

SUPER – Sustainable Urbanisation and Land Use Practices in European Regions

Applied Research

Annex 3.5: Case study DE-30ha

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Authors

Anna Hellings, BBSR (Germany), Volker Schmidt-Seiwert, BBSR (Germany), Joaquín Farinós-Dasí, University of Valencia (Spain), Albert Llausàs, University of Valencia (Spain), Carmen Zornoza-Gallego, University of Valencia (Spain), David Evers, PBL (Netherlands)

On the basis of contributions from

David Evers, Maarten van Schie, Lia van den Broek, Kersten Nabielek, Jan Ritsema van Eck, Frank van Rijn, Ries van der Wouden, PBL - Netherlands Environmental Assessment Agency (Netherlands)

Volker Schmidt-Seiwert, Anna Hellings, Regine Binot, Lukas Kiel, supported by Jonathan Terschanski, BBSR - Federal Institute for Research on Building, Urban Affairs and Spatial Development (Germany)

Giancarlo Cotella, Umberto Janin Rivolin, Alys Solly, Erblin Berisha, Donato Casavola, Politecnico di Torino (Italy)

Ivana Katuriđ, Mario Gregar, Sven Simov, Katarina Pavlek, Ranko Lipovac, URBANEX (Croatia)

Joaquín Farinós-Dasí, Albert Llausàs, Carmen Zornoza-Gallego, University of Valencia (Spain)

Dorota Celinska-Janowicz, Adam Ploszaj, Katarzyna Wojnar, University of Warsaw, Centre for European Regional and Local Studies - EUROREG (Poland)

Mailin Gaupp-Berghausen, Erich Dallhammer, Bernd Schuh, Ursula Mollay, Roland Gaugitsch, Liudmila Slivinskaya, ÖIR GmbH - Austrian Institute for Regional Studies (Austria)

Tristan Claus, University of Ghent (Belgium)

Advisory Group

Project Support Team: Isabelle Loris, Flanders Department of Environment (Belgium), Tamara Slobodova, Ministry of Transport and Construction (Slovakia), Harald Noreik, Ministry of Local Government and Modernisation, (Norway), Frederick-Christoph Richters, Ministry of Energy and Spatial Planning (Luxembourg)

ESPON EGTC: Marjan van Herwijnen (project expert), György Alföldy (financial expert)

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Table of contents

List of Figures	ii
List of Tables	ii
1 General introduction	1
1.1 Case study DE-30ha	2
1.2 Scale/s of analysis.....	3
1.3 Geographical scope	4
2 Contextual analysis	5
2.1 Typical urban development	5
2.2 Basic institutional conditions	6
2.3 Initiative	7
2.4 Planning permission	8
2.5 Development process.....	8
2.6 Current issues	9
3 Sustainability of objectives	10
3.1 Thematic dimensions	10
3.2 Temporal balance.....	10
4 Impact assessment	12
4.1 Pre-intervention	12
4.1.1 Identification of the problem	12
4.1.2 Inception of goals/action	13
4.1.3 Pre-intervention conclusions	14
4.2 Implementation	14
4.2.1 Technical capability	14
4.2.2 Data and information	14
4.2.3 Participation.....	15
4.2.4 Strategic vision	16
4.2.5 Institutional coordination	16
4.2.6 Institutional leadership	16
4.2.7 Political will	17
4.2.8 Implementation conclusions.....	18
4.3 Sustainability assessment	18
4.3.1 Planning and development culture	18
4.3.2 Economy	19
4.3.3 Ecology.....	20
4.3.4 Equity	20
4.3.5 Balance	21
4.3.6 Multi-stakeholder assessment conclusions.....	23
4.4 Conclusions	25
4.5 Implications for sustainable urbanization and land use	29
5 Sources	32

List of Maps

Map 1.1: Location of case study “DE-30ha”	3
Map 4.1: Changes to urban use per LAU Area from 2012 to 2018.....	24
Map 4.2: Population Development in LAU Areas from 2011 to 2017.....	25
Map 4.3: Changes to urban use over time 2000-2018.....	27

List of Figures

Figure 2.1: Land take for settlement and transport infrastructure	6
Figure 2.2: Per capita settlement and transport infrastructure in m ²	8
Figure 4.1: Network of Negotiation	26
Figure 4.2: Affectedness and Influence of Stakeholders by Subsector.....	28

List of Tables

Table 1.1: DE-30ha scales	3
Table 4.1: The main focal issues according to interviewed stakeholders	12

Abbreviations

AESOP	Association of European Schools of Planning
ARTS	ESPON Assessment of Regional and Territorial Sensitivity
BBSR	Bundesinstitut für Bau-, Stadt- und Raumforschung (Federal Institute for Research on Building, Urban Affairs and Spatial Development)
CEMAT	Council of Europe Conference of Ministers Responsible for Spatial/Regional Planning
CLC	Corine Land Cover
COMPASS	ESPON Comparative Analysis of Territorial Governance and Spatial Planning Systems in Europe
EC	European Commission
ECP	ESPON Contact Point
ECTP	European Council of Town Planners
EEA	European Environmental Agency
ERDF	European Regional Development Fund
ESPON	European Territorial Observatory Network
ESPON EGTC	ESPON European Grouping of Territorial Cooperation
EU-LUPA	ESPON European Land Use Patterns
EU	European Union
GVA	Gross Value Added
ISOCARP	International Society of City and Regional Planners
ITI	Integrated Territorial Investments
JRC	EU Joint Research Centre
LCC	(Corine) Land Cover Change
LUE	Land Use Efficiency
MCA	Multi-Criteria Assessment
NUTS	Nomenclature of Territorial Units for Statistics
PCG	Project Coordination Group
SCBA	Societal Cost Benefit Analysis
SDG	Sustainable Development Goal
SPIMA	ESPON Spatial Dynamics and Strategic Planning in Metropolitan Areas
SUPER	ESPON Sustainable Urbanisation and Land Use Practices in European Regions
TANGO	ESPON Territorial Approaches for New Governance
TIA	Territorial Impact Assessment

1 General introduction

In ESPON SUPER, the case studies contribute to the objective of unravelling how different interventions in diverse social, environmental and economic settings have transformed land-use development practices. In particular, the aim is to analyse, understand and learn from the successes and failures of practitioners and decision makers over the last three decades in their search for more sustainable land use. All case studies are based on close observation and direct contact with each territory and with the people involved in the design and implementation of each intervention. To this end, each case study was assigned to the project team with the greatest local knowledge of the territory, institutions and language.

The methodological framework used for all case studies consisted of three groups or basic sources of information and knowledge.

1. **Context:** each intervention addressed or influenced a particular land-use development practice which had emerged within a specific territorial and institutional context, which is crucial for understanding and interpreting the results. It was also important to know the objectives related to the sustainability of land use that had been set for each territory, albeit on paper, at the regulatory level. These tasks were based on desk research, even though, in some cases, local stakeholder support was valuable to locate the most relevant pieces of information.
2. **Developments:** the second source of data was the quantitative land use changes in the form of maps and graphs. This allowed each case study team to consider to what extent the underlying contextual factors and the studied interventions had transformed the territory and the rates of urbanization. This information was essential for evaluating the effects that each intervention had on land-use sustainability and, more indirectly, on culture and spatial planning practices.
3. **Stakeholder interviews:** each case study held over ten in-depth interviews with stakeholders involved in one way or another with the intervention. At these meetings, they were asked about the reasons for and the perceived urgency of the intervention, how its objectives were defined and by whom, the experience of implementing each intervention, the pitfalls encountered, as well as the benefits it had brought in terms of improving the three thematic dimensions of land-use sustainability: ecological, economic and social equity. In addition, stakeholder maps were produced that present the type and intensity of the relationships that some stakeholders had with the rest in a visual way.

This report on the case study of DE-30ha presents a synthesis of all three outputs in order. It is structured as follows. This introductory section provides a summary of the main characteristics of the case study (Section 1.1), the scale of analysis (Section 1.2) and geographical scope (Section 1.3). Section 2 contextualizes how urbanization occurs in the case study area. It contains descriptions of typical urban developments, how this is regulated,

who promotes it, how it is implemented and emerging challenges regarding land-use development. Keeping with this contextual approach, Section 3 discusses how the studied intervention addresses the challenge of sustainability in its three thematic dimensions (Section 3.1) as well as in its temporal dimension (Section 3.2).

Section 4 presents the main results of the case study research in three parts. Section 4.1 analyses how the priorities of the intervention were configured based on information collected from the interviewed stakeholders. In particular, it seeks to know how a perceived problem was identified or constructed to justify the intervention, the extent to which land use sustainability was a consideration, and whether these elements tended to unite the community in favour of a collective interest or whether, on the contrary, they were a source of tension and conflict. Section 4.2 discusses in more detail how seven organizational and institutional aspects may have influenced the relative successes and failures of the intervention. Section 4.3 combines the analysis of land use changes, the opinions of the consulted stakeholders and, where relevant, the stakeholder maps, to make an assessment of the actual results of the intervention on the planning and development culture and the different thematic dimensions of sustainability. Finally, Section 4.5 explicitly answers questions posed to the ESPON SUPER team, thus reflecting the direct contribution of each case study to the project's objectives.

While each individual case study contributes to answering the questions posed, its true value lies in the possibility of combining and contrasting the outputs of the eleven cases. This choral work is presented in Annex 3.13. The triangulation of results allows for the formulation of generalizable conclusions and recommendations that can contribute to the design of new plans and policies better aligned with the objectives of sustainability and land take abatement at the European level. In this way, the case study presented in this report also contributes to this other broader objective.

1.1 Case study DE-30ha

The German Soil Protection Legislation which came into force in 1999 promotes brown field recycling and gives clear regulation on soil clean up. It legally applies the precautionary principle to soils, but in this respect implementation is still weak. The 30 hectares goal successfully builds on the communities of practitioners around the soil issues.

The 30 hectares goal illustrates the modality of the National Sustainable Development Strategy that combines hard regulation with soft policies and with a multi stakeholder approach.

Map 1.1: Location of case study “DE-30ha”.



1.2 Scale/s of analysis

The target to reduce land take to less than 30 ha per day of land for settlements and transport infrastructure by 2030 is integral part of the German sustainability strategy from 2002. It is a threshold for the country as a whole. In the consequence the objective is taken up at various administrative levels, such as the spatial development plans of different Länder, in which they proclaimed their own land saving targets and developed their own strategies. Therefore, different interventions and objectives are represented by the NUTS 1 level. However, since the spatial planning responsibilities lies with the Länder and especially the planning autonomy with the local authorities, this local scale in particular must be examined more closely. The greatest variety in land development strategies can be seen at the municipal level. This is done in the form of various case studies in which the municipalities are exposed to different economic and demographic conditions (shrinking and growing regions)..

Table 1.1: DE-30ha scales

Scales	Main scale	Other scales
Supra/Trans-national		
NUTS 0	Germany	
NUTS 1		Länder
NUTS 2		
NUTS 3		

LAU1 – NUTS 4		Different municipalities
LAU2- NUTS 5		

1.3 Geographical scope

In this case study, the scope is more "inward looking". From national target to down to local level and respective implementation. The main question is in fact, how to implement the 30 ha target for the whole country in the relation to the interests of the Länder, regions and municipalities. Because municipal or regional decision will have nationwide impact, the approach of land take trading would have to be considered more closely.

2 Contextual analysis

2.1 Typical urban development

The reconstruction of German cities after the Second World War was not only intended to solve the housing shortage, but also served to re-educate and ideologically renew society. Since the underground infrastructure was largely intact, the cities were rebuilt on old plans, with planners in all occupation zones adhering to the ideas of the interwar period, i.e. the idea of a dispersed and green city. The Marshall Plan boosted the economy in the western zones and after the founding of the two states, West Germany followed the path of international modernity, while in the Eastern part the socialist urban development was introduced, with monumental parade axes and central squares as backdrops for demonstrations and parades.

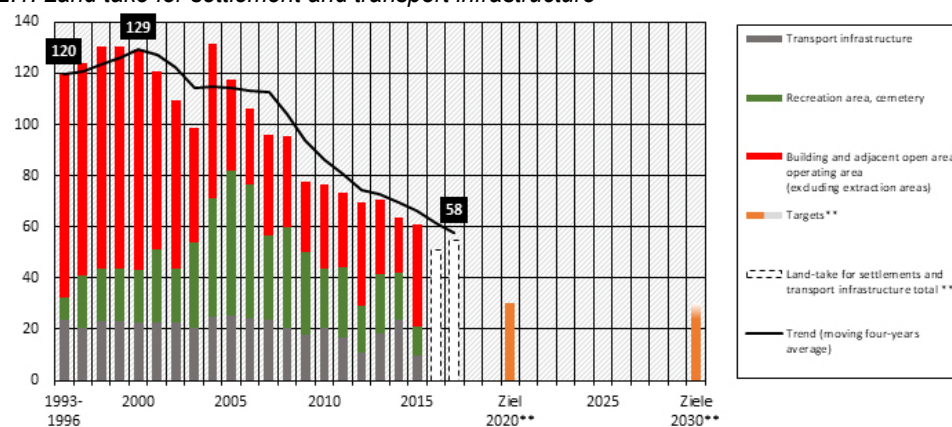
In the 1960s, the worst damages of the war were repaired and new centre planning took place to give a contemporary expression to the rapidly growing cities, always with a view to the car-friendly city, this happened in both East and West Germany. At the same time as the centres were being expanded in line with consumer needs, typified large housing estates on the fringes of cities in both East and West promoted a deliberate decentralisation, combated the housing shortage and created demand for consumer goods. The new settlements of East Germany were provided with generous green spaces for recreation and a tiered infrastructure, which included playgrounds, kindergartens and schools, as well as the supply of daily necessities such as consumer goods, pharmacy and doctor. Young families with children were the main beneficiaries of this, while poorly educated, marginalised and retired people were left behind in the neglected old building quarters.

In the Federal Republic, the middle classes preferred to move into their own homes in the countryside and left the large housing estates to the lower income groups (Ruethers, 2018). This form of suburbanisation, even in the course of economic growth, was not to be found in the East at first, but was made up for after the Berlin Wall fell. While East Germany was massively affected by emigration after the Reunification, the deconcentration in the urban regions did not start due to potential settlement pressure, but rather due to politically set framework conditions such as tax benefits. This also favoured the development of large-scale shopping centres on greenfield sites, which in the first phase were almost entirely built by large West German companies. This "artificially" accelerated suburbanisation led to vacancies on the residential and commercial market as early as the mid-1990s, which shows that there was a clear lack of development in the market. Correspondingly, the opposite trend gradually set in in some regions (Sander et al., 2004: 24 ff.).

The increase of settlement and transport areas and related ecological problems like the fragmentation of landscapes or the surface sealing are a challenge in Germany which has not yet been managed. In shrinking regions as well, an unlimited expansion of settlement and transport areas can be observed. Although in Germany, new areas are still taken for settlement and transport purposes, the land take of new areas has decreased since 2000. Between 1997 and 2000, the settlement and transport area has thus increased by 129

hectares (ha) on average per day, which corresponds to about 180 football pitches. Between 2014 and 2017, however, the average daily increase dropped to only 58 ha (Rienow et al. 2015; UBA 2019) (Figure 2.1). However, these developments only correlate with population development to a limited extent; land consumption in stagnating and shrinking regions is often higher than in growing regions. This is mainly due to low interest rates, which have led to a significant increase in the affordability of single-family homes in particular in recent years. In addition, mayors of many rural communities are trying to attract new residents by declaring cheap building land. As a result, it has become less expensive to build a new house in the countryside than to renovate old buildings, resulting in vacancies and empty village centres due to the simultaneous shrinking population, so that just as after reunification too much is being built in the wrong place (Deschmeier et al. 2017). From 2011 to 2015, about 61% of the settlement increase, but only 11% of the population increase could be found in rural areas.

Figure 2.1: Land take for settlement and transport infrastructure



** Target 2020: Climate Action Plan 2050; Targets 2030: '30 minus X' hectares per day: German Sustainable Development Strategy, revised 2016; 20 hectares per day: Integrated Environmental Programme 2030

Source: UBA, 2019

2.2 Basic institutional conditions

Land use in Germany is influenced and regulated by a complex system of political and legal frameworks. In doing so, spatial planning plays a major function in coordinating spatial developments of the society, the economy and the natural, built and social environment. The development of settlement and transport areas is subject to the planning law, the construction law and the specialised planning law on various spatial levels, e.g. the German Federal Spatial Planning Act, regional planning and local development planning. According to the intervention regulation mentioned in the Federal Nature Conservation Act and the Federal Building Code, negative impacts of interventions into nature and landscapes, for example caused by construction projects, should be avoided, compensated or replaced.

Type and intensity of the agricultural land use are strongly influenced by the agricultural policy and the environmental policy. Since the agricultural reform in 2015, the payment of a part of

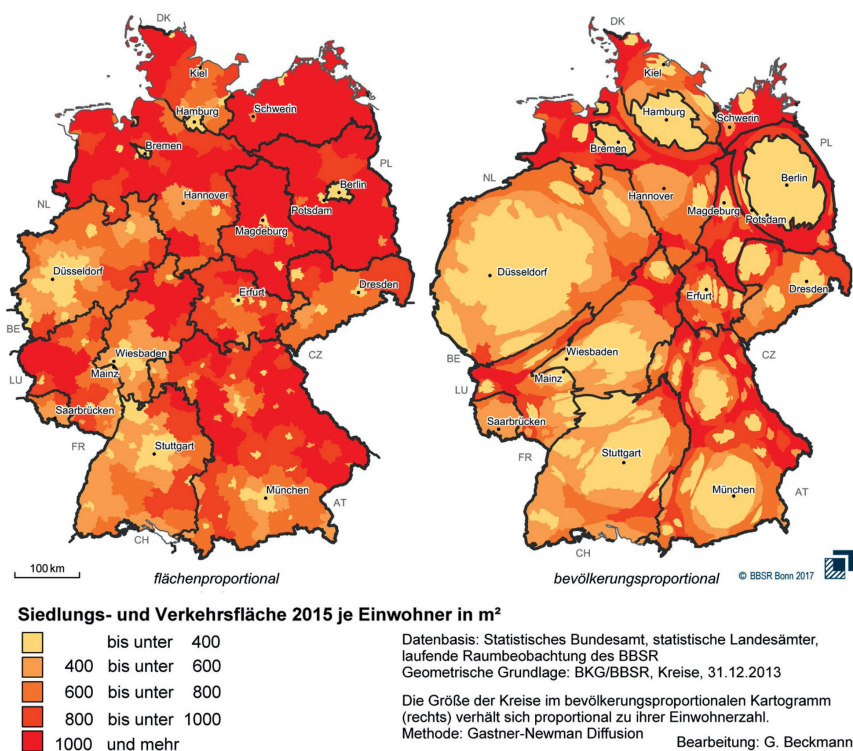
the land premium to farmers is bound to so-called greening conditions. They include a minimum degree of crop diversity, maintaining permanent grassland and defining an environmentally suitable land use. Due to its useful, protection and recreational function, preserving the forest is laid down in the national forest conservation act and related forest conservation acts of the federal states. Changing its type of land use requires permission. Since the 1990s, increasing the production of renewable energy sources has increasingly become important from the point of view of spatial and land use. These trends have especially been caused by the Renewable Energy Sources Act since 2000. In the electricity sector, the Act has enormously pushed ahead the energy transition. Among other things it promotes land-consuming biogas plants, wind power and open-space photovoltaic power stations, the largest need for land resulting from the production of biomass for biogas plants (Goemann & Weingarten, 2018).

2.3 Initiative

Reasons for the land take by settlements and transport can be found both on the demand and the supply side. On the demand side, the increasing per capita consumption of living space is the main cause for the increase of settlement areas used for residential purposes (Figure 2.2). Due to increasing real estate prices, favourable positions in surrounding areas or simply due to the familiar environment, many people stay in their initial flats or houses even if, due to a changed family situation, they need less living space. Younger generations though increasingly start a family later, live much longer in single households and move to the surrounding area with their families.

On the supply side, local authorities still designate building sites in order to promote new private and commercial settlements and to increase the tax revenue. So land is still consumed especially in regions with a decreasing or stagnating population. As a consequence, the land competition between local authorities increases in the same way as the number of inhabitants decreases (Siedentop, 2018).

Figure 2.2: Per capita settlement and transport infrastructure in m².



Source: Dosch & Beckmann (2018).

2.4 Planning permission

In the context of the “National Sustainable Development Strategy”, the German Federal Government in 2002 set the goal to reduce the daily increase of settlement and transport areas to 30 hectares by 2020. In the revised version of 2016, the goal was formulated to limit the increase by 2030 to “less than 30 hectares”. It thus bears in mind that land is a significant limited resource for whose use the sectors agriculture and forestry, settlements and transport, nature conservation, extraction of resources and energy production compete.

In order to achieve the 30 hectare goal by 2020, the Federal Government has already taken various measures. In 2013, for example, it enacted a law strengthening the urban development-oriented inner urban development”. It furthermore supports local authorities in using derelict sites, open spaces and vacant sites and in the adaptive reuse of vacant buildings in town/city and village centres (UBA, 2019).

2.5 Development process

In spite of the trend that indicates a slowdown of the land take for settlements and transport, Germany is still far from reaching the 30 hectare goal. If the development continues like in the last five years, the 30 hectare goal will not be achieved for both the year 2020 alone and for a mean value of four years. For 2030, even a 20 hectare goal could be achieved if the trend continued steadily.

But it cannot be guaranteed that the trend continues. Following an amendment of the Federal Building Code and of the Federal Land Utilisation Ordinance, more compact building was facilitated by establishing so-called “urban areas” in 2017. However, the introduction of section 13B in the Federal Building Code at the same time facilitated the expansion of settlements in greenfields considerably thus counteracting all efforts to support inner urban development and revitalisation measures in town/city/village centres (valid until december 2019).

All in all, continuous population and economic growth and intensive building activities entail the risk that the land take continues to increase beyond 2019. According to calculations of the German Environment Agency, 3,000km² of land might get lost by 2030, which is a much larger area than the Saarland (a German federal state).

2.6 Current issues

- Detaching the links between population growth and increase of settlement areas
- Which regional compensation mechanisms exist or should be created in the future (land planning permits etc.)?
- Adopting new laws counteracting the 30 hectare goal
- Regenerating and redensifying inner cities and urban fringe areas with regard to the climate goals

Shrinking rural area:

- Trend of an increase of settlement areas which is independent from the population growth
- Does the 30 hectare goal hamper an increase of the economic attractiveness and the competitiveness of less-developed regions (designation of new commercial and residential areas, expansion of local public transport)?
- Increasing need for land of the agricultural sector (renewable energies, maintenance of biodiversity, cash crops, food security)

Increasing importance of city centres:

- Inner urban development: redensification measures in existing neighbourhoods and adaptive reuse of derelict settlement and conversion areas.
- Limiting the land consumption might make available areas in agglomerations more expensive and thus increase the real estate prices. So is there a conflict between environmental and social interests?

3 Sustainability of objectives

3.1 Thematic dimensions

The 30 ha target itself is not an intervention in the conventional sense but can be understood as a target of the Federal Government in form of a soft intervention. As part of the German sustainability strategy, it is a component of the theme: "Making cities and settlements inclusive, safe, resilient and sustainable". In the 2016 edition of the sustainability strategy, it is understood primarily as an indicator that serves above all to measure and evaluate land take. The 2002 sustainability strategy attempts to demonstrate the decoupling of the economy and land use and to create other enticements for economic actors, since newly developing business parks on the outskirts of residential areas in particular can be affected by the implementation of the objective.

Originally a primarily ecological target for the protection of soil, biodiversity, nature and also agricultural land, the topic of ecology in connection with the 30 ha goal is discussed within the sustainability strategy 2002, and is no longer mentioned in the new edition of 2016.

In addition to ecology, the social component also has a part to play in achieving the goal. Whereas in 2002 it was still in the subordinate clause, by 2016 it will become increasingly important and is regarded as particularly relevant for the realisation of the sustainability target: "Making cities and settlements inclusive, safe, resilient and sustainable". As these points seem to contradict each other at first glance the desire to create access to affordable housing is often cited by opponents of the 30 ha target.

"Economical, nature- and socially compatible land use is a central element of sustainable settlement development." (Bundesregierung 2002: 288)

Apart from the fact that the land saving target primarily benefits ecology and was set, among other things, on the basis of land and soil protection, the other dimensions of sustainability are only briefly and insufficiently described in the new edition of the sustainability strategy document. In addition, current research or subsequent interventions tend to focus less on the impact of land savings on social and economic concerns.

3.2 Temporal balance

The 30 ha target was first mentioned in the sustainability strategy in 2002 and is still valid in a similar form today. If a maximum consumption of 30 ha per day by 2020 was set at that time, the new edition of the Sustainability Strategy 2016 set the target of consuming less than 30 ha per day by 2030.

"The uptake of additional land for settlement and transport purposes shall be limited to less than 30 hectares per day by 2030". (Bundesregierung, 2016: 159)

In fact, the consumption of land by residential and transport areas has declined significantly since 2002, but is still far away from its final goal. In 2013, with the amendment of the German

Building Law Act (Baugesetzbuch), the law to strengthen internal development was adopted, which requires that whenever construction projects are carried out on new areas, it is always necessary to first check whether there are not existing areas that can be used for this purpose. As the implementation of the rather "soft" target of 30 ha otherwise lies with the Länder and municipalities, their laws and plans must also be taken into account over time. While many municipalities take the target into account in their planning, there are currently rather counteracting tendencies at federal level, such as the family housing grants (Baukindergeld) or the temporary exemption to include the development of outdoor areas under 10,000 sqm in accelerated procedures, thus enabling municipalities to quickly create new development plans in outdoor areas without the needs to check possibilities of internal development.

4 Impact assessment

4.1 Pre-intervention

4.1.1 Identification of the problem

Since the United Nations Conference on Environment and Development in Rio de Janeiro in 1992, the guiding principle of sustainable development has been at the centre of political action and discussions worldwide. In Germany, this sustainability discussion focused primarily on environmental politics (Schuster, 2000: 153). In the late 1990s there was a broad consensus that the immense land use for settlement and transport areas in Germany could not be continued in this way. At that time, the new land demand was about 129 ha per day (Dosch & Einig, 2005). With the draft of an environmental programme, in which she wanted to show that politics must be made measurable, the former Minister of the Environment Angela Merkel managed to start a debate on indicators (Joerissen & Coenen, 2007: 52; BMU, 1998), which was later included in the national sustainability strategy in 2002. One of the key indicators of this sustainability strategy was the issue of reducing the use of new land by settlement and transport areas at the expense of open space. This was to be limited to 30 hectare per day by 2020 when the targets were reached. With the new edition of the national sustainability strategy in 2016, the 30 hectare target became the "30 hectare minus X" target, which means that in 2030 less than 30 hectare per day should be newly used for settlement and transport areas (RNE, n.d).

Table 4.1: The main focal issues according to interviewed stakeholders

Focal issue	# instances
Land use	12
Environmental and resource protection	5
Sustainability discussion	4
Decoupling awareness of soil	1

To evaluate the case study, 12 different stakeholders were interviewed. They came from federal ministries, state planning, scientific institutions, national and regional nature conservation associations, from urban planning of shrinking and growing regions, and last but not least a member of the German Council for Sustainable Development, which declared the goal. The exuberant land consumption at that time was identified as a problem by every stakeholder, but the introduction of the 30 hectare target is, according to some stakeholders, also due to the discussions about sustainability at that time and a resulting growing awareness of the problem (Schmidt et al., 2004: 1). It also is "not an environmental goal, but a sustainability goal" in the sense that the title in the sustainability strategy does not refer to the "area" itself, but to "generational justice" (stakeholder, Ministry of Environment). Other reasons that led to the introduction of the 30-hectare target were above all ecology, biodiversity, climate, soil and resource protection, especially those areas that are directly or indirectly negatively affected by land consumption. A member of the German Council for

Sustainable Development took a further step back and named the causes for this excessive land consumption, which was mainly due to the fact that we now have a decoupling of consciousness of the soil (Thoenes et al., 2004: 2). Whereas for years it was assumed that people valued the resources on which they depended and thus especially the soil, it is now apparent that, among other things, the enormous increase in value that the soil experiences when it is converted into building land means that the soil and its natural functions are losing importance. The increase in value is clear when comparing the land value before and after planning. For example, in 2013 the average price for farmland in North Rhine-Westphalia was around €4 and the average price for residential land (detached single and two-family houses in good locations in the Ruhr area) was between €230 and €400. The planning-related increase in value usually remains with the beneficiary owners according to the applicable law; only the increases in value due to reallocation and development can (partly) be skimmed off in favour of the public. This reminds us that planning-related increases in value motivate owners to make value-increasing changes of use (Davy, 2017: 270 f).

4.1.2 Inception of goals/action

There is very strong support for the target, and it seems almost uncontested that it needs to be on the political agenda. In particular, the fact that the target has moved the focus to the issue of land and also repeatedly brought it into the discussion is seen as very positive and important by almost all stakeholders. While, on the one hand, the simplicity and above all the measurability of policy by means of a quantitative limit is seen as particularly suitable, according to one stakeholder, precisely this limit is a mistake. He is of the opinion that the goal cannot be to limit oneself in a country and in a society that is striving for progress, but that an effective and efficient use of land would be much more goal-oriented in many areas. Three other stakeholders consider the goal to be quite useful for the reasons mentioned above but criticise the lack of appropriate control over where the goal should lead.

One third of the stakeholders, those from the Federal Government and federal state authorities, think that the target has come at exactly the right time as before the political awareness and also the awareness of the environment was not yet present in society. Another aspect is based on the upheaval of the system in East Germany after the German reunification, which, according to them, would have made an earlier proclamation of the target unfavourable. However, the member from the German Council for Sustainable Development contradicts this. In his opinion, the target should have been set before the reunification, which would have set the tone for the new federal states, because that is where the incredible use of greenfield land took place after reunification (see Chapter 2.1). A kind of Americanisation of cities, which subsequently spilled over to the old federal states as well (Juergens, 2017: 4) . Since the original target was set for 2020 and land consumption in Germany is currently nearly twice as high (BMU, n.d), for the majority of stakeholders this was the reason why it might have been better to announce the target earlier, as it might then have been reached

already. However, almost all agree that the implementation of the target has started too late or too hesitantly.

4.1.3 Pre-intervention conclusions

The broad acceptance of the 30 hectare target can be attributed to various aspects. One important reason seems to be the timing of the proclamation, as there was a certain euphoria about sustainability in Germany as a result of the Rio process, which meant that there was little political headwind and there was a high level of approval for the target (Besecke et al., 2005: 82; Schuster, 2000: 153). It was certainly also important that, in addition to the support from research, the former Minister of the Environment Angela Merkel was also very committed to the goal and continues to follow its development to this day: "We know that in some areas we have managed to decouple resource consumption and economic growth - unfortunately not in all areas. For example, one of our most difficult indicators is land consumption. Here we have not yet decoupled economic growth [...]" (Angela Merkel, 14 November 2019, Berlin). Although the simplicity of the objective is criticised by some stakeholders, almost every single one of them makes clear that some kind of overall objective is immensely important and that it is precisely the measurability of policy through indicators and the associated simplicity of the objective that makes criticism or even contradiction more difficult.

4.2 Implementation

4.2.1 Technical capability

Since the target was already set in 2002, the statements of the stakeholders on the technical possibilities vary considerably. While some say that the target itself should have provided a kind of "toolbox" for the regions, others say that the planners already knew what it was about. For the goal itself it is not important how good the technical possibilities are, because it only serves as an overall goal where you want to go. Only in terms of implementation or planning in the municipalities and cities the appropriate instruments have to be used and they were already available at that time and were improved in the course of planning.

4.2.2 Data and information

The statements on the data situation also differ. According to an interview with an environmental association, it was already possible at that time to determine how much land was being used daily by means of development plans and request to the municipalities. This meant that the land consumption could be determined sufficiently. The opinion that there was sufficient data available at that time, however, is in the minority. Changes in statistical recording make time series complicated, especially at the present time, and make analyses more difficult (Statistisches Bundesamt, 2020, see Fig. 2.1). Since 2016, the distinction

between "buildings and adjacent open areas" and "operating area excluding extraction areas" has become obsolete due to the switch from the automated property book (ALB) to the automated real estate cadastre information system (ALKIS). In addition, the regrouping of land uses has resulted in severe statistical artefacts for 2016. Against this background, it neither makes sense to portray the overall changes in "settlement and transport areas" for the subcategories "transport areas", "recreation areas" and "building and adjacent open areas", nor does it seem to be useful to report a total value for the changes observed with "settlement and transport areas". From 2016 on, the Federal Statistical Office therefore published only the value for the 4-year average. This also applies to the year 2017. To compensate for known statistical artefacts, the Federal Statistical Office has made corrections to the 2017 indicator. A major problem was not the data itself, but the lack of information and the fact that not everyone was clearly informed about what is the issue. Already from a first evaluation of the implementation of the topic of land saving in the German sustainability strategy by RNE in the form of workshops, online surveys and expert discussions, this lack of information and a lack of coverage of the topic in the public media is evident (Ulmer et al., 2007: 31 ff.). All stakeholders make clear that the data situation has of course improved enormously.

4.2.3 Participation

There was no participation process at the end of the 1990s. However, since it was proclaimed within a kind of sustainability euphoria following the Rio processes, acceptance was very high and it was neither criticised nor perceived as unfair. This is also confirmed by Ulmer et al. (2007: 6). The target of a reduction to 30 hectares has initially met with the approval of most participants. However, it was emphasised that it can neither be a legally binding target nor a measurable target in terms of its statistically possible achievement. Participation in itself, however, is a legally regulated procedure in urban land use planning, which is why it has been used again and again in the implementation of space-saving measures. The example of Tempelhof in Berlin is quite well known, where a petition for a referendum prevented the subsequent use of the Tempelhofer Feld for buildings and aims at preserving the more than 300 hectare area on account of its natural and cultural-historical significance and at maintaining the field as an inner-city open area (Mackrodt, 2015: 288). In Munich, too, many new furniture stores in the outskirts of the city were prevented by citizens' decisions (Sueddeutsche Zeitung, 2013). However, the prevention of concrete development plans was not the only result of participation processes. In Bavaria, a referendum ensured that the Bavarian state government declared a 5 ha target for Bavaria and anchored this in the state planning law (LfU, n.d.; Sueddeutsche Zeitung, 2019). There was also broad participation in REFINA (Research for the Reduction of Land Consumption and for Sustainable Land Management), a research project of the Federal Ministry of Education and Research (REFINA, n.d.). The project is part of the German Government's National Sustainability Strategy.

4.2.4 Strategic vision

The goal as an official goal of the Federal Government is the result of a political discourse. It is a very clear, well-defined, tailored goal and there is nothing wrong with it, especially because it is kept so simple. Originally with a clear vision for the future, namely to reduce land consumption in Germany to 30 hectare per day by 2020. With the renewal of the sustainability strategy, this clear goal of reducing 30 hectare has been softened a little by minus X (RNE, n.d.). Nevertheless, it has a strong pulling power and had a strong influence on the view of the issue. There is almost no one who is against the target, it is a generally accepted goal. Only between the lines you can hear criticism from time to time. One third of the stakeholders criticise that just this clear vision is kept too simple and unconcreted, without concrete plans and ideas for implementation. It belongs to the "wash me, but don't get me wet" category.

4.2.5 Institutional coordination

Institutional coordination is seen negatively by almost all stakeholders, as it is a Federal Government goal but has to be implemented at state and municipal level and there is a lack of coordination and agreement between the various levels (Besecke et al., 2005: 89 f.). Even if at state level individual objectives are now laid down in the principles of the state development plans, there is still a lack of further analysis of what this means for the individual regions and municipalities, while at the same time municipal planning sovereignty is maintained. This is also made clear when evaluating the online survey. While the Federal Government and the state governments see implementation as the task of the municipalities, the stakeholders in the field of municipal and city planning would like to see more instruments and information from higher levels.

4.2.6 Institutional leadership

Whether it is the former Minister of the Environment Angela Merkel, the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety, the German Advisory Council on the Environment, environmental associations or the agricultural, forestry and nature conservation sectors, the driving force behind the 30 hectare target seems to be clearly on the side of the environment. Science and research in particular are constantly working towards the implementation of the target and are trying to find new solutions. For example, the Federal Ministry of Education and Research (BMBF) also launched its funding priority REFINA (Research for the Reduction of Land Consumption and for Sustainable Land Management) in 2004/2005 as part of its emerging sustainability research (REFINA, n.d). The funding priority was financially well positioned, which meant that many actors from the Federal Government, the federal states, local authorities, universities and institutes got involved in order to develop many new ideas. However, this leadership is not institutional, but

rather tries to direct the view of political actors in this direction. At the municipal level, stakeholders make clear that urban planners have a leading role in the issue, while some wish the states to take a leading role, but this is not being fulfilled at many state levels. Other stakeholders, in turn, believe that there is currently no real institutional leadership at all.

The fear that open spaces may be lost is ever-present among many actors, which creates particular pressure and in some cases leads to the preservation of the remaining open spaces (Besecke et al., 2005: 20). According to one stakeholder, there seem to have been activities at the Federal Government level as well to push through their own views without taking others into account. Instead of the originally discussed reduction of new uses by 30%, the reduction to 30 hectare was finally pushed through without further communication (this statement could not be confirmed by literature or other stakeholders). A nature conservation association, however, considers it as a matter of course that each stakeholder should try to give special weight to his own interests and not to weigh them up. After all, this weighing up is the task of the Federal Government, the states, the cities and municipalities, and ultimately of planning.

4.2.7 Political will

Even though the target has been agreed upon by the ministries and thus accepted by all political areas, the target was dropped from the agenda of the inter-ministerial communication and negotiation process during the introduction of Section 13b of the Federal Building Code (§13b, BauGB) in 2016/2017 by the Ministry of the Environment, to which the construction sector was still affiliated at that time (Deutscher Bundestag, 2020). The stakeholders at Federal Government level see that there are problems with the implementation of the objective, among other things with the aforementioned inter-ministerial communication, but overall the policy has moved closer together and cooperation with the federal states has also intensified. In their opinion, the target is not criticised and political support is also needed, because however good science or administrations may be, as soon as it comes to concrete planning, to projects and strategies for implementing the target, politics is needed.

By contrast, the assessment is different at state level, to some extent at municipal level and also among environmental associations and the Council for Sustainable Development. Even in Bavaria, to which the national target was transferred and implemented as 5 hectare target, not because the government wants it, but because of the implementation of a petition for a referendum. In addition to headwinds from various parties in the conservative and liberal camp, there is also a lack of political will to solve communication problems and provide suitable instruments. It is rather the other way round, for example, laws that contradict it were passed or targets, that had been disaggregated at state level, were overturned by a new state government (North Rhine-Westphalia) (topagrar, 2019).

4.2.8 Implementation conclusions

Although the simplicity of the objective is considered a strength and has led to growing awareness, as soon as it comes to implementation, it is something that is criticised by many. What is interesting here are the different perspectives of communication and of the implementation of the goal. Stakeholders at the Federal Government level see problems, including in the inter-ministerial communication (Besecke et al., 2005: 83), but are generally of the opinion that politicians have moved closer together and cooperation has intensified. A different point of view is held at state and municipal level as well as by environmental associations. Here, one would have wished significantly more instruments and ideas for the implementation of the objective by the Federal Government. There is a lack of clear leadership or a pioneering role that takes charge of coordination and communication instead of keeping municipal planning sovereignty high and leaving it to local planning to decide whether or not to take the goal into account.

4.3 Sustainability assessment

4.3.1 Planning and development culture

Assessing the full extent of the changes brought about by the implementation of the target is not easy, as the original target (by 2020) has not been attained and the achievement of the renewed target is 10 years in the future. What can be stated is that the already existing reduction of new uses of open space for settlement and transport areas has led to a redensification in cities and thus to more compact settlement structures. The following are some examples of how the implementation of densification can look like: When at the end of the 20th century many businesses had to give up due to the economic structural change, an industrial wasteland was created south of Reutlingen's old town. An investor bought the site and worked closely with the administration to develop a zoning plan for the entire area. Today, the area is characterised by a variety of uses that complete and strengthen the offer of the old town. Gastronomy provides vitality and tangible water at the Triebwerkskanal provides flair. This has created a new place of identification and at the same time a functional and attractive access to the old town - the centre will be strengthened by the core city expansion south (Baukultur-bw, n.d.A). In Freiburg, too, there was an inner-local fallow land which was created by the abandonment of a gardening business. The new residential quarter, which was created, not only blends in well with the surrounding landscape and buildings, but also contributes to the ecological balance in the urban area through its green roofs (Baukultur-bw, n.d.B)

As one of the most important international financial centres and a rapidly growing metropolitan region, the city of Frankfurt has to contend with a shortage of housing and rising property prices (FAZ, 2019; statista 2020). A sustainable settlement policy in the form of subsequent densification, taking into account the preservation of green spaces, is urgently needed here. In the Europaviertel, the derelict areas of the former main freight station were

converted into a mixed-use urban quarter (residential and office units) and planned as an extension area for Messe Frankfurt. In Frankfurt's Ostend district, approx. 820 residential units as well as the necessary infrastructure and community facilities were created by converting commercial and industrial areas. The development of areas formerly used by the United States military included an office and commercial area as well as a residential area with almost 2,000 residents (Boehm et al., 2016: 118).

This was not least due to the growing awareness of the issue of land use, which can be traced back to the 30 hectare target and has resulted in one or two successful citizens' petitions. Another reason is the introduction of an urban area which allows for higher densities and Section 13a in the Federal Building Code. Section 13a means that a zoning plan for land re-use, redensification or other measures of internal development (zoning plan for internal development) can be drawn up in an accelerated procedure (BauGB §13a). The planning processes have also been improved in other respects and those who wish to act sustainably today have not only some new instruments to use, but above all a large number of generally accepted arguments. This leads to planning where normally the motto is "inner urban development before expansion outwards". In some municipalities, joint industrial estates are being developed, brownfield sites are being reactivated, there are building gap surveys, increases in the number of housing units per area, dual uses, or companies are being encouraged to increase their production instead of building extensively. However, the dismantling of regional planning, which began at the same time as the 30 hectare target, is seen as particularly negative (Ulmer et al., 2007: 36), since sustainable land management occurs in particular at those locations where intermunicipal cooperation takes place and the earlier regional planning pursued precisely this approach of joint planning.

4.3.2 Economy

Almost all stakeholders believe that the target has not had any negative impact on economic development so far and is often even positive. This is also based on the positive development of various indicators such as the GDP as a comparison as well as on research projects that show that it is more favourable in purely economic terms and in the long term "to go brownfield" than to develop new areas. A concentration of companies through inner urban development or joint industrial estates enables marketing directly on site and shorter production routes. The development takes place where the demand is, thus, also in the long run, consequential burdens are minimised because outside areas are more difficult to reach. Furthermore, due to a future increase in the energy prices, for example, accessibility will also become more expensive for employees and they will decide in favour of nearby companies (Siedentop, 2011: 178). Negative effects are mainly seen in the short term and mostly for individual companies if they cannot build at the most cost-effective location or logistics locations in the inner urban places have poorer transport connections. The lack of space also has local effects if companies have to relocate due to a lack of expansion opportunities, but

this can lead to innovations or shift individual aspects of production, such as storage, to the road. Although the appropriate infrastructure must be available for this, a lot of infrastructure facilities have been developed in recent years despite a decline in new land consumption and even 30 hectare per day still allow some development.

4.3.3 Ecology

The target represents an environmental objective for most stakeholders. The preservation of greenfield sites is justified by the preservation of the ecology, because land protection indirectly is also a kind of soil, climate and resource protection, since ecologically valuable areas are no longer built-up (NABU, 2020: 6). Therefore, it is obvious that it has positive effects on the ecology. But especially stakeholders from the environmental sector point out that the target is not sufficient and can only be an interim target, as 30 hectare per day are still lost for greenfield areas. From a global point of view, an ecological damage is only shifted by, for example, building a textile factory outside Europe, far away from any ecological and social sustainability, in order to protect our open space.

With regard to our responsibility towards future generations, the above mentioned effects must be structural and one stakeholder even believes that this future generation, which is just growing up, will prevent the effects from becoming structural, as they are growing up with a completely different environmental awareness and basic ideas.

4.3.4 Equity

The social impacts are generally perceived as positive as the economic and environmental impacts. Greenfield sites are not only maintained for recreational purposes, but a limitation of the expansion outwards also promotes a concentration on the inner area, the "walkable city" and thus a better supply of the population (medical services, food, jobs). Through local or intra-local development the distances are correspondingly shorter which means that social strata and groups, which are only partially mobile either because of their financial possibilities or their physical condition, can also be served. In addition, an inner urban development does not only allow village structures, some of which are centuries old, and associated social connections to remain, but also promotes the integration of new citizens, especially in cities. However, the development of the interior is always in conflict with the preservation and development of urban green spaces. Often, over the years, a diverse vegetation with high biodiversity develops on brownfields or they are used as informal green spaces. Due to the limited availability of space and the simultaneous need for building development, in conflict situations the choice often turns out to be to the disadvantage of the green. Nevertheless, due to the importance of the nature as a compensatory function in view of climate change and the fact that green spaces improve the quality of living and the attractiveness of cities in general, urban green have been gaining in importance again in recent years and the model of "double

interior development" has been introduced. Tensions are thus arising in the municipalities between, on the one hand, building densification and, on the other hand, the preservation and development of urban green spaces with their diverse functions. In an integrated approach, open spaces in the existing stock are to be used sensibly for construction, while at the same time inner-city open spaces are to be developed, networked and qualitatively improved (Boehm et al., 2016: 12). In Hamburg, for example, solutions are being developed in the "Open Space Quality Offensive" to show how the quality of open space can be strengthened and improved in an increasingly dense city through the cooperation of numerous stakeholders. These qualitative approaches are to be implemented especially in places where there are few green spaces, parks or gardens. For this purpose, an open space requirement analysis was carried out in 2012. The implementation of individual activities is currently being tested as part of the "Spot ON Hamm Horn" pilot project (Hamburg, n.d.; Metropolregion Hamburg, 2017: 24).

Particularly in the context of the current debate on affordable housing, it must not be overlooked that land prices, the land price development, land distribution, the distribution of ownership must be taken into account when restricting the development of settlement areas. Especially stakeholders of ministries and municipalities or states with areas exposed to a strong settlement pressure point out the problem that, by limiting the development of greenfield, remaining areas are devalued, land and thus also the real estate become more and more expensive (Siedentop, 2011: 177). This can be seen for example in Esslingen, where they have no further development opportunities due to its geographical location, which means that the real estate prices have increased by more than 60 to 70% in the last four to five years. This is also reflected by the development of rents, which especially affects those who cannot keep up financially. These effects will intensify. From a global perspective, the pressure on the ground will continue to increase due to the pent-up demand of other societies and the resulting simplification of daily life and increased mobility needs, according to one stakeholder.

4.3.5 Balance

Some of the innovations that the 30 hectare target implied have already been partly mentioned and can be found in particular in planning ("inner urban development before expansion outwards", to develop joint industrial estates, to increase production, multiple uses, breaking down the target to the state level). In addition, there is a lot of research taking place in this area and new collaborations were established. For some stakeholders, the business game of area certificate trading represents a possibility that the implementation might work (Henger, 2019). The examples from Kassel and Rendsburg should be highlighted, which have a very successful joint planning with the surrounding municipalities, which is not based on the 30 hectare target but already existed before. While, on the one hand, the example of the football fields is highlighted as a positive example for better understanding, communication on

the topic is highlighted as one of the biggest mistakes, on the other hand. In some cases, it was not made clear what exactly is meant by this, firstly the issue of full sealing and which areas are actually considered to be land use, and secondly communication between various levels and with other institutions. Some complain about a lack of instruments or clear instructions from above as well as an adaptation at state level. The Federal Government, however, holds municipal planning sovereignty high and shows that implementation must take place here and that the municipalities must act in accordance with the goal. The only stakeholder at state level also says that breaking-down the target in the state development plan, as happened in Hessen, is not a real help for the municipalities, as a further disaggregation for the individual regions, would be necessary in order to take account of differences in development, for example in the rapidly growing Frankfurt metropolitan region or shrinking rural regions in northern Hessen. In addition to municipal planning sovereignty, most stakeholders actually see the lack of binding character as one of the biggest obstacles. There are no specialised laws that make land saving mandatory. Moreover, there are even laws, which contradict the target that have been passed, such as Section 13b and the government grant scheme to support families building homes, the "Baukindergeld" (BMI, n.d.). Further major obstacles are the mentioned dismantling of regional planning (Diller, 2015: 117 ff.; Ulmer et al., 2007: 36) as well as the competition between mayors and permits handed over from *Bezirkregierungen* (district governments) to county councils according to land use plans, which is based on the will of the voters.

In the opinion of stakeholders, there seem to be relatively few losers. They, for example, include municipalities and cities that currently do not have a land-saving approach to land use, often structurally weak regions that use the argument of cheap building land outdoors to attract investors (Rohr-Zaenker & Mueller, 2014: 3). Furthermore, the lack of construction and housing for people living in densely populated areas leads to a loss of green space in the city or to rising rents. The winners are directly opposed to the owners of real estate. But also agriculture and nature, as well as regions that manage to create their own common identity through joint planning are winners. For many stakeholders there are actually only winners and no losers.

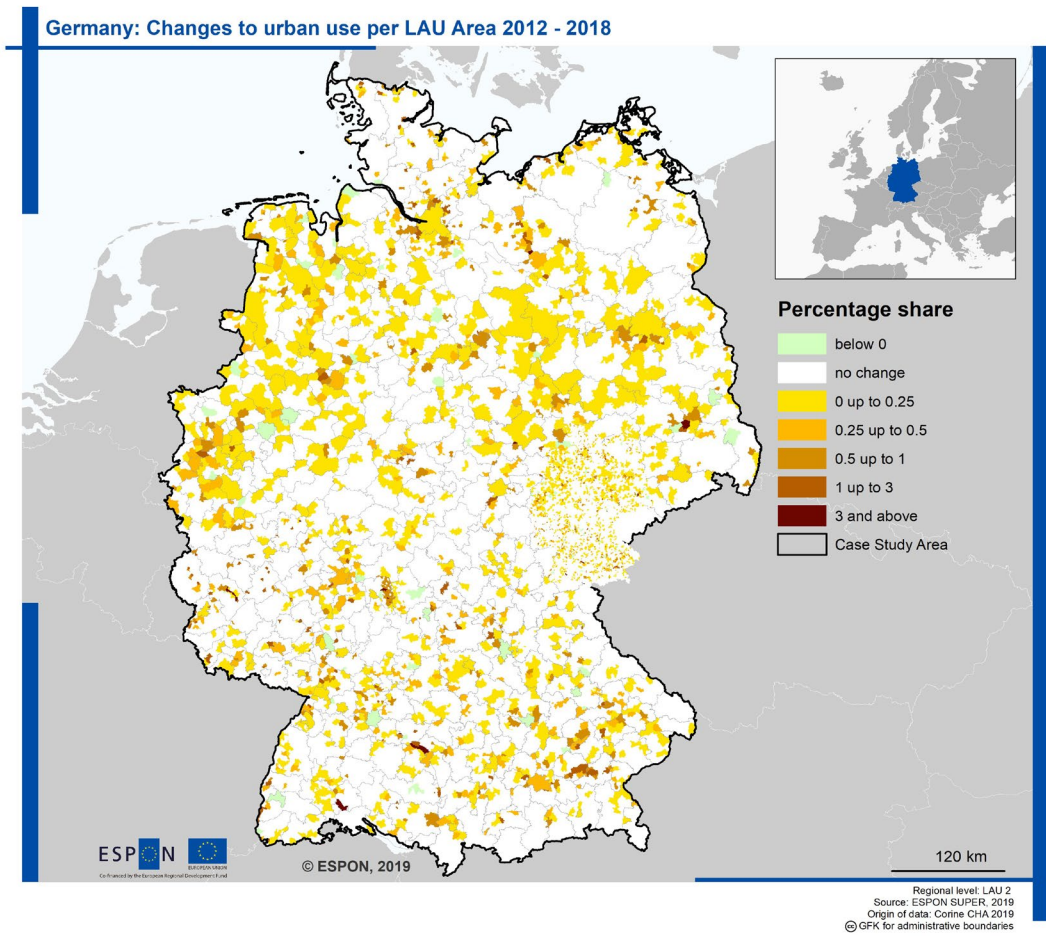
The expectations of only a quarter of stakeholders were fulfilled, while some say that the target was clearly missed and that it is still a long way to go until the target is reached. Those whose expectations were fulfilled say that it already had an effect and that half of the new land use has been reduced. Nevertheless, most stakeholders think that one cannot do without an overall objective. But one would need a binding obligation and more instruments would have to be made available, whether through compensation mechanisms, trading with land certificates, breaking-down the target to countries or by automatically reducing new land use through sustainable construction methods and more efficient use.

4.3.6 Multi-stakeholder assessment conclusions

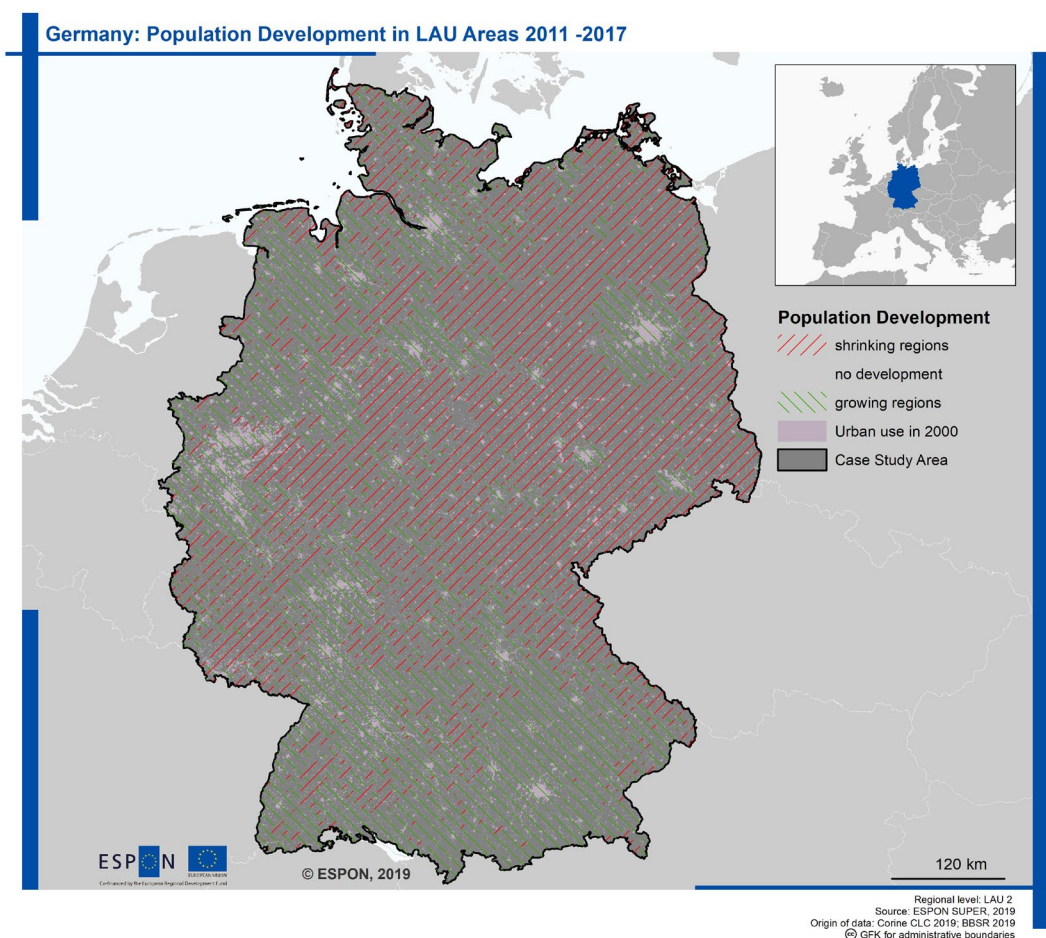
Through the proclamation of the 30 hectare target, the subject of land use gained in importance and is a recurring topic of discussion. It has also gained new topicality through the "homeland debate", as the referendum in Bavaria stated that "a loss of land is a loss of homeland". Apart from that, it must be said that the target has not yet been achieved and that attainment is not expected to take place before 2030, which means that the actual effects and changes can only be estimated to a limited extent and instead current trends and results of land-saving measures were considered. When considering economic indicators and also the development of infrastructure, no effects of the 30 hectare target or a reduction of new land use are currently noticeable at national level; things might, of course, look different if it had actually been implemented by 2020 as originally planned. The effects on the housing market can also only to a limited extent be attributed to the 30 hectare target, as people are using considerably more housing space today than they did a few years ago and thus the demand for housing is increasing in some regions despite declining or stagnating population figures. The average household size has decreased from three persons in the 1950s to two persons in 2015. This correlates with the increase in living space, which rose from under 20 to over 46 square metres per person in the same period. Families with at least one child occupy less than half as much living space per head as single households. Most living space per capita, is occupied by individuals in the 60 to 75 age group in owner-occupied housing with an average of 97 square metres per person (NABU, 2020: 22).

The maps show that significant suburbanisation processes can be identified, particularly in southern and western Germany. Whereas cities in these growing regions partly even show a negative development of settlement areas, a growth of urban use areas can be seen in their surroundings between 2012 and 2018. Conversely, it is clear that, as already described above, in many rural regions settlement areas are increasing despite declining populations, especially in the new federal states, but also in parts of the old federal ones.

Map 4.1: Changes to urban use per LAU Area from 2012 to 2018



Map 4.2: Population Development in LAU Areas from 2011 to 2017



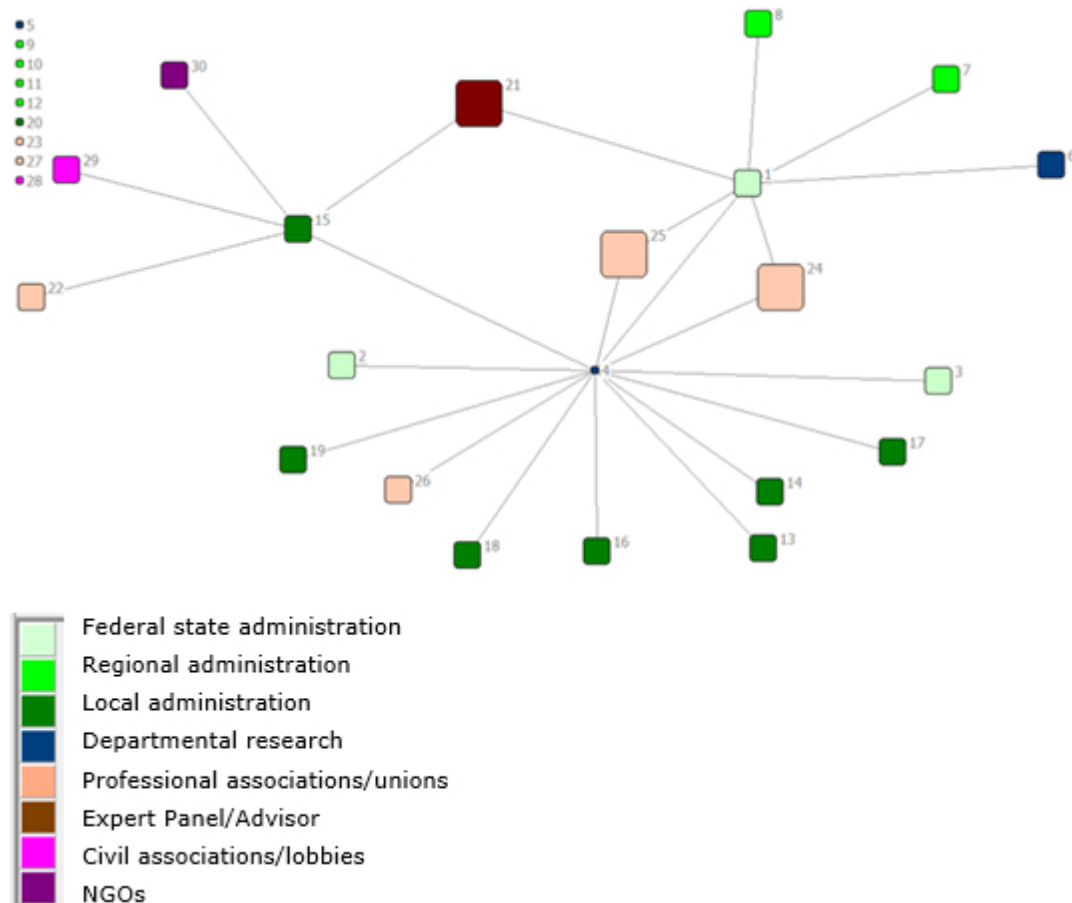
However, the implementation of the target seems to have lost importance in recent years in Germany, as the adoption of Section 13b of the Federal Building Code (BauGB) and the decision on the government grant scheme to support families building homes (Baukindergeld) has made building outdoors more attractive again thus counteracting the 30 hectare target. Nevertheless, the motto "internal development before external development" still applies and, with the development of joint industrial estates, the reactivation of brownfield sites, the recording of vacant lots or the increase in the number of housing units per area, provides suitable instruments for implementing space-saving measures. For a successful implementation, however, cooperation with the surrounding communities and various planning levels is indispensable.

4.4 Conclusions

The case study as such does not describe an intervention in the actual sense, but rather an overriding objective to which policymakers at the Federal Government level and, in the meantime, some of the federal states have committed themselves. However, due to the

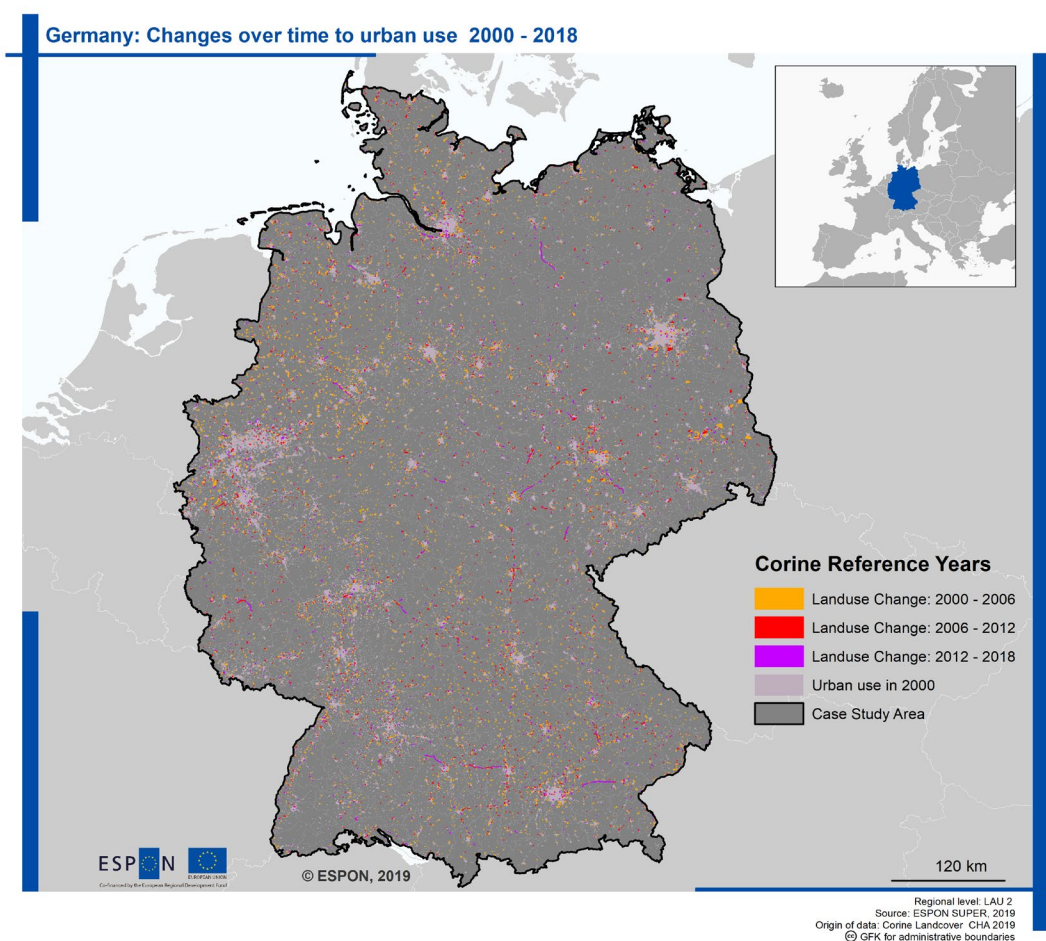
federal structure in Germany and the municipal planning sovereignty, the implementation of this goal has not yet taken place and was again extended to 2030 by the sustainability strategy of 2016 with the addition: "30 hectare minus X". According to stakeholders, the lack of implementation can in particular be attributed to a lack of communication and to a lack of cooperation at various levels, but also among other institutions; these statements are also clarified again by the network of negotiation (Figure 4.1).

Figure 4.1: Network of Negotiation



Due to the lack of achievement, evaluating the effects on planning as well as on the economy, ecology and equity is only possible to a limited extent and only reflects current views of a possible development as well as a smaller reduction of new land use that has taken place so far. The interviewed stakeholders are, however, well aware of this lack of implementation and they reflect both the effects of measures already implemented and the errors and obstacles of the target very well and make similar statements to those found in research. The reduction that has already taken place can also be seen from the calculations. If one compares the development of changes to urban use since 2000, a very clear reduction can be seen, as changes from 2000 to 2006 are predominant in the map (Map 4.3).

Map 4.3: Changes to urban use over time 2000-2018

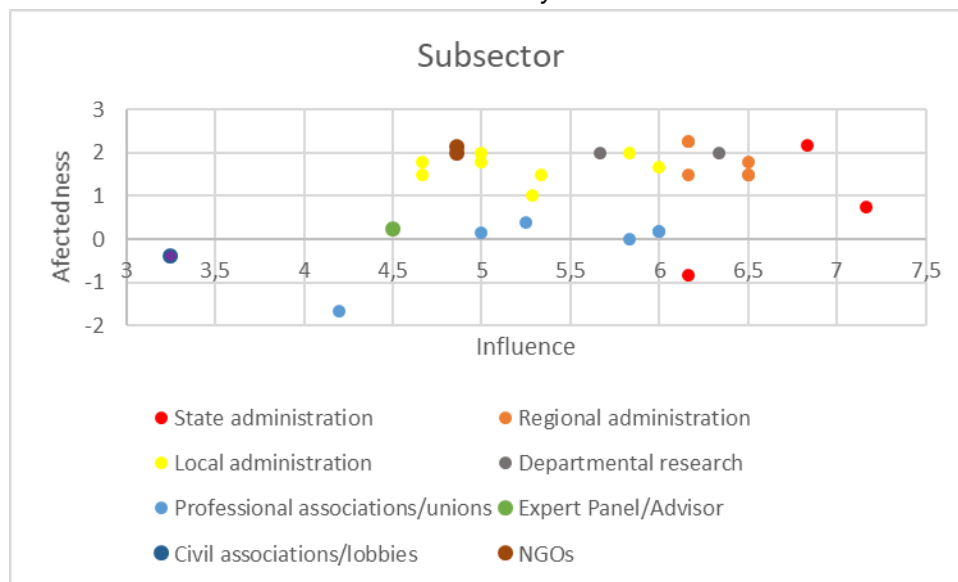


One of the greatest strengths but also an obstacle is the simplicity of the target. On the one hand, it is very popular and almost no one contradicts the target and that open spaces have to be saved. On the other hand, it is also not binding, which is why laws have been passed in recent years that have contributed to a “counter-development”. Particularly worth noting is the already often mentioned Section 13b of the Federal Building Code, which was an invitation to the municipalities to use land and was issued in a political context that was marked by immigration in 2015/2016. People hoped that more land that was made available would help to counter the housing shortage and also to meet the new housing needs of refugees, especially in big cities with a high population density. In 2019, however, we know that no large city has applied Section 13b, that not a single rental and housing flashpoint was mitigated by it, but that small and smallest municipalities, mostly in shrinking regions, have used it to designate single-family house settlements, some with oversized floor areas. However, these effects cannot yet be seen in the statistics, since the survey of new land uses from the German cadastral system is based on four-year averages.

Already occurring negative effects are not foreseeable due to the 30 hectare target, at least at national level; only in the local context could not always all aspects of sustainability be considered. Special weight is given to the three stakeholders, who, on the one hand, are exposed to a high population growth and/or, on the other hand, already before the

proclamation of the 30 hectare target had joint planning activities with the surrounding communities, which are still ongoing today. All three of them manage to save land through various instruments and to get by with what is available. The city with increased settlement pressure is also the one that has been most negative about the target and has listed many negative effects. In contrast, the other two stakeholders have very successful joint regional planning activities and, even where housing demand or the need for new industrial estates is high, there is still sufficient scope for action by redensifying and developing joint industrial estates. The importance of regional planning is also emphasised by the member of the Council for Sustainable Development, who considers its dismantling to be the greatest obstacle to the objective that has not yet been implemented. Figure 4.2 also highlights the fact that regional planning has a much greater influence than local administration, while the latter has to take the decisions and ultimately implement the objective in some form or another due to the local planning sovereignty.

Figure 4.2: Affectedness and Influence of Stakeholders by Subsector



In addition to joint planning, however, the inner urban development in particular and the urban area (higher densities) according to the Federal Building Code are some of the most important instruments. This enables the creation of new living space and a local development of infrastructure and commerce, which in the long term has hardly any negative consequences, both economically and socially, and in some cases even positive effects. Nevertheless, the remaining open spaces are shrinking at an above-average rate, especially in the core cities (Goetzke et al., 2012: 186). However, the added value of urban green spaces is increasingly being recognised, especially in large German cities, as the densification and development of green spaces must not be at the expense of the urban population. For example, the cities of Hamburg (see Chapter 4.3.4) and Munich, where they have both: a property-related standard for minimum greening (in the case of new plans) and characteristic values for the green features of the direct neighbourhood, the quarter and the district. (Schubert et al., 2019: 14). Redensification and green space maintenance can work if

the legal framework is adapted by modernising the Federal Land Utilisation Ordinance (Baunutzungsverordnung BauNVO) i.e. increasing floor areas and the mixture of uses. Redensification potentials are developed by central brownfield land registers and land speculation is made more difficult.

A transfer, to the net zero target at European level, for example, is somewhat more difficult, however, as many of the problems that have occurred in Germany are due to the federalist structures and the German planning system. Nevertheless, it can be stated that joint planning in individual regions in combination with inner urban development in many areas is promising in terms of reducing new land use for settlement and transport areas.

4.5 Implications for sustainable urbanization and land use

This case study sought to illuminate the black box of development practices within a particular territory in Europe, focusing on a particular intervention which changed, or attempted to change, these practice to more sustainable ends. The primary source material was in-depth interviews with stakeholders directly involved in decision-making on spatial development, on crafting or applying the intervention, or both. Through their candid explanations, it was possible to provide a nuanced, and often critical, account of the origins, mechanisms and impacts of the intervention. As can be read above, the results show stakeholders in agreement on some issues and disagreeing on others.

The purpose of this final section is to give voice to the case study researchers by asking them to specifically reflect on the key questions posed to the project at its inception. The ideas and opinions expressed in this final section – printed in italics – are, therefore, solely those of the authors.

To what extent can the observed land-use changes in the case be considered sustainable?

Even if the original goal of limiting the new use of land for settlement and transport to 30 ha per day by 2020 was not achieved, it has been more than cut in half since the sustainability strategy was published.

To what extent did short-term thinking weigh up against concerns of long-term economic, ecological and social vitality)?

As it is a long-term goal that an indicator should be included in the German sustainability strategy, there were no conflicts in this respect.

Was there a tension between sustainability at different levels of scale (e.g. a locally sustainable development having unsustainable attributes at the regional level)?

Conflicts directly related to different scale levels are not known. However, conflicts often occur when the development of settlement areas in natural areas is used to take compensatory measures at the expense of agricultural areas. The ecology receives a compensation but at the expense of the economy. The restriction of land also leads to ever higher costs and thus has an impact on rents which especially affects those who cannot keep up financially.

To what extent is there a correlation between urban form (e.g. high-density contiguous urbanisation versus low-density scattered development) and sustainability?

Land consumption in scattered, stagnating and shrinking regions is often higher than in compact growing regions and cities.

To what extent were place-based approaches and territorial cooperation responsible?

As it is a goal that has to be proclaimed at the federal level, but has to be implemented in municipalities due to the municipal planning sovereignty, place-based approaches and territorial cooperations are automatically required. Apart from the possibility of trading in land certificates, which is very promising, regional cooperation between cities and municipalities should be emphasised, as the implementation of the objective is particularly successful where corresponding structures already exist (example: Rendsburg and Kassel).

How sustainable are the measures themselves over time?

Negative impacts already occurring cannot be foreseen due to the 30 ha objective, at least at the national level; only in the local context could not always all aspects of sustainability be considered.

To what extent do they enjoy popular support or consensus among stakeholders?

The fear that open spaces may be lost is ever-present among many actors, which creates particular pressure and in some cases leads to the preservation of the remaining open spaces. So it is a generally accepted goal and it was neither criticised nor perceived as unfair.

How can urban sprawl be contained and which instruments can be used to do that?

In addition to joint planning or a possible land certificate trading, interior development and with it § 13 a (acceleration of interior development) and the urban area (higher densities) in the BauGB should be mentioned as one of the most important instruments. This enables the creation of new living space and a local development of infrastructure and trade, which in the long term has hardly any negative consequences, both economically and socially, and sometimes even positive effects.

How can we benefit economically from measures to limit land take/soil sealing?

A concentration of companies through inner urban development or joint industrial estates enables marketing directly on site and shorter production routes. The development takes place where the demand is, thus, also in the long run, consequential burdens are minimised because outside areas are more difficult to reach.

How can external costs be internalized? For example: at the moment it is often cheaper to develop greenfields instead of brownfields, but the costs of for instance the ecosystem services lost by developing a greenfield are not included in the development costs.

At present, it is cheaper to develop green spaces than brownfield sites, but long-term costs such as accessibility in the face of rising energy prices and the development of new infrastructure are not taken into account.

How can green and open spaces in urban areas be maintained for the quality of life, despite the (laudable) effort to densify settlement areas?

In Germany, the model of double interior development was created for this purpose, which calls for the preservation of green spaces in the interior while at the same time increasing their density. For example Munich, where they have both: a property-related standard for minimum greening (in the case of new plans) and characteristic values for the green features of the direct neighbourhood, the quarter and the district. Redensification and green space maintenance can work if the legal framework is adapted by modernising the Federal Land Utilisation Ordinance (Baunutzungsverordnung BauNVO) i.e. increasing floor areas and the mixture of uses. Redensification potentials are developed by central brownfield land registers and land speculation is made more difficult.

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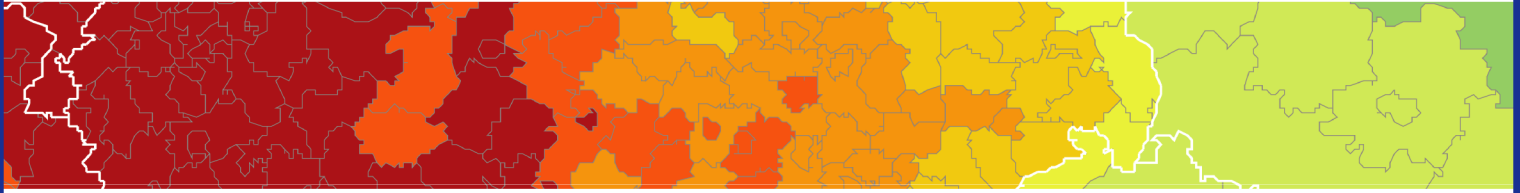
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ESPON EGTC

4 rue Erasme, L-1468 Luxembourg - Grand Duchy of Luxembourg

Phone: +352 20 600 280

Email: info@espon.eu

www.espon.eu, [Twitter](#), [LinkedIn](#), [YouTube](#)

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