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## **COMMISSION STAFF WORKING DOCUMENT**

### **Commission recommendations for Germany's CAP strategic plan**

#### *Accompanying the document*

### **COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS**

#### **Recommendations to the Member States as regards their strategic plan for the Common Agricultural Policy**

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## CONTENTS

<b>1. COMMISSION RECOMMENDATIONS FOR GERMANY’S CAP STRATEGIC PLAN .....</b>	<b>2</b>
<b>1.1 Foster a smart, resilient and diversified agricultural sector ensuring food security .....</b>	<b>2</b>
<b>1.2 Bolster environmental care and climate action contribute to the environmental and climate-related objectives of the Union .....</b>	<b>3</b>
<b>1.3 Strengthen the socio-economic fabric of rural areas and address societal concerns .....</b>	<b>4</b>
<b>1.4 Modernising the sector by fostering and sharing of knowledge, innovation and digitalisation, and encouraging their uptake .....</b>	<b>5</b>
<b>1.5 Recommendations .....</b>	<b>5</b>
<b>2. ANALYSIS OF AGRICULTURE AND RURAL DEVELOPMENT IN GERMANY .....</b>	<b>8</b>
<b>2.1 Support viable farm income and resilience across the EU territory to enhance food security .....</b>	<b>8</b>
<b>2.2 Enhance market orientation and increase competitiveness including greater focus on research, technology and digitalisation .....</b>	<b>9</b>
<b>2.3 Improve farmers' position in the value chain.....</b>	<b>10</b>
<b>2.4 Contribute to climate change mitigation and adaptation, as well as sustainable energy .....</b>	<b>12</b>
<b>2.5 Foster sustainable development and efficient management of natural resources such as water, soil and air.....</b>	<b>14</b>
<b>2.6 Contribute to the protection of biodiversity, enhance ecosystem services and preserve habitats and landscapes.....</b>	<b>16</b>
<b>2.7 Attract young farmers and facilitate business development in rural areas....</b>	<b>18</b>
<b>2.8 Promote employment, growth, social inclusion and local development in rural areas, including bio-economy and sustainable forestry .....</b>	<b>20</b>
<b>2.9 Improve the response of EU agriculture to societal demands on food and health, including safe, nutritious and sustainable food, as well as animal welfare.....</b>	<b>22</b>
<b>2.10 Cross-cutting objective on knowledge, innovation and digitalisation .....</b>	<b>24</b>

## **1. COMMISSION RECOMMENDATIONS FOR GERMANY'S CAP STRATEGIC PLAN**

In the framework of the structured dialogue for the preparation of the common agricultural policy (CAP) strategic plan, this document contains the recommendations for the CAP strategic plan of Germany. The recommendations are based on analysis of the state of play, the needs and the priorities for agriculture and rural areas in Germany. The recommendations address the specific economic, environmental and social objectives of the future CAP, in particular the ambition and specific targets of the Farm to Fork Strategy and the Biodiversity Strategy for 2030. As stated in the Farm to Fork Strategy, the Commission invites Germany, in its CAP strategic plan, to set explicit national values for the Green Deal targets<sup>1</sup> taking into account its specific situation and these recommendations.

### **1.1 Foster a smart, resilient and diversified agricultural sector ensuring food security**

Germany is the second largest agricultural producer in the EU. The agricultural sector is highly specialised, with the focus on livestock production and arable crops. It is market-oriented and is a large exporter of meat, dairy and cereal products. Nevertheless, the shift to a sustainable food system presents both significant economic opportunities as well as challenges for German farmers. Agricultural productivity has been lagging behind the EU average, also due to increasing capital intensity. Income in the farming sector remains below the country's average income. Livestock and arable crops in particular experience considerable income fluctuations. The CAP payments therefore play an important safeguarding role. Against this background, improving the fairness and effectiveness of direct payments and other income support tools by lowering the concentration of direct payments and territorial differences, especially for areas facing natural constraints, should be encouraged. Income support should be better targeted towards smaller farms by increasing direct payments per hectare for smaller farms. Agricultural income remains volatile despite the diverse risk management mechanisms available. More innovative and preventive types of solutions to manage production and income risks in agriculture should therefore be considered.

In the light of environmental challenges in Germany, designing income support to reward environmental performance would be desirable. The food supply chain in Germany is characterised by the long-standing practice of cooperation between primary producers, in form of non-recognised (predominantly cooperatives) as well as recognised producer organisations (POs). Despite the strong presence of producer organisations and well-developed sectoral coverage, with milk, cereals and pig meat sectors as mostly represented sectors, the share of value added for primary producers in the food supply chain remains considerably below the EU average. This can be attributed mainly to the high concentration in food and beverages manufacturing and especially in retail, and the focus on low food prices, particularly compared to its western neighbouring countries. In this respect, the potential for increasing the value added of agricultural products through quality schemes and regionally produced food should be harnessed, in particular in view of increasing consumer demand for organic, plant-based, genetically modified (GM)-free and animal friendly produced food.

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<sup>1</sup> It concerns the targets related to use and risk of pesticides, sale of antimicrobials, nutrient loss, area under organic farming, high diversity landscape features and access to fast broadband internet.

## **1.2 Bolster environmental care and climate action contribute to the environmental and climate-related objectives of the Union**

On environmental performance, the opportunities for Germany's agricultural sector vary depending on the part of the country. Some Länder, especially in the north-west and south-east, have high livestock density and land use intensification, which significantly affect ecosystems and imply certain climate change vulnerabilities. This is particularly reflected in continuously high levels of nutrient surplus (nitrogen and phosphorous) in water bodies and ammonia emissions to the air. On water quality, not all water bodies have achieved good status yet and agriculture is the most significant pressure. Better integration of the water objectives of the Water Framework Directive into agriculture is needed and synergies should be optimised with policies including the CAP. Germany has recently taken steps to strengthen its national rules on the use of fertilisers, but putting these new rules into practice will be a challenge in the coming years. For ammonia and methane emissions, despite the slight decrease in emissions since 2015 following several years of increase, more effective efforts are still needed to meet the ammonia emission reduction commitments for 2020-2029 (high risk of non-compliance). Such efforts should include adapting and upgrading manure storage and application systems and animal housing, in line with higher animal welfare standards and with the methane strategy.

The risk of water and wind erosion in arable land remains an issue mainly in uplands, especially in Bayern, Baden-Württemberg, Sachsen, Rheinland-Pfalz and Saarland, as well as in the North German lowlands and in coastal areas of the North Sea and the Baltic Sea. Remedial practices such as catch crops, under sown crops and minimum tillage should be encouraged in addition to mandatory requirements.

As a result of climate change (extreme event such as drought), a negative effective water balance and negative effects on groundwater recharge are projected for some regions like the northern parts of Germany, and in the south west. Key actions for more climate-resilient agriculture include in particular farm resilience plans and drought resilience plans. Furthermore, in the land use, land use change and forestry (LULUCF) sector, greenhouse gas (GHG) emissions from cropland show an increasing trend, while grassland GHG emissions, despite a decreasing trend, remain the highest in the EU. Therefore, more sustainable management of arable land and low-intensity management of permanent grassland should be promoted, also to protect farmland related habitats and species. Carbon farming and agroforestry to increase carbon stocks could be developed for suitable regions. Forests remain the biggest sink in the LULUCF sector, although the carbon storage capacity has been decreasing due to ageing tree stock and increased mobilisation due to excessive damages. Sustainable and climate-resilient forest management and restoration is therefore needed to maintain a strong carbon sink and ecosystem services. Key measures for climate resilient forests include i) the creation of a forest climate fund ('Waldklimafonds'); ii) more sustainable and adapted forest management; iii) integration in regional forest management regulations; and iv) actions, and research and information platforms. A vast portion of peatland and wetland, which covers a sizeable area in Germany, was drained in the past also for farming, which turned it into a GHG emitter instead of a carbon sink. Maintenance and restoration of peatland and wetland for their carbon sequestration potential will therefore be crucial in the future. In terms of renewable energy production from agriculture, Germany needs to strike a better balance between the objective of increasing the share of renewables in energy consumption and the share of agricultural area under energy crops, as it can often cause further land intensification and biodiversity loss. Therefore, rebalancing the production of renewable energy from crops to fuelwood, wood residues and by-products should be considered.

The decline of protected habitats and species associated with agricultural land has not been reversed or halted in Germany. In particular, 90 % of grassland habitats are in less than favourable state of conservation, with further deterioration. Moreover, the share of landscape features and fallow land is very marginal. Great efforts by the agricultural sector and adequate financial input will therefore be needed to achieve at least 10% of agricultural area under high diversity and reverse deterioration in conservation trends in biodiversity. Maintenance or restoration of the favourable conservation status of protected habitats and species identified in the prioritised action framework as well as in the EU and national species and habitats action plans should be ensured. Appropriate action should be taken to respond to the high demand of civil society to protect pollinators in Germany, also in light of the EU pollinators initiative. To meet the EU 2030 target of 25% of agricultural area under organic farming, Germany will need to boost the uptake rate, in particular by setting appropriate strategies at Länder level, as some have been lagging behind in their ambition. This should include identifying potential in local organic food production and food chain structures that should be further strengthened and developed.

### **1.3 Strengthen the socio-economic fabric of rural areas and address societal concerns**

The transition towards a green and modern agricultural sector, as envisaged in the Farm to Fork Strategy, requires addressing one of the biggest social challenge facing European agriculture: generational renewal. Farm succession patterns in Germany change, away from family business inheritance to selling it off to third parties. Most businesses (70%) suffer from uncertainty about succession. This often leads to underinvestment on holdings, especially small farms, efficiency loss and delayed succession.

Overall, German agricultural demographics shows a positive trend as the share of young farmers has increased since 2010, while the EU has experienced a downward trend. However, there are regional differences in the share of young farmers. Improving the succession of farms, while addressing the unfavourable gender balance among young farmers, critically hinges on adequate access to finance, sustainable business models and knowledge, which facilitate informed investments. It is also intrinsically linked to favourable prospects allowing people to stay and live well in rural areas. These prospects are called into question by phenomena linked to ageing and depopulation, such as a very strong old age dependency ratio in large parts of eastern Germany (among others) and projected negative demographic trends for a large part of Germany until 2032. This might be due among others to the large urban-rural gap in gross domestic product (GDP) per capita and specific challenges, which often exist for certain vulnerable parts of the society. This holds in particular for female participation in rural and farm employment (the gender gap in rural employment is 8 percentage points (pp) and the proportion of female farmers is one of the lowest in the EU), and the educational situation of the younger generation in rural areas (Germany ranks in the upper middle field among EU Member States on early school leavers in rural areas.). Careful consideration of the specific needs of women in agriculture and rural areas is needed in order to deliver on gender equality. Addressing the specific needs of these areas will require investments into both physical and human capital, underpinned by adequate financial resources and particular attention to those territories and stakeholders most in needs. At the same time, ensuring the protection of agricultural workers, especially those in precarious, seasonal and undeclared employment, will play a major role in delivering on the respect of rights enshrined in legislation. This is an essential element of the fair EU food system envisaged in the Farm to Fork Strategy.

The Strategy also aims to contribute to sustainable EU food systems. This implies among others prioritising a stronger shift towards consumer preferences in areas such as quality

production, more balanced diets and health. German production pattern is very dependent on the use of inputs like pesticides. Their global sale stays stable. Effective controls on the implementation of integrated pest management are still lacking, whilst the Biodiversity and Farm to Fork Strategies ask for action to reduce by 50% the overall use of – and risk from – chemical pesticides by 2030 and reduce by 50% the use of more hazardous pesticides by 2030. While Germany has made significant efforts to reduce antimicrobials in animal production, some measures need to continue to be implemented to achieve the EU Farm to Fork objective. In addition, breeding conditions need to be further improved in some animal sectors, such as pig and poultry as well as dairy production in order to alleviate animal welfare concerns. Germany should also make an effort to shift towards healthier, more environmentally sustainable diets.

#### **1.4 Modernising the sector by fostering and sharing of knowledge, innovation and digitalisation, and encouraging their uptake**

Knowledge and innovation have a key role to play in helping the farmers and rural communities meet the present and future challenges. The agricultural knowledge and innovation system (AKIS) should facilitate knowledge flows between its actors to respond to the growing information needs of farmers, to speed up innovation and to increase the valorisation of existing knowledge in order to achieve the CAP objectives. The German AKIS is among the ‘strongest’ in the EU (high resource allocation). However, knowledge networks do not cooperate enough with each other, and the lack of overall coordination leads to ‘fragmentation’ of actions and services provided. Germany has set up a well working European Innovation Partnership (EIP) network, and some Länder have already achieved good results with their EIP operational groups (OGs). As the competence for advisory services lies with the Länder, different organisational structures and horizontal knowledge flows have emerged. An overall reinforced coordination could help structure knowledge flows within Germany and also across borders. It is therefore important to further strengthen AKIS coordination and horizontal knowledge flows between research and practice as well as ensure efficient networking of advisors in the knowledge system and investing in their training and skills, especially for private advisors. Advisors should also be supported in their role as efficient ‘innovation support services’. The downward trend in total factor productivity in Germany could be slowed by promoting cooperation and sharing of knowledge and innovation, as well as helping find practical solutions for farmers to address environmental, climate and biodiversity-related challenges. The digital transition of the farming sector in Germany should be continued by making large-scale training efforts and by exploiting the EU’s technological lead in satellite observation, precision farming, geolocation services, autonomous farm machinery and drones to better monitor and optimise agricultural production processes. Digital transition for the farming sector as well as businesses and private and public services in rural areas will also require flawless coverage of fast digital infrastructure across the country. In terms of fast broadband accessibility in rural areas, Germany still has a considerable gap to fill.

#### **1.5 Recommendations**

To address the above interconnected economic, environmental/climate and social challenges the Commission considers that the German CAP strategic plan needs to focus its priorities and concentrate its interventions on the following points, while adequately taking into account the high diversity of the German agriculture and rural areas:

*Foster a smart, resilient and diversified agricultural sector ensuring food security*

- **Improve the resilience and viability of farms** by better targeting the income support on smaller and medium-sized farms and farms located in areas facing natural constraints, by using, for example, the complementary redistributive income support for sustainability and the reduction of payments.
- **Strengthen the competitiveness of the agricultural sector** by targeting investment interventions towards more sustainable solutions for future food markets as well as promoting cooperation and sharing of knowledge, information and innovation.
- **Increase the value added captured by primary producers in the food supply chain** through targeted actions available under both CAP pillars by increasing the value added of agricultural products, in particular through quality schemes as well as local and regional value chains.

*Bolster environmental care and climate action and contribute to the environmental and climate-related objectives of the Union*

- **Halt and reverse the deterioration in conservation status of all protected habitats and species depending on agriculture** through an appropriate blend of obligations under conditionality and interventions, such as result-based and collective commitments, by ensuring connectivity among selected habitats and increasing the presence of high-diversity, non-productive landscape features in farmland, thus contributing to the **EU Green Deal target on high diversity landscape features**. Special attention should be given to the preservation of farmland birds and wild pollinators.
- **Contribute to the EU Green Deal target on organic farming** by enhancing the currently increasing trend of areas under organic farming through adequate conversion and maintenance schemes.
- **Alleviate the strong pressures from agriculture on natural resources**, especially in the livestock and intensive production sectors, by promoting low-emission systems and techniques for achieving efficient ammonia emission reductions, and facilitating innovative farming practices and more extensive land management (reduced and improved fertiliser application, creation of large vegetalised buffer strips along water courses and application of catch crops) to prevent soil erosion and to further reduce the nutrient surplus in synergy with Nitrates legislation, thus **contributing to the EU Green Deal target on nutrient losses** and achieving the objectives of the Water Framework Directive.
- **Foster climate change mitigation** by promoting less intensive management of arable land to increase carbon sequestration and of permanent grassland for carbon storage as well as protection of carbon-rich soils through rewetting and restoration of peatlands and wetlands. Reduction of GHG emissions from agriculture, particularly methane emissions, should be promoted. Preservation of tree stocks and increase of carbon sinks in forests should be enhanced, as well as the multifunctional forest management that makes the most of all the ecological services provided by forests.
- **Adapt agriculture and forestry to projected climate change** through an appropriate combination of agricultural and silvicultural practices. Actions to decrease the impacts of extreme weather events, and further strengthen water efficiency in farming as well

as invest in flood prevention and protection should be facilitated in affected regions. Restoration of forests in order to build resilience to climate-related threats and reconnect healthy and biodiverse forests should be accelerated.

*Strengthen the socio-economic fabric of rural areas and address societal demands*

- **Contribute to the EU Green Deal target on reducing the use and risk of pesticides** by promoting best practices, giving priority to non-chemical pest management practices, and ensuring the uptake of Integrated Pest Management by all professional users of pesticides, and by phasing out high-risk pesticide use.
- **Contribute to the EU Green Deal target on reducing the sale of antimicrobials.** Whilst its sales of **antimicrobials** are below the EU average, Germany should continue to implement measures to reduce the use of antimicrobials in farming, for example by integrating targets into concrete and more ambitious CAP actions.
- **Promote higher levels of animal welfare** by putting in place more ambitious measures to support farmers in improving their livestock management practices, especially as regards the welfare of pigs.
- **Counter phenomena of ageing and depopulation** by enhancing the economic attractiveness of rural areas, compared to urban areas, and by addressing specific difficulties of vulnerable groups, including via targeted investments into the business environment and human capital. In doing so, it will be important to ensure synergies with other EU and national funds.

*Foster and share of knowledge, innovation and digitalisation in agriculture and rural areas, and encourage their uptake*

- **Contribute to the EU Green Deal target on broadband** by timely ensuring fast digital infrastructure coverage across the country in order to unlock the potential of digital transition in rural economies and in the farming sector. In this respect, it will be important to ensure synergies with other EU and national funds.
- Invest in AKIS coordination and **horizontal knowledge flows between research and practice and in efficient networking of advisors** in the knowledge system, in particular for private advisors, as well as in advisors' training and skills.



## **2. ANALYSIS OF AGRICULTURE AND RURAL DEVELOPMENT IN GERMANY**

German agriculture is very diverse across 16 Länder in terms of farm structure as well as natural conditions for farming. There is a north-south disparity in farm sizes. Small-scale structures are mainly found in the south of Germany. More than 80% of farms are specialised, whereof around two thirds are specialised in livestock production. In Germany, rural and intermediate areas cover almost 90% of the territory, where almost 60% of German population live, however with considerable differences between the Länder. Rural areas in Germany accommodate the vast majority of small and medium-sized economy and ensure food security as well as offer space for quality living, nature and tourism.

### **2.1 Support viable farm income and resilience across the EU territory to enhance food security**

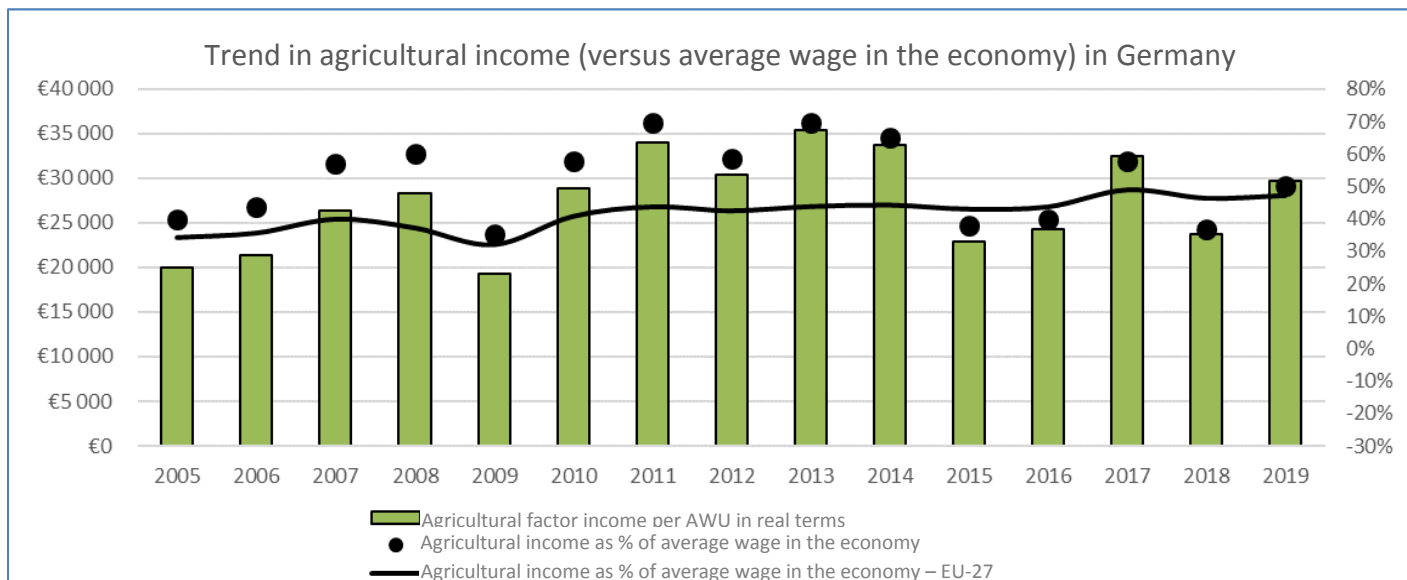
In Germany, the agricultural income is about 52% of the average wage of the economy, with substantial variations between 2005 and 2019. In the more recent period (2015-2019), the share tends to be lower than before (2011-2014), due to a decrease in farm entrepreneurial income.<sup>1</sup>

The agricultural factor income fluctuates over the time, as well. It fell down in 2009 and 2015 and picked up in 2013 and 2017. Direct payments form approximately 40% of the income and payments under rural development are around 6%. In the period from 2015 to 2018, 20% of the beneficiaries farmed about 71% of the land and received 69% of the direct payments.

The factor income increases with farm physical size from 20 up to 200 hectares and fluctuates beyond, while the direct payment per hectare decreases constantly. The average unit support for farms below average size is 110% of the total average unit amount in Germany. Concerning the economic size, the income also increases whereas the direct payment per hectare decreases. However, important differences in income by farm size persist. As regards sectors, the income shows highest values for cereals, oilseeds and protein crop farms and granivores, however with deviations between the years. The lowest income, though in upward trend, is for horticulture, fruits, permanent crops and cattle, which are mainly smaller size farms. The cattle sector presents the highest share of income support in the income. The average direct payment per hectare varies only modestly between sectors despite the differences in the income level.<sup>2</sup>

The factor income is lower in areas facing natural constraints (ANC) (ca. 77% of the non-ANC). In these areas, the total share of operating subsidies (direct payments and rural development support excluding investment support) and the total payment per hectare are considerably higher than the country average. Difference in the share of direct payments exist between the Länder, where the Land with the lowest income show the highest share of direct payments, while the direct payment per hectare varies moderately between the Länder.<sup>3</sup> Those results illustrate the moderate differentiation of the unit amount given the still high income differences between categories.

In Germany, the income is volatile and a variety of different risk management instruments exist covering climate, veterinary and income risks with high level of uptake: private crop insurance (75% for hail; 5% for multi-peril) and contractual price agreements (50%), nationally funded animal health funds (50%) and state aid (income taxation). The risk management tools that exist under rural development support are currently not used in Germany due to limited amount of available funding as well as preferences for market-orientated mechanisms or for already existing instruments.<sup>4</sup>



Source: Directorate General for Agriculture and Rural Development. *CAP context indicators C.25 Agricultural factor income and CAP context indicator C.26 Agricultural entrepreneurial income*. Income based on EUROSTAT [[aact\\_eaa04](#)], [[aact\\_ali01](#)] and [[aact\\_eaa06](#)], adding back the compensation of employees to the entrepreneurial income and divided by the total number of annual working units. Note: 2019 data estimated. The average wage in the economy based on EUROSTAT [[nama\\_10\\_a10\\_e](#)] thousand hours worked using employees domestic concept and [[nama\\_10\\_a10](#)], item wages and salaries

## 2.2 Enhance market orientation and increase competitiveness including greater focus on research, technology and digitalisation

Germany has a market-oriented agriculture, with certain sectors very much export-oriented, especially in meat, dairy and cereal products. Although Germany is the second largest agricultural producer in the EU, it is a net importer of agri-food. Between 2008 and 2018, the deficit increased from EUR 8.7 billion to EUR 15.3 billion<sup>5</sup>, mainly intra-EU for primary products like fruit and vegetables and piglets for pork production.

Between 2005 and 2016, the total number of farms declined by 30% from 390 000 to 276 000; the agricultural area declined from 17.0 million hectares to 16.7 million hectares; and the average farm size increased from 44 to 60 hectares, which is well above the EU average of 15 hectares. The number of livestock units remained stable. This decline in number of farms is experienced in most of the sectors, together with a growth in average size, as the smaller farms with little perspective tend to stop. The decline in number of farms is below the EU-27 average<sup>6</sup>.

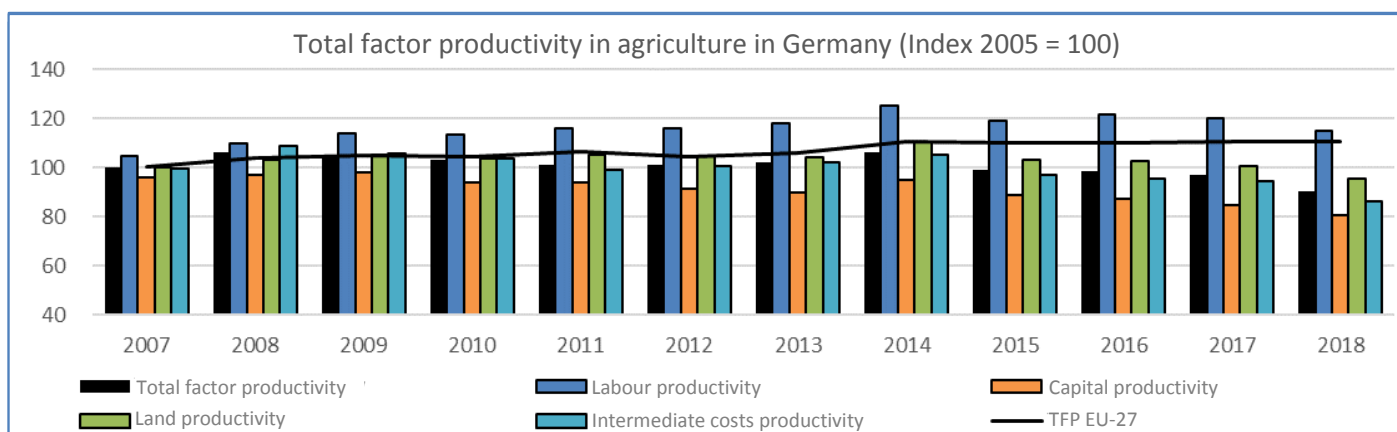
Germany is the largest EU milk producer (22% of total EU production in 2018). In 2008-2018, the milk production has been growing at a comparable rate to Denmark and the Netherlands (1.4% p.a.). The milk yield reached 8 000 kg per cow in 2018, almost 1 000 above the EU average. Between 2005 and 2016, the average size of German dairy farm grew from 54 to 71 cows (52 being EU-28 average)<sup>7</sup>.

Germany is also the largest producer of both non-GM and organic milk in absolute terms, even though only 3% of the German milk is organic, which is comparable with France and the Netherlands, but well below Austria and the Scandinavian countries (9-16%). In Germany, there is an increasing consumer demand for GM-free, plant-based, animal friendly produced and organic food.

Germany is the second biggest producer of arable crops (cereals, oilseeds, sugar beet) in the EU. It represents 15% of the total EU gross production. While Germany is self-sufficient in soft wheat and barley, it needs to import maize as well as rapeseed and soya beans to satisfy their domestic demand. Germany is heavily relying on intra-EU partners for their maize and rapeseed imports but on extra-EU for soya beans. Germany benefits from a competitive advantage on yields for certain commodities: respectively the fifth and fourth highest yield for soft wheat and barley, and fourth highest in rapeseed (average 2009-2019), but the production of rapeseed is declining<sup>8</sup>.

The production of fruit and vegetables is subject to a major structural change, which is even more intense in vegetable production than in fruit production<sup>9</sup>. The trend is towards more specialised farms with larger areas. In vegetable production, there is a significant increase in the area under cultivation, which leads to a significant increase in production.

Since 2014, the total factor productivity is declining. While, on the one hand, the labour productivity improved as the labour input decreased by 18%<sup>10</sup> between 2005 and 2017, on the other hand, the capital productivity decreased by 20% as farms got more capital intensive, partly caused by increased investments in sustainability. The gross fixed capital in German agriculture grew by 50% from EUR 6.1 billion in 2005 to EUR 9.4 billion in 2017<sup>11</sup>. German horticulture for harvesting and food processing is relying to certain extent on migrant workers, as the gross value added (GVA) per employee is with EUR 46 600 below the EU average (EUR 48 000).



Source: European Commission. *CAP context indicator C.27 Total factor productivity*. Based on EUROSTAT [[aact\\_eaa05](#)], [[aact\\_eaa04](#)], [[aact\\_ali01](#)], [[apro\\_cpsh1](#)] and [[ef\\_mptenure](#)] and FADN

### 2.3 Improve farmers' position in the value chain

Germany has a longstanding practice of cooperation of primary producers. The most common form of cooperation represent cooperatives (around 2 400 in 2017). Less than 10% of the cooperatives operate as recognised POs.<sup>12</sup> With 693 recognised POs in 2019, which makes up for one fifth of all POs in EU-27, Germany ranks second after France.<sup>13</sup> Almost half of the existing POs were established before 1990 and a quarter between 1990 and 2000. The majority of POs (60%) has less than 100 members, and less than 10% have more than 1 000 members. With 16 sectors, Germany has the largest variability of recognised POs as regards

the sectorial coverage in the EU.<sup>14</sup> Unlike in other Member States, where the vast majority of POs is recognised in the fruit & vegetables sector, in 2018 the highest number of POs in Germany was recognised in milk and milk products (194), followed by cereals (160), pig meat (101), and wine sector (90). There were 11 PO associations in 2018, most of them in pig meat (4), and milk and milk products (3), and in 2016, an interbranch organisation in the sugar sector was established.<sup>15</sup>

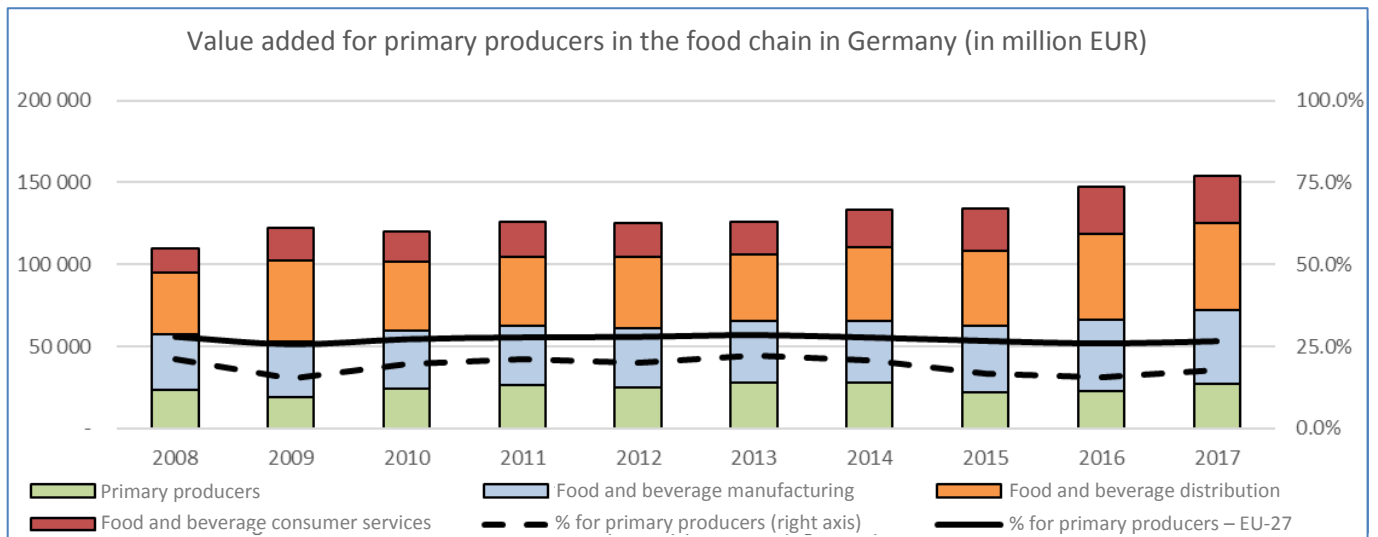
In terms of adding value to agricultural products, Germany had 170 products under EU quality schemes in September 2020. This represents a relatively low share (5%) in the EU compared to other larger Member States like Italy (27%) and France (23%). Almost half of quality products in Germany are wines and spirits, followed by fruit & vegetables and cereals and processed meat.<sup>16</sup>

In 2018, Germany had the largest organic market in Europe, worth EUR 10.9 billion.<sup>17</sup> Consumer demand for organic food in Germany continues to rise. In 2019, the market share of organic food in total food turnover in Germany was around 5.7%.<sup>18</sup> Based on 2019 consumer survey Ökobarometer, almost a half of the respondents say they buy organic food frequently or exclusively, whereas in 2018 it was only 28%. While organic eggs and organic fruit and vegetables continue to be consistently demanded by consumers, recently there is an increasing demand also for organic bread products and potatoes.<sup>19</sup>

According to a 2020 representative survey on eating and dietary habits in Germany, consumers' preference for regionally produced food is increasing, also in the light of the Covid-19 pandemic. More than 80% of consumers surveyed prefer that their food comes from their region. The importance of regional origin also depends on the product. The focus lies on fresh products, mainly milk, milk products and eggs, bread and bakery products and fresh fruit and vegetables.<sup>20</sup>

Between 2008 and 2017, the share of value added in the food supply chain captured by primary producers in Germany was on average around 20%, with a drop to 15% in 2009 and 2015-2016 and a slight recovery to 18% in 2017, which is considerably lower than EU average of 27%. This is partly because the costs of the intermediate goods and services used had increased at a faster rate than the value of the agricultural output. However, the low value added captured by primary producers in Germany can mainly be attributed to high concentration in food and beverages manufacturing and especially in retail. In 2017, the share of value added in the food supply chain captured by food and beverages manufacturing amounted to 29%, by retail 35% and by food and beverages consumer services 17%.<sup>21</sup>

Food industry is one of the most important industries in Germany. In 2019, approximately 6 100 enterprises employed more than 618 000 people, with turnover of EUR 185.3 billion. The majority are small and medium-sized enterprises. The most important sectors are meat and meat processing, dairy, confectionery and bakery, and production of alcoholic beverages.<sup>22</sup> In 2019, the four largest retail enterprises had a market share of around 70%. The top-listed enterprise alone had a market share of 26.8%.<sup>23</sup> Food prices in Germany are low in comparison to its neighbouring countries, such as France, Belgium, Austria, Luxemburg and Denmark.<sup>24</sup>



Source: European Commission. [CAP indicators – Data explorer](#). CAP Result indicator RPI\_03 Value for primary producers in the food chain.

## 2.4 Contribute to climate change mitigation and adaptation, as well as sustainable energy

In 2018, Germany's GHG emissions from agriculture (including LULUCF categories cropland and grassland) amounted to 96 Mt CO<sub>2</sub> equivalent, which presented 21% of EU-27. Thus, Germany remains the biggest contributor to total GHG emissions from agriculture in the EU. Compared to 1990, GHG emissions from agriculture decreased by 19%, but they have roughly stabilised over the last two decades. The share of agriculture (including LULUCF categories cropland and grassland) in total German GHG emissions (with LULUCF) was 11% in 2018.<sup>25</sup>

The main sources of agricultural GHG emissions (without LULUCF categories cropland and grassland) in Germany in 2018 were enteric fermentation with 39% (25 Mt CO<sub>2</sub> equivalent), agricultural soils with 39% (24.6 Mt CO<sub>2</sub> equivalent), and manure management with 15% (9.3 Mt CO<sub>2</sub> equivalent). In the three categories, GHG emissions decreased between 14% and 29% since 1990 and between 3% and 6% since 2013. Despite these reductions, with 2.81 tCO<sub>2</sub>eq per livestock unit (LU) of ruminants, emissions from enteric fermentation slightly exceeded EU-27 average in 2016 (2.67 tCO<sub>2</sub>eq per LU). So did emissions from manure management (0.53 tCO<sub>2</sub>eq per LU compared to 0.48 tCO<sub>2</sub>eq per LU in EU-27). GHG emissions from agricultural soils, however, (1.48 tCO<sub>2</sub>eq per hectare of agricultural land) significantly exceeded EU-27 average (0.94 tCO<sub>2</sub>eq) in 2018.<sup>26</sup>

In the LULUCF sector, net removals are dominated by forestland, with -67 Mt CO<sub>2</sub> equivalent in 2018. However, removals from forest showed a decrease by 5.6% compared to 1990 and by 1.5% compared to 2013.<sup>27</sup> This is due to changes in the use of wood and a shift in the distribution of age classes of trees with the resulting reduction in tree growth.<sup>28</sup> Based on 2012 forest inventory, deciduous trees represent 45% of forest trees in German woodland, with beech covering 15% and oak 10%. Among coniferous trees, spruce grows on 26% of forestland and pine on 23%.<sup>29</sup> Spruce and pine forests are often monocultures. However, area under mixed stocks has been increasing due to conversion of coniferous trees to mixed stocks in the past decades.<sup>30</sup> In the recent years, German forest has suffered damages due to adverse climatic events, such as heat waves, drought, storms, fires, and snow breakage, as well as pest infestation.<sup>31</sup> In 2018, cropland emissions increased by 27.5% compared to 1990 and by 5.4% compared to 2013. Although emissions in grassland in 2018 showed a reduction by 34% compared to 1990 and by 7% compared to 2013, the grassland emissions reported by

Germany are by far the highest in EU-27.<sup>32</sup> The share of permanent grassland in the total agricultural area has slightly decreased since 2000, from 30% to 28% in 2018<sup>33</sup>.

In Germany, peatlands are concentrated in the North German low plain (78%) and in the Alpine foothills (20%). According to 2010 estimations, peatlands covered around 1.4 million hectares, out of which approximately 65% were farmed. Overall, it was estimated that more than 90% of all German peatlands were affected by drainage, making it major GHG emitter. According to estimations, GHG emissions from drained peatlands produced up to 10%-30% of total emissions in northern Germany.<sup>34</sup>

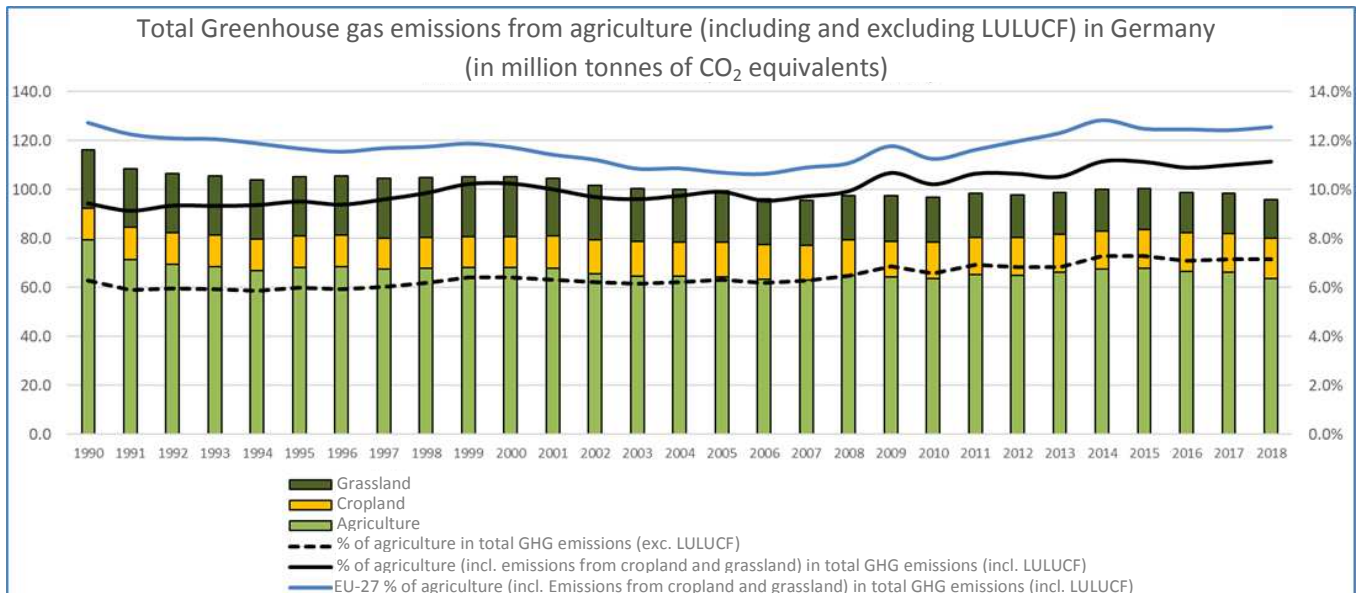
The German Climate Action Programme 2030<sup>35</sup> sets the 2030 GHG emissions reduction targets, whereby agriculture is to achieve a reduction in GHG emissions by 34-31%<sup>36</sup> compared to 1990.

In 2018, total production of renewable energy in Germany amounted to 43 Mt oil equivalent (Mtoe). This made up for the largest share in total production of renewable energy in EU-27, i.e. 20%. The share of agriculture in total German production of renewable energy was 24.1% (12.1% in EU-27) and of forestry 27.2% (41.4 in EU-27).<sup>37</sup> In terms of individual renewable sources of energy, energy production from fuelwood, wood residues and by-products shows a decrease by 17.3% between 2013 and 2018, while energy production from other vegetal materials and residues shows an increase by 160.7%<sup>38</sup>. In 2019, approximately 2.4 million hectares of agricultural land were under energy crops. More than two thirds were energy crops for biogas production, with maize as the main crop.<sup>39</sup>

In 2018, the share of renewable energy in gross final energy consumption in Germany was 16.5%, which is still below its 2020 target of 18%<sup>40</sup>. Direct use of energy in agriculture and forestry as well as in food processing has been increasing. In 2018, direct use of energy in agriculture and forestry amounted to 3.3 Mtoe, which represents 1.7% of total final energy consumption in Germany, and 119.1 kgoe per hectare of agricultural land and forestland. Compared to 2013, direct use of energy increased drastically. Direct use of energy in food processing amounted to 5.2 Mtoe, which presented 2.6% of the total final energy consumption. Compared to 2013, direct use of energy in food processing increased by 5%.<sup>41</sup>

In 2018, almost 4% of agricultural area in Germany was under contracts contributing to reduction of GHG and ammonia emissions<sup>42</sup> and 1% of agricultural area and forestland was under contracts contributing to carbon conservation and sequestration<sup>43</sup>.

In terms of vulnerability to the effects of climate change, the effects of gradual temperature change vary for different crops. They could lead to yield increase for crops such as grain maize or rape, and to yield decrease for winter wheat or silo maize. Warmer temperatures could lead to an early pest infestation or to several generations of pests per season. Growing heat stress and vector borne disease risks are also expected for livestock. A negative water balance is expected for some regions. Damages due to droughts are expected for the continental region, e.g. North-Eastern part with its sandy soils, and extreme temperatures in the South-West. Regarding forests, impacts are mainly expected due to lower water availability, heat stress, pests, and risk of forest fires. Forest fires are projected to increase substantially, by up to 50% in the long term.<sup>44</sup> In view of this scenario, the importance of species-rich forests, climate-resilient species and provenances (where it is possible autochthonous) will grow as a way to address these challenges.



Source: European Environmental Agency. As in EUROSTAT [[env air gge](#)]

## 2.5 Foster sustainable development and efficient management of natural resources such as water, soil and air

In Germany, the risk of soil erosion both by water and by wind is still limited compared with other Member States. With 1.4%, the share of agricultural area at risk of soil erosion by water was clearly below the EU-27 average of 7% in 2016.<sup>45</sup> Nevertheless, erosion phenomenon is more prominent sub-regionally. The risk of water erosion in arable land is present in hills and mountain areas, like Bavarian tertiary hills, Erzgebirge, Kraichgau, and hills between Rheinland-Pfalz and Saarland<sup>46</sup>, while potential risk of wind erosion is especially present in the North German lowlands and in coastal areas of the North Sea and the Baltic Sea<sup>47</sup>. The risk of soil erosion in arable land can be reduced through remedial actions such as catch crops, under sown crops and minimum tillage (57% of tillable agricultural land was tilled conventionally in 2016<sup>48</sup>). The mean soil organic carbon (SOC) content in arable land of Germany is 30.1 g/kg, which is below the mean EU<sup>49</sup>. The impact of soil improving measures may be increased by research, innovation and demonstration activities available under the forthcoming Horizon Europe Mission on soil health.

In relation to the Water Framework Directive, around 90% of surface water bodies are failing to achieve good ecological status and all surface water bodies are failing to achieve good chemical status. For groundwater, around 4% were failing good quantitative status and around 36% were failing good chemical status. Diffuse agriculture pollution is the most significant pressure on both surface and groundwater bodies with nitrate being the top pollutant causing failure to achieve good chemical status in groundwater.

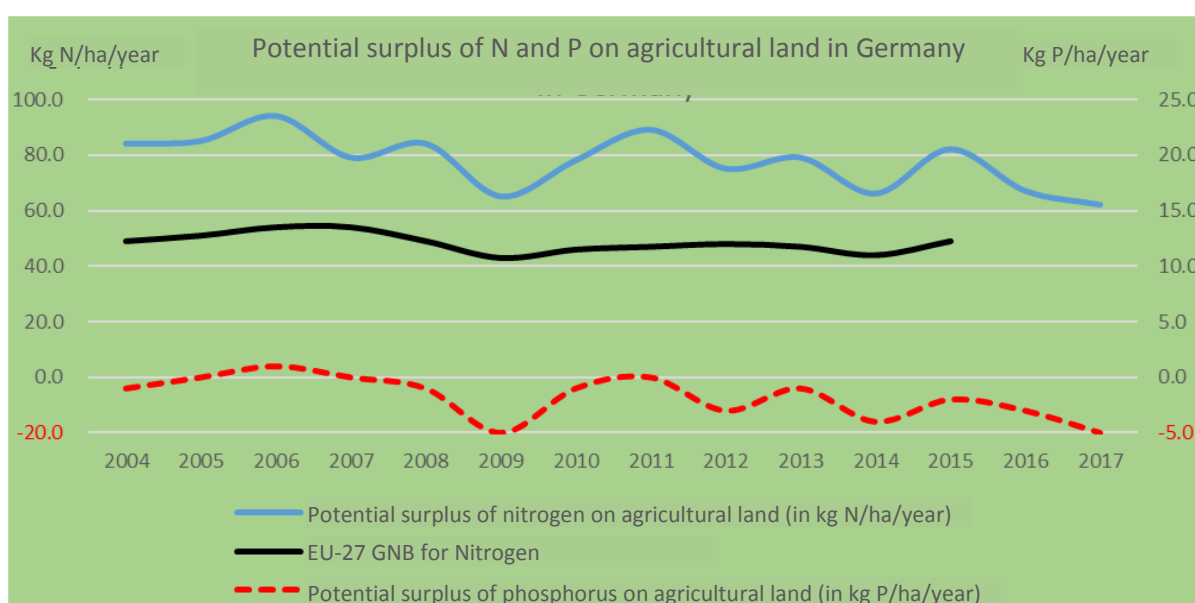
The surplus of nutrients is still very high, especially nitrogen values are largely above the EU average (more than 75 kg/ha/year + 54% compared with EU average in 2015), despite some improvements with regard to phosphorous (the same trends as EU average). In 2017, only 25% of surface water was classified as high quality (less than 2 mg/l NO<sub>3</sub>-N), while 63% of groundwater was considered as high quality (less than 25 mg/l NO<sub>3</sub>). Still, 28% of groundwater in agricultural areas are above the limit value established in the Nitrates Directive of 50 mg/l NO<sub>3</sub>. This situation has not improved in comparison with 2012.<sup>50</sup> Of all the Member States, Germany has the second-highest number of monitoring stations with average nitrate levels exceeding 50 mg/l<sup>51</sup>. There is a strong correlation between regional animal density and hot spots where water pollution has been identified. Following a ruling of the Court of Justice of the European Union in June 2018, Germany has reinforced measures

to reduce and prevent pollution of water caused by nitrates from agriculture gradually. The last update of the national fertiliser legislation was published on 1 May 2020. Germany needs to correctly identify the polluted areas on which reinforced measures to reduce nutrient pollution should apply.

In 2015, none of the water bodies of the transitional and coastal waters in the North Sea and the Baltic Sea was in good or very good status. In the North Sea, 51.7% of water bodies were in moderate, 34.5% in poor and 13.8% in bad status, while in the Baltic Sea the situation is much more dire. There, one third of water bodies is in moderate, one third in poor and one-third in bad status. The main reason is the excessive flow of nutrients into coastal and transitional waters (eutrophication). These come mainly from agriculture, wastewater treatment plants and shipping.<sup>52</sup>

As regards water quantity, based on the new indicator water exploitation index (WEI<sup>+</sup>) in 2018, there was no situation of over abstraction in all water catchment areas (all indexes on extraction represent a share lower than the limit of 20% of available water as established by EEA), except in Weser. Irrigation concerns only some arable land in few regions. In 2016, only 2.7% of total agricultural area were irrigated in Germany.<sup>53</sup>

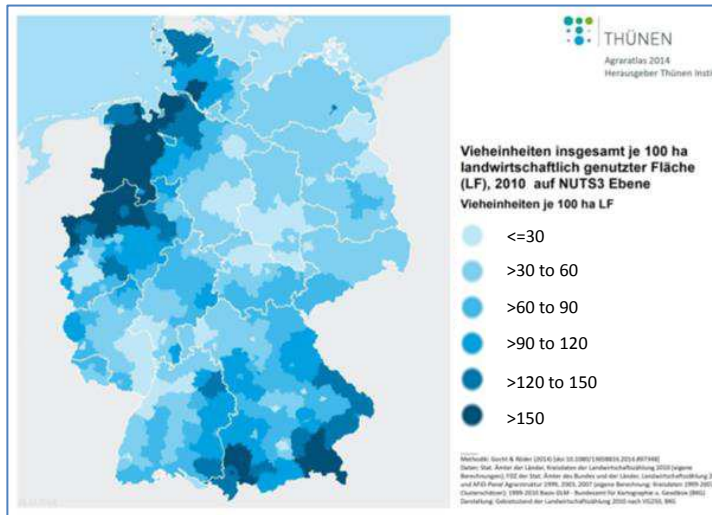
Among different non-CO<sub>2</sub> air pollutant sources, agriculture is the main source of ammonia emissions in Germany (95%). Between 2005 and 2016, ammonia emissions have increased by more than 8%, reaching 675 kt in 2016. The 2018 figures show an improvement, as the total emissions value has fallen to 636 kt. The livestock sector is the main contributor to these ammonia emissions (75%).<sup>54</sup> Progress so far has been insufficient and Germany has been found to be at high risk of non-compliance with the ammonia emission reduction commitments for 2020-2029 and at medium risk of non-compliance with the emission reduction commitment for 2030 onwards. On the regional level, the emission density (g NH<sub>3</sub>/ha agricultural area) in 2010 was the highest in Nordrhein-Westfalen and in Niedersachsen. One source of pressure is the livestock density, which grew by 3.5% in 2012-2015 compared with 2008-2011. Beyond ammonia air pollution, almost 13% of the total reported emissions of nitrogen oxides, 29% of the total reported emissions of non-methane volatile organic compounds and 9% of the total fine particulate matter emissions in Germany come from agricultural sources.



Source: European Commission. CAP context indicator C.40 Water quality. Based on EUROSTAT [aei pr gnb]

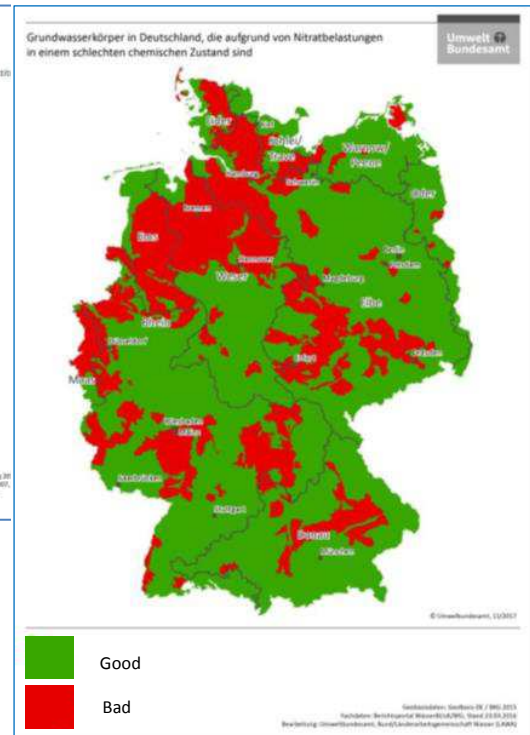


Livestock units per 100 hectares of agricultural area in 2010



Source: *The Thünen agricultural atlas*, Thünen-Institut (2014)

Groundwater bodies in bad chemical status due to nitrate concentration



Source: German Federal Environment Agency (11/2017)

## 2.6 Contribute to the protection of biodiversity, enhance ecosystem services and preserve habitats and landscapes

The level of intensity of farmed agricultural land has a relevant impact on biodiversity and environmental pressures. In 2017, 38.4% of agricultural area in Germany was managed by farms with high input intensity per hectare (EU-27 average: 36.3%), which represents a significant decrease compared to 2015 and 2013 (57.8% and 56.2% respectively).<sup>55</sup> In 2018, 70.6% of agricultural area in Germany was arable land, 28.2% was permanent grassland and meadows and 1.2% was under permanent crops<sup>56</sup>.

The national network of Natura 2000 sites covered 15.5% of Germany's territory (EU-27: 19.8%) in 2018, with special protection areas amounting to 11.3% (EU-27: 14.1%) and sites of community interest only 9.4% (EU-27: 14.9%). The share of agricultural area (including natural grassland) under Natura 2000 was 10.7% and the share of forest area was 25.4%.<sup>57</sup>

The conservation status of agricultural grassland habitats according to the Habitats Directive in the 2013–2018 period shows that only 10% were in favourable condition, 36.7% in unfavourable-inadequate condition and 53.3% in unfavourable-bad condition. While the share of habitats assessed as favourable increased by 3.3 pp compared to the 2007–2012 period, the share of habitats assessed as unfavourable-bad increased by 13.3 pp, showing further deterioration of the state of habitats in Germany.<sup>58</sup> In 2017, the high nature value farming indicator (HNV) continued to decline compared to 2009 (from 13.1% to 11.4%). While there was a strong and continuing decrease within the lowest quality level of HNV-Farmland, the highest quality level remained static at a low value.<sup>59</sup> In an ongoing infringement procedure, Germany is asked to step up the protection of flower-rich grasslands in protected Natura 2000 sites that play a vital role for pollinating insects, bees and butterflies.

The value of the farmland bird index reported in 2013 was 82.6 (2000=100), which was the lowest value since 2000 (except in 2011 when it was 81.2).<sup>60</sup> In 2016, the value of the national “common biodiversity and landscape quality” indicator<sup>61</sup> was at 70.5% of its 2030 target. The different sub-indicators give a more nuanced picture. The sub-indicator for farmland birds shows a decreasing trend from 71.7% in 2000 to 60.5% in 2016. On the other hand, the situation for forest birds is much more favourable. There was a positive trend and increase from 73.4 in 2000 to 87.5 in 2016.<sup>62</sup>

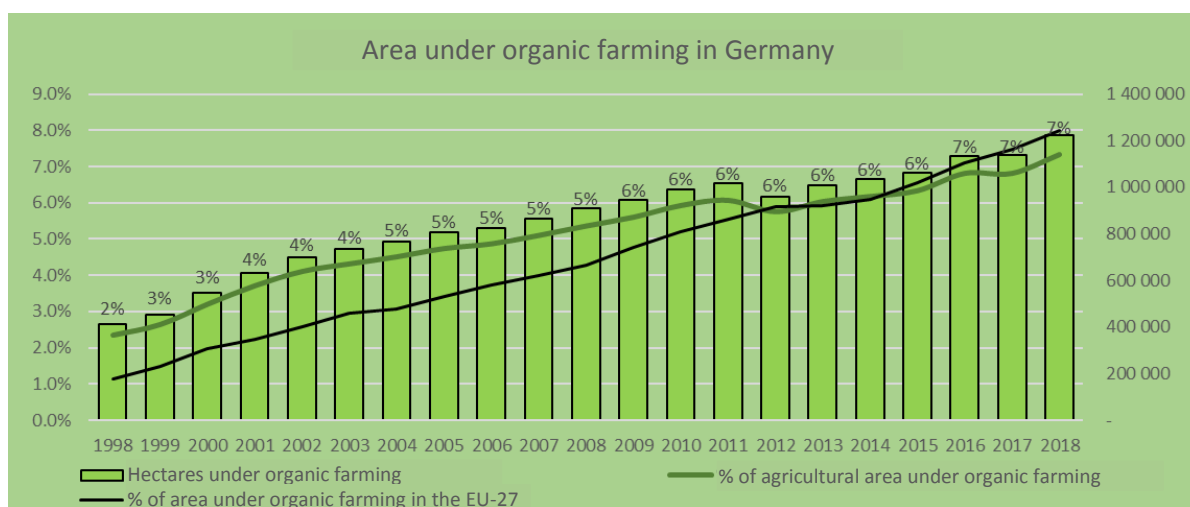
A study by the Entomologischer Verein Krefeld from 2017 showed an average 76% decrease in insect biomass based on long-term observations in 63 protected areas in Germany over 27 years.<sup>63</sup> The study results are concurrent with the data observed in red lists of endangered species, which currently monitor almost 8 000 species. In 45% of red-listed insect species, a long-term downward trend is evident, and 42% of red-listed insect species are considered to be endangered, extremely rare or already extinct. Out of 561 red-listed bee species in Germany, 41% are considered to be of conservation concern.<sup>64</sup>

In 2018, fallow land presented 1.6% of total agricultural area, and landscape elements made out for 0.5% of total agricultural area, compared to 4.1% and 0.5% in EU-27 respectively<sup>65</sup>. In 2019, 13% of arable land in Germany was declared as ecological focus area. Thereof, landscape features and terraces covered 2.1% and land laying fallow 15%.<sup>66</sup>

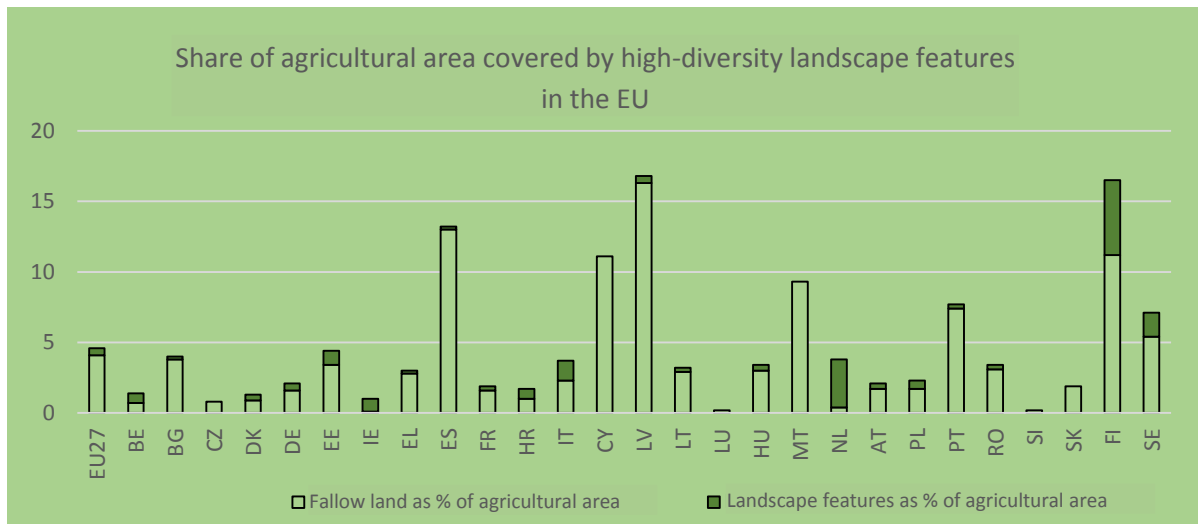
In Germany, area under organic farming has been steadily increasing. In 2018, it covered 1.2 million hectares of agricultural area, thereof 43.5% was arable land, 54.8% permanent grassland and 1.7% permanent crops. This represents 7.3% in total agricultural area (almost in line with the 8% in EU-27). This shows an increase by 27.2% compared to 2012<sup>67</sup>. However, the distribution of the share of agricultural area under organic farming between the Länder varies considerably<sup>68</sup>.

At national level, biodiversity-related issues are addressed by the 2007 National Biodiversity Strategy (NBS)<sup>69</sup>. The progress of the NBS is monitored through a set of indicators, regularly presented in the so-called Indicator Reports (latest 2019<sup>70</sup>).

In 2020, 14% of agricultural land in Germany was under contracts contributing to biodiversity and landscapes<sup>71</sup>. German rural development programmes dedicated 51% of the rural development funding to restoring, preserving and enhancing eco-systems in agriculture and forestry<sup>72</sup>.



Source: European Commission. CAP context indicator C.19 Agricultural area under organic farming. Based on EUROSTAT [[org\\_cropar\\_h1](#)] and [[org\\_cropar](#)]



Source: Directorate General for Agriculture and Rural Development. Based on EUROSTAT for land laying fallow and Joint Research Centre based on LUCAS survey for estimation of landscape elements  
 \* Linear elements considered here: Grass margins, shrub margins, single trees bushes, lines of trees, hedges and ditches. This estimation is to be taken with caution because of methodological caveats.

## 2.7 Attract young farmers and facilitate business development in rural areas

The current age structure of Germany's agricultural sector is good and compares well in the European context. The graph below<sup>73</sup> shows that in 2016, Germany had a higher than average share of young farmers below 35 years of age (Germany 7.4% vs EU-27 5.1%) as well as a lower than average share of farmers older than 55 years of age (Germany 39.5% vs EU-27 57.9%). The combination of these two statistics leads to the young farmer to elderly farmer ratio of 0.19, again above average in the EU (0.09). Pairing with France, this young to old ratio is the fourth highest in the EU after Austria (0.42), Poland (0.27) and Slovakia (0.24)<sup>74</sup>.

The graph below also shows a positive trend in the German agricultural demographics, where the share of young farmers increased since 2010, while the EU trended downward. At regional level, the German picture gets more diverse<sup>75</sup>, with Rheinland-Pfalz, Niedersachsen and Brandenburg depicting young farmer to elderly farmer ratio that range close to the EU average of 0.09. Nevertheless, the overall trend in the agriculture sector is a shift towards farmers staying longer in the business and thus leading to an ageing of the sector, as evident when looking a bit further back in the German age structure development. The young farmer share is down from the 2005 level of approximately 9%. Looking ahead, by 2027 approximately 109 000 German farmers will have reached the retirement age of 65, leading to an estimate of 9 650 holdings per year to change owner due to retirement. Over the next 10 years, approximately 35% of all holdings will be concerned. Also in terms of gender balance, there is a clear margin for manoeuvre. Since 2005, women represent only a very small part of young farmers, reaching a ratio of roughly one female per seven male young farmers in 2016.

Regarding the 2016 average German farm size in hectares, the structure across age groups is quite uniform, contrasting to other EU Member States with more differentiated patterns<sup>76</sup>. During the last decade, German young farmers caught up with the other age groups, showing the highest growth rates. From that perspective, no significant structural difference due to age exists. In terms of standard output (SO), young farmers in 2016 reached higher levels compared to older farmers. The young farmers have realised a better growth rate between 2005 and 2016, over proportional to the increase in hectare farm size<sup>77</sup>.

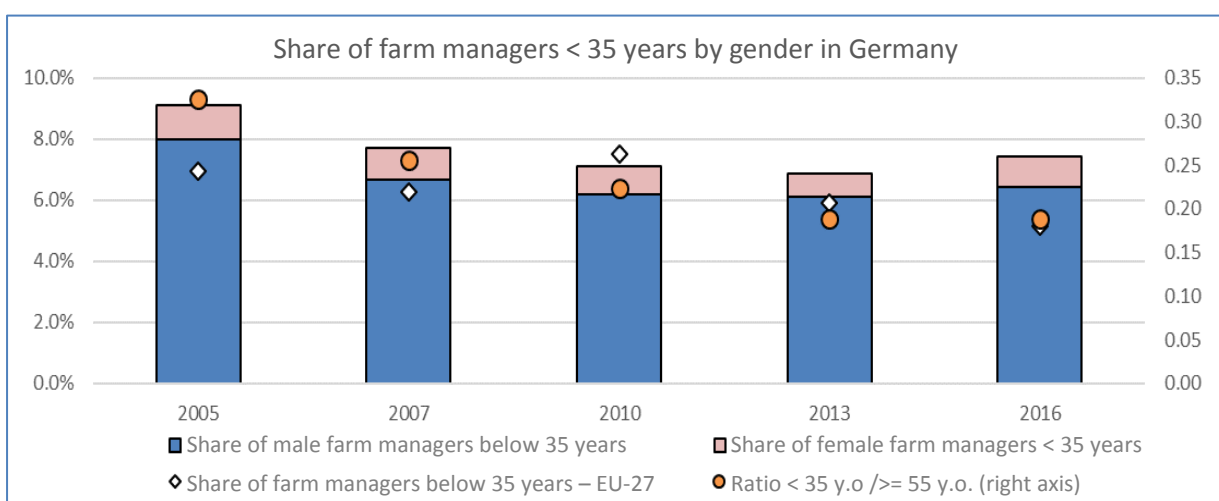
For new entrants and the installation of young farmers, the main barriers in Germany are access to land, access to finance and the traditional approach to farm successions. Farmland

in Germany is scarce, while regional differences exist with higher scarcity in southern Länder and somewhat less pressure on land in eastern parts of the country. For the near future, expectations are that the pressure on land use will further increase. On the one hand, the land scarcity in itself represents a bottleneck for new entrants, but on the other hand also leads to high land prices. In this line of causality, access to finance is an additional impediment. High land prices create a huge hurdle since the agricultural income is not sufficient to repay the upfront investment in a reasonable timeframe<sup>78</sup>. Access to finance is constrained for farmers mainly due to a lack of collateral and a lack of credit history. New entrants and young farmers not inheriting businesses from their parents are particularly disfavoured. Traditionally, farmers found their successors in their own family. This approach to succession planning, however, is changing, with currently almost 70% of active farmers not having solved the succession aspects of the farms<sup>79</sup>. Therefore, succession to outsiders becomes increasingly necessary. The financing gap that relates to this group of farmers is estimated to be between EUR 44 million and EUR 80 million<sup>80</sup>.

Under the young farmer payment scheme, Germany paid out 1.36% of its direct payments envelope in 2018, which is close to EU average<sup>81</sup>. In the 2015-2018 period, the number of young farmer beneficiaries increased by 70%, and the hectares declared by young farmers by 73%<sup>82</sup>. In 2014-2020 rural development programming period, Germany does not provide start-up support for young farmers, except Sachsen-Anhalt. The objective there is to support 70 young farmers, using 0.4% of Sachsen-Anhalt’s financial envelope.

The share of young farmers in Germany with agricultural training is higher than the EU average (In 2016: 62% vs 43%). However, educational level among these trained young farmers in Germany has deteriorated. While in 2005 the majority of young farmers achieved “full” training, “basic” knowledge is now the prevalent educational level since 2010.<sup>83</sup> Information and advice towards young farmers or potential young farmers is scattered over many different sources, which complicates informed decision making, while internet platforms mainly offer basic information<sup>84</sup>. Advisory services, in general, are broadly available, however, they do not cover management and business issues needed for developing a business plan or starting a new agricultural activity<sup>85</sup>.

More broadly, the business environment in Germany is favourable. However, business development, also in rural areas, could be further facilitated by increasing the support to entrepreneurs regarding administrative procedures and legal compliance issues, including through further improvement of digital public services<sup>86</sup>.



Source: EUROSTAT. [[ef\\_m\\_farmang](#)]

## 2.8 Promote employment, growth, social inclusion and local development in rural areas, including bio-economy and sustainable forestry

Germany has less rural (39%) and more intermediate (50%) areas than the EU-27 (45% and 46%)<sup>87</sup>; rural areas are most important (60% or more of the total territory) among others in Mecklenburg-Vorpommern and parts of Bayern (towards the border with Czechia)<sup>88</sup>. German population lives, comparatively, less in rural (16%) and more in intermediate/urban (41%/44%) areas than the EU-27 (21% and 39%/40%)<sup>89</sup>. Similar to urban areas, in rural areas nearly 15% are aged under 15, around 65% are aged between 15 and 64 and around 20% are aged over 65, while in terms of gender there is a balance<sup>90</sup>. While recently population increased in all types of areas, it increased clearly less in rural areas (1.1% in 2015-2019 compared to 1.9% in intermediate and 2.9% in urban areas)<sup>91</sup>. Already today the old age dependency ratio is very strong ( $\geq 42.5\%$ ) in large parts of eastern Germany (except e.g. around Berlin) and in some northern coastal areas among others.<sup>92</sup> For the future, there are projected negative demographic trends for a very large part of Germany until 2032 (except e.g. parts of Bayern, of the South-West and of Nordrhein-Westfalen)<sup>93</sup>. In Germany, the share of foreign-born residents in rural areas is quite similar for EU-born (6% in 2019) and not EU-born (5%) persons (about 3 pp and 2 pp above EU-27 average)<sup>94</sup>.

In Germany, in 2005 both the total and the rural employment rate<sup>95</sup> had started roughly at the same level than the EU-27 rate for rural areas (around 65%), while thanks to a steady growth ever since, today both are clearly above the EU-27 average (68%) with respectively 77% and 80%; Germany ranks second among all EU Member States. Over the last 15 years, both male and female employment grew in rural areas (84% and 76% respectively in 2019) and while the gender gap closed by one third, it remains at 8 pp in 2019.<sup>96</sup> For both men and women with low/medium educational level, the employment rate<sup>97</sup> is higher in rural than in urban areas, while for the highly educated it is rather evenly distributed among territories; also here the gender gap shows (13 pp for the low and 7 pp for the high educated in rural areas)<sup>98</sup>.

Between 2010 and 2017, the share of employment very slightly increased in tourism and very slightly decreased in the food industry and, slightly more in agriculture; in 2017, they respectively reached 3.8%, 2.2% and 1.2%<sup>99</sup>, while the primary sector globally accounted only for 3.2 % of the employment in rural areas in 2016<sup>100</sup>. Agricultural labour force is still predominantly male (30% female in 2016) and of family origin<sup>101</sup>, while with only 10% Germany had the fourth lowest share of female farmers in EU-28 (28%) in 2016<sup>102</sup>. Between 2007 and 2010, the number of small farmers in Germany decreased for the two categories of smallest farms<sup>103</sup> (respectively -3.2 pp to 0.5% and -10.6 pp to 11.6%); in 2016, both size classes accounted only for a very minor share of farms (0.3% and 10.5%), of hectares (0% and 1.2%), of livestock units (0.9% and 1.3%) and of SO (0% and 0.3%)<sup>104</sup>.

In the aftermath of the financial crisis, the unemployment rate<sup>105</sup> in Germany, both in total and in rural areas, has been declining by 2 pp between 2013 and 2019 reaching 3% and 2% respectively. In Germany, rural unemployment is therefore slightly lower than for the country as a whole and below the nearly 6% for EU-27 rural areas, which implies that Germany has the second lowest rural unemployment rate (after Czechia). The situation is comparatively less favourable for the young generation (aged 20-24) of which, despite decreasing as well by 2 pp since 2013, nearly 4% remained unemployed in rural areas<sup>106</sup> (nearly 13% for EU-27) in 2019; for young men the unemployment rate in rural areas is with 4.6% higher than for young women with 2.6% (young women also recovered slightly faster since 2013 with -2.2 pp compared to -1.8 pp for young men). The population aged 50-64 in rural areas even has a lower unemployment rate of 1.9% (4.2% for EU-27), which in essence corresponds to the unemployment rate for women and men of that age group in rural areas. To note that urban

areas are relatively worse off in terms of unemployment rate (overall and for the age groups looked at)<sup>107</sup>.

While in 2009, the share of young people (aged 15-24) neither in employment nor in education and training ranged between 8% and 10% for Germany as a whole as well as for cities, towns and suburbs and rural areas, since then it decreased and ranged in 2019 between 4% and 7% for the country in total (5.7%) and for the different territories. Out of this, rural areas had the lowest share with 4.2%, which was the second lowest share in EU-27 (10.7%), while with 4.9% the share for young women in rural areas was slightly higher than for young men with 3.5% (implying that the gender gap was basically the same as in 2009).<sup>108</sup> Between 2009 and 2019, the share of early leavers from education and training (aged 18 to 24) evolved rather stable in total, for cities and towns and suburbs (for all the average ranged between 10.5% and 11%) and likewise, yet at a slightly lower level, for rural areas (on average 8.6%); over the period, the share for young men and young women has moved close to the total share for rural areas being overall slightly disadvantageous for young men (9.5% to 8.3% in 2019). Since 2015, the share for rural areas in Germany has been around 3 pp lower than for EU-27, while in 2019 it ranked in the upper middle field among the EU Member States.<sup>109</sup> Since 2009, in Germany the educational level has improved in all types of areas (relative weight decreased for low education and increased for high education), but in 2018 the urban-rural gap for higher education had increased by 4.5 pp (to 10.6 pp, driven by a faster development in urban areas). At the same time, rural areas continued to have the lowest share of population with low education (17% in 2018) of all territories.<sup>110</sup>

Looking at GDP per capita, although between 2005 and 2016 in Germany both rural areas and intermediate areas became *relatively* richer (around +10 pp), with respectively 102% and 110% of EU average in 2016 compared to 148% for the urban areas, the historically wide gap among territories largely persisted.<sup>111</sup> Since 2010, the share of value added has grown by 4 pp in EU-27 rural areas, while in Germany it remained in essence stable in rural areas (13%) as well as in the primary sector (around 1%)<sup>112</sup>. In terms of tourism, between 2012 and 2017 in Germany the number of beds overall very slightly increased; since 2012 in Germany the share of beds in rural areas has been lower than in EU-27 rural areas (42% vs 45% in 2018) and, just like it, decreased until 2018 (by 2 pp vs 6 pp)<sup>113</sup>.

In 2005, in Germany the poverty rate was close to 20% in all types of areas. Subsequently, it rose in rural areas until 2010, then basically decreased until 2015 and then stayed rather stable, while over the period it rose in urban areas (in particular in 2012) and stayed rather stable in towns and suburbs; in 2018 it amounted to 17%, 22% and 16% respectively. Over 2010-2018, it was on average 8 pp lower in rural areas in Germany than in EU-27<sup>114</sup>. Whereas between 2012 and 2018, in Germany the mean income increased in all territories, with nearly 20% it did so in particular in intermediate (EUR 27 500 in 2018) and rural areas which, with EUR 24 800 in 2018, had slightly bypassed the urban areas. Mean income in rural areas continues to be higher for men than for women (ca EUR 900 in 2018); the median income largely follows the same patterns<sup>115</sup>. It is currently higher than the EU-27 average for all types of territories (21 800 vs 15 200 in purchasing power standard for rural areas in 2018), but less dispersed<sup>116</sup>.

In the 2014-2020 programming period, 321 local action groups were established under LEADER to advance the bottom-up approach engaging local actors in the development of their rural areas. Under the German rural development programmes, EUR 1.3 billion (14% of Germany's envelope under the European Agricultural Fund for Rural Development (EAFRD)) were allocated to the implementation of LEADER. The frontrunners Sachsen and Brandenburg dedicated respectively around 40% and 27% of their regional budgets to

LEADER. Only Sachsen-Anhalt has implemented the multi-fund Community-Led Local Development, together with the cohesion funds.<sup>117</sup>

In Germany, forests cover 32.7% of the total land area and other wooded land 0% (respectively 39.8% and 5.3% in EU-27).<sup>118</sup> Between 2005 and 2017, Germany saw an (sometimes strong) increase in major economic indicators for forestry and logging: the total output increased from EUR 4 141 million to EUR 8 513 million (wood in the rough and trees accounted for the biggest shares in 2017), persons employed<sup>119</sup> from 47 400 to 48 000 annual working units (while decreasing for EU-27), the alleged labour productivity<sup>120</sup> from EUR 36 600 to EUR 66 400 GVA per person employed and the investments from EUR 168 million to EUR 275 million<sup>121</sup>. Germany ranked first among the Member States both in terms of timber resources (2015<sup>122</sup>) and their net annual increment (2010<sup>123</sup>).<sup>124</sup> Between 2011 and 2015, in Germany the turnover from the bio-economy was roughly EUR 390 billion, while employment was roughly around 2 million (with a decrease between 2011 and 2015); the turnover per person employed increased from EUR 176 300 in 2008 to EUR 201 600 in 2015 (from EUR 97 000 to EUR 119 000 for EU-27). Food, beverages and tobacco was the most important sector (53% of the 2015 turnover and 45% of 2015 employment) followed by agriculture, paper, wood products and furniture and bio-based chemicals, pharmaceuticals, plastics and rubber (excl. biofuels) (13%, 10%, 9% and 10% of the 2015 turnover and 27%, 8%, 11% and 5% of 2015 employment).<sup>125</sup>

## **2.9 Improve the response of EU agriculture to societal demands on food and health, including safe, nutritious and sustainable food, as well as animal welfare**

The implementation of National Action Plans against Antimicrobial Resistance (AMR) in Member States has already led to a decrease in overall EU sales of antimicrobials. Based on the tenth European Surveillance of Veterinary Antimicrobial Consumption (ESVAC) report<sup>126</sup> for 25 countries, from 2011 to 2018 an overall decrease of 34.6% in sales per population correction unit (mg/PCU) was observed. Germany is part of a group of Member States, where the most significant decrease was registered. From 2011 to 2018, the sale in mg/PCU fell from 211.5 to 88.4 mg/PCU, which is below the EU average of 118.3 mg/PCU but above leaves room for further reduction in order to achieve the EU Farm to Fork objectives for 2030. This decrease is observed in almost all regions.<sup>127</sup> It results from the national policy based on the German Antibiotic Resistance Strategy (DART)<sup>128</sup>. DART includes a set of measures to detect, prevent and better combat antibiotic resistance. This strategy is implemented by the regional competent authorities, which are allowed to impose sanctions.

There is an increased demand for animal-based food produced under conditions, which respect animal welfare. This trend is clearly expressed in a 2013 study on food consumption in Germany<sup>129</sup>. Nevertheless, a lack of enforcement of EU animal welfare legislation is observed, in particular in the pig sector. Although prohibited as a routine measure, the tail docking of pigs is still common practice in Germany. Husbandry conditions on pig farms still do not allow for an increase in the percentage of pigs reared with intact tails, which has barely changed since 2016. Animal welfare concerns are also present in poultry meat production, and diseases in broilers, as well as in cattle production, in particular with regard to transport arrangements. Biosecurity is equally a challenge. Germany is among the countries affected by African Swine Fever, hence the need for reinforced measures.

Meeting high animal welfare standards involves increased production costs. German rural development programmes support investment cost in relation to housing improvement and conversion in order to increase animal welfare under measure investment in physical assets.

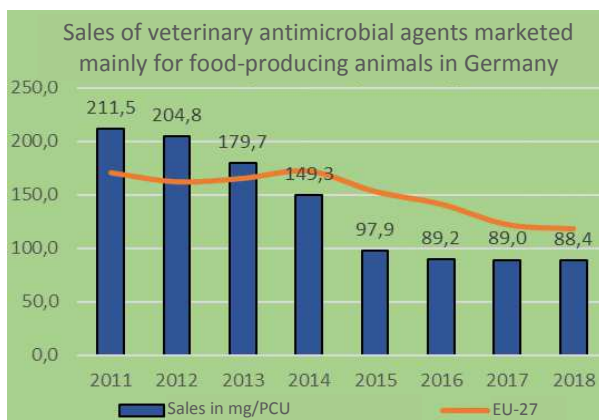
According to Eurostat statistics, the total sales of plant protection products, despite some fluctuations, increased slightly by 2% over the 2011-2018<sup>130</sup> period. According to the last update for 2018, the Harmonised Risk indicator 1, measuring the use and risk of pesticides, shows a downward trend by 18% since the baseline period in 2011-2013 (slightly stronger decline than the EU average trend minus 17%).

Based on the Harmonised Risk indicator 2 (HRI2), which is calculated by weighting the number of emergency approvals, the trend still shows a stable use of emergency approvals. From 2016 to 2018, the HRI2 was dominated by emergency approvals with active and most toxic substances from the group of candidate for substitution<sup>131</sup>.

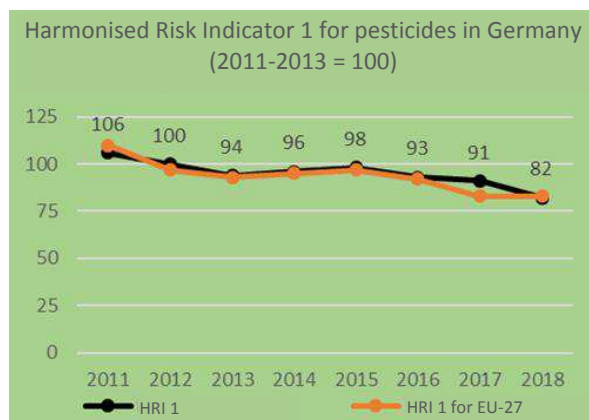
In Germany, training of users, control of pesticide application equipment in use, and pesticide storage conditions are implemented according to Sustainable Use Directive (SUD) provisions, but there is still a gap in the National Action Plan for the SUD. The main issue in Germany is that effective controls on the implementation of the general principles of integrated pest management need to be put in place for all types of professional users of plant protection products.<sup>132</sup>

Based on 2012 data, Germany represented more than 12% of the total EU food waste amount per year (88 million tonnes)<sup>133</sup>. A national strategy for reduction of food waste was adopted in February 2019<sup>134</sup>, but no mandatory measures have been taken until now.

Germany has a high burden from non-communicable diseases due to dietary risk factors expressed as Disability Adjusted Life Year (DALYs) per 100,000 population attributable to diet<sup>135</sup>. This DALY's value is influenced by a number of dietary factors. A significant part of the German population is overweight or obese<sup>136</sup>. Efforts should focus on shifting towards healthy sustainable diets, in line with national recommendations, in order to contribute to reducing overweight and obesity rates and the incidence of non-communicable diseases while simultaneously improving the overall environmental impact of the food system. This would include moving to more plant based foods, with less consumption of red and processed meat (which is high in Germany)<sup>137</sup> and more fruit and vegetables (consumption of which is very low consumption in Germany<sup>138</sup>) as well as whole grains, legumes, nuts and seeds.



Source: European Medicines Agency, European Surveillance of Veterinary Antimicrobial consumption (ESVAC). *Sales of veterinary antimicrobial agents in 31 countries in 2018 – trends from 2010 to 2018 Tenth ESVAC Report.* [EMA/24309/2020](https://www.ema.europa.eu/en/press-room/2020/04/WG-20-00012)



Source: European Commission. *Harmonised Risk Indicator for pesticides (HRI1), by group of active substance.* As in EUROSTAT [[SDG 02 51](#)]



## 2.10 Cross-cutting objective on knowledge, innovation and digitalisation

AKIS in Germany counts among the strongest ones in the EU (high resource allocation)<sup>139</sup>, yet falling halfway between being fully fragmented and fully integrated (knowledge networks insufficiently operating in cooperation and lack of coordination)<sup>140</sup>.

For the 2014-2020 programming period, Germany has earmarked 3% of their total EUR 9.45 billion EAFRD budget for the 'Knowledge transfer and innovation' priority, which includes M01 (knowledge transfer and information actions), M02 (advisory services, farm management and farm relief services) and M16 (Co-operation-EIP)<sup>141</sup>. Furthermore, 2.1% are earmarked for roll-out of broadband infrastructure and digitalisation in rural areas.

In the framework of the national rural network a dedicated network for the European Innovation Partnership for agriculture (EIP-AGRI) was set up. This positive experience can be the basis for the future national CAP network to intensify such actions and play a key role in promoting synergies between the CAP and European Research Area. The best way to do so is to keep in close touch with the Horizon National Contact Points and to intensify the spreading of the information on the EIP website, and by setting up advisory back-offices where the latest knowledge and innovation is collected and shared with the field advisors and the farmers. At EU level, the Standing Committee on Agricultural Research is an important channel for connecting research and innovation and for removing obstacles to innovation.

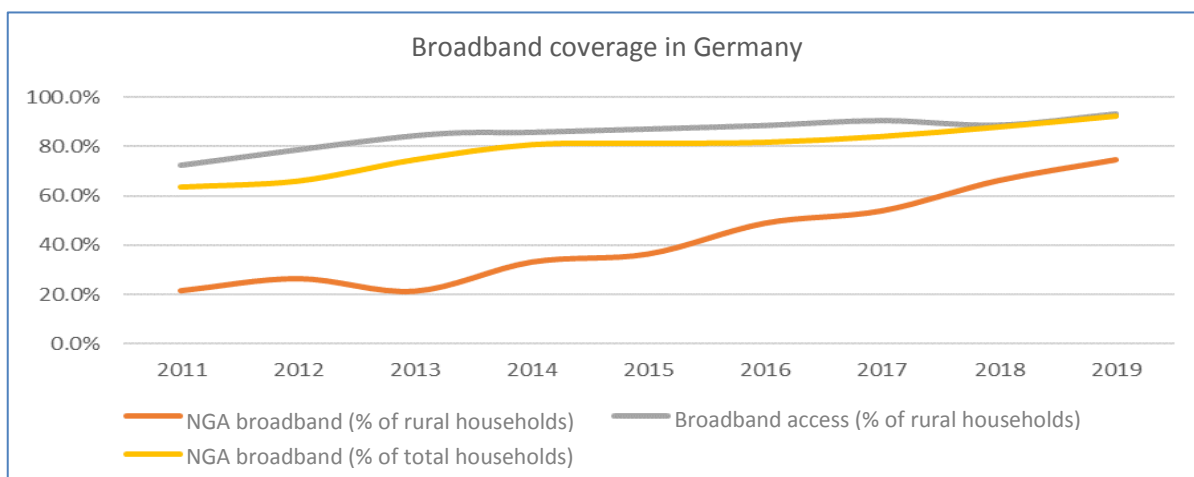
Germany is ranked fourth in the EU with close to 180 Operational Groups (OG) – having an average budget of EUR 507 000 – launched under EIP-AGRI<sup>142</sup>. While the overall 2014-2020 target of 232 OG has not yet been reached, some Länder such as Baden-Württemberg, Niedersachsen & Bremen, Nordrhein-Westfalen and Schleswig-Holstein have already surpassed their regional targets. Overall, the number of beneficiaries advised (22 754) was above EU average (18 595), while the number of advisors trained was below<sup>143</sup>.

As the competence for agricultural advisory services lies with the Länder, very different organisational structures have emerged, including official advice from agricultural offices or authorities as downstream organisations of the ministries of agriculture; chambers of agriculture with official and business consultancy; private consultants and self-employed consultants; advice from cooperatives, producer and control rings; advice from upstream and downstream suppliers/processors; advice from research organisations. Thematic working panels are in place for a number of topics, including advisory services and agricultural research, to coordinate the exchange between the federal and Länder ministries. Nevertheless, the differences in the approach towards the provision of advisory services between the Länder create obstacles for horizontal knowledge flows.<sup>144</sup> An efficient networking of advice providers in the knowledge system is missing, especially of private providers, since an increasing privatisation of advisory services in Germany is evident. Digitalisation is a crucial topic, in particular, since the use of digital technologies will further change production advice. Technological possibilities, however, have not yet been fully utilised by advisory services.<sup>145</sup>

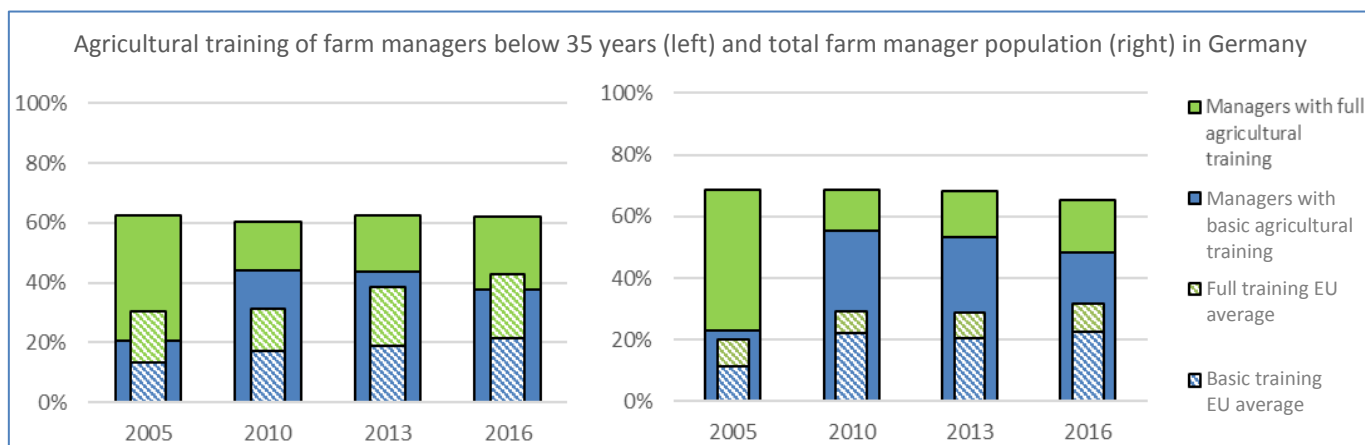
Between 2005 and 2016, nearly 65% of all farmers in Germany attained a basic or full training, while over the same period the number of farmers completing basic training grew more than the number of farmers attaining a full training. In 2016, the share of farmers with basic or full training out of all farmers was higher in Germany than at EU level (65% to 32%), while the relative importance of basic to full training was roughly 4:1 in Germany compared to roughly 3:1 at EU level<sup>146</sup>.

In 2013, there was a very strong territorial gap in terms of fast broadband with 75% of overall households and only 21% of rural households covered. In 2019, 92% of overall households and, thanks to a very strong catch-up, 75% of rural households benefitted from fast internet; however, the territorial gap in terms of fast broadband coverage still amounts to 17 pp. In 2019, the share of people with basic or above basic digital skills ranged roughly between 65% and 75% for all territories (lowest in rural areas); this places Germany among the Member States with the highest and less dispersed shares<sup>147</sup>. Germany ranks first in the EU on 5G readiness. In 2019, Germany ranked 18th in the EU on integration of digital technology in business activities and 21st on digital public services, since only 49% of German online users actively engaged with e-government services, compared with an EU average of 67%.

In early September 2020, there were nine fully operational Digital Innovation Hubs<sup>148</sup> related to agriculture, hunting and forestry among a total of 142 hubs amongst EU members. Digital Innovation Hubs are to support scaling up digital innovations and bringing it to the “end users” and build up regional capacities to deploy those innovative digital technologies. In 2018, the Ministry of Food and Agriculture created a new Directorate dedicated specifically to the subject of “digital innovations” and every Directorate-General of the Ministry has a designated Digitalisation Officer<sup>149</sup>. Since September 2019, the ministry has launched eight ‘digital trial fields’ as a new funding tool to harness the potential of digitalisation in agriculture<sup>150</sup>. Trial fields are digital test fields on agricultural holdings, which perform tests to analyse - among other things - how digital technologies can best be used to protect the environment, improve animal welfare, promote biodiversity and reduce workloads.



Source: European Commission. *Digital Economy and Society Index*. DESI individual indicators – 1b1 Fast BB (NGA) coverage [[desi\\_1b1\\_fbbc](#)]



Source: European Commission. *CAP context indicator C.24 Agricultural training of farm managers*. Based on EUROSTAT [[ef mp training](#)]

- <sup>1</sup> Directorate General for Agriculture and Rural Development. *CAP context indicators C.25 Agricultural factor income and CAP context indicator C.26 Agricultural entrepreneurial income*. Income based on EUROSTAT [[aact\\_eaa04](#)], [[aact\\_ali01](#)] and [[aact\\_eaa06](#)], adding back the compensation of employees to the entrepreneurial income and divided by the total number of annual working units. Note: 2019 data estimated. The Average wage in the economy based on EUROSTAT [[nama\\_10\\_a10\\_e](#)] thousand hours worked using employees domestic concept and [[nama\\_10\\_a10](#)], item wages and salaries.
- <sup>2</sup> Directorate General for Agriculture and Rural Development own calculations based on FADN data.
- <sup>3</sup> Directorate General for Agriculture and Rural Development own calculations based on FADN data.
- <sup>4</sup> Directorate-General for Agriculture and Rural Development (European Commission), ECORYS, Wageningen Economic Research. *Study on risk management in EU agriculture*. Publications Office of the European Union, Luxembourg. 2018. <https://op.europa.eu/en/publication-detail/-/publication/5a935010-af78-11e8-99ee-01aa75ed71a1>.
- <sup>5</sup> European Commission. Directorate General for Agriculture and Rural Development. *Analytical factsheet for Germany: Nine objectives for a future Common Agricultural Policy*. September 2019. 22 pages. [https://ec.europa.eu/info/sites/info/files/food-farming-fisheries/by\\_country/documents/analytical\\_factsheet\\_de.pdf](https://ec.europa.eu/info/sites/info/files/food-farming-fisheries/by_country/documents/analytical_factsheet_de.pdf).
- <sup>6</sup> European Commission. Directorate General for Agriculture and Rural Development. *Analytical factsheet for Germany: Nine objectives for a future Common Agricultural Policy*. September 2019. 22 pages. [https://ec.europa.eu/info/sites/info/files/food-farming-fisheries/by\\_country/documents/analytical\\_factsheet\\_de.pdf](https://ec.europa.eu/info/sites/info/files/food-farming-fisheries/by_country/documents/analytical_factsheet_de.pdf).
- <sup>7</sup> European Commission. Directorate-General for Agriculture and Rural Development. *Short-term outlook report – EU-27 statistical annex*. [https://ec.europa.eu/info/sites/info/files/food-farming-fisheries/farming/documents/short-term-outlook-statistical-annex\\_en.pdf](https://ec.europa.eu/info/sites/info/files/food-farming-fisheries/farming/documents/short-term-outlook-statistical-annex_en.pdf).
- <sup>8</sup> EUROSTAT. [[apro\\_cpnh1](#)].
- <sup>9</sup> EUROSTAT. [[apro\\_cpnh1](#)].
- <sup>10</sup> European Commission. Directorate General for Agriculture and Rural Development. *Analytical factsheet for Germany: Nine objectives for a future Common Agricultural Policy*. September 2019. 22 pages. [https://ec.europa.eu/info/sites/info/files/food-farming-fisheries/by\\_country/documents/analytical\\_factsheet\\_de.pdf](https://ec.europa.eu/info/sites/info/files/food-farming-fisheries/by_country/documents/analytical_factsheet_de.pdf).
- <sup>11</sup> European Commission. Directorate General for Agriculture and Rural Development. *Analytical factsheet for Germany: Nine objectives for a future Common Agricultural Policy*. September 2019. 22 pages. [https://ec.europa.eu/info/sites/info/files/food-farming-fisheries/by\\_country/documents/analytical\\_factsheet\\_de.pdf](https://ec.europa.eu/info/sites/info/files/food-farming-fisheries/by_country/documents/analytical_factsheet_de.pdf).
- <sup>12</sup> Montanari, F., Chlebicka, A., Szabo, G. G., Amat, L., Traon, D., Sorrentino, A., Russo, C., Ferreira, I. *Study of the best ways for producer organisations to be formed, carry out their activities and be supported*, Final report. Publications Office of the European Union, Luxembourg. 2019. 171 pages. <https://op.europa.eu/en/publication-detail/-/publication/2c31a562-eef5-11e9-a32c-01aa75ed71a1>.
- <sup>13</sup> European Commission. *CAP indicators – Data explorer*. CAP Output indicator OIM\_05 Producer organisations.
- <sup>14</sup> Montanari, F., Chlebicka, A., Szabo, G. G., Amat, L., Traon, D., Sorrentino, A., Russo, C., Ferreira, I. *Study of the best ways for producer organisations to be formed, carry out their activities and be supported*, Final report. Publications Office of the European Union, Luxembourg. 2019. 171 pages. <https://op.europa.eu/en/publication-detail/-/publication/2c31a562-eef5-11e9-a32c-01aa75ed71a1>.
- <sup>15</sup> German Federal Ministry of Food and Agriculture. *Statistisches Jahrbuch über Ernährung, Landwirtschaft und Forsten der Bundesrepublik Deutschland 2019*. 63. Jahrgang, Federal Office for Agriculture and Food, 2020. p. 140.
- <sup>16</sup> European Commission. *eAmbrosia – the EU geographical indications register*. <https://ec.europa.eu/info/food-farming-fisheries/food-safety-and-quality/certification/quality-labels/geographical-indications-register/#>.
- <sup>17</sup> Research Institute of Organic Agriculture (FiBL). *European organic market grew to 40.7 billion euros in 2018*. FiBL, Frick/Nuremberg, 12 February 2020. <https://www.fibl.org/en/info-centre/news/european-organic-market-grew-to-40-7-billion-euros-in-2018.html>.
- <sup>18</sup> Statista GmbH. *Marktanteil von Bio-Lebensmitteln in Deutschland bis 2019*. Statista GmbH, 2020. <https://de.statista.com/statistik/daten/studie/360581/umfrage/marktanteil-von-biolebensmitteln-in-deutschland/>.
- <sup>19</sup> German Federal Ministry of Food and Agriculture. *Ökobarometer 2019*. Federal Office for Agriculture and Food, 2020. 24 pages.
- <sup>20</sup> German Federal Ministry of Food and Agriculture. *Deutschland, wie es isst Der BMEL-Ernährungsreport 2020*. 2020. [https://www.bmel.de/SharedDocs/Downloads/DE/Broschueren/ernaehrungsreport-2020.pdf?\\_\\_blob=publicationFile&v=21](https://www.bmel.de/SharedDocs/Downloads/DE/Broschueren/ernaehrungsreport-2020.pdf?__blob=publicationFile&v=21).

- <sup>21</sup> European Commission. *CAP indicators – Data explorer*. CAP Result indicator RPI\_03 Value for primary producers in the food chain.
- <sup>22</sup> German Federal Ministry of Economic Affairs and Energy. *Lebensmittelindustrie*. 2020. <https://www.bmwi.de/Redaktion/DE/Artikel/Branchenfokus/Industrie/branchenfokus-lebensmittelindustrie.html>.
- <sup>23</sup> Statista GmbH. *Marktanteile der führenden Unternehmen im Lebensmittelhandel in Deutschland bis 2019*. Statista GmbH, 2020. <https://de.statista.com/statistik/daten/studie/4916/umfrage/marktanteile-der-5-groessten-lebensmitteleinzelhaendler/>.
- <sup>24</sup> EUROSTAT [[prc\\_ppp\\_ind](#)].
- <sup>25</sup> European Environmental Agency (EEA). *EEA greenhouse gas – data viewer*. <https://www.eea.europa.eu/data-and-maps/data/data-viewers/greenhouse-gases-viewer>.
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- <sup>32</sup> European Environmental Agency (EEA). *EEA greenhouse gas – data viewer*. <https://www.eea.europa.eu/data-and-maps/data/data-viewers/greenhouse-gases-viewer>.
- <sup>33</sup> European Commission. *CAP indicators – Data explorer*. CAP Result indicator RPI\_12 Share of grassland in total UAA.
- <sup>34</sup> Jensen, R. et al. *Potentiale und Ziele zum Moor- und Klimaschutz Gemeinsame Erklärung der Naturschutzbehörden*. Schleswig-Holstein Office for Agriculture, Environment and Rural Areas, 2012. 38 pages. <https://www.umweltdaten.landsh.de/nuis/upool/gesamt/moore/moorresolution.pdf>.
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- <sup>36</sup> The distribution of emissions in the 2030 German Climate Action Programme corresponds to the areas of action laid down in the 2050 German Climate Action Plan, not to the categories of the official UNFCCC reporting. Therefore, a comparison of the GHG emissions reductions set in the 2030 German Climate Action Programme and the GHG emissions reductions based on EEA data viewer on greenhouse gas emissions and removals according to IPCC sectors is not possible.
- <sup>37</sup> European Commission. *CAP context indicator C.43 Production of renewable energy from agriculture and forestry*. Based on EUROSTAT [[nrg\\_bal\\_c](#)] and [[nrg\\_cb\\_rw](#)], and Strategie Grains.
- <sup>38</sup> EUROSTAT. [[nrg\\_cb\\_rw](#)].
- <sup>39</sup> Agency for Renewable Resources e.V. *Anbau und Verwendung nachwachsender Rohstoffe in Deutschland*. 2020. <https://www.fnr-server.de/ftp/pdf/berichte/22004416.pdf>.
- <sup>40</sup> EUROSTAT. [[t2020\\_31](#)].
- <sup>41</sup> European Commission. *CAP context indicator C.44 Energy use in agriculture, forestry and food industry*. Based on EUROSTAT [[nrg\\_bal\\_s](#)].
- <sup>42</sup> European Commission. *CAP indicators – Data explorer*., CAP Result indicator R.17 Percentage of agricultural land under management contracts targeting reduction of GHG and/or ammonia emissions (focus area 5D).
- <sup>43</sup> European Commission. *CAP indicators – Data explorer*. CAP Result indicator R.20 Percentage of agricultural and forest land under management contracts contributing to carbon sequestration or conservation (focus area 5E).
- <sup>44</sup> Buth, M. et al. *Vulnerabilität Deutschlands gegenüber dem Klimawandel*. Climate Change 24/2015, Umweltbundesamt, 2015. Dessau-Roßlau. <https://www.umweltbundesamt.de/publikationen/vulnerabilitaet-deutschlands-gegenueber-dem>.

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- 55 European Commission. *CAP context indicator C.33 Farming intensity*. Based on FADN –Agri-environmental indicator “Intensification/Extensification”.
- 56 European Commission. *CAP context indicator C.18 Agricultural area*. Based on EUROSTAT [[apro\\_cpsh1](#)].
- 57 European Commission. *CAP context indicator C.34 Natura 2000 areas*. Based on NATURA 2000 Barometer and European Environmental Agency, Corine Land Cover 2018.
- 58 European Commission. *CAP context indicator C.36 Conservation status of agricultural habitats*. Original source: [European Environmental Agency](#).
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- 60 European Commission. *CAP context indicator C.35 Farmland birds index (FBI)*. As in EUROSTAT [[env\\_bio2](#)], original source: EBCC, BirdLife, RSPB and CSO.
- 61 The biodiversity and landscape quality indicator monitors the changes in the population of 59 selected bird species representing the six main landscape and habitat types in Germany (farmland, forest land, settlements, inland waters and coasts/seas, Alps (currently suspended)). An expert panel has set a target value for 2030, which presents 100%.
- 62 German Federal Environment Agency. *Indicator: Species diversity and landscape quality*. 2020. <https://www.umweltbundesamt.de/en/indicator-species-diversity-landscape-quality#at-a-glance>.
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- <sup>140</sup> In a 'strong' AKIS, 1) influential actors or organisations at national level support the knowledge system, 2) dedicated resources are allocated to the AKIS, for example, to enhance advisory services, knowledge production and exchange, and 3) evidence exists that farmers are being reached by and benefit from advisory services. A weak AKIS would be lacking of these features. An 'integrated' AKIS features a coordinating structure, often a public body, and the system is supported by national policies on AKIS and advisory services that frame the (inter)actions of AKIS actors. In addition, in an integrated AKIS there is evidence of linkages between various actors. A fragmented AKIS is characterised by several independent knowledge networks that operate in parallel. They are typically not well coordinated, rarely cooperate and even might compete. Source: Knierim, A., Prager, K. *Agricultural Knowledge and Information Systems in Europe: Weak or strong, fragmented or integrated?* PRO AKIS, European Commission 7th Framework Programme project. July 2015. [https://430a.uni-hohenheim.de/fileadmin/einrichtungen/430a/PRO\\_AKIS/About/OVERVIEW.OF.AKIS.IN.EUROPE.AKIS\\_characterisation\\_briefing\\_final.pdf](https://430a.uni-hohenheim.de/fileadmin/einrichtungen/430a/PRO_AKIS/About/OVERVIEW.OF.AKIS.IN.EUROPE.AKIS_characterisation_briefing_final.pdf).
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