



FRAGMENTED SPATIAL PLANNING: HOW THE DIFFERENTIAL REGIONAL LEGISLATIVE FRAMEWORK INFLUENCES LAND CONSUMPTION IN ITALY

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Abstract. This contribution focuses on how Italy's differential regional spatial planning legislative framework results in a differential capacity to address land consumption. It does so by exploring how the 21 regional laws that frame spatial planning activities in the country address sustainable land use issues differently, and what implications these differences have for local instruments and practices. The heterogeneous situation regarding land consumption is initially presented, drawing on existing studies. The analysis then shifts to examine how sustainable land use concerns have been through time integrated into the 21 regional legislative frameworks that govern spatial planning across the country. To assess these frameworks, a number of key variables have been identified and used to compare the regional laws. The results of the analysis support a reflection on the legislative, socioeconomic, and morphological factors that contribute to the observed regional disparities in land consumption.

Keywords: sustainable land use, land consumption, spatial planning, regional legislation, Italy.

Introduction

Since the second half of the 20th century, urbanization processes have accelerated, leading to growing recognition of the limited nature of land resources. The COVID-19 pandemic has further underscored the importance of creating sustainable built and natural environments to enhance resilience to future crises (Cotella & Vitale Brovarone, 2020, 2021). In this context, it is vital to make well-informed decisions on urbanization and land use management, recognizing these decisions not only as political or technical but as deeply connected to societal well-being and quality of life (Solly et al., 2020, 2021).

This challenge is recognized at the European level, where the European Union (EU) has introduced an increasing number of policies aimed at promoting sustainable development and urbanization (Atkinson, 2001; Adams et al., 2012; Cotella, 2019). A key EU objective is to halt excessive land transformation and achieve zero net land take by 2050, an aim reinforced by the European Green Deal, which calls for a climate-neutral Europe by the same year (Cotella et al., 2016; Sikora, 2021). In response, policymakers at various territorial levels have made efforts to promote more sustainable urbanization and land use practices. However, this has led

to a complex and varied set of interventions, reflecting the diversity in governance structures across different regions (Bottero et al., 2019; Rotondo et al., 2020). This effort has been further bolstered by the Sustainable Development Goals (SDGs), which highlight the role of spatial planning in addressing both urbanized and depopulated rural areas (Paniagua, 2020; Vitale Brovarone & Cotella, 2020; Vitale Brovarone et al., 2021; Berisha et al. 2022).

The focus of this contribution is to explore how Italy's heterogeneous regional spatial planning legislative framework provides municipalities with different capacities to control land consumption. In Italy, sustainable land use is influenced not only by the socio-economic processes driving spatial development but also by the effectiveness of the regulatory instruments in place. Both factors are shaped by the high variability in regional spatial planning, socio-economic development, and administrative cultures across the country (EC, 2017; Berisha et al., 2021, 2024). To address these issues, this contribution conducts a comparative analysis of the regional spatial planning laws in Italy, to assess their ability to guide territorial development and land use sustainably. After an initial overview of Italy's national and regional land consumption patterns, the analysis focuses on how sustainable land use is addressed in the spatial planning laws of Italy's 19 regions and the two autonomous provinces of Trento and Bolzano. Specific legislative elements have been identified to evaluate the extent to which these laws empower municipalities to manage land consumption effectively.

The findings from this analysis shed light on the legislative, socioeconomic, and morphological factors that contribute to the differences observed among Italian regions in terms of land consumption. In conclusion, the study summarizes the main results and outlines directions for future research, particularly in understanding how regional legislative frameworks can further support municipalities in controlling land consumption.

The fragmented Italian spatial planning landscape...

The Italian spatial planning system originates from the National Law 1150/1942, which has undergone numerous amendments over time. However, since the 1970s, following the establishment of regions and the transfer of legislative powers in the field of *urbanistica*, there has been increasing regionalization of spatial planning (Berisha et al., 2021). This shift allowed each region to adopt its own spatial planning laws, leading to a growing diversity and divergence in regional planning systems and practices (Gelli, 2001; Vettoretto, 2009). Today, some regions still rely on legal frameworks from the previous century, while others have significantly reformed their planning approaches due to both internal reforms and external influences, notably the role played by the European Union (Cotella & Janin Rivolin, 2011).

The Italian planning system, concerning the management of land use and its transformations, is predominantly structured around a single municipal-level instrument: the *piano regolatore comunale* (municipal master plan). This instrument, and the broader planning framework, is characterized by a highly conformative nature, with a strong focus on quantitative parameters and the legal status of landowners' development rights (Janin Rivolin, 2008). Consequently, the municipal level, and thus municipalities, holds primary authority over the management of land-use rights and land consumption. However, municipalities have often allocated land-use rights according to logics not always aligned with the common good (Cotella & Berisha, 2021). This has frequently undermined the effectiveness of territorial planning as a tool for strategic vision and development management. As noted by Vettoretto (2009), such practices have facilitated

the emergence of urban coalitions composed of politicians, developers, landowners, professionals, and other stakeholders, driven by the goal of maximizing urban rent through permissive planning policies.

Technically, this competitive and 'liberal' (and under-covered) approach has been supported by frequent and extensive amendments to land-use regulations and zoning plans - known as *varianti di piano* (plan variants) – often justified by overestimated growth projections and accompanied by episodes of corruption (Cotella & Berisha, 2021). The situation has been further exacerbated by widespread tolerance of illegal construction activities, particularly in Southern Italy, which has intensified the systemic issues.

From the 1970s onward, these practices have had significant spatial implications, fostering the proliferation of widespread low-density urban expansion, which has, in turn, undermined the sustainability and economic efficiency of territorial systems (Vettoreto, 2009). This situation worsened during the 1990s as a result of national government budget cuts linked to the decentralization of resources under the Berlusconi administration. These measures led to a substantial reduction in local public budgets, affecting municipalities indiscriminately and imposing particularly severe challenges on smaller localities (Cotella et al., 2015). The reform triggered intensifying competition among neighbouring municipalities to attract private activities and investments, which suddenly became key sources of local revenue through the collection of local taxes and urbanization fees levied on territorial transformations (Cotella & Berisha, 2021).

This fragmented and unsustainable approach to land use management at the municipal level highlights the pressing need for a more cohesive and innovative planning framework at the national scale. In response, over the past two decades, regional governments have sought to address these challenges by implementing new spatial planning. These laws have introduced innovative measures such as the normalization of local urban renewal and regeneration programs, the inclusion of communicative and participatory planning processes, the involvement of private stakeholders in territorial transformations and service provision, and the use of ex-ante and ex-post evaluation of plans. These evaluations encompass various methodologies, from environmental assessments to integrative approaches, all designed to evaluate the impact of spatial transformations on territorial systems. As a result, Italy's regions now exhibit substantial differences in their spatial planning tools, procedures, objectives, and functions, largely depending on the period during which each law was developed and enacted. The devolution of legislative planning competencies to regional authorities has resulted in a fragmented system, with 21 distinct regional spatial planning frameworks (19 regions plus the autonomous provinces of Trento and Bolzano). Despite this wave of regional innovation, or perhaps because of it, a legislative gap persists at the national level concerning sustainable land use and land consumption. In recent years, several legislative proposals have been discussed to address this void. These include (i) law proposal n.63, *Disposizioni per il contenimento del consumo di suolo e per il riuso dei suoli edificati*, (ii) law proposal n.86, *Disposizioni per la riduzione del consumo di suolo nonché delega al Governo in materia di rigenerazione delle aree urbane degradate*, and (iii) law proposal n.164, *Disposizioni per l'arresto del consumo di suolo, di riuso del suolo edificato e per la tutela del paesaggio*. However, none of these proposals have been approved to date.

In the absence of national legislation, regions have attempted to address the issue of sustainable land use and land consumption by incorporating various amendments and provisions into their spatial planning laws. This has further exacerbated the heterogeneity among regions. This legal fragmentation is problematic, as regions often grant exemptions for territorial transformation projects, which frequently result in increased land consumption. Consequently, despite efforts to mitigate the issue, land consumption in Italy continues to rise from a quantitative perspective (Munafò, 2023).

....and its impact on land use

According to the last report published by ISPRA¹ (*Istituto Superiore per la Protezione e la Ricerca Ambientale*) the new artificial coverings in 2023 concern 76.8 km² of land, that is, on average, about 21 hectares per day. An increase in the transformation speed confirms a significant acceleration compared to data recorded in the recent past, reaching the highest values seen in the last 11 years, during which daily land consumption never exceeded 20 hectares. Over the past year, our country has lost more than 2.4 m² of land every second (Fig. 1).

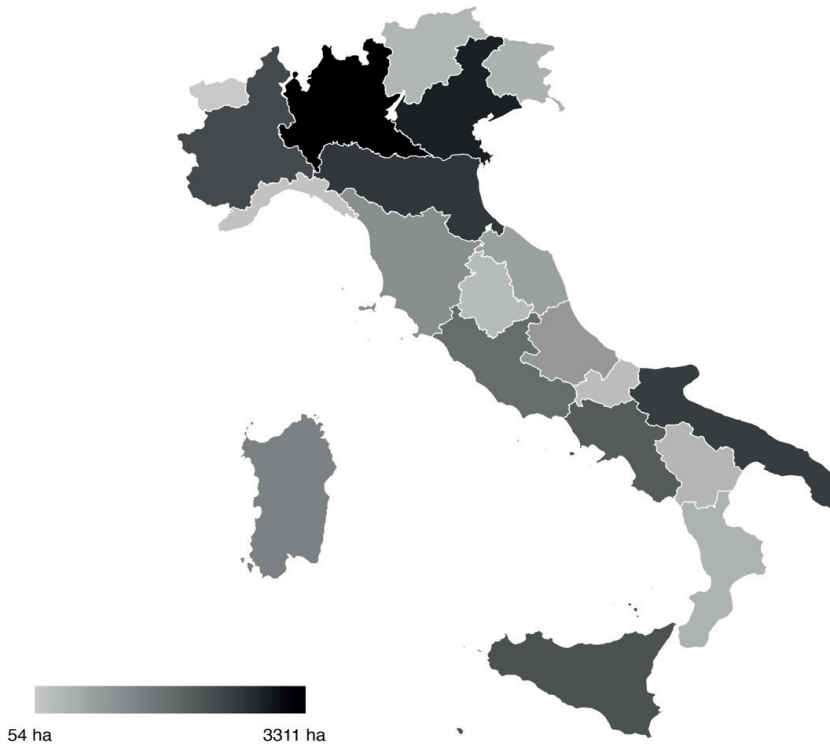


Figure 1. Net land consumption in hectares at the regional level between 2018 and 2022
Source: own elaboration based on ISPRA data.

At the regional level, the highest percentages are recorded in Lombardy (12.16%), Veneto (11.88%), and Campania (10.52%). Similar to the national data, the regional estimates have been revised and updated, effectively excluding areas that should not be considered consumed land (Fig. 2). However, the ranking of the regions remains unchanged: following the top three, Emilia-Romagna, Puglia, Lazio, Friuli-Venezia Giulia, and Liguria exhibit values above the national average, ranging from 7% to 9%. The Aosta Valley continues to have the lowest percentage of land consumption at 2.15%. It is essential to consider both the diverse regional morphology and the historical and unique evolution of the territory when interpreting the significance of the observed values.

¹ ISPRA – *Istituto Superiore per la Protezione e la Ricerca Ambientale*, see more here: https://www.isprambiente.gov.it/en?set_language=en

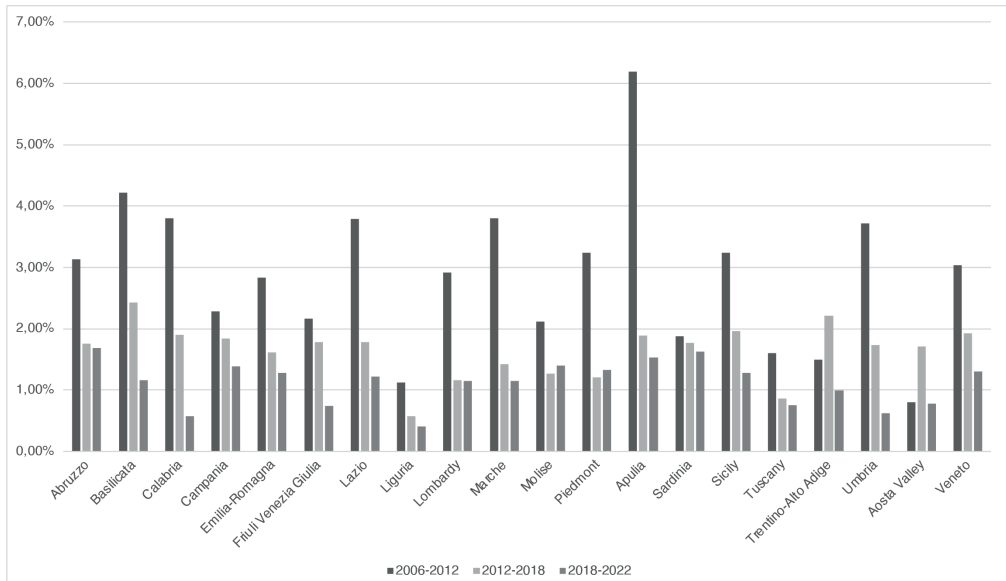


Figure 2. Land Consumption trend by region
Source: own elaboration based on ISPRA data.

The observed pattern of intensified land consumption between 2006 and 2012, characterized by regional disparities and driven by economic, demographic, and governance factors, provides critical context for understanding the subsequent slowdown in land consumption recorded between 2012 and 2018. The earlier period of rapid urban expansion, particularly in regions such as Sardinia, Apulia, Marche, Piedmont, and Veneto, stands in stark contrast to the relative stabilization observed in regions like Molise and Aosta Valley, highlighting how varying economic and geographic conditions have influenced land-use dynamics across Italy.

However, the transition from the rapid expansion of 2006–2012 to the deceleration of 2012–2018 cannot be fully understood without considering broader socio-economic shifts, particularly the lingering effects of the 2008–2009 global financial crisis. This crisis, which disrupted economic activity across Europe, had lasting repercussions on Italy’s construction and infrastructure sectors – industries historically central to land consumption. The economic downturn curtailed both public and private investment, diminished the feasibility of large-scale development projects, and constrained urban expansion, leading to a significant deceleration in the conversion of agricultural or natural land into urbanized areas.

This comparison underscores the strong connection between land consumption trends and macroeconomic cycles. During the pre-crisis years of economic growth, urban development was often regarded as a key driver of economic activity, contributing to the significant changes in land use observed between 2006 and 2012. Conversely, the post-crisis period revealed the fragility of this model (Bonora, 2012), as the economic slowdown directly reduced construction activity and land consumption (Guida, 2012). Nevertheless, this temporary reduction should not be misinterpreted as a transition toward more sustainable land management practices. Rather, it reflects a crisis-induced pause in development, driven by reduced investment capacity rather than proactive environmental or land-use policies (Pileri, 2017; Munafò, 2018).

The deceleration observed between 2012 and 2018 presents an opportunity to critically evaluate the structural drivers of land consumption and to assess the effectiveness of emerging regional regulations aimed at land protection. While stricter policies likely contributed to the slowdown, the broader context of economic instability played an equally significant role. This raises the question of whether the trends observed during this period represent a genuine shift toward sustainable land-use practices or merely a temporary consequence of external economic pressures.

To ensure that the reduced rates of land consumption observed between 2012 and 2018 translate into long-term sustainability, Italy must address the root causes of unsustainable land-use patterns. This involves rethinking development models that prioritize urban expansion during periods of economic growth and implementing structural policies that safeguard natural and agricultural lands regardless of macroeconomic conditions. Without such measures, the temporary deceleration linked to periods of crisis risks being reversed during recovery phases, reigniting pressures for land conversion similar to those observed during the 2006–2012 period.

The period from 2018 to 2022 reinforces the trend of deceleration in land consumption, with most regions exhibiting even lower rates of land conversion. This sustained decline across several regions reflects a convergence of factors, including the implementation of stricter land-use regulations, demographic shifts leading to plateaued demand for new construction, and ongoing economic stagnation in certain areas. Regions such as Liguria, Friuli-Venezia Giulia, and Umbria clearly demonstrate this pattern, showing significantly reduced levels of land consumption compared to earlier periods.

This phase, however, was deeply influenced by the COVID-19 pandemic, which had profound economic, social, and environmental repercussions (Hakovirta & Denuwara, 2020). The pandemic disrupted traditional models of urban development, as mobility restrictions, changes in work patterns, and shifts in housing preferences reduced the immediate pressures for urban expansion (Barbarossa, 2020; Balducci, 2020; Armondi et al., 2022). Simultaneously, the health crisis underscored the importance of sustainable and resilient urban environments, reinforcing the need to prioritize urban regeneration over the conversion of greenfields into urbanized areas (Balducci, 2022).

At the same time, European strategic frameworks and national recovery programs such as the *Piano Nazionale di Ripresa e Resilienza* (PNRR) played a critical role in shaping land-use trends during this period. These initiatives emphasized sustainable development, with substantial investments directed towards urban regeneration, energy-efficient housing, and the revitalization of existing urban spaces. The PNRR, in particular, sought to integrate environmental sustainability with economic recovery, encouraging the reuse of already urbanized areas and limiting the pressures for new land consumption (Accettura, 2023; Casavola & Berisha, 2024).

The juxtaposition of these dynamics – reduced demand for new construction due to the pandemic and active policy interventions promoting urban regeneration – signals a potential shift in Italy's approach to land management. This period offers an opportunity to evaluate whether the observed deceleration is indicative of a more permanent transition towards sustainable land-use practices or merely a temporary effect of external crises and targeted funding. To sustain and build upon this momentum, it is crucial to institutionalize the principles underlying the deceleration in land consumption. This includes fostering long-term policies that prioritize urban regeneration and the efficient use of existing urban areas, ensuring that the recovery initiatives like the PNRR have a lasting impact beyond their funding cycles. Moreover, these efforts must be complemented by strategic planning at regional and local levels, tailored to address specific demographic, economic, and geographic challenges.

Significant regional disparities in land consumption persist across the time periods considered, highlighting the distinct socio-economic drivers at play in different parts of Italy. Southern regions and islands, such as Sardinia and Apulia, continue to exhibit notably higher rates of land consumption, especially in the earlier periods, when compared to northern regions like Trentino-Alto Adige and Aosta Valley. These differences are not only a reflection of divergent economic and demographic conditions but also the influence of sector-specific drivers, including tourism, industrial agriculture, and infrastructure development.

In southern regions, tourism has played a significant role in shaping land consumption patterns. Coastal areas and other scenic landscapes, particularly in Sardinia and Apulia, have seen substantial urban and infrastructural development to support the growing demand for vacation homes, resorts, and hospitality facilities (Ioppolo et al., 2013; Granata & Scavone, 2016; Cucari et al., 2023). The seasonal influx of tourists creates pressures for the construction of accommodations, roads, and recreational facilities, often at the expense of natural or agricultural land. This trend underscores the challenge of balancing economic benefits from tourism with the need to protect the region's environmental and cultural heritage. Additionally, industrial agriculture has contributed to land conversion in the South. The shift from traditional farming practices to more intensive, mechanized systems has required larger contiguous plots of land, leading to the transformation of natural habitats and small-scale agricultural landscapes into industrialized agricultural zones (van Meijl et al., 2006; Schils et al., 2020; Long et al., 2021). These regions often face higher pressures to increase agricultural productivity, both for domestic consumption and export, which exacerbates the loss of natural and semi-natural areas.

In contrast, regions like Trentino-Alto Adige and Aosta Valley, characterized by mountainous terrain, sparse populations, and a high proportion of protected land, display consistently low levels of land consumption. The physical and regulatory constraints in these areas naturally limit urban expansion and large-scale agricultural conversion. Furthermore, the economic model in these regions often emphasizes sustainable tourism, small-scale agriculture, and renewable energy, which align more closely with conservation goals.

Methodology of analysis

To evaluate and compare the 21 regional and provincial spatial planning laws in Italy with respect to their capacity to promote more sustainable land use, we followed a structured methodological approach. First, we examined whether these laws contained references to key concepts such as sustainable land use, sustainable urbanization, urban sprawl, land consumption containment, zero-net land take, urban regeneration, and other relevant terms that form the conceptual framework of the topic under investigation. This initial screening provided a foundation for identifying a set of key elements, whose inclusion in regional legislative frameworks indicates a certain degree of attention to the issue of sustainable land use (Table 1).

Each of these key elements was then assigned a score on a scale from 1 to 4, reflecting its relative importance in promoting sustainable land use. The weighting of these elements was directly informed by the findings of the ESPON SUPER project, which had reviewed and assessed the effectiveness of over 230 initiatives aimed at promoting sustainable urbanization and land use across 39 European countries (ESPON, 2020). By leveraging these results, we ensured that the assigned scores were based on a robust and comprehensive analysis of international best practices in sustainable spatial planning.

Table 1. Characterizing elements and related scoring

Characterizing Elements	Score
CE1. Inclusion of land consumption and regeneration as a guiding principle in legislation	1
CE2. Presence of one or more specific articles addressing land use issues	4
CE3. Regulations aimed at limiting land consumption through regeneration programs for existing building stock	1
CE4. Legislation that sets an overall quota on permissible land consumption	1
CE5. Laws defining the boundaries of urbanized areas	1
CE6. Explicit references to actions for ecological compensation	1
CE7. Regulations mandating the monitoring of land consumption and the creation of inventories of disused buildings for redevelopment	2
CE8. Implementation of urban regeneration programs	2
CE9. Legislation defining temporary uses for certain properties	1
CE10. Regulations providing incentives and rewards for urban regeneration and land de-sealing initiatives	2

Source: author's own elaboration.

The assessment methodology outlined in Table 1 focuses on the presence and robustness of specific legislative measures, reflecting the assumption that comprehensive, enforceable regulations are more effective in promoting sustainable land use than general principles or symbolic actions. The scoring system highlights the potential of concrete legislative tools – such as specific articles on land use (CE2) and monitoring systems (CE7) – while critiquing the limited impact of broader, more abstract principles (CE1) or temporary measures (CE9).

By focusing on the specific elements of land use legislation, the assessment helps to identify the strengths and weaknesses in current regional frameworks. The lower scores for many CEs suggest that while the regions may have initiated steps toward more sustainable land use, much of the legislation lacks the depth and enforceability necessary to make a significant impact. Higher scores, such as for CE2, highlight areas where legislative frameworks are more likely to succeed in controlling land consumption and promoting regeneration, suggesting that these should be models for other regions aiming to improve their approach to sustainable land management.

This assessment methodology tries to effectively distinguish between superficial and substantive legislative efforts. The scoring provides a structured way to compare regional legislation and assess how well different regions are equipped to address the challenges of sustainable land use and land consumption. The findings suggest that while many regions have started the process, there is still considerable room for improvement in both the scope and enforcement of these laws.

Finally, the results of this legislative assessment were compared with actual land consumption data for the respective Italian regions. This comparison facilitated a critical reflection on the relationship between spatial governance, planning policies, and the outcomes in terms of sustainable urbanization and land use. It allowed for an understanding of whether regions with more comprehensive legislative frameworks also demonstrated lower levels of land consumption, thereby shedding light on the effectiveness of these policies in practice.

Comparative analysis of regional laws *vis-à-vis* the regional performance in terms of land consumption

From the comparison and assessment of the various regional/provincial regulations concerning spatial planning, it is possible to confirm that the attention to sustainable urbanisation and land use varies rather much from region to region (Table 2).

Table 2. Comparative table of regional regulations

Region	CE1	CE2	CE3	CE4	CE5	CE6	CE7	CE8	CE9	CE10	Total
Abruzzo	1	4	1	1				2		2	11
Basilicata			1					2		2	6
Calabria	1	4	1			1		2		2	11
Campania	1	4	1				2	2		2	12
Emilia Romagna	1	5	1	1	1	1	1	2	1	2	16
Friuli Venezia Giulia	1		1			1	2	2			7
Lazio	1		1			1		2		2	7
Liguria	1	4	1			1		2		2	11
Lombardy	1	4	1	1		1	2	2		2	14
Marche	1	4	1	1				2			9
Molise										2	2
Piedmont	1	4	1	1	1	1	2	2		2	15
Apulia	1	4	1			1	2	2		2	13
Sardinia	1	4	1	1		1	2	2		2	14
Sicily	1							2		2	5
Tuscany	1	4	1		1	1	2	2			12
Umbria	1		1	1				2			5
Aosta Valley	1		1					2			4
Veneto	1	4	1	1		1	2	2	1	2	15
Prov. Bolzano	1	4	1		1	1					8
Prov. Trento	1	4	1	1			2	2			11

Source: author's own elaboration.

Several key trends emerge from the table. First, it becomes evident that a handful of regions—Emilia-Romagna, Piedmont, and Veneto – have developed robust legal frameworks, achieving scores of 15 to 16 points. These regions exemplify best practices in sustainable land management, offering transferable solutions for other regions seeking to enhance their policies. Notably, their holistic regulation of land use includes quotas on permissible land use and clear urban boundaries, effectively curbing urban sprawl and preserving green spaces. These measures reduce infrastructure costs and ensure development focuses on optimizing existing urban areas, balancing cost-effectiveness with environmental sustainability.

The integration of monitoring and accountability systems stands out as another critical feature. Regular assessments of land consumption and inventories of disused buildings enable poli-

cymakers to prioritize redevelopment, reducing the need to expand into undeveloped areas. For instance, Emilia-Romagna's data-driven approach ensures efficient resource allocation for urban renewal. Economic incentives further strengthen these frameworks. By rewarding urban regeneration and land de-sealing initiatives, these policies align development with environmental goals, as seen in Piedmont, where such incentives stimulate innovation and transform underutilized areas into vibrant economic hubs. Urban regeneration programs, focusing on repurposing existing buildings, mitigate land consumption while fostering long-term sustainability. In Veneto, such initiatives address housing needs, boost economic growth, and revitalize communities. Complementary ecological compensation measures ensure that development preserves biodiversity and enhances ecosystem services, contributing to environmental health and quality of life. Lastly, the flexibility offered by temporary use legislation activates vacant spaces for interim community or economic activities, preventing urban decay and maximizing utility. These adaptable and comprehensive approaches provide a scalable model for achieving sustainable urbanization.

However, these regions are the exception rather than the rule. The majority of regions score between 6 and 14 points, indicating a moderate commitment to sustainability, but often with significant gaps in critical areas. Regions such as Sardinia, Campania, and Apulia fall into this middle range, indicating some progress but lacking comprehensiveness. Their frameworks often include key articles addressing land use issues (CE2), but they fail to address more innovative and impactful measures such as the creation of overall consumption quotas (CE4) or ecological compensation measures (CE6).

Regions such as Sicily, Umbria, Aosta Valley, and particularly Molise (with only 2 points) have the lowest recorded rating, demonstrating minimal legislative response to land consumption and urban sustainability. These regions lack foundational policies such as the regulation of land consumption or the monitoring of disused buildings for potential redevelopment. This underscores a concerning neglect in regions where the absence of such frameworks could result in unchecked urban sprawl, inefficient land use, and a growing environmental footprint.

The uneven distribution of scores across the regions reveals a fragmented and inconsistent national response to the challenges of land consumption and sustainable land use. While some regions have made commendable strides, others have only minimally addressed these critical issues, if at all. This disparity may result in vastly different environmental and urban outcomes across Italy, where some regions could continue to expand unchecked while others make progress toward sustainability. This inconsistency may also be partially attributed to differing regional priorities or the varying political and economic pressures influencing urban planning policies. Regions with significant development pressures, such as those with large metropolitan areas, may struggle to implement stringent land use regulations due to economic constraints or lobbying by developers. By contrast, regions that are less developed or more rural may not perceive land consumption as an immediate threat, leading to legislative complacency.

Furthermore, the lack of a strong national framework or incentive structure to guide regional legislation on these matters exacerbates the issue. Without national-level quotas, monitoring systems, or financial incentives, regional governments are left to their own devices, leading to the patchwork of policies observed here. It raises the question of whether Italy needs a more unified national approach to spatial governance and planning, similar to other European countries where stronger central frameworks exist.

Critical Reflections and Implications

The comparison between the legislative ranking of Italian regions and their actual land consumption data, considered in conjunction with the timeline of legislative evolution (Fig. 3), offers valuable insights into the effectiveness of regional policies in promoting sustainable land use.

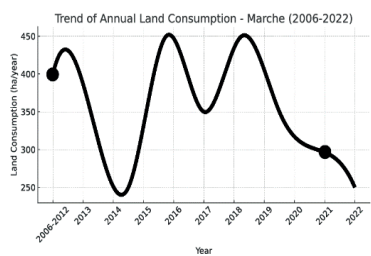
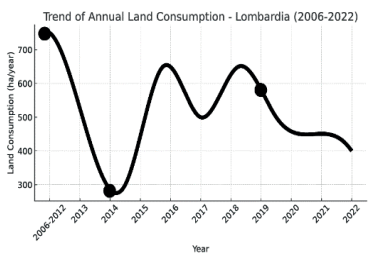
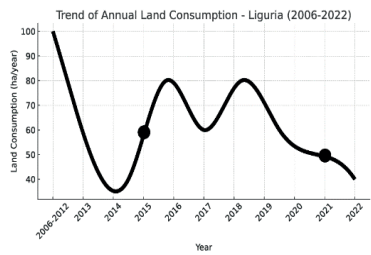
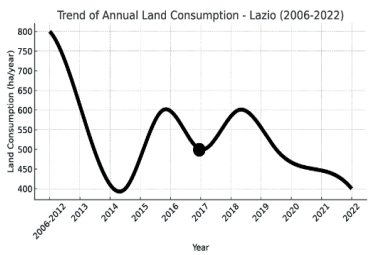
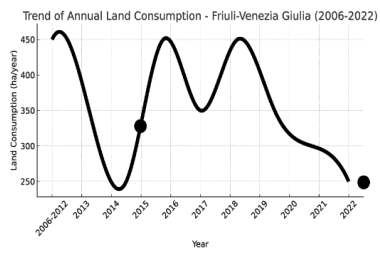
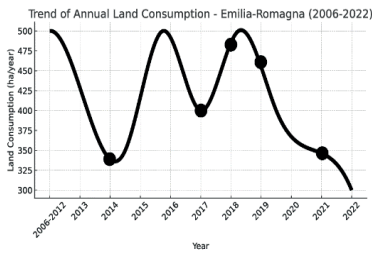
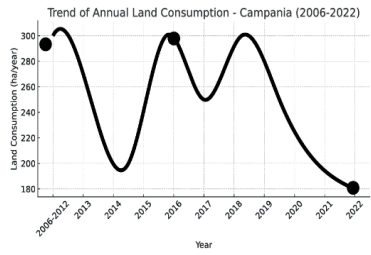
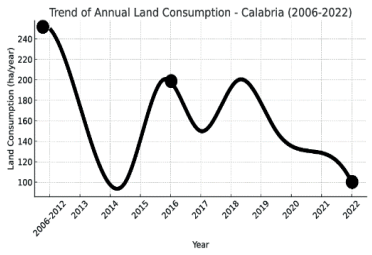
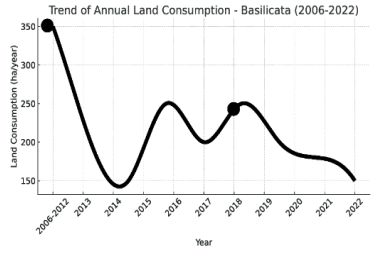
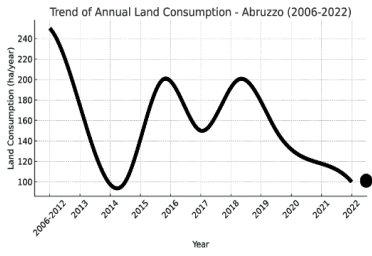
By examining the relationship between the introduction of legislation and real-world land consumption trends, we can gain a deeper understanding of how regulatory frameworks have influenced regional efforts toward sustainability.

Regions such as Emilia-Romagna, Piedmont, Veneto, Lombardy, and Sardinia, which rank highest in the legislative assessment with scores ranging from 14 to 16 points, have demonstrated a significant commitment to integrating the principles of sustainable land use into their legal frameworks. However, the timeline of legislative adoption plays a critical role in determining their impact. For instance, Emilia-Romagna introduced comprehensive legislation as early as 2009, and this early action has contributed to relatively stable and controlled land consumption rates. This finding suggests that timely intervention is essential for preventing the entrenchment of unsustainable land use patterns.

In contrast, Veneto and Lombardy, despite their high legislative scores, began implementing key sustainable land use policies only in 2014 and 2015, respectively. While these regions have made considerable legislative progress, their later start has allowed existing urbanization pressures to persist, which is reflected in ongoing challenges related to land consumption. This highlights that while robust legal frameworks are necessary, their effectiveness is contingent on early and proactive policy implementation. Delayed action can hinder the mitigation of pre-existing land use practices that contribute to unsustainable growth.

Regions such as Campania, Apulia, Liguria, and Tuscany fall within the middle range of the legislative rankings, with scores between 11 and 13 points. Although these regions have introduced important measures such as urban regeneration programs and incentives for sustainable land use, the timing of these policies is a notable factor. For example, Campania introduced significant land use legislation around 2016, which has resulted in moderate progress in reducing land consumption. However, the delayed enactment of such policies has likely limited their effectiveness. Similarly, Apulia and Tuscany began adopting sustainable land use frameworks in 2013 and 2017, respectively, with their mid-ranking performance reflecting the challenges of addressing entrenched urbanization trends in a relatively short timeframe. This analysis underscores that both the content and timing of legislative measures are critical to their success, as regions that act later tend to struggle with reversing unsustainable land use practices.

Finally, regions such as Sicily, Umbria, Molise, and Aosta Valley exhibit the lowest legislative scores, ranging from 4 to 7 points. These regions have either delayed or minimally addressed sustainable land use in their legal frameworks, with key policy developments occurring only recently. For example, Sicily introduced relevant land use legislation in 2019, yet the region continues to have relatively low land consumption rates, possibly due more to external factors such as its economic and demographic context than to the effectiveness of its regulatory framework. The absence of comprehensive policies in these regions leaves them vulnerable to future increases in land consumption, especially if development pressures intensify.



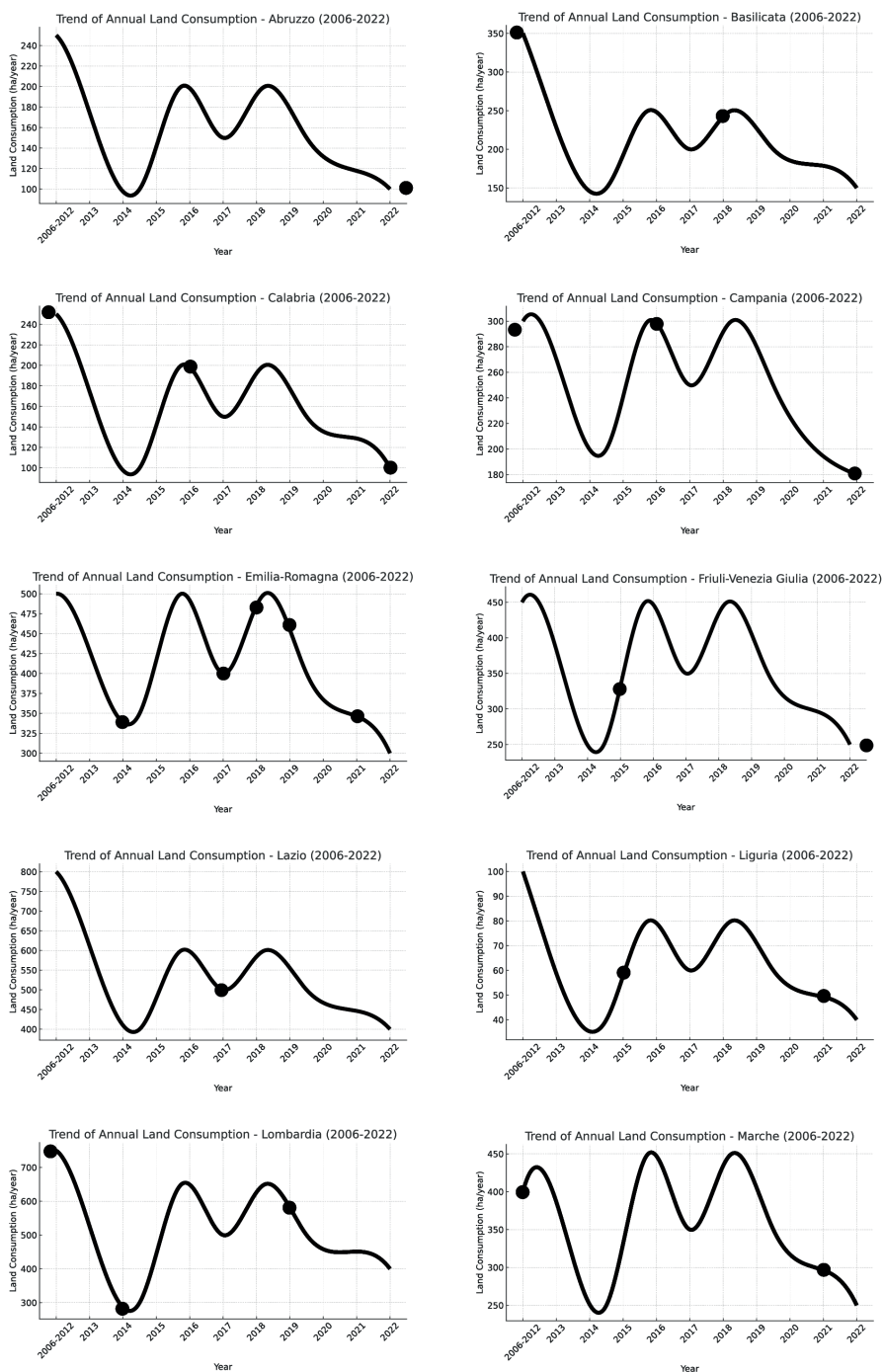


Figure 3. Legislative evolution of regional regulations on spatial planning, land use and urban regeneration (circle) together with the annual trend of net land consumption by region. Note: due to limitations in data availability, disaggregated annual data for the period prior to 2012 are not accessible.
Source: own elaboration.

The comparison between legislative scores and actual land consumption data reveals several important patterns. First, early legislative action is critical for effectively controlling land consumption. Regions like Emilia-Romagna which adopted comprehensive policies early have been more successful in managing land consumption. Second, high legislative scores alone do not guarantee reduced land consumption, as demonstrated by Lombardy and Veneto, where delayed policy implementation allowed unsustainable urbanization patterns to persist. Finally, in some regions, low land consumption is more likely the result of external socio-economic factors, rather than the strength of their legal frameworks. This is particularly evident in regions like Sicily and Aosta Valley, where low land consumption appears more closely related to limited economic development than to effective land use regulation.

The findings also suggest that strong legal frameworks must be accompanied by effective enforcement, economic incentives, and public awareness campaigns to produce meaningful outcomes. Regions like Emilia-Romagna and Piedmont, which have implemented comprehensive monitoring systems and financial incentives for sustainable development, perform better both in legislative rankings and in controlling land consumption. In contrast, regions that lack such mechanisms continue to face challenges in curbing land consumption, even when their legislative frameworks appear robust on paper.

This analysis highlights the importance of not only developing comprehensive and coherent land use policies but also ensuring their timely implementation and enforcement. Regions that have been successful in controlling land consumption typically adopted proactive and early measures, while regions with delayed policy action or minimal regulatory frameworks remain vulnerable to unsustainable development. For Italy to address the broader challenge of sustainable land use effectively, a more coordinated national approach may be necessary to support regions with weaker legislative frameworks. This could help ensure that all regions are equally equipped to manage land consumption and promote sustainable urbanization.

Conclusive remarks and future research perspectives

The article has provided a qualitative analysis of Italian regional and provincial legislation on spatial planning, focusing on the extent to which these frameworks incorporate elements aimed at limiting land consumption and promoting more sustainable land use. Based on this assessment, several hypotheses emerge regarding the relationship between spatial planning regulations, actual land consumption patterns, and broader economic, productive, and morphological factors.

In regions such as Lombardy and Veneto, high land consumption levels are driven by a combination of strong economic forces, including significant private investment, and favorable morphological characteristics that make the land attractive for industrial or residential transformation. These economic and physical conditions underscore a critical limitation of legislation: while robust legal frameworks for sustainable land use are in place, they often struggle to counteract the pressures exerted by economic incentives and geographical advantages. This suggests that legislation alone is insufficient to achieve sustainable land use goals unless complemented by policies that address the underlying economic and structural drivers. For instance, stricter regulations on industrial zoning, financial incentives for brownfield redevelopment, or subsidies for vertical urban development could help redirect growth pressures away from greenfield areas.

By contrast, regions such as Molise and Aosta Valley provide a revealing counterpoint. These areas demonstrate low levels of land consumption despite their relatively weak legislative frame-

works for sustainable land use. This discrepancy highlights the importance of external factors, such as reduced private investment and less favorable morphological conditions for large-scale development, which naturally limit urban expansion. For policymakers, this indicates that socio-economic and geographical contexts play a substantial role in shaping land consumption patterns. Policies in these regions might benefit from a focus on anticipatory measures to prevent future development pressures, such as preserving ecological corridors, introducing sustainable zoning regulations, or proactively managing urban sprawl before it emerges as a significant challenge.

A clear trend across Italy is the growing effort by many regions to reform their spatial planning laws, incorporating elements aimed at limiting land consumption and promoting sustainable practices. While these legislative initiatives are a step in the right direction, their fragmented and inconsistent implementation limits their overall effectiveness. This fragmentation arises from the absence of a cohesive national legislative framework, leaving regions to operate independently and resulting in significant disparities in policy approaches and outcomes.

To address this issue, the development of a comprehensive national law on sustainable land use is essential. Such a framework would provide unified guidance, ensuring consistency in land use practices while allowing for localized adaptations to accommodate specific regional characteristics. By harmonizing existing regional reforms, a national law could build on the innovative approaches pioneered by regions like Emilia-Romagna, with its adaptive zoning measures, or Piedmont, which has introduced incentives for brownfield redevelopment. Moreover, such a framework could mitigate administrative inefficiencies and foster a more predictable regulatory environment for developers and stakeholders.

Despite the proactive efforts of some regions to legislate on land consumption and urban regeneration in the absence of national guidance, the analysis reveals a critical gap between policy intentions and actual land use trends. Discrepancies between legislative frameworks and outcomes suggest that other factors – particularly socioeconomic and morphological conditions – play a decisive role in influencing land use patterns (Kroll et al., 2012). Furthermore, these gaps raise concerns about the effectiveness and adaptability of Italy's spatial governance system. Scholars have critiqued the rigidity of conformational spatial planning systems, arguing that such structures often hinder public authorities from managing spatial development dynamics effectively (Healey, 1998; Nadin & Stead, 2008; Faludi, 2000; Janin Rivolin, 2008; Albrechts, 2013). In Italy, this challenge is particularly pronounced, as spatial planning has historically struggled to align legal objectives with real-world development patterns.

Nonetheless, the legislative reforms undertaken by various regions and the significant innovations embedded in their planning frameworks offer a solid foundation for constructing a national spatial planning law. This proposed law should prioritize sustainable land use, the containment of land consumption, and urban regeneration, while addressing Italy's long-standing planning challenges since the post-World War II era (Vettoretto, 2009). It should establish clear definitions, principles, and guidelines, acting as a blueprint for consolidating and refining regional regulations into a cohesive national strategy.

While the qualitative analysis presented here is preliminary and subject to certain limitations, it represents an important first step in identifying the key components that could inspire a national reference framework. However, further research is required to investigate how these components influence the development and implementation of regional spatial planning tools. Such studies should focus on local case studies to examine how planning instruments are utilized in practice to guide land use toward sustainable outcomes. These case studies could provide critical insights into the capacity of planning frameworks to translate legislative principles into tangible, on-the-ground results.

This analysis underscores the need for an integrated approach to spatial planning that combines strong legislative frameworks with practical, context-sensitive policy measures (Berisha & Casavola, 2024). A comprehensive national law on sustainable land use has the potential to harmonize regional efforts, enhance policy cohesion, and address long-standing governance challenges. Policymakers should also consider the importance of economic instruments, stakeholder engagement, and monitoring systems to ensure that spatial planning aligns with sustainability goals. By leveraging regional best practices and addressing structural inefficiencies, Italy can create a more equitable, efficient, and sustainable model of spatial governance.

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