of Landscape for each region, recording and inferring natural and human values, dynamics, and pressures (Franchi et al.).

In 2006 (Franchi et al.), coinciding with the validation of the European Landscape Convention, all landscapes of the French territory were identified and qualified using a pioneering method, creating cartographic documents based on the dialogue with local communities to prepare coherent plans for collective expectations and translate the socio-territorial project (Ministère de la Cohesion des Territoire et des relations avec la Collectivite

[5] "In the mid 1970s, in order to protect springs, courses and water reservoirs of São Paulo Metropolitan Region, State Laws 898, of December 18, 1975, and 1.172, of November 17, 1976 were approved to discipline land use and occupation in these areas. After 20 years, the need to review this legislation led to the approval of State Law 9.866, of November 28, 1997, which provides guidelines and standards for protection and recovery of springs river basins of regional interest of São Paulo State" (GOVERNO DO ESTADO DE SÃO PAULO, PORTAL DOS MANANCIAIS, 2022. Available on: https://www.infraestruturameioambiente.sp.gov.br/portalmananciais/legislacao-estadual/).

Territoriales, 2020). The approximation to the landscape reinforced the longing for harmonious and balanced development of agricultural, natural, forest, and urban portions, aiming at territorial cohesion and hearing of urban, peri-urban, and rural communities (Ministère de la Cohesion des Territoire et des relations avec la Collectivite Territoriales, 2020).

In 2007, the Blue-Green Network (BGN) was proposed in Grenelle Ambiental Forum, gathering water systems and ecological corridors, encouraging and anticipating the approval of the environmental connectivity proposed by the Grenelle laws. The Loi de l' Engagement National pour l' Environnement, unfolded in Grenelle I and II (Law n° 2009-967 of August 03, 2009, and Law n° 2010-788 of July 12, 2010), regulated government spheres and territorial planning scales, preserving cities, biodiversity and rural surroundings. Grenelle I consolidated the debates known as Grenelle de l' Environnement, complemented in 2010 by the law of July 12, of a national commitment to the environment. In turn, Grenelle II approached energy consumption, intersectoral imbrications of housing policies, transport, and mobility, implementing integrated planning to contain territorial fragmentation and predatory actions against the environment.

This legislation that adopted the anti-sectoral and environmental continuity logic, with guidelines built since the 2000s, guides all current territorial management documents. Management instruments coordinating several scales proved to be the most important outcome, first with SCoT - Schéma de Cohérence Territorial – formulation, which defines intervention perimeters gathering public policies, planning, and urbanism, eliminating conflicts between actors and seeking a balance between environmental preservation and socio-economic development. With that, BGN started to guide the SCoT with support from government representatives, national and local organizations, industry sectors and unions, professional associations, and non-governmental organizations.

The urbanism documents coordinated by SCoT include housing, trade, services, and mobility, improving the biophysical environment quality, and adapting to demographic fluctuations while gathering ecology and landscape. Integration between natural and urban environments became the motto to overcome spatial fragmentation, including ecological continuity and BGN.

SCoT was the first precise instrument associated with the urbanism code to coordinate PLUs – Local Urbanism Plans -, synchronizing housing, economy, tourism, trade, agriculture, landscapes, and environment (Sybarval, 2021), in addition to the plans of each municipality inside inter-municipal arrangements, in appropriate scale. Simultaneously a strategic and tactic tool for sustainable development with a flexible perimeter, corresponding to an urban area, large residential area, or job-generating region (Renewed SCoT), it takes as reference the mobility network, territorial and rural balance hub (PETR), metropolitan center or regional natural park to unite urbanism and environment, biodiversity, energy, climate and water

policies. It considers the SDAGE – Master Plan for Water Development and Management – policy, which incorporates large river basins in France, and SAGE - Plan for Water Development and Management (Gest'eau, 2022), which acts in sub-basins and aims at preserving the aquatic ecosystem.

The French Urbanism Code (article L.121-1, and L.110) - (Legifrance, 2022) requires that SCoT consider natural risks and water quality, coordinating SAGE application managed by a local commission. All policies coordinated by SCoT comply with the Urbanism Code (articles L131-1 to L131-10) (id., ibid.), being spatialized in PLUs or Intermunicipal Urban Plans (PLUI). Choosing the perimeter for SCoT depends on inter-municipal decisions, ruled by EPCI – Public Municipal Cooperation Institute. This flexible choice is characteristic of management ruled by urbanistic laws L 143-1 to L 143-50 (id., ibid.).

After 20 years of application, SCoT proved to be relevant in the evolution of territorial planning (Ministry of Environment, Energy, and Sea, Quelles evolution pour les Schemas de Coherence Territorial, 2017) because it describes the first generation of the instrument as protection of rural municipalities against metropolitan areas, reflecting local social forces.

The advantages of management with SCoT made the instrument evolve to associate several of them (InterSCoTs), and gather Local Urban Plans (PLU) into PLUIs, increasing the scale and showing that the parts build the territory systemic complex (Ministère de la Transition Ècologique, 2022). SCoT and InterSCot were pioneers in balancing urban and rural development for preserving natural areas and landscapes, advocating multiple uses and ecological corridors, and containing urban expansion with green belts (id., ibid). Intermunicipal coordination ensured consistency to sectoral plans – PLUs, which became compatible with SCoT. In 2021, new legislation modernized this last instrument, emphasizing the relations involving economic development, local agriculture, trade/housing, mobility, equipment and services, and ecological and energy transitions, with preservation of natural resources (Ministère de la Transition Ècologique, 2022).

SCoT's Guidance and Objectives Document (DOO) is legally binding, defining the location and quantifying housing, large equipment and infrastructure, mobility, and economic development. Its objective is to coordinate environmental protections against these other factors and combine the management of natural, agricultural, and forest lands with soil management, using the Blue-Green Network (BGN), which became mandatory for SCoTs after Laws Grenelle (I and II). Presentation Report, inventory and diagnosis, Sustainable Planning and Development (PADD) project, and prescriptive document for the action, expressed in the Guidance and Objectives Document (DOO), are required (Moscarelli, 2016).

With their evolution, the SCoTs included restoration of river beds and fight against environmental pollution to achieve coherence with the uses proposed for waterfronts and river basins (Gass et al., 2016), and started to coordinate arrangements on local and regional

scales. Simultaneously, it became an intermunicipal and municipal instrument, uniting economic and social aspects, and mandatory for the whole French territory. With Grenelle II, the Council of Ministers approved it, providing national support.

As of January 1, 2017, municipalities that do not join the SCoT count on limited buildability criteria and cannot institute new urbanization zones, demonstrating the effort to achieve full adoption. A precise cartography should follow, bringing together indicators that impact biodiversity conservation: (a) quantified objectives of urban expansion reduction and strengthening of urban site density, (b) protection of green and rehabilitation of biological continuities with the Blue-Green Network (BGN).

In 2017 (with applicability as of 2019), SRADDET was created to ensure to SCoTs their inter-scale vocation, with the questioning imposed on regions' dimensions and competencies. With SRADDET, the SCoTs found their place regarding PLUs and PLUIs, coordinating territorial planning diagnosis and projects which constitute these plans. Its difference lies in transversality and contribution to territorial coherence in a regional scale, bringing together pre-existing regional schemes, and unifying domains like mobility, ecological coherence, climate and energy issues, and waste control (France et Urbaine, 2022). The instrument coordinates regional and sub-regional planning documents, resulting from consultations with central communities, vinculating local urbanistic plans – the SCoTs and, in their absence, the PLUs, urban transport plans, climate-air-energy territorial plans -, considering that they all have to be compatible with their general rules.

ABC Region Intermunicipal Consortium and North Coast Coastal Zone Management Plan (São Paulo) – the Brazilian intersectoral management

ABC Region Intermunicipal Consortium

One of the Brazilian cases of interest in understanding intersectoral planning is the ABC Region Intermunicipal Consortium, in the São Paulo region with the same name6, which has been losing industries since the 1970s. This consortium, formed by the municipalities of Santo André, São Bernardo do Campo, São Caetano, Mauá, Ribeirão Pires, and Rio Grande da Serra, emerged to face the economic and industrial crisis that deepened in the 1990s due to the flagrant reduction in jobs in this sector, which led to the creation of the ABC Region Regional Economic Development Agency to organize integrated planning actions.

This year it completed 25 years, being an innovation in São Paulo and Brazil planning context, with territorial arrangement with inter-municipal planning and management, amid a long federalist experience. Territorial arrangements ruled by consortiums (Klink, 2009)

[6] Santo André, São Bernardo do Campo, São Caetano, and also Mauá, Ribeirão Pires, Rio Grande da Serra (extension of Santo André municipality) and Diadema municipalities integrate the region known as ABC Paulista. The 7 municipalities cover a total areas of 825 km². (CONSÓRCIO INTERMUNICIPAL DO GRANDE ABC, 2022. Available at https://consorcioabc.sp.gov.br/o-grande-abc).

contribute to scaling up economic efficiency and transparency, and managing common interest public functions, such as mobility, environmental sanitation, and urban development.

In December 1990, the seven mayors that integrated the collaborative arrangement created the Billings and Tamanduatehy Basins Intermunicipal Consortium, which included environmental management related to solid waste destination, and focused on urban and economic development (Ferracini, 2013). Industrial plants re-allocated with municipalities along Anhanguera-Bandeirantes highways, west of São Paulo Metropolitan Region, led to industrial de-concentration, originated from advantages offered by other municipalities related to less expensive land, tax exemption, and deepening of the crisis in the 1990s, amid economic conditions of global opening and destructuring of production chains linked to the industry.

With the gradual dismantling of metropolitan coordination in Brazil in the 1990s, horizontal forms of organization, like inter-municipal consortiums, emerged to renew regional management. The metropolitan municipalities' low tax collection capacity, social vulnerability, and institutional and resource difficulties strengthened this modality. Such a scenario of crisis difficulted the generation of industrial jobs and jobs in the service sector, giving rise to the ABC Region Intermunicipal Consortium as a regional governance experience and the creation of the ABC Region Economic Development Agency (pdrABC, 2016).

ABC Region presents characteristics that favor integrated governance, like cohesive industrial and services heritage, in addition to a robust environmental base, with the presence of Billings Reservoir bathing six of the seven municipalities integrating it, except for São Caetano do Sul. An important historical hub of conurbation and connection between São Paulo capital and the coast, its municipalities present high levels of urbanization and flow of activities, goods, and people, polycentric structure and different levels of job offers. However, there are several imbalances in the quality of equipment, services, and public spaces.

A socio-environmental agenda was then proposed because the low density of land occupation in areas with significant infrastructure, resulting from real estate market action, led to insufficient provision of green mass and displacement of vulnerable populations to the borders of the urban patch, resulting in low quality of the built space, and environmental damages.

Such characteristics reveal the need to provide an infrastructure capable of avoiding damage to spring areas and fighting occupations under geotechnical risk. The sustainable development of water resources surroundings becomes urgent. It is one of the main mottos of the plan because damages to these areas can deepen the uncontrolled process of occupation, dispersed urbanization, and spatial fragmentation.

The main ways and highways crossing the region are metropolitan and regional corridors, gathering economic activities, and settled and floating populations. Diversified uses on different scales are hindered by these corridors' lack of environmental quality, insecure and

disconnected from their surroundings, presenting large plots and scarce urban land division. Such configuration and the presence of springs close to the existing axes and points of economic activity demanded integrated planning to avoid environmental degradation resulting from urbanization. Railway and road axes along rivers and reservoirs require articulation of land use and occupation to mobility, aiming at densification associated with job opportunities.

On February 8, 2010 (Consórcio ABC, 2022), the netting arrangement became the first multi-sector consortium of public law and autonomous in Brazil, with a General Meeting supported by a Public Consortium Contract (Law 11.107 of 2005). Created as Private Association under Civil Law, from 2009 to 2010, it became Public Consortium with metropolitan agenda based on regional actions and instruments, counting on the Regional Mobility Plan, Regional Risk Reduction Program, and the pioneer project of an Operation Control Center (OCC) for regional monitoring. Partnerships with state and federal governments were essential for the Consortium financing, fundraising (PAC – Growth Acceleration Program), management, and environmental and urban risk reduction.

This institutionality enabled this arrangement to have executive power, with solid agreements between affiliate administrations and the opening of bidding for works favoring the seven municipalities, which could receive funds from federal and State spheres and international bodies. Most resources come from partner municipalities and their budgets; several activities are operationalized by the Meeting, which brings together the seven mayors of the consortium, with the annual election of president and vice-president. Eleven thematic programs were proposed to guide the consortium, involving environmental justice, creation of quality jobs with high added value, with an emphasis on areas that produce ecosystemic services, ensuring that the region will be a space for collective production and appropriation of wealth, taking care of the local scale – in terms of mobility, drainage, solid wastes, reduction of environmental risks, housing, safety, economic development and tourism, health, education and leisure, social policies and institutional development (pdrABC, 2016).

This integration aims at a sustainable city-region with a compact urbanized area, technological emphasis on production chains and production of new urbanity (pdrABC, 2016). Territorial cohesion and intra and inter-regional stability of municipalities, and them with São Paulo metropolis, are goals of the plan, articulating urbanized and peri-urbanized areas. The goal is to balance the urban-regional structure (pdrABC, 2016), reduce socio-spatial inequalities, create and evenly distribute jobs, trade, and public and private services, in addition to containing the horizontal expansion towards protected areas of springs, fighting the adverse effects of urbanization of peri-urban, rural and/or environmentally sensitive areas, and soil waterproofing.

The Blue-Green Network, or the water system of waterfronts and springs, vegetation corridors and masses, is the natural base for anthropic interventions in the form of urbanization

and regionalization, and is included in the Consortium planning as an environmental diagnosis for ABC Region. It indicated a lack of life quality due to the retraction of ecosystemic services resulting from urbanization, whose planning could not preserve the environment and urban system at the speed and irregularity of urban expansion (pdrABC, 2016).

According to pdrABC (2016), the generation of ecosystemic services can be achieved using the regional green infrastructure and water systems, linking diversity preservation and land uses, as well as the development of rural and peri-urban areas with productive activities. These strategies are relevant to keep and improve social, environmental, and urban conditions, as well as environmental protection and contention of the urban patch, seeking the compact city-region.

The rationalized intensification of the existing urban space, recovery of buildings and degraded areas, and the use of urban empty spaces, opening of green areas, new centralities, and public spaces are placed as pdrABC specific objectives. Containing peripheral urban expansion presupposes reducing the pressure on green, rural, and environmentally protected areas, valuing and protecting those destined for agricultural, cattle raising, and artisanal production, and encouraging sustainable and creative productive activities in rural/urban borders areas (pdrABC, 2016).

Categories of land use and occupation were proposed to include the environmental agenda in PDR (pdrABC, 2016)7. For the Blue structure, systems for rainwater retention next to basins draining areas, and a strategy of review of laws of municipal land subdivision, use, and occupation, and specific laws to Billings, Alto Tietê, and Guaió were presented to ensure land, urban and housing regularization, improving the socio-environmental condition and providing other types of settlement that ensure ecosystemic services. Based on these environmental bases, pdrABC seeks economic strategies to potentiate territorial assets focused on agglomeration economies, such as railways, Via Anchieta, Rodoanel (beltway), universities and centers of higher education, and the human capital represented by families with average income above five minimum wages, as well as the proximity to São Paulo and Santos port.

Based on these assets and what is identified as Blue-Green Network, large industries from the chemical/petrochemical, transport, rubber, and plastic sector are incorporated, proposing programs and instruments to mobilize a network of micro and small companies

[7] Environmental Conservation – areas for rendering of ecosystemic services, with uses and activities destined to environmental education, research and ecotourism. Ecological Recovery – idle areas that house activities with environmental impacts, distant from accessibility axes, liable to recovery to improve ecosystemic service rendering. Agro-ecological development – areas for low density settlements, keeping ecosystemic services with low presence of infrastructure, and large plots for ecological and family agricultural production, and forest recovery. Socio-ecological Occupation – areas nearby transport networks and unoccupied urban areas subject to pressures for occupation, and division with infrastructure and alternative and isolated technologies, depending on the context and green infrastructure elements. Environmental Requalification – areas of precarious low income settlements, with high density and poor infrastructure, with interventions that can recover Permanent Preservation Areas, reduce geotechnical risks and provide green infrastructure mainly to contain diffuse pollution and erosion (pdrABC, 2016).

destined for the generation of services to production. The economic restructuring and outsourcing in progress, along with a still Fordist large industry, is complemented by the ambition to develop the industry 4.0, creating a Technological Park – a network park, in an environment favorable to science, technology, and innovation.

The reassurance of a regional technological development hub occurs with the network park, with logistic opportunities, and strengthening of the industrial park due to its proximity to the beltway (Rodoanel). pdrABC uses the opportunity of inter-municipal expansion of the real estate market and re-conducts coefficients of use to raise surplus from the increase in buildability, avoiding undertakers seeking advantages in isolated municipalities. Urban land use and occupation as a common interest public function were supported in the consortium as a form of application of instruments and regulations of the Statute of the Metropolis and guaranteeing the social function of property.

The consortium's most recent advances have particular importance for reassuring the possibility of choice of spatial division, gaining autonomy and flexibility to decide strategies and programs, association plans and projects, and contributing as means of regional participative management. In the context of São Paulo metropolitan governance, the Regional Master Plan is an innovation, defining the role of ABC in São Paulo Metropolitan Region with distinct and integrating territorial arrangement.

pdrABC counts on macro-zoning conceived to achieve this virtuous scenario. As a territorial arrangement based on Public Consortium, with a unique division in the São Paulo Metropolitan Region interior, it does not count on a ZEE. However, the plan articulates environmental elements to the macro-zoning, listing programs and actions. Relations between macro-zones and guidelines and instruments of the urban and environmental policy proposed to PDRabc shaped its preparation, seeking multi-sector coordination (pdrABC, 2016).

The macrozoning spatializes objectives and instruments with dialogue between Territorial Programs and Strategic Actions. For each macro-zone management, instruments and urbanistic parameters were defined to build economic, environmental, and urban management, regulating land division, use, and occupation8. For macro-zones in strategic areas for preservation and recovery of springs, higher organicity was defined between Local Urban Center Macro-zone (MCL) and Environmental Protection and Rural and Urban Control and Qualification Macro-zone (MPA) to build a Consolidated Peri-urban with environmental quality. These macro-zones, directly settled on the Blue-Green fabric, enable control and contention of urban expansion and disperse urbanization, strengthening connections across the other macro-zones, keeping low densities.

[8] The Metropolitan Structuring Macro-zone – MEM; Urban Consolidation Macro-zone – MCU; Macrozone for Vulnerability Reduction and Environmental Recovery – MRR; Local Urban Center Macro-zone - MCL; Macrozone for Environmental Protection and Rural and Urban Qualification – MPA, and Natural Ecosystem Conservation Macrozone – MEC.

The Environmental Protection and Rural and Urban Control and Qualification Macro-zone (MPA) keeps on playing its role of environmental conservation, along with the Natural Ecosystem Conservation Macro-zone (MCE), with the role of Environmental Conservation Area (id., ibid), and is responsible for "Conserving and recovering forest fragments, ecological corridors and permanent preservation areas" (pdrABC, 2016, p. 38). The Natural Ecosystem Conservation Macro-zone (MCE) counts on Atlantic Forest massifs, large biodiversity, and rare presence of economic activities and permanent occupation to keep the forest provides environmental protection, assure biodiversity and water resources.

Since 2015, the consortium started to count on a Technical-Scientific Collaboration Term (TCTC 01 of 2015) with the Federal University of ABC, in order to execute, monitor, and assess the implementation of a Regional Multiannual Plan, allowing the development of territorial diagnosis, assessment of economic opportunities, preparation of scenarios and trends, culminating in a Regional Master Plan (pdrABC, 2016).

Despite the advances of this associative model, the main inter-municipal management challenges (pdrABC, 2016) are in theoretically collective institutions and forms of action that still operate dispersedly, without regulation and management by a coordinating instance, suffering from a still little cooperative municipalism, showing supra-municipal policies, but no coordination instruments in this scale. The absence of vertical coordination and instruments linked to the national sphere for metropolitan areas with induction mechanisms, incentives, and macro-financing, hinders horizontal collaborative governance via consortiums. These difficulties are felt by the consortium under analysis, delaying the implementation of goals and hindering a truly integrated action.

São Paulo North Coast – a case of integrated planning in Coastal Zone – the Coastal Management Plan and ZEEC

The North Coast is a priority region for an integrated plan due to its nature as a coastal zone, where protection of environmental heritage and exploration of coastal and marine resources are motivations for this type of territorial planning (Itani & Zuquim, 2021). This seafront underwent uncontrolled occupation and negative socio-environmental consequences with Atlantic Forest deforestation, urbanization expansion in permanent preservation areas (PPA), illegal marinas, discharge of effluent in the ocean without proper treatment, and activities that together generated territorial conflicts and uncontrolled exploration of natural resources (Takara, 2020).

ZEEC/LN was the first regulated coastal zoning in the country (Itani & Zuquim, 2021); in São Paulo state, only two regions concluded their coastal zoning, the North Coast and Baixada Santista Sector. The North Coast Sector Ecological-Economic Zoning is provided in State Law n° 10.019, of July 3, 1998 (ALESP, 1998), and is cartographically expressed in

official maps of the Brazilian Institute of Geography and Statistics (IBGE), in 1:50.000 scale (ALESP, 2017), ratifying the scale adopted in France, in SCoTs.

State Decree nº 49.215/2004 (ALESP, 20024) provides for the North Coast Ecological-Economic Zoning (ZEEC/LN), reviewed in 2017 (Decree no. 62.913/17) (id., 2017). In chapter V of State Law n° 10.019 of 1998, the following objectives are presented: a) create an Ecological and Economic Zoning (ZEE), b) create an information system, and c) implement and monitor an action and management plan. This law update occurred in 2004, defining goals and actions per zone.

The integrated management of coastal areas was regulated in 1988 by the National Coastal Management Plan (PNGC), based on the guidelines of the National Environmental Policy and National Marine Resources Policy (PNRM) of 1980, which provided for the sustainable use and exploration of living, mineral and energy resources of the Territorial Sea. PNGC law provided for state and municipal plans for coastal management, and São Paulo state approved its plan in 1998, regulating management guidelines outlined since the 1980s. Among them are the subdivision in four coastal sectors, North Coast, Baixada Santista, Iguape Estuary Lagoon Complex, and Vale do Ribeira, and the definition of a tripartite management structure, involving the State, municipalities, and civil society.

Another guideline refers to the typology of zones, with the classification of permitted uses and the definition of PEGC instruments – a system of information, monitoring, and control of action and management plan indispensable for policy implementation. At the time of PNGC regulation by Federal Decree 5.300/04, ZEE – Ecological-Economic Zoning, a broad category that includes ZEEC (Coastal Zoning), it was understood as a mandatory instrument (Federal Decree 4.297/02), proposed for the implementation of plans, works, and public and private activities.

ZEECs/SP is similar to SCoTs because studies for the North Coast (ALESP, 2017) include a survey of legislation at different levels of government, intended to coordinate and avoid conflicts, reconciling public policies for an ecologically balanced environment (ALESP, 2017). They determined that the primary means for planning would be IBGE maps, in 1:50.000 scale, reassuring ZEE as environmental zoning because they link decisions by public and private agents, articulating them to plans, programs, projects, and activities, and protecting natural resources. Ecosystemic investments and services were ensured, aligning ecological, economic, and social sustainability, and reconciling economic growth and environmental protection, which places it as a form of multi-sector coordination.

The North Coast ZEEC is critical for multi-sector planning because, since 2004, this territory's use and occupation have started to be regulated by a regional instrument. The territorial planning in this subdivision was proposed from an environmental perspective. Tools that help choose activities and actions are based on geo-referenced mappings for qualitative

and quantitative analysis of the territory (Itani & Zuquim, 2021) to guide the planning and management of resources and activities9 (Takara, 2020).

The BGN is expressed and guides the Coastal Plan Law document, and in the 2017 review, mitigating and compensatory measures are clearly mentioned to be applied to the North Coast regional level, in order to promote occupation with low impacting effect (ALESP, 2017), defined as the one that "I – does not change the zone socio-environmental characteristics; II – does not cause significant impacts on Conservation Units biota and forest remains next to the zone; III – keep soil permeability conditions according to occupation parameters defined for the zone; IV – does not change water bodies' characteristics; V – does not change ecosystems' functionality, ensuring conservation of genetic and natural resources and biological diversity in the area to be licensed" (ALESP, 2017, p. 12).

The coastal zone management acted to achieve political integration while debating objectives and interests and reaching consensus, unified by an environmental approach. The geographical integration provided in the instrument articulates the coastal zone by managing air, sea, and land. Such geographical comprehension of the coastal zone is enriched with Water Resources Management Units (UGRH). São Paulo ZEECs and ZEEC/LN consider in their zoning the limits of their UGRHs, and ZEEC/LN corresponds to UGRH 3, grounded on blue and green elements they must articulate, establishing with these limits the appropriate action scale for better management.

This ZEE implementation is directly associated with a system of information, monitoring, and control, as well as action and management plans, which define public policies and a hierarchy of decisions to reach the Zoning objectives and goals. Difficulties in coordination and integration of sectoral policies and implementing action and management plans after the ZEE approval raised questions about this instrument's efficacy, pointing out gaps (Itani & Zuquim, 2021) and indicating the need for improvement in the coordination of levels.

As one of the four sectors of São Paulo State coastal management, with a tripartite management structure, it counts on a collegiate for each sector and a group of four sectors, denominated, respectively, Sectoral Groups and State Group of Coastal Management Coordination. Its management covers São Sebastião, Ilhabela, Caraguatatuba and Ubatuba municipalities. These municipalities integrate Vale do Paraíba and North Coast Metropolitan Region (RM Vale), created by state complementary law 1.166, of January 9, 2012, one of the six metropolitan regions of São Paulo Macrometropolis, comprehending 39 municipalities. In

[9] ZEECs/SP of the North Coast and Baixada Santista integrate fourteen public policies: National Environmental Policy (PNMA), National Basic Sanitation Policy (PNSB), National Water Resources Policy (PNRH), Urban Policy (PURB), National Solid Waste Policy (PNRS), National Biodiversity Policy (PNB), National Sea Resources Policy (PNRM), National Maritime Policy (PNM), National Policy for Sustainable Development of Aquaculture and Fishing (PNSAP), National Policy for Sustainable Development of Traditional Peoples and Communities (PNPCT), National Tourism Policy (PNT), National Policy for Agroecology and Organic Production (PNAPO) and National Mining Plan 2030 (PNM- 2030) (TAKARA, 2020).

the context of a significant extension like RMVale, the coastal plan grounded on the blue-green network and hydrographic Management Unit defines a scale that facilitates integrated management and a methodology that must be continuously improved, despite the coordination difficulties experienced.

At the time of proposition and review, the North Coast ZEE faced real estate interests that drive summer tourism (id., ibid.), in addition to the urgent and conflicting issue of the region's environmental conservation. Preparing a unique proposal was essential because it could incorporate environmental conservation, urban activities, municipal master plans, and interests from several sectors. It was regulated by State Decree 49.215/04, representing the first coastal zoning instituted and regulated in the country.

The North Coast case is an important critical parameter for detecting a lack of process coordination because the absence of effective integration and review lies in the problems related to the participation of institutional actors, such as the São Paulo Metropolitan Planning Company (EMPLASA) in the process of ZEE review. From 2012 to 2015, this body operated as the executive secretariat of Vale do Paraíba and North Coast Development Council but did not follow the ZEEC review to integrate it into the Integrated Urban Development Plan (PDUI) provided in the Statute of the Metropolis.

This untying hindered the entire gathering of land use policy and housing localization, fragmenting outcomes (Itani & Zuquim, 2021). ZEE's role is still undefined and does not find linking to PEGC action and management plans due to the absence of means and instruments for implementation and coordination (Itani & Zuquim, 2021). Other problems involving the integration of sectoral policies and the ZEE articulator role refer to the weakness of actions of the sectoral group after approval of this zoning in 2004, and its review in 2017. The State Coastal Management Coordination Group acted only at the time of the ZEEC proposal and did not systematically gather its representatives (Itani & Zuquim, 2021).

In ZEEC, land and marine zones and subzones were defined, these latter with two strips, between tides and maritime. In each zone, socio-environmental characteristics and guidelines for management, uses, and socio-economic activities were listed; in land strips, rates of property use were defined, and also goals for conservation or recovery of native vegetation and/or green areas, as well as basic sanitation objectives, and solid waste collection and disposal. This definition of indicators integrated the ZEE in a regulatory and binding way (Itani & Zuquim, 2021), which means that rates and indicators should be used for environmental licensing. This regulatory gap changed the outcomes, motivating clashes and the 2017 review.

Since ZEEC implementation, there was no application of systems of information, monitoring, and control, which reveals a lack of coordination that impacted the integrated plan's success. The difficulties and delays in ZEEC linking to the territory plans, instruments, and

management, like municipalities' Master Plans and Conservation Units management plans, indicated a lack of coordination as the main negative attribute of the process. Emerich (Itani, 2018) considers that the "management plan" is not a new instrument to be created, but rather a coordination of existing plans in the ZEEC course and its implementation, mentioning the French instrument construction process, from SCoT to SRADDET. The gathering of plans and procedures to make the Sectoral Group work, articulating water, sewage, solid wastes, drainage, Conservation Units, ecological corridors, and marine EPAs (Itani, 2018) would make the environmental foundation the base for coastal planning, which now shows poor actions of the State Coastal Management Coordination Group, and retraction of institutional actors like the extinct EMPLASA. This differs from what we observe in the French experience, where coordination instruments are prepared and improved.

Up to a point, the North Coast Coastal Management Plan is similar to a SCoT: it establishes its action area and uses the smaller river basin in São Paulo state, with 1,987 Km2 (compared to a SAGE dimension, 1,962 km2) (Gest'eau, 2022). It gathers five municipalities and defines clear goals to be achieved, action and management plans, a system of information, control and monitoring, and application costs, integrating strategy and tactics, on a 1: 50,000 scale. The lack of coordination observed in gathering plans and procedures in the Sectorial Group gives rise to the proposed new properly regional instruments in light of the SRADETT.

Final remarks

The article proposed a reflection on flexible and multi-scale integrated planning at the inter-municipal level. It considered the French historical experience on the theme, taking it as a reference to show the relevance of collaborative and voluntary territorial arrangements (Intermunicipal Consortiums) or arrangements linked to the legislation of Coastal Management in São Paulo state, whose principles are environmental preservation and ecological connectivity. The Blue-Green Network (BGN) adequacy and opportunity, the water and green system as a base for this form of planning was emphasized in the three experiences, like the scale connection more appropriate to the multisectoral territorial planning for having biophysical foundations and guarantee of territorial consistency and coherence.

The process of integrated territorial planning development and evolution in France is significant for Brazilian reflections because their strong institutionality is emphasized at several levels, as their articulation and coordination instruments, such as the Territorial Coherence Scheme - SCoT and SDRADDET. The transversal role of these instruments was indicated, and their flexibility to enable territorial network arrangements and coordination of several

proposed arrangements made possible the voluntary organization of territorial divisions, starting from the collaborative association of municipalities.

The French instruments ensure documents' compatibility and aim to eliminate conflicts between scales and institutional levels, leaving room for relations with higher government spheres. This case shows a vast history of territorial planning with collaborative arrangements that, despite its problems, has taken the management of their territory as a process, demonstrating the improvement of instruments and strong regulation involving national (with specific ministries for Territorial Planning and Ecological Transition), inter-municipal (regional) and municipal levels, reconciling the flexibility of collaborative arrangements and a decentralized centralization – of coordination and monitoring. This coordination involves the sphere of the Nation and consortiums, with communicating vessels with municipalities planning and their local plans (PLU) and PLUI, with assistance of SCoT and SDRADDET: “Ce modèle matérialise une vraie co-production de la politique d’aménagement entre région et collectivités infrarégionales” (France Metropolitaine, 2016, p. 10). The involvement of the different and conflicting social and political actors around environmental and biodiversity preservation has led to planning policies and instruments to achieve multisectoral coherence, with continuous implementation of SCoT and InterSCoT, and SDRADDET, aiming at coordination.

The Brazilian case, with its federalist administrative regime, showed that, though operationalized at the level of Metropolitan Regions managed by states, such collaborative territorial arrangements based on BGN are possible and present positive effects in coordinated implementation. However, they present gaps and pending issues of management and coordination. Such arrangements go beyond administrative limits seeking scale and association more appropriate to their development concerns, and enable the construction of larger systems based on the parts' specificities – grounded on Blue and Green systems.

Such processes, positive aspects, and difficulties presented in international experiences and debates are not absent in Brazil, and find application in cases of voluntary collaborative associations, such as Intermunicipal Public Consortiums, and those experiences outlined by the State, like Management Plans for coastal regions, as presented in ABC Region and North Coast Intermunicipal Consortium. The national examples show advances in constructing an Environmental Policy and modeling instruments, like ZEE – Economic and Ecological Zoning, for consolidation of the environmental and ecological grounding involved in European Union territorial planning policy, and is firmly rooted in the French BGN model.

ABC Region Intermunicipal Consortium integrates different sectoral approaches in its Regional Development Plan (pdrABC), based on the region's river basins and macrozoning approximating ZEE objectives. It is a voluntary collaborative arrangement in its green and blue network, but with the formulated project for economic and social development, inter-municipal governance, and management of seven municipalities, contributing to São Paulo Metropolitan

Region planning, without being confused with it. The Consortium and its RDP, and macrozoning base the multisectoral and environmental articulation, reproducing in their scale what the PDUI for São Paulo Metropolitan Region has sought with the preparation not connected to the State ZEE, still in process, delaying the PDUI preparation and application.

The North Coast Coastal Management Plan, being its seafront subject to specific legislation, was born with multisectoral integration starting from a ZEE, bound by law to this type of territory, reaching positive results, despite mismatches and difficulties of coordination and involvement of the society, as well as a mismatch against PDUI, still in progress. The urgency of questioning collaborative arrangements as part of management and coordination processes and instruments is revealed at the Brazilian level, as also the creation of Metropolitan Regions and Urban Agglomerations, and what they represent in terms of scale, planning, and management.

Difficulties associated with this type of inter-municipal planning are exemplified by the extinction of EMPLASA (Empresa Paulista de Planejamento Metropolitano SA) in May 2019 in São Paulo state, indicating the dismantling of this institution that managed Metropolitan Regions, weakening the technical-political structure for follow-up, monitoring, and regulation with inter-municipal reach. In addition to these difficulties, the Brazilian Forest Code (Law nº 12.651/12) keeps on prioritizing agricultural and cattle raising activities, which shows a contradiction between specific legislations and the National Environmental Policy, weakening the preservation of water resources, which indicates a lack of coordinated action that makes BGN truly institutionalized.

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