



# DYNAMIX

Decoupling growth from resource use  
and environmental impacts

# DYNAMIX policy mix evaluation



Reducing land sealing in Germany



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1.

# 1 Resource/Issue

*Name of resource targeted (or focus of the case study, if the policy mix is broader than the specific resource(s) we have decided to analyse):*

Land is a limited resource and under pressure from increasing demands for agricultural and forestry products as well as land requirements for settlements and infrastructure. The sustainable use of land is key to the provision of ecosystem services, be it regulation of water quality, availability of water resources, provision of food or storage of carbon in soils. Hence, land is a key resource that needs to be protected.

An important driver that reduces the usability of land is urbanization and the increase of settlement areas, often referred to as “land take”, defined as the “increase of urban, commercial or industrial land in a given period” (European Commission 2013)<sup>1</sup> or the increase of settlement areas/artificial surfaces over time, usually at the expense of rural areas (Prokop et al. 2011).<sup>2</sup>

This case study analyses land take in Germany and the policies that have been taken to reduce additional land take.

The German case study will particularly focus on the reasons for the development of the German key indicator “Increase in settlement and traffic areas in ha per day” (“Anstieg der Siedlungs- und Verkehrsfläche in ha pro Tag”). Similar to the European definition “Settlement and traffic areas” in Germany include not only built areas but also related recreational and open spaces, cemeteries etc. (see Figure 1).

## Glossary:

Within this case study different terms are used to describe the sustainability of land use in Europe and Germany. The following list, taken from Prokop et al 2011 (p.23-25), will provide an overview of the most important terms.

Most of the definitions described there were derived from the Environmental Assessment of Soil for Monitoring project (ENVASSO) which published recommendations for the monitoring of all soil threats including soil sealing. Terms related to urbanization processes were taken from the European Environment Agencies (EEA) report “Urban Sprawl. The ignored challenge” (Prokop et al. 2011).<sup>3</sup>

### **Artificial Surfaces**

The term “artificial surface” is used in the CORINE Land Cover nomenclature and refers to “continuous and discontinuous urban fabric (housing areas), industrial, commercial and transport units, road and rail networks, dump sites and extraction sites, but also green urban areas.

### **Settlement areas**

Settlement areas are also known as “urban land” and “built-up land” and include areas for housing, industrial and commercial activities, areas for health care, education, and nursing infrastructure, traffic areas (streets and railways), cemeteries, recreational areas (parks and sports grounds), and dumps sites. In local land use plans this category usually corresponds to all land uses beyond agriculture, nature, forests, and water courses. Artificial surfaces and

settlement areas refer to the same structures, whereas settlement areas are defined by spatial planners and artificial surfaces are measured by means of remote sensing.

### **Sealed soils**

Sealed soils can be defined as the destruction or covering of soils by buildings, constructions and layers of completely or partly impermeable artificial material (asphalt, concrete, etc.). It is the most intense form of land take and is essentially an irreversible process. Sealed land is a subset of the above mentioned category; i.e. land consumed by development of settlements, infrastructure, and commercial and industrial areas. An indicator of the intensity of land take is the proportion of the total built-up land area which is sealed.

### **Land take**

Land take is also known as "urbanisation", "increase of artificial surfaces" and represents an increase of settlement areas (or artificial surfaces) over time, usually at the expense of rural areas. This process can result in an increase of scattered settlements in rural regions or in an expansion of urban areas around an urban nucleus (urban sprawl). A clear distinction is usually difficult to make.

### **Land use intensity**

Land use intensity refers to the amount of artificial surface per capita. Low land use intensity refers to a high amount of artificial surface per capita. Influencing factors for low land use intensities are above all the amount of second homes, the dominance of small disperse settlement structures and large touristic infrastructures. High land use intensity refers to a small amount of artificial surface per capita, being mainly the result of very compact settlement structures and high population density.

## **2 Geographical area of policy mix coverage**

*Country name, and region or city if appropriate (if policy mix is applied regionally or locally):*

The case study analyses the policy mix that has been put in place to achieve a reduction in additional land take in Germany. It focuses on the policies in place at the federal level, but also gives illustrative examples from the states, regional and municipal levels (i.e. examples from the "Bundesländer", "Kreise", "regionaler Planungsverbände", "Gemeinden" etc.).

## **3 Policy context**

### **3.1 Needs assessment: The environmental problem /resource challenge**

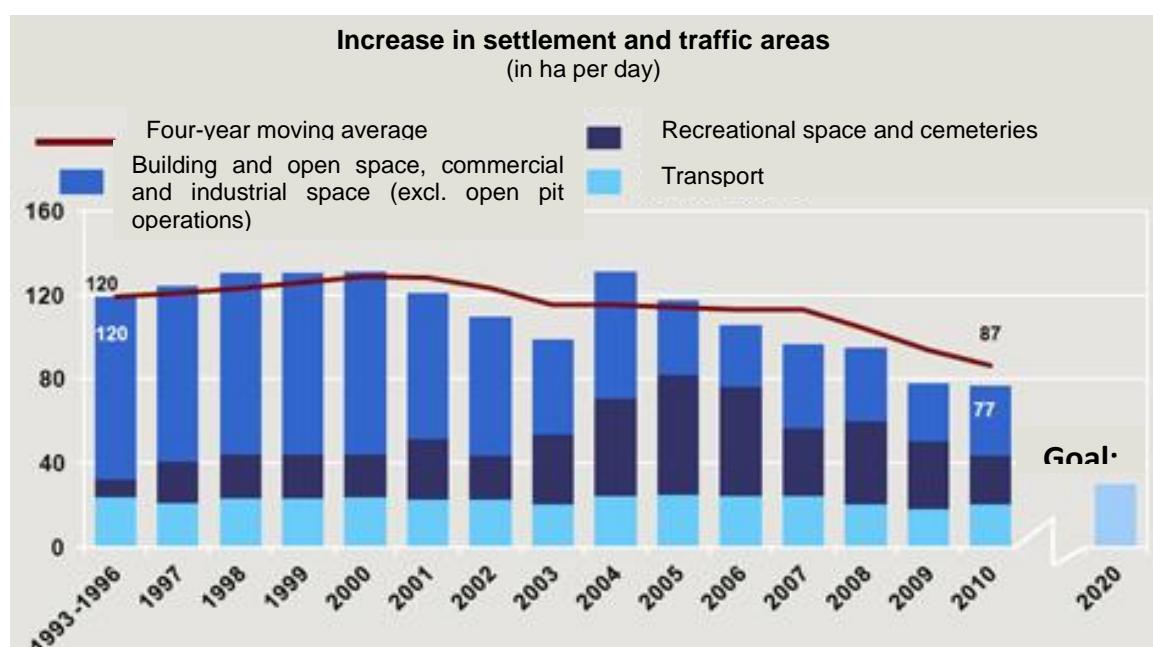
*What is the environmental problem/concern (consider both quantity and quality), e.g. soil erosion, excessive use of non-renewable or renewable resources and the crossing of environmental thresholds/tipping points for impact, resource scarcity concerns?*

*Who is the target group affected that have been, are or will be beneficiaries of the policy response?*

Germany covers an area of 357,111 km<sup>2</sup>. According to Prokop et al (2011) the amount of artificial surface per capita is about 10 % below the EU average with 365 m<sup>2</sup> per inhabitant. This can be explained with the high density of urban agglomerations: With 81.8 million inhabitants (Nov. 2009), i.e. 229 inhabitants per km<sup>2</sup>, Germany is one of the most densely populated countries in the EU (Prokop et al. 2011).<sup>4</sup> Only Malta, the Netherlands, Belgium, and the United Kingdom have higher population densities.

In recent years trends as regards land take in Germany were unsustainable: in 2011, each day, 81 ha were lost to settlement and traffic areas (Bundesregierung 2013)<sup>5</sup> (see Figure 1). Approximately 43-50 % of the area lost was sealed (Bundesregierung 2012).<sup>6</sup> In 2006 the amount of sealed surface per capita in Germany amounted to 249 m<sup>2</sup> which is about 10 % above the EU average (Prokop et al. 2011).<sup>7</sup> This means that although the artificial surface per capita is below the EU average, artificial surface is sealed to more intensively than in other EU countries, resulting in a higher amount of sealed surface per capita.

**Figure 1: Increase in German settlement and traffic areas in hectares per day, 1993-2010**



Source: Statistisches Bundesamt. 2011a. *Statistik zum Flächenverbrauch*. Wiesbaden accessed on 23.07.2013 at <http://www.netzwerk-laendlicher-raum.de/themen/flaechen/verbrauch/>)

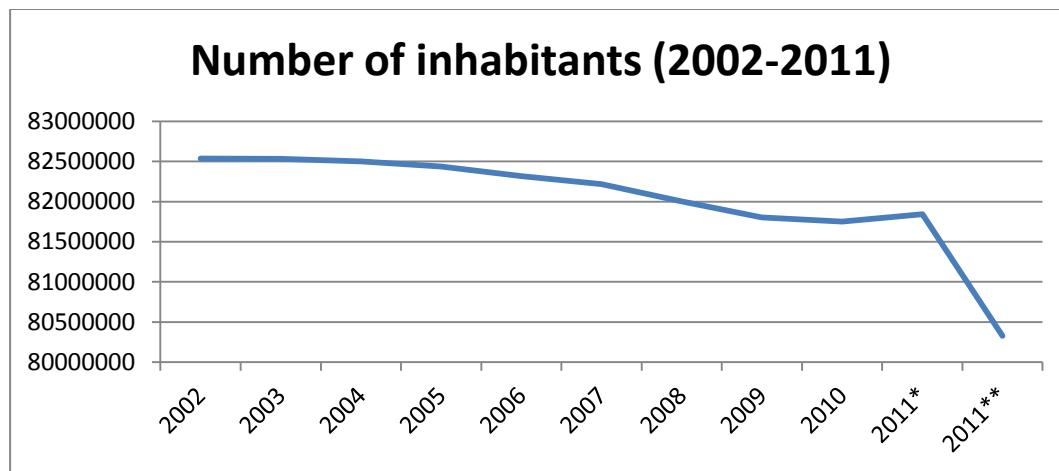
While the numbers in Figure 1 show that the *additional* land take per day is slowing down (from more than 120 ha per day in 1993 to 81 ha a day in 2011), the actual *overall* land take is nevertheless increasing (see Figure 3) and remains on a high level<sup>i</sup>. A reversal of the trend is not in sight. On the contrary, after a decrease of building permissions during the economic recession in 2009, the economic recovery in 2011 lead again to an increase in the number of building permissions and most projects are likely to be completed in the coming years (Bundesregierung 2013).<sup>8</sup>

<sup>i</sup> Between 1992 and 2007 settlement and traffic areas grew from 40305 km<sup>2</sup> to 46789 km<sup>2</sup> which equates an increase by 16,1% (BfN 2008, p.4).

Hence it is increasingly unlikely that the so called “30 hectare goal” (i.e. to restrict daily new land take to 30 hectare per day by 2020) that has been nationally set by the government in 2002 within the Strategy for Sustainable Development will be achieved (Bundesregierung 2002, BfN 2009, Jörissen and Coenen 2007).<sup>9,10,11</sup>

The land take trend in Germany is even more unsustainable if one takes into account that Germany’s population has been declining since the turn of the century (2002/2003) . These two trends combined mean that overall the artificial surface/sealed surface per capita has been rising every year since 2002 (see Figure 2).

**Figure 2: Number of inhabitants in Germany, 2002-2011**



Source: Statistisches Bundesamt. 2013b. *Bevölkerung und Erwerbstätigkeit - Vorläufige Ergebnisse der Bevölkerungsforschreibung auf Grundlage des Zensus 2011*, page 11 (accessed on 23.07.2013 at <http://de.statista.com/statistik/daten/studie/1217/umfrage/Zahl-der-Einwohner-in-Deutschland/>)

*Are there any economic or social problems related to the issue and environmental problems – e.g. is there important price volatility, (risk of) unavailability of resources for the economy or society?*

The **negative environmental consequences** of land take are manifold as it affects the ecosystem services provided by soils, particularly:

- provision of food and raw materials: soil underpins 90 % of all human food, fibre, and fuel and is essential for water and ecosystem health (EEA 2011);<sup>12</sup>
- storage of carbon in soils, thereby contributing to a potential slowing of climate change: according to the EEA (2011) Europe's soils store about 73 to 79 billion tonnes of carbon;
- archive for both natural and cultural history;
- support of human settlements, infrastructure and recreation;
- element of cultural heritage through the maintenance of landscapes;
- regulation of water quality/ filtering;
- water retention;
- pollutant degradation;
- nutrient cycling;
- provision of habitats for flora and fauna;
- genetic reserve.

More specifically, soil sealing is a strong intervention in soil biology including soil organisms, as it reduces the groundwater recharge rate, severely reduces evaporation and it is a barrier for water infiltration, which can lead to excess overland flows during heavy rain events and flooding. Increasing levels of soil sealing and building areas close to rivers have led to severe flooding in Germany, e.g. in 2002 and 2013. Even after sealed soils are restored they can barely gain back their former production capacity and other soil functions (Jörissen and Coenen 2007).<sup>13</sup>

Particularly in urban areas soil sealing also results in a changed local climate (warming up, reduced air humidity, development of dust/ particulate matter (Jörissen and Coenen 2007).<sup>14</sup>

Additionally, the agglomeration of transport infrastructure causes noise and CO<sub>2</sub> emissions from cars, trucks, etc. and the fragmentation of habitats, which is a major reason for the loss of biodiversity. In 2001 only 15 % of the total area of Germany was unfragmented areas of a size above 100 km<sup>2</sup> (from Jaeger 2001, cited in Jörissen and Coenen 2007).<sup>15</sup> Together with a lack of wildlife corridors this leads to a pressure on species and their populations, either in terms of a critical size or a lack of genetic exchange that can lead to the extinction of species (from Akademie für Technikfolgenabschätzung Baden-Württemberg, cited in Jörissen and Coenen 2007).<sup>16</sup>

It also needs to be considered that beyond the area that German statistics include as transport infrastructure, there are additional negative impacts beyond the core sealed area (e.g. noise barriers, drainage systems that affect hydrologic balance of the surrounding area as well as agricultural growing restrictions close to transport infrastructure).

Land take in Germany has largely been at the expense of agricultural areas (from 191 028 ha in 2000 to 186 771 in 2011) (Statistisches Bundesamt 2013a)<sup>17</sup> thereby limiting their production capacity. Moreover, new buildings in Germany are disproportionately, often situated on very productive agricultural soils, for historic reasons as past settlements have often been founded close to suitable arable land (Jörissen and Coenen 2007).<sup>18</sup>

Moreover, land take has also negative social and economic aspects:

- Many areas in Germany are affected by urban sprawl. The spatial segregation between rural and urban areas often leads to the depopulation of town centres (with the exception of large towns). As the majority of people that migrate to suburban areas are young, wealthy families with kids this often leads to an unbalanced social structure and decreasing tax revenues for the cities (Jörissen and Coenen 2007).<sup>19</sup>
- The building of new infrastructure goes hand in hand with rising maintenance costs, which need to be paid by the wider public independently of the extend they use the infrastructure (Jörissen and Coenen 2007).<sup>20</sup>
- Land take challenges inter-generational fairness (i.e. reduces the land use flexibility of future generations).
- Increased competition for land for different uses including for agriculture (food, feed and energy production including the growing degree of organic agriculture that has additional land requirements), forestry, settlements, mining, recreation etc. lead to social tensions between land users (Bundesregierung 2012).<sup>21</sup> Moreover, Germany already „imports“ land from areas outside Europe (SERI 2011),<sup>22</sup> as more than half of Europe's agricultural and forestry products are produced outside the EU (UBA 2012),<sup>23</sup> even if exports of domestically produced products are taken into account. This means that if, in order to increase food sovereignty, these products were produced in Germany, the competition for land would be even higher.

## 3.2 Policy context and policy needs

*What policy challenge(s) did the problem pose and what policy challenges does it still pose?*

*What is the policy context related to the policy mix being evaluated? What policies have been put in place to address the issues, what policies are currently in place and which ones are already foreseen for future introduction (e.g. to address past, existing and future objectives)?*

*What sort of policy response did (and does) the problem call for?*

Problems arising from land take have been addressed as early as the 1920s by a growing and increasingly complex range of policy instruments (see chapter 5).

It is therefore difficult to define when the “policy mix” addressing land take in Germany was established. Moreover, there was a constant but not linear development of spatial planning instruments and policies and most experts agree that the current available mix is not following an overall concept with one clear goal but it is a mix of instruments that address land take to varying degrees. Lastly, there are important differences between the Länder (and regions, municipalities etc.) level and the federal level as they have different competences but also different instruments, which pose limitations to a clear delineation of a policy mix.

Chapter 6 will outline the policy mix and its elements that are considered to be most relevant for the reduction of German land take. As one of the important policy mix components – the Federal Nature Conservation Act (BNatSchG) - was adopted in 1976 this is considered to be the starting point of the policy mix that is more closely analysed within the following chapters.

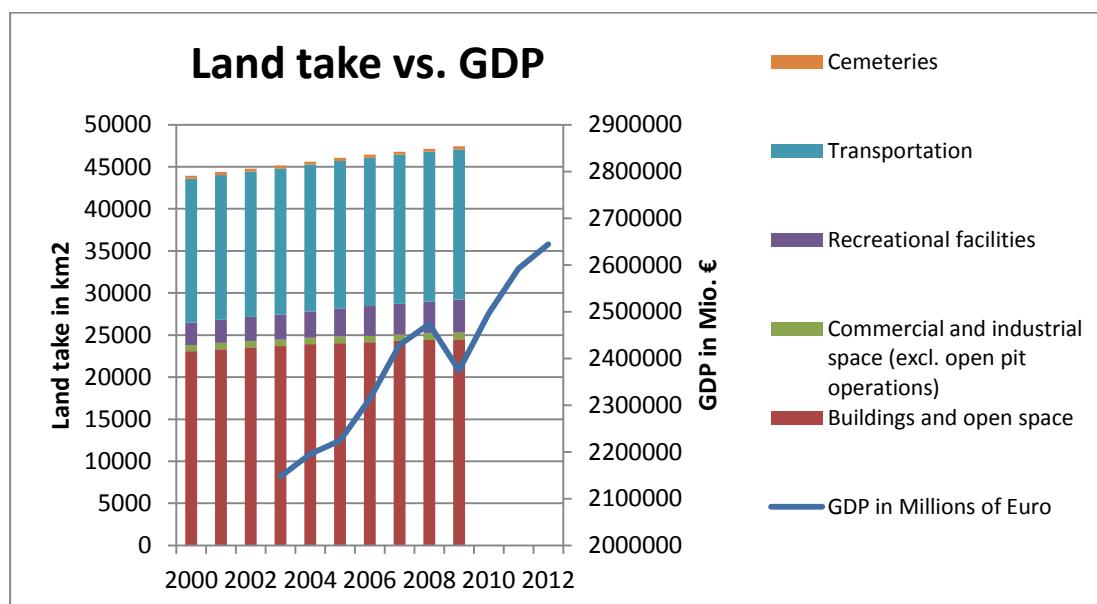
As efforts to improve land use policies are still ongoing, no “end date” for the policy mix has been set, but the analysis of instruments and effects ends where the last data is available (2011/2012) .

## 3.3 Historical performance and projections into the future: Insights on decoupling

*What has been the trend vs. GDP (or other economic performance metrics, such as sectoral growth) and what type of decoupling has been achieved?*

The comparison between the economic development expressed as GDP and the development of land take show that trends for both (steadily) increased over the last 10 years (see Figure 3). A similar development can also be observed for the indicator “GDP per capita”, which was constantly growing from 23.419 Euro per person in 1991 up to 28.973 Euro in 2010 (Statistisches Bundesamt 2012).<sup>24</sup> One could therefore argue that economic development and land take are coupled to a certain extent, particularly as times of economic recession lead to a slight decrease in additional land take<sup>ii</sup>. However, causality has not been scientifically established.

<sup>ii</sup> For example, in the year 2000, the area for settlement and transport in Germany increased daily by 131 ha; from 2000 to 2002, this daily growth declined to 105 ha mainly due to the economic situation (Bundesregierung 2004 in Malburg-Graf et al 2007).

**Figure 3: German cumulative land take versus development of GDP, 2000-2012**

Source: Statistisches Bundesamt. 2010. FS 3 Land- und Forstwirtschaft, Fischerei, R. 5.1 *Bodenfläche nach Art der tatsächlichen Nutzung 2009*, Wiesbaden (accessed on 23.07.2013 at <http://www.umweltbundesamt-daten-zur-umwelt.de/umweltdaten/public/document/downloadImage.do?ident=21306>)

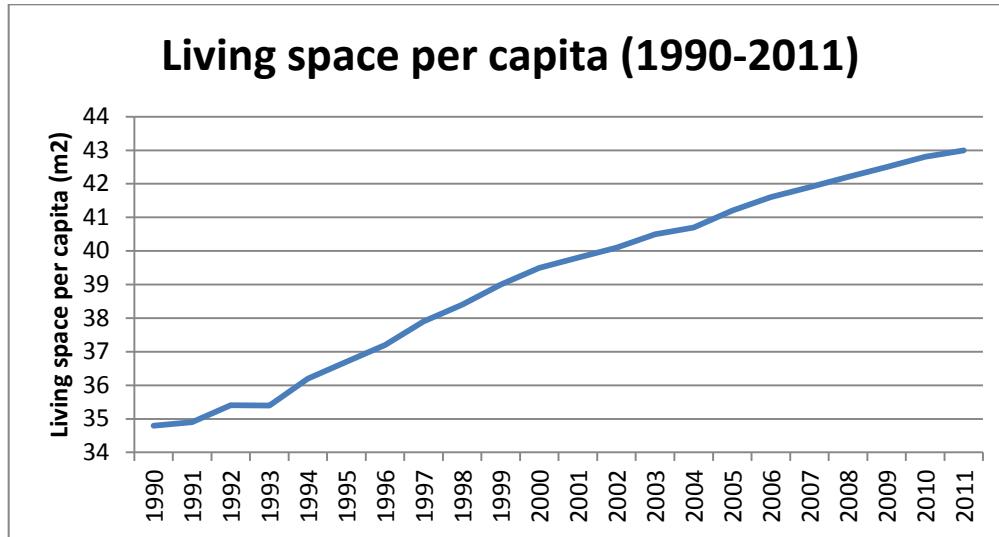
Another close correlation can be seen between building investments and land take: The four year moving average (see Figure 1) shows a continuous slowdown of (additional) land take from 129 ha per day in the year 2000 to 87 ha per day in 2010. This corresponds with building investments which decreased by 15,8 % over the same time period (Bundesregierung 2012).<sup>25</sup> Hence, in the case of land sealing for Germany relative decoupling was achieved, at best.

## 4 Drivers affecting change: resource use/ environmental issues

*What are the drivers affecting resource use (driving demand for the resource and leading to resource overuse) or other environmental impacts?*

There are two main drivers for land take in Germany:

1. Increased living space per capita: Although Germany's population is decreasing - which should in theory lead to a reduction of (additional) land take - the living space per capita is constantly increasing (see Figure 4). The biennial surveys about environmental awareness in Germany (BMU 2013)<sup>26</sup> show that while the environmental awareness in Germany is generally high (in 2012 environmental concerns ranked second place after concerns about the economic development/jobs) neither environmental concerns nor the awareness of the connection between dwelling forms and environmental impacts do affect the personal preferences as regards housing (and more specifically the preference for single family houses and increased living space).

**Figure 4: Average German living space per capita (m<sup>2</sup>), 1990-2011**

Source: Statistisches Bundesamt 2011b: *Gebäude und Wohnungen* and Statistisches Bundesamt: GENESIS-Online (2012) (accessed on 23.07.2013 at <http://www.statistik.sachsen-anhalt.de/apps/StrukturKompass/indikator/zeitreihe/139>)

2. Economic incentives, particularly the competition of municipalities for residential and business taxes. While municipalities have to balance economic requirements with environmental requirements, in praxis (short term) economic regional interest often outweighs environmental interests that are mainly supraregional or even national/international<sup>iii</sup> (BfN 2009).<sup>27</sup> Other economic reasons for additional land take are cost saving opportunities in architecture (low rise buildings), especially in business parks. Furthermore, increased costs are likely if brownfields are (re)developed (including decontamination).

The policy mix has been less effective than it would have been otherwise partly due to some policies in place that have had and that continue to have a negative influence on the achievement of the goal. Among them are the following instruments:

#### a. Land acquisition tax (Grunderwerbssteuer)

Land acquisition taxes need to be paid when land is bought. Varying between the states they makes up 3,5 % up to 5,5 % of the “taxable base” (“Steuerbemessungsgrundlage”), which is often based on but not equal to the price paid for the land. The tax revenues go to the states which partly pass them on to the municipalities.

As the tax in its current mechanisms indirectly privileges the building of new houses (as opposed to the renovation or rehabilitation of old buildings) there are many reform suggestions, including its abolition.

<sup>iii</sup> Many studies though have shown that an overall cost benefits short- medium and long term often lead to less positive or often even negative total balance of fiscal advantages (BfN 2008, p.6).

### b. Land tax (Grundsteuer).

The land tax in Germany is one of the oldest German taxes (introduced 1938) and relates to the property of land and buildings. Tax revenues belong to the state. Similarly to the land acquisition tax, the calculation base is very complex. Both however have in common that they are not targeted towards the reduction of land take. The land tax is criticized due to its outdated calculation basis. There are calls for revising it in order to ensure it discourages developing on greenfields by making it more expensive than the redevelopment of formerly used sites in the inner-city zone (Malburg-Graf et al. 2007).<sup>28</sup>

### c. Municipal finance system

A further aspect, which leads to even more complexity, is the municipal finance system. The income of a municipality consists mainly of a series of taxes like the land tax, the land acquisition tax and the **trade tax** (Gewerbesteuer). This economic mixture aggravates the problem of excessive use of unbuilt land for settlement and transport: the more inhabitants and business companies a municipality gains the more income it receives. Some taxes, like the land tax and the trade tax, are direct taxes to the municipalities. Other taxes, like the land acquisition tax, are reallocated by the federal states via a municipal financial equalization system ("kommunaler Finanzausgleich") (Malburg-Graf et al. 2007).<sup>29</sup>

### d. Grants

Most experts and studies come to the conclusion that carefully directed financial support of the inner development of a city can be an important measure. There is no consensus however whether taxes on land use and sealing as indirect negative incentives are more or less efficient than grants, which could act as direct positive incentives (Malburg-Graf et al. 2007).<sup>30</sup> A grant with a negative impact on land take was the federal subvention for private homebuilders (**First home buyer allowance**/“**Eigenheimzulage**”), which had been in place (though with different conditions) since 1949. It was abolished in 2005. However, the abolishment only had little impact on additional land take (Malburg-Graf et al. 2007, Jörissen and Coenen 2007)<sup>31,32</sup> but lead to large savings of the federal government as the yearly costs for this grant went up to 11,4 billion € (2004).

Another payment that is discussed to have negative influence on land use as it also finances suburbanization and commuters between rural and urban areas is the **commuter tax relief payment** (“Entfernungspauschale”/ “Pendlerpauschale”). It is still in place.

Land take has also been a secondary effect of national and **EU grants** that have stimulated the building industry, particularly in East Germany after the reunification: Building on greenfield sites was encouraged by the available funding systems and resulted in uncontrolled sprawl (Prokop et al. 2011).<sup>33</sup>

Positive impacts to reduce land take can be traced back to **public investments in the housing sector** that helped to support land recycling, the development of inner cities and adaptation of urban areas to the challenges of demographic change and<sup>iv</sup>.

Moreover, the progress report of the German Sustainability Strategy (Bundesregierung 2012)<sup>34</sup> points out that the massive growth of renewable energy plants (biomass, photovoltaic and wind) was a driver of land take in the last years.

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<sup>iv</sup> “Wohnungspolitik”, „Städtebauförderung, programmes like “Stadtumbau Ost”, „KfW-Programm Altbausanitize“

## 5 Situation/trend prior to introduction of policy mix

*Information on the baseline situation before the policy mix was introduced.*

As the current policy mix originates in many decades of experiences with spatial planning instruments and landscape planning instruments the following paragraphs will briefly outline this genesis/historic context:

- First attempts to establish spatial planning go back to the 1920s (e.g. "Siedlungsverband Ruhrkohlenbezirk", which can roughly be translated as "Syndicate of Municipalities of the Ruhr Coal Mining District") and have been triggered by the growth of urban areas and development of industrial agglomerations (Blotevogel 2003).<sup>35</sup> Efforts focused on the conservation of natural areas (mainly for recreation), but were limited to the regional level.
- This initial phase was then followed by a NS-connote spatial planning since 1933 with the establishment of a federal institution for spatial planning in 1933 ("Stelle für Siedlungsplanung", renamed "Reichsstelle für Raumordnung" in 1934).
- After the Second World War spatial planning mainly addressed Germany's reconstruction. In 1949 Germany's constitution provided the federal level with the legislative power ("Rahmenvorschriften") to define spatial planning and nature conservation framework legislation for the Bundesländer.
- In 1965 the federal regional planning act ("Raumordnungsgesetz des Bundes" (ROG)) was adopted (amended many times ever since, the last time in 2008). Spatial planning between 1965 and 1972 was characterised by a high degree of formality, high complexity, an increase in a scientific approach, less flexibility and a low level of public involvement. In 1975 the first (and only) Federal Planning Programme ("Bundesraumordnungsprogramm") was adopted. However, as there was a lot of resistance from the states and the need to agree on the smallest common denominator the Federal Planning Programme that emerged from the process was rather weak and largely ineffective (Blotevogel 2003).<sup>36</sup>
- After the mid 70s until the 80s spatial planning was progressively devolved to the lower/ local and municipal levels including a stronger emphasis and consideration for environmental issues and public participation (Blotevogel 2003).<sup>37</sup> In 1976 the Federal Nature Conservation Act (BNatSchG) was adopted ("Bundesnaturschutzgesetz" (BNatSchG)). The BNatSchG established the German landscape planning system, the impact regulation/ compensation instruments ("Eingriffsregelung") and other instruments. The federal state was now moving more into the position of an „enabling state“ that was expected to create suitable framework conditions for more independent regional developments (Blotevogel 2003).<sup>38</sup>
- After 1990 spatial planning was faced with new challenges, namely the German reunification and the integration into the EU which lead to a renaissance of spatial planning. Moreover, ecological issues and sustainability requirements were strengthened in the general orientation („Leitbild der nachhaltigen Raumentwicklung“) (Blotevogel 2003).<sup>39</sup>

## 6 Description of policy mix(es)

*This section presents the main policy mix that will be the focus of this ex-post assessment.*

**Lifecycle focus of the policy mix:** Land use

<b>Sector(s) covered:</b>	Several sectors (influenced by land take)
<b>Scale of application of policy mix:</b>	National level mostly
<b>Implementing body:</b>	Not available

**Objective of policy mix:** Achieve a reduction in additional land take in Germany. A national target, the so called “30 hectare goal” (i.e. to restrict daily new land take to 30 hectare per day by 2020) has been nationally set by the government in 2002 within the Strategy for Sustainable Development.

This chapter section will describe the policy mix to reduce additional land take in Germany in place between 1976 and today. What is here described as a policy mix is a complex package of interrelated instruments that targets the reduction of land to variable degrees rather than a mix that was coherently designed and put in place in one go.

The components of the policy mix have been clustered in different categories (see Figure 7) which will be further explained in chapter 6b. Chapter 10 (overall assessment) will additionally summarize the role and impact of the different instruments.

## 6a. Supplementary context questions including elements pertinent to paradigm discussions in DYNAMIX

*Timeline for the different phases of the policy cycle (i.e. rationale and objective-setting; appraisal; implementation and monitoring).*

*Description of the government in power during each of the three following policy phases: rationale and objective-setting; appraisal; and implementation and monitoring.*

*Does the mix contain policies that are unusual or not typical of the country/ies or regional/local administration that implemented it?*

*Names of resource efficiency concepts, terms, models, ranking/classification systems, accounting methods etc. used or relied upon in each of the three phases of the policy cycle: rationale and objective-setting; appraisal; and implementation and monitoring, and how they were used (e.g.: ‘waste hierarchy’ – used in objective-setting to link policy objectives to more desirable uses for waste).*

While the following chapter 6b will go into more detail with regard to the single elements of the mix, it needs to be said beforehand that the German planning system is a very complex one. This is due to the number of instruments but even more due to the (fiscal, planning, policy etc) interlinkages between the federal, state, regional and the local/municipal level<sup>v</sup>. This case study won't be able to describe these links in detail, particularly since the distribution of competences differs across sectors and policy areas and also changed over time (e.g. reform of federalism/“Föderalismusreform” in 2006).

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<sup>v</sup> See concepts local planning autonomy (“kommunale Planungshoheit”), federal legal guidelines restricting state legislation (“Rahmengesetzgebung des Bundes”) etc.

The complexity of interactions between different levels also impacts decision making, e.g. between the lower house (Bundestag) and the upper house of the German parliament (Bundesrat) and the cooperation between state and federal level.

Still, the formation of a government be it on the state or federal level had and has an influence: while environmental and social policies rank highest in the political agenda of the Green Party (Bündnis 90/ Die Grünen), the social-democrats and the left party (Die Linke.), the conservative Christian Democrats (CDU/CSU) and the liberal centre/ centre right FDP (The Free Democratic Party) tend to be more economically oriented.

However, important changes in the building codes/ legislation tend to be agreed in broader coalitions, as e.g. the amendment of the building code in 2013 that aimed at improving efficiency in the use of land (Bundestag 2013).<sup>40</sup>

What is also special to the German case is that there are many instruments where Germany (be it on the federal or state level) was and partly is a pioneer in testing and implementing these (landscape planning system, compensation system/ “Eingriffsregelung”; currently: trading certificates for land, circular land use management) which often lead/has lead to international interest.

## 6b. Instruments and orientation of policy mix

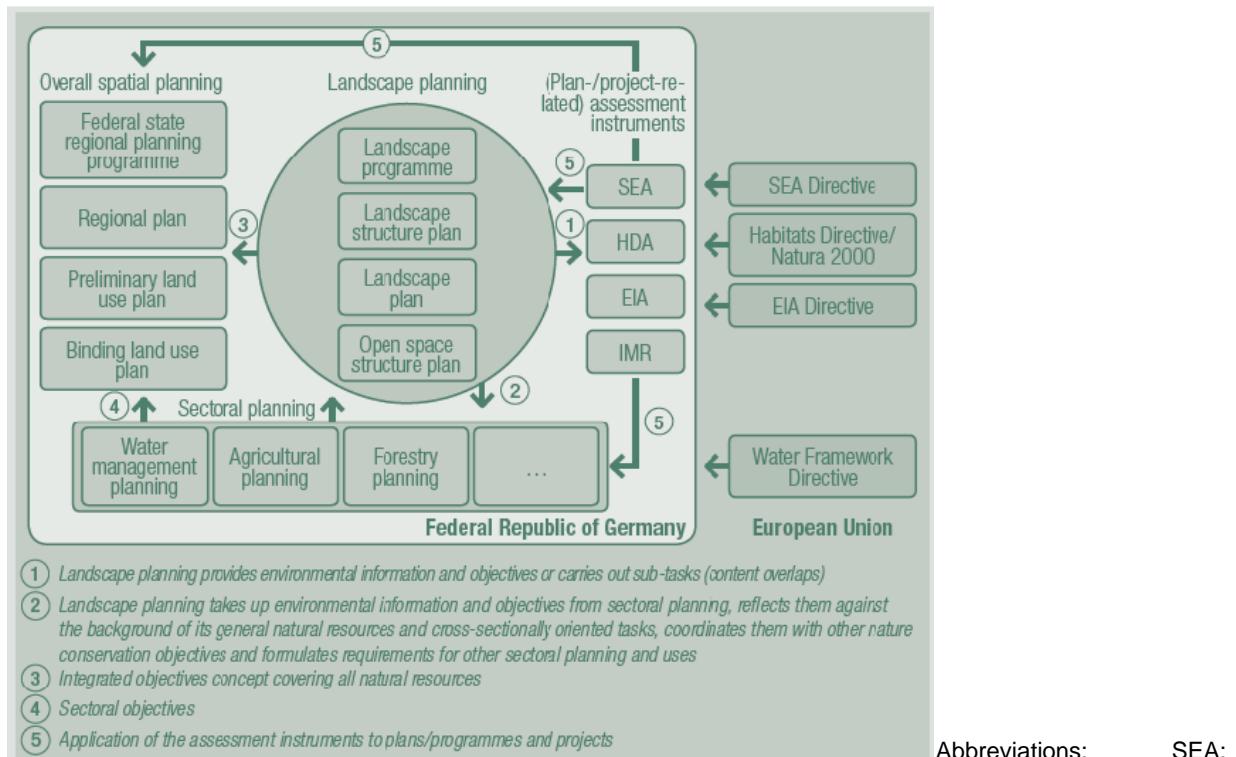
*Instruments in the mix and whether one type of tool (i.e. regulatory, economic, information) is dominant.*

*For each instrument, what is its aim? What requirements does it place on relevant players (for example, phasing out a certain substance, meeting minimum recycling targets, etc.)? What reporting requirements exist?*

### Regulatory and planning instruments

In Germany there are four planning levels: the municipal, the regional, the federal state (“Bundesländer”) and the federal level. The **spatial planning act** (“Raumordnungsgesetz”) provides the framework for spatial order and planning. The federal states make this framework operational through a federal state planning. Each federal state consists of several planning regions, which work out regional plans with guidelines on the regional planning structure. These guidelines are to be taken into consideration on the municipal level (Malburg-Graf et al. 2007).<sup>41</sup>

In parallel to the overall **spatial planning** process, **landscape planning** comprehensively addresses environmental issues. Figure 5 and Figure 6 illustrate the position of landscape planning within the overall spatial planning system. For both spatial planning and landscape planning each respective higher level plan forms the functional orientation framework for the subordinate planning level.

**Figure 5: Position of landscape planning in the German planning system**

Source: Haaren, Christina v.; Galler, Carolin & Ott, Stefan 2008. *Landscape planning. The basis of sustainable landscape development*. Published by the Bundesamt für Naturschutz Deutschland, Bonn; download at [http://www.umwelt.uni-hannover.de/haaren.html?&no\\_cache=1&tx\\_tkinstpersonen\\_pi1\[showUid\]=75&tx\\_tkinstpersonen\\_pi1\[publikationen\]=1](http://www.umwelt.uni-hannover.de/haaren.html?&no_cache=1&tx_tkinstpersonen_pi1[showUid]=75&tx_tkinstpersonen_pi1[publikationen]=1)

**Figure 6: Plan products of landscape planning at the levels of overall spatial planning and sectoral planning**

Planning area	Landscape planning	Overall spatial planning	Sectoral planning <sup>4)</sup>	Planning scale of landscape planning
Land (federal state)	Landscape programme <sup>1)</sup>	Federal state regional planning programme	Sectoral programme or sectoral plan at federal state level	1: 500,000 to 1: 200,000
Region/ administrative district, district	Landscape structure plan <sup>1)</sup>	Regional plan	Sectoral framework plan	1: 100,000 to 1: 25,000
Municipality	Landscape plan <sup>2)</sup>	Preliminary land use plan	Project plan at approval or planning determination level and/or construction plan	1: 10,000 to 1: 5,000
Part of the municipal area	Open space structure plan <sup>3)</sup>	Binding land use plan		1: 2,500 to 1: 1,000

**Notes:**

- These plans have different names in individual federal states.
- Except the city states Berlin, Bremen and Hamburg as well as North Rhine-Westphalia and Thuringia.
- These plans are not provided for in all federal states; in some they have different names.
- Including EIA and landscape envelope planning.

Source: Haaren, Christina v.; Galler, Carolin & Ott, Stefan 2008. *Landscape planning. The basis of sustainable landscape development*. Published by the Bundesamt für Naturschutz Deutschland, Bonn; download at [http://www.umwelt.uni-hannover.de/haaren.html?&no\\_cache=1&tx\\_tkinstpersonen\\_pi1\[showUid\]=75&tx\\_tkinstpersonen\\_pi1\[publikationen\]=1](http://www.umwelt.uni-hannover.de/haaren.html?&no_cache=1&tx_tkinstpersonen_pi1[showUid]=75&tx_tkinstpersonen_pi1[publikationen]=1)

Landscape planning has been established as a central planning instrument of prevention oriented nature conservation since 1976. Its core objectives and tasks are described in the **Federal Nature Conservation Act<sup>vi</sup>** (§9)<sup>vii</sup> (BNatSchG 2010).<sup>42</sup> According to §9, landscape planning is supposed to specify the overall objectives of environmental and nature protection for the different regional levels. The plans provide extensive information about the natural conditions and should develop adequate measures to realize these objectives and formulate requirements for other environmentally relevant planning decisions.

Hence information on soils, geology, bodies of water, air and climate, fauna and flora can be used to inform planning processes, e.g. to guide the location of traffic and settlement areas and other projects (or even prevent/reduce these developments). For example in many regions landscape planning instruments/plans define suitable areas for wind power parks (“Eignungsgebiete”).

Landscape planning is not legally binding at the first stage of its development but becomes binding through integration in other planning (see also Figure 5 and Figure 6). Exceptions are the German state of North Rhine-Westphalia and the city states (“Stadtstaaten”) Berlin, Bremen and Hamburg where landscape planning becomes directly legally binding.

Despite the regulations provided by the higher planning levels, the local level still has considerable power in Germany: Germany's constitution (“Grundgesetz”) and the spatial planning act, guarantee **local planning autonomy** (“kommunale Planungshoheit”). The **building law** (“Baugesetzbuch”) regulates land use planning on the local level.

The current version of this legal framework contains a soil conservation article and a powerful link to the nature conservation act (BNatSchG 2010),<sup>43</sup> which requires the legally binding **compensation of environmental impacts** in the case of building measures (“Eingriffsregelung”) (Malburg-Graf et al. 2007).<sup>44</sup> The Impact Mitigation Regulation (IMR) (“Eingriffsregelung”) follows the principle to avoid and minimize environmental impacts and to compensate those which are not avoidable (residual impacts).

After the adoption of the “**Europarechtsanpassungsgesetz Bau**” (which roughly translates as “law to implement EU rules in the building law”) in 2004 the building law implemented the requirements for the **strategic environmental assessment** as outlined in the EU directive 2001/42/EC (Strategic Environmental Assessment Directive).

The 2004 amendment also included the new opportunity to **temporarily limit the permission of building plans** (“Baurecht auf Zeit”).

In 2013 the building law was again amended in order to reduce land take<sup>viii</sup> (Bundesgesetzblatt 2013).<sup>45</sup> It intends to further strengthen the requirement for new building

<sup>vi</sup> Since 2002 the Federal Nature Conservation Act also contains more instruments to improve sustainable land use and reduce the pressure on habitats, e.g. through provisions on wildlife corridors, green belts etc (“Biotopverbund”).

<sup>vii</sup> After its amendments in 2002 and 2010 the Federal Nature Conservation Act was again strengthened to reduce land take, protect habitats and support land recycling.

<sup>viii</sup> „Gesetz zur Stärkung der Innenentwicklung in den Städten und Gemeinden und weiteren Fortentwicklung des Städtebaurechts“, June 11, 2013. Bundesgesetzblatt Jahrgang 2013, Teil 1, Nr. 29, ausgegeben zu Juni

developments to take place within existing settlements, e.g. by requiring a written justification if agricultural and forestry areas are to be converted.

In terms of soil protection – which is closely related to the environmental impacts of land take – the **Federal Soil Protection Act** of 1998 is part of the policy mix, too. It intends to protect all soil functions. However, while it also contains provisions to protect the soil from erosion and sealing, its main practical application relates to the protection against harmful changes to soil and on rehabilitation of contaminated sites.

A current legislative proposal that might be adopted at the end of 2013 is the adoption of the **Federal Compensation Ordinance** (“Bundeskompensationsflächenverordnung”) that is meant to set new requirements to protect agricultural land, reducing land take, improving the implementation of land recycling (reuse of abandoned, vacant, or underused properties for redevelopment or repurposing) and the establishment of wildlife corridors etc.

Also not yet decided but planned is the amendment of the **Federal Transport Infrastructure Plan** (“Bundesverkehrswegeplan”) that will be adjusted to include a limitation on land take<sup>ix</sup>.

### Strategies

Since 2002 the Federal Government of Germany has a “**30 hectare goal**” by 2020, meaning that land take in Germany should be reduced to 30 ha per day by 2020. The “30 ha goal” is a non-binding political intention, as laid down in the Federal Strategy for Sustainable Development, that defines the decrease of the settlement area per day as one of 21 sustainability indicators (Bundesregierung 2002).<sup>46</sup> It serves as a symbol of sustainable land use in the future and not only as a quantitative aim (Malburg-Graf et al. 2007).<sup>47</sup> It also doesn't have a qualitative dimension, e.g. which areas should be particularly protected etc.

However, the sustainability strategy reiterates the commonly used spatial planning concept of “**inner-development before outer-development**” („Innenentwicklung vor Außenentwicklung“), and gives it a quantitative target relation (3:1) (Bundesregierung 2002).<sup>48</sup> The Federal Strategy for Sustainable Development is frequently assessed in progress reports (2004, 2005, 2008 and 2012). The progress reports also outline the achievements so far and the need for action.

Partly inspired by the federal initiative and concept several municipalities, states and majors declared that they want to reduce land take to zero hectare by 2050 (RNE 2013).<sup>49</sup> For example in 2006 **Baden-Württemberg** adopted a goal of “**zero net growth**” to be achieved “in the long term”. Since 2013 Thüringen emphasized its will to achieve “no net land take” by 2020 and established a “land coalition” (“Bündnis für Flächenschutz”)<sup>xi</sup>.

### Voluntary/ cooperation instruments

An important and successful voluntary instrument is **cooperative municipal and regional area management** (Jörissen and Coenen 2007, Malburg-Graf et al. 2007, Ulmer et al. 2007).<sup>50,51,52</sup>

<sup>ix</sup> Ronald Pofalla 2013 in Agra Europe 16/13, 15 April 2013, p.14 „Regierung bekräftigt das 30 ha Ziel“.

<sup>x</sup> title: „Flächen gewinnen in Baden-Württemberg – Flächenmobilisierung in der Innenentwicklung“, see [http://www2.um.baden-wuerttemberg.de/servlet/is/35961/Abschlussbericht\\_Flaechen\\_gewinnen.pdf?command=downloadContent&filename=Abschlussbericht\\_Flaechen\\_gewinnen.pdf](http://www2.um.baden-wuerttemberg.de/servlet/is/35961/Abschlussbericht_Flaechen_gewinnen.pdf?command=downloadContent&filename=Abschlussbericht_Flaechen_gewinnen.pdf)

<sup>xi</sup> See Agra Europe 13/13, March 25, p.17 „Thüringer Bündnis für Flächenschutz nimmt Arbeit auf“ and Thüringer Ministerium für Landwirtschaft Forsten Umwelt und Naturschutz. 2013

Besides “traditional” forms of cooperation (**association of local authorities, communes and regions**)<sup>xii</sup> which are also foreseen in the building law, the 1998 amendment of the building law and spatial planning act of 1998<sup>xiii</sup> institutionalized new instruments of voluntary cooperation, e.g. **urban development contracts, regional development concepts**<sup>xiv</sup>, etc (Jörissen and Coenen 2007).<sup>53</sup>

These forms of cooperation can directly impact land take if e.g. building and business areas or “commonly planned areas for compensation measures” (“Kompensationsflächenpools”) are planned, or simply measures that are taken to **share data/ information** (Jörissen and Coenen 2007).<sup>54</sup>

Also considered very useful, but only available in a few regions are **building area cadastral** (Baulandkataster) which provide an overview about available building potentials. There are ongoing discussions on whether or not such a building area cadastral could be established at the federal level (Bundesregierung 2012).<sup>55</sup>

A rather new concept that can be part of regional area management is “**circular flow land use management**” (“Flächenkreislaufwirtschaft”). This approach developed by the German Institute of Urban Affairs (Difu) since 2003, and tested in five German regions<sup>xv</sup> is a problem solving approach and overall strategy/ planning paradigm for land use (Bundesamt für Bauwesen und Raumordnung 2006, cited in Malburg-Graf et al. 2007).<sup>56</sup> It transfers the concept of a circular economy to the use and management of land (Difu 2013)<sup>57</sup> and follows the objective to integrate derelict land into a qualified inner development of urban areas.

It includes “land recycling” activities but even goes beyond specific recycling instruments as it requires an integrated approach of different policies and instruments that all aim to reduce additional land take (Malburg-Graf et al. 2007, RNE 2004).<sup>58,59</sup> It assures that all (potential) options and phases of land use (planning, use, abandonment, temporary use, permanent (re)use, renaturation etc.) are considered in land use management and policies (Difu 2013).<sup>60</sup> A successful implementation requires a policy mix of current and new legal, planning, economic and communication instruments as well as cooperation between actors and governance levels (Difu 2013, Malburg-Graf et al. 2007).<sup>61,62</sup>

Moreover, **cooperation between other levels (federal, state, regional, municipality)** is important, too. In June 2008, the heads of state governments (“Regierungschefs der Länder”) established a working group „sustainability“, that also prepared measures to reduce land take (LABO 2010).<sup>63</sup> However, there is still a big need for exchange particularly between the federal level and the state level (PBNE 2012).<sup>64</sup>

<sup>xii</sup> „Gemeindeverbände, Regionalverbände, Zweckverbände“

<sup>xiii</sup> BauROG - Einführungserlaß zum Bau- und Raumordnungsgesetz 1998  
Vorschriften mit Bezug zum allgemeinen und besonderen Städtebaurecht. 18. August 1997. BGBI. I S. 2081

<sup>xiv</sup> „städtobauliche Verträge, Städtenetze, regionale Entwicklungskonzepte, vertragliche Vereinbarungen zur Vorbereitung und Verwirklichung von Raumordnungsplänen, Möglichkeit zur Erstellung regionaler Flächennutzungspläne“ (Jörissen/ Coenen 2007). Many best practice examples are outlined in LABO 2010.

<sup>xv</sup> e.g. Freiberg in Middle Saxony, see [http://www.circuse.eu/index.php?option=com\\_content&view=article&id=92%3Amiddle-saxony-de-&catid=26&Itemid=31](http://www.circuse.eu/index.php?option=com_content&view=article&id=92%3Amiddle-saxony-de-&catid=26&Itemid=31)

## Information based instruments

The lack of **knowledge about the environmental and economic impacts of land take** is often considered a fundamental barrier that impacts the public acceptance of land saving policies and hence enforceability of measures (Jörissen and Coenen 2007, RNE 2004).<sup>65,66</sup>

This need has been increasingly addressed in the last years, through the publication of various **handbooks, guidelines, manuals** for different target groups.

Several regions have also created **web based information and communication tools**, including:

- North Rhine-Westphalia has set up the “Land alliance” (“Allianz für die Fläche”), intending to increase exchange of **best practice** to reduce land take, to bring together different actors, to promote a **regional certificates/labels for land saving municipalities**<sup>xvi</sup> (“Zertifizierungssystem für Flächen sparende Kommunen”) etc.<sup>xvii</sup>
- Comparable initiatives have been taken e.g. in Bavaria (“Bündnis zum Flächensparen”), with a particular focus on awareness raising<sup>xviii</sup> and
- Baden-Württemberg (“Flächenmanagement-Plattform”) including a **land recycling award** and other measures<sup>xix</sup>.

Moreover, informative planning tools, such as **“follow-up cost calculators”** (e.g. “Folgekostenrechner für Kommunen” used in Hamburg<sup>xx</sup>) have been developed that intend to help take informed decisions about new building projects and their (often hidden) costs.

However, there is still a certain demand for information based instruments such as the amendment of land use statistics and indicators to include qualitative aspects of land take/ land use.

On the federal level an **information and communication platform** is currently developed (working title “InfoPlattform Fläche”<sup>xxi</sup>).

## Economic/ Fiscal instruments

Different studies have shown that many experts see big potential to reduce land take via economic and fiscal instruments, but consider a change of current instruments difficult due to a lack of social acceptance (BfN 2009, Jörissen and Coenen 2007, Malburg-Graf et al. 2007).<sup>67,68,69</sup> Reforms would be very complex and would have to be handled with care because of the interactions between various economic measures and other sustainability goals (Malburg-Graf et al. 2007).<sup>70</sup>

Given that the current economic instruments are rather contributing to the cause than to the solution of the current land take dimensions (see chapter on drivers), most instruments are

<sup>xvi</sup> Intended to be a motivating factor for municipalities aiming to decrease land take, as well as a communication tool for successful municipalities.

<sup>xvii</sup> <http://www.allianz-fuer-die-flaeche.de>

<sup>xviii</sup> <http://www.stmug.bayern.de/umwelt/boden/flaechensparen/index.htm>

<sup>xix</sup> <http://www2.mvi.baden-wuerttemberg.de/servlet/is/103764/>

<sup>xx</sup> the calculator has been developed by the German research project REFINA, for further information see <http://refina.segeberg.de/index.phtml?NavID=1862.84&La=1>

<sup>xxi</sup> The development of the “InfoPlattform Fläche” is currently subject of a German research and development project (“Entwicklung und Erprobung einer wissens- und erfahrungsbasierter Kommunikationsplattform als Maßnahme zur Förderung des Know-how-Transfers zum kommunalen Flächenmanagement”, UFOPLAN 2013, F+E Vorhaben 3713 16 102, AZ 91 054/89).

subject of reform discussions. However, an economic instrument that intends to directly address the reduction of land take – even if still in the pilot phase – is the introduction of tradable planning permits (land certificates):

Tradable planning permits have been often discussed as a potential/promising instrument. In Germany, a lot of research has been underway on this issue for years now (for example, under the REFINA research program), including a currently running pilot project<sup>xxii</sup> that goes back to an agreement of the 2009 coalition agreement between CDU/CSU and FDP. Over the course of 4 years 40 municipalities will take part in the pilot project (Prokop et al. 2011).<sup>71</sup> The idea of tradable planning permits stems from the concept of tradable CO<sub>2</sub> rights, more accurately the cap and trade system. If the mechanism is applied to the field of land use planning, the communal development plans are only legally valid if they are backed by planning permits, which have to be held by the communes (Loehr 2012),<sup>72</sup> e.g. in compliance with the “30 ha goal”.

However, whereas economists are convinced of the optimal goal achieving potential, the instrument of permits is often contested from a judicial point of view. Critics point to the difficulties in allocating the contingents and the conflict with the local planning autonomy or challenge whether a permit solution would lead to a real change of consciousness because of the possibility of using land for settlement purposes up to a certain target (Malburg-Graf et al. 2007, Jörissen and Coenen 2007).<sup>73,74</sup> The implementation is also likely to lead to high administrative costs.

## Research

Particularly since the late nineties there are many research activities in Germany that address the challenge of reducing land take. Examples include:

- The research programme „REFINA“ („research to reduce land take and promote sustainable land management“/„Forschung für die Reduzierung der Flächeninanspruchnahme und ein nachhaltiges Flächenmanagement“) supported by the Federal Ministry for Research and Education (BMBF). It was established in 2004 and is part of the Federal Strategy for Sustainable Development. The funding budget amounts to 22 mio Euro (Prokop et al. 2011).<sup>75</sup> Until 2013 more than 100 projects have been supported under this program (RNE 2013).<sup>76</sup> Projects developed innovative concepts for reducing the rate of land take, particularly inner development and reuse of brownfields. Activities included the development of best practice examples, dissemination, the experimental development of a computer-game<sup>xxiii</sup> to improve awareness rising, etc.
- The research programme “experimental urban development („Experimenteller Wohnungs- und Städtebau“ (ExWoSt)) and pilot projects for regional development („Aktionsprogramm „Modellvorhaben der Raumordnung“ (MORO)), that followed the paradigm „dense-urban-green“ („kompakt - urban - grün“) had a positive impact on land take reduction targets. The programmes were supported by the Federal Ministry of Transport, Building and Urban Development (BMVBS).
- Research programmes also exist on the state level, e.g. a regional development program in Schleswig Holstein („Gebietsentwicklungsplanung für den Lebens- und Wirtschaftsraum Rendsburg“) or „MELAP“ in Baden-Württemberg („Modellvorhaben zur Eindämmung des Landschaftsverbrauchs durch Stärkung des innerörtlichen

<sup>xxii</sup> „Projekt Forum – Handel mit Flächenzertifikaten“, <http://www.ufz.de/index.php?de=21103>

<sup>xxiii</sup> project “Spiel-Fläche”, <http://www.refina-info.de/de/projekte/anzeige.phtml?id=3131>

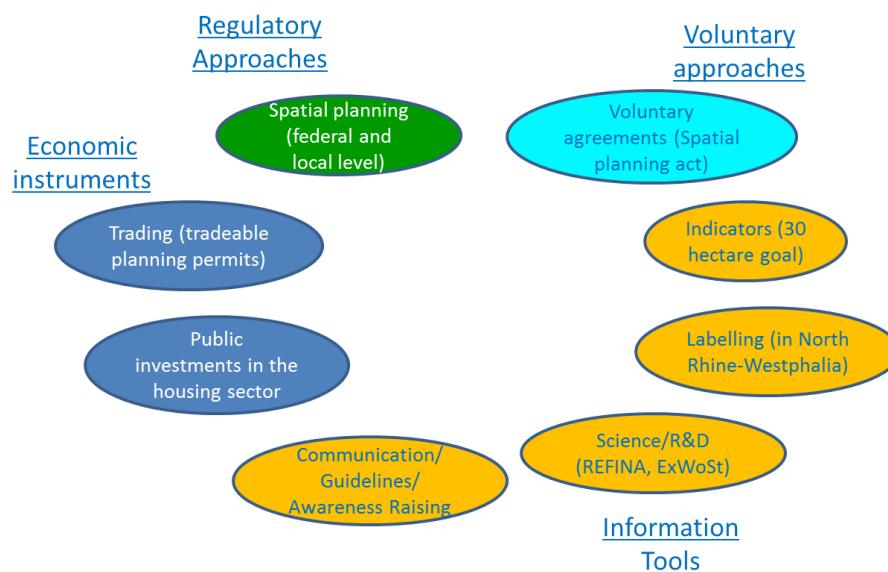
Potentials“), a pilot project that aims to reduce land take by strengthening inner/urban areas.

The research programmes provide input for the further development of informative instruments, planning tools, communication tools, markets based instruments and overall concepts. However, the suggested concepts and tools developed within the research projects often lack practical implementation (BMBF 2013).<sup>77</sup>

Figure 7 below gives an overview of the main elements of the policy mix following the six categories outlined above.

It does not refer to all of the mentioned elements but summarizes the main elements. All categories - with the exception of research activities that had a comparably lower impact but influenced the development of instruments in all other categories - can be considered as almost equally important in the policy mix, with regulatory/planning instruments and cooperation instruments having the strongest impact. Elements in dotted lines highlight promising new/innovative/regional activities, but can not (yet) considered to be an established and influential part of the policy mix.

**Figure 7: Main elements of the German policy mix to reduce land take (Federal level)**



Source: Own Compilation

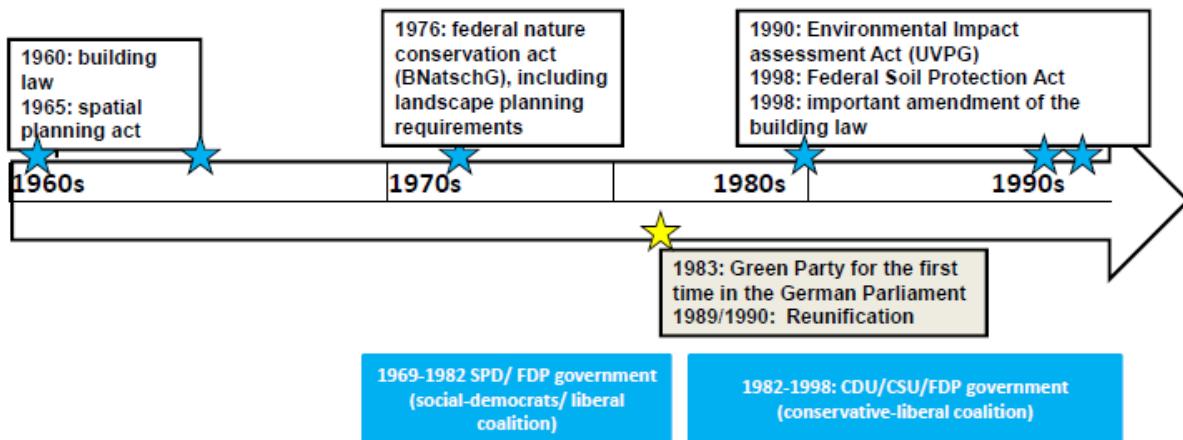
## 6c. Evolution of policy mix

*Evolution of the policy mix throughout its existence –details of the introduction of the first policy tool(s), then all subsequent relevant tools, and related revisions/reforms (e.g. progressive increases in rates applied through economic tools, broader extension of regulation requirements, etc.).*

Figure 8 and Figure 9 below illustrate the evolution of the policy mix. As many instruments go back as far as to the 60s and 70s two figures have been prepared to show the main steps in the policy evolutions. The text boxes/ events above the arrow are mandatory planning/ regulatory instruments (with the exception of the sustainability strategy that had an important impact but is not mandatory). Those below the arrow are context information e.g. about the

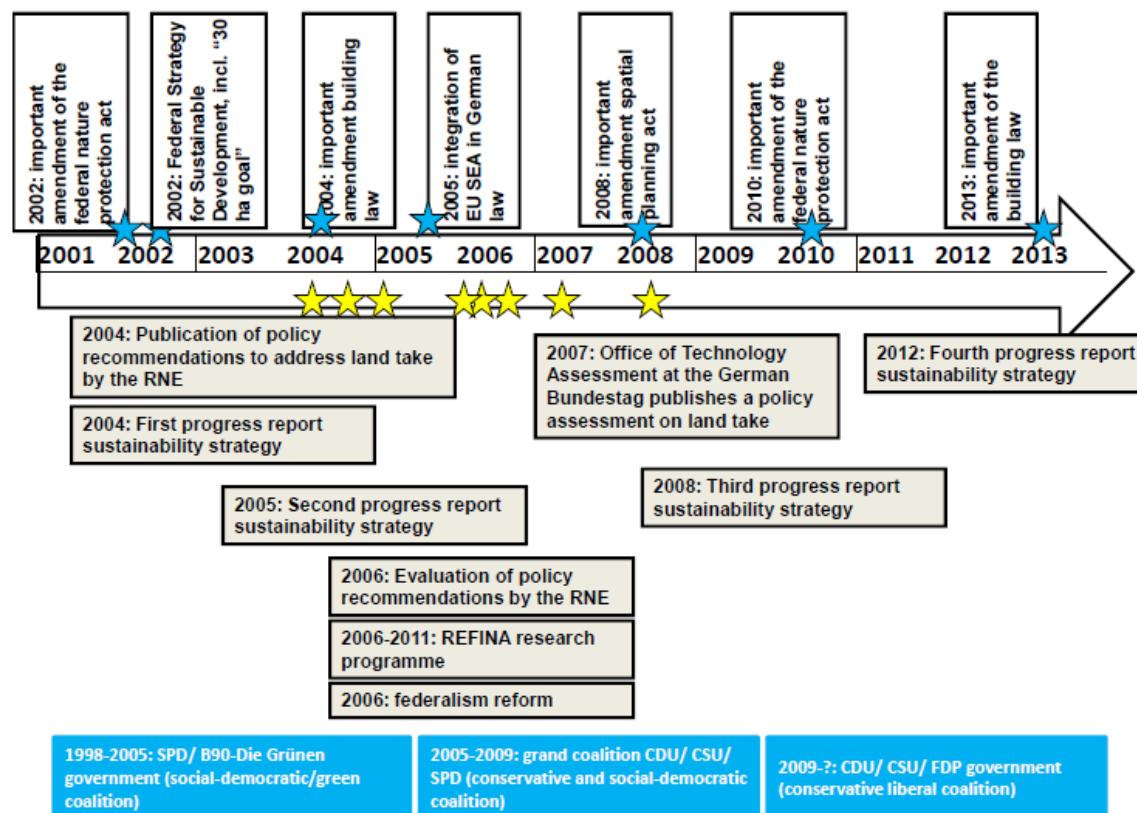
governments in place, establishment of research programs, publications of policy recommendations etc. Each “event” is marked with a star.

**Figure 8: Evolution of the German land policy mix, 1960s-1999**



Source: Own Compilation

**Figure 9: Evolution of the German land policy mix, 2000-2013**



Source: Own compilation

## 7 Evaluation of policy mix: effectiveness (environmental sustainability)

*Does/did the policy mix result in a positive environmental outcome?*

*Were its stated objective(s) met? Were the instruments used sufficient to meet the objectives?*

*Did other, unforeseen/unintended positive outcomes or impacts (environmental, social, economic) result? Did other such negative outcomes or impacts result?*

*Were these objectives set at a level to meet environmental needs (e.g. avoid crossing environmental thresholds/tipping points or achieve more sustainable levels of resource use/extraction (e.g. maximum sustainable yield (MSY) in fisheries)?*

*Which sectors/actors were identified as having key impacts/influences on the problem/issue? (e.g. specific industrial/ business sectors, consumers, economy as a whole?) Did any of the instruments specifically target these key sectors/actors? Was there significant take-up/implementation of (voluntary) instruments by these sectors?*

*Was the policy mix applied to a sector previously not targeted by policies on the issue under question, or in a new area/issue – thereby aiming to stimulate change?*

*What were the anticipated and actual outcomes, impacts and effects of the policy mix on the behaviour of sectors and actors targeted? (e.g. reductions in emissions from industry, increased recycling rates, increase/decrease in certain product purchases, etc.).*

*Relationships between the instruments, identifying positive/negative influences on the overall policy mix or on key instruments in the mix, as well as any positive or negative impacts from changes to the mix (introduction or termination of instrument(s), increase or decrease in tax/levy/charge, etc.). Level of ‘connectivity’ (strong, weak) between each instrument and the primary one(s).*

*Are there any indicators, monitoring systems, review processes or other monitoring mechanisms in place to track progress?*

Despite some progress to reduce land take in Germany, the “30 ha goal” until 2020 is unlikely to be achieved (RNE 2013, Ulmer et al. 2007, Malburg-Graf et al. 2007, BfN 2009).<sup>78,79,80,81</sup>

Modeling efforts by the German Institute “Gesellschaft für wirtschaftliche Strukturforschung” (GWS) in 2006 about future land use/ land take in Germany showed that under a baseline scenario without a change in the policies in place, land take in 2020 will still be 81 hectare and only decrease to 74,5 hectare in 2030, the decline mainly being attributed to demographic changes (i.e. a shrinking population) (Jörissen and Coenen 2007).<sup>82</sup> Also a 2006 online poll<sup>xxiv</sup> about the “30 ha goal” with 404 experts participating revealed that 34 % participants believe that this goal could not be achieved by 2020 (Ulmer et al. 2007).<sup>83</sup>

However, since the modelling efforts and the online poll in 2006 some further progress was made and it still possible that the goal will be achieved.

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<sup>xxiv</sup> In the year 2004, the German Council for Sustainable Development (CSD) (as requested by the German Federal Government in a follow up process of the Federal sustainability strategy) published recommendations on how to achieve the “goal-30-ha” (RNE 2013). In 2006, an evaluation (Ulmer 2007) of the recommendations was completed including desk analysis online poll and three expert workshops(Malburg-Graf et al 2007, p.1)

In any case, challenges will remain as even the achievement of the “30 ha goal” will mean that there is a daily increasing land take with the correlating environmental impacts (as described in chapter 3).

## 8 Evaluation of policy mix: efficiency (economic sustainability)

*Is/was the policy mix considered cost-effective?*

*What has been the level of impact on resource use of the policy mix (the effect)?*

*What have been the costs of implementing the policy mix for target audience (e.g. business, households, etc.)?*

*What are the costs (financial, human) of implementing the policy mix for the implementing authority – i.e. the administrative/transaction costs?*

*Were sufficient resources made available to ensure an effective implementation of the policy-mix?*

*Was anything foreseen in the policy-mix to address competitiveness concerns (e.g. use of exemptions) or minimise transaction costs (e.g. thresholds below which monitoring wasn't required)?*

*Did the policy mix involve providing financial support (e.g. subsidies, low interest loans, tax breaks etc.) to key actors (e.g. sector, households, etc.)?*

*Did the measures generate revenues (e.g. in the case of taxes) and if so, was revenue recycled/re-injected into the economy, and to what levels and activities? Did revenue recycling have positive amplifying effects?*

*In synthesis - was the policy mix cost-effective?*

*What elements of the mix were (un)helpful in improving cost-effectiveness?*

*How was relative/absolute decoupling achieved?*

*Were resource limits or other thresholds taken into account and how were they addressed?*

As shown in chapter 3.1., land take is not only an environmental problem but also has adverse economic and social consequences. Addressing land take and reducing the pressures on land is therefore also contributing to social and economic sustainability. However, there might be conflicts between a short term economically and politically rational decision (e.g. a new industrial park that creates tax revenues for the municipality) and long term economic interest of the community at large (e.g. coverage of maintenance cost of oversized industrial parks, loss of access of citizens to recreational areas and services associated with green infrastructure and/or agricultural land). To which extent the chosen instruments are (in-) efficient has not yet been analyzed.

Economically beneficial instruments are for example cost benefit calculators and other informative instruments (e.g. best practice guidelines) that help regions and municipalities to take economically reasonable, informed decisions that prove truly beneficial in the long-term.

However, the complex and often very formalised spatial and landscape planning system requires a lot of administrative efforts and hence results in costs that have to be considered and balanced as well.

## 9 Evaluation of policy mix: welfare (social sustainability)

*What social impacts have you found associated with the policy mix? E.g. jobs created, reduced health impacts, distributional impacts etc.*

*Were social aspects included in an ex-ante impact assessment of the policy mix if one was undertaken? What were these?*

*Has monitoring of social impacts been included in implementation, to identify actual effects compared to anticipated ones?*

*Was the policy mix designed to not be socially regressive? What measures were undertaken to ensure this?*

*Were equity concerns addressed and, in case of re-structuring of the economy/sector, measures in the area of reskilling of the workforce foreseen?*

*What other public acceptability elements were addressed or considered?*

Many elements of the policy mix that have been analysed within this case study do not only target the environmental impacts of land take but are actually often socially motivated. This particularly includes measures to support sustainable urban development, i.e. regulatory and planning measures and economic instruments that target inner-before-outer-development or follow the paradigm of dense-green-urban areas. These efforts help achieving a higher quality of life and a socially balanced mix of inhabitants and reduce segregation in urban areas, as suburbanisation usually leads to a concentration of younger and wealthier families at the margins of urban centres and leads to a decline in quality of life within urban centres.

The reduction in traffic associated with more dense cities, in which public transport infrastructure development is more viable, also leads to a reduction in noise, emission of pollutants and can improve the quality of live in rural areas.

In addition, reducing land take also allows future generations' flexibility in land use, thus contributing to more inter-generational-fairness.

Finally, Germany's land take has an international dimension as land take reduces agricultural and forestry land in Germany, leading to the need to import more agricultural and forestry products for German consumption. Indirectly this leads to "exporting" associated environmental externalities associated with such the production of these goods (e.g. carbon leakage, pollution, etc.).

Achievements to reduce land take in the past have therefore also contributed to social sustainability.

## 10 Overall assessment

*What is your overall view on the success(es) or failure(s) of this policy mix?*

*How did the policy mix enable decoupling?*

*How could it have been improved to achieve its original objective(s) and to achieve absolute decoupling?*

The explanations above illustrate that there is a broad mix of instruments available to shape and steer the reduction of land take in Germany. The last 10 years after 2002 have lead to considerable improvements of the planning policies and contributed to slowing down the daily land take, although without changing the more general trend to additional land take.

However, many experts agree that while the planning and regulatory instruments and polices available to steer land take and land use are generally suitable instruments (BfN 2009, Jörissen and Coenen 2007),<sup>84,85</sup> they also agree on a lack of enforcement, e.g. due to conflicting interests of different planning levels as well as conflicting environmental, social and economic objectives etc (BfN 2009, RNE 2004).<sup>86,87</sup>

Most studies also suggest that with the current policy mix or only slight modifications of single instruments a fundamental change to reverse land take cannot be achieved. It is therefore necessary to adapt the policy mix. Recommendations on a suitable package of instruments differ, but most studies/ policy analysis agree that only a smart mix of instruments can achieve the desired reduction of land take (RNE 2004, Jörissen and Coenen 2007, Ulmer et al. 2007, BfN 2009, Bundesregierung 2012).<sup>88,89,90,91,92</sup>

- The progress report of the Federal Strategy for Sustainable Development emphasizes the need for efficient soil and land management through regulatory, planning, economic, cooperation and information instruments. Examples include a changed land tax and modern land data information systems (including a building area cadastral) that are centrally updated and maintained and easy to access (e.g. online) as well as improved implementation of municipal area management and circular flow land use management. The strategy also announces that opportunities to politically address these issues will be discussed on the federal and state ministerial level<sup>xxv</sup> (Bundesregierung 2012).<sup>93</sup>
- Results from a series of expert workshops and an online poll as analyzed by Ulmer et al (2007) suggest that an emphasis should be put on strengthening "a) municipal area management, b) regional cooperation and c) circular flow land use management".
- The Federal Agency for Nature Protection (BfN 2009)<sup>94</sup> believes that a new orientation of economic instruments (up to a fundamental reform) is necessary. It emphasizes the need for a) obligatory cost-benefit-analysis related to new building areas, argues b) for a reward of sustainable land use via the municipal financial equalization, meeting the twin challenges of dense and ecologically sustainable inner cities through improved planning instruments and suggests c) a change of the land tax as well as d) new economic instruments like a tax on newly designated building areas ("Neuausweisungsabgabe", "Baulandausweisungsumlage", "Neuerschließungsabgabe") and tradable planning permits.

<sup>xxv</sup> Mandated by the „Konferenz der Chefs der Staats- und Senatskanzleien“ and the head of the Federal Chancellery of Germany (as decided November 18, 2010) the prüfen die Raumordnungs-, Agrar-, Bau-, Finanz-, Innen- und Umweltministerkonferenzen

- Others like the German Council for Sustainable Development (RNE), the Academy for Spatial Research and Planning (Akademie für Raumforschung und Landesplanung) and environmental NGOs (BUND, NABU) suggest amending and sharpening planning regulations. The RNE also suggests that research should explore how different property rights (building leases/heritable building right (e.g. "Erbbaurecht")) can contribute to reduce land take.
- Almost all actors however agree that keeping the "30 ha goal" is important as a symbolic indicator<sup>xxvi</sup>.

According to modelling activities for different policy mixes Jörissen and Coenen (2007) came to the conclusion that a comprehensive and smart mix to achieve the 30 ha goal can be successful in meeting this objective with only moderate changes, including to economic and planning instruments.

For the future it will also remain crucial to set an appropriate policy framework on the federal level that allows states, regions and municipalities to develop according to their needs and specific circumstances. A main challenge here remains to address demographic dynamics that lead to an overall population decrease but with high differences between regions (shrinking rural areas, growing urban areas).

## 11 Relevance to the EU and transferability

*Can the policy mix be applied at the EU level? Is it transferable to other Member States/countries?*

*What lessons are there that may be of general interest regarding policy mixes and what issues are there as regards transferability of the insights?*

Germany has a broad policy mix to address land take.

It also has some particular instruments, that only few countries have experiences with, such as its complex system of landscape planning, the impact mitigation regulation ("Eingriffsregelung") or more recently with trading certificates for land or Circular Flow Land Use Management that has been first tested in Germany and now transferred to Italy, Austria, Poland, Slovakia and the Czech Republic<sup>xxvii</sup>.

Particularly these instruments are suitable and potentially interesting for other countries and EU regions that face similar challenges like Germany (land take, densely populated, demographic change, etc.). However, the complex spatial and landscape planning system is difficult to transfer as it is very complex and formalised and tailored to the German federal system (Blotevogel 2003).<sup>95</sup> It may therefore only be transferable to a limited extent, especially with its specific distribution of competences across different levels. This is not to say, however, that it may not be possible to progressively put similar tools and instruments in

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<sup>xxvi</sup> Counter arguments are however, that publicity for the "goal-30-ha" is difficult because it has no direct relevance for the individual citizen and personal land use patterns. (Ulmer et al 2007)

<sup>xxvii</sup> See CircUse project website: <http://www.circuse.eu/index.php?s=1>. CircUse is a project implemented through the CENTRAL EUROPE Programme co-financed by the ERDF.

place in other EU MS, adapting it to the institutional context, where there is political will to do so. It is however also clear that introducing an adapted version of the German system primarily makes sense in countries where there is the administrative capacity to manage and enforce such a complex system. Where relatively effective spatial planning systems are already in place, some of the tools and instruments used or tested in Germany could still help further increase their efficiency and effectiveness.

## 12 Stakeholder contribution

### *What insights did stakeholders provide?*

No stakeholder consultations were carried for this report.

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<sup>93</sup> Bundesregierung. 2012. „Nationale Nachhaltigkeitsstrategie, Fortschrittsbericht 2012“. Berlin, p. 195, 243

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