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# M.A.RIO

## Metropolitan Approach for Rio de Janeiro

### Executive summary

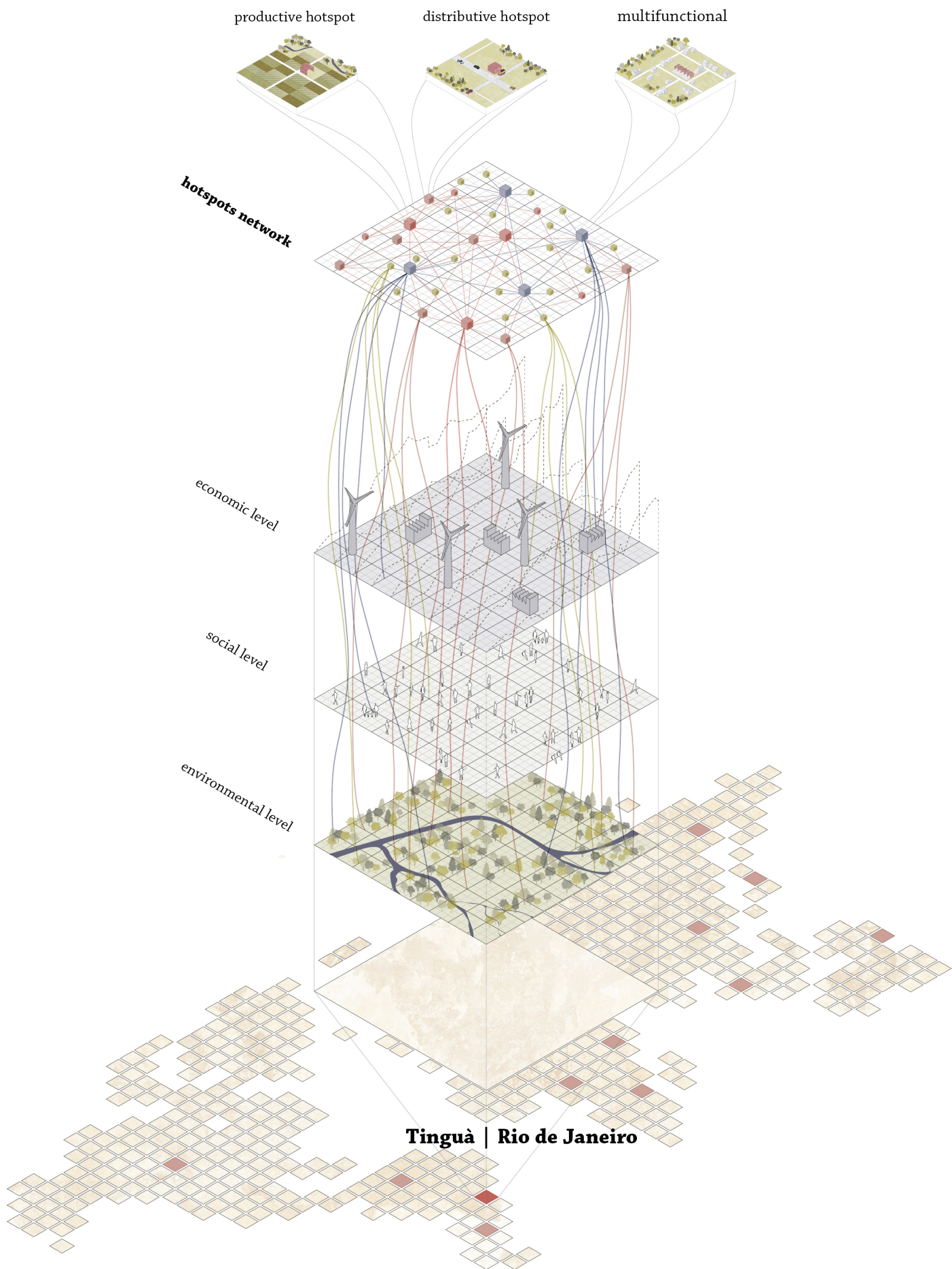
Urbanisation is a global phenomenon that is gradually transforming the traditional relation between urban and rural areas. In metropolitan regions, where cities extend to peri-urban and rural areas, this interconnection often witnesses a disparity in the population's living conditions disadvantaging the periphery. However, with a responsive metropolitan planning, urban dynamics can be strategic drivers for sustainable development in rural areas. M.A.RIO's project aims to provide an innovative planning strategy, suitable to similar realities, on the basis of the analysis of Rio de Janeiro Metropolitan Region (RMRJ). The case study is Tinguá's valley, an underdeveloped rural area in the periphery of RMRJ, which has strong biological value and provides central municipalities with important ecosystem services such as food and water but is isolated in terms of infrastructures and services. The proposed solution is based on the recognition of familiar agriculture as a trigger for social, environmental and economic development. It also follows UN Guiding Principles of Rural-Urban Linkage, with the aim of combining the preservation and reinforcement of the biological value, the design of the rural landscape and the creation of an efficient model of circular economy. The team developed and applied a strategy focusing on the geographical interpretation of metropolitan complexity, combining maps and spatial information technologies to allow the identification of latent landscape patterns. The solution proposes the design of an implemented agricultural pattern activated by a model of circular economy that is founded on a network of small but focused interventions, defined as hotspots. The logic of the hotspot is that of an "incubator of possibilities", which acts not only as an immediate response to specific local needs, but also as a generator of value on the metropolitan scale. Such innovative planning becomes a tool to support metropolitan decision-making, shifting from the political, social and geographical dichotomy between urban and rural areas, towards their mutual interconnection to achieve a Sustainable Development.

### Key Words

Urban Rural Linkage, Metropolitan Cartography, Urban Acupuncture, Circular Economy, Sustainable Development Goals.



The RMRJ network able to include peripheries through food and water system



## Project description written by the Principal Academic Tutor

The project is connotated by a strong metropolitan vision, aiming at the improvement of the current practices of metropolitan disciplines, with new competences of *shaping and re-shaping the metropolis*. This vision implies an interdisciplinary approach integrating various disciplinary knowledge, and transversal management skills, and dealing with the metropolitan complexity and fragmentation. Also, it intends to bridge the gap between the theory and practice by specifying the metropolitan needs and defining the intellectual tools to overcome them.

In Latin America, the rapid growth of cities faces challenges in ensuring sustainable and equitable development of the metropolitan areas. The project, through the cooperation among universities and independent research centres in Italy and Brazil, aims to explore the city of Rio de Janeiro as a case study on the metropolitan scale and develop a toolkit based on the reading of the territory with a **multilateral approach** that includes geographical, architectural, economic, environmental and public policy perspectives. This new reading will highlight socio-economic inequalities and environmental issues, providing to the team the opportunity to define a more circumscribed study area, where to generate an innovative solution, based on the principles of circular economy and sustainable development.

In summary, the intent is to develop a framework for the analysis of the socio-economic dynamics in the Rio de Janeiro Metropolitan Region, focusing on management of ecosystem services and provision of infrastructure and services, and realize a strategy to trigger circular economy practices for the development of local food production activities, while preserving water resources and biodiversity in the Atlantic Forest. This strategy constitutes a tool for the municipal decision-makers and will be generated thanks to the cooperation between the team and various external institutions, among which Conservation International, local NGOs and politicians from Rio de Janeiro. International funding and partners will be search for pursuit the real implementation of the designed solution.

## Team description by skill

All the members of team were deeply involved in the development of the project, and in the decision making, however we divided in two sub-groups to better address the specific needs and topics.

One group focused on the development of a territorial strategy and the design of a new landscape for the area, studying several literature references and developing and applying a specific methodology for this case study. This group deepened the study of David Gouverneur's approach to informality and Pedro Ortiz's theory of the MetroMatrix analysing his polycentric metropolitan model. Then applied it in the study of Rio de Janeiro Metropolitan Region understanding the regional dynamics to apply the methodology of metropolitan cartography. **Floriana Accordia** focused more on Gouverneur's approach, **Bianca Gentili** on Ortiz's, **Irene Sofia Ceron** defined the metropolitan dynamics. These dynamics constituted the basis for **Benedetta Gatti** to implement metropolitan cartography and provide maps on various scales.

The other group looked into the implementation of the production and market system; **Simone Mazzero** studied circular economy models, while **Melissa Latella** specialized on urban acupuncture strategies and Sustainable Development Goals, while cooperating to develop the Hotspot Network Strategy. This allocation of tasks was not a merely subdivision of the team, as it allowed each member to become an expert in relation to one topic and coordinate the colleagues' actions during the collaborative development of the project.

Also, the team was able to in touch with Brazilian references. In November 2017, three team members went to Rio de Janeiro for an on-field survey of the study area, while in April 2018, a delegation of Brazilian politicians participated in a one-week workshop to collaborate to the project and discover the rural innovation in the Milan countryside. A further meeting in Rio de Janeiro is expected in November 2018 to pursuit the real implementation of the project.

## Goal

The project aims to provide an **innovative planning strategy for the sustainable development of informal settlements and their inclusion in the metropolitan dimension**. The planning strategy was developed to a case study in Rio de Janeiro Metropolitan Region, on the analysis of an under-developed rural area in the municipality of Nova-Iguaçu, near Tinguá Biological Reserve. Tinguá represents an emblematic case, since it shows the complexity of the governance in the metropolitan periphery, at the interface between urban and rural realities. In fact, although Tinguá provides precious ecosystem services, as water and natural tourism, to the whole region, it is cut out from Nova-Iguaçu municipality in terms of infrastructure and services.

The proposed solution is addressed to both impending environmental and socio-economic issues in Tinguá, considering that they are common to most of informal settlements worldwide. On the one hand, the biological and social value of the area must be preserved and reinforced action on the Atlantic Forest and the water reservoirs. On the other hand, the urban and economic development of the area must be fostered, it is essential to create new opportunities for the local community, with a particular attention to farmers, while realizing a monitoring system to collect sensitive data to support governance and planning activities.

The aim of this strategy is to suit the **UN 2030 SDGs Agenda**, focusing on **Goal#11: “sustainable cities and communities”**. Especially on target 11.a which is *to sustain a positive social, economic and environmental link between rural and urban areas strengthening national and regional development planning*. This framework follows the Guiding Principles of **Rural-Urban Linkage** by UN-Habitat, **to achieve a sustainable trade system able to make Tinguá a relevant node in the metropolitan dimension**.

## Understanding the problem

Mega Rio, Rio city, as well as the other urbanised centres, attract global and regional flows of people, capital and goods, and are supported by a strong infrastructure and service system. However, the **urban sprawl is constantly expanding throughout the region and pushing urbanisation towards underserved peripheral areas and areas of high biological value**. In fact, Brazilian territory, thanks to the Atlantic forest has the greatest biodiversity throughout the world. In this framework, the ever-growing urban expansion is threatening the natural heritage of RMRJ. In particular, the trend of increasing urban population results in a strong urban sprawl which sees the predominance of understructured informal settlements that have no access to services and facilities. Rio's peripheries are the most impaired by this phenomenon because, among the different municipalities that compose the RMRJ, there is not a unitary governance on the metropolitan scale.

Tinguá as a rural informal periphery has several weaknesses but also some unique values. The biological reserve and the water springs presents make this place an attractive pole for tourists and a huge hydro-electrical resource. In addition, the resiliency of the farmers' community who were able to re-arrange in a parallel informal system as they were excluded from the formal one, is a crucial value since the agriculture is the only activity that can employ Tinguá's inhabitants without making them dependent from bigger centralities.





Urban sprawl is threatening areas of high biological value



The reconstruction of the agricultural pattern

## Exploring the opportunities

The collocation of Tinguá, its physical characteristics and social composition of its inhabitants offer some valuable starting points. The proximity to the metropolitan area, currently not expressed in term of accessibility to services, could attract greater interest from metropolitan council and inhabitants. The **ecosystem services**, acting as linkage among rural and urban areas, represent a topic of general interest, both in Rio de Janeiro and in other metropolitan areas. The informal setting of **familiar agriculture**, currently experiencing a great wave of interest in Brazilian planning strategies, offers undeveloped **social capital** to be addressed as triggers for an innovation of the market chain. The compresence of all these factors sets up a great opportunity to implement an innovative project, which would address the local issues with a multidisciplinary approach.

## Generating a solution

The solution follows the guiding principles of rural-urban linkage proposing familiar agriculture as a multi-layered metropolitan link with the aim of combining the preservation and reinforcement of the biological value, the design of an agricultural pattern and the application of an efficient model of circular economy. Two tools based on the use of spatialized data and maps allowed for the understanding of Rio de Janeiro metropolitan dynamics. These tools, namely the MetroMatrix and the Metropolitan Cartography, provide a reading of territory and the identification of a latent agricultural pattern. Thus, the solution relied on the enforcement of this pattern by the creation of **Tinguá AGROpark**. In practice, the development of Tinguá's informal settlement and farming land was fostered by the implementation of the **Hotspot Network Strategy** (HNS) created by the team on the basis of urban acupuncture theories and Gouverneur's planning strategy. HNS consists of the strategic positioning of elements that could attract the establishment of the settlement in prior defined areas and protect natural resources. These elements consisted in punctual interventions called **hotspots**. The mutual and synergic interaction among the various hotspots creates a network that provides facilities and services to the local farmers and constitutes a food production chain that is complementary to the already existing informal one. The network works accordingly to the principles of both **circular economy** and **Participatory Market Chain Approach**, as hotspots do not solely consist in light infrastructures but also act as social facilitator for farmers, being the first forum for the share of initiatives and **social learning**. In parallel to the hotspot one, also a network of focused interventions in realized to prevent water contamination and promote a sustainable water management, while a data gathering system alongside the production chain allows for the collection of useful information that institutions can use for activities planning and decision-making.

In order to be aligned with international interests, some of the indicators associated to the SDGs' targets in the UN 2030 Agenda were selected to assess the effectiveness of the designed solution and its **social impact**.

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