

Land Take and Logistics Hubs: Castel San Giovanni, the Milan Logistic Region's Gateway to Emilia-Romagna (Italy)

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Abstract

This research examines the impact of logistics infrastructure on land take in Castel San Giovanni, a municipality hosting one of Italy's largest logistics hubs. Situated on the southern edge of the Milan Logistic Region, the town has undergone rapid transformation due to fragmented planning and the large-scale expansion of its Logistic Park. By analysing development documents and measuring land take over time, the study illustrates the consequences of insufficient planning coordination. These are assessed in light of regional directives, focusing on Emilia-Romagna's Regional Law No. 24/2017. In the absence of a national regulatory framework, this law reflects the ongoing tension between strategic environmental goals, such as the EU's Net Zero Land Take target by 2050, and local dynamics marked by deregulated growth and limited institutional oversight.

Key words: Land Take, Logistic platforms, E-commerce, Emilia-Romagna region

1. Introduction

1.1. The role of logistics platforms in land take growth

In recent decades, land take in Italy has undergone a significant acceleration, driven by the growing expansion of logistics settlements linked to the strengthening of distribution networks and the explosion of e-commerce (ISPRA, 2024). This phenomenon has particularly affected Northern Italy, where the pressure from logistics and e-commerce has led to the radical transformation of entire territories. The consequences of this model include the degradation of ecosystem services, the reduction of landscape quality, and increased pressure on private mobility and natural resources (Artmann, 2016; Dupras et al., 2016; Ursić et al., 2016). According to ISPRA data (The Italian Institute for Environmental Protection and Research), the phenomenon currently affects more than 7.16% of the national territory, with an estimated average annual loss of 456–501 million euros in ecosystem services such as water regulation, carbon sequestration, and biodiversity habitats (ISPRA, 2024). Land use changes entail not only the removal of highly fertile agricultural areas but also a reduction in the natural services essential to environmental quality and community well-being. Moreover, the transformation of agricultural and rural areas also results in a profound redefinition of cultural heritage and place identity, marking a rupture with historical settlement traditions (EEA, 2013).

In this context, the urgency for more conscious territorial governance is tied to the need for regulatory and planning tools capable of integrating environmental, social, and landscape dimensions in land use regulation. At the European level, a comprehensive soil directive has not yet been adopted, but the "Soil Monitoring Law," recently proposed by the European Commission, incorporates the principle of "Healthy Soil" into the Green Deal to ensure the preservation and restoration of soil ecosystem functions. This kind of proactivity, together with the goal of No Net Land Take (NNLT) (European Commission, 2023), represents an important sign of attention, although the most significant actions to limit land consumption and promote regeneration practices remain at the national and regional levels. These policies not only address soil protection and urban sprawl but are also consistent with broader EU environmental strategies, such as biodiversity conservation goals outlined in the EU Biodiversity Strategy for 2030. It is therefore of fundamental interest to examine the regulatory frameworks that govern logistics settlement development, to understand how their application, and often limited enforceability, influences actual territorial transformation processes on the ground.

1.2. The significance of Castel San Giovanni as a representative case study

The logistics hub of Castel San Giovanni, located in the province of Piacenza, stands out for the exceptional speed and scale of its development, making it an emblematic case in the Italian logistics landscape. The analysis of its chronological process highlights how the synergy between regulatory flexibility, local political will, and significant private capital has prevailed over an integrated vision of territorial transformation. This predominance has led to significant consequences not only on the environmental and ecological level but also on the social, economic, and urban structure of the area. Castel San Giovanni thus represents a paradigmatic and accentuated example

of a phenomenon that is spreading widely across Northern Italy: the rapid and fragmented expansion of logistics settlements, often carried out in the absence of effective supra-local coordination and the safeguarding of the social fabric of the affected contexts.

The province of Piacenza, moreover, has long been characterised by an explicit logistics vocation, recognised in the strategic objectives of the main planning tools (Gabellini et al. 2010) from the Regional Territorial Plan (PTR) to the Provincial Territorial Coordination Plan (PTAV) and further formalised in the Simplified Logistics Zones (ZLS) documents, developed from national directives and subsequently adapted at the regional level. However, this vocation is realised through a settlement process that is often not fully recognisable in official planning documents due to its incremental, ad hoc, and fragmented nature.

1.3. Objectives and methodology of analysis

This research aims to critically investigate the relationship between the development of logistics platforms and land consumption, with particular attention to the regional regulatory framework and, primarily, to Regional Law No. 24/2017¹ of Emilia-Romagna, which governs the protection and use of the territory. The analysis focuses on the case study of the Logistic Park of Castel San Giovanni, intending to reconstruct its development process and highlight the central role played by planning and implementation tools, which have constituted the normative and procedural backbone of this development. In particular, the main instruments at the municipal, provincial, and regional levels are examined, from structural plans to territorial agreements and procedural plan amendments, which have enabled the progressive realisation of the hub through an incremental and exceptional approach.

The regulatory component is integrated with a quantitative analysis of land consumption, carried out using GIS tools applied to land use data provided by the Emilia-Romagna Region, relating to the period 2003–2020. This analysis allows for a precise mapping of the territorial transformations that have occurred, outlining their spatial extent and temporal dynamics. The methodology adopted, therefore combines a documentary and regulatory review with a territorial investigation at the municipal scale, aimed at measuring the impact of planning decisions.

The multi-level approach makes it possible to identify the critical issues that have enabled a development markedly inconsistent with the guiding principles of the regional legislation itself and the European directives on the sustainable use of land.

2. General context: Italian land take by the logistic framework

2.1. Development of the logistics sector in Italy and Europe: the role of the RLM

In recent decades, the logistics sector has experienced exponential growth throughout Europe, driven by the globalisation of production chains and the integration of markets. In this context, Italy has become a key node in continental goods flows thanks to its strategic geographical position at the centre of the Mediterranean and the convergence of major trans-European corridors. Lombardy in particular stands out as a national and European logistics hub: from a transport perspective, it lies at the centre of a macro-area defined as the Milan Logistic Region (RLM). This territory transcends regional administrative boundaries and also includes neighbouring areas of Piedmont (Novara) and Emilia-Romagna (Piacenza). This functional region, with Milan at its centre, is characterised by an economic connective tissue represented precisely by logistics flows (Dallari and Curi, 2020) and has been described as equivalent to the circulatory system of an organism, an essential network ensuring the distribution of resources necessary for economic functioning.

According to a study by the LIUC Logistics Research Centre, Milan and its logistics region handle around 140 billion euros in goods annually, involving over 35 million people, including operators, employees, and service users (Dallari and Curi, 2020). The RLM covers an area of approximately 27,770 km² with 10.7 million inhabitants (a density of 385 inhabitants/km²) and contributes around 18% of Italy's GDP, confirming itself as one of the country's and Europe's leading economic engines.

At the national level, logistics real estate has become one of the most dynamic sectors in the market. Since 2017, the logistics segment, once marginal, has seen extraordinary growth, establishing itself as the leading asset class in the Italian property market (Marchesini 2024). In 2023, investments in logistics properties reached approximately 1.7 billion euros, accounting for over a quarter (27%) of the total national real estate market

1 Emilia-Romagna Regional Law of 21 December 2017, No. 24, "Regulations on the protection and use of the territory".

volume (ISTAT, 2024). This represents an unprecedented level of capital for the sector and highlights the strategic importance logistics has assumed in the economic landscape. In terms of physical volumes, 2023 marked the fifth consecutive year with over 2 million m² of new warehouses leased or purchased (take-up), and forecasts for 2024 indicate a further increase of 1.7 million m² to be occupied by the end of the year (ISTAT, 2024). Overall, the logistics sector in Italy currently employs 1.16 million people and generates a value of 92.7 billion euros, equivalent to 5.4% of national GDP (Tecnocasa, 2024). These figures confirm that logistics, from being an ancillary function, has become a primary economic driver for the country.

Within the RLM, the province of Piacenza plays a particularly significant role as a hinge area. Piacenza is, in fact, the first Emilia-Romagna territory immediately south of Milan and benefits from a favourable geographical position at the intersection of several communication routes. Traditionally, Piacenza lies along the Via Emilia (east-west axis), which connects the main centres of Emilia-Romagna, but in recent years its importance has extended to transversal links between north-western and north-eastern Italy. In perspective, the Piacenza area connects, on one side, Liguria, Piedmont, and south-eastern France, and on the other, Verona, north-eastern Italy, and eastern Europe. This central position along multiple routes, combined with its relative proximity to a major international seaport such as Genoa, has favoured the development of a strong local logistics hub: already in 2010, the Provincial Territorial Coordination Plan indicated that around 50% of new productive areas developed in the province of Piacenza between 2000 and 2010 were destined for logistics (PTCP, 2012). The area's infrastructure supports this vocation: Piacenza features a strong intermodal character, with navigable waterways (the River Po), an extensive railway network (with both passenger and freight links on the Milan-Bologna line and secondary routes), as well as a primary motorway network. At the A1 Motorway (Milan-Bologna) intersection with the A21 (Turin-Brescia), the Piacenza area offers excellent road accessibility for freight transport. Several nearby motorways exit, and the possibility of activating rail links to logistics hubs (such as Castel San Giovanni, already equipped with dedicated tracks awaiting use) makes this area extremely attractive to national and international logistics operators.

2.2. The increase in demand: e-commerce, just-in-time, and the transformation of logistics

The reasons behind the boom in contemporary logistics are multiple and linked to structural changes in economic and consumption models. Firstly, the explosion of e-commerce has redefined distribution needs: the widespread diffusion of online shopping, further accelerated by the Covid-19 pandemic (Casaleggio Associati, 2021), has generated unprecedented demand for sorting centres, proximity warehouses, and delivery platforms. E-commerce and retail companies require advanced logistics bases to ensure fast and reliable deliveries across the territory, increasing the demand for modern logistics spaces. Secondly, the adoption of the just-in-time (JIT) model and, more generally, of Lean Management practices in production chains has led companies to minimise warehouse stock at production sites, relying instead on frequent and timely supplies. This reorganisation implies that logistics is no longer seen as a mere transport service downstream of production, but rather as an integral and decisive part of the production process itself. What was once considered a phase of transport is now in all respects an autonomous and crucial production segment: efficient logistics management can generate savings of between 5% and 15% of a company's profits by optimising production, storage, and distribution (Farioli, 2019). In other words, global competition is pushing companies to reorganise their supply chains, often outsourcing logistics to specialised operators and investing in logistics innovation to improve delivery times and costs (Panfilo, 2018).

The consequence of these dynamics is that logistics has become an independent industrial sector, with its actors, capital, and spatial requirements. The phenomena that we can detect in the logistic spots of the territory of Piacenza province highlights how large contract logistics companies and 3PL (third-party logistics) operators have emerged, managing the entire flow of goods on behalf of producers and distributors, thus promoting the rise of increasingly large and technologically advanced logistics hubs (Alfieri, 2023). Contemporary warehouses differ greatly from traditional industrial sheds: large single-storey surfaces of tens (if not hundreds) of thousands of square metres, high internal clear heights to maximise vertical storage, and extensive fully impermeable yards for manoeuvring and loading/unloading, allowing easy access for articulated lorries and heavy vehicles. This building typology, the mega-warehouse or big box, is designed to meet the market's continuous demand for flexibility (Marchesi, 2023), such as rapid reconfiguration of interior spaces and the ability to manage variable goods flows. At the same time, however, it exerts strong pressure on the territory, given its out-of-scale dimensions to the traditional urban fabric. Entire peri-urban agricultural areas have been rapidly converted into logistics districts, with particular concentration in flat areas near major metropolitan hubs – contexts where

the availability of relatively cheap land, combined with proximity to consumer markets, creates ideal conditions for logistics settlements (Dallari & Curi, 2020). The Italian landscape, especially in the Po Valley, has thus seen a multiplication of large warehouses with standardised architecture, often located near motorway junctions.

2.3. Logistics and land take: the scale of the phenomenon

Land consumption driven by the growth of logistics represents one of the most critical aspects in terms of territorial sustainability. In Italy, land consumption has reached alarming levels in recent years: according to ISPRA data, in 2023, new artificial land cover affected 72.5 km², with net consumption amounting to 64.4 km², equivalent to approximately 17.6 hectares per day, or 2.3 square metres of land per second. Between 2006 and 2023, the country lost a total of 1,289 km² of natural or agricultural surfaces. In 2023 alone, more than 72 km² of new land were sealed (ISPRA 2024). These transformations are due to various factors (residential urbanisation, infrastructure, industrial sites, etc.), but the logistics sector has contributed increasingly, especially in Northern Italy.

Precisely quantifying the land consumption attributable to logistics is not straightforward, as official land use databases and municipal urban plans lack a specific category for logistics settlements. These are generally included under industrial or commercial zones, making it difficult to isolate and monitor the phenomenon. Recent studies provide useful strategies to address this methodological gap, highlighting how the absence of an ad hoc classification in land use data hinders the implementation of targeted policies to contain land consumption linked to logistics hubs. To address this limitation, research is currently experimenting with innovative mapping methodologies, combining photointerpretation from aerial images and auxiliary data, to allow the quantification of the phenomenon through in-depth studies (Ronchi et al., 2023).

Although not ranking first at the national level, the Emilia-Romagna Region is also among the territories most affected by land consumption. The percentage of regional land now sealed reached approximately 8.91% in 2023 (ISPRA, 2024), placing Emilia-Romagna fourth in Italy after Lombardy (12.1%), Veneto (11.86%), and Campania (10.57%).

Although this figure is lower than that of the leading regions, it reflects significant anthropic pressure, particularly concentrated along the foothill belt and the plain crossed by the Via Emilia. In this context, the province of Piacenza stands out for the speed with which logistics areas have expanded in recent years. In addition to the emblematic case of Castel San Giovanni, where an area of about 200 hectares has been urbanised to make way for one of the largest logistics hubs in the country, the entire provincial territory has seen a proliferation of storage and distribution facilities, including in smaller municipalities, often near motorway exits. Land consumption in the province of Piacenza has increased significantly, contributing to the regional figure. According to ISPRA, in 2023, the province of Piacenza recorded land consumption of 128.9 hectares (ISPRA 2024), with previously agricultural areas being covered by warehouses, yards, and new access infrastructure.

3. The regulatory framework

3.1. National and regional regulation

In Italy, the regulation of land consumption and territorial transformations is entrusted to a complex, multi-level system involving national, regional, provincial, and municipal regulations. Although in recent years public decision-makers have shown increasing intention to address the phenomenon of land consumption by attempting to activate policies and programmes aimed at responding to this issue (Ronchi et al., 2018), at the national level the absence of a specific framework law on soil has created a regulatory vacuum, leaving ample room for intervention by regions and local authorities. Among the main environmental and urban planning regulations, Legislative Decree No. 152/2006 (Environmental Code) sets out the general principles of environmental protection, but does not address the phenomenon of land consumption in a systemic way. In particular, it does not provide an explicit definition of “land consumption”, leaving room for heterogeneous interpretations and applications at the regional level.

The environmental management of logistics areas and transformations is complex. On the one hand, there are national plans and programmes aimed at strategically strengthening the logistics sector; on the other, regional regulations are introduced in very different ways into the landscape of territorial governance. This heterogeneity is accentuated by the absence of a specific urban planning category for logistics, which is often assimilated

into general productive functions, despite having distinct characteristics and impacts. At the national level, the intense market pressure and the growing demand for territorial areas that meet specific requirements, such as adequate infrastructure, efficient connections with highly specialised supply chains, and integration with tertiary and administrative sectors, have led public decision-makers to reconsider the issue of land consumption with greater attention, recognising the need to counter the phenomenon of “logistics sprawl” (Aljohani & Thompson, 2016). This strategic direction is accompanied by the need to rationalise spending on new road and rail infrastructure, as well as to govern the location processes of logistics functions. In this context, policies such as the Simplified Logistics Zones² (ZLS) emerge as tools to incorporate these needs and provide national-level guidance (Bonfantini et al., 2022). The ZLS are indeed configured as strategic areas for regional economic development, where the infrastructure system supports coordinated growth of the productive fabric. Companies located in these zones benefit from economic and financial incentives and procedural simplifications. Considered from a national perspective, the ZLS, together with the Special Economic Zones (ZES), are intended to identify growth-driving areas, catalysts for small, medium, and large enterprises intercon-

nected within an integrated infrastructure system operating on a European scale (Bonfantini et al., 2022). Despite these references, a unified national regulatory framework capable of systemically addressing the phenomenon of land consumption is still lacking. Territorial management is largely entrusted to the Regions, which have developed differentiated and often uncoordinated legislative tools. Some Regions, such as Lombardy, with the recent Regional Law No. 15/2024³, have adopted specific regulations to govern logistics settlements and their territorial impacts, while others, such as Emilia-Romagna, have integrated these issues within general land governance laws. This legislative asymmetry produces uneven effects, with direct consequences on the spatial distribution of logistics functions and the ability to manage their environmental impact.

The Emilia-Romagna Region has adopted advanced regulatory and planning tools for soil protection and sustainable territorial development. At the heart of this system is Regional Law No. 24/2017, which promotes urban regeneration and places strict limits on new land consumption, giving priority to the reuse of existing areas through municipal-level General Urban Plans (PUG). Supporting this, PRIT 2025 guides the location of infrastructure in a way consistent with territorial planning, while the Pact for Labour and Climate sets out ambitious programme goals, such as net-zero land consumption by 2050. More broadly, instruments such as the Regional Territorial Plan (PTR) and the Landscape Plan contribute to ensuring coherence between economic development, environmental protection, and landscape quality.

3.2. Regional Law Emilia-Romagna 24/2017: governing transformations between controversies and prospects
Regional Law 24/2017 “Regional rules on the protection and use of territory” represents an ambitious attempt by the Emilia-Romagna Region to combine economic growth, environmental protection, and urban quality. The law was introduced in a context marked by growing concerns over land consumption and aims to steer territorial transformations towards goals of sustainability, resilience, and regeneration. However, despite its integrated vision, the law does not include a specific regulatory tool for logistics settlements, which continue to be treated in the same way as generic productive functions. Among the central objectives of LR 24/2017 are: the limitation of irreversible land consumption; urban regeneration as the priority principle of transformation; the introduction of environmental, ecological, and landscape criteria into planning processes; and the obligation for implementing parties, including logistics operators, to provide ecological compensation and mitigation measures.

The law also adopts a multi-level governance model and promotes tools such as the General Urban Plan (PUG) – a new integrated tool replacing the former Structural Plan (PSC) and Operational Plan (POC) – and the Programme Agreement for supra-municipal projects. In support of the emphasis the law seeks to place on the containment of land consumption, it states: “Territorial and urban planning may provide, for the entire period, an overall land consumption limit of no more than 3 per cent of the urbanised territory surface area” (LR 24/2017).

Despite its advanced theoretical framework, the implementation of LR 24/2017 has revealed several critical issues.

² The Simplified Logistics Zones (ZLS) were introduced by the 2018 Budget Law (Law of 27 December 2017, No. 205, “State Budget for the financial year 2018 and multi-year budget for the three-year period 2018–2020”).

³ Lombardy Regional Law of 8 August 2024, No. 15, Regulation of logistics settlements of supra-municipal relevance.

In particular, the law has struggled to curb the uncontrolled development of logistics platforms, often authorised through urban planning amendments, as will be demonstrated in the documentary analysis of the case study examined in this research. Furthermore, it should be noted that the law includes a list of categories exempt from the calculation of net land consumption, meaning that certain areas are not counted in the containment calculation. Among these are precisely those areas that “Are not counted for the purposes of calculating the maximum share of land consumption: new productive settlements of regional strategic interest that are subject to settlement and development agreements [...]” (LR 24/2017). Thus emerges a side of the law that controversially responds to the declared aim of containing land consumption while, conversely, allowing for a rather broad list of exceptions. The lack of a specific urban planning category for the logistics sector has also made it difficult to distinguish between traditional productive settlements and large logistics hubs, hindering any ex-ante assessment of environmental and landscape impacts. The absence of sector-specific regulatory tools has led to fragmented local policies, where municipal administrations, often under pressure from economic operators, are left to manage complex projects without adequate technical and regulatory support.

One of the most problematic aspects in the management of territorial transformations, finally, is the systematic use of urban planning amendments, as evidenced in the results of the analysis conducted on the case study considered in this research. These instruments allow for modifications to current urban planning tools to approve new developments, often as exceptions to the goals of limiting land take. Their use has been particularly frequent in the logistics sector, where investors’ tight timelines and economic pressure push for rapid and simplified solutions.

4. The Logistic Park of Castel San Giovanni: one of the largest logistics hubs in Italy

4.1. Castel San Giovanni: territorial context and strategic role

Castel San Giovanni, located at the westernmost edge of the province of Piacenza, is today one of the most significant logistics nodes in Northern Italy. With fewer than 15,000 inhabitants, the municipality lies in a highly connected geographical position, strategically located at the intersection of the Via Emilia, the A21 (Turin–Brescia) and the A1 (Milan–Bologna) motorways, near the border with Lombardy and only 70 km from the Milan node. This infrastructural configuration makes it a key junction between the western Po Valley and the Milan metropolitan system, effectively positioning it as the logistical gateway of Emilia-Romagna to the Milan Logistic Region (RLM). Functionally, over the past twenty years, Castel San Giovanni has assumed the role of a territorial gateway, supported not only by road accessibility but also by the availability of large, flat agricultural surfaces that were easily convertible. Before its transformation, the area was characterised by extensive agricultural use, strong landscape continuity, and a local ecological network linked to major waterways, particularly the Tidone Valley and the River Po, just a few kilometres north of the site. This setting facilitated a rapid shift toward logistics development (Figure 1), which began in the early 2000s, supported by supra-municipal planning instruments and an active local political willingness. Castel San Giovanni is, in fact, one of the first cases in Emilia-Romagna of systematic conversion of agricultural land to logistics use, carried out in the absence of a truly organic programme, through a sequence of specific agreements and planning amendments.

In just over a decade, the municipality transitioned from a compact urban structure, surrounded by agricultural fields, to a functionally dual landscape, polarised between the historical town centre and the new logistics development, which now extends over more than 200 hectares (2 km²), nearly equaling the area of the historical centre (2.9 km²). The Logistic Park currently employs approximately 2,500 workers and is organised under a condominium management model divided into two main blocks (Condomini A and B). Its principal logistics typology is third-party logistics (Gazzola, 2022), and it hosts major companies such as AMAZON ITALIA, LEROY MERLIN, FIEGE – ZARA, CLOSE2YOU, GEODIS, VAILOG, and GXO Logistics. This expansion has resulted in significant soil sealing and has intensified infrastructural, environmental, and social pressures on the existing territory.



Figure 1: Territorial framework and ecological network overlapping of the Logistic Park.

This image represents the current state of the logistics hub's expansion as of 2023. As can be seen, during the various phases of expansion, the additive planning approach repeatedly intersected areas belonging to the ecological network. Author's elaboration based on data from the Emilia-Romagna Geoportal. (Appendix Figure 1) 4.2. Timeline and instruments: the development of the logistics hub

The Castel San Giovanni Logistic Park represents one of the most significant examples of territorial transformation driven by the growth of the logistics sector in Emilia-Romagna. The development of the hub has an intriguing origin, rooted in what was once locally known as the "Fallimento Speranza" (Speranza Bankruptcy) lands (Gazzola, 2022). The idea to establish one of the region's most important Territorial Development Production Hubs in Castel San Giovanni emerged from a strategic decision to revitalise a large industrial area within the municipality, an area that would be reoriented toward the growing logistics and freight movement sector. This strategic direction began to take shape in the 1990s, when a local private investor acquired extensive plots of land, previously occupied by a major pig farm near the highway, following the bankruptcy of the former enterprise. Although the vision was ambitious, it initially raised concerns, particularly within the local administration, which feared it might not be equipped to manage the implications of hosting such a large-scale logistics development within its jurisdiction. These concerns were especially evident during the early stages, as the municipality worked to define the types of functions and activities that could be allowed in the area. In this context, PTCP formally designated Castel San Giovanni as a Territorial Development Production Hub (PPST), thereby reinforcing its logistical vocation, a direction that was later confirmed and operationalised through subsequent municipal planning instruments.

The first formal local act dates back to 2002, with the approval of the then-current General Regulatory Plan (PRG), which already included provisions for new productive settlements south of the town, although not yet explicitly designated for logistics. The new Municipal Structural Plan (PSC), approved in 2007, incorporated these provisions, identifying that area as a potential zone for productive expansion. The scale shift occurred shortly thereafter, in 2007, when the site was formally designated as the future “Logistic Park” through a planning amendment under the SUAP procedure (One-Stop Shop for Productive Activities), promoted by a group of private investors and approved by the municipal administration with a view to supporting local economic development. This exceptional intervention via SUAP effectively bypassed the standard Operational Plan (POC), avoiding unified planning for the logistics park as a whole: subsequent expansions were thus implemented through ad hoc amendments rather than within an overarching framework. However, SUAP, designed to streamline procedures for initiating specific productive activities, appears ill-suited for managing large-scale, structural transformations. In the case of Castel San Giovanni, the procedure was used as a shortcut to initiate planning amendments and fast-track approvals, undermining the coherence and strategic evaluation required by comprehensive planning.

In 2008, a Programme Agreement was signed between the Municipality, the Province, and private operators, legitimising the start of the first developments and providing for the construction of primary and secondary infrastructure (new access roads, utility connections, environmental mitigation measures). Despite the lack of supra-municipal coordination or an integrated territorial vision, this agreement enabled construction work to begin quickly: by 2010, the first logistics platforms were already operational, including those for Zara and Geodis. Between 2011 and 2015, the logistics park expanded further east and south, through new sectors implemented via successive amendments that bypassed existing planning instruments. During this phase, global operators such as Amazon established a presence, with a platform of approximately 100,000 m² active since 2015. Amazon's arrival marked another scale leap: in addition to attracting further investors, it triggered increased pressure on municipal services, a sharp rise in local housing demand, and an acceleration in landscape transformation.

During this period, in 2012, a Territorial Development Agreement was signed between the Province of Piacenza and the Municipality of Castel San Giovanni. This agreement provided the institutional and regulatory framework for consolidating the logistics hub and its future expansions. It defined the characteristics of the Territorial Development Production Hub (PPST), including implementation methods, mitigation and compensation measures, ecological infrastructure, and mobility networks, in accordance with the PTCP and urban planning regulations. At the regional level, Regional Law No. 24/2017 on land governance introduced stricter requirements for sustainable planning. However, by the time it came into force, most of the Logistic Park had already been developed. From 2014 to 2021, successive expansions were implemented through SUAP planning amendments within the “possible expansion” zones outlined in the Territorial Agreement (Figure 2). These allowed for the rapid construction of new sectors — Lotti P-R (2016), S (2017), Z (2018), Y-T (2020) —based on operators' requests.

The SUAP process, designed to simplify procedures for production-related developments, bypassed more structured urban planning assessments and all procedures required to ensure appropriate compensation measures for the impact of the logistics complex considered as a whole. By 2020, all designated expansion areas had been built out, with new logistics players, such as Leroy Merlin, joining Amazon, Geodis, and Zara. The hub reached full build-out despite growing concerns over traffic, land consumption, housing pressure, and habitat fragmentation—issues that underscore the regulatory tensions between strategic environmental objectives and local implementation practices.

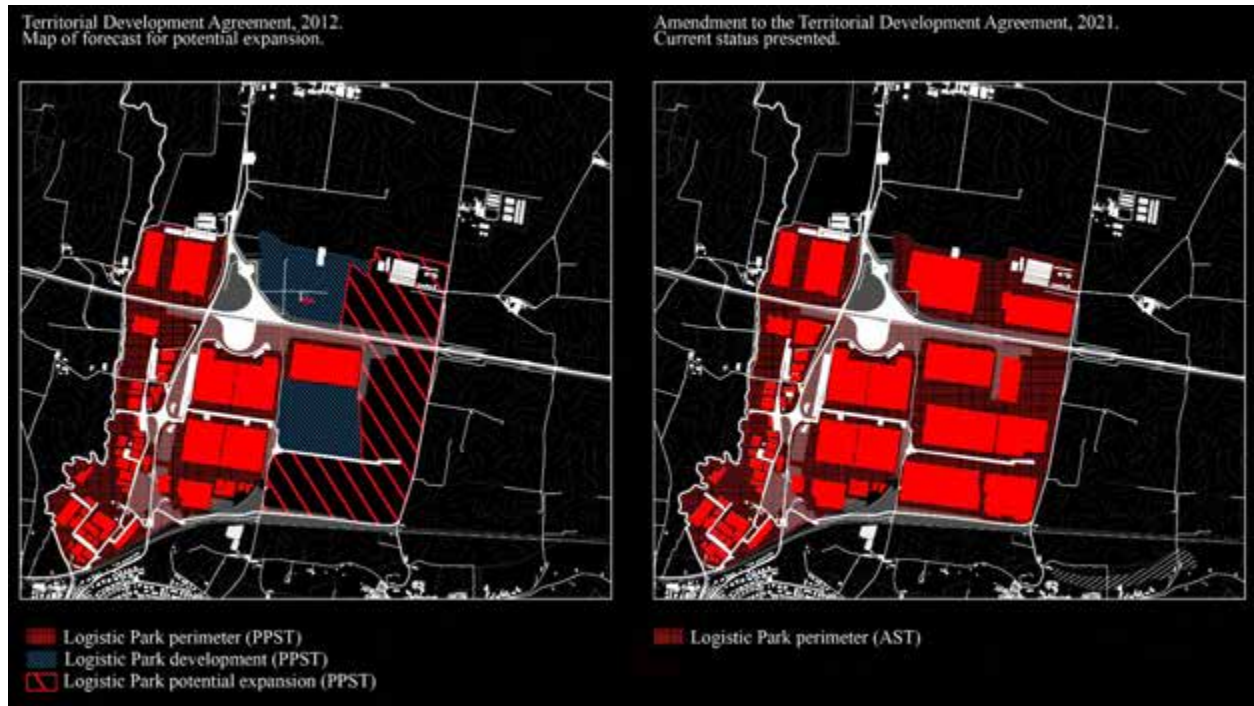


Figure 2: Comparison between potential expansion and final layout in 2021.

The data are processed using the information contained in the documents supporting the approval of the completion of the logistics hub, and refer to the potential expansion scenario outlined in the development agreement signed between the municipality and the province in 2012, and its subsequent update in 2021. (Valsat, 2020). Author's elaboration on Valsat document. (Appendix Figure 2)

4.3. Territorial transformations: land take analysis

The development of the logistics hub in Castel San Giovanni has led to a significant transformation of the local territorial structure, with extensive effects on the agricultural landscape, land use, and the urban morphology of the municipality. The settlement has substantially altered the traditional relationship between town and countryside, creating a new functional centrality that goes beyond the boundaries of the historical urban core and reshapes priorities in terms of accessibility and infrastructure at the municipal scale. To investigate the impact of the logistics hub's integration into the pre-existing agricultural fabric, this research includes a land use change study based on regional data from the Emilia-Romagna geoportal. This dataset provides percentage indicators for urbanised areas, agricultural zones, natural areas, and wetlands from 2003 to 2020. A further analytical step involved quantifying the percentage variation in consumed and renaturalised land—elements of direct relevance to Regional Law 24/2017. The data confirm a drastic change in land use (Figure 3). In just 17 years (2003–2020), urbanised surface area increased by approximately 387 hectares, while the municipality lost around 531 hectares of agricultural land. This brought the municipal land consumption rate to 18.22%, one of the highest figures in the province of Piacenza. For comparison, the entire province of Piacenza recorded, in 2023 alone, an increase of 128.9 hectares of consumed land, largely due to the expansion of new logistics settlements. Analysing the direct proportionality between the urban centre and the logistics sector, the current urbanised territory of Castel San Giovanni reveals the rapid and unbalanced settlement growth that occurred in just over a decade.

The logistics hub grew in a modular and additive fashion, with sectors progressively added without integrated planning for the remaining open spaces or urban edges. Each new intervention was conceived independently, lacking an overall coordinated design. This has resulted in a fragmented and polarised configuration of the local landscape: the municipal territory is now clearly divided between the traditional urban core and the new productive zone, while the remaining green areas appear fragmented, marginal, and unintegrated into the pre-existing ecological network.

Visual and functional connections between the urban centre and the surrounding countryside have been disrupted, and the internal infrastructure of the logistics hub has assumed an autonomous character, poorly connected to the existing urban fabric.

The urbanisation methods adopted, lacking environmental mitigation or ecological compensation measures, have exacerbated the impacts on the territory. The constructed warehouses are characterised by their monofunctional scale and standardised architecture: single-storey platforms reach surface areas of 30,000–70,000 m², with heights of 12–15 metres. The vast asphalted yards surrounding them, dedicated to heavy vehicle movement and parking, form extensive additional impermeable surfaces, increasing rainwater runoff and local flood risk.

Overall, large-scale soil sealing has compromised the land's ability to absorb stormwater, raising the likelihood of flooding and altering the natural hydrological regime. Simultaneously, territorial fragmentation has reduced ecological continuity between agricultural and natural areas, with negative effects on biodiversity and the local microclimate. No green infrastructure or adequate vegetated buffer zones were planned to mitigate the impact, nor are there public functions or communal spaces within the logistics complex: the logistics hub thus appears as an autonomous element, poorly integrated into the broader urban system.

From a settlement perspective, the expansion did not follow a principle of urban compactness but instead produced an external body, a 'twin city' with a logistics character. The new built lots developed in succession along the road infrastructure built for the hub, prioritising heavy vehicle functionality but proving inefficient in landscape and ecological terms. The large scale and uniform appearance of the buildings, combined with the absence of green transitions, have accentuated the visual rupture with the rural context, creating a landscape impact perceptible even from a distance. Ultimately, the territorial transformations induced by the logistics hub have replaced the former agricultural landscape with a continuous built and asphalted environment, marking the territory irreversibly from both ecological and morphological perspectives.

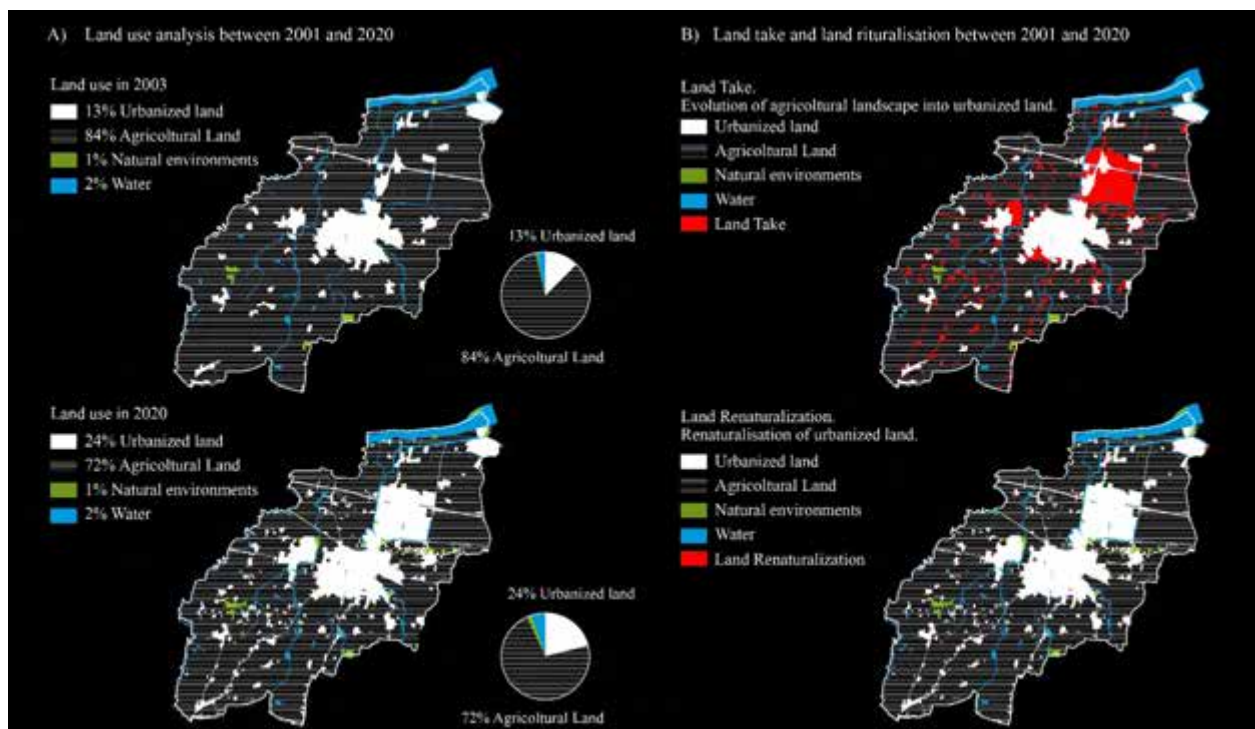


Figure 3: Land use analysis and land take, and land renaturalisation process analysis. Study conducted within data from 2003 and 2020.

A) Land use in the municipality of Castel San Giovanni in 2003 (above) and in 2020 (below). The map and pie charts show the expansion of artificial surfaces (grey areas) at the expense of agricultural land (yellow areas) between 2003 and 2020. In 2003, urbanised land accounted for 13% of the municipal surface, while by 2020 it had reached 21%.

B) Land consumption (in red) and minor renaturalisation phenomena (in dark green) in the municipal territory of Castel San Giovanni between 2003 and 2020. The red areas indicate agricultural or natural surfaces converted into urbanised land during the period, mostly concentrated in the logistics hub quadrant, while the limited renaturalisation efforts appear as isolated fragments within an increasingly artificialised landscape. Author's elaboration based on data from the Emilia-Romagna Geoportal. (Appendix Figure 3)

5. Conclusions

The case study of Castel San Giovanni offers a critical lens through which to interpret the complex interplay between logistics-driven territorial development and regional planning frameworks in contemporary Italy. The findings reveal a dissonance between the objectives of sustainable land governance, such as those outlined in Emilia-Romagna's Regional Law No. 24/2017, and the mechanisms through which large-scale logistics settlements have been realised in practice.

The logistic transformation of Castel San Giovanni occurred through an incremental and ad hoc process, heavily reliant on SUAP amendments, which permitted bypassing standard urban planning instruments and, crucially, the systematic assessment of environmental and cumulative territorial impacts. While such procedures have facilitated the rapid deployment of logistics infrastructure, they have simultaneously undermined the integrative principles of land-use regulation, resulting in the fragmentation of the local ecological network, the erosion of agricultural land, and a significant landscape discontinuity between the historic urban core and the logistics enclave.

This empirical evidence corroborates broader criticisms raised in recent discourse surrounding the implementation of LR 24/2017. As highlighted by investigative analyses (Pileri, 2023; Rosano, 2023), the exemption of strategic productive settlements from soil consumption calculations, coupled with the delayed adoption of General Urban Plans (PUGs) by the majority of municipalities, has significantly weakened the law's regulatory efficacy. In the absence of a national framework law, regional initiatives risk being rendered ineffectual by institutional fragmentation and political-economic pressures at the local scale.

These dynamics have repercussions beyond the regional context, aligning with broader European concerns about soil sealing and the unsustainable expansion of settlement areas. The European Commission's Soil Strategy for 2030 acknowledges the centrality of land as a non-renewable resource, setting the target of No Net Land Take by 2050 as a guiding principle for Member States. This target is grounded in recognition that artificial soil cover causes irreversible losses of ecosystem functions, such as water regulation, carbon storage, and biodiversity support, and imposes long-term socio-environmental costs (European Commission, 2021; EEA, 2019).

Considering such findings, it becomes imperative to reconsider the instruments governing territorial development. A shift is required toward a governance model that transcends market-driven logic and embraces the intrinsic value of soil, cultural landscapes, and the well-being of communities. This highlights the need for a supra-local and possibly national governance scale to effectively regulate logistics-driven development, overcoming the current fragmentation and enabling coordinated, strategic planning across administrative boundaries. Future planning strategies should embrace adaptive and environmentally conscious frameworks capable of responding to emerging pressures. These frameworks must aim to mitigate environmental degradation and address the spatial fragmentation produced by uncoordinated development. In the case of Castel San Giovanni, overcoming the current disconnection between urban growth and territorial coherence requires a rethinking of planning priorities. However, any future intervention must be embedded in a long-term, coordinated vision that recognises the complexity of territorial transformations and ensures that land-use governance aligns with both ecological sustainability and social equity.

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Appendix:

Figure 1:

Author's GIS elaboration on regional data available at: <https://geoportale.regione.emilia-romagna.it/>, together with the combination of raster data available on the regional planning document (PTR- Piano Territoriale Regionale) and the maps provided by the region about the Ecological Network (RER – Rete Ecologica Regionale).

Figure 2:

Author's GIS elaboration based on regional data available at: <https://geoportale.regione.emilia-romagna.it/>, combined with data extracted from the analysis of the Territorial Development Agreement (2012) and its Amendment (2021), available on the Piacenza Province website at:

file:///C:/Users/margh/Downloads/2_1_xy_documento_di_valsat_30122020-172754.pdf,

https://www.provincia.pc.it/Allegati/Livelli/AT_Rep_n_144_del_9_9_2021_28022022-161131.pdf.

The original Territorial Development Agreement document is not available; however, relevant maps are included in the Valsat document (environmental legitimacy procedure), which was drafted to support the future expansion of the logistics hub.

Figure 3:

Author's GIS elaboration on regional data available at: <https://geoportale.regione.emilia-romagna.it/>. Due to differences in the data acquisition methods used by the region to detect land use across different years, some inconsistencies may be observed. However, the data remain broadly consistent with the results obtained and accurately reflect the overall transformation trends.