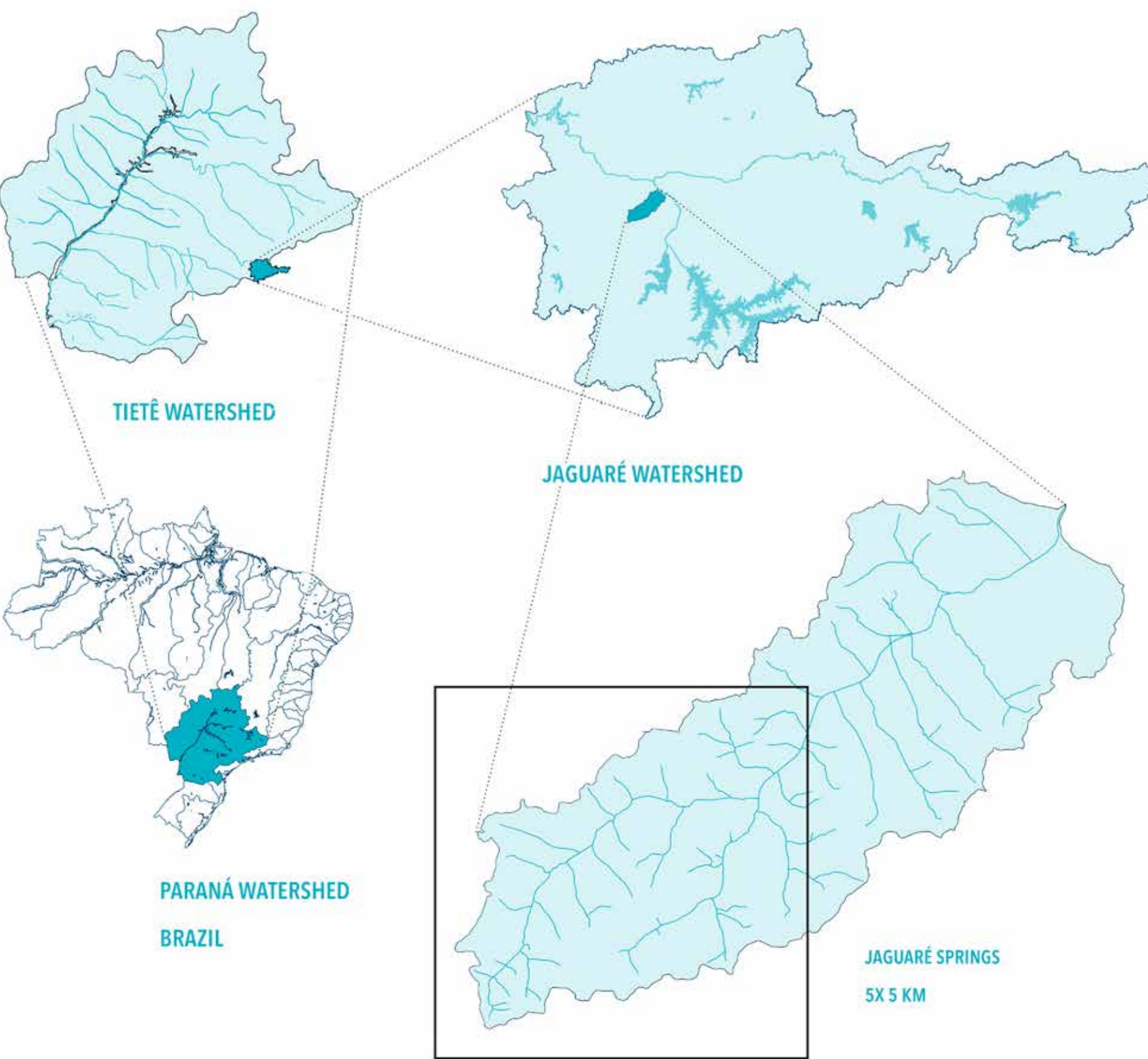


Green Infrastructure Plan for the sources of the Jaguaré Creek at the São Paulo city

The goal of this Project is to identify a Landscape Based Model and develop a strategy for implementing a Green Infrastructure Network, following the Landscape Information Modeling (LIM) approach for the Sources of the Jaguaré Watershed in the City of São Paulo, Brazil.

Background
This Watershed was the subject of a revitalization plan, which gathered a considerable amount of hydrological and urban data on the area, and identified the main pressures that affect its water bodies, according to existing and planned conditions. Its open spaces, especially along streams and springs, are and will be increasingly subject to predatory occupation, and the moment is now for a reversal of that expectation. Likewise, the pattern of urbanization that extends along the basin is calling for a re-qualification, in which Green Infrastructure's Nature based Solutions can point to a new, more sustainable model of adaptation to climate change, and to social and economical development, that this Southern Metropolis so eagerly needs.



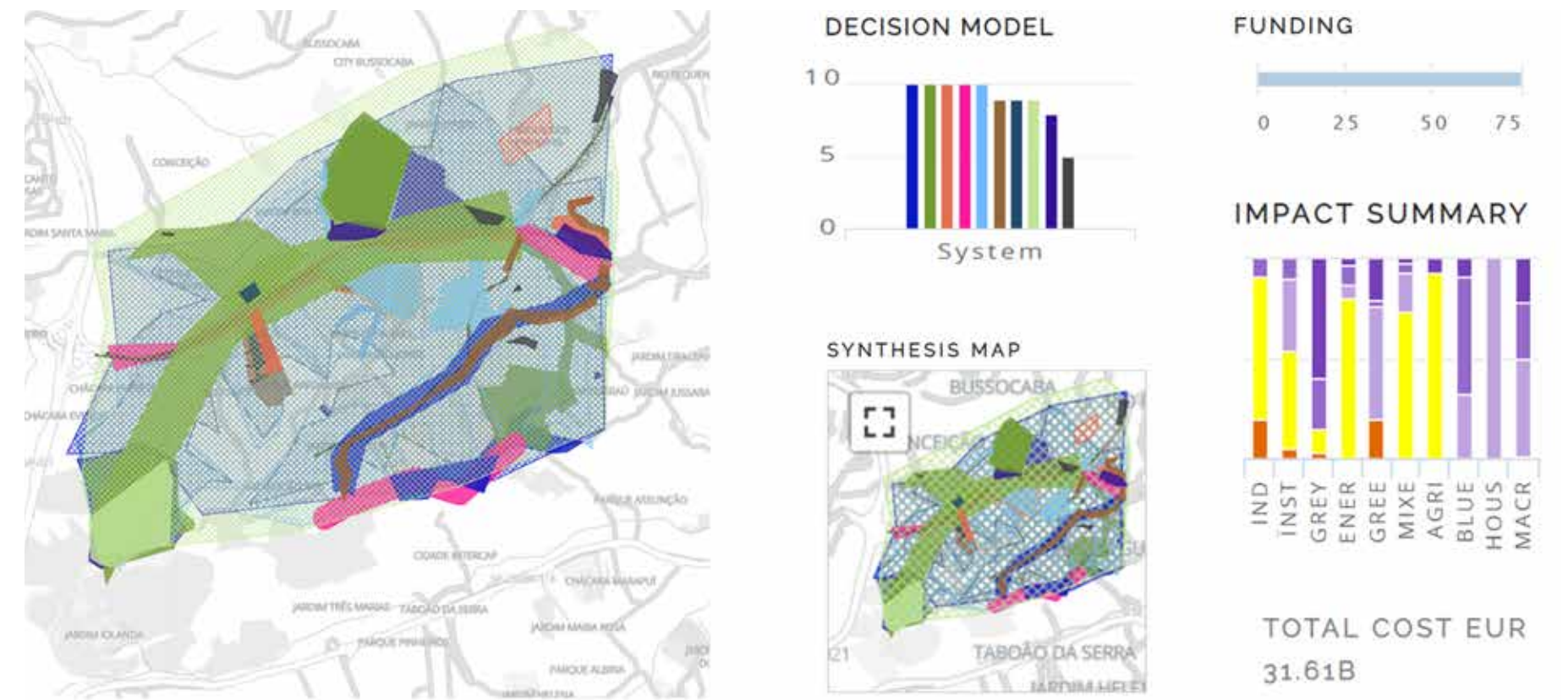
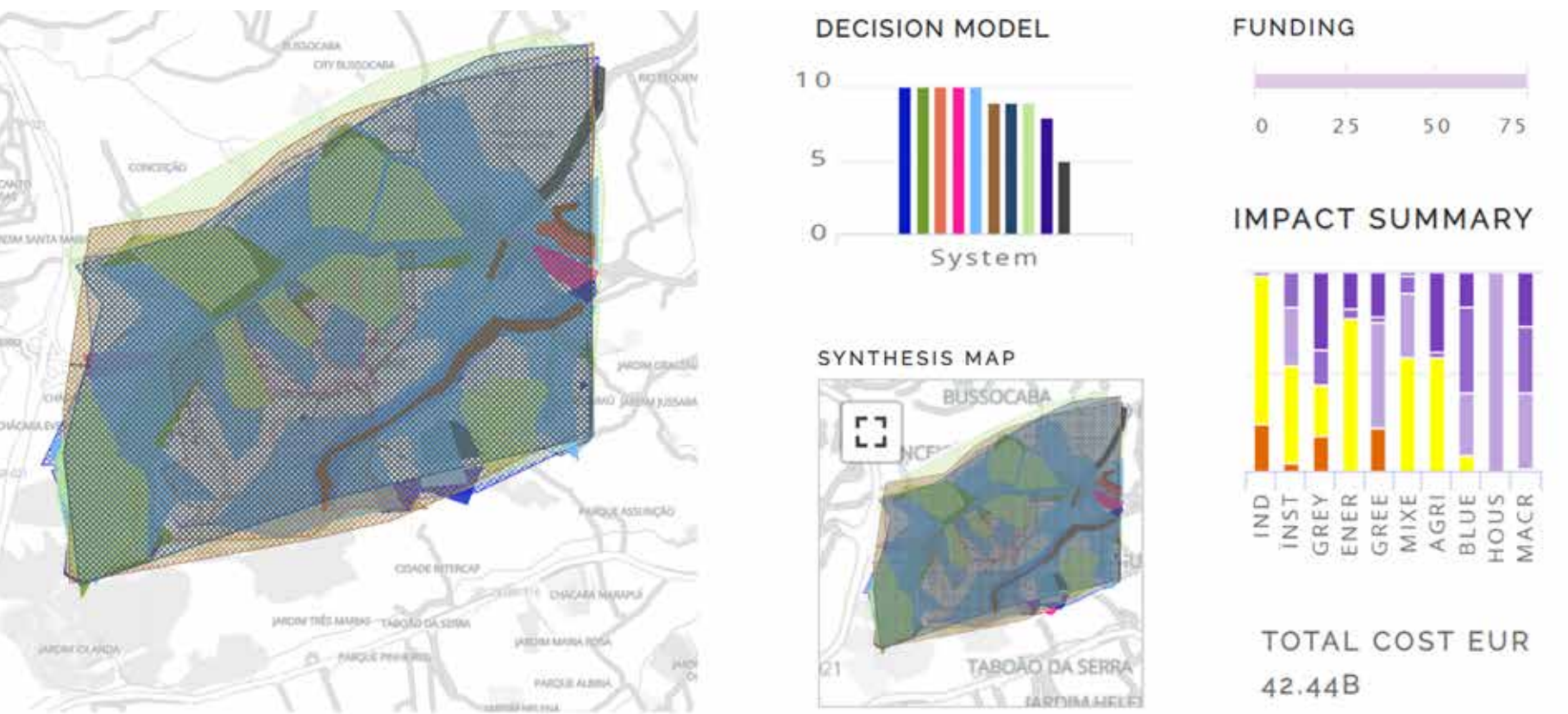
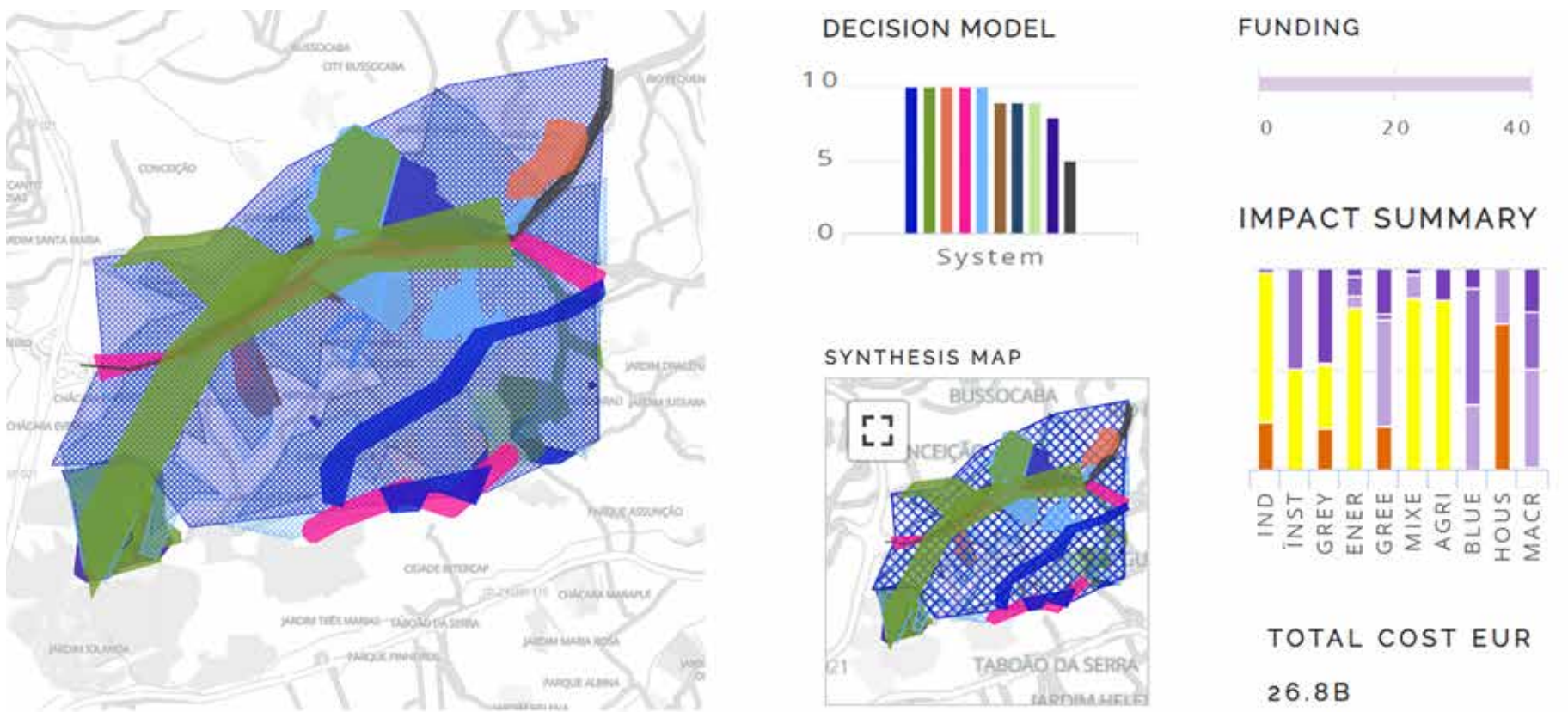
Five Major Requirements by 2050

- Implementing a Green Infrastructure Network in the Jaguaré Springs (São Paulo, Brazil), following the Landscape Information Modeling (LIM) and SIG from LABVERDE, USP.
- Develop strategies that deal with the large variation of water volume between dry and rainy periods.
- Improve Jaguaré river water quality.
- Provide adequate housing to the resident population of places at risk of landslides and floods.
- New park: Jaguaré Linear Park.

Major assumptions and innovations

- **WAT 2035/2050 2** Water retention
- **WAT 2035 4** Stormwater trading
- **WAT 2035 8** Bioretention
- **AGR 2035/2050 10** Urban farming – Urban Agriculture
- **TRA 2035 20** Alternative Ways Of Transportation: Canal-Path
- **MIX 2035 11** Smart city as smart systems
- **IND/COM 2035 7** White Biotechnology
- **RES 2050 9 3** Reduced concrete GHG Emissions
- **ENE 2035/2050 1** Renewable Energy Resources
- **GRN 2035 3** Increased Vegetation linked with stormwater
- **GRN 2035 4** Ecosystem services of green infrastructure

Project area: 5 x 5 km



Early adopter scenario

The Jaguaré Watershed in the City of São Paulo, Brazil is an area characterized by considerable territorial complexity, with diverse spatial and social realities which discourage homogeneous solutions for the whole territory. The area presents a series of conflicts between land use, water resources, infrastructural systems and urban management. This Watershed was the subject of a revitalization plan, which gathered a considerable amount of hydrological and urban data on the area, and identified the main pressures that affect its water bodies, according to existing and planned conditions. The quality of the water was considerably degraded by the combination of discharge of fresh sewage and diffuse pollution. Thus, the propose for 2035 that contemplate: universal basic sanitation, residences to the population – that living in risk areas – was essential for the selection of innovative diagrams for 2050. One example are the green diagrams (96% of the established target in the Early Adopter) such as Jacarezinho Linear Park. To realize this park it is necessary to establish previously necessary goals for the later choice of innovations, like establishment of wetlands. In this way, in the place selected for studies, the early adoption is only effective if the essential needs of local infrastructure are met.



Existing situation: 2020

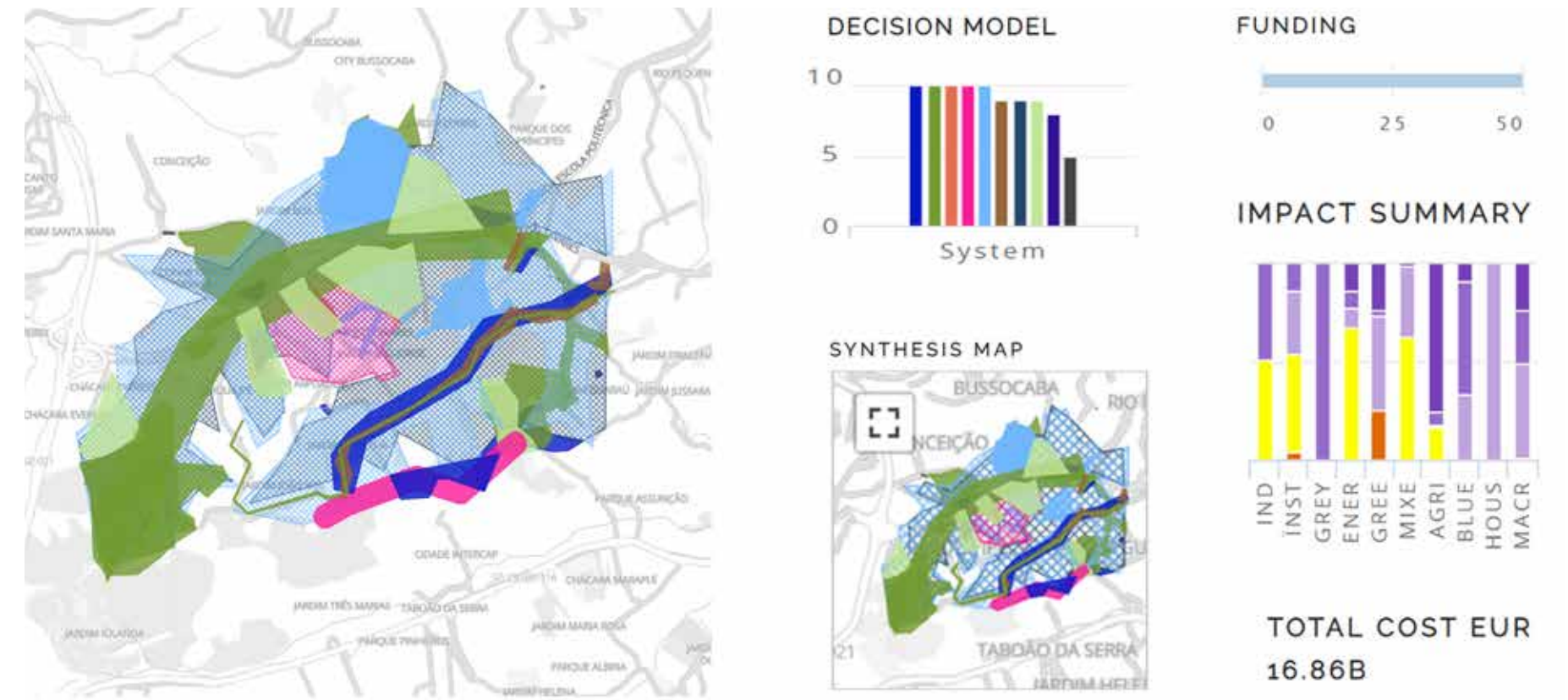
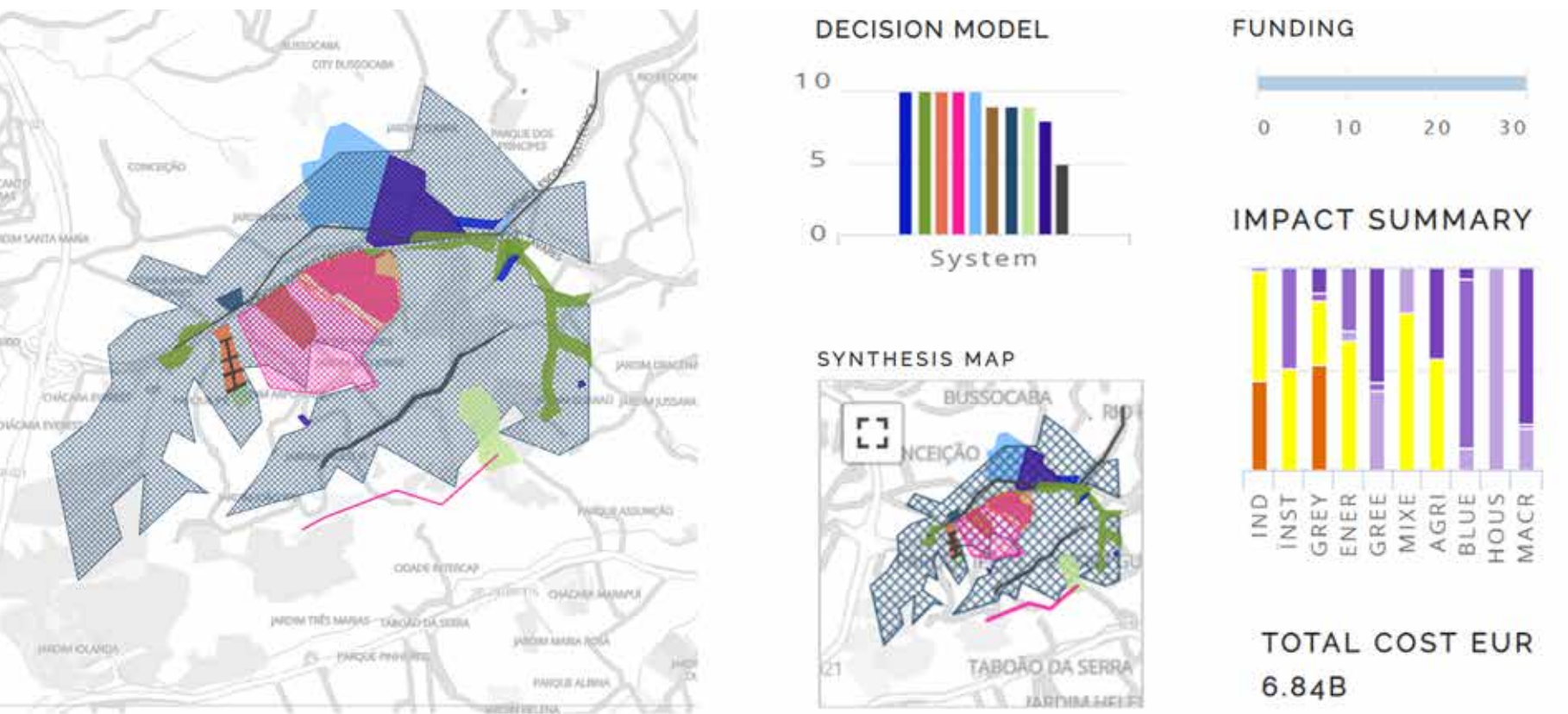
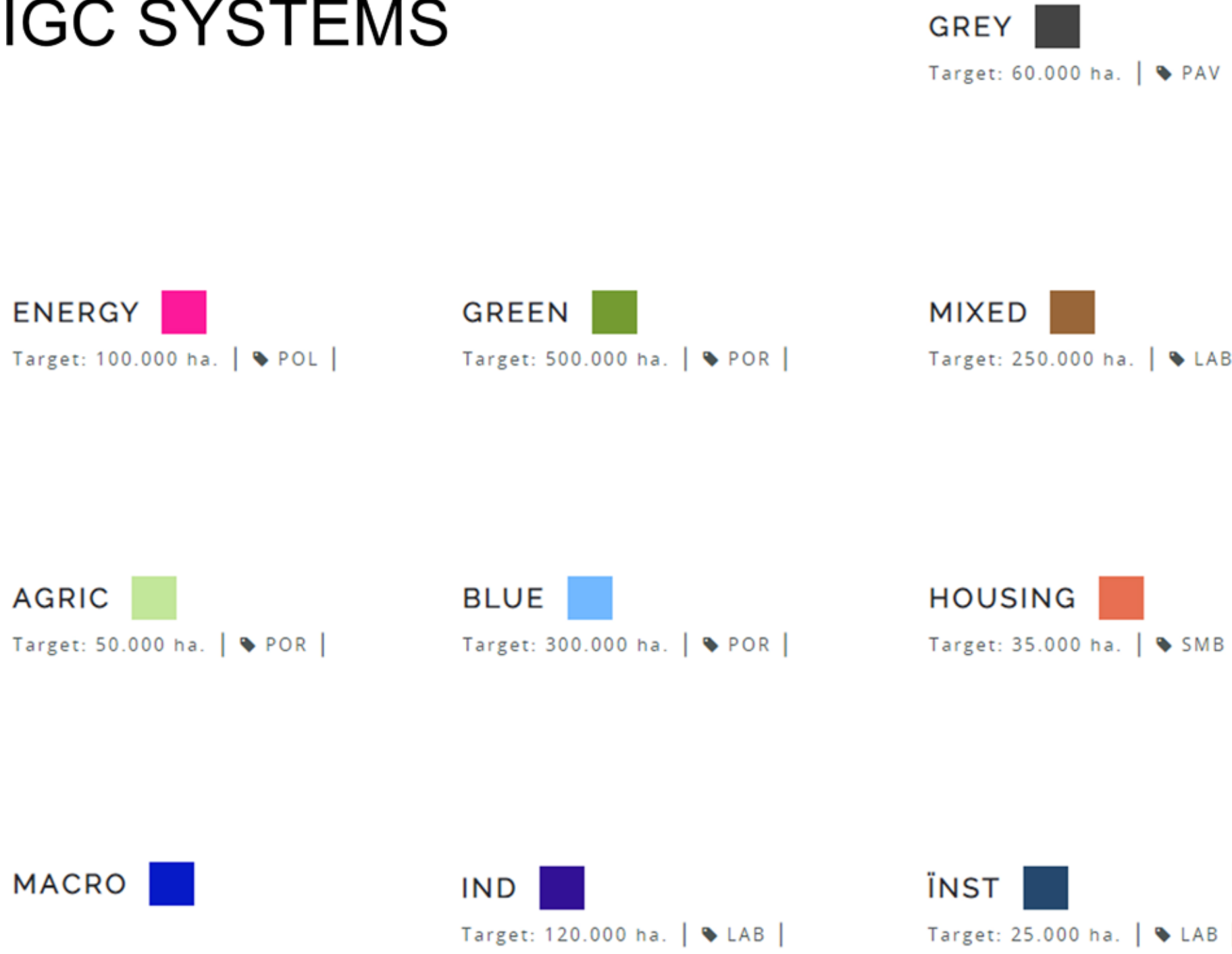


Early adopter: 2035



Early adopter: 2050

IGC SYSTEMS



Late adopter scenario

Despite having open areas available for green projects, both private and public, the price of land is high. It is an area that, like the city of São Paulo, as a whole, is shifting from an industry-based economy to services. The powerful pressure of the real estate market for the constructive adhesion of the area, if done in the conventional way, the late adoption, will implicate in amplify the phenomenon of heat island, which means the worsening of the quality of life of the inhabitants of the springs of Jaguaré. Delaying some measures that are essential to start in 2020, for example, for hydrography and water treatment, may amplify the natural tendency of great volume variation between dry and rainy periods. Also, the quality of the water will be considerably degraded by the combination of discharge of fresh sewage and diffuse pollution. Thus, it is necessary to carry out as soon as possible basic infrastructure projects so that innovative ideas in all 10 systems can be proposed, such as Green Infrastructure Network in the Sources of the Jaguaré Watershed (São Paulo, Brazil), following the Landscape Information Modeling (LIM) from LABVERDE (Faculty of Architecture and Urbanism, University of Sao Paulo).



Late adopter: 2035



Late adopter: 2050

BRAZIL



Impacts: 2050

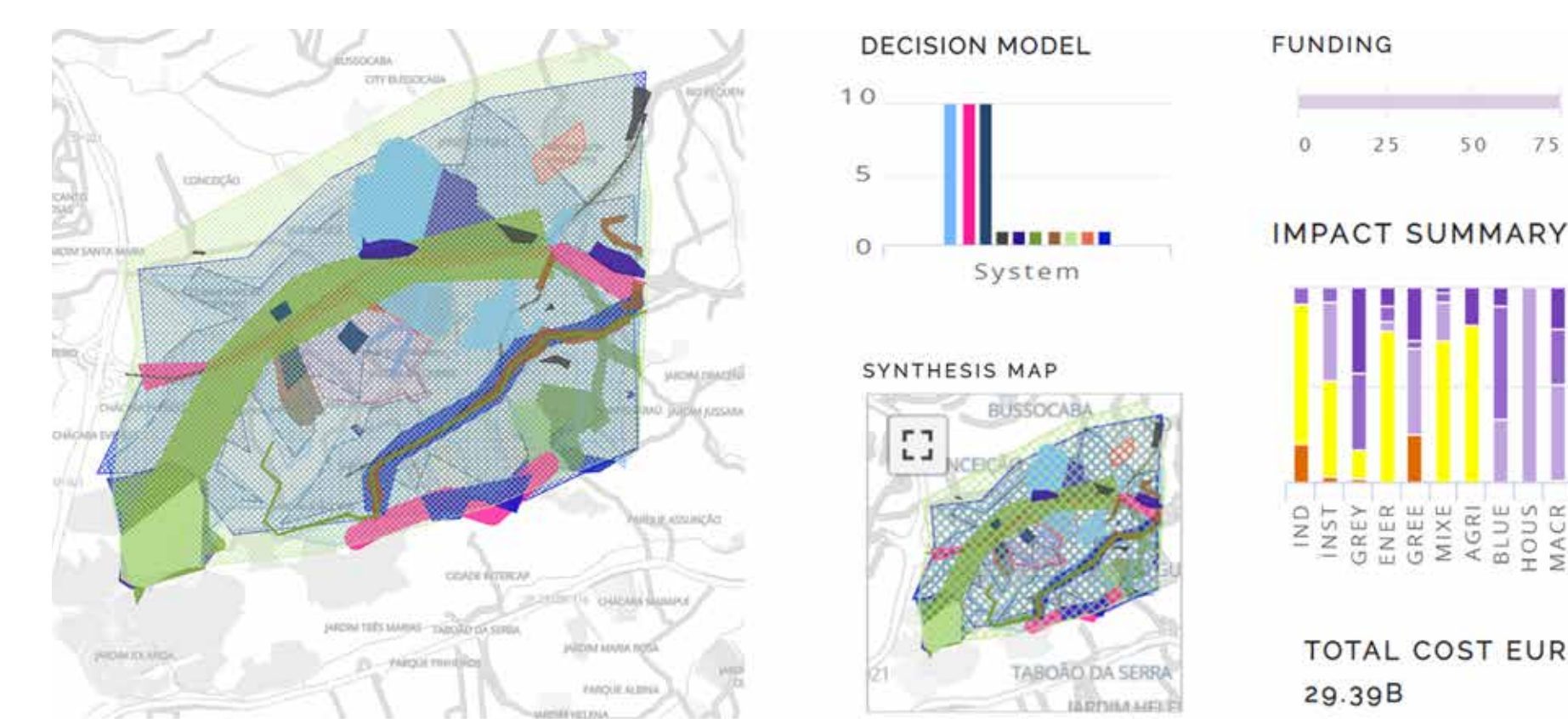
The early adoption is only effective if the essential needs of local infrastructure are met.

Green Infrastructure Network for Jaguaré Spring: 1/10 of the total 270km² drainage area of Pinheiros River, one of the two main watercourses crossing the Greater São Paulo

Water quality improvement: non-point source pollution mitigation, waste recycling and sewage collection and treatment

Flood risk management: priority areas identified and addressed
(flood control through hydrological simulations of the watershed)

Improvement of the quality of life: proposition of linear parks, adequate housing to the resident population of places at risk of landslides and floods.



Non-adopter scenario

The open spaces of the The Jaguaré Watershed in the City of São Paulo, Brazil, especially along streams and springs, are and will be increasingly subject to predatory occupation, and the moment is now for a reversal of that expectation.

Likewise, the pattern of urbanization that extends along the basin is calling for a re-qualification, in which Green Infrastructure's Nature based Solutions can point to a new, more sustainable model of adaptation to climate change, and to social and economical development, that this Southern Metropolis so eagerly needs. Considering the moment of rapid change in land use and occupation of the Jaguaré basin (and in São Paulo City), not adopting innovative measures for 2035 (in the non-adopter scenario) could lead to the loss of important green areas in the city of São Paulo (such as the riparian forests of open streams, the presence Atlantic forest located in the sources of the basin); also the maintenance of substandard living conditions for residents of dwellings in areas of risk (flooding or sloping slopes); increased pollution of the air by the use of polluting means of transport and water by the lack of basic sanitation in part of the residences; increase in heat islands and extreme weather events.



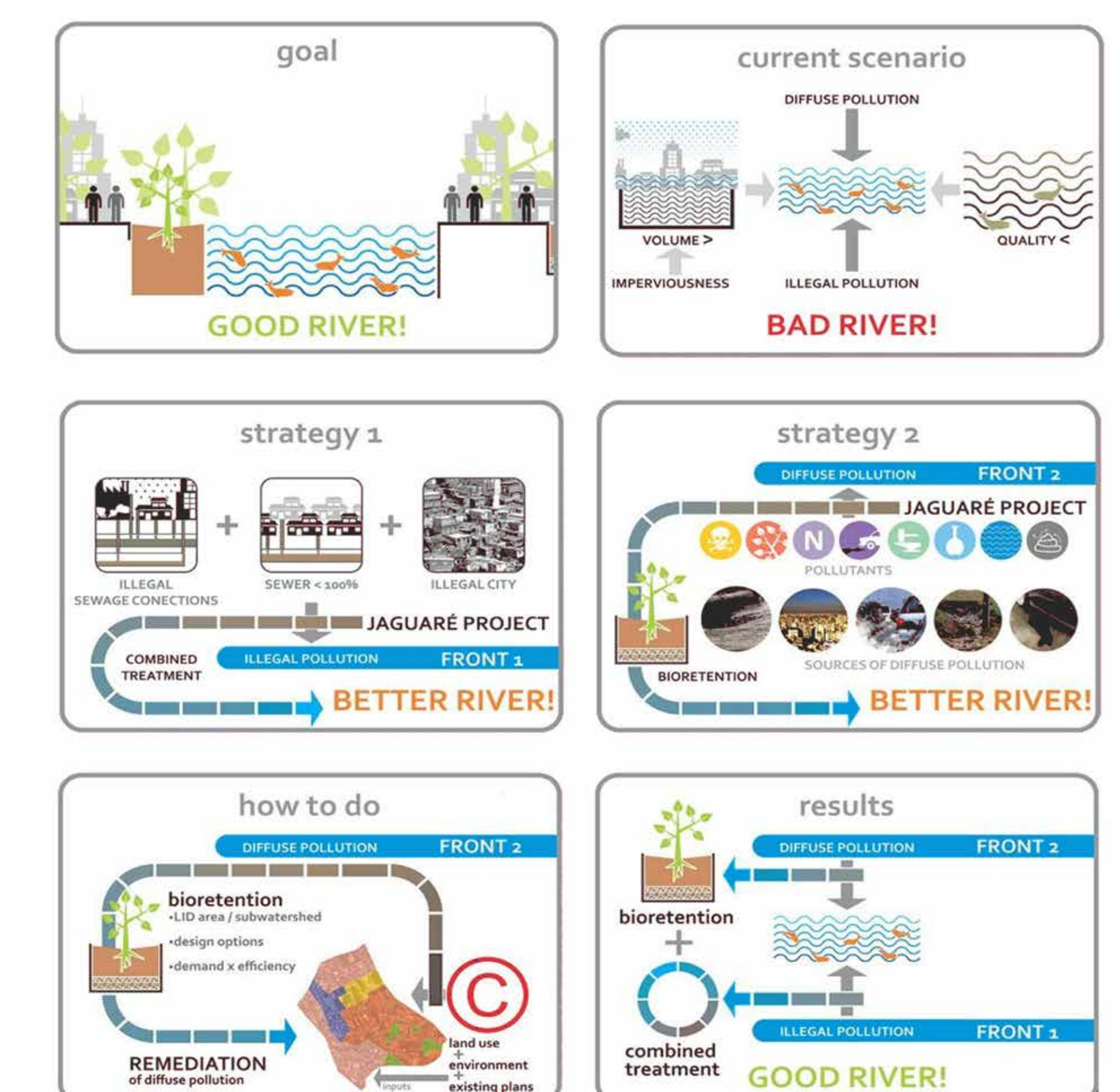
Aerial view of P5 test site with proposed meanders channels during moderate flow conditions



Aerial view of P5 test site with proposed anastomosing channels during peak flow conditions



View towards: Springs



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