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**Commission recommendations for Germany's CAP Strategic Plan**

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[Mandatory element]

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## **1. Commission recommendations for Germany's CAP Strategic Plan**

In the framework of the structured dialogue for the preparation of the 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 Common Agricultural Policy, 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**

The German agriculture sector is the second largest agricultural producer in the European Union. It is highly specialised, with focus on livestock production and arable crops. It is market-oriented and is a strong exporter of meat, dairy and cereal products. Nevertheless, the shift to a sustainable food system presents both important economic opportunities as well as challenges for German farmers. Agricultural productivity has been lagging behind EU average, also due to increasing capital intensity. The income in the farm sector remains below the German average income. Especially livestock and arable crops have considerable income fluctuations. Thus, the CAP payments play an important safeguarding role. In this context, improving the fairness and effectiveness of the direct payments and other income support tools by lowering the concentration of direct payments and the territorial differences, especially for areas facing natural constraints, should be encouraged. The income support should be better targeted towards smaller farms by reinforcing direct payments per hectare for smaller farms. The agricultural income remains volatile despite the diverse risk management mechanisms available. Hence, more innovative and preventive types of solutions to manage production and income risks in agriculture should 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 a longstanding practice of cooperation of primary producers, in form of non-recognised (predominantly cooperatives) as well as recognised producer organisations. Despite the strong presence of producer organisations and a 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 mainly be attributed to high concentration in food and beverages manufacturing and especially in retail, and the focus on low food prices, especially in comparison 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, 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**

With regard to environmental performance, the opportunities for Germany's agriculture sector are not homogeneously spread through the country. Some Länder, especially in the north-western and in south-eastern part, are characterised by high livestock density and land use intensification, which significantly affect ecosystems and imply certain climate change vulnerabilities. This is particularly reflected in continuous high levels of nutrient surplus (nitrogen and phosphorous) in water bodies and ammonia emissions to the air. As regards water quality, not all water bodies are in good status yet and agriculture is the most significant pressure. Better integration of water objectives of the Water Framework Directive in agriculture is needed and synergies should be optimised with policies including the CAP. Germany has recently taken steps to reinforce 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 emission increase, more effective efforts are still needed to reach 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, 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 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, 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 with a view to protect farmland related habitats and species. Carbon farming and agroforestry to increase carbon stocks could be developed for appropriate regions. Forest remains the biggest sink in the LULUCF sector, although due to ageing tree stock and increased mobilisation due to excessive damages the carbon storage capacity has been decreasing. Therefore, sustainable and climate-resilient forest management and restoration is needed in order to maintain a strong carbon sink and ecosystem services. Key measures for climate resilient forests include the creation of forest climate fund („Waldklimafonds“); more sustainable and adapted forest management; integration in regional forest management regulations and actions, and research and information platforms. A vast portion of peatland and wetland, which covers a significant area in Germany, was drained in the past also for farming, thus becoming GHG emitter instead of a carbon sink. Therefore, maintenance and restoration of peatland and wetland for its carbon sequestration potential is crucial in the future. In terms of renewable energy production from agriculture, better balance needs to be

struck between the objective of increasing the share of renewables in the 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 the 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. Therefore, great efforts by the agricultural sector and adequate financial input will be needed to achieve at least 10% of agricultural area under high diversity and reversal of deterioration in conservation trends in biodiversity. Maintenance or restoration of favourable conservation status of protected habitats and species identified in the Prioritized 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 for the protection of pollinators in Germany, also in light of the EU Pollinators Initiative. With a view to EU 2030 target of 25% of agricultural area being under organic farming, Germany will need to step up the uptake rate, especially by setting appropriate strategies at Länder level, as some Länder have been lagging behind in their ambition in this respect. This should include correct identification of 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 most important social challenges for European agriculture, generational renewal. German farm succession patterns change away from family business inheritance to selling it off to third parties. Most businesses (70%) suffer from uncertainty about succession. Such uncertainty 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 trended downward. However, there are regional differences in the share of young farmers. Improving the succession of farms, while addressing the unfavourable gender balance among German young farmers, critically hinges on adequate access to finance, sustainable business models and knowledge, which enable making informed investments and is intrinsically linked to favourable perspectives allowing people to stay and well-live in rural areas. These perspectives are put into question by phenomena linked to ageing and depopulation, such as a very strong old age dependency ratio in large parts of the Centre-East (among others) and projected negative demographic trends for a very large part of Germany until 2032. Among others, this might be due to the strong urban-rural gap of GDP/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 at 8 percentage points and Germany has one of the lowest shares of female farmers), and the educational situation of the younger generation in rural areas (in terms of early school leavers in rural areas, Germany ranks in the upper middle field among the EU Member States). There must be careful consideration of the specific needs of women in agriculture and rural areas 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 the precarious, seasonal and undeclared ones, will play a major role in delivering on the respect of rights enshrined in legislation, which is an essential element of the fair EU food system envisaged by the Farm to Fork Strategy. The Strategy also aims at contributing to sustainable EU food systems, which will among others imply to prioritise a stronger shift towards consumer preferences in such areas as quality production, more balanced diets and health. German production pattern is very dependent on input uses such as 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 dairy production in relation of 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. Agricultural Knowledge and Innovation System (AKIS) should facilitate the knowledge flows between its actors to respond to the growing information needs of farmers, for speeding up innovation and increasing valorisation of existing knowledge to achieve the CAP objectives. The AKIS in Germany counts among the ‘strongest’ ones in the EU (high resource allocation), yet knowledge networks do not cooperate sufficiently between each other and 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 already have 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 the structuring of 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 declining total factor productivity development in Germany could be slowed down by promoting cooperation and sharing of knowledge and innovation, as well as help to 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 through large-scale training efforts and by exploiting the EU’s technological lead in satellite observation, precision farming, geolocation services, autonomous farm machinery, drones to better monitor and optimise agricultural production processes. Digital transition not only for the farming sector, but also for all businesses as well as private and public services in rural areas will 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.
- **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 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

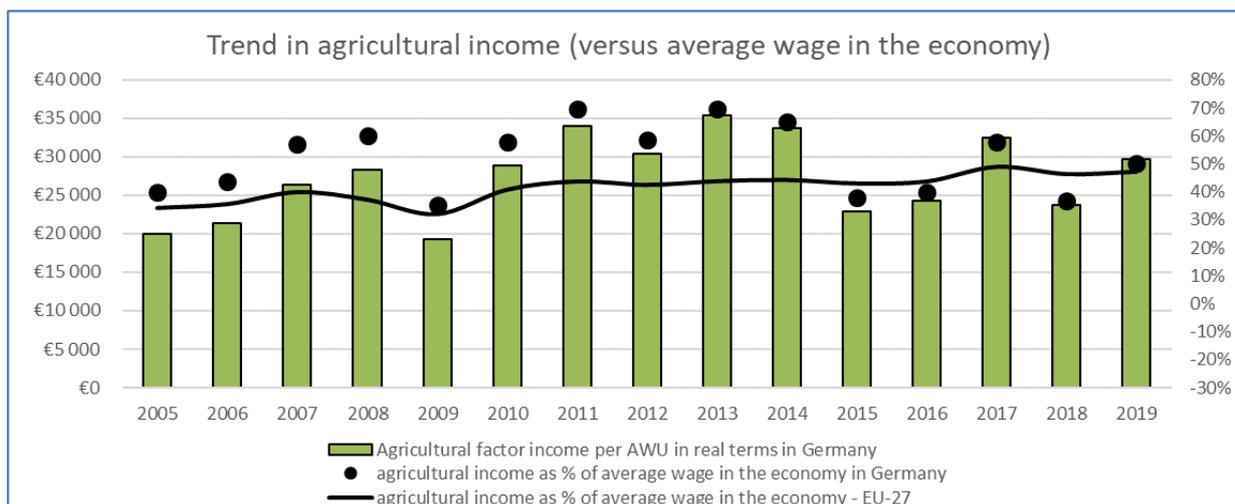
In Germany, the **agricultural income is about 52% of the average wage of the economy**, with substantial variations over the period 2005-2019. In the more recent period (2015-2019), the share tends to be lower than before (2011-2014), due to a decrease in farm entrepreneurial income.<sup>1</sup>

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 circa 40% of the income and payments under payment under rural development are around 6%. In the period 2015-2018, 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: DG AGRI based on EUROSTAT

## 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>

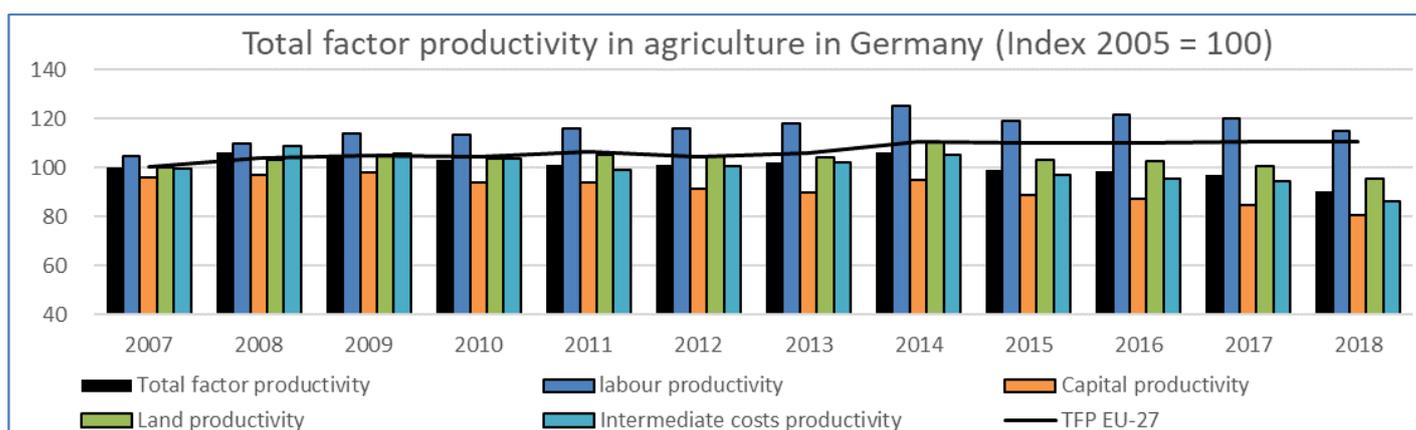
Germany is the largest EU milk producer (22% of total EU production in 2018). In 2008-2018, the milk production has been growing at a comparable rate to Denmark and Netherlands (1.4% p.a.). The milk yield reached 8 000 kg/cow in 2018, almost 1 000 above the EU average. Between 2005 and 2016, the average 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 5<sup>th</sup> and 4<sup>th</sup> highest yield for soft wheat and barley, and 4<sup>th</sup> 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 per employee** is with EUR 46 600 **below the EU average** (EUR 48 000).



Source: EUROSTAT for TFP and DG AGRI for partial productivity

### 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 producer organisations (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>

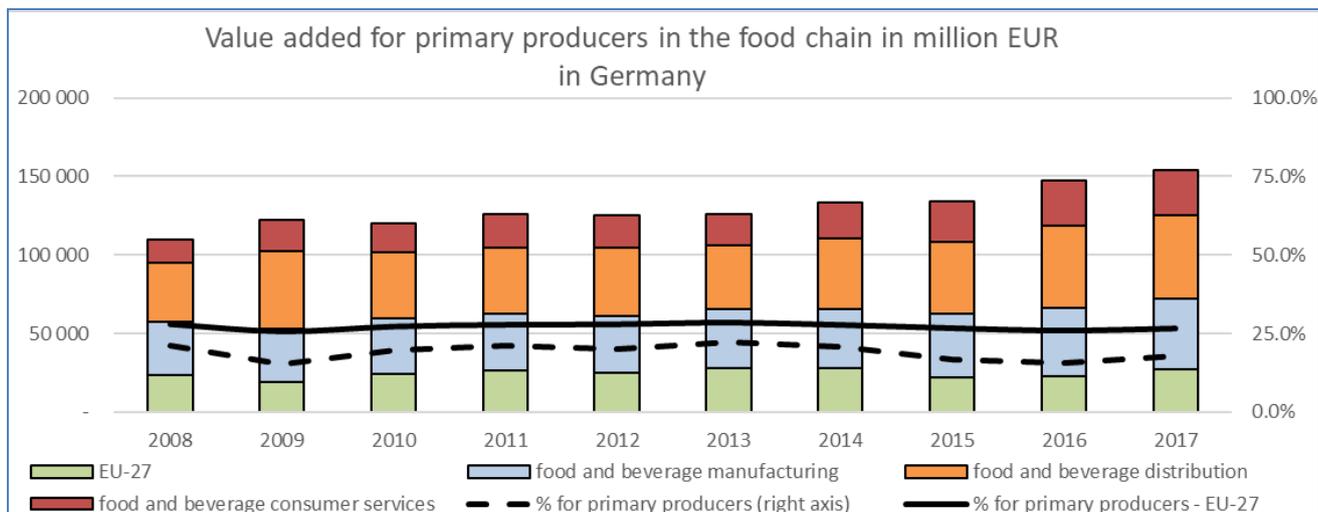
In 2018, **Germany had the largest organic market in Europe**, worth EUR 10.9 billion.<sup>17</sup> Consumer demand for organic food in Germany continues to rise. In 2019, the market share of organic food in total food turnover in Germany was around 5.7%.<sup>18</sup> Based on consumer survey Ökobarometer 2019, 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 representative survey published in 2020 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 industry, dairy industry, confectionery and bakery industry 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: EUROSTAT

## 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 in 2018, 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 t CO<sub>2</sub> equivalent per hectare of agricultural land) significantly exceeded EU-27 average (0.94 t CO<sub>2</sub> equivalent) 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 forest inventory 2012, deciduous trees present 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 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>

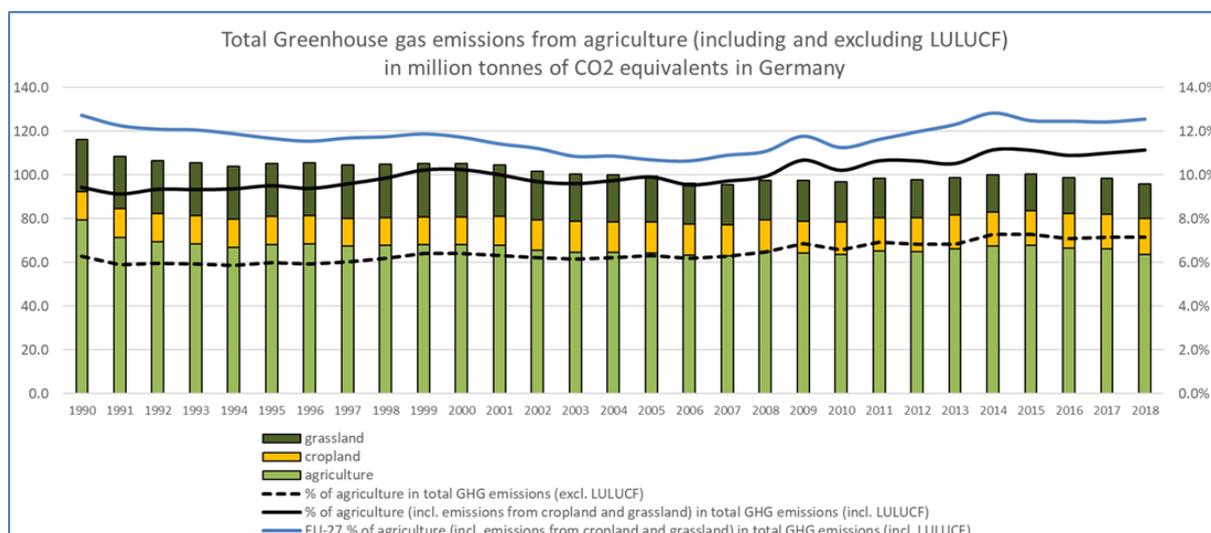
In 2018, total production of renewable energy in Germany amounted to 43 Mt oil equivalent (Mtoe). This made up for the **largest share in total production of renewable energy in EU-27**, i.e. 20%. **The share of agriculture in total German production of renewable energy was 24.1%** (12.1% in EU-27) **and of forestry 27.2%** (41.4 in EU-27).<sup>35</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>36</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>37</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>38</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>39</sup>

In 2018, almost 4% of agricultural area in Germany was under contracts contributing to reduction of GHG and ammonia emissions<sup>40</sup> and 1% of agricultural area and forestland was under contracts contributing to carbon conservation and sequestration.<sup>41</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>42</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>43</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>44</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>45</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>46</sup>). The mean soil organic carbon (SOC) content in arable lands of Germany is 30.1 g/kg which is below the mean EU<sup>47</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.

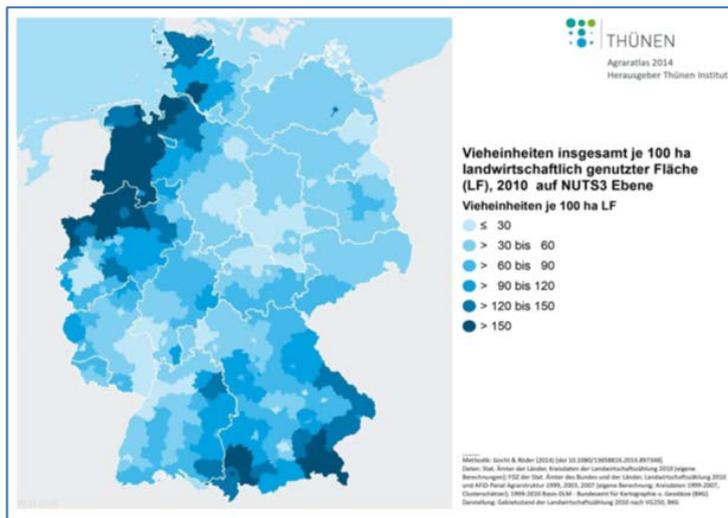
The surplus of nutrients is still very high, especially nitrogen values are largely above the EU average (more than 75 kg/ ha/year + 54% compared with EU average in 2015), despite some improvements with regard to phosphorous (the same trends as EU average). In 2017, only 25 % of surface water was classified 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>48</sup> Of all the Member States, Germany has the second-highest number of monitoring stations with average nitrate levels exceeding 50 mg/l.<sup>49</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>50</sup>

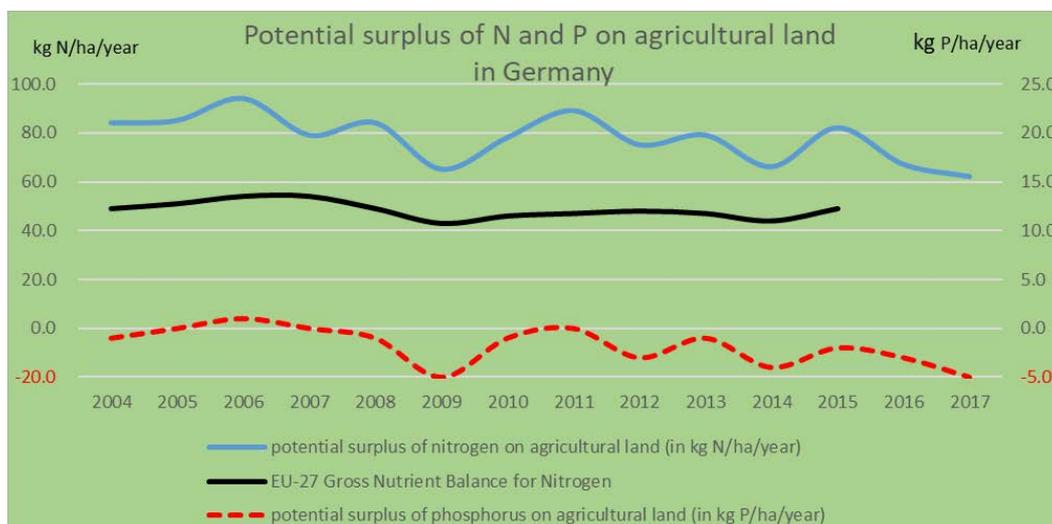
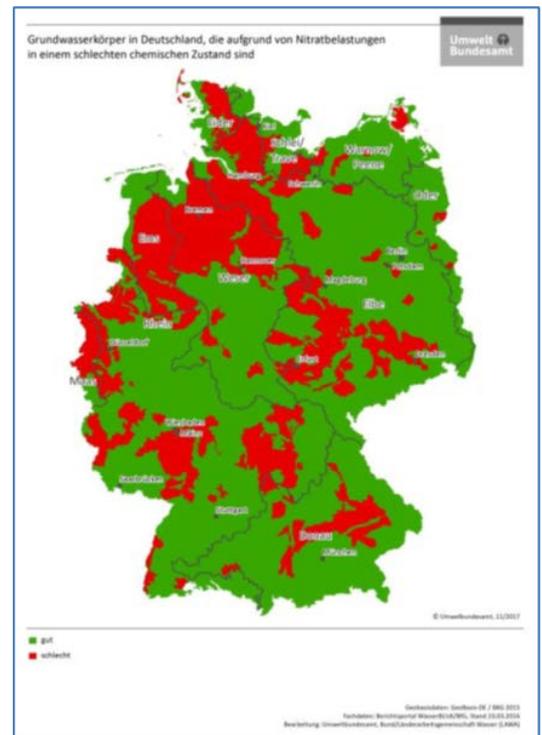
As regards water quantity, based on the new indicator water exploitation index (WEI<sup>+</sup>) in 2018, there was no situation of over abstraction in all water catchment areas (all indexes on extraction represent a share lower than the limit of 20% of available water as established by EEA), except 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>51</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>52</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.

### Mapping: Livestock units per 100 hectares of agricultural area in 2010



### Mapping: water bodies in bad chemical status as regard Nitrate concentration



Source: EUROSTAT [aei\_pr\_gnb]

## 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>53</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>54</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 (SPAs) amounting to 11.3% (EU-27: 14.1%) and sites of community interest (SCIs) 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>55</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% points compared to the 2007–2012 period, **the share of habitats assessed as unfavourable-bad increased by 13.3% points, showing further deterioration of the state of habitats** in Germany.<sup>56</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>57</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>58</sup> In 2016, the value of the national “common biodiversity and landscape quality” indicator<sup>59</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>60</sup>

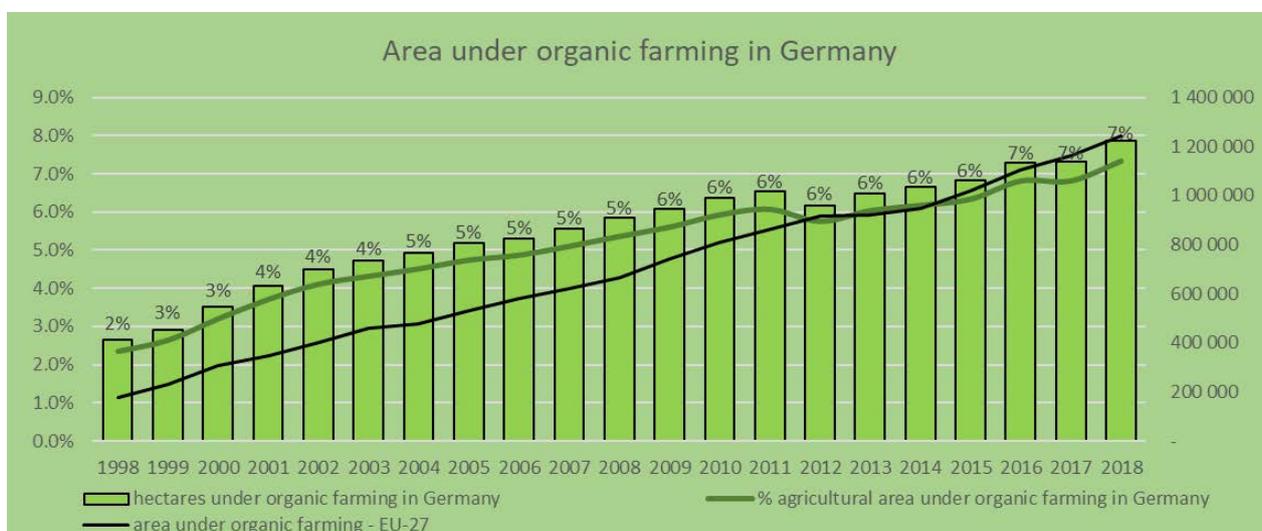
A study by the Entomologischer Verein Krefeld from 2017 showed an average **76% decrease in insect biomass** based on long-term observations in 63 protected areas in Germany over 27 years.<sup>61</sup> The study results are concurrent with the data observed in red lists of endangered species, which currently 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>62</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

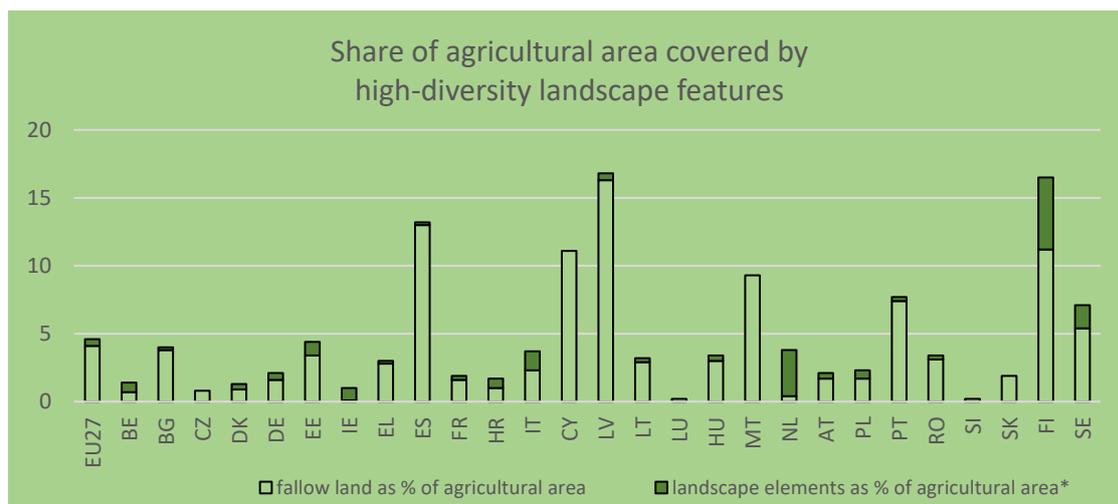
respectively<sup>63</sup>. In 2019, 13% of arable land in Germany was declared as ecological focus area. Thereof, landscape features and terraces covered 2.1% and land laying fallow 15%.<sup>64</sup>

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>65</sup>. However, the distribution of the share of agricultural area under organic farming between the Länder varies considerably.<sup>66</sup>

In 2020, 14% of agricultural land in Germany was under contracts contributing to biodiversity and landscapes<sup>67</sup>. German rural development programmes dedicated 51% of the rural development funding to restoring, preserving and enhancing eco-systems in agriculture and forestry.<sup>68</sup>



Source: EUROSTAT [org\_cropar\_h1 and org\_cropar]



Source: DG AGRI based on Eurostat and JRC based on LUCAS survey.

\* 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>69</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>70</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>71</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 1 female per 7 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>72</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**, young farmers in 2016 reached higher levels than 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>73</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>74</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>75</sup>. Therefore, succession to outsiders

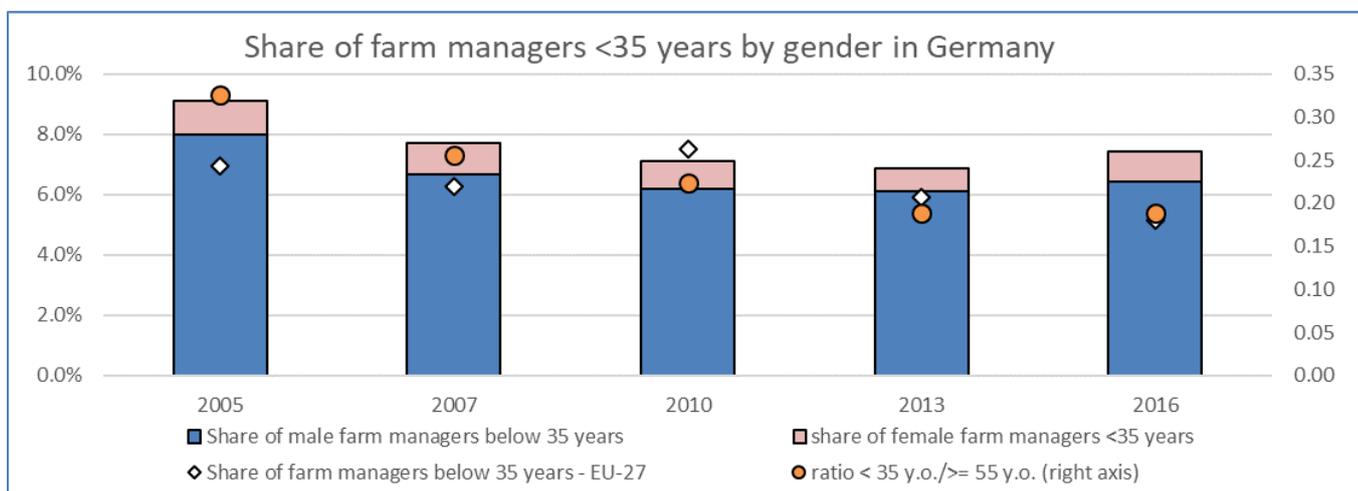
becomes increasingly necessary. The financing gap that relates to this group of farmers is estimated to be between EUR 44 million and EUR 80 million<sup>76</sup>.

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>77</sup> In the period 2015-2018, the number of young farmer beneficiaries increased by 70%, and the hectares declared by young farmers by 73%.<sup>78</sup> Under rural development programming period 2014-2020, 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>79</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>80</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>81</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>82</sup>.



Source: EUROSTAT

## 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>83</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>84</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>85</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>86</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>87</sup>. Already today the old age dependency ratio is very strong ( $\geq 42.5\%$ ) in large parts of the Centre-East (except around Berlin and parts of Mecklenburg-Vorpommern) and in some Northern coastal areas among others.<sup>88</sup> For the future, there are **projected negative demographic trends for a very large part of Germany until 2032** (except Southern Bayern and parts of the South-West and of Nordrhein-Westfalen)<sup>89</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>90</sup>.

In Germany, in 2005 both the total and the **rural employment rate**<sup>91</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 1/3, it **remains at 8 percentage points (pp)** in 2019.<sup>92</sup> For both men and women with low/medium educational level, the employment rate<sup>93</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>94</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>95</sup>, while the primary sector globally accounted only for 3.2 % of the employment in rural areas in 2016<sup>96</sup>. Agricultural labour force is still predominantly male (30% female in 2016) and of family origin<sup>97</sup>, while **with only 10% Germany had the fourth lowest share of female farmers in EU-28 (28%) in 2016**<sup>98</sup>. Between 2007 and 2010, the number of **small farmers in Germany** decreased for the two categories of smallest farms<sup>99</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>100</sup>

In the aftermath of the financial crisis, the unemployment rate<sup>101</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 Czech Republic). 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>102</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>103</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 2<sup>nd</sup> 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>104</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>105</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>106</sup>

Looking at **GDP/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>107</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>108</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 vs 6 pp)<sup>109</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>110</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>111</sup>. It is currently higher than the EU-27 average for all types of territories (21 800 vs 15 200 in PPS for rural areas in 2018), but less dispersed<sup>112</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 EAFRD envelope) 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>113</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>114</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 to EUR 8 513 million (wood in the rough and trees accounted for the biggest shares in 2017), persons employed<sup>115</sup> from 47 400 to 48 000 annual working units (while decreasing for EU-27), the alleged labour productivity<sup>116</sup> from EUR 36 600 to EUR 66 400 GVA/person employed and the investments from EUR 168 to EUR 275 million<sup>117</sup>. Germany ranked first among the Member States both in terms of timber resources (2015<sup>118</sup>) and their net annual increment (2010<sup>119</sup>).<sup>120</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>121</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 ESVAC report<sup>122</sup> for 25 countries, from 2011 to 2017 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 to 88 mg/PCU, which is below the EU average of 118 mg/PCU but above the projected target of 50% reduction for the EU in line with the Farm to Fork objectives for 2030. This decrease is observed in almost all regions.<sup>123</sup> It results from the national policy based on the **German Antibiotic Resistance Strategy (DART)**<sup>124</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>125</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 (ASF), 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.

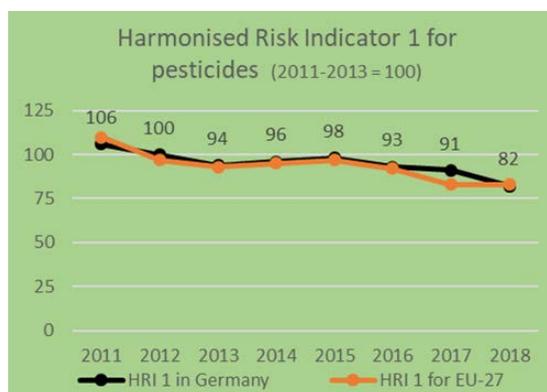
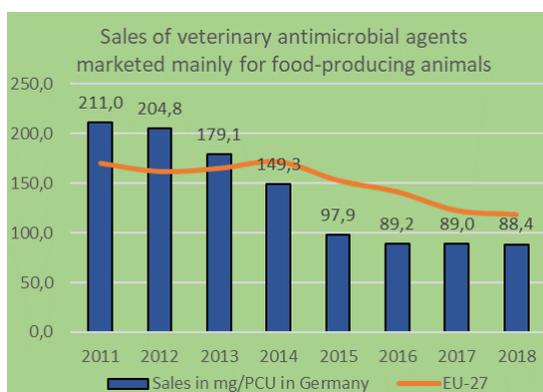
According to Eurostat statistics, the **total sales of plant protection products, despite some fluctuations, increased slightly by 2%** over the 2011-2018<sup>126</sup> period. According to the last update for 2018, the Harmonised Risk indicator 1 (HRI1), measuring the use and risk of pesticides, shows 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 HR2 was dominated by emergency approvals with active and most toxic substances from the group of candidate for substitution.<sup>127</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>128</sup>

Based on 2012 data, Germany represented more than 12% of the total EU food waste amount per year (88 million tonnes)<sup>129</sup>. A **national strategy for reduction of food waste was adopted** in February 2019<sup>130</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 DALYs per 100,000 population attributable to diet<sup>131</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>132</sup>. Germany has a high estimated consumption of red meat<sup>133</sup> and a very low consumption of fruits and vegetables<sup>134</sup>.



Source: DG AGRI after ESVAC, Tenth ESVAC Report (2020) Source: EUROSTAT [aei\_hri]

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

The **Agricultural Knowledge and Innovation System (AKIS) in Germany counts among the strongest ones** in the EU (high resource allocation)<sup>135</sup>, yet falling halfway between **being fully fragmented and fully integrated** (knowledge networks insufficiently operating in cooperation and lack of coordination)<sup>136</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>137</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 (ERA). 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.

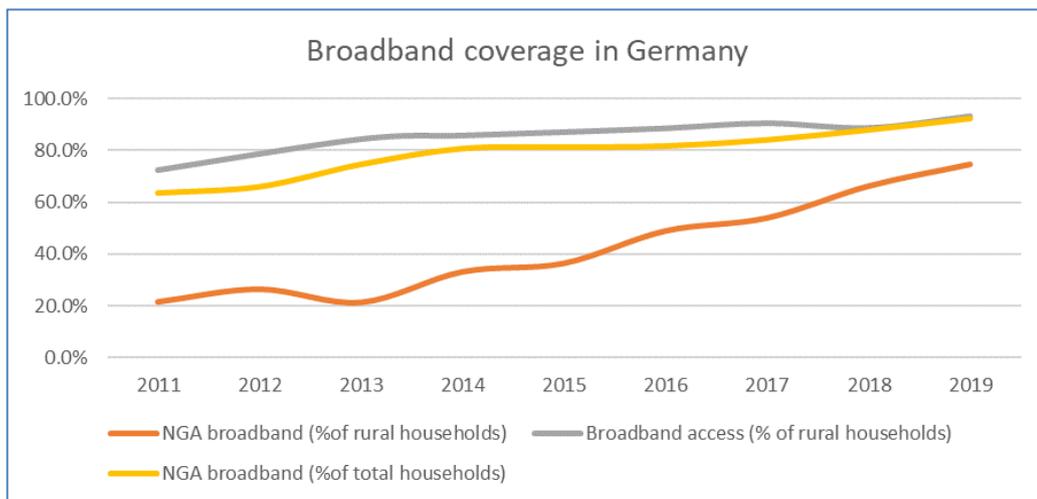
Germany is ranked 4<sup>th</sup> in the EU with close to 180 **Operational Groups (OG)** – having an average budget of EUR 507K – launched under EIP-AGRI<sup>138</sup>. While the overall 2014-2020 target of 232 OG has not yet been reached, some Länder such as Baden-Württemberg, Niedersachsen & Bremen, 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>139</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>140</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>141</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>142</sup>.

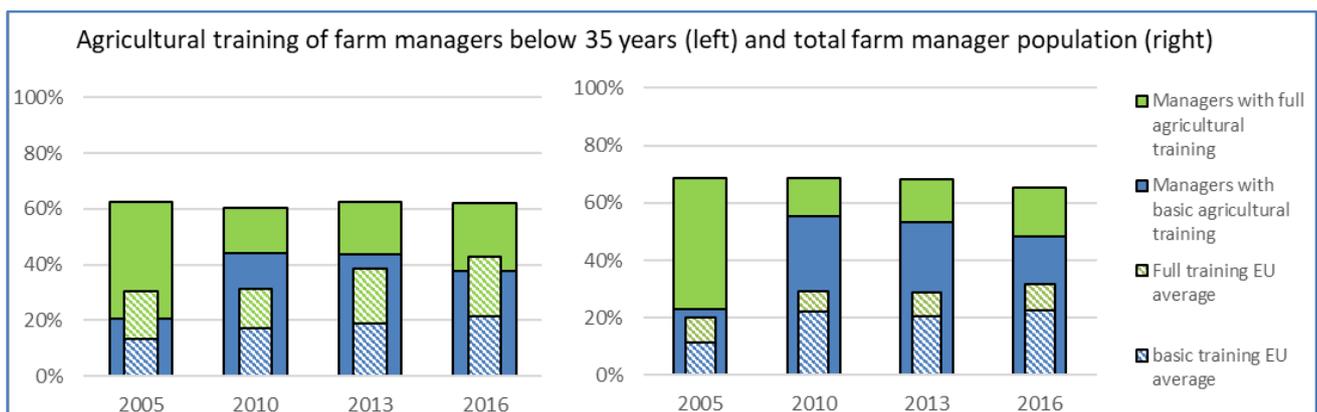
In 2013, there was a very strong territorial gap in terms of fast broadband with 75% of overall households and only 21% of rural households covered. In 2019, 92% of overall households and, thanks to a very strong catch-up, 75% of rural households benefitted from fast internet; however, the **territorial 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>143</sup>. Germany ranks first in the EU on 5G readiness. In 2019, Germany ranked 18<sup>th</sup> in the EU on integration of digital technology in business activities, and 21<sup>st</sup> 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>144</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>145</sup>. Since September 2019, the ministry has launched 8 ‘digital trial fields’ as a new funding tool to harness the potential of digitalisation in agriculture<sup>146</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: DESI report

Source: EUROSTAT [ef\_mp\_training]



(Endnotes are still under finalisation.)

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<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*. 2018. <https://op.europa.eu/en/publication-detail/-/publication/5a935010-af78-11e8-99ee-01aa75ed71a1>

<sup>5</sup> European Commission. *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)

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<sup>8</sup> EUROSTAT. [apro\_cp]. Crop production.

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<sup>22</sup> Federal Ministry of Economic Affairs and Energy. *Lebensmittelindustrie*. 2020. <https://www.bmwi.de/Redaktion/DE/Artikel/Branchenfokus/Industrie/branchenfokus-lebensmittelindustrie.html>.

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- <sup>72</sup> EUROSTAT. [[ef\\_m\\_farmang](#)]. Indicator “average utilised agricultural area by farm” by age group.
- <sup>73</sup> EUROSTAT. [[ef\\_m\\_farmang](#)]. Indicator “average standard output by farm” by age group.
- <sup>74</sup> *fi-compass*, 2020, Financial needs in the agriculture and agri-food sectors in Germany, Study report, 80 pages. [https://www.fi-compass.eu/sites/default/files/publications/financial\\_needs\\_agriculture\\_agrifood\\_sectors\\_Germany.pdf](https://www.fi-compass.eu/sites/default/files/publications/financial_needs_agriculture_agrifood_sectors_Germany.pdf)
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- <sup>87</sup> See endnote 85. Reference year: 2015-2019.
- <sup>88</sup> European Commission. *Commission Staff Working Document – Additional figures, maps and tables on the key aspects of demographic change and its impact. Accompanying the report on the impact of demographic change*. SWD(2020) 241 final. Map 2: Old-age dependency ratio by region. 2019. [https://ec.europa.eu/info/sites/info/files/commission-staff-working-document-impact-demographic-change-17june2020\\_en.pdf](https://ec.europa.eu/info/sites/info/files/commission-staff-working-document-impact-demographic-change-17june2020_en.pdf).
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- <sup>90</sup> See endnote 88. Figures 40 and 41: Proportion of population born in another EU Member State and proportion of population born outside the EU as share of population aged 15 years or over by degree of urbanisation. 2019.
- <sup>91</sup> 15-64 years
- <sup>92</sup> European Commission. *CAP context indicator C.05 Employment rate*. Based on EUROSTAT [[lfst\\_r\\_ergau](#)]. Reference year: 2005-2019.
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- <sup>94</sup> EUROSTAT. [[lfst\\_r\\_erednu](#)]. Reference year: 2018.
- <sup>95</sup> European Commission. *CAP context indicator C.13 Employment by economic activity*. Based on EUROSTAT [[lfst\\_r\\_lfe2en2](#)]. Reference year: 2010-2017.
- <sup>96</sup> European Commission. *CAP context indicator C.11 Structure of the employment*. Based on EUROSTAT [[nama\\_10r\\_3empers](#)]. Reference year: 2016.
- <sup>97</sup> European Commission. *CAP context indicator C.22 Farm labour force*. Based on EUROSTAT [[ef\\_lf\\_main](#)]. Reference year: 2016

- <sup>98</sup> Franić, R. and Kovačićek, T. *The professional status of rural women in the EU*. Study for the European Parliament. 2019. Figure 17 : Proportion of farm managers who are women. 2016. Based on Eurostat. [https://www.europarl.europa.eu/RegData/etudes/STUD/2019/608868/IPOL\\_STU\(2019\)608868\\_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/STUD/2019/608868/IPOL_STU(2019)608868_EN.pdf)
- <sup>99</sup> Defined in terms of economic output (“standard output” or “SO”). The two classes are respectively farms with “< 2000 EUR of SO” and “< 8000 EUR of SO”.
- <sup>100</sup> EUROSTAT. [[ef\\_m\\_farmleg](#)]. Reference year: 2007, 2010 and 2016.
- <sup>101</sup> 20-64 years
- <sup>102</sup> EUROSTAT. [[lfst\\_r\\_urgau](#)]. Reference year: 2013-2019.
- <sup>103</sup> See endnote 102. Reference years: 2013-2019 for young men and women; 2019 for total, men and women aged 50-64 years; and 2019 for urban areas.
- <sup>104</sup> EUROSTAT. [[edat\\_lfse\\_29](#)]. Reference year: 2009 and 2019.
- <sup>105</sup> EUROSTAT. [[edat\\_lfse\\_30](#)]. Reference year: 2009-2019.
- <sup>106</sup> EUROSTAT. [[edat\\_lfs\\_9913](#)]. Reference year: 2009-2018.
- <sup>107</sup> European Commission. *CAP context indicator C.08 GDP per capita*. Based on EUROSTAT [[urt\\_10r\\_3gdp](#)]. Purchasing power standard (PPS, EU27 from 2020), per inhabitant in percentage of the EU27 (from 2020) average. Reference year: 2005-2016.
- <sup>108</sup> European Commission. *CAP context indicator C.10 Structure of the economy*. Based on EUROSTAT [[urt\\_10r\\_3gva](#)]. Reference year: 2010-2016 for rural areas and 2010-2019 for the sectoral breakdown.
- <sup>109</sup> European Commission. *CAP context indicator C.30 Tourism infrastructure*. Based on EUROSTAT [[tour\\_cap\\_natd](#)]. Reference year: 2012-2017/8 (for share of beds in rural areas there are no EU-27 data for 2013)
- <sup>110</sup> European Commission. *CAP context indicator C.09 Poverty rate (People at risk of poverty or social exclusion)*. Based on EUROSTAT [[ilc\\_peps13](#)]. Reference year: 2005-2018.
- <sup>111</sup> EUROSTAT. [[ilc\\_di17](#)]. Reference year: 2012-2018 in Euro. One difference in the pattern is that the 2012-2018 increase of the median income of intermediate areas is more similar to the one of urban than of rural areas.
- <sup>112</sup> See endnote 88. Figure 37: Median equivalised net income, 2018 (Purchasing power standard (PPS), by degree of urbanisation.)
- <sup>113</sup> Rural Development Programme of Baden-Württemberg, 2014-2020, Version 5.1, Rural Development Programme of Bayern, 2014-2020, Version 7.1, Rural Development Programme of Berlin & Brandenburg, 2014- 2020, Version 6.0, Rural Development Programme of Hessen, 2014- 2020, Version 5.1, Rural Development Programme of Mecklenburg Vorpomern, 2014- 2020, Version 7.2, Rural Development Programme of Niedersachsen & Bremen, 2014- 2020, Version 6.2, Rural Development Programme of Nordrhein-Westfalen, 2014- 2020, Version 5.1, Rural Development Programme of Rhineland-Pfalz, 2014- 2020, Version 5.2, Rural Development Programme of Saarland, 2014- 2020, Version 6.1, Rural Development Programme of Sachsen, 2014- 2020, Version 6.1, Rural Development Programme of Sachsen-Anhalt, 2014-2020, Version 7.2, Rural Development Programme of Schleswig-Holstein, 2014- 2020, Version 6.1, Rural Development Programme of Thüringen, 2014- 2020, Version 5.1, *Financing plan - 10.3 Breakdown by measure or type of operation with a specific EAFRD contribution rate*, 2020.
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- <sup>115</sup> The indicator *C.13 Employment by economic activity* shows a constant share of forestry in employment of 0,1% between 2010 and 2017. See endnote 95.
- <sup>116</sup> The indicator *C.15 Labour productivity in forestry* shows a decrease between 2012 and 2018 of -4% in Germany (+11% for EU-27). European Commission. *CAP context indicator C.15 Labour productivity in forestry*. Based on EUROSTAT [[for\\_eco\\_cp](#)] and [[for\\_awu](#)]
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- <sup>118</sup> Roughly 3 500 000 000 m<sup>3</sup> over bark of growing stock in forests available for wood supply.
- <sup>119</sup> Roughly 118 600 000 m<sup>3</sup> over bark in forests available for wood supply. The net annual increment is the average growth in volume of the stock of living trees available at the start of the year minus the average natural mortality of this stock.
- <sup>120</sup> See endnote 117. Table 2: Timber resources
- <sup>121</sup> European Commission. *Jobs and Wealth in the European Union Bioeconomy*. Knowledge centres and data portals. Results from a collaboration between the JRC and the nova-Institute. <https://datam.jrc.ec.europa.eu/datam/mashup/BIOECONOMICS/index.html> To note that data on turnover are no longer available.

<sup>122</sup> 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/documents/report/ema-243092020_en.pdf).

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<sup>127</sup> German Federal Office for Consumer Protection and Food Safety. *Harmonisierte Risikoindikatoren*. [https://www.bvl.bund.de/DE/Arbeitsbereiche/04\\_Pflanzenschutzmittel/01\\_Aufgaben/02\\_ZulassungPSM/05\\_HarmonisierteRisikoindikatoren/psm\\_HRI\\_node.html](https://www.bvl.bund.de/DE/Arbeitsbereiche/04_Pflanzenschutzmittel/01_Aufgaben/02_ZulassungPSM/05_HarmonisierteRisikoindikatoren/psm_HRI_node.html)

<sup>128</sup> DG SANTE letter to Germany on Farm2Fork – Ref. Ares(2020)2643693

<sup>129</sup> Kranert, M., Hafner, G., Barabosz, J., Schuller, H., Leverenz, D., Kölbig, A., Schneider, F., Lebersorger, S., Scherhauer, S. *Ermittlung der weggeworfenen Lebensmittelmengen und Vorschläge zur Verminderung der Wegwerfrate bei Lebensmitteln in Deutschland*. Universität Stuttgart, Bundesministerium für Ernährung und Landwirtschaft. 2012. [https://www.bmel.de/SharedDocs/Downloads/DE/Ernaehrung/Lebensmittelverschwendung/Studie\\_Lebensmittelabfaelle\\_Langfassung.html](https://www.bmel.de/SharedDocs/Downloads/DE/Ernaehrung/Lebensmittelverschwendung/Studie_Lebensmittelabfaelle_Langfassung.html)

<sup>130</sup> Bundesministerium für Ernährung und Landwirtschaft (BMEL). *German strategy for food waste reduction: Nationale Strategie zur Reduzierung der Lebensmittelverschwendung*. 2019. [https://www.bmel.de/SharedDocs/Downloads/DE/Ernaehrung/Lebensmittelverschwendung/Nationale\\_Strategie\\_Lebensmittelverschwendung\\_2019.pdf?\\_\\_blob=publicationFile&v=3](https://www.bmel.de/SharedDocs/Downloads/DE/Ernaehrung/Lebensmittelverschwendung/Nationale_Strategie_Lebensmittelverschwendung_2019.pdf?__blob=publicationFile&v=3)

<sup>131</sup> European Commission Science Hub. *EU burden from non-communicable diseases and key risk factors*. October 2020. <https://ec.europa.eu/jrc/en/health-knowledge-gateway/societal-impacts/burden>

<sup>132</sup> EUROSTAT. [SDG\_02\_10]. Overweight rates are above EU27 average. [https://ec.europa.eu/eurostat/databrowser/view/sdg\\_02\\_10/default/table?lang=en](https://ec.europa.eu/eurostat/databrowser/view/sdg_02_10/default/table?lang=en)

<sup>133</sup> Red meat being defined as beef, lamb and pork, 118,68 g/per capita/d, net of waste in the EU 2010. Global Burden of Disease Study 2017, M. Springmann.

<sup>134</sup> Defined as: consumption of  $\geq 5$  portions, it is below EU27 average and one of the 2 additional criteria is met: a) 1-4 portions below EU27 average, b) 0 portions above EU27 average. EUROSTAT. [HLTH\_EHIS\_FV3C]. [https://ec.europa.eu/eurostat/databrowser/view/hlth\\_ehis\\_fv3c/default/table?lang=en](https://ec.europa.eu/eurostat/databrowser/view/hlth_ehis_fv3c/default/table?lang=en)

<sup>135</sup> EU SCAR AKIS (2019). *Preparing for Future AKIS in Europe*. Brussels, European Commission. [https://ec.europa.eu/info/sites/info/files/food-farming-fisheries/key\\_policies/documents/report-preparing-for-future-akis-in-europe\\_en.pdf](https://ec.europa.eu/info/sites/info/files/food-farming-fisheries/key_policies/documents/report-preparing-for-future-akis-in-europe_en.pdf)

<sup>136</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)

<sup>137</sup> Rural Development Programme of Baden-Württemberg, 2014-2020, Version 5.1, Rural Development Programme of Bayern, 2014-2020, Version 7.1, Rural Development Programme of Berlin & Brandenburg, 2014- 2020, Version 6.0, Rural Development Programme of Hessen, 2014- 2020, Version 5.1, Rural

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Development Programme of Mecklenburg Vorpomern, 2014- 2020, Version 7.2, Rural Development Programme of Niedersachsen & Bremen, 2014- 2020, Version 6.2, Rural Development Programme of Nordrhein-Westfalen, 2014- 2020, Version 5.1, Rural Development Programme of Rhineland-Pfalz, 2014- 2020, Version 5.2, Rural Development Programme of Saarland, 2014- 2020, Version 6.1, Rural Development Programme of Sachsen, 2014- 2020, Version 6.1, Rural Development Programme of Sachsen-Anhalt, 2014-2020, Version 7.2, Rural Development Programme of Schleswig-Holstein, 2014- 2020, Version 6.1, Rural Development Programme of Thüringen, 2014- 2020, Version 5.1, *Financing plan - 10.3 Breakdown by measure or type of operation with a specific EAFRD contribution rate*, 2020.

<sup>138</sup> Excel file provided by B2: OG\_factsfigures\_Updated\_25.08.2020 FOR PUBLICATION

<sup>139</sup> 'Output Indicator' tab in excel file provided by B2: RD data for CCO fiche with RDP totals\_25Aug2020

<sup>140</sup> Paul, C., Knuth, U., Knierim, A., Ndah, H.T. and Klein, M. *AKIS and advisory services in Germany: Report for the AKIS inventory (WP3) of the PRO AKIS project*. 2014. [https://www.uni-hohenheim.de/uploads/media/Pro\\_Akis\\_-\\_Country\\_Report\\_Germany.pdf](https://www.uni-hohenheim.de/uploads/media/Pro_Akis_-_Country_Report_Germany.pdf)

<sup>141</sup> Knierim, A., Gerster-Bentaya, M., Thomas, A. (2018) . *Landwirtschaftliche Beratung - quo vadis?*. B&B Agrar, issue 5-2018. Federal Office for Agriculture and Food. 2018. pp. 26-27.

<sup>142</sup> CAP CONTEXT INDICATORS – 2019 update. [https://ec.europa.eu/info/sites/info/files/food-farming-fisheries/farming/documents/cap-context-indicators-table\\_2019\\_en.pdf](https://ec.europa.eu/info/sites/info/files/food-farming-fisheries/farming/documents/cap-context-indicators-table_2019_en.pdf)

<sup>143</sup> People with basic or above basic digital skills, 2019. Rural factsheet. Only the Netherlands have higher shares for all areas which are also less dispersed.

<sup>144</sup> European Commission Smart Specialisation Platform. *Digital Innovation Hubs*. [https://s3platform.jrc.ec.europa.eu/digital-innovation-hubs-tool?p\\_p\\_id=digitalinnovationhub\\_WAR\\_digitalinnovationhubportlet&p\\_p\\_lifecycle=0&p\\_p\\_state=normal&p\\_p\\_mode=view&p\\_p\\_col\\_id=column-1&p\\_p\\_col\\_count=1&formDate=1599036953363&freeSearch=&countries=19&evolStages=3&marketSectors=1&h2020=false](https://s3platform.jrc.ec.europa.eu/digital-innovation-hubs-tool?p_p_id=digitalinnovationhub_WAR_digitalinnovationhubportlet&p_p_lifecycle=0&p_p_state=normal&p_p_mode=view&p_p_col_id=column-1&p_p_col_count=1&formDate=1599036953363&freeSearch=&countries=19&evolStages=3&marketSectors=1&h2020=false)

<sup>145</sup> Federal Ministry of Food and Agriculture. *Digitalisation*. 2020. [https://www.bmel.de/EN/topics/digitalisation/digitalisation\\_node.html](https://www.bmel.de/EN/topics/digitalisation/digitalisation_node.html)

<sup>146</sup> Federal Ministry of Food and Agriculture. *More than 50 million euros for digital trial fields in the agricultural sector*. 2 July 2020. <https://www.bmel.de/EN/topics/digitalisation/digital-trial-fields.html>