

Planning for the periurban: the experience of the Agrarian Park of the Baix Llobregat

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Abstract

The Parc Agrari del Baix Llobregat (PABL) is a leading European example of how to manage peri-urban agricultural systems in highly complex metropolitan areas. Located along a strategic infrastructure corridor in the Barcelona region, the park integrates fertile agricultural land, ecological networks, and urban pressures, playing a pivotal role in regional food policy and territorial resilience. Its institutional evolution has established a multilevel governance framework that can coordinate regulatory protection, agricultural production, and spatial development. Adopting a bioregionalist perspective, this article interprets the PABL as a territorial laboratory in which environmental, productive, and social cycles are continuously sustained through cooperative mechanisms and shared institutional arrangements. The study emphasises the importance of governance continuity in stabilising agro-ecological practices, reinforcing short supply chains, and preventing land speculation. It outlines future trajectories centred on proximity-based economies and collective land management.

Keywords: Peri-urban agriculture; Multilevel territorial governance; Bioregionalism; Agri-food resilience; Multifunctional landscape systems.

1. The construction process of the Parc Agrari del Baix Llobregat: institutional evolution, urban planning tools and governance innovations

The Parc Agrari del Baix Llobregat (PABL) constitutes one of the most advanced references in Europe for the management of agricultural peri-urban areas and the construction of multifunctional territorial models in highly complex metropolitan contexts. Located in the western belt of Barcelona's metropolitan area, in the Llobregat valley between the Garraf massif and the Gavà and Castelldefels coastline, the Park occupies a strategic position along one of the Mediterranean's main urban and infrastructural development routes. Its location, marked by the presence of major infrastructures such as the port, airport and railway and motorway network, makes it a critical node in the relationship between the city, agricultural land and environmental systems (Casals, 2009; Tucci, 2019). The PABL is integrated into a wider metropolitan green belt made up of natural parks, agricultural spaces and ecological corridors managed by the Diputació de Barcelona, configuring a continuous landscape in which

productive, ecological and settlement functions intertwine. In this context, the area maintains one of the most fertile agricultural plains in Catalonia, where professional agriculture generates high added-value horticultural production and plays an essential role in metropolitan food policies oriented towards reducing the ecological footprint, supporting short supply chains and strengthening territorial resilience.

The park's current configuration is the result of a long institutional and territorial journey that began in the late 1970s and mid-1990s. The 'Salvem el Pla!' manifesto of 1977, promoted by the Unió de Pagesos, represented an initial moment of civic mobilisation in favour of protecting agricultural spaces threatened by urban expansion (Callau, Paül, 2008). This awareness was taken up again in 1996 when the Diputació de Barcelona commissioned the Unió de Pagesos to elaborate the study 'Implantación de un Parque Agrario en el Baix Llobregat', which defined criticalities, potentials and first lines of action for a model of an agricultural park in the delta and lower valley of the Llobregat.

In the same year, during the European LIFE programme, the alliance between the Diputació, the Consell Comarcal del Baix Llobregat and the Unió de Pagesos was consolidated, which led to the presentation of a joint proposal for the protection and enhancement of the agricultural space. This process resulted in the definition of a multifunctional territorial continuum of more than 15,000 hectares around the metropolis, in which natural and agricultural areas were integrated through ecological relations and connecting corridors (Consorci del PABL, 2002). The path started with LIFE culminated in the drafting of the *Pla de Gestió i Desenvolupament*, the result of a broad participatory process involving farmers, administrations and scientific bodies. Approved in 2002, the Plan defined the functions, objectives and operational priorities of the Management Consortium, guiding agricultural development, environmental improvement and territorial valorisation. At the same time, the *Pla Especial de Protecció i Millora* (approved definitively in December 2003 and June 2004 and published in the Diari Oficial de la Generalitat de Catalunya in September 2004) established the Park's current urban protection regime, regulating land uses and limiting the impacts of urban and infrastructural expansion. Urban coherence was further strengthened in 2015 with the definitive approval of the revision of the *Pla Especial* and the specific modification of the *Pla General Metropolità* in the park's area (DOGC no. 6959, 18 September 2015), consolidating land-use protections and planning alignment across multiple municipalities (Consorci del PABL, 2002).

This institutional and regulatory set-up has enabled the development of a cooperative, multi-level governance model, supported by the Parc Agrari Consortium and regional and metropolitan agri-food strategies. The defined system aims at protecting fertile soil, promoting sustainable agricultural practices, safeguarding water and soil resources, and enhancing the landscape as a cultural and identity asset (Gastó et al., 2010).

The effects of the project confirm the Park's systemic role as a multifunctional territorial infrastructure: containment of soil consumption, increase in biodiversity, reduction of food transport emissions, creation of new agricultural employment, strengthening of local agri-food networks, dissemination of fresh, quality food, and growth of environmental awareness in urban communities. The park thus plays a hinge function between city and countryside, acting as a territorial device capable of integrating agricultural productivity, environmental protection, social cohesion and innovation.

The experience of Baix Llobregat has generated significant influences in other Catalan contexts, including the Espai Agrari de la Baixa Tordera, where territorial management initiatives launched in the 1990s and formalised in 2017 testify to the emergence of forms of local self-government, community cooperatives and solidarity networks for the protection of productive space. These processes fit within the framework of contemporary bioregionalist perspectives, which propose governance models rooted in local specificities and based on cooperation between communities, farmers and institutions.

In an evolutionary perspective, instruments such as the *Pla Especial* could be reinterpreted to support advanced forms of territorial economy, such as self-managed agricultural cooperatives, operating on public or community land with shared rules for sustainable use; solidarity economy districts, aimed at networking producers, farmers' markets, short supply chain distribution systems and responsible consumption initiatives; short supply chains, or models of collective land ownership, such as *community land trusts*, to guarantee the long-term agricultural use of land and prevent speculation. This evolution would transform the plan from a simple regulatory device into a platform for socio-territorial innovation, helping to strengthen the local economy, promote proximity production and build more resilient and cohesive territorial systems.

In this perspective, the Parc Agrari del Baix Llobregat can be interpreted as an advanced laboratory for rethinking the role of peri-urban areas in the 21st century, demonstrating how integrated planning policies can support the ecological transition and improve the territorial quality of contemporary metropolises (Prats et al., 2021).

2. The PABL within the international debate on peri-urban governance and bioregional planning

The Parc Agrari del Baix Llobregat is an important case study in the broader international debate on the governance and planning of peri-urban territories, particularly with regard to agricultural parks, metropolitan green belts, and food-oriented territorial strategies. Since the late twentieth century, peri-urban areas have increasingly been recognised as hybrid territories requiring specific regulatory, ecological and socio-economic frameworks, rather than merely as residual or transitional spaces between urban and rural domains.

In the United Kingdom, the green belt tradition, established in the post-war planning system, has historically functioned as a containment device aimed at preventing urban sprawl and maintaining a clear morphological distinction between cities and the countryside (Hall & Ward, 1998). While green belts have been effective in limiting outward expansion and safeguarding open land, they have often operated through restrictive zoning logics centred on development control, without necessarily integrating agricultural productivity or ecological metabolism into a comprehensive territorial strategy (Amati, 2008). As several scholars have observed, the green belt model tends to prioritise a defensive, preservation-oriented paradigm in which open space is primarily valued for its buffering and landscape functions rather than as an active component of metropolitan socio-ecological systems.

In contrast, agricultural park initiatives in Italy and France have progressively adopted a more project-oriented approach. In the French and Mediterranean debates, Pierre Donadieu (1998, 2006) and André Fleury have made significant contributions to the redefinition of peri-urban agriculture as a territorial project rather than a marginal land use (Fleury, & Donadieu, 1997). They emphasise that agricultural space is a structuring element of metropolitan landscapes and is capable of articulating ecological continuity, cultural identity, and productive functions within highly urbanised regions. In Italy, initiatives such as the Parco Agricolo Sud Milano and the Parco della Piana di Firenze have used regional planning frameworks to control urbanisation while promoting agricultural continuity and preserving the landscape. However, governance structures in many cases remain closely tied to administrative hierarchies, and the integration of productive innovation, ecological cycles and metropolitan metabolic strategies is not always fully systematised.

Within this European landscape, the PABL represents a further evolution. Unlike the predominantly defensive logic of British green belts, the PABL does not simply demarcate a limit to urban growth; it redefines peri-urban agricultural land as a strategic infrastructural system embedded within metropolitan dynamics. The PABL's model integrates three dimensions that are often treated separately in other contexts: a binding statutory protection regime, a stable, multi-level governance structure institutionalised through a consortium model, and an explicit orientation towards agro-ecological productivity, short supply chains, and resource cycles as components of metropolitan resilience. Thus, the PABL shifts from a land containment paradigm to a territorial metabolism paradigm, in which agricultural space functions as a productive, ecological, and socio-institutional engine within the metropolitan system.

From a theoretical perspective, this evolution resonates with collaborative and communicative planning theories (Healey, 2007), which emphasise negotiated institutional arrangements and relational governance. It also aligns with literature on the commons and polycentric governance (Ostrom, 1990), which emphasises the collective stewardship of shared resources. At the same time, the PABL aligns with bioregionalist approaches, which conceive of territory as a living system that is structured by ecological cycles, local production networks, and community-based governance (Magnaghi, 2005). The emphasis on multifunctionality, adaptive governance and systemic resilience also connects the case to discussions on resilient urban regions and ecological transition (Beatley, 2011), in which metropolitan sustainability is pursued by integrating green infrastructures and localised metabolic cycles.

Therefore, the originality of the PABL case lies not only in its spatial configuration, but also in the systemic integration of planning instruments, governance arrangements, and eco-productive processes. Unlike the containment-oriented logic of green belts and more sector-specific agricultural park initiatives, the PABL unifies regulatory protection, institutional innovation and metabolic reactivation. This integrated approach provides transferable insights for other Mediterranean and European metropolitan regions facing land pressure, agricultural fragmentation and ecological vulnerability. It suggests a shift from defensive preservation models to regenerative, resilience-oriented peri-urban planning paradigms.

3. Methodological Framework: From Territorial Diagnosis to Strategic Scenarios

The cumulative effect of management and development policies implemented over the years has gradually moulded the agricultural and environmental systems of the Parc Agrari del Baix Llobregat, reflecting the strategic decisions and operational priorities set out in the Plan. In this sense, the present study builds on a detailed territorial analysis of the park and its urban surroundings, focusing on structural data, spatial configuration, infrastructure systems, and socio-economic dynamics as interconnected components of a complex metropolitan landscape.

The research presented in this article stems from a project commissioned by Barcelona Regional (BR) in 2013–14. Under the direction of Willy Müller, the then CEO of BR, the institution entrusted the Gausa-Raveau studio with developing the strategic research framework, based on previous studies by Manuel Gausa. Within this institutional context, the GIC-Lab Educational Unit of dAD-UNIGE (University of Genoa) collaborated with the Gausa-Raveau studio, Actar Arquitectura, and the IAAC (Institute for Advanced Architecture of Catalonia) to contribute to the analytical and project-oriented development of the research.

The research aims to investigate some key issues:

1. Role and identity of PABLL: assessing how the Park can act as a meeting point and exchange between productive, recreational, natural, urban, logistical and tourist functions, strengthening its presence and recognisability within the metropolitan system.
2. Territorial integration: analysing the park's relations with the network of protected parks, the coastline, strategic infrastructures (port, airport, transport) and the various surrounding urban and natural tissues, identifying connection and reconnection potential between contiguous but heterogeneous environments.
3. Flows and attractiveness: exploring how tourist flows and economic activities linked to Barcelona can interact with the park, transforming visitors and users into actors of a sustainable and diversified fruition.
4. New functions and vocations: to verify how the reconfiguration of agricultural, recreational, tourist and cultural activities can generate economic and planning incentives, enhancing the traditional heritage and supporting a multiple, recreational-productive and resilient vocation of the territory.
5. Comparative models: consider similar experiences at an international level as a reference to identify innovative strategies for integrating the agricultural industry, active tourism and sustainable local development.

The methodological approach is articulated in three sequential and interrelated phases: (1) multi-layered territorial diagnosis, (2) systemic abstraction and hierarchisation, and (3) strategic scenario construction and validation. This ensures transparency and traceability in the transition from empirical analysis to operational projection, thereby strengthening the robustness and replicability of the proposed model.

The first phase consisted of an integrated analysis based on the superimposition of spatial, environmental, infrastructural, socio-economic and institutional layers. Quantitative data, such as land use distribution, demographic trends, infrastructure density, productive sectors and environmental parameters, were interpreted alongside qualitative assessments of governance arrangements, landscape identity and functional interdependencies. The objective was relational as well as descriptive: to identify structural tensions, discontinuities, underutilised resources and latent synergies within the park–metropolitan system. This diagnostic phase established a solid analytical basis for defining future objectives and synthesising the complex interactions between the park, metropolitan infrastructures, and the surrounding urban context.

Building upon the diagnostic findings, the research proceeded through a process of systemic abstraction to identify recurrent spatial and functional patterns. The four territorial sub-structures were defined according to a combination of morphological and operational criteria, including:

- spatial continuity and infrastructural articulation;
- presence of strategic nodes and interchange systems;
- ecological corridors and landscape gradients;
- concentration of heritage assets and productive clusters.

These elements were organised into a hierarchy based on their capacity to function as structural connectors between urban, agricultural, and environmental systems. This formed the spatial framework of the proposed plan. In parallel, the seven eco-productive cycles were identified through an analysis of the material and information flows operating within and around the park. Selection criteria included:

- the existence of critical or underutilised resource streams (e.g. water, organic waste, biomass, energy residues);
- the feasibility of circular reactivation through locally implementable technologies;
- potential to generate environmental regeneration and socio-economic value;

Scalability and transferability to comparable peri-urban contexts was also considered.

While the sub-structures define the spatial framework, the eco-productive cycles represent the operational processes that activate and transform that framework within a systemic logic.

The four integrated development scenarios were constructed as 4×4 combinatory matrices connecting spatial sub-structures and eco-productive systems. Rather than fixed master plans, these scenarios function as strategic activation hypotheses, guiding adaptive and incremental transformations.

Each scenario was assessed according to three validation criteria:

- Territorial coherence: consistency with existing morphological, environmental, and institutional conditions.
- Adaptive feasibility: the capacity for progressive implementation without requiring radical systemic restructuring.
- Transferability: applicability of the underlying principles to other peri-urban metropolitan regions facing analogous pressures.

Through this methodological articulation, the proposed model emerges as a structured and empirically grounded framework rooted in institutional collaboration, layered analysis and systemic reasoning, rather than as a speculative projection detached from context. Progressing from diagnosis to hierarchisation and scenario activation enhances the transparency, robustness of the argument and operational relevance of the research, positioning it as a potential reference model for bioregional and resilience-oriented planning strategies.

The main operational objectives of the research are to:

1. Analyse in depth the current situation of PABLL and its strategic, urban, cultural, economic, social and landscape implications.
2. Quantify and statistically represent the data, elaborating a critical and propositional diagnosis of the current dynamics and their evolutionary potential.
3. Define qualitative scenarios and application criteria on different territorial scales.
4. Propose models, actions and operational strategies consistent with the Park's multifunctional functions.
5. Elaborate communication and results dissemination tools, able to generate public awareness and involvement.
6. Stimulate debate and produce guidelines for the integration of the Park within the overall metropolitan strategy.

The articulated methodological structure outlined above establishes a coherent progression from empirical diagnosis to strategic formulation, ensuring both analytical rigour and operational orientation. By grounding scenario construction in layered territorial analysis, hierarchical structuring and explicit validation criteria, the research framework avoids speculative abstraction and maintains a constant reference to institutional, spatial and metabolic realities.

The following chapters develop in detail the three phases described – diagnosis, systemic structuring and scenario activation – demonstrating how the interpretative reading of the PABLL can be translated into a structured strategic model. Through this progression, the research positions the park not merely as a protected agricultural area, but as a dynamic territorial platform capable of integrating governance, production, ecology and metropolitan resilience within a bioregional perspective.

4. Phase 1. Multi-layered territorial diagnosis

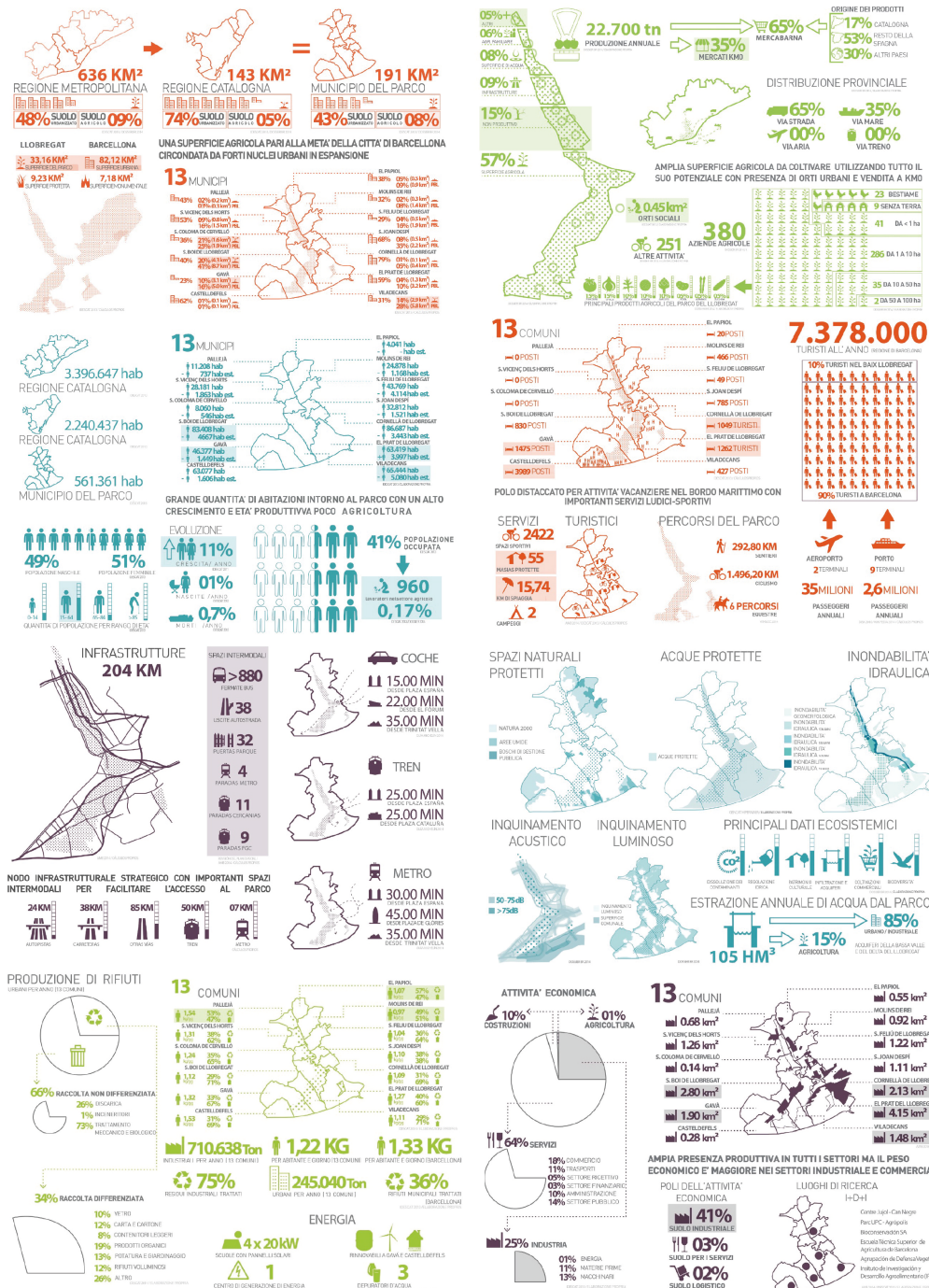
The first phase of the research was based on an integrated territorial diagnosis combining spatial, environmental, infrastructural, socio-economic and institutional layers. Quantitative indicators were interpreted together with qualitative assessments in order to construct a relational reading of the park–metropolitan system. Rather than producing a descriptive inventory, the analysis aimed to identify structural imbalances, latent potentials and systemic interdependencies, establishing the analytical foundation for the subsequent strategic framework.

The following thematic sections synthesise this diagnostic reading by articulating the park's structural configuration, socio-economic profile and environmental dynamics as interconnected components of a single metropolitan system.

4.1 Territorial Dimension and Spatial Structure

The Parc Agrari del Baix Llobregat (33.16 km²) represents a significant agricultural enclave within the Barcelona metropolitan system, accounting for approximately 5% of the metropolitan surface and nearly one third of its total agricultural land. In a context where urbanised land reaches almost half of the metropolitan territory and agricultural land rarely exceeds 5–10%, the park constitutes a structurally scarce and strategic resource.

The park extends across thirteen municipalities, with varying degrees of agricultural incidence and spatial fragmentation, particularly along the river corridor. Despite this administrative complexity, the system is articulated around a central reception and training area in Sant Boi, which performs educational, governance and coordination functions. This polycentric configuration reflects both the metropolitan scale of the park and the need for coordinated inter-municipal management.



Img.1_ PABLL-BCN+, 1. Dimensions and Surfaces; 2. Society and Demography; 3. Networks and Infrastructures, 4. Visitor Flows and Tourism; 5. Productive Sectors; 6. Agricultural Uses and Exploitation, 7. Environmental Parameters; 8. Waste and Renewable Energy, by Gausa-Raveau Actarquitectura, Gic-Lab, 2016

4.2 Demographic and Productive Context

The municipalities included within the PABLL perimeter host approximately 15% of the Barcelona metropolitan population. The area is characterised by a predominantly active demographic profile and a strongly tertiarised economic structure: services generate 64% of added value, followed by industry (25%), while agriculture accounts for only 1% of total economic output. Direct agricultural employment remains marginal (0.17%), highlighting the structural imbalance between the agricultural vocation of the territory and the surrounding metropolitan economy.

However, the park represents one third of the metropolitan agricultural surface and maintains a high level of productive specialisation, particularly in horticulture (tomatoes, artichokes, onions and lettuces). Approximately 57% of the park's land is dedicated to agricultural use. While 35% of production supplies the local market, 65% is distributed through Mercabarna, positioning the park within broader regional food networks. The presence of nearly one thousand social gardens further reinforces its role in food education, social cohesion and micro-production.

4.3 Infrastructural Integration and Accessibility

Although agriculturally oriented, the PABLL is deeply embedded within metropolitan mobility systems. The territory is crossed by motorways, railways and local road networks, and is served by an extensive public transport infrastructure. This high infrastructural density positions the park as a central and accessible node within the metropolitan geography.

Nevertheless, a paradox emerges: despite strong macro-connectivity, internal accessibility remains limited due to insufficient intermodal nodes and weak entrance structuring. This condition highlights a strategic challenge concerning the park's integration with surrounding urban fabrics and its usability for residents and visitors.

4.4 Tourism and Multifunctional Potential

The park is located within a highly attractive tourist context, with approximately seven million annual visitors in the wider area and 16 km of coastal beaches nearby. However, direct tourist penetration into the agricultural landscape remains limited, indicating underexploited potential. The existence of 1,500 km of trails and 55 protected farmsteads offers a significant basis for developing multifunctional rural tourism, agro-cultural activities and heritage valorisation strategies, reinforcing the park's capacity to diversify its economic base while maintaining agricultural continuity.

4.5 Environmental and Metabolic Dynamics

Despite strong infrastructural and industrial pressures, the park preserves relevant ecological assets. Approximately one quarter of its surface is composed of high-quality green areas, partly included in the Natura 2000 network. Water extraction reaches 105 hm³ annually, predominantly for industrial and urban uses, underscoring the park's integration within broader metropolitan resource cycles.

Waste production in the thirteen municipalities remains significant, with limited levels of separate collection, while industrial waste flows are substantial. Renewable energy installations and water purification infrastructures are present but not yet systematically integrated into a coherent circular framework. These conditions reveal both environmental pressures and opportunities for metabolic optimisation.

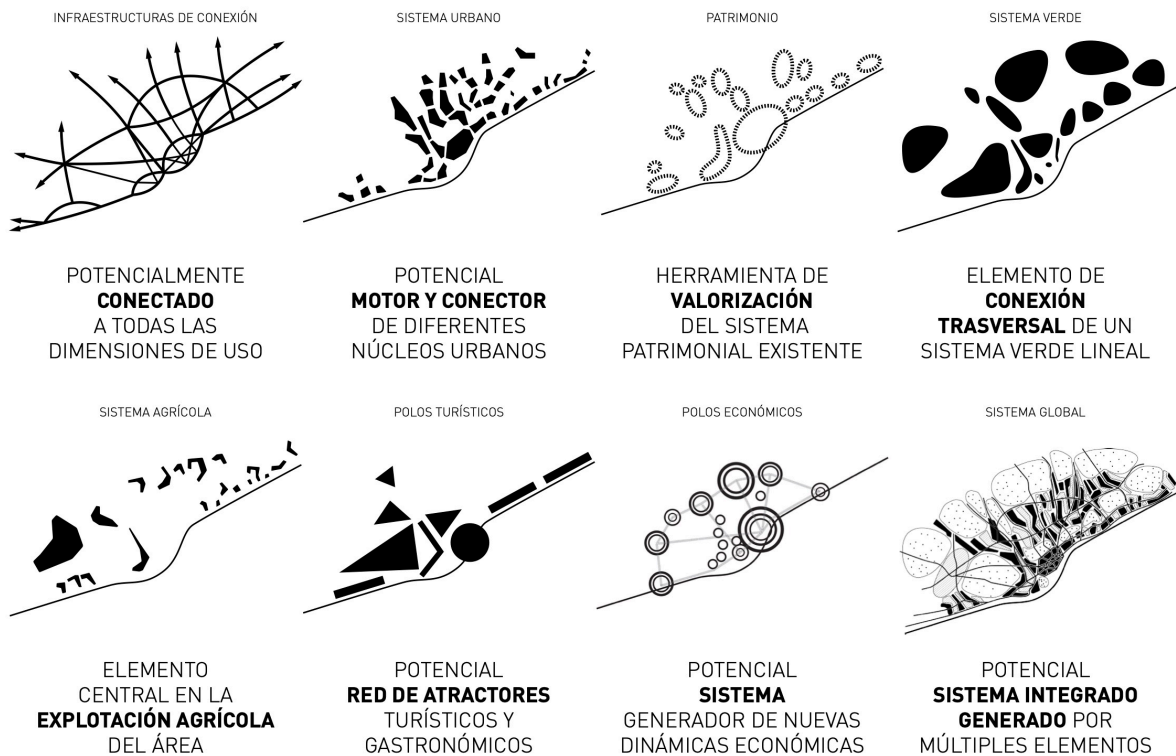
4.6 Emerging Strategic Vectors

The thematic synthesis of spatial, socio-economic and environmental data allows the identification of four guiding vectors for strategic intervention:

- Programme densification and diversification, integrating agricultural production, short supply chains, tourism and export-oriented strategies;
- Network reconnection, improving internal accessibility and reinforcing links with metropolitan infrastructures, coastal systems and protected areas;
- Heritage and product enhancement, strengthening landscape identity, quality branding and local distribution systems;
- Economic reactivation and adaptive reuse, promoting multifunctional transformation of farms and underutilised areas into agro-tourist, research and cultural facilities.

The integrated diagnostic reading of the PABLL reveals a structurally strategic yet internally imbalanced metropolitan landscape. The park emerges simultaneously as a scarce agricultural resource, a multifunctional territorial infrastructure and a space subject to strong urban, infrastructural and economic pressures. The coexistence of high macro-connectivity and limited internal accessibility, of productive specialisation and

economic marginality, and of ecological value and metabolic inefficiencies outlines a system characterised by both tension and potential.



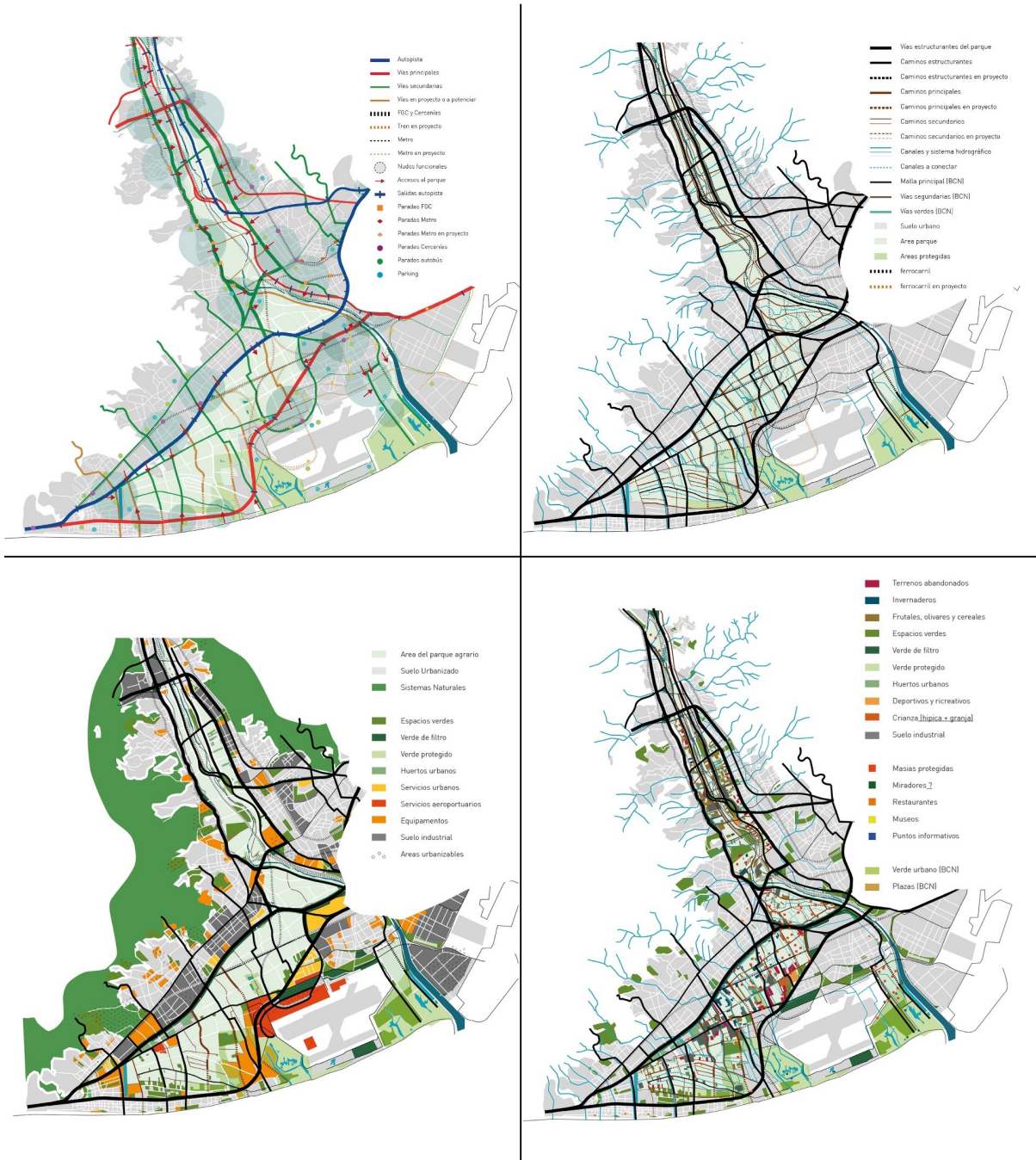
Img.2_ PABLL-BCN+ , A summary of logograms of design strategies, by Gausa-Raveau Actarquitectura, Gic-Lab, 2016

Within this framework, the project proposes the conception of PABLL as a 'Multipark' ('a park of parks'), understood as a large system articulated in distinct but interconnected thematic subparks that combine agricultural use with recreational, gastronomic and experimental functions. The strategy envisages the creation of redefined boundaries and permeable borders, capable of fostering integration between the park and the surrounding territories, while guaranteeing agricultural continuity and landscape enhancement and promoting a bio-regional development model in which the sustainable management of natural, agricultural and cultural resources is combined with strategies of tourist attraction, economic innovation and social cohesion, generating a resilient system that is recognisable and replicable in other peri-urban contexts.

At the territorial and inter-urban level, the research proposes an approach that facilitates the strategic projections of the PABLL through diagrams and diagrammatic diagrams, following the principle of diagrammaticity (Gausa, 2015). These tools make it possible to consider the conditions and potential of the systems under consideration from an intentional perspective, identifying spatial vectors capable of 'enhancing', 'strengthening' or 'reworking' the landscape. Maps, cartographies and thematic or planimetric data are translated into structural schemes, criteria diagrams and conceptual ideograms, creating a progressive "intentionality" in the reading of the territory. The integration of recognition, diagnosis and conceptualisation makes it possible to grasp both the eco-infrastructure dimension and the latent urban-landscape structure, generating guidelines and directive vectors that orient a strategic and intentional reading of the Park and its multifunctional complexity.

At the geo-urban level, the PABLL manifests a latent potential as a great interchange axis on a metropolitan scale, which can be declined in various complementary functions: as an infrastructural ring or 'super-node' for the management of flows; as an open space for environmental interchange; as a green connection between natural areas and the coast; as a productive agricultural field; as a patrimonial network for cultural and identity exchange; as a recreational and tourist pole; as an economic cluster between productive poles; and finally as an integrated system that articulates relations between metropolitan systems and subsystems.

At the urban and interurban level, the Park's internal analysis reinforces these potentials and highlights its interactions with the centre of Barcelona. In this context, the PABLL fits into a territorial 'great circle' that connects the main sea-mountain routes, internal secondary roads and landscape routes, with proportions and relations inspired by the Cerdà grid (6x6 macroblocks, 3x3 superblocks and 1x1 spaces between blocks). Infrastructures, interchanges, internal roads, waterways, land uses and perimeter boundaries articulate the different levels of interpretation, offering a complex but coherent vision of the Park's potential as a multifunctional urban-territorial node.



Img.3_ PABLL-BCN+, 1. Map of the system of internal roads + rivers and streams; 2. Scheme of infrastructure and infrastructural exchangers; 3. Regimes of soils + perimeter limits system scheme; 4. Land use system scheme, by Gausa-Raveau Actarquitectura, Gic-Lab, 2016

DIAGRAMA INTERPRETATIVO DE LA INTEGRACIÓN DE LOS SISTEMAS



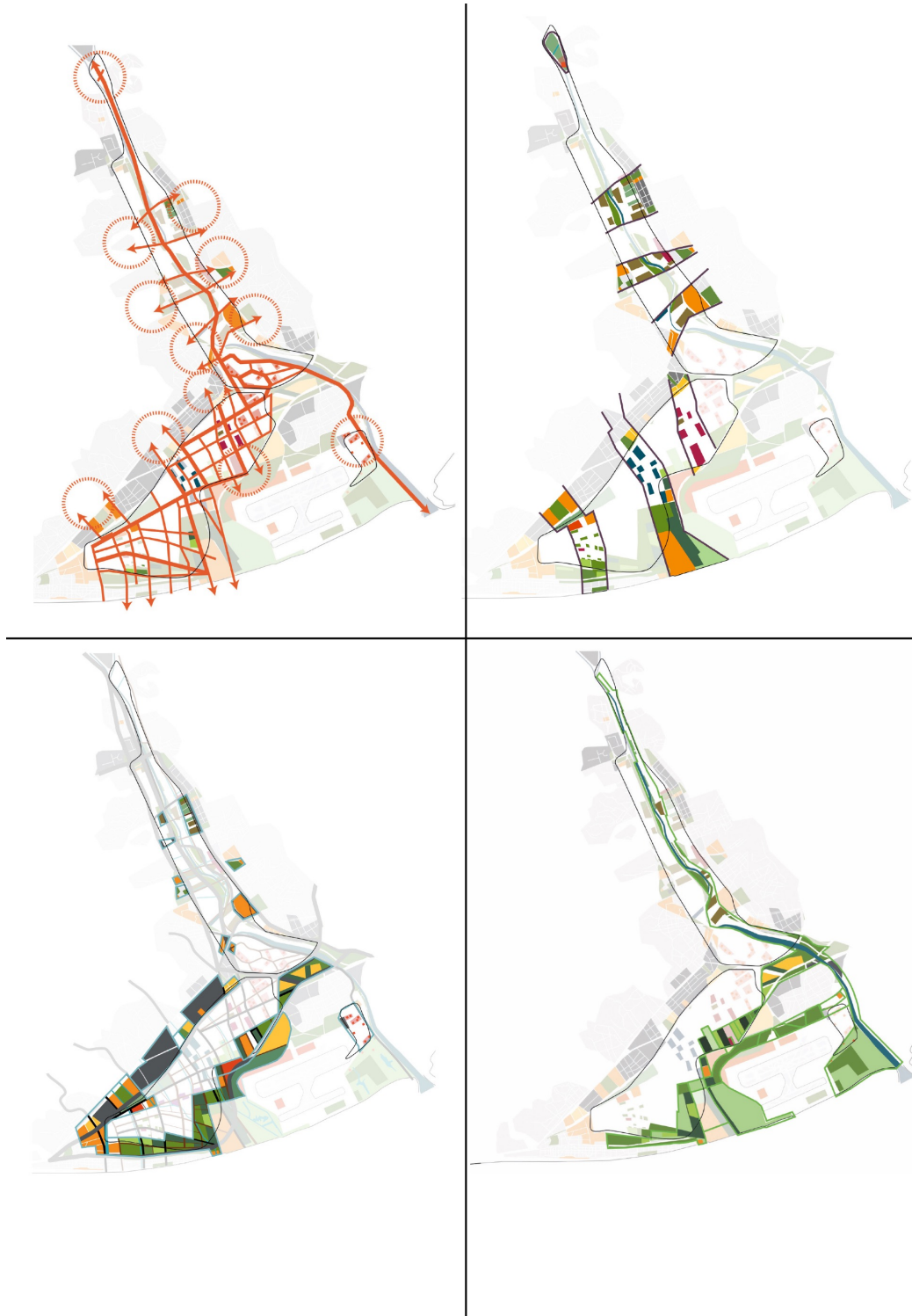
ESQUEMA INTERPRETATIVO DE LA INTEGRACIÓN DE LOS SISTEMAS



Img.4_ PABLL-BCN+, Interpretative scheme of the integration of systems, by Gausa-Raveau Actarquitectura, Gic-Lab, 2016

5. Phase 2. Selection of territorial sub-structures and eco-productive systems

Building on the multilayer analysis developed earlier, the second phase of the study proposes a strategic synthesis, organised into four conceptual readings that integrate the infrastructural, functional, heritage, environmental, productive and landscape potential that emerged in the preliminary phase. These readings serve to guide planning through specific programmes and general structures, i.e. development systems on both a global and local scale.



Img.5_ PABLL-BCN+, Sub-structural and strategic schemes, by Gausa-Raveau Actarquitectura, Gic-Lab, 2016

The preceding thematic diagrams are combined and superimposed, generating multilayer structures that constitute an integrated, variable and coherent scenario: a proto-masterplan in which each layer, understood as an intentional projection of systems, contributes to create a global, interconnected and flexible whole. Also in this phase, cartographies and thematic information (plans) are transformed into structural schemes, criteria diagrams and conceptual ideograms, developing a progressive "strategic intentionality" that combines recognition, diagnosis, concept and operational approach on different scales.

The aim is to propose an efficient and diversified reformulation of the traditional landscape-programming equation, embodied in the concept of Multipark or 'Park of Parks'. This approach makes it possible to identify and enhance the multiple possibilities for use latent within the area, articulating a single large plural space: a large agricultural park composed of four sub-parks, each characterised and individualised, but interconnected with the others, so as to configure a coherent and functional landscape network.

The first sub-structure, referred to as The Central Network or 'Inner Z', constitutes an internal set of interconnected scenic routes, supported by the existing road network and historical buildings in the park. In this context, the focus is on enhancing roads and waterways for public use, strengthening the central axis connecting the river to the beach, and increasing recreational and sports trails for walkers and cyclists. Within the network, greenways and supporting forest areas are introduced, while existing farms are given new life as educational farms, eco-tourism centres or recreational spaces with local restaurants, hostels and cafes. At the same time, crops for social use, such as urban gardens or educational spaces, are promoted, and micro-sectors with information points are created to promote integrated socio-agrarian and recreational activities.

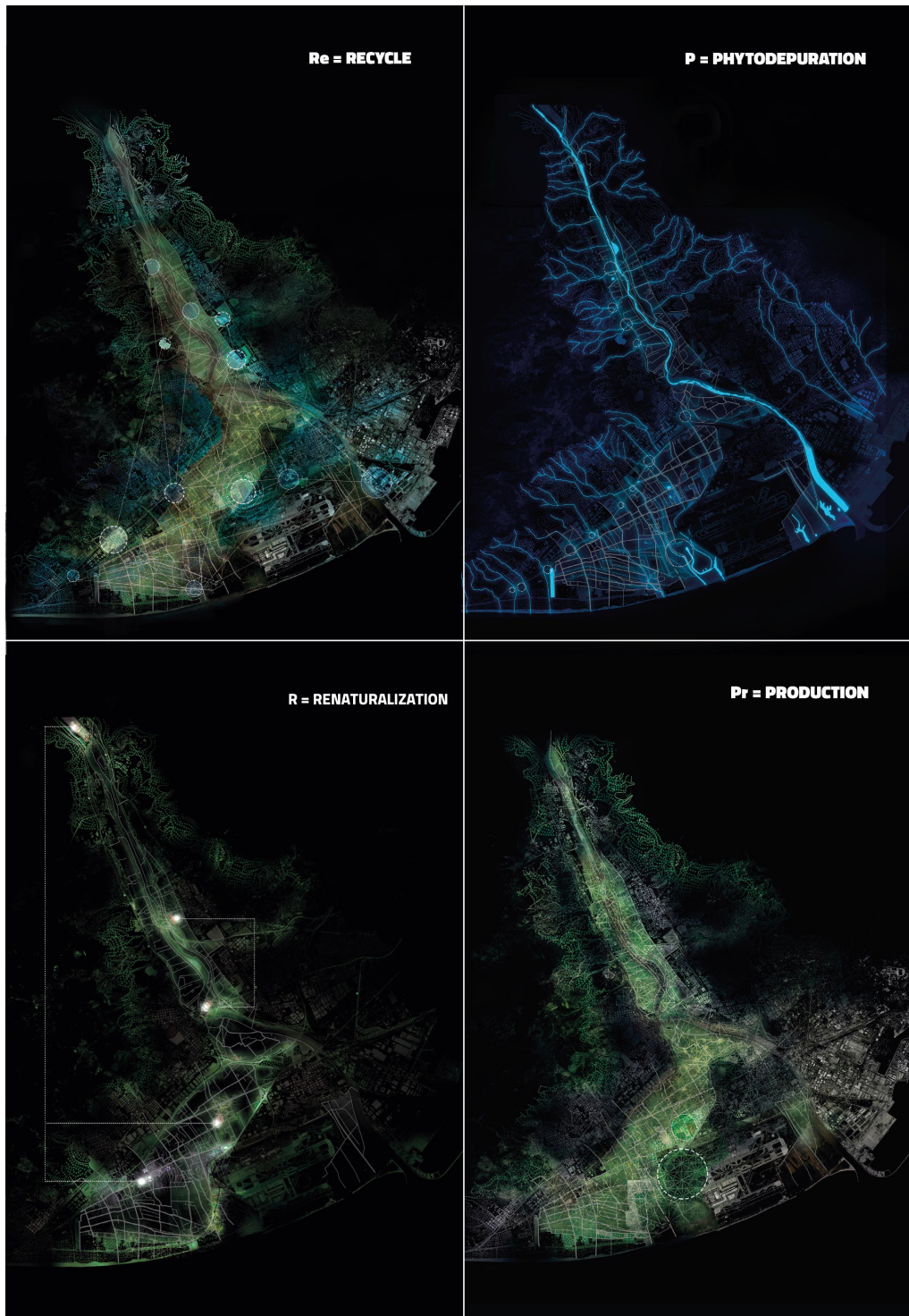
The second sub-structure, The Cross Bands or 'H In-Between', articulates the park through a sequence of cross-bands that act as gateways and connections between the main poles, supported by the central grid of fields and internal penetration routes. Here, the focus is on improving perimeter access and interchanges, creating interurban parks as gateways within the perimeter ring, and supporting new areas of mixed residential and productive development. Interurban streets are enhanced as connective green infiltrations, while agricultural areas and experimental land are reorganised, transforming unproductive areas into recreational or sporting spaces. Farms are rehabilitated with educational or eco-tourist functions, while agro-innovative workshops reuse agricultural waste for new productive activities.

The third sub-structure, The Perimetral Ring or 'O Surrounding', constitutes the functional perimeter of the park, based on the perimeter scenery and the main surrounding roads. Here are developed attractive poles of activity related to agriculture, such as research centres, distribution and tasting of local products, recreational areas and spaces for seasonal events. The park's Reception and Management Centre assumes the role of a central hub for the distribution of programmes, while new park-ports and multifunctional facilities integrate residential, production and recreational activities. The coastal strip is enhanced with eco-tourist services and rural tourism facilities, while the old perimeter industrial structures are redeveloped with an agricultural vocation, ensuring a balance between public use, production and landscape conservation.

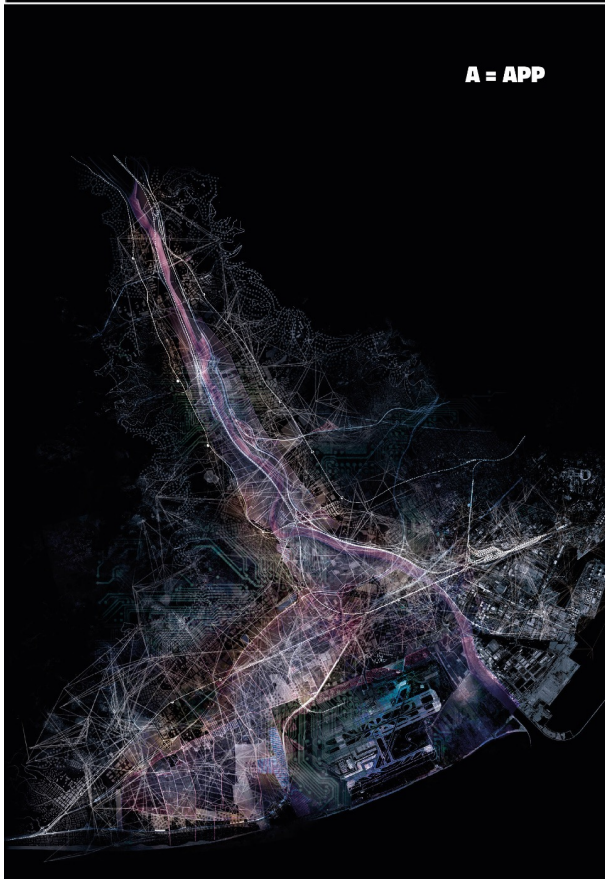
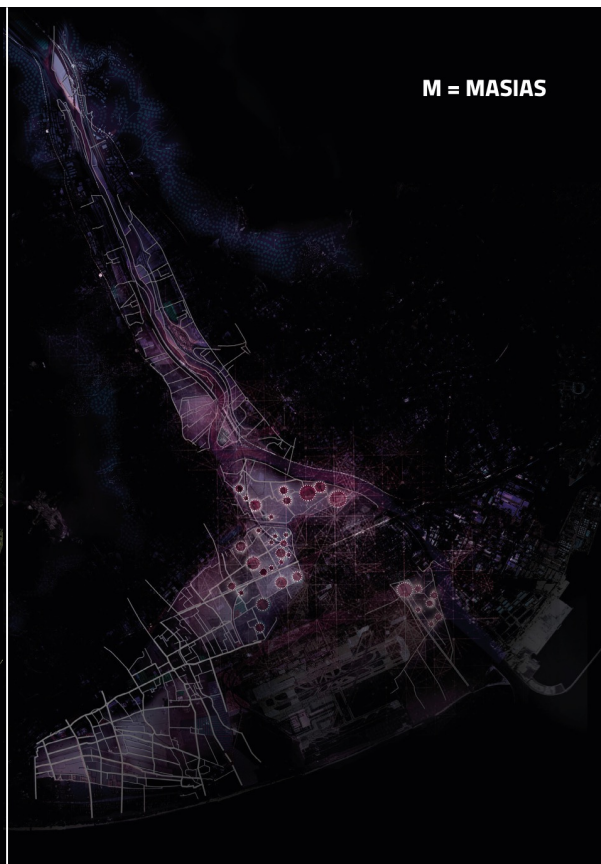
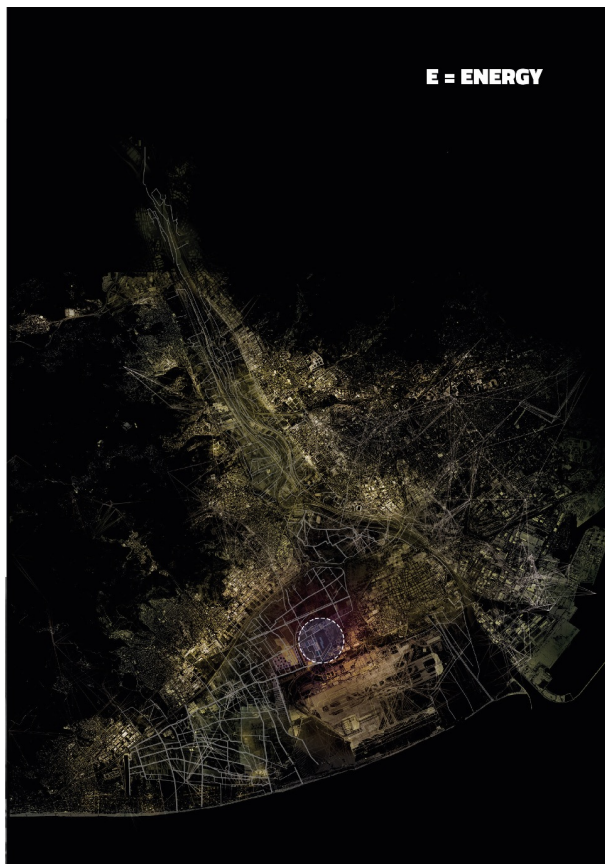
Finally, the fourth sub-structure, The Green Spine or 'Dorsal Y', completes the longitudinal river park with a new 'green arm' parallel to the motorway, which acts as an environmental filter between the airport and the agricultural area, integrating and extending the functions of the perimeter. This green ridge accommodates marginal programmes, expands river and recreational areas, implements wooded areas and seasonal micro-parks, and promotes social gardens and educational activities. Eco-tourist accommodation facilities and relaxation and wellness centres fit in harmoniously with the natural environment, offering spaces that connect public enjoyment with landscape conservation and ecological enhancement of the park.

Alongside the definition of the four landscape and planning sub-structures that articulate the park in the form of a plural territorial system, the investigation has investigated, in parallel, a series of potential sustainable development systems capable of operating transversally with respect to these configurations. The objective was to identify processes capable of regenerating the existing productive and environmental components by redirecting them within "networked" and "cycle" logics, so as to strengthen the park's agro-environmental

vocation and, at the same time, expand its opportunities for transformation in the direction of a bio-regional model. With this in mind, the processes and resources already present in the park - agricultural, energy, environmental, water, ecosystem - have been reinterpreted not as isolated elements, but as potentially interconnected nodes within a set of evolutionary cycles capable of triggering positive retroactions on a territorial scale (Gausa, Canessa, 2018).



Img.6_ PABLL-BCN+ , Productive and ecological systems , by Gausa-Raveau Actarquitectura, Gic-Lab, 2016. (FIRST 4)



Img.7_ PABLL-BCN+ , Productive and ecological systems , by Gausa-Raveau Actarquitectura, Gic-Lab, 2016. (LAST 3)

Starting from a targeted repertoire of theoretical references, best practices and comparable case studies, replicable and modifiable processes were selected, organised by theme and referable to models capable of generating value both for the systems within the park and for the territorial networks connected to it.

This reconnaissance has made it possible to outline seven possible "eco-productive scenarios", each of which identifies an operational sphere and a specific evolutionary trajectory, aimed at reactivating the park's development according to parameters of adaptability, circularity and optimisation. In each scenario, evolutionary vectors emerge - technological, environmental, energy, information - which, if integrated within complex cycles and dynamic interaction networks, make it possible to illustrate the operational peculiarities of the processes analysed and to foresee their potential application to the context under examination.

The seven eco-productive systems identified within the framework of the research take the form of material and information cycles capable of supporting the park's operation and, at the same time, increasing its overall quality.

1. Recovery and energy production cycle: The first of these processes is the integrated recovery and energy production cycle, which connects agricultural waste, organic residues and wastewater from both the park's activities and the future adjacent residential areas in a treatment and transformation system aimed at the production of biogas and purified water. This cycle, centred on the presence of a Green Fab-Lab as an operating node, makes it possible to generate economic benefits and environmental improvements, redistributing energy and purified water resources within the territorial system that originated them.
2. Water treatment cycle: This is flanked by the water treatment cycle, aimed at the qualitative regeneration of watercourses and agricultural production flows through phyto-purification techniques distributed in strategic points, particularly near industrial areas and main water conduits. The reuse of purified water in agricultural and production processes activates a circular mechanism that reduces pressure on resources and at the same time improves the quality of irrigated soils, contributing to the eco-systemic rebalancing of the park.
3. Soil restoration cycle: The third process concerns the soil restoration cycle, which aims at the progressive rehabilitation of surfaces compromised by industrial activity or abandonment through the planting of plant species suited to the selective absorption of heavy metals. Distributed transversally over the entire park area and in particular along the infrastructure strips and on abandoned sites, this cycle activates a slow but constant form of renaturalisation, capable of restoring ecological continuity, landscape quality and productive potential to the regenerated soils.
4. 'Second level' products cycle: A fourth system addresses the issue of valorisation of agricultural waste through the production of 'second level products': pruning residues and organic materials are selected, processed and re-introduced into the agricultural supply chain in the form of crop supports, structural elements or energy biomass. This reconversion, once again centred on an operational Green Fab-Lab, gives the park a double advantage: on the one hand, the creation of value from what would be waste, and on the other hand, the reduction of procurement costs for agricultural materials and the generation of distributed energy.
5. Energy produced from coffee cycle: Particularly significant is the cycle related to energy production from coffee waste, which expands the eco-productive dimension of the park beyond its boundaries. Through the collection of waste generated by cafés, restaurants and services in neighbouring cities, and thanks to its proximity to mobility and logistics infrastructures, waste from urban consumption is transformed into energy and reintroduced into the agricultural land system. This process establishes a virtuous link between the urban community and the park, strengthening economic and environmental interdependencies and helping to build a metropolitan metabolic network.
6. Masías cycle: In parallel, the masías cycle addresses the reactivation of the rural heritage through a combination of productive, receptive and educational functions. The reconversion of the masías into facilities for rural hospitality, local catering, educational activities and slow tourism generates economic value that can be reinvested in agricultural activities, expands employment opportunities and reinforces the park's role as a

cultural device. This process nurtures knowledge and belonging, consolidating connections between resident communities, visitors and local production.

7. Digital cycle: Finally, the digital cycle introduces an information dimension capable of coordinating, monitoring and optimising the park's functions through sensory networks, mobile applications and interactive databases. The intelligent management of water resources, energy flows, internal mobility, lighting and services related to tourism and agricultural activities makes it possible to anticipate needs, plan operations and integrate tangible and intangible data in real time. This digital infrastructure not only increases management efficiency, but also extends the influence of the park beyond its physical limits, interacting with large metropolitan infrastructures and helping to define an interactive bioregion model.

Taken together, these seven cycles outline an integrated eco-productive platform, in which the different systems are self-sustaining and mutually reinforcing. Each cycle operates as an optimisation and regeneration device, capable of connecting material processes, valorising existing resources and mobilising data at the different scales of the park. The adoption of physical and digital maps as interpretative and operational tools makes it possible to visualise the interactions between the cycles, recognise strategic nodes and anticipate possible evolutionary scenarios, transforming the park into a dynamic matrix where matter, energy and information intertwine in continuous processes of territorial improvement.

6. Phase 3: Scenario construction and validation

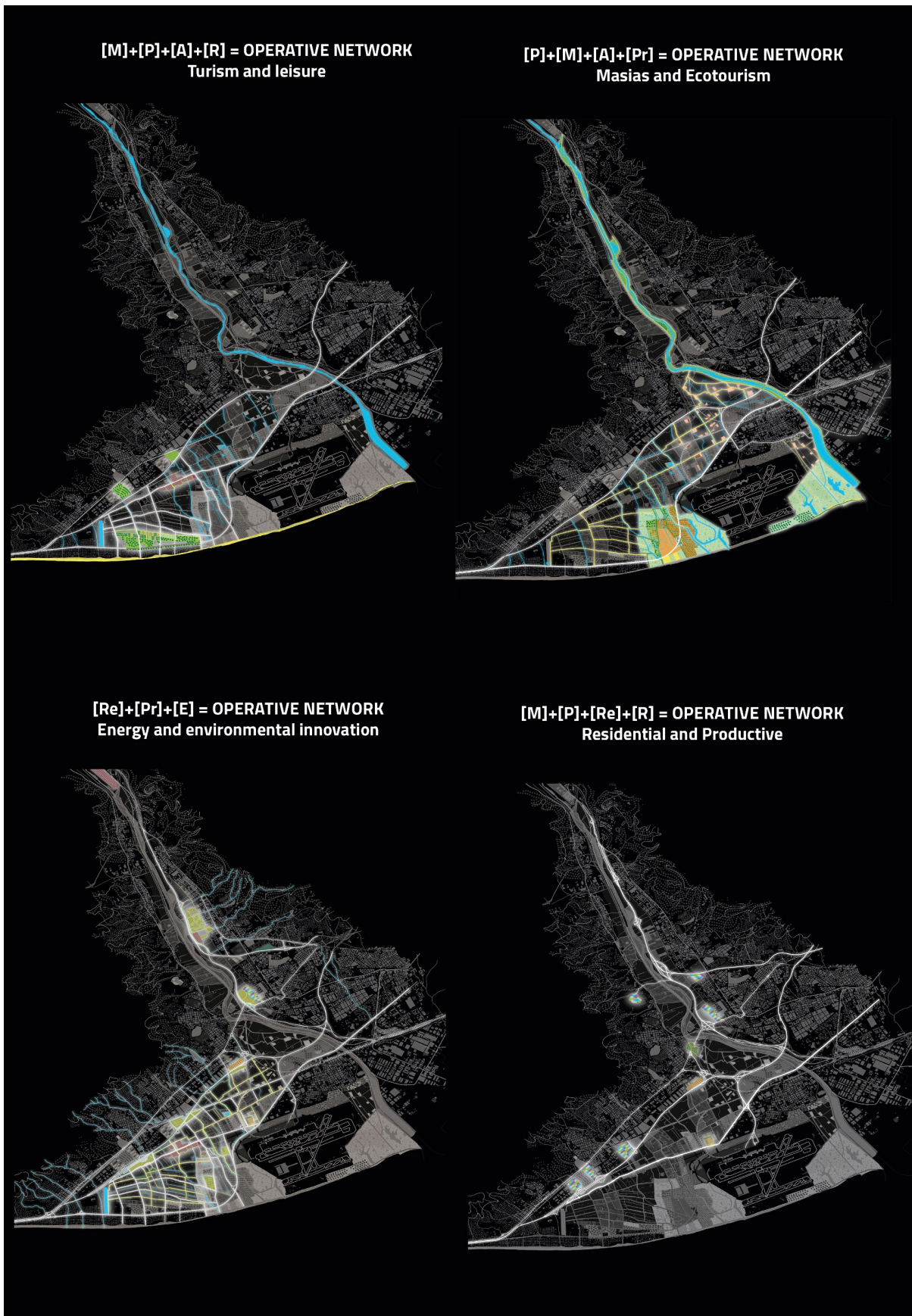
While the second phase establishes the spatial and metabolic architecture of the park through the identification of sub-structures and eco-productive cycles, it remains primarily analytical and configurational. The integrated eco-productive platform outlined above defines the components and operative logics of the system; however, their full potential emerges only when these elements are strategically combined and activated. It is precisely at this intersection—between structural configuration and dynamic interaction—that the research moves towards the formulation of development scenarios capable of translating systemic coherence into transformative action. From the integration of the four physical sub-structures already defined and the seven eco-productive systems, a broader strategic matrix emerges, resulting in the identification of four integrated development scenarios. These scenarios - formulated as combinatorial activation hypotheses of the structural components and eco-productive processes - configure a transformation meta-system (4×4) designed to "switch on", i.e. make active and performative, the connections between landscape, infrastructure, production and habitability (Gausa, Canessa, 2018).

The first scenario "Tourism and leisure", centred on tourism and leisure, proposes an articulation of recreational and outdoor activities capable of enhancing the relations between the coastline, wooded areas and agro-perimeter belts, guaranteeing continuity between the seaside and rural dimensions.

The second scenario "Masias and Ecotourism", dedicated to farms and rural ecotourism, aims to strengthen a network of slow and local hospitality, connected to the existing agricultural building heritage and based on the complementarity between agricultural production, local catering and widespread hospitality.

The third scenario "Energy and environmental innovation", dedicated to energy and agro-environmental innovation, identifies the park as a possible experimental platform for new forms of energy production and the processing of agricultural waste, integrating the production sector with emerging technological opportunities and envisaging the possibility of a Green Fab-Lab near the industrial belt.

Finally, the fourth scenario 'Residential and Productive', focusing on residential and productive mix, introduces a settlement development model capable of integrating residential, productive and environmental functions, outlining new sustainable and multifunctional residential landscapes that combine daily life, production, ecosystem services and collective spaces.



Img.8_ PABLL-BCN+ , Integrated Scenario, by Gausa-Raveau Actarquitectura, Gic-Lab, 2016.

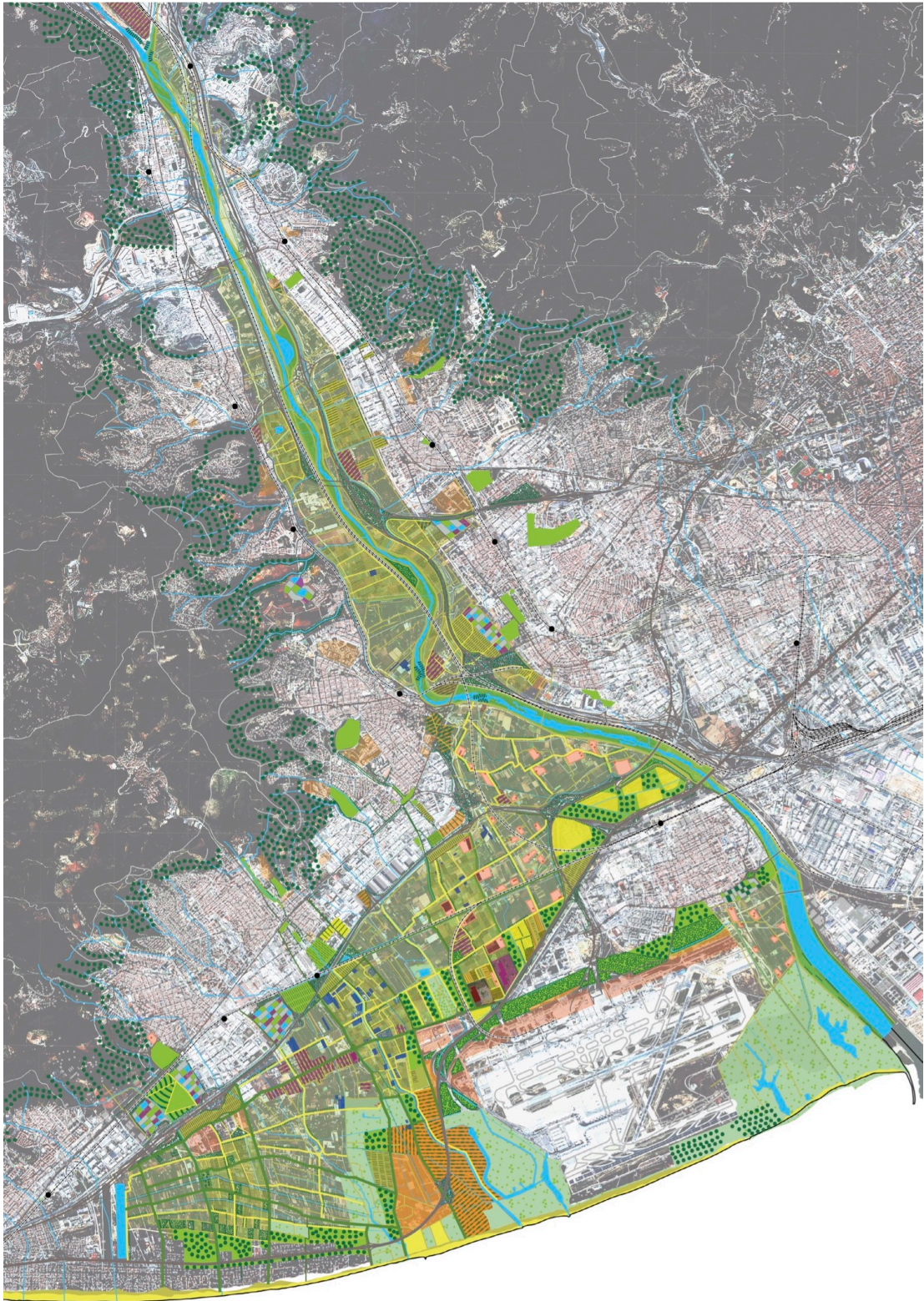
Taken together, these scenarios show how the traditional functional and formal equation of landscape design - centred on the territory-landscape-project-use sequence - can be rethought in the light of an informative and cyclical approach based on networks, sensitisation, interaction and circularity. The integration of the two dimensions - the 'Park of Parks' as a physical-landscape structure and the 'networked system' as an information-productive device - opens up a model of an agricultural multi-park in which ecosystem connections, productive infrastructures and digital media operate simultaneously, generating a synergetic field of transformative possibilities. This convergence configures the park not only as a natural and agricultural space, but as a hybrid platform of exchange between matter and information, between evolutionary processes and territorial structures, between design and management: a territorial laboratory in which local potential is combined with broader evolutionary trajectories, oriented towards sustainability and systemic innovation (Gausa, 2019).

In this perspective, the value of the park as a territorial incubator of innovation cannot be traced solely to spatial design or the definition of new ecosystem configurations, but depends substantially on the capacity to activate and sustain over time forms of multi-level governance capable of transforming strategic visions into stable operational practices. This implies a coordination system capable of maintaining continuity with the processes initiated, ensuring that project guidelines do not remain confined to the programmatic dimension, but are progressively translated into lasting actions, experimentation and management devices (Gausa et al., 2013).

The adoption of a bioregionalist perspective highlights how the territory's potential cannot be fully expressed through physical structures or productive innovations alone, however advanced they may be, if they are not accompanied by institutional and cultural apparatuses capable of consolidating relations, coordinating public and private actors, integrating divergent skills and interests, and guaranteeing in the long term the metabolisation of the environmental, productive and informative cycles identified by research. The bioregion, in this sense, is not a simple geographical delimitation, but an interpretative framework that recognises the territory as a living system, in which forms of governance must operate not as external elements, but as co-evolving components capable of sustaining and orienting transformations over time.

Guaranteeing continuity therefore means building adaptive governance, capable of learning from ongoing processes, of reconfiguring itself on the basis of the results achieved and socio-environmental changes, and of progressively renewing tools and alliances. Governance of this kind orients territorial transformation not through episodic interventions or static regulations, but through incremental policies, flexible devices and collaborative mechanisms capable of keeping open the design dimension of the park as a space-process. The park thus emerges as a long-term infrastructure, capable of sustaining over time an ecosystem of practices, experimentations and narratives that nurture territorial cohesion and social innovation.

In this framework, the future of PABLL+ is not exclusively linked to its material resources or functional configurations, but to its capacity to preserve and renew the relations between landscape, production and community over time, so that innovative processes do not remain episodic exceptions, but gradually become an integral part of the territorial structure. The research thus provides not only a strategic vision, but also an invitation to conceive the park as a permanent device of evolutionary governance, capable of combining direction, mediation and regeneration, and of nurturing over time a design culture based on co-production and shared responsibility (Gausa, Canessa, 2018).



Img.9_ PABLL-BCN+ , Protomasterplan as a Structural Landscape Vision, by Gausa-Raveau Actarquitectura, Gic-Lab, 2016.

In a perspective of future evolution, this governance infrastructure could be reinterpreted to support socio-territorial innovation devices capable of stabilising the cycles outlined by the research in the long term. Among these, one could imagine self-managed agricultural cooperatives, based on the sustainable use of public or

community land; solidarity economy districts, aimed at networking producers, local markets, short supply chain distribution systems and responsible consumption practices; or forms of collective land ownership, such as *community land trusts*, capable of maintaining agricultural use over time and preventing speculative phenomena. Such an approach would transform the plan from a simple regulatory instrument into an engine of socio-territorial innovation and bioregional resilience, capable of strengthening the local economy, enhancing local food production and consolidating over time more cohesive, regenerative and future-oriented territorial relations. Ultimately, the park is configured not only as a space of opportunity, but as an institutional and cultural laboratory in which the project becomes an ongoing practice of articulation between territory, community and governance.

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