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Net-zero land take ambitions and realities in European policies - A comparative study through public policy analysis

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Abstract

This study examines the acceptance and implementation of No Net Land Take (NNLT) policies across seven European countries - Belgium (Flanders), France, Germany, Italy, Norway, Slovakia, and Ukraine - through a comparative public policy analysis. While all countries recognise the urgency of reducing land take, their policy responses vary significantly due to differing institutional frameworks, socio-political contexts, and economic pressures.

Key findings reveal a persistent gap between NNLT objectives set at the European and national levels and their practical implementation at the local level. In many cases, policies are undermined by conflicting priorities, such as economic development, property rights, and infrastructure demands. Promising practices, including Germany's focus on inner development, Italy's advanced land monitoring systems, and Norway's bottom-up approach offer valuable lessons. However, fragmented governance and insufficient enforcement mechanisms remain significant barriers.

The study underscores the need for stronger cross-sectoral coordination, tailored incentives, and comprehensive monitoring systems to bridge the gap between policy goals and outcomes. By fostering international collaboration and learning from diverse experiences, this research provides insights to advance the effective implementation of NNLT policies and achieve sustainable land use by 2050.

Keywords

No Net Land Take; policy analysis; comparison

Introduction

Land is a finite and multifunctional resource that underpins essential societal needs (Davy, 2016), including food production, biodiversity, housing, infrastructure, and climate regulation (Weil & Brady, 2017). Approximately 4.4% of the EU's surface area is affected by land take (EEA, 2022); 40-60% of this is sealed (Prokop et al., 2011; EEA, 2022). Continuous land take and soil sealing result in the irreversible loss of fertile soil, ecosystem fragmentation, and increased vulnerability to climate risks (Prokop & Salata, 2017).

Land take can be (partially) explained by population growth and economic development (Colsaet et al., 2018), which drive demand for housing, infrastructure, and services. However, empirical studies show that land consumption often exceeds what would be expected from these factors alone (Lacoere, 2023). While the population in Europe grew by 10% between 1975 and 2015, the settlement area doubled during the

same period (Pesaresi et al., 2017). One-third of new land take occurs in regions with declining demographic development (Schiavina et al., 2022). The average land take has risen from 109 m^2 per person in 1985 to 143 m^2 per person in 2020, with a significant variation across countries (van Vliet et al., 2024). Thus, planning practices, land-use policies, and institutional frameworks also significantly influence land take patterns.

The European Commission has recognised the problematic increase in land take and soil sealing across member states. In response, it introduced the No Net Land Take (NNLT) target in the Roadmap to a Resource Efficient Europe (2011), the Soil Strategy 2030 (2021), and the Land Take Hierarchy as part of the new Soil Monitoring Law (2025) (European Commission 2011, 2021, 2025).

The target demonstrates a clear policy commitment by the European Union to halt the net conversion of natural and agricultural land to artificial surfaces by 2050. The initiative highlights the importance of sustainable land management and requires member states to embed land take reduction targets into their spatial planning and development policies. However, to effectively reduce land take, implementation depends on how each country incorporates the NNLT target into its legal, administrative, and spatial planning systems, adjusting measures to fit national and regional contexts (Decoville & Feltgen, 2023).

In recent years, the EU Commission's initiative and several national NNLT policies have gained increasing attention in the planning literature. Scholars have researched how to measure land take (Decoville & Schneider, 2016) and explored the implications of these developments for spatial governance (Schiavina et al., 2022; Claus et al. 2025; Buitelaar & Leinfelder, 2020), land use regulation (Dembski et al., 2025; Hengstermann et al., 2023), and sustainable development – including potential rebound effects (Nørgård & Xue, 2016) – highlighting both the challenges of implementation and the opportunities for integrating environmental objectives into national and regional planning systems. The initiatives undertaken at the European level should be seen as a pressing call for the establishment of national objectives and the implementation of measures at sub-national levels. Consequently, it is essential to analyse and compare the relevant activities.

The international comparison of national NNLT policies is still at an early stage (see, notably, Lacoere et al., 2024, in the TPR special issue by Idt et al., 2025). There is a

pressing need for more comparative international research to investigate how the EU's NNLT target is being implemented across countries. Such studies provide crucial insights into the enabling factors and obstacles influencing the effectiveness of this policy in reducing land take and implementing the land hierarchy. By examining variations in governance structures, legal frameworks, enforcement mechanisms, and stakeholder engagement, comparative research can identify best practices and common challenges, fostering a deeper understanding of the conditions necessary for successful implementation. This knowledge would not only support the EU's broader sustainability goals but also help refine strategies to overcome barriers, ensuring more equitable and efficient transitions towards sustainable land management practices across diverse national contexts.

This paper evaluates NNLT policies in selected European countries, aiming to clarify the fundamental rationale behind national strategies to minimise land take and soil sealing. More specifically, the study seeks to analyse and compare how No Net Land Take (NNLT) policies are designed, governed, and implemented across the seven countries, in order to identify the institutional, legal, and political factors that shape national approaches and determine the key barriers and enabling conditions for achieving the 2050 target. Accordingly, the paper addresses the following research question: How do European countries translate the EU's NNLT target into national policy frameworks, and what institutional, governance, and stakeholder-related factors explain the differences in implementation across Belgium (Flanders), France, Germany, Italy, Norway, Slovakia, and Ukraine.

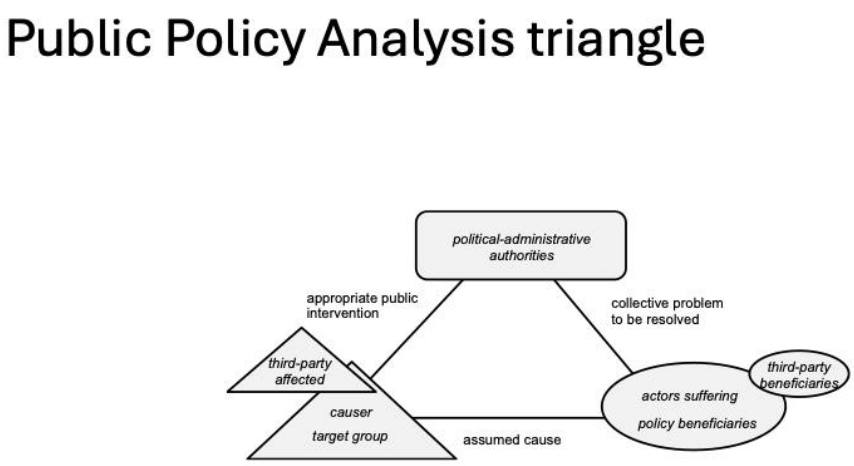
To answer this question, the study employs the public policy analysis component of the institutional resource regime analysis (Gerber et al., 2009), specifically centred on the triangle of actors (Knoepfel et al., 2011). This approach is grounded in actor-centred institutionalism (Scharpf, 1997) and facilitates a systematic review of the roles and interactions of key stakeholders in the development and implementation of these policies.

Public Policy Analysis

This comparative paper applies public policy analysis to reveal the general logic behind national approaches to land take and soil sealing. It clarifies the underlying actor

model, emphasising the roles and interactions of key stakeholders in shaping policy outcomes. In particular, it utilises the triangle of actors (Knoepfel et al., 2011) as the conceptual framework to identify and understand the main stakeholders involved in public decision-making processes. The triangle comprises three primary actor categories: those affected by or benefiting from successful policy implementation, the political-administrative actors responsible for implementing the policy, and target groups whose behaviour initially causes the problem and needs to be changed. The sides of the triangle represent the relationships among these actors, namely the politically perceived problem, the causal hypothesis, and the policy intervention. Finally, third parties are also mentioned, who are not explicitly part of public policy but can be affected either positively or negatively. This model helps clarify the roles, interests, and interactions among these groups, providing a structured way to analyse how policies are shaped, implemented, and contested within a specific governance context.

Figure 1 – Actor-Centred Public Policy Analysis (Source: Knoepfel et al., 2011)



The specific definitions of these eight elements are as follows (Knoepfel et al., 2011): 1) Political Definition of the Problem: The interpretation of the problem by political actors, often influenced by competing interests and values. 2) Causal Hypothesis: Assumptions about what causes the problem (e.g., oversupply of development rights, economic incentives for expansion). 3) Intervention Hypothesis: The proposed measures

or instruments to address the problem (e.g., downzoning, compensation schemes, incentives for inner development). 4) Ultimate Beneficiaries: Groups or individuals suffering from the current situation and who benefit from solving the problem (e.g., current and future generations, environmental interests). 5) Political-administrative actors: public actors perceived or assigned to tackle the problem. 6) Target Groups: Actors causing the problem and whose behaviour can contribute to solving it. Expected to implement or comply with the policy (e.g., landowners, developers). 7) Positively affected Third Parties: Actors indirectly affected by the policy in a positive way (e.g., landowners, NGOs, industry groups). 8) Negatively affected Third Parties: actors indirectly affected by the policy in a negative way.

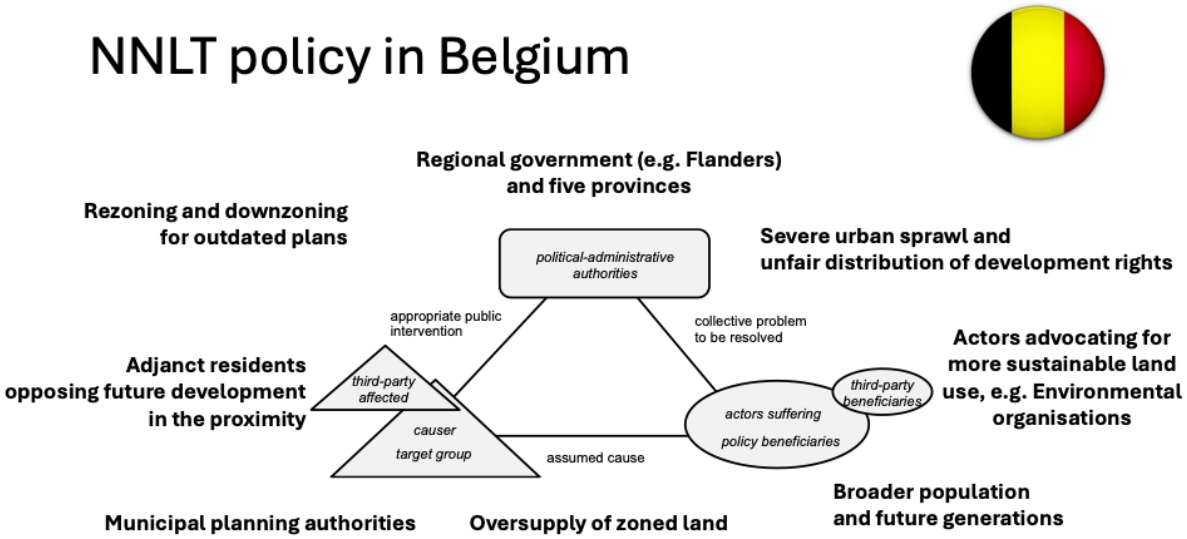
This paper employs this analysis model to examine public policy in seven selected countries. The application is conducted for (in alphabetical order): Belgium (specifically Flanders), France, Germany, Italy, Norway, Slovakia, and Ukraine. The countries were selected to capture both the geographical diversity of Europe and the varying stages of development of NNLT-related policies. The sample includes countries where land-take reduction has already received considerable academic and policy attention, such as France and Belgium (Flanders), as well as countries that have not been the focus of international research, such as Norway, Slovakia, and Ukraine. At the same time, the final selection was influenced by the countries represented by participants in the PhD Summer School from which this article emerged. The study therefore combines a comparative research rationale with the expertise and empirical knowledge available through the doctoral network, allowing for the inclusion of both well-established and less explored national perspectives on NNLT.

Belgium (Flanders)

Since 2018, the Flemish Government has pursued a No Net Land Take (NNLT) objective through the *bouwshift*, which aims to gradually reduce land consumption and redirect development towards already urbanised areas. Despite this commitment, progress has remained relatively limited. According to the most recent figures available for 2019–2022, land consumption still amounts to 3.8 hectares per day. A central challenge is the mismatch between current land-use objectives and the large oversupply of development rights embedded in historical zoning plans. Research estimates that at

least 30,000 hectares would need to be rezoned in order to align existing planning frameworks with the objectives of the *bouwshift* (Lacoere & Leinfelder, 2022), a conclusion recently reaffirmed in the draft *BRV memorandum* of 2025. Within the Flemish policy debate, continued land consumption and the degradation of open space are therefore increasingly regarded as urgent spatial planning problems requiring government intervention (**political definition of the problem**).

Figure 2 – Actor-Centred Public Policy Analysis of Belgium NNLT Policy (Source: created by the authors based on Knoepfel et al., 2011)



The problem is generally attributed to the historical planning system (**causal hypothesis**). For decades, local land-use plans allocated extensive development rights, creating a large stock of legally developable land that exceeds future needs. Municipalities therefore continue to possess significant reserves of building land, while landowners maintain expectations regarding future development opportunities. To address this, policy has focused on rezoning and downzoning under the umbrella of the *bouwshift* (**intervention hypothesis**). Development rights in selected locations are reduced or withdrawn in order to preserve open space, limit further urban sprawl, and encourage redevelopment within existing urban areas. The effectiveness of this approach largely depends on local implementation, since municipalities must adapt their planning frameworks and take politically sensitive decisions concerning future land use.

Responsibility for implementation is divided between the Flemish Government and municipalities. The Flemish Government acts as the main **political-administrative actor** by defining strategic objectives and establishing the broader planning framework. However, due to subsidiarity and the distribution of planning competences, implementation largely depends on the 285 municipalities, which function as the principal (**target group**) because they control local zoning decisions. The main **ultimate beneficiaries** are current and future generations, who are affected by the loss of open space, biodiversity and ecosystem functions. Environmental organisations and other actors advocating more sustainable land use may also benefit indirectly from stronger protection of open space (**positively affected third parties**).

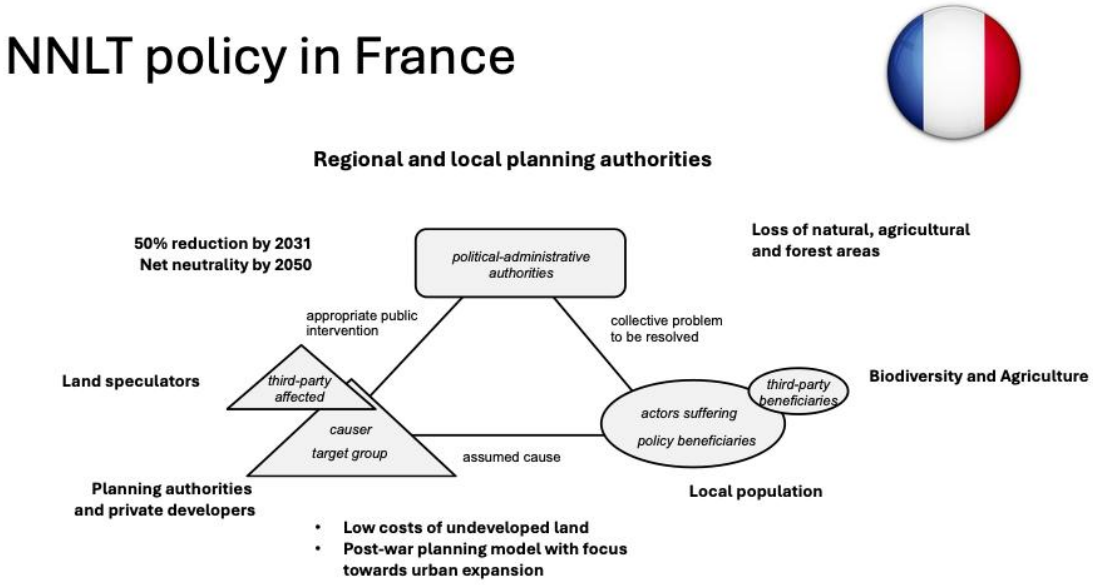
The most important conflict concerns landowners whose development rights may be reduced or withdrawn through rezoning measures. These actors constitute the principal (**negatively affected third parties**) and have frequently opposed such interventions through legal challenges, political lobbying, and public debates concerning property rights. The compensation debate has created a dilemma for the *bouwshift*. Policymakers have been confronted with the question of whether landowners should receive full, partial, or no compensation for losses resulting from downzoning (Lacoere et al., 2023). While the Flemish Government seeks to protect open space and promote redevelopment, generous compensation arrangements increase the financial burden of rezoning and discourage municipalities from implementing the necessary planning measures. The continuing tension between ambitious land-take reduction goals and entrenched property-rights claims therefore remains one of the principal barriers to the operationalisation of NNLT in Flanders (**intervention hypothesis**).

France

In France, limiting land take has been a long-standing objective of public policy and has gradually evolved into the nationally recognised goal of *Zéro Artificialisation Nette (ZAN)*. Earlier legislation, including the *ALUR, VSD* and *ELAN* laws, sought to limit urban sprawl and promote more compact forms of development. The objective gained particular importance with the adoption of the 2021 Climate and Resilience Act (*loi Climat et Résilience*), which incorporated the *ZAN* target into French law following the recommendations of the Citizens' Convention on Climate. The legislation established a

two-stage trajectory consisting of a 50% reduction in land take by 2031 and net zero artificialisation by 2050. The subsequent *ZAN II* law further clarified implementation arrangements and the role of local authorities. Yet implementation has remained contested, with debates concerning local autonomy, administrative complexity and the definition of artificialisation (Desjardins, 2024; Lacoere et al., 2025; Charmes, 2023). Excessive land take is increasingly regarded as a collective challenge threatening agricultural land, biodiversity, ecosystem services and territorial sustainability (**political definition of the problem**).

Figure 3 – Actor-Centred Public Policy Analysis of French NNLT Policy (Source: Created by the authors based on Knoepfel et al., 2011)



In France, land take is generally linked to a post-war model of urban expansion in which municipalities competed for residents and economic activity (**causal hypothesis**). This model was supported by relatively inexpensive undeveloped land and planning approaches that often favoured outward expansion over regeneration and densification (Le Bivic et al., 2025). The French debate is also shaped by the coexistence of two measurement frameworks: one focusing on the consumption of natural, agricultural and forest areas (*ENAF*) and another on artificialisation more broadly. As a result, policy discussions often concern not only the extent of land take itself but also the indicators used to measure it (Delattre & Lecourt, 2024). To address this, the *ZAN*

framework relies on densification, brownfield redevelopment, urban regeneration and restrictions on further urban expansion (**intervention hypothesis**). The first phase focuses on reducing land take, while the longer-term objective increasingly relies on renaturation and other compensation measures.

Implementation takes place through a highly structured multi-level planning system. The national state acts as the principal **political-administrative actor** by establishing legal obligations and strategic objectives. These are translated through the regional *SRADDETs*, the supra-municipal *SCOTs* and the intermunicipal *PLUis*, while prefects oversee implementation at the local level. Local authorities and planning bodies therefore function simultaneously as key **target groups** whose decisions directly influence land-consumption patterns. Developers and construction actors are also expected to adapt their investment strategies to a more land-efficient development model (Nessi, 2024). Successful implementation primarily benefits the wider public through the protection of agricultural land, biodiversity, landscape quality and ecosystem services (**ultimate beneficiaries**). Agriculture and biodiversity are frequently presented as the main winners, while actors specialising in brownfield development, land recycling and ecological compensation may also gain new opportunities (**positively affected third parties**).

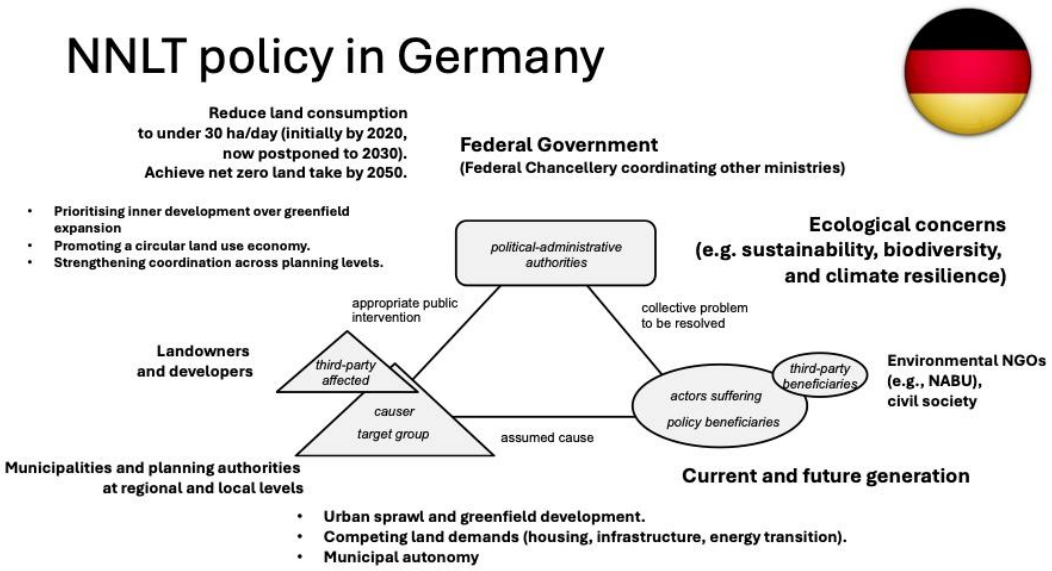
Implementation nevertheless generates substantial political conflict. Many municipalities continue to regard urban development as an important source of economic growth and demographic attractiveness, leading to tensions between national objectives and local ambitions. The construction sector, real-estate interests and political associations have actively lobbied against provisions regarded as overly restrictive. Their influence contributed to several derogations, including the rural guarantee, which allows municipalities to retain limited development opportunities irrespective of broader land-take reduction targets. These groups constitute the main (**negatively affected third parties**), together with households aspiring to single-family homeownership and landowners who expected future increases in land value (Desrousseaux & Fournier, 2024). The principal tension therefore lies between increasingly ambitious national *ZAN* objectives and local traditions of growth-oriented planning. Debates concerning local autonomy, territorial equity, housing provision and

measurement methods continue to shape the implementation of French NNLT policy (**intervention hypothesis**).

Germany

Reducing land take (*Flächenverbrauch*) has been a central objective of German sustainability policy since the early 2000s. In 2002, the federal government incorporated quantitative land-saving targets into the National Sustainability Strategy, aiming to reduce the conversion of land for settlement and transport purposes from approximately 120 hectares per day to less than 30 hectares per day. Although this target was later postponed to 2030, the most recent update of the *Deutsche Nachhaltigkeitsstrategie* increased ambition further by linking land-use policy to the vision of a circular land-use economy and the long-term objective of achieving *Netto-Null-Flächenverbrauch* by 2050. Despite these ambitions, land consumption remains above target levels. According to Destatis, settlement and transport areas increased by an average of 51 hectares per day between 2020 and 2023 (Hofmeister, 2018; Destatis, 2025). Continued land conversion is therefore increasingly regarded as a sustainability challenge for biodiversity, climate resilience and the long-term availability of land resources (**political definition of the problem**).

Figure 4 – Actor-Centred Public Policy Analysis of German NNLT Policy (Source: created by the authors based on Knoepfel et al., 2011)



Housing, transport, energy and digital infrastructure continue to generate significant pressure on land resources (**causal hypothesis**). Germany's decentralised planning system gives municipalities considerable autonomy over local development decisions, while economic incentives linked to population growth, business attraction and municipal revenues have often favoured outward expansion. In response, planning policy has increasingly embraced the principle of *Innenentwicklung vor Außenentwicklung*, prioritising inner development over greenfield expansion. This approach is embedded in both the Spatial Planning Act (*Raumordnungsgesetz*) and the Federal Building Code (*Baugesetzbuch*), which emphasise economical land use and the reuse of already developed sites. The German debate has also evolved beyond simple quantitative targets towards broader discussions of qualitative densification that incorporate housing, green infrastructure and mobility considerations (Reiß-Schmidt, 2018; Umweltbundesamt, 2023). The proposed response therefore centres on strengthening coordination across planning levels, reusing previously developed land and further operationalising the principles of land-efficient development (**intervention hypothesis**).

Responsibility for implementation is shared across multiple levels of government. Federal and state authorities function as the main **political-administrative actors** by establishing strategic objectives and the legislative framework. Research institutions and agencies such as the *Umweltbundesamt* have also played an important role in advancing the debate on *Flächensparen* (Umweltbundesamt, 2018 & 2023). However, implementation ultimately depends on municipalities, which retain extensive authority over local land-use planning. Municipalities, together with developers, infrastructure providers and investors, therefore constitute the principal **target groups** because their decisions shape patterns of land consumption. Successful implementation benefits society through the preservation of open space, reduced soil sealing, improved biodiversity protection and greater climate resilience (**ultimate beneficiaries**). Municipalities experiencing demographic decline may also benefit from urban regeneration strategies and more efficient use of existing infrastructure, while lower long-term infrastructure costs represent an additional benefit (**positively affected third parties**).

Despite broad agreement on the desirability of reducing land consumption, implementation remains difficult. Developers and landowners whose economic interests depend on continued development opportunities frequently oppose more restrictive policies and therefore represent important (**negatively affected third parties**). Municipalities may also perceive stronger land-saving measures as limiting local development opportunities, particularly in regions facing housing shortages or seeking investment and employment. A central dilemma is that NNLT objectives increasingly compete with housing provision, energy-transition projects and local development ambitions. The expansion of renewable energy infrastructure, electricity networks, transport corridors and digital infrastructure continues to generate new land demands that often conflict with land-saving objectives (ARL, 2024a; ARL, 2024b). Strong municipal autonomy, combined with these competing demands, continues to hinder the operationalisation of NNLT across planning levels (**intervention hypothesis**).

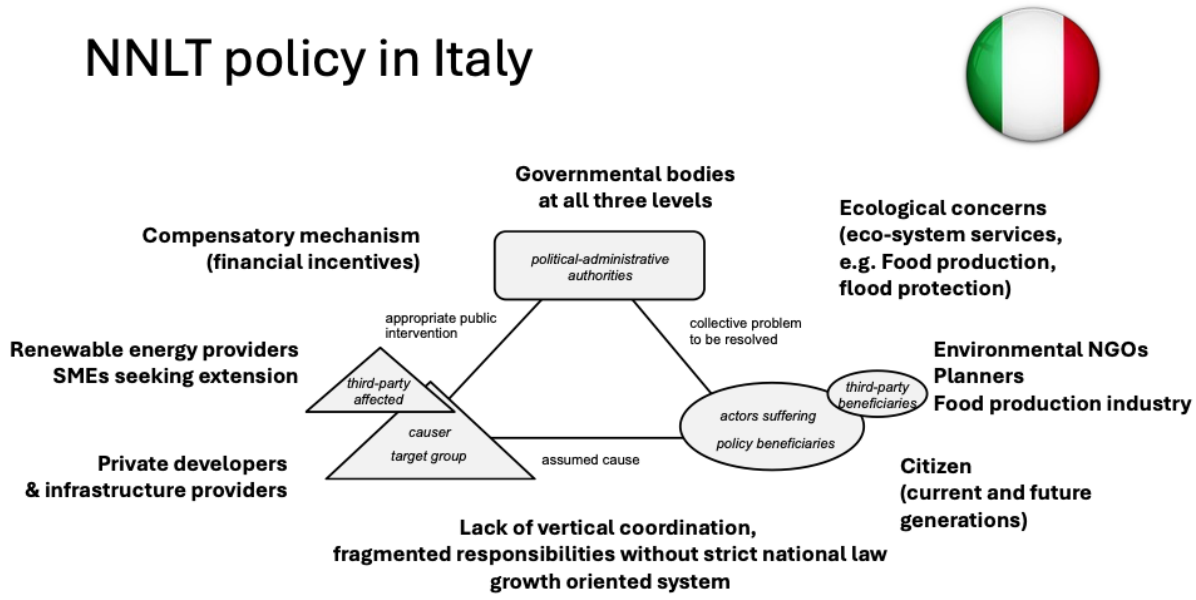
Italy

Italy has earlier legislation addressed related concerns through landscape protection and soil contamination. However, the term *consumo di suolo* entered the national policy agenda only around 2011-2012. Since then, a series of national strategies - including the *Strategia Nazionale per lo Sviluppo Sostenibile (SNSvS*), the *Piano per la Transizione Ecologica (PNTE)*, and the *Strategia Nazionale per la Biodiversità al 2030* - have gradually aligned around the objective of reducing land consumption and ultimately achieving zero net land take. The constitutional reform of 2022 further strengthened this policy direction by elevating environmental protection and biodiversity conservation to fundamental constitutional principles (MASE, 2017; Delibera, 2022; Legge Costituzionale, 2022; Decreto Ministeriale, 2023). Although this increasing political attention, Italy still lacks a dedicated national law on land take. Despite this, Italy has one of the most developed national systems for monitoring land consumption. Monitoring data from ISPRA and the National System for Environmental Protection (SNPA) show that land take reached 19.9 hectares per day (64.4 km^2 annually) in 2023, 22.9 hectares per day (87.3 km^2 annually) in 2024 and 21.5 hectares per day (78.5 km^2 annually) in 2025 (SNPA, 2024, 2025).

The Italian case can therefore be understood as one of partial institutionalisation of NNLT: the objective is recognised at the national strategic level and supported by an advanced monitoring system, but it has not yet been translated into a binding and coordinated national regulatory framework.

The Italian case is also characterised by historically dispersed and fragmented settlement patterns. The phenomenon described as urban sprinkling – the low-density diffusion and intermixing of residential, productive and other urban uses across formerly rural landscapes – has contributed to both land consumption and landscape fragmentation (Romano et al., 2017). Monitoring data from ISPRA and the National System for Environmental Protection (SNPA) show that land take reached 19.9 hectares per day in 2023, while net land take amounted to 64.4 km^2 (SNPA, 2024). As a result, consumo di suolo is increasingly regarded as a threat to ecosystem services, biodiversity, agricultural land, climate adaptation, and the long-term sustainability of urban and rural areas (political definition of the problem).

Figure 5 – Actor-Centred Public Policy Analysis of Italian NNLT Policy (Source: created by the authors based on Knoepfel et al., 2011)



Viewed through the policy triangle, the Italian case reveals a pronounced mismatch between policy recognition, regulatory authority and implementation capacity. The problem is generally attributed to a combination of economic incentives, fragmented

governance, and development-oriented planning practices (causal hypothesis). NNLT implementation depends heavily on regional and local priorities. In many situations, greenfield development remains more attractive than urban regeneration because undeveloped land is cheaper and easier to develop than previously developed sites. Italian regions have addressed land consumption. Regional approaches remain highly heterogeneous in terms of definitions, targets, regulatory instruments, implementation mechanisms, and monitoring provisions (Casavola, 2024; Zullo et al., 2025). To address the problem, policy increasingly focuses on stronger land protection, urban regeneration, brownfield redevelopment, reuse of existing buildings, and the application of the land-take hierarchy promoted by the EU Soil Strategy for 2030 (intervention hypothesis). The aim is to redirect development away from agricultural and natural land and towards already urbanised areas.

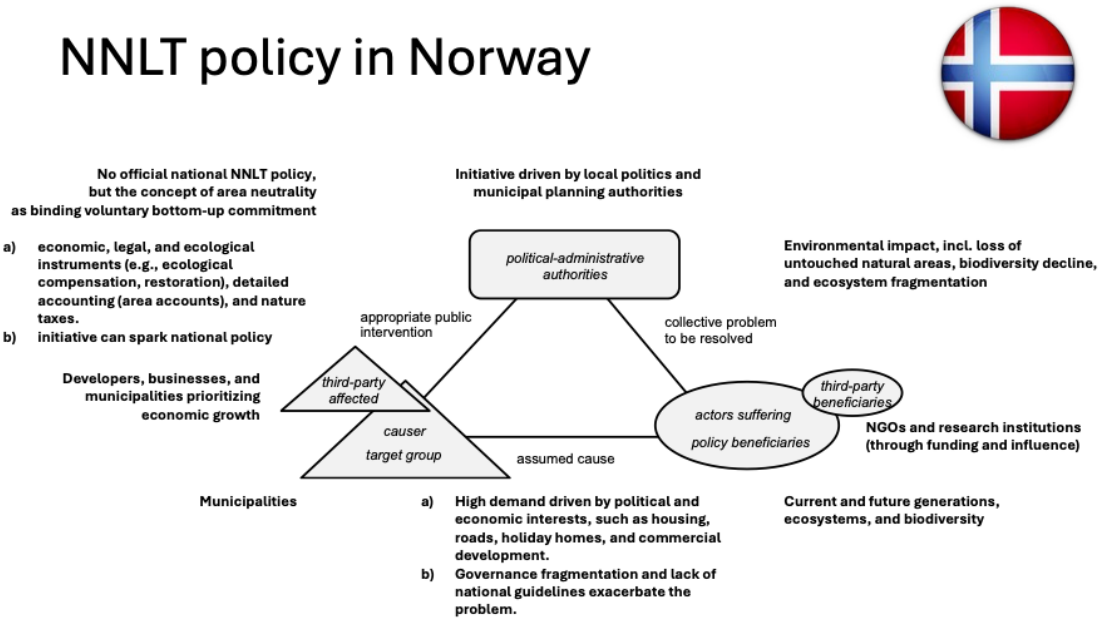
Implementation relies primarily on regional and municipal authorities. Italian regions have addressed land consumption unevenly, and the No Net Land Take (NNLT) objective has not been embedded across legislative and spatial-planning frameworks equally in all regions. Regional approaches remain highly heterogeneous in terms of definitions, targets, regulatory instruments, implementation mechanisms, and monitoring provisions (Casavola, 2024; Zullo et al., 2025). Regional governments act as the key political-administrative actors because they possess legislative and strategic planning competences, while municipalities retain responsibility for development approvals and therefore strongly influence actual land-use outcomes. National ministries and technical agencies, in particular ISPRA and the SNPA monitoring system, provide data and support policy development. Municipalities, private developers, infrastructure providers, industrial investors and other land-development interests constitute the principal target groups because their decisions generate demand for new land. The main ultimate beneficiaries of reduced land take are current and future generations, who benefit from the protection of fertile soils, biodiversity, ecosystem services, climate-regulation functions and flood prevention. Environmental organisations, planners, sustainable agriculture sectors, and actors involved in brownfield redevelopment and urban regeneration may also benefit from stronger implementation of NNLT-related policies (**positively affected third parties**).

At the same time, stricter land-conservation policies create tensions with economic development objectives. Construction companies, greenfield developers, logistics operators and other growth-oriented actors may face additional restrictions and therefore constitute the principal (**negatively affected third parties**). Similar tensions arise for renewable-energy projects, which often require large areas of land, and for SMEs seeking expansion opportunities where suitable brownfield sites are unavailable or economically unattractive. The Italian case therefore highlights the gap between increasingly ambitious policy objectives and the fragmented governance arrangements responsible for their implementation. The absence of a national law, regional variation, strong municipal autonomy and continuing incentives favouring expansion continue to hinder progress towards *consumo netto di suolo pari a zero*. Balancing economic development with land conservation and regeneration remains the central challenge (**intervention hypothesis**).

Norway

Unlike most of the other cases examined in this study, Norway has not adopted an official No Net Land Take (NNLT) target. Nevertheless, increasing attention has been given to the concept of *arealnøytralitet* (area neutrality), which was introduced by the environmental organisation *Sabima* in 2013 (Halleraker, 2025; Wilhemsen, n.d.; PwC & Sabima, n.d.). The concept emerged in response to growing concern about the loss and fragmentation of natural areas. According to the Norwegian Environment Agency, encroachment-free nature has declined by more than 10,000 km^2 over the last 35 years, while wilderness-affected natural areas have fallen from roughly half of Norway's land area at the beginning of the twentieth century to around 11.2% in 2023 (Miljødirektoratet, 2024). Against this background, land take is primarily discussed as a biodiversity and ecosystem issue rather than as a problem of urban sprawl or agricultural land loss (**political definition of the problem**). This distinguishes the Norwegian debate from many continental European cases.

Figure 6 – Actor-Centred Public Policy Analysis of Norwegian NNLT Policy (Source: created by the authors based on Knoepfel et al., 2011)



The degradation and fragmentation of natural areas are generally attributed to the cumulative effects of housing development, transport infrastructure, holiday homes, commercial activities, renewable-energy projects and other forms of land use (**causal hypothesis**) (Løken, 2023). Research undertaken by the Norwegian Institute for Nature Research (NINA) has shown that municipalities have allocated substantial areas for future development, creating continued pressure on nature (Simensen et al., 2023). In response, proponents of *arealnøytralitet* argue that new development should be balanced through avoidance, restoration and compensation measures (**intervention hypothesis**). This debate has generated increasing interest in instruments such as *arealregnskap* (area accounts), *naturregnskap* (nature accounts) (NINA, n.d.), ecological compensation and nature restoration (Hagen et al., 2022; Miljødirektoratet, 2023; Klima- og miljødepartementet, 2024). These approaches seek to ensure that losses of natural areas are either avoided or compensated for through ecological improvements elsewhere.

A distinctive feature of the Norwegian case is the central role of municipalities. Local authorities function as the main **political-administrative actors** because they have extensive autonomy over legally binding land-use plans for both terrestrial (Norsk

Kommunalteknisk Forening, 2025) and marine areas (Dyrset, 2025). Municipalities are simultaneously important **target groups**, since many of the decisions contributing to land take originate at the local level (see e.g., Nordre Follo kommune, n.d.; Løken, 2023). Developers, businesses, infrastructure providers and political actors promoting local growth likewise form part of the target group whose behaviour would need to change in order to reduce land consumption. The main **ultimate beneficiaries** are biodiversity, ecosystems and society more broadly through the protection of environmental quality and ecosystem services. Environmental NGOs, research institutions, universities and consultancies involved in developing and promoting area-neutral approaches may also benefit from growing policy interest in the topic (**positively affected third parties**). Organisations such as Sabima, NINA, NMBU and KS have all contributed to advancing these discussions (e.g., PwC & Sabima, n.d.).

Despite increasing interest in *arealnøytralitet*, implementation remains contested. Developers and businesses dependent on access to land often oppose restrictions on development and therefore constitute the main **negatively affected third parties.** Municipalities may also resist stronger limits when they perceive them as constraining economic growth, employment opportunities or local revenues. These tensions are particularly visible in coastal and marine areas, where development interests frequently clash with environmental concerns. Although the concept of *arealnøytralitet* has gained considerable traction from the bottom up - with growing interest among municipalities, NGOs and researchers - it has not yet been translated into a coherent national policy framework. Responsibility remains divided between different ministries and policy tracks, particularly those linked to nature accounts and area accounts. The continuing tension between biodiversity protection and local development ambitions therefore remains the defining feature of the Norwegian debate on *arealnøytralitet*.

Slovakia

Slovakia has not formally adopted a No Net Land Take (NNLT) target, and the concept remains largely absent from national policy debates. Recent developments have nonetheless intensified discussions about land use and spatial planning. Most notably, amendments to the Spatial Planning Act (200/2022 Z. z.) and a new Building Act (25/2025 Z. z.) introduced substantial procedural changes intended to accelerate development.

These reforms replaced the traditional two-stage zoning and building permit system with a single permit procedure, introduced mechanisms such as fictitious consent, reduced approval requirements for smaller projects, and restricted opportunities for public participation. While intended to simplify procedures, these changes have also raised concerns because they may facilitate additional land take. At the same time, Slovakia has a long-standing tradition of protecting agricultural land in case of their permanent set-aside through specialised legislation, economic instruments, and land-quality classifications (220/2004 Z. z.). The debate is therefore characterised by a tension between development-oriented reforms and farmland-protection objectives. Although NNLT is not an explicit policy goal, the continuing conversion of valuable agricultural land for residential, commercial, and industrial uses is increasingly perceived as a major land-use problem (**political definition of the problem**). Concerns about the loss of fertile soils, urban sprawl, and inefficient land use are also reflected in strategic documents such as *Envirostrategy* 2030 (Ministerstvo životného prostredia Slovenskej republiky, 2019).

Figure 7 – Actor-Centred Public Policy Analysis of Slovakian NNLT Policy (Source: created by the authors based on Knoepfel et al., 2011)



Despite existing protection mechanisms, authorities have struggled to redirect new development towards lower-quality land and brownfields (**causal hypothesis**). Between 1993 and 2020, land take increased by more than 110,000 hectares, while significant reductions were recorded in the area of gardens, orchards, vineyards, and arable land. In total, between 2005 and 2022, the agricultural land area decreased by 2.5% (Slovak Environment Agency, 2023). In 2025, the built-up areas in Slovakia accounted for 5% of the total area (ÚGKK SR, 2026). Industrial parks have frequently been developed on greenfield sites, even though numerous brownfields originating from former cooperatives, industrial facilities, and state-owned properties remain available (Izakovičová, 2022; Pekárová, 2024). Existing legislation discourages the conversion of productive agricultural land through fees linked to soil quality and ecological potential, yet these mechanisms have not fundamentally altered development patterns. Housing demand, industrial expansion, municipal growth ambitions, and the perceived need for economic development continue to exert pressure on high-quality agricultural land. A more NNLT-oriented approach would involve directing development towards brownfields and lower-quality land, strengthening restrictions on valuable agricultural soils, and increasing economic disincentives for land conversion (**intervention hypothesis**).

Responsibility for land protection is distributed across several levels of government. The Ministry of Agriculture and Rural Development acts as the principal **political-administrative actor** by establishing the legislative framework governing agricultural land protection and land conversion. Other government bodies are responsible for specific areas such as regional development, environmental protection and transport. Implementation, however, occurs largely at municipal levels (first level offices), where decisions concerning spatial planning and development are made. Municipalities therefore occupy a dual position. They are responsible for implementing land-protection objectives but are also often promoters of development projects intended to generate growth, housing, and employment. A specialised Authority for Spatial Planning and Construction was established in 2022, with regional offices taking over some responsibility from the municipalities, including the appeal of decisions (second level offices). Together with developers, landowners, and actors in the construction sector, municipalities constitute the principal **target groups** because their decisions directly

influence patterns of land conversion. The main **ultimate beneficiaries** are current and future generations, who benefit from the preservation of fertile soils, biodiversity, ecosystem services, and long-term food-production capacity. Farmers, environmental organisations, conservation interests, and local communities concerned about landscape change may also benefit from stronger land-protection measures (**positively affected third parties**).

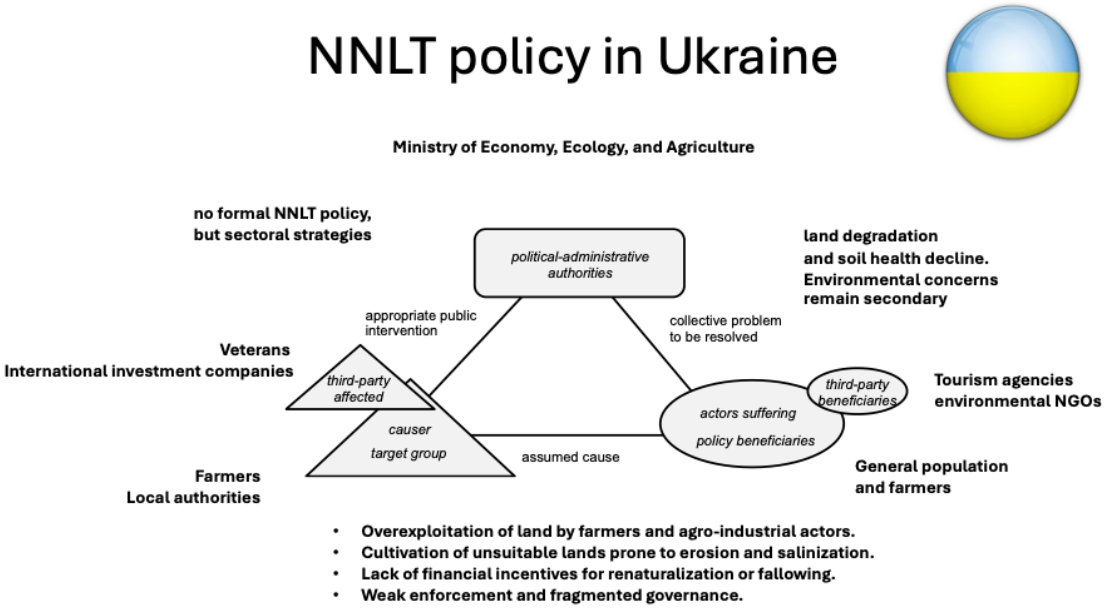
The main implementation challenges stem from conflicts between land protection and development interests. Developers, landowners, and construction-sector actors often regard stricter protection measures as constraints on investment opportunities and therefore represent the principal **negatively affected third parties**. Municipalities may similarly oppose stronger restrictions when these are perceived as limiting economic development or reducing their ability to attract residents and businesses. This conflict is particularly visible in the continuing expansion of industrial parks and suburban residential developments on productive agricultural land despite the existence of legal protection mechanisms. Slovakia therefore presents a notable contradiction: while it possesses one of the more developed systems for agricultural-land protection in Central Europe, recent planning reforms have reduced procedural barriers to development and may facilitate additional land conversion. Reconciling economic development ambitions with the long-term protection of scarce and increasingly valuable agricultural land remains the central challenge (**intervention hypothesis**).

Ukraine

Although international policy discussions increasingly focus on No Net Land Take (NNLT) and Land Degradation Neutrality (LDN), Ukraine has not adopted either concept as an explicit policy objective. Nevertheless, concerns related to land degradation and soil protection feature in several strategic documents, including the Concept of the National Target Programme for Land Use and Protection (Cabinet of Ministers of Ukraine, 2022), the National Action Plan to Combat Land Degradation and Desertification (Cabinet of Ministers of Ukraine, 2016), and the Concept of Combating Land Degradation and Desertification (Cabinet of Ministers of Ukraine, 2014). These documents primarily frame land as an agricultural and environmental resource rather than as a broader

spatial-planning issue. A notable example is the national target to reduce the share of tilted land from 54% to 44%, which was not achieved and was subsequently reaffirmed without a new implementation deadline. As a result, the central concern in Ukraine is not land take in the sense commonly found in Western European NNLT debates, but rather the ongoing degradation of land resources through unsustainable land use. Excessive exploitation of agricultural land, declining soil quality, biodiversity loss, and landscape degradation are increasingly recognised as significant challenges (**political definition of the problem**). Broader discussions of suburbanisation and urban land conversion remain relatively limited despite evidence that land take is occurring around major settlements.

Figure 8 – Actor-Centred Public Policy Analysis of Ukrainian NNLT Policy. Source: Created by the authors based on Knoepfel et al. (2011).



Land degradation is mainly attributed to intensive agricultural use, including cultivation of erosion-prone and environmentally unsuitable land (**causal hypothesis**). The problem is further aggravated by weak incentives for sustainable land management, limited access to scientific and technological support, and the absence of financial mechanisms encouraging land restoration or the withdrawal of degraded land from production. Although some localised controversies concerning wind-power developments and other infrastructure projects exist, agricultural land use remains the

principal source of environmental degradation. A more comprehensive approach would require stronger land-management instruments, incentives for restoration and ecological recovery, improved monitoring systems, and greater integration of conservation objectives across sectoral policies (**intervention hypothesis**). Despite various policy initiatives, many objectives have remained largely declarative and have not been translated into effective implementation measures.

Ukraine's institutional framework remains fragmented. Responsibility for land-related policy is concentrated within ministries responsible for agriculture, the economy, and environmental protection, although agricultural objectives tend to dominate. These institutions therefore function as the principal **political-administrative actors**. Local authorities possess certain planning and land-management responsibilities but have only limited influence over broader land-use dynamics. Municipalities are often expected to contribute to the mitigation of land degradation despite lacking clear national guidance and sufficient resources. The principal **target groups** are farmers, agricultural enterprises, and large agricultural holdings whose management practices directly affect soil quality and environmental conditions. Developers and wind-energy investors may also contribute to land take in specific locations. The main **ultimate beneficiaries** of stronger land-protection measures are ecosystems, biodiversity, and society more broadly through the preservation of healthy soils and functioning ecosystem services. Environmental organisations, agricultural scientists, consultants, and tourism operators dependent on attractive landscapes therefore represent important **positively affected third parties**.

The most significant implementation challenges arise from the political economy of land use. Two groups are particularly likely to resist stronger NNLT-related measures and therefore constitute important **negatively affected third parties**. The first consists of war veterans entitled to receive land plots for residential development under existing arrangements. Because these claims often enjoy political support, restrictions on land allocation can be difficult to implement. The second group comprises large agricultural holdings, including enterprises supported by foreign investment, whose commercial interests depend on maintaining access to land and maximising agricultural production. These actors possess substantial economic and political influence and may oppose restrictions on land use or obligations relating to restoration and renaturalisation.

Despite several strategic documents addressing land degradation, implementation remains weak due to limited funding, fragmented governance, low public awareness, and insufficient enforcement. The absence of a coherent national framework remains a major obstacle to the development of NNLT-related policies in Ukraine (**intervention hypothesis**).

Discussion: Comparative Analysis

A comparison of the seven countries shows that they all address the environmental consequences of land-use change, but they do so from rather different **political definition of the problem**. In Belgium (Flanders), France, Germany and Italy, the discussion is centred on land take as a planning problem linked to urban expansion and the consumption of open land. France speaks of artificialisation and has institutionalised the objective through *Zéro Artificialisation Nette (ZAN),* while Flanders focuses on the *bouwshift* and Germany on reducing *Flächenverbrauch*. Italy increasingly frames consumo di suolo as both spatial-planning problem and a threat to ecosystem services and agricultural land. Norway differs somewhat, as the debate around *arealnøytralitet* is driven primarily by concerns about biodiversity loss and habitat fragmentation. Slovakia focuses mainly on the protection of high-quality agricultural land, whereas Ukraine's debate is shaped above all by concerns about land degradation and soil quality rather than land take itself.

Although the problems are framed differently, the explanations offered (**causal hypothesis**) are remarkably similar. In most cases, land take is linked to long-standing development patterns that have favoured expansion over reuse. In Flanders, the key issue is the large stock of development rights created by historical zoning plans. France points to a post-war growth model based on urban expansion and competition between municipalities. Germany highlights the continuing demand for housing, transport infrastructure, renewable energy and digital infrastructure, combined with strong municipal autonomy. Italy similarly identifies economic incentives favouring undeveloped land over more complex regeneration processes, substantial heterogeneity among regional planning frameworks and fragmented multi-level governance as drivers of continued greenfield development. Comparable development pressures are evident across the case countries, including housing demand,

infrastructure expansion, leisure-related development, and broader economic activities. In Norway, these pressures have become particularly salient in debates surrounding the NNLT) policy, while Slovakia struggles to redirect development away from productive agricultural land and towards brownfields. Ukraine stands apart in that agricultural overexploitation rather than urbanisation is considered the principal cause of environmental degradation. Despite these differences, all seven countries point to institutional and economic incentives that continue to encourage land conversion.

The policy responses (**intervention hypothesis**) proposed are more diverse. Belgium seeks to reduce land take through rezoning and downzoning under the *bouwshift*. France has developed the most comprehensive framework, combining quantified targets with densification, brownfield redevelopment and ecological compensation through her '*loi ZAN'*. Germany emphasises *Innenentwicklung vor Außenentwicklung*, prioritising inner development and the reuse of already developed sites. Italy follows a similar path through urban regeneration and brownfield redevelopment, although without a comprehensive national law. Norwegian discussions focus on *arealnøytralitet*, ecological compensation and new accounting tools such as *arealregnskap* and *naturregnskap*. Slovakia relies primarily on agricultural-land protection and would move closer to an NNLT approach by steering development towards lower-quality land and brownfields. Ukraine's proposed measures focus on land restoration, monitoring and more sustainable agricultural practices rather than spatial-planning instruments.

The actor analysis also reveals several similarities. In all seven countries, implementation depends on multiple levels of government as **political-administrative authorities** in charge. National or regional authorities define the overall policy direction, but local actors largely determine whether these objectives are realised in practice. Municipalities are therefore central actors in almost every case. This is particularly visible in Belgium, France, Germany, Italy, Norway and Slovakia, where local authorities control key planning decisions. Ukraine is somewhat different because agricultural actors play a more prominent role than municipalities. Even so, the cases point in the same direction: policy ambitions are usually formulated at higher levels of government, whereas implementation depends heavily on decisions made locally.

The same pattern appears when looking at the **target groups**. Municipalities, developers, investors and other actors involved in land development are expected to change their behaviour in most countries. In Belgium, municipalities are expected to implement downzoning. In France and Germany, both local authorities and developers are expected to support more land-efficient forms of development. Italian and Norwegian debates also focus on changing local planning practices and development patterns. Slovakia seeks to influence municipalities, developers and landowners, while Ukraine primarily targets farmers and agricultural holdings. Despite the variation, the target groups are generally those whose decisions directly contribute to land conversion or degradation.

Across all seven countries, the **ultimate beneficiaries** are also broadly similar. Reduced land take is expected to protect biodiversity, ecosystem services, open space, agricultural land and environmental quality. Most countries explicitly refer to future generations as the more direct beneficiaries, while Norwegian municipalities place particular emphasis on ecosystems and biodiversity. In Ukraine, healthy soils and long-term land productivity are especially important. Although the language differs, the underlying rationale is comparable: land is treated as a limited resource whose protection generates long-term public benefits.

A similar degree of consistency can be found among **positively affected third parties**. Environmental organisations appear in all cases, either as advocates of stronger land protection or as beneficiaries of successful implementation. Research institutions play an especially visible role in Norway, where organisations such as NINA and Sabima have contributed significantly to the debate. In France and Italy, actors involved in brownfield redevelopment and ecological restoration may benefit economically from stricter land-use policies. Farmers emerge as potential beneficiaries in Slovakia because stronger farmland protection aligns with their interests. In Ukraine, tourism interests and environmental experts stand to gain from better protection of landscapes and soils.

The **negatively affected third parties** are generally easier to identify. Across most countries, they include actors whose economic interests depend on access to developable land. Landowners play a particularly important role in Flanders because downzoning directly affects development rights. Developers, construction interests and growth-oriented municipalities appear repeatedly in France, Germany, Italy, Norway and

Slovakia. In Ukraine, resistance is expected mainly from large agricultural holdings and other actors dependent on unrestricted access to land. In this respect, all seven cases reveal a similar tension between environmental objectives and economic interests.

The main differences emerge when examining implementation challenges. In Flanders, the core issue concerns compensation for withdrawn development rights. France struggles with balancing national *ZAN* objectives and local growth ambitions. Germany faces increasing competition between land-saving goals, housing provision, infrastructure expansion and the energy transition. Italy's difficulties stem largely from fragmented governance and the absence of a strong national legal framework. Norway has developed a lively debate around *arealnøytralitet* but lacks a coherent national policy. Slovakia faces a contradiction between agricultural-land protection and planning reforms designed to stimulate development. Ukraine confronts more fundamental problems related to administrative capacity, funding and enforcement.

Conclusion: From a European Objective to Local Land-Use Decisions

One of the central findings of this study is that NNLT is simultaneously a European, national, and local policy issue. The concept itself has largely emerged through European policy debates, particularly through the EU Soil Strategy, the Roadmap to a Resource Efficient Europe, and the broader objective of achieving no net land take by 2050. Yet the comparison demonstrates that the practical meaning of NNLT is ultimately determined within national planning systems and, even more importantly, through local land-use decisions. In other words, while NNLT is formulated as a European objective, it can only be realised through thousands of decisions taken by national administrations, regional planning authorities, and municipalities.

The comparison shows that the translation of a common European objective into national policy frameworks is far from straightforward. Countries differ not only in their legal systems and planning traditions, but also in the way they define the underlying problem. At the same time, the study reveals a recurring gap between political commitment and implementation. Even in countries where NNLT has become an explicit policy objective, implementation often conflicts with other policy priorities. The comparison repeatedly identifies situations in which governments promote land protection while simultaneously introducing measures that facilitate additional

development. The comparison therefore suggests that the main challenge is not the absence of policy goals for land and land protection, but the reconciliation of competing policy objectives within the same governance system.

The findings also highlight the importance of scale. National governments often define strategic objectives, but municipalities remain the actors that ultimately decide whether land is developed, protected, rezoned, or restored. As a result, NNLT policies frequently encounter what can be described as a vertical implementation challenge. National and regional authorities may seek to reduce land take, while local governments remain under pressure to provide housing, attract investment, expand infrastructure, or increase tax revenues. In practice, these local priorities often generate incentives that favour development rather than restraint. The implementation of NNLT therefore depends not only on national legislation, but also on whether municipalities perceive land conservation as compatible with their own development objectives.

A further lesson concerns the role of incentives. Across all countries, resistance to NNLT is rarely rooted in opposition to environmental protection as such. Instead, conflicts emerge because land-use restrictions redistribute costs and benefits among different actors. Landowners may lose development opportunities, municipalities may perceive constraints on local growth, and developers may face higher costs or increased uncertainty. Consequently, successful implementation requires more than regulatory restrictions. Mechanisms that make land recycling, brownfield redevelopment, urban regeneration, and inner development economically attractive appear equally important. The experiences of Germany and Italy suggest that NNLT is more likely to succeed when environmental goals are aligned with economic incentives rather than positioned in opposition to them.

Another noteworthy finding concerns the growing importance of information and monitoring. Effective implementation depends on the ability to identify, measure, and evaluate land-use change. Monitoring systems are not merely technical instruments. They shape how problems are perceived, influence political debates, and determine whether progress towards NNLT can be assessed credibly. Future NNLT policies may therefore depend as much on improved information systems as on additional regulatory instruments.

Finally, the comparison points to the need for greater integration across policy sectors. Land take is not solely a planning issue. It is closely connected to climate policy, biodiversity protection, housing provision, agricultural policy, transport infrastructure, and renewable-energy development. Many implementation conflicts identified in this study arise precisely because decisions taken in one sector create pressure on objectives pursued in another. As some European countries move towards the 2050 NNLT objective, success will therefore depend less on adopting additional targets and more on the capacity to coordinate competing policy agendas across different levels of government.

Taken together, the seven cases suggest that NNLT should not be understood as a single policy, but rather as a governance challenge to integrate the goal in planning and development practices the different tiers. The European level provides direction yet implementation remains firmly embedded in national institutions and local planning practices. Whether Europe achieves its long-term objective will ultimately depend on the ability of national and local actors to translate broad environmental ambitions into everyday land-use decisions. In that sense, the future of NNLT will be determined not primarily in Brussels, but in regional planning offices, municipal councils, and local development negotiations across Europe.

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Author statement on the use of Artificial Intelligence (AI) tools

We confirm that AI tools were used in the preparation of this manuscript in the following ways: AI tools were used to support the drafting and revision of this manuscript. As all authors are non-native English speakers, AI-assisted editing was used to improve language quality, harmonise writing style across contributions, and enhance analytical comparability through more consistent terminology and presentation. All intellectual contributions, interpretations, and final text were critically reviewed and validated by the authors, who take full responsibility for the accuracy, originality, and integrity of the work. We also confirm that all references cited in the manuscript are authentic, have been checked against original sources, and are not fabricated or generated by AI.

References

ARL – Academy for Territorial Development in the Leibniz Association. (2024a). Perspektive netto-null Flächenverbrauch – Innenentwicklung, flächensparendes Bauen, Flächenrückgabe und städtebauliche Qualifizierung als Elemente einer Flächenkreislaufwirtschaft. https://doi.org/10.60683/4DGK-PP55

ARL – Academy for Territorial Development in the Leibniz Association. (2024b). Raumentwicklung - ARL-Journal für Wissenschaft und Praxis: Fläche. https://doi.org/10.60683/S0Q5-ZE87

Buitelaar, E., & Leinfelder, H. (2020). Public design of urban sprawl: Governments and the extension of the urban fabric in Flanders and the Netherlands. Urban Planning, 5(1), 46-57.

Cabinet of Ministers of Ukraine. (2014). On approval of the Concept of Combating Land Degradation and Desertification (Decree No. 1024-r). https://zakon.rada.gov.ua/go/1024-2014-%D1%80

Cabinet of Ministers of Ukraine. (2016). On approval of the National Action Plan to Combat Land Degradation and Desertification (Decree No. 271-r). https://zakon.rada.gov.ua/laws/show/271-2016-%D1%80#Text

Cabinet of Ministers of Ukraine. (2022). On approval of the Concept of the National Target Program for Land Use and Protection (Decree No. 70-r). https://zakon.rada.gov.ua/laws/show/70-2022-%D1%80#Text

Casavola, D. (2024). Fragmented Spatial Planning: How the Differential Regional Legislative Framework Influences Land Consumption in Italy. Europa XXI, 47, 5–22. DOI: 10.7163/Eu21.2024.47.9

Charmes, É. (2023). Jusqu'où les surfaces urbanisées sont-elles artificialisées? Fonciers en débat. https://fonciers-en-debat.com/jusquou-les-surfaces-urbanisees-sont-elles-artificialisees-a-propos-du-projet-de-nouveau-decret-sur-la-nomenclature-des-sols/

Claus, T., Gheysen, M., & Leinfelder, H. (2025). How exceptions to land use regulations enter planning legislation. The Flemish case of rebuilding non-conforming dwellings. European Planning Studies, 33(3), 352-376.

Colsaet, A., Laurans, Y., & Levrel, H. (2018). What drives land take and urban land expansion? A systematic review. *Land Use Policy*, *79*, 339-349.

Davy, B. (2016). *Land policy: Planning and the spatial consequences of property*. Routledge.

Decoville, A., & Feltgen, V. (2023). Clarifying the EU objective of no net land take: A necessity to avoid the cure being worse than the disease. Land Use Policy, 131, 106722. DOI: 10.1016/j.landusepol.2023.106722

Decoville, A., Schneider, M. (2016). Can the 2050 zero land take objective of the EU be reliably monitored? A comparative study. In: Journal of Land Use Science 11 (3), 331–349. https://doi.org/10.1080/1747423X.2014.994567

Decreto Ministeriale (2023), Approvazione del piano d'azione nazionale per la sostenibilità ambientale dei consumi nel settore della pubblica amministrazione 2023. (23A04670) (GU Serie Generale n.193 del 19-08-2023). (2023). Gazzetta Ufficiale. https://www.gazzettaufficiale.it/eli/id/2023/08/19/23A04670/SG

Delattre, R., Lecourt, T. (2024). Faut-il pouvoir mesurer la consommation d'espace pour la réduire? Géopoint. Mesurer l'espace et Après?, Jun 2024, 19-21.

Delibera (2022), Approvazione del Piano per la transizione ecologica ai sensi dell'art. 57-bis, comma e) e seguenti, del decreto legislativo 3 aprile 2006, n. 152. (Delibera n. 1/2022). (22A03536) (GU Serie Generale n.138 del 15-06-2022). (2022). Gazzetta Ufficiale. https://www.gazzettaufficiale.it/eli/id/2022/06/15/22A03536/SG

Dembski, S., Hartmann, T., Hengstermann, A., & Dunning, R. (2025). Densification policy between state and market: strategies of land policy in four European countries. *Town Planning Review*, *96*(4), 469-493.

Desjardins, X. (2024). Ce que nous disent les débats sur le « Zéro artificialisation nette » des défis de la planification écologique. Revue juridique de l'environnement, 49, 9-12.

Desrousseaux, M., Fournier, M. (2024). Le rétrozonage ou le retour à l'affectation agricole ou naturelle des sols : du conflit au projet territorial. Annales de géographie, No. 5-6, 241-258. DOI: 10.3917/ag.759.0241

Destatis. (2025). Pressemitteilungen: Siedlungs- und Verkehrsfläche wächst jeden Tag um 51 Hektar. https://www.destatis.de/DE/Themen/Branchen-Unternehmen/Landwirtschaft-Forstwirtschaft-Fischerei/Flaechennutzung/_inhalt.html

Dyrset, G. (2025). Blue growth in Norway–Three emerging narratives. Marine Policy, 178, 106718. https://doi.org/10.1016/j.marpol.2025.106718

European Commission (2011). Roadmap to a Resource Efficient Europe. COM(2011) 571. Brussels.

European Commission (2021). EU soil strategy for 2030. COM(2021) 699 final. Brussels.

European Commission (2025). Directive on Soil Monitoring and Resilience. COM(2023) 416. Brussels.

European Environment Agency (2022). *Land take and land degradation in functional urban areas* (EEA Report No 17/2021). Luxembourg: Publications Office of the European Union. https://www.eea.europa.eu/en/analysis/publications/land-take-and-land-degradation

Gerber, J. D., Knoepfel, P., Nahrath, S., & Varone, F. (2009). Institutional Resource Regimes: Towards sustainability through the combination of property-rights theory and policy analysis. *Ecological economics*, *68*(3), 798-809.

Hagen, D., Skrindo, A. B., Evju, M., Nybø, S., Simensen, T., & Kolstad, A. L. (2022). Nye virkemidler i arealforvaltningen–naturrestaurering, arealregnskap og naturavgift. https://hdl.handle.net/11250/2981763

Halleraker, J. H. (2025). Arealnøytralitet. Store norske leksikon. Retrieved September 29 2025, from https://snl.no/arealn%C3%B8ytralitet

Hengstermann, A., Wenner, F., Jehling, M., & Hartmann, T. (2023). Innovative land policies in Europe. *Raumforschung und Raumordnung| Spatial Research and Planning*, *81*(6), 575-578.

Hofmeister, S. (2018). Nachhaltigkeit. In Handwörterbuch der Stadt- und Raumentwicklung (pp. 1587–1602). ARL – Academy for Territorial Development in the Leibniz Association. https://www.arl-net.de/system/files/media-shop/pdf/HWB%202018/Nachhaltigkeit.pdf

Idt, J., Le Bivic, C., & Melot, R. (2025). Urban planning in the context of no net land take: towards a new planning paradigm in Europe?. *Town Planning Review*, *96*(4), 337-346.

Izakovičová, Z. (2022). Zmeny poľnohospodárskej krajiny Slovenska. Agroporadenstvo / Ústav Krajinnej Ekológie SAV. https://www.agroporadenstvo.sk/rastlinna-vyroba-rastlinna-vyroba?article=2592

Klima- og miljødepartementet. (2024). NOU 2024:2 I samspill med naturen. Naturrisiko for næringer, sektorer og samfunn i Norge. Retrieved September 29, from https://www.regjeringen.no/no/dokumenter/nou-2024-2/id3024887/

Knoepfel, P., Larrue, C., Varone, F., & Hill, M. (2011). *Public policy analysis*. Policy Press.

Lacoere, P. (2023). Van groei naar grens. Ruimteneutraliteot en bouwshift als doelstellingen van duurzaam landgebruik (From growth to limits). Gompel&Svacina. Antwerp.

Lacoere, P., Decoville, A., Delattre, R., Melot, R., Grimski, D., Schamann, M., & Halleux, J. M. (2025). National introduction of no net land take: a comparative study of five pioneering countries seeking to limit their land consumption. *Town Planning Review*, *96*(4), 347-371. DOI: 10.3828/tpr.2024.44

Lacoere, P., Hengstermann, A., Jehling, M., & Hartmann, T. (2023). Compensating downzoning. A comparative analysis of European compensation schemes in the light of net land neutrality. Planning Theory & Practice, 24(2), 190-206. https://doi.org/10.1080/14649357.2023.2190152

Lacoere, P., Leinfelder, H. (2022). Land oversupply. How rigid land-use planning and legal certainty hinder new policy for Flanders. In: European Planning Studies 31 (9), 1926-1948. https://doi.org/10.1080/09654313.2022.2148456

Le Bivic, C., Guelton, S., Jehling, M., Kleiner, C. (2025). Land Policy in France: Tensions Between National Policies and Local Practice, in: Hartmann, T., Hengstermann, A., Jehling, M., Schindelegger, A., Wenner, F. (Eds.), Land Policies in Europe: Land-Use Planning, Property Rights, and Spatial Development. Springer Nature Switzerland, Cham, pp. 105–120. DOI: 10.1007/978-3-031-83725-8_7

Legge Costituzionale (2022), n. 1 Modifiche agli articoli 9 e 41 della Costituzione in materia di tutela dell'ambiente. (22G00019) (GU Serie Generale n.44 del 22-02-2022). (2022). Gazzetta Ufficiale. https://www.gazzettaufficiale.it/atto/serie_generale/caricaDettaglioAtto/originario?atto.dataPubblicazioneGazzetta=2022-02-22&atto.codiceRedazionale=22G00019&elenco30giorni=false

Løken, M. (2023). Political rationales behind implementation of the area neutrality policy in the Norwegian municipality of Nordre Follo [Master's thesis, Norwegian University of Life Sciences]. https://hdl.handle.net/11250/3089280

Miljødirektoratet. (2023). Evaluering av økologisk kompensasjon i Åkersvika naturreservat. Retrieved September 29, from https://www.miljodirektoratet.no/publikasjoner/2023/mars-2023/evaluering-av-okologisk-kompensasjon-i-akersvika-naturreservat/

Miljødirektoratet. (2024). Inngrepsfrie naturområder. Retrieved September 18 2025, from https://www.miljodirektoratet.no/ansvarsomrader/overvaking-arealplanlegging/naturkartlegging/Inngrepsfrie-naturomrader/

Ministero dell'Ambiente e della Sicurezza Energetica (MASE). (2017). Strategia Nazionale per lo Sviluppo Sostenibile. https://www.mase.gov.it/portale/documents/d/guest/snsvs_ottobre2017-pdf-1

Ministerstvo životného prostredia Slovenskej republiky. (2019). Zelenšie Slovensko: Stratégia environmentálnej politiky Slovenskej republiky do roku 2030. https://www.minzp.sk/files/iep/03_vlastny_material_envirostrategia2030_def.pdf

Nessi, H. (2024). L'impact de la politique du Zéro artificialisation nette. Sur les pratiques des aménageurs et l'aménagement urbain. Revue internationale d'urbanisme. No. 15. https://www.riurba.review/article/15-foncier/impact-du-zan

NINA. (n.d.). Naturregnskap. Retrieved September 29 2025, from https://www.nina.no/B%C3%A6rekraftig-samfunn/Naturregnskap

Nordre Follo kommune. (n.d.). Arealnøytralitet. Retrieved September 29 2025, from https://www.nordrefollo.kommune.no/vi-utvikler-nordre-follo/klima-og-miljo/arealnoytralitet/

Nørgård, J., & Xue, J. (2016). Between green growth and degrowth: Decoupling, rebound effects and the politics for long-term sustainability. In *Rethinking climate and energy policies: New perspectives on the rebound phenomenon* (pp. 267-284). Cham: Springer International Publishing.

Norsk Kommunalteknisk Forening. (2025). Hvordan kan Kommune-Norge bli arealnøytralt? Innsikt fra Klimafestivalen i Bergen. Retrieved September 29 2025, from https://www.nkf.no/artikler/hvordan-kan-kommune-norge-bli-arealnoytralt-innsikt-fra-klimafestivalen-i-bergen

Pekárová, E. (2024). Poľnohospodárska pôda na Slovensku v číslach. Agroporadenstvo. https://www.agroporadenstvo.sk/nove-poznatky-poda?article=3186

Pesaresi, M., Ehrlich, D., Kemper, T., Siragusa, A., Florczyk, A. J., Freire, S., Corbane, C. (2017): Atlas of the Human Planet 2017. Global Exposure to Natural Hazards. EUR 28556 EN. Brussels.

Prokop, G. & Salata, S. (2017). The European approach: Limitation, mitigation and compensation. In: Urban Expansion, Land Cover and Soils Ecosystem Services. Routledge, 265-275.

Prokop, G., Jobstmann, H. & A. Schönbauer (2011). Report on best practices for limiting soil sealing and mitigating its effects. In: European Communities (Ed.): Technical Report 2011/050. European Commission, Brussels.

PwC & Sabima. (n.d.). Naturpositiv ledelse: En praktisk veileder til arbeid med naturrisiko i næringslivet. Retrieved September 29 2025, from https://www.pwc.no/no/nyheter/naturpositiv-ledelse-rapport-digital.pdf

Reiß-Schmidt, S. (2018). Innenentwicklung. In Handwörterbuch der Stadt- und Raumentwicklung (pp. 995–1000). ARL – Academy for Territorial Development in the Leibniz Association. https://www.arl-net.de/system/files/media-shop/pdf/HWB%202018/Innenentwicklung.pdf

Romano, B., Zullo, F., Fiorini, L., Ciabò, S., & Marucci, A. (2017). Sprinkling: An Approach to Describe Urbanization Dynamics in Italy. *Sustainability*, 9, Article No. 97. https://doi.org/10.3390/su9010097

Scharpf, F. W. (1997). *Games real actors play: Actor-centered institutionalism in policy research*. Routledge.

Schiavina, M., Melchiorri, M., Corbane, C., Freire, S., & Batista e Silva, F. (2022). Built-up areas are expanding faster than population growth: regional patterns and trajectories in Europe. *Journal of land use science*, *17*(1), 591-608.

Simensen, T., A'Campo, W., Atakan, A., Heggdal, J. E., Aune-Lundberg, L., Vagnildhaug, A., Kristensen, Ø., & Lindaas, G. O. (2023). Planlagt utbyggingsareal i Norge. Identifisering av mulig framtidig utbyggingsareal i kommunale arealplaner etter plan-og bygningsloven (NINA Rapport; 2310). Norsk institutt for naturforskning (NINA).

Sistema Nazionale per la Protezione dell'Ambiente (SNPA). (2024). Consumo di suolo, dinamiche territoriali e servizi ecosistemici (Edizione 2024, Report ambientali SNPA, 43/2024).

Sistema Nazionale per la Protezione dell'Ambiente (SNPA). (2025). Consumo di suolo, dinamiche territoriali e servizi ecosistemici (Edizione 2025, Report ambientali SNPA, 46/2025).

Slovak Environment Agency. (2023). *Land use*. ENVIROPORTÁL. https://www.enviroportal.sk/indikator/1704

ÚGKK SR. (2026). *Štatistická ročenka o pôdnom fonde v SR podľa údajov katastra nehnuteľností k 1. Januáru 2026* (1.). Úrad geodézie, kartografie a katastra Slovenskej republiky.

Umweltbundesamt. (2018). Instrumente zur Reduzierung der Flächeninanspruchnahme. Aktionsplan Flächensparen. https://www.umweltbundesamt.de/sites/default/files/medien/1410/publikationen/2018-05-24_texte_38-2018_reduzierung-flaecheninanspruchnahme.pdf

Umweltbundesamt. (2023). Dreifache Innenentwicklung: Definition, Aufgaben und Chancen für eine umweltorientierte Stadtentwicklung. https://www.umweltbundesamt.de/sites/default/files/medien/1410/publikationen/230515_uba_hg_dreifacheinnenentwicklung_2auflg_br.pdf

van Vliet, J., Yang, H., Bakker, V., & Li, M. (2024). Global inequality in built-up land per capita and its change trajectories between 1985 and 2020. *Geography and Sustainability*, *5*(4), 541-547.

Weil, R. & Brady, N. (2017). The Nature and Properties of Soils. 15th Edition. Pearson. Harlow.

Wilhemsen, E. (n.d.). Et arealnøytralt Norge. Retrieved September 29 2025, from https://www.sabima.no/et-arealnoytralt-norge/

Zákon č. 25/2025 Z. z., Stavebný zákon v znení účinnom od 1. novembra 2025 do 31. decembra 2026. Slov-Lex. https://www.slov-lex.sk/ezbierky/pravne-predpisy/SK/ZZ/2025/25/ Zákon č. 200/2022 Z. z. o územnom plánovani v znení účinnom od 1. marca 2026. Slov-Lex. https://www.slov-lex.sk/ezbierky/pravne-predpisy/SK/ZZ/2022/200/Zákon č. 220/2004 Z. z. o ochrane a využívaní poľnohospodárskej pôdy a o zmene zákona č. 245/2003 Z. z. o integrovanej prevencii a kontrole znečisťovania životného prostredia a o zmene a doplnení niektorých zákonov v znení účinnom od 1. júna 2025. Slov-Lex. https://www.slov-lex.sk/ezbierky/pravne-predpisy/SK/ZZ/2004/220/

Zullo, F., Montaldi, C., Felli, A., Tomei, V., Marziali, E. (2025). Cambiare tutto per non cambiare niente: l'Italia verso l'obiettivo del No Net Land Take. In: Consumo di suolo, dinamiche territoriali e servizi ecosistemici. Edizione 2025, Report ambientali SNPA, 46/2025 (pp. 381–385). https://ricerca.univaq.it/handle/11697/271219