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Commission recommendations for Estonia's CAP strategic plan

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

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

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1. COMMISSION RECOMMENDATIONS FOR ESTONIA'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 Estonia. The recommendations are based on analysis of the state of play, the needs and the priorities for agriculture and rural areas in Estonia. The recommendations address the specific economic, environmental and social objectives of the future common agricultural policy (CAP) and 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 Estonia, in its CAP Strategic Plan, to set explicit national values for the Green Deal targets^{*}, taking into account its specific situation and these recommendations.

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

Estonia has good opportunities for achieving sustainability in its agricultural production, but the country also faces certain challenges.

The share of agriculture in total value added is higher in Estonia than the EU average. Furthermore, income per worker in agriculture is 83% of the average wage in Estonia, which is significantly higher than the EU average. On the other hand, agricultural factor income is below the EU average, and has been highly volatile over the last 15 years. This means a high level of uncertainty for farmers, but the situation could be improved by greater use of and further development of risk management instruments (including crop and livestock insurance). Climate change adaptation instruments (such as drainage management for handling changing rainfall patterns and farm resilience plans) play also an important role in making the agricultural sector more resilient.

CAP support schemes play a key role in the farms' revenues, particularly for certain sectors (cattle, sheep and goat farms); in some years average income would even be negative without the support schemes. At the same time, the concentration of direct payments in Estonia is one of the highest in the EU. This mirrors the concentration of land, where over the last 17 years there has been a strong decrease in the number of farms and increases concentration of farmland management. To reduce the income gap with big farms, more targeted support from the CAP in favour of small and medium-sized farms should be considered.

Increasing the competitiveness of farms largely depends on access to finance. It seems to be difficult for farmers to obtain guarantees and long-term loans, and some producers lack adequate financial planning skills.

There are no recognised producer organisations in Estonia although a number of co-operatives are operating in the agricultural sector. However, the existing co-operatives are rather small and do not yet have strong enough bargaining power to improve the position of farmers in the value chain. With its high level of digital and technological capital, Estonian farmers could benefit further from development of short-supply chains as well as on-line and other direct marketing channels. There is also potential for quality schemes to strengthen the position of farmers, thus contributing to the objectives of the Farm to Fork Strategy.

^{*} 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 and contribute to the environmental- and climate-related objectives of the Union

Estonia presents a mixed picture in terms of the environmental and climate objectives of the CAP and the Green Deal. On the one hand, it has a marked enthusiasm for organic farming (with uptake not far off the EU level target of 25%), it is not a heavy user of fertilisers, and its inland waters are fair in terms of quality (though pollution in the Baltic Sea affects its coastal waters). On the other hand, various problems and pressures are evident. Greenhouse gas (GHG) emissions (gross and net) are rising and expected to rise further. Estonia is expected to miss the targets on reducing ammonia emissions. Not all water bodies have yet achieved a good status and nitrate concentrations are increasing in some of them, with agriculture identified as a significant contributing factor. Various habitats and species are also under pressure (for example in grassland and forest areas).

Against this backdrop, ambitions and projections for further growth in the agricultural sector may raise questions about long-term sustainability. At present, an above-average proportion of Estonia's farmland is considered to be intensive in terms of input use (though that fact also reflects strong regional differences).

In response to this situation, steps to improve nutrient management have a major role to play. Besides helping to meet the EU Farm to Fork Strategy's target for nutrient losses, better nutrient management would also help mitigate climate change (as could more efficient enteric fermentation in livestock), cut ammonia emissions, improve water quality, address nutrient deficiencies in some areas and reduce pressure on biodiversity. On the other side of the carbon balance sheet, replacing harvested forest on time and in a sustainable manner – with appropriate species mixes and management – would enhance Estonia's carbon sink, as would protecting the country's considerable peatland area. Biodiversity and ecosystems could also benefit from improvements to overall CAP support for the management of semi-natural grasslands, and from efforts to re-introduce landscape features in areas where they have been lost – in line with the related target in the Biodiversity Strategy.

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

Estonia has one of the highest proportions of rural areas among EU Member States, and the share of population living in rural and urban areas is almost equal. Unlike the decreasing trend for the EU as a whole, the share of young farmers in Estonia is increasing. It also has one of the highest ratios of young to elderly farm managers to elderly in the EU, and the share of female farmers is relatively high compared to the EU average. These elements present an advantage, but certain improvements are still possible.

The key issue for new entrants to agriculture sector in Estonia is access to land. While Estonia is a front-runner in the use of financial instruments, new entrants find it difficult to obtain loans from banks, which seem to lack relevant knowledge and dedicated financial products.

Estonia has followed the LEADER approach to local development, which continues to offer opportunities to strengthen the socio-economic fabric of rural areas. Despite positive trends, a high poverty rate in rural areas and a gap between the employment rate in rural areas and the rest of the country remain an issue; GDP per capita in rural areas is still below the EU average and, although it has been rising, the convergence rate is slowing down. There is also a slow trend of depopulation and ageing in rural areas.

Estonia must take account of the specific needs of women in agriculture and rural areas to deliver on gender equality and close the gender gaps in employment, pay, pensions, care and decision-making. Also, 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.

Estonia is generally on the right track regarding the transition set out in the Green Deal and the Farm to Fork Strategy towards safe, nutritious and sustainable food and animal welfare, but there are still issues that need addressing. The sale of plant protection products in Estonia is decreasing, but implementation records are inconclusive. Risks linked to pesticides have, after a period of increase, started decreasing over the last 3 years. However, Estonia remains far beyond EU average with regard to the reduction of risk from pesticide use.

Estonia applies animal welfare measures widely in rural development, but the standards are not always perceived to be sufficiently ambitious. While the sales of antimicrobials are below the EU average, they could be further reduced to contribute to the Green Deal target of halving sales of antimicrobials in the EU by 2030. Continued awareness of an investment in biosecurity is also important, in view of the persistent risk of African Swine Fever (ASF) outbreaks.

Estonia should make an effort to shift towards healthier sustainable diets as it has a very high rate of non-communicable diseases caused by dietary risk factors.

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

The agricultural knowledge and innovation system (AKIS) in Estonia appears to be weak and fragmented. No central hub exists to coordinate innovation and knowledge exchange in agriculture and the upstream and downstream activities that relate to it (e.g. environment, climate, biodiversity, food and non-food systems including processing and distribution chains, consumers and citizens, etc.). Training and advisory services are provided in Estonia by publicly funded advisors and a number of independent organisations, although their level of specialisation and skills varies. Importantly, cooperation and information exchange between public and private advisors is not working as well as in some other Member States. Furthermore, Estonia planned to implement only a very low number of operational groups under the European Innovation Partnership, which did not allow it to benefit fully from the opportunities offered by this European initiative.

Estonia performs well on digital public services, but is merely level with the EU average in terms of integrating digital technology in the economy. Moreover, while both broadband coverage in rural areas and the level of digital skills is higher than the EU average, gaps still exist between urban and rural areas. This gap needs to be addressed to contribute to the Green Deal target of completing fast broadband internet access in rural areas.

1.5 Recommendations

To address the above interconnected economic, environmental/climate and social challenges, the Commission considers that the Estonian CAP strategic plan needs to focus its priorities and

concentrate its interventions on the following points, while adequately taking into account the local conditions:

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

- **Ensure fairness and better targeting of income support** by reducing income gaps between different farm sizes (in favour of smaller and medium-sized farms), by applying, for example, the complementary redistributive income support for sustainability and the reduction of payments.
- **Strengthen the competitive position of the agricultural sector by improving access to finance**, in particular by reviewing financial instruments to be used in conjunction with the CAP. The latter should be accompanied by adequate advice on financing issues.
- **Make the agricultural sector more resilient** by encouraging and facilitating the use of risk management instruments and by supporting investments targeting climate change adaptation.
- **Improve farmers' position in the food supply chain** by ensuring further organisation of agrifood markets by encouraging producer co-operatives to seek recognition as Producer Organizations as well as better targeting the support for cooperation of producers.

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

- **Ensure improvement in nutrient management**, thereby helping to achieve the **Green Deal target on reducing nutrient losses**. A better nutrient balance should be sought in both intensively and extensively farmed areas, reflecting regional differences. Effective implementation of conditionality will be important in achieving this, as will a widespread transition to agro-ecological practices and precision farming – which Estonia should consider supporting through funded schemes.
- **Reduce GHG emissions from enteric fermentation** in farmed livestock in line with the Methane Strategy, including through support for advice, innovation and management practices, as appropriate.
- **Ensure adequate protection of Estonian peatlands** – including through effective design of related conditionality elements and support for carbon farming. Rewetting may also be appropriate in some cases. **Encourage the timely regeneration of harvested forest**, in such a way as to maximise long-term carbon capture (with species which are adapted to climate change and favourable to biodiversity), within a wider context of sustainable forest management. Support not only for planting but also for advice on species selection may be appropriate.
- **Encourage effective management of semi-natural grasslands**, as highlighted also in the Prioritized Action Framework for CAP funding. Estonia should consider expanding the provision of dedicated support beyond the current area, as well as ensuring that the implementation of rules concerning direct payments (especially definitions) do not exclude land from eligibility in ways which may encourage poor management practices.

This should be done in a wider context of efforts to improve biodiversity status in farm and forest areas more generally.

- **Seek to increase the density of high-diversity farm landscape features of benefit to biodiversity – thus helping to achieve the Green Deal target on landscape features** – especially in areas with low landscape diversity. The implementation of GAEC¹ standard 9 will be important in this respect, and voluntary support schemes for creating and maintaining features may also be appropriate.

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

- **Put in place more ambitious animal welfare measures**, especially for pigs and laying hens, to improve animal and human health and food quality **in line with the Farm to Fork Strategy**, and **improve biosecurity** in view of ASF risk, through targeted investment support and knowledge transfer actions.
- **Contribute to the EU Green Deal targets on pesticides** by promoting **the sustainable use of pesticides**, in particular by ensuring the uptake of integrated pest management practices.
- **Tackle poverty reduction and reverse depopulation and ageing trends** in rural areas by investing in basic infrastructures and services that will boost economic development and quality job creations in rural areas. In doing so it will be important to ensure synergies with other EU and national funds.

Fostering and sharing of knowledge, innovation and digitalisation in agriculture and rural areas, and encouraging their uptake

- **Contribute to the Green Deal target of completing fast broadband internet access in rural areas** by focusing on closing the gap between the fast broadband availability in rural and urban areas through targeted investment interventions. In doing so it will be important to ensure synergies with other EU and national funds.
- **Strengthen AKIS integration** by implementing and interlinking dedicated information and knowledge exchange interventions, in particular focusing on coordination and support for public and private independent advisors. **Advance cooperation for innovation** through interactive European Innovation Partnership (EIP) projects and EIP networking activities. Invest in creating innovation support services to develop bottom-up ideas.

2. ANALYSIS OF AGRICULTURE AND RURAL DEVELOPMENT IN ESTONIA

The agricultural sector in Estonia is characterised by a decreasing number of farms and increasing farmland area. It is limited by specific Baltic conditions in terms of crop varieties. Estonian market is predominantly oriented to the Baltic and Nordic states. Agriculture plays a more important role in the overall economy of Estonia than is the case in other EU Member States, and seems to be more attractive to young farm managers than observed on the average in the EU Member States. However, the COVID crises revealed the importance of non-native workers in the agricultural sector and the difficulty of the sector attracting workers. It is still seen as a non-attractive sector, with a large decline in number of workers. High level of land concentration and relatively limited range of crop production result in a limited level of diversity of Estonian agriculture. While overall status of nature and biodiversity protection and usage of natural resources seems rather satisfactory, certain issues remain. Rural areas have a predominant role in Estonia, with 82% of the territory and 44.5% of population share. Rural areas face depopulation, poverty and ageing. The low level of economic activity, the limited quality job opportunities and missing basic infrastructures and services make rural areas less attractive.

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

In Estonia, the agricultural income is about 82% of the average wage in the whole economy between 2015 and 2019. The share varies a lot over the period 2005-2019, mainly due to fluctuations in agricultural income. The average share for the period 2005-2019 is 104%, which is much higher than the EU average (approx. 40%)²⁻⁴. See the graph below.

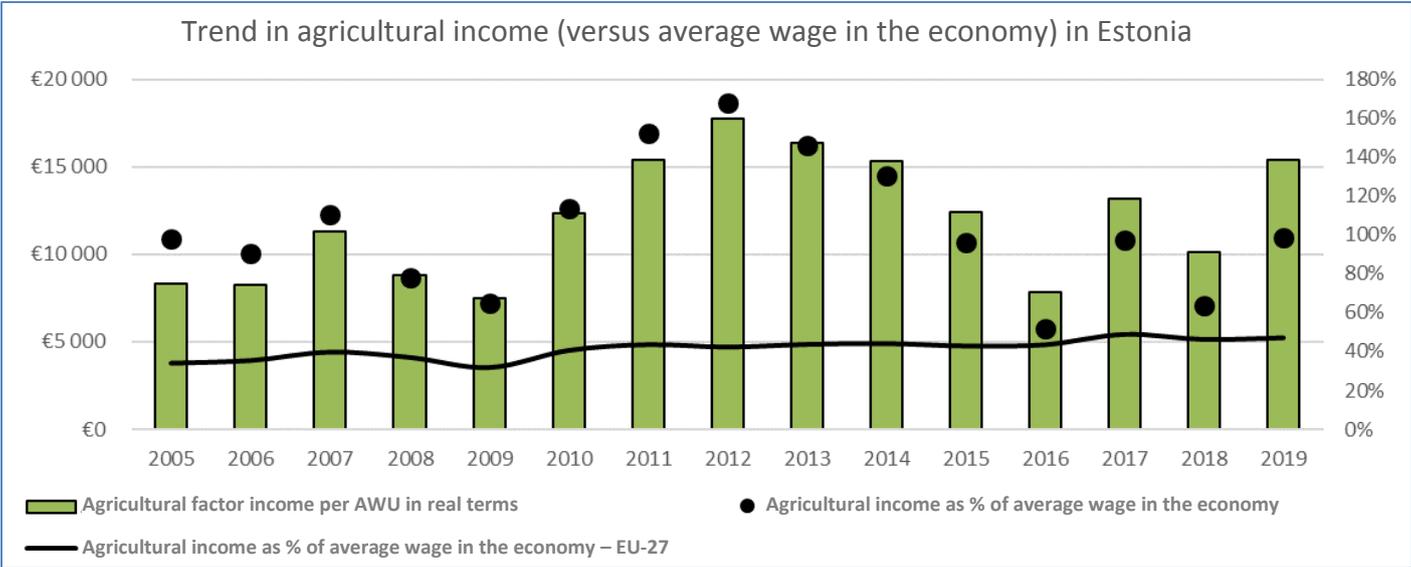
For the period 2005-2019, the average agricultural factor income per worker (EUR/AWU³ 12 018) is volatile, with no clear upward or downward trend. In the vast majority of years, the income is below the EU figures⁴. EU subsidies play a key role in the farms' revenues, with direct payments forming annually on average 46% (one of the highest share in the EU)⁵ and payments under rural development 26% (substantially above the EU average at 7%) of the agricultural factor income⁶ (period 2015-2018). The concentration of direct payments in Estonia is one of the most important in the EU, with the 20% biggest beneficiaries concentrating 86% of total direct payments, which reflects exactly the concentration of land (20% of the largest beneficiaries farm 86% of land)⁵. It is also observed that a significant share of direct payment beneficiaries (34%) have a lower economic size than EUR 2000². This situation reflects as well the low degree of differentiation and targeting of the direct payment received per hectare (see below). Estonia did not implement the redistributive payment in the period 2015-2020.

The factor income tends to increase with physical farm size. The direct payment per hectare does not vary much with farm physical size⁴⁻⁵. The factor income trend is similar for the economic farm size. The direct payment per hectare also tends to increase very slightly with the economic size⁷. Some of the small (in physical and economic terms) farms may actually not apply for direct payment per hectare, which would explain the lower value of the decoupled direct payment per hectare that in theory should be similar in a Member State that implements the Single Area Payment Scheme.

For sectors, the factor income is the highest for granivores⁸, cereals, oilseeds and protein field crops farms and the lowest in sheep and goats farms. The direct payment per hectare is comparable whatever the sector (coupled support compensates for lower decoupled direct payment per hectare in horticulture farms). The share of total income support (direct payments) in income is highest for cattle and sheep and goat farms, certain years factor income would (on average) even be negative without support for those sector⁵.

The factor income was similar in less favoured areas (LFA) than for non-LFA areas over the period 2004-2010 and became slightly lower (on average 96% of income of non-LFA areas) until 2014⁴. From 2015 on, the whole territory is designated as areas facing natural or other specific constraints (ANC)^{5,9}. However, whereas no payments for ANC are granted in the current programming period, it is observed that a geographical distinction has been introduced under coupled support, with one ‘dairy measure’ for mainland and one for islands.

The analysis of risk management instruments¹⁰ shows that the offer in Estonia (national support to cover the rest of veterinary losses not taken on board by the EU/national shared mechanism for animal diseases losses compensation; support for crop insurance with broad coverage including climatic risks, support for livestock insurance with all livestock types covered) is quite broad. As of 2019, the support for insurance premium is available through the Estonian Rural Development Programme (RDP). However, by the end of the year, there was no uptake yet¹¹, with one reason being the lack of suitable products on the insurance market.



Source: Directorate General for Agriculture and Rural Development. *CAP context indicators C.25 Agricultural factor income and CAP context indicator C.26 Agricultural entrepreneurial income*. Income based on EUROSTAT [aact_eaa04], [aact_ali01] and [aact_eaa06], adding back the compensation of employees to the entrepreneurial income and divided by the total number of annual working units. Note: 2019 data estimated. The Average wage in the economy based on EUROSTAT [nama_10_a10_e] thousand hours worked using employees domestic concept and [nama_10_a10], item wages and salaries.

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

In the period of 2003-2016 the number of farms in Estonia decreased by almost 55%, from 36 860 to 16 700. The opposite tendency is recorded for the utilised agricultural land (UAA), which has increased by 24.2%, from 795 640 hectares in 2003 to 988 410¹² in 2019. As a result, the average farm size increased between 2005 and 2016 from 32 to 60 hectares. However, in 2016 the majority of farms (almost 65%) were of size below 20 hectares, and those with 100 hectares and over formed 11.4% of the total number.¹³

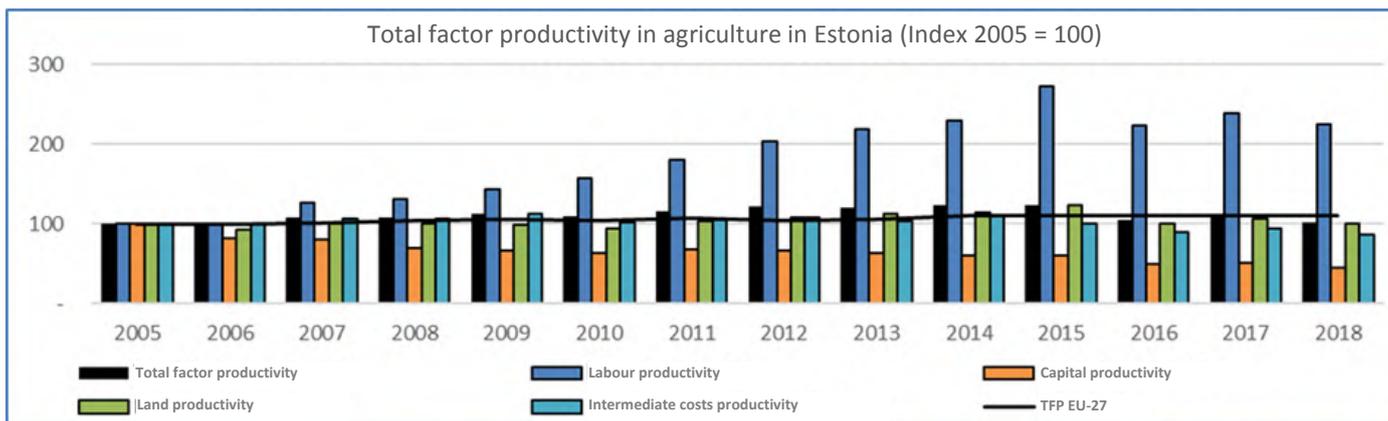
Of the total agricultural area reported in 2018, 67.6% was arable land, 31% permanent grassland and a modest 0.4% was used for permanent crops.¹⁴ Between 2005 and 2013, the number of livestock units was rather stable over time at around 310 thousand LU. This number decreased to 280 thousand in 2016, after the outburst of African swine fever and the Russian ban on EU products in 2014. After that drop, the number of livestock units has remained rather stable again.

The agricultural, forestry and fisheries sector accounted for 3.3% of the gross value added (GVA) of Estonia in 2019 (for comparison, the EU average was 1.8%). Crops formed almost 54% of agricultural output, and over 23% of crops were cereals. Animal output reached slightly over 46% with milk production as the main contributor (57% of total animal output).¹⁵

High outflow of labour force (over -48% during 2005-2019) was the main driver for steady increase in labour productivity, and in turn, in total factor productivity (TFP) in 2005-2015. The following years saw a drop – caused by harsh weather conditions of 2016 and 2018 – with TFP falling below EU average by 2018. In 2019, after an exceptionally good year in agriculture, the labour productivity increased again to almost 90% of the EU average; however, when calculated for 2017-2019 it accounts for more modest 71%.¹⁶ While the reported outflow of labour is largely a result of structural changes, the COVID crisis revealed also the sector's vulnerability – its low attractiveness and the developed dependency on non-native workers.

The financing gap in the agricultural sector is estimated between EUR 28 million and EUR 117 million. Lack of collateral, high lending risk and poor financial planning skills are among the main constraints on access to finance, and in addition, there seems to be an insufficient availability of long-term loans.¹⁷

The agri-food trade balance is negative. The balance is positive with non-EU countries, but it forms a lesser part of the trade (7% of all imported and 25% of all exported agri-food products in 2019)¹⁸. The main trading partners are Finland, Latvia and Lithuania, for export also Russia and Sweden. In 2019, the main products for export continued to be cereals (20%), and milk and milk products (19%).¹⁹



Source: European Commission. *CAP context indicator C.27 Total factor productivity*. Based on EUROSTAT [[aact_eaa05](#)], [[aact_eaa04](#)], [[aact_ali01](#)], [[apro_cpsh1](#)] and [[ef_mptenure](#)] and FADN.

2.3 Improve farmers' position in the value chain

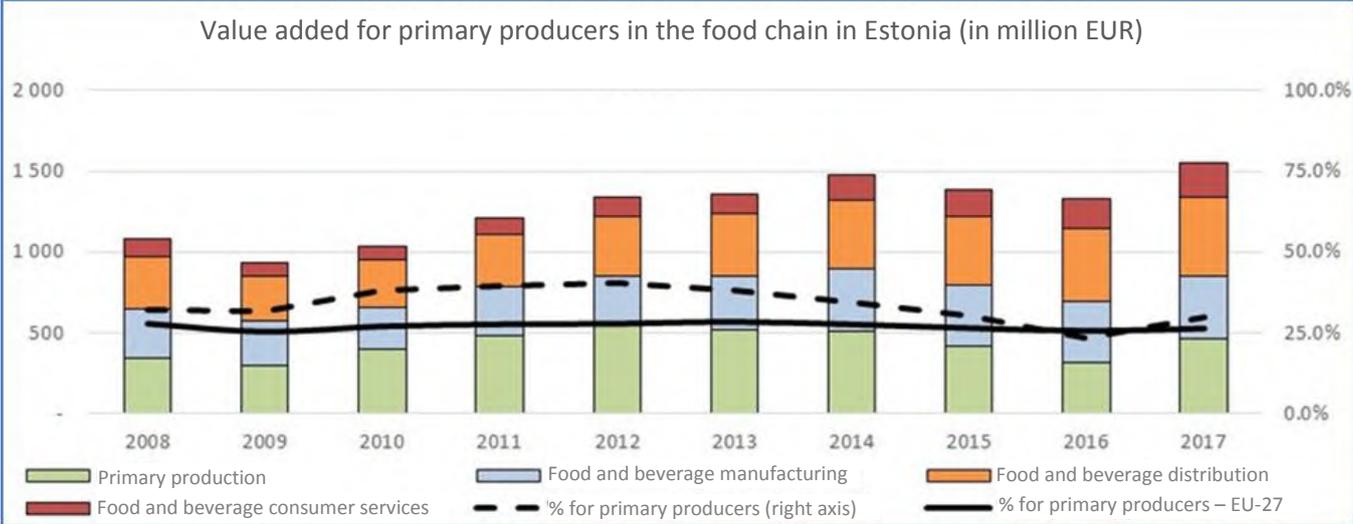
Although the factor income of the primary production and processing sectors in absolute value are in Estonia much below the EU average, the share captured by the farmers of total value added is higher in Estonia than the EU average (30% versus 24% in 2017). This share is relatively stable over the years although shrinking in crisis years. During market failures, market prices are dropping faster in Estonia than in other Member States on average and primary producers are often obliged to take higher risks than other stakeholders in the supply chain with more market power.

There are no recognised producer organisation or inter-branch organization in Estonia. However, there were 152 agricultural co-operatives registered in Estonia in 2018.²⁰ To make full use of the benefits stemming from the producers' cooperation, co-operatives and other type of non-recognized producer organisations would have to be recognised by the public authorities. Therefore, co-operatives should be encouraged to seek recognition. Moreover, they should be encouraged to explore the use of quality labelling to improve cooperation between producers and to strengthen their bargaining position in the value chain.

80% of the co-operatives are small (13.3 producers per co-operative in 2016), with low turnover. A "silo approach" is predominant – cooperatives in different sectors or different regions are not interacting, members are not overlapping and development is impeded by the inability of members to adopt a proper management and ownership model and to raise additional capital. Because of historical factors, co-operating and joint operations are not highly regarded, in particular by the older generation of farmers. However, long-term knowledge transfer measures, financed from the Estonian RDP for 2014-2020, has started to change that narrative. This measure should be continued and mergers of smaller co-operatives and co-operation between different stakeholders in the supply chain, including in the form of inter-branch activities, should be fostered. Knowledge transfer, generational renewal, advisory and training measures targeting co-operation in agriculture should be enforced in order to consolidate the primary sector and thus improve farmers' position in the supply chain.

Estonia has not yet transposed the Directive on unfair trading practices²¹ in the agricultural and food supply chain into its national law although it should do it by May 2021. A private code of good trading practices as adopted by the Estonian Traders Association in 2008 has not phased out the use of unfair trading practices within agricultural sector.

During the 2014-2020 programming period, Estonia has implemented rural development support for short supply chains or marketing through local markets. The number of applicants who have benefited from this measure remains low. Value of food products bought online in Estonia is low as well (estimated to be ca 1%) although it grew multiple times during the COVID confinement. COVID crises also contributed to the launching of several e-commerce facilities by individual farmers but several of these have become inactive upon end of the confinement. Food e-commerce market in Estonia remains pre-mature and rather turbulent. Nevertheless, there are at least seven countrywide e-commerce platforms providing food products directly from producer to the consumer plus large number of regional platforms and/or possibilities to order food via social media (mainly Facebook).



Source: European Commission. [CAP indicators – Data explorer](#). CAP Result indicator RPI_03 Value for primary producers in the food chain.

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

In 2018, agricultural emissions of greenhouse gas emissions (GHG) in Estonia amounted to 1.8 million tonnes of CO₂ equivalents²², up by almost 10% compared to the year 2000. In terms of share, agriculture represents 7% of Estonia’s total GHG emissions (EU average is 10%) and slightly less than a half percent of the total EU-27 GHG emissions from agriculture.²³ 47% of agricultural emissions in Estonia relate to agricultural soils, 38% to enteric fermentation of livestock (mainly cattle) and 14% to the management of manure.²⁴ An upward trend in GHG emissions in the agricultural sector is expected to continue due to predicted growth in livestock numbers and an increased milk yield, in case of dairy cows. Also, the emissions from liming and from the use of synthetic and lime fertilizers are expected to increase.²⁵

The land use, land-use change and forestry (LULUCF) sector, acting as a carbon sink in Estonia, plays an important role in the national carbon cycle. Estonia is one of the few EU Member States in which peatlands and peat-topped soils are strongly present – covering 20.2% of total national territory, 9.150 km² (data for 2011)²⁶. Such areas, whether used as agricultural land or not, can be large sinks for or sources of atmospheric CO₂ and must therefore be appropriately managed. In particular peatland used as arable land is to be considered at risk of degradation. Suitable soil management techniques or rewetting are considered useful tools to prevent degradation, to stop further GHG emissions and to preserve carbon sequestration.

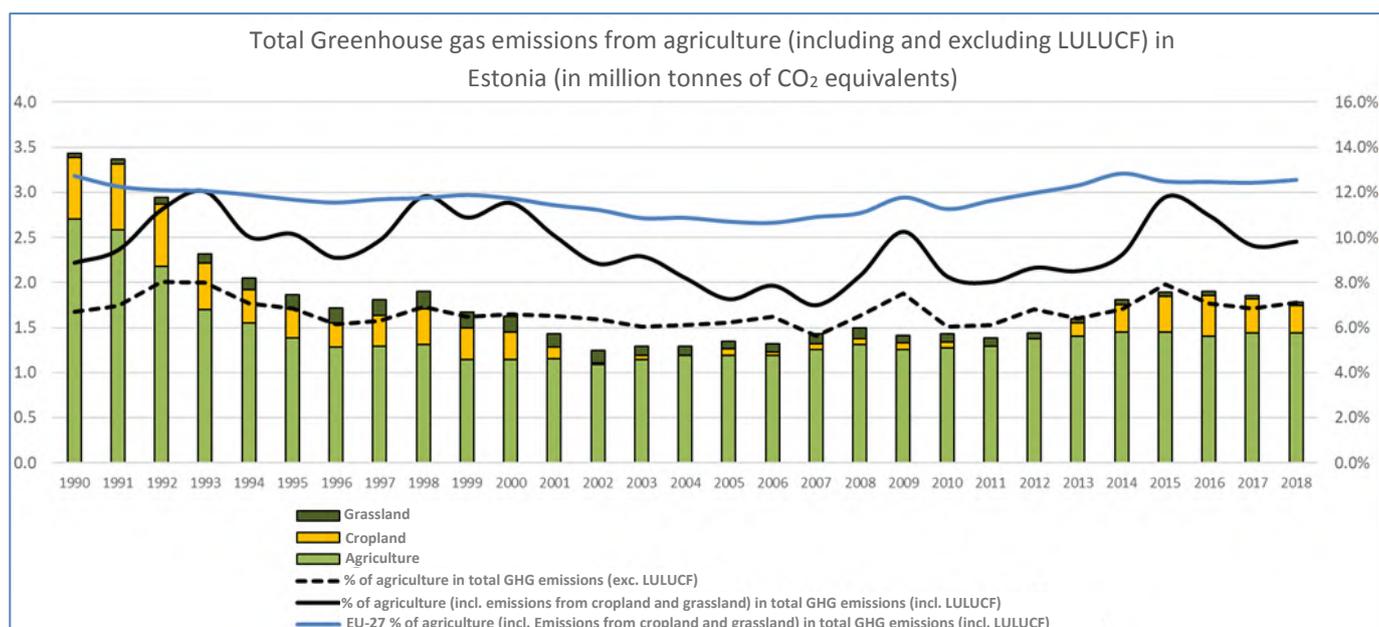
Forests cover about 56%²⁷ of the country's territory and the majority of CO₂ removals in the LULUCF sector comes from the biomass increment in forest land.²⁸ So far the removal of CO₂ has outweighed the GHG emissions of the sector, though, this trend is changing. According to the national projections, the LULUCF sector remains a carbon sink until 2030 (though the effect being almost negligible already as of 2025), after which the sector is projected to be a source of emissions. This course is mainly due to increased emissions from cropland and the reduction of carbon stored in forests, as the replacement of older forests with younger ones reduces forest stocks. In the coming years, forest stocks will reach a peak and then begin to decline, which is why an increase in CO₂ emissions from forest land is expected.²⁹

The National Energy and Climate Action Plan 2021-2030³⁰ reflects on how to achieve the target for decreasing the emissions in the sectors falling under the scope of the Effort Sharing Regulation (which includes agriculture) by 2030 at 13% compared to 2005. The Action Plan lists the planned actions for the agricultural and forestry sector (22 and 8 measures respectively) for this purpose. These focus on environmentally friendly land management and animal rearing techniques.

In 2018, renewable energy represented almost 30% of the energy consumed, exceeding the 2020 target of 25%³¹. However, the share of agriculture in the production of total renewable energy in Estonia was a marginal 0.3% (the EU-27 average 12.1%). The main contributor (94.5%) to renewable energy production was the forestry sector.³² Energy consumption in Estonian agriculture and forestry as a share in total final energy consumption is 4.3%, above the EU-27 average of 2.9%.³³ While there was an overall slight decrease (-2.5) in the number of kg of oil equivalent use per hectare (kgoe/ha) of agricultural land and forest area in the EU-28 between 2009 and 2015, the energy consumption in Estonian agriculture increased by almost 12 kgoe/ha.³⁴

The current Estonian RDP already recognises reducing GHG emissions as an important challenge; several measures supporting environmentally friendly management do target also GHG and/or ammonia emissions, covering almost 52% of the agricultural land with respective management contracts at the end of 2019 (exceeding slightly the initial target for 2023 of 49.6%)³⁵. Support is also provided for investments into renewable energy production, for which already EUR 13 million of total investment in renewable energy production have been achieved by the end of 2019 (i.e. about 64% of the target set for 2023). Furthermore, by the end of 2019, the target for 2023 to support management contracts contributing to carbon sequestration and conservation on 14.8% of Estonian agricultural and forest land has been reached.³⁶

Like other Nordic countries, the Estonian agricultural sector is vulnerable to risks stemming from climate change such as decreases in summer rainfall and increased numbers of winter storms and floods as well as pests and diseases risks.³⁷ National studies also predict a likelihood of an increase in the average amount of precipitation, reduction in snow cover and spring time floods due to temperature rise and the increasing number of extreme climate events, such as droughts or heavy showers.³⁸



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

Estonia's situation in terms of management of natural resources is better than that of some Member States, but there are nevertheless points which require attention.

Emissions of ammonia from Estonian agriculture (which make up almost 89% of total reported emissions) have been roughly stable for a decade or more, hovering between 9 000 and 10 000 tonnes per year. However, recent data (2017 and 2018) indicate an uptick in volumes and in any case – crucially – the country is not projected to meet its ammonia emission reduction targets under the National Emissions reduction Commitments (NEC) Directive.³⁹ Moreover, a review of Estonia's National Air Pollution Control Programme suggests that proposed technical measures targeting ammonia may be inadequate if intended growth for the agricultural sector production is not achieved in an appropriate way.⁴⁰

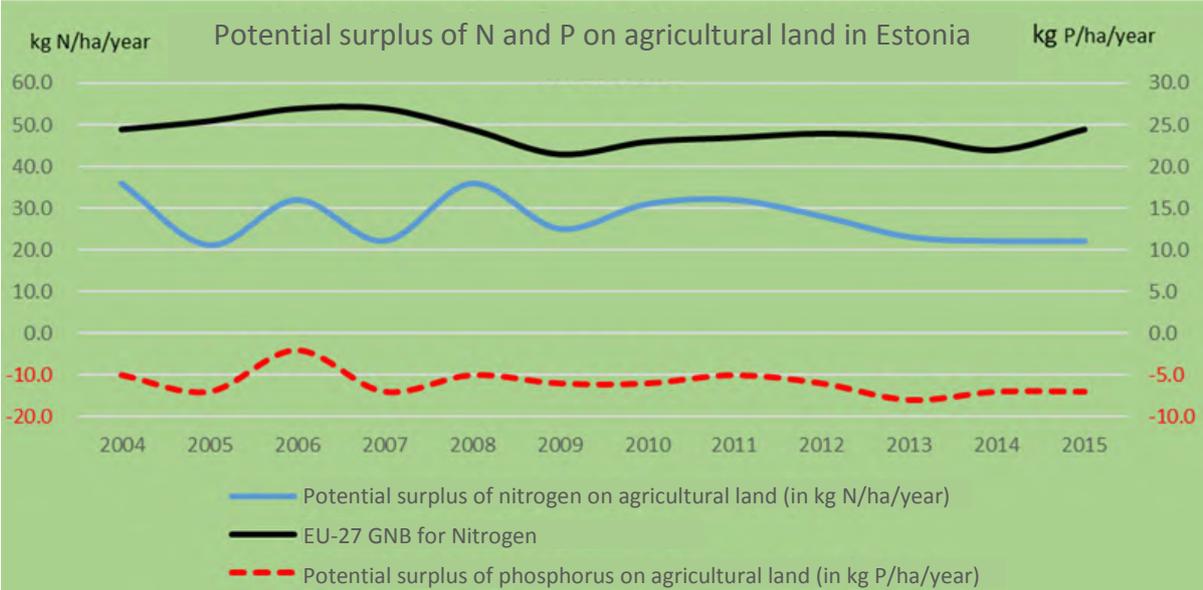
The pressure on water availability in Estonia is unusually high for a Baltic Member State: values for the Water Exploitation Index+ have typically lain between 10% and 15% in recent years (compared with less than 1% in Latvia and usually less than 5% in Lithuania).⁴¹ However, as Estonia has a very small area equipped for irrigation (just 0.3% of agricultural land in 2016)⁴² agriculture is not the main source of this pressure and is not currently under threat from it – though this could be an issue to watch for the long term.

The picture on water quality in Estonia is slightly clouded by doubts over the current classification of water bodies, but nevertheless pressures seem to be most acute in coastal waters: only 13% of these were reported as having good ecological status, compared with 60% of rivers and 67% of lakes.⁴³ Moreover, the most recent figures (for 2012-2015) on eutrophication and hypertrophication in coastal waters showed a substantial rise⁴⁴ – which reflects a serious and more general problem of eutrophication in the Baltic Sea as a whole. Groundwater bodies in Estonia are generally not suffering high pollution from nitrates: in 2015-2017 95% of them were considered to be of “high quality” (i.e. with less than 25 mg of nitrates per litre of water).⁴⁵ Nevertheless, reporting under the Nitrates Directive revealed rising

nitrate concentrations in 44% of groundwater stations in Nitrate Vulnerable Zones between the periods 2008-2011 and 2012-2015.^{46 47} (At the same time, 21% of groundwater bodies are failing good chemical status) Estonia has designated 3267 km² as Nitrate Vulnerable Zones, which is 7% of the total territory and 34% of the total agricultural area,⁴⁸ and overall, diffuse agricultural pollution is the third significant pressure on surface waters and the sixth most significant with regard to groundwater bodies.

On the other hand, on its territory as a whole Estonia is not a heavy user of fertilisers. Its gross nitrogen surplus was 22 kg/ha/year in 2015 – less than half the EU average and down from 36 kg/ha/year in 2004 – and it recorded a phosphorus deficit of 7 kg/ha/year in the same year (up from 2 in 2006).^{49 50} However, given the hotspots of problems mentioned above, and the fact that a substantial proportion of farmland is subject to a high input intensity (55% in 2017, against an EU-27 average of 36%)⁵¹, attempts at balanced fertilisation will clearly need regional differentiation. Note that the impact of activities to improve nutrient management in Estonia could be increased by linking them to research, innovation and demonstration activities available under the forthcoming Horizon Europe Mission on soil health and food. In this context, it is significant that 28% of arable soils are left without soil cover in winter⁵² and 54% of tillable land is under conventional tillage⁵³.

Although appropriate fertilisation may present an issue for the future if Estonia is to get the most from its agricultural soils in a sustainable manner, in general those soils show positive characteristics. The mean organic carbon content in arable land was 51g/kg in 2015⁵⁴ – more than in the EU as a whole – and with an average rate of soil loss from water at 0.21 tonnes/ha/year (EU average: 2.46)⁵⁵, Estonian soils do not suffer from significant water erosion. Nor is there major pressure on farmland from urban sprawl in a country with artificial land coverage of 1.9% (compared with an average of 4.1% in the EU-28).⁵⁶ From 2000 to 2018, 0.28% of cropland and 0.65% of grassland was lost to “artificial areas” – low by EU standards (though the figure for forest and woodland, 2.1%, was more significant).⁵⁷



Source: EUROSTAT [[aei_pr_gnb](#)].

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

Available data – including information from the Prioritised Action Framework for Estonia drawn up pursuant to the Habitats Directive and the Birds Directive - indicate causes for concern in Estonia with regard to specific objective 6.

The Farmland Bird Index was at 62 in 2017 (compared to 70 in the EU-27), having fallen sharply from a value of 102 in 2007.⁵⁸ The message from this general trend has been confirmed by a marked decline in the breeding population of the skylark – a key indicator species in Estonia as in many EU countries.⁵⁹

At the same time, the conservation status of grassland habitats of EU interest affected by agriculture is deteriorating overall. Although in the reporting period 2013-2018 the proportion of such habitats with “favourable” status was stable from the previous reporting period at 38% (compared with 20% in the EU as whole), 13% had moved downwards to the status “unfavourable – bad” (from “unfavourable – inadequate”).⁶⁰ It may be relevant that only 11% of permanent grassland in Estonia’s Natura 2000 areas is designated as “sensitive”, compared with 55% in Natura 2000 zones in the EU as a whole.⁶¹ In any case, a key contributing factor to the decline of grassland habitats in protected areas has been identified as non-management of many semi-natural grasslands: although a support scheme is currently available through Estonian RDP, assessments indicated that this should be expanded.⁶²

Forest habitats of EU interest in Estonia are also experiencing mixed fortunes: only 20% have enjoyed “favourable” status in the period 2013-2018, and numbers of key forest birds are declining (e.g. the population of *Tetrao urogallus* has fallen by 31% over 19 years)⁶³.

These statistics on protected areas are significant in themselves but should also be understood in a wider geographical context – especially as Estonia’s Natura 2000 zones cover a relatively modest surface: just 6% of UAA (compared with 11% in the EU) and 18% of forested area (30% in the EU).⁶⁴

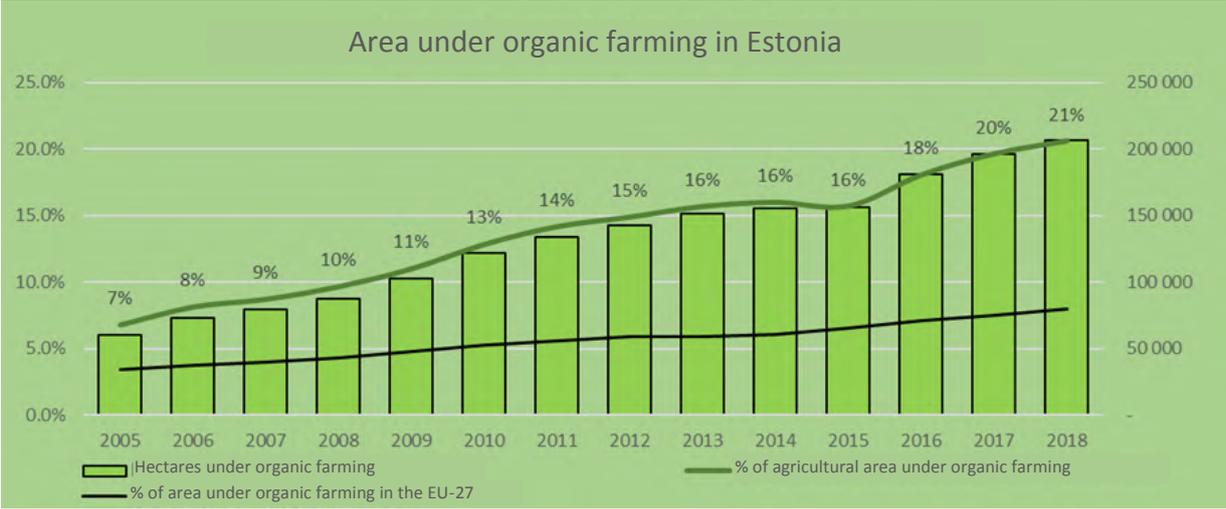
A trend of concern is that the presence of permanent grassland is being eroded: in 2018 it covered 31% of agricultural area, down from 34% in 2013.⁶⁵ Otherwise, where grassland is still in place, noted threats from the perspective of biodiversity and landscapes include cultivation and fertilisation (note the comparison with the threat of non-management inside Natura 2000 zones).⁶⁶ Evidence also suggests that definitions and eligibility rules applied by Estonia may make some semi-natural grasslands ineligible for direct payments, which can encourage inappropriate management. The absence of a dedicated support scheme for such land outside protected areas is also considered problematic.⁶⁷

In the case of other agricultural eco-systems – including on cropland – the main pressures identified come from increased use of plant protection products, mineral fertilisers and liquid manure, especially in areas where livestock rearing is more concentrated.⁶⁸ In this context, it is perhaps significant that Estonia has a greater proportion of farms categorised as using a high input intensity (55% in 2017) than does the EU as a whole (36%).⁶⁹

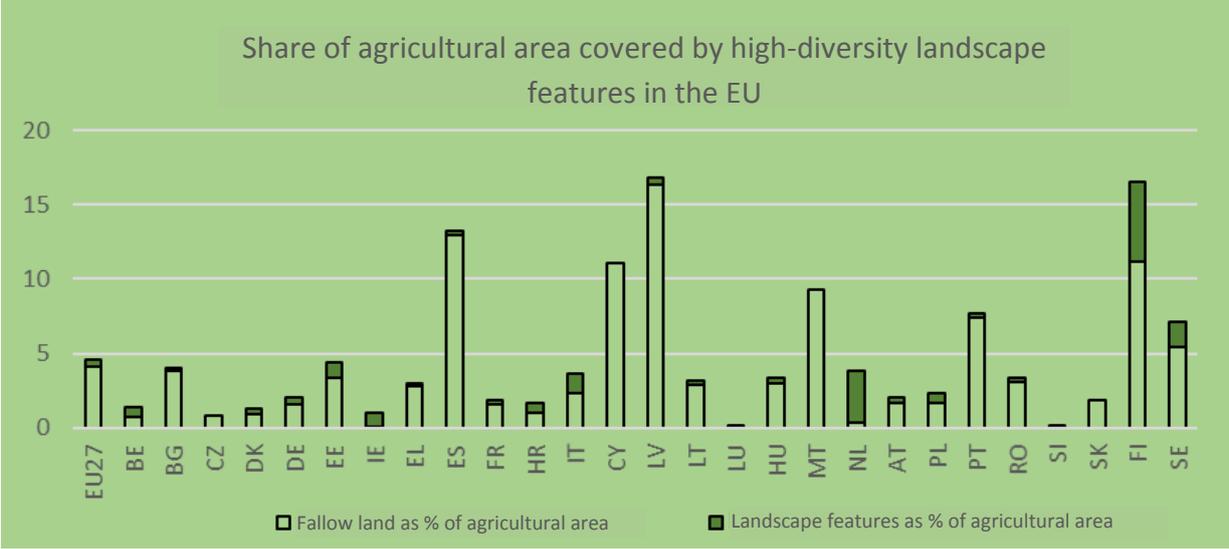
About 1% of Estonia’s UAA is taken up by linear landscape features which can be beneficial to biodiversity – such as hedges, ponds, ditches and traditional stone walls – in addition to about 3.4% of UAA taken up by fallow land. This compares reasonably well to the EU averages (0.6% for linear landscape features, 4.1% for fallow land).⁷⁰ However, the distribution in

Estonia is uneven: certain agricultural areas, especially certain arable areas, have become relatively unbroken, monotonous landscapes.⁷¹

Despite the above-mentioned substantial presence of more intensive farms, Estonia has enthusiastically adopted organic farming – which covered 22% of UAA in 2019 (second only to Austria), half of which is permanent grassland.⁷² The share of UAA under conversion is also high, at around 3%.



Source: EUROSTAT [[org_cropar_h1](#)] and [[org_cropar](#)].



Source: Directorate General for Agriculture and Rural Development. Based on EUROSTAT for land laying fallow and Joint Research Center based on LUCAS survey for estimation of landscape elements.

* Linear elements considered here: Grass margins, shrub margins, single trees bushes, lines of trees, hedges and ditches. This estimation is to be taken with caution because of methodological caveats.

2.7 Attract young farmers and facilitate business development in rural areas

In 2016, 8.7% of the total number of farm managers in Estonia were below 35 years old and 49.9% older than 55 years. Whereas the EU average decreased between 2010 and 2016, Estonia had an increase in the share of young farmers in the same period. In addition, Estonia's ratio of young managers to elderly (0.17 in 2016) is one of the higher ratios in the EU.^{73 74 75} The ratio of young female managers to male managers is about 3:10, which is also one of the higher ratios in Europe. The average economic farm size in Estonia is the highest in the age class of 45 to 54 years old in 2016.

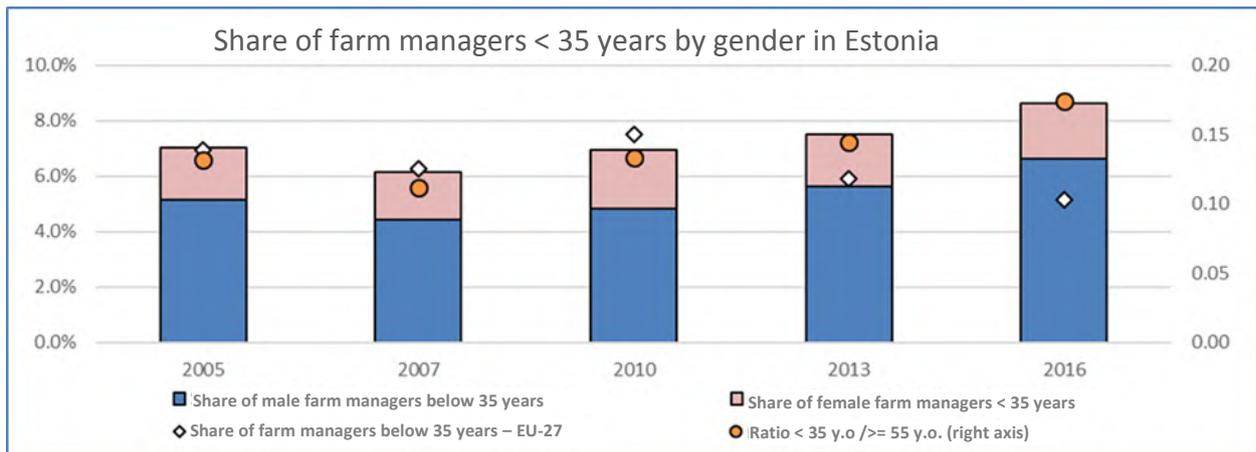
Access to land (land to buy or to rent) seems to be the most important general need for young farmers in Estonia. Access to land was reported⁷⁶ as critical by 37% of Estonian farmers, compared to 11% in the EU.

The demand for financing⁷⁷ is particularly high amongst young farmers and new entrants, but banks have not developed dedicated products for them. Overall, interviews with farmers' organizations and financial institutions confirm that this segment of the sector is experiencing the most difficulties in obtaining loans from banks. Estonia is notable for making use of financial instruments to incentivise investment on farms, which is partly designed to address generational renewal goals in rural areas.^{78 79}

In Estonia in 2016, the share of farm managers below 35 years of age with at least a basic level of agricultural training (55%) is higher than the respective share among total farm managers (40%). The share of young farm managers with at least a basic agricultural training in Estonia is also higher than the EU average.⁸⁰

In the 2014-2020 programming period Estonia is implementing several CAP measures aiming at generational renewal. Under Pillar I, the young farmer payment (YFP) amounted to 0,67% of the direct payment envelope in 2018⁸¹. Although this represents an increase in comparison to the estimated share (0,3%) and to previous years data, such figure remains below the EU average share of 0.92% (possible maximum being 2%). The average YFP/beneficiary stood at EUR 1131 in 2018, placing Estonia in the group of Member States with lower YFP/beneficiary.⁸² This can be partly explained by the fact that Estonia has set up the threshold of payments entitlements that can be activated for the YFP at 39 ha (range being legally between 25 and 90 ha). Currently, Estonia has not added eligibility conditions (e.g. skills, training etc.) to be met by young farmers to receive the YFP. The results of the implementation of setting up support for young farmers under rural development have been positive with 455 beneficiaries of planned 553 having received support by the end of 2019.⁸³ Nevertheless, it is important to continue with measures to encourage the younger generations to enter agriculture. In addition to existing support measures, further support should be provided to young entrepreneurs through advisory services and mentoring programmes, as they are the most in need of practical knowledge to cope with the day-to-day management of the business. Knowing that the farm replacement services can be used during holidays, sickness or other reasons may also encourage taking up agricultural business.

Business development could be facilitated by the development of the infrastructure in rural areas. Accessible digital solutions and fast internet provide people with more flexible working time and teleworking possibilities; improved basic services such as medical care, schools, children's leisure activities and other leisure activities also facilitate moving to rural area.⁸⁴



Source: EUROSTAT. [[ef_m_farmang](#)].

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

Estonia is among the EU Member States with the highest rural areas percentage: 82% of the total area is predominantly rural⁸⁵. The share of population living in urban and in rural areas is however almost equal, respectively 45.2% and 44.5%. While in 2015-2019 the population in urban areas grew by 5%, the rural population decreased by 1% and the share of elderly people increased in a higher speed than in other territories.⁸⁶ The employment rate in rural areas in Estonia decreased after the economic crisis in 2008 from 75% to 66% in 2010. In 2016, the rural employment rate was back at pre-crisis level⁸⁷ and continued to increase reaching 77% in 2019⁸⁸. Despite rapid convergence with the EU, the gap in social and economic performance between the capital region and the rest of the country has increased.⁸⁹ According to the national data, the largest employer is the service sector, which provides employment for 61% of the rural population, followed by the industrial sector with 31% and the primary sector with 8%.

The rural poverty rate of 28.5% (2019 data) is high compared to urban areas and above the EU average.⁹⁰ The GDP per capita in rural areas is below the EU average. While the trend has been upwards since 2000, it has not yet caught up with the EU average and the convergence has been slowing down between 2012 and 2016 (the PPS index in Estonia staying at 50 against EU average of 71 for rural areas).⁹¹

As regards younger generation, 6.9% of 15-24 years old in Estonia are neither in employment, nor in education or training (NEET); this rate is higher in rural areas, but stays still below the EU average (8.5% and 10.7% respectively). The share of young NEET women in rural areas is higher than of young men (9.6% and 7.6% respectively), but both figures are again below the EU average (11.7% and 9.8% respectively).⁹² When looking at the rate of early leavers from education and training (18-24 years old), then Estonia in general scores slightly lower than EU average (9.8% vs 10.2%), but the rate in rural areas exceeds this average (12.3% vs 10.7%). The picture is different when comparing men and women in rural areas: when 8.6% of young women are considered as early leavers, the issue is more pronounced among young men with 15.2%.⁹³

Local action groups (LAGs) play an important role in local development. Currently there are 26 LAGs whose area of operation cover almost the whole territory and the whole rural population. During current programming period 9% of EAFRD funding is allocated to LEADER, which is high compared to the EU average of 7%. Supported projects mainly aim at improved

possibilities for sporting and other recreational activities, rural tourism, cultural heritage and developing services for local people.⁹⁴ While doing so, they have also created a significant 913 new jobs.⁹⁵

Forests cover almost 56%⁹⁶ of the total area of Estonia. Forestry sector⁹⁷ employs 35 800 persons (20% in forestry, 49% in wood industry, 26% in furniture industry and 5% in paper industry). The percentage of people employed by forestry sector has been rather stable for over a decade staying at between 5-6% of total employed persons in Estonia.⁹⁸ The labour productivity with EUR 37 032 per AWU in 2015 to 2017 is close to 70% of the EU average.⁹⁹

The turnover in bio-economy sectors in Estonia has steadily grown since 2008 and reached EUR 7 billion in 2017.¹⁰⁰ Main contributors are wooded products and furniture sector (39%), food and beverages sector (29%), agriculture (14%) and forestry sector (11%). As the number of persons employed in the bio-economy sectors has slightly declined compared to 2008, the turnover per person employed increased from EUR 62 000 in 2008 to EUR 100 000 in 2017.¹⁰¹ While Estonia does not yet have a comprehensive national Bio-economy strategy, the Estonian Research Council commissioned a targeted study in 2018 (expected to be completed in 2021).¹⁰²

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

For Estonia, the overall sales of veterinary antimicrobial agents for food producing animals has been stagnating and lately, in 2013-2017, even dropped by almost 27%.

The sales of antimicrobial agents expressed as milligram per population correction unit (mg/PCU) has been steadily decreasing, and at 53.3 mg/PCU in 2018, it was well below the EU average of 118.3 mg/PCU. Estonia should continue to implement measures to maintain its downward trend for the overall sales of antimicrobials to contribute to the Farm to Fork target at EU level and ensure that all the necessary measures are in place for a smooth implementation of the new provisions of Regulation (EU) 2019/6¹⁰³ on veterinary medicinal products applicable as from 2022. The most important consumer of antimicrobials in Estonia is the cattle sector followed by the pigs sector. Estonia had around 10% of 2017 sales of antimicrobials included in the AMEG Category 2 (classified as the highest priority critically important antimicrobials for human health (HP CIAs) by the World Health Organisation - i.e. the third and fourth generation cephalosporins, fluoroquinolones, other quinolones and polymyxins). The most widely used HP CIA antimicrobial in Estonia are polymyxins and fluoroquinolones.

In 2018, the sale of plant protection products (PPPs) in Estonia totalled 636 tonnes, a decrease in relation to 2017. While there are obvious variations in the use of PPPs, data shows globally a decreasing trend in the last years. The sales stays largely below EU average and is one of the lowest in the EU. Herbicides are the most important category of PPPs sales in Estonia (about 67% of all PPPs).

Based on the calculation of Harmonised Risk Indicators (HRIs) the risks linked to pesticides increased by 31% in the period of 2011-2018 in comparison to 17% decrease at the EU level.¹⁰⁴ However, the risk shows downward trend for the last three years. The significantly reduced sale of PPPs containing non-approved active substances is an important factor in this trend.

Despite the low figures the Integrated Pest Management (IPM) implementation record of Estonia is mixed. Estonia appears to have implemented most of the IPM principles, mainly crop

rotation and using certified seeds. IPM guidelines have been established for most of the crops and a scoring system for self-control on the implementation of IPM has been introduced. A web-based monitoring systems for plants pest has been implemented in parallel. The implementation of IPM by PPP professional users is verified during official control by the competent authority in Estonia. On the other hand, Estonia needs to act on its obligation to inspect pesticide application equipment in use.

At EU level, the European Commission has estimated annual food waste between 30% and 50% of edible food along the entire food chain until reaching the consumer, representing an annual loss of 89 million tons in the EU. In Estonia, a study carried out for the Ministry of Environment¹⁰⁵ showed that around one third of the food is thrown away in Estonian households, corresponding to around EUR 120 per year (which is below EU average).

While the recently adopted waste legislation addresses the food waste after the farm gates, not enough attention is given to food loss and waste occurring at the primary production level and the early stages of the supply chain. This could be tackled by extending the national food waste prevention programme required by Article 29(2a) of the Waste Framework Directive 2008/98/EC¹⁰⁶ and by the implementation of the Directive on unfair trading practices¹⁰⁷ to reinforce the farmers' bargaining power.

Estonia has a number of issues regarding the respect of the legal baseline of animal welfare elements. For instance, the tail docking of pigs is still a routine practice. The conditions on farm should improve so that the number of tail-docked pigs could decrease. Efforts could also be made to promote the production of eggs under non-cage systems for laying hens.

Estonia is a major user of animal welfare support (currently included in 34 rural development programmes of 17 Member States representing 1.8% of total EAFRD expenditure). The Estonian RDP has assigned 4.7% of its EAFRD funding to the animal welfare measure, with a total of EUR 42.6 million of public funding. The European Court of Auditors' Special Report (31/2018) on animal welfare¹⁰⁸ however pointed to weaknesses concerning cost-effectiveness of this measure. In addition, Estonia is listed among the countries affected by African Swine Fever (ASF). While the ASF is currently not present in pig farms, and despite the substantial reduction in the number of pig farms in Estonia (701 in 2015 and 109 in 2020¹⁰⁹), it needs to be noted that in 2017 almost half of the herds were with up to 100 pigs¹¹⁰. In terms of farm biosecurity this is considered as an increased risk. Hence, there is a need to assure high biosecurity in all pig farms in order to avoid further spread of ASF.

Estonia has a high burden from non-communicable diseases due to dietary risk factors expressed as disability adjusted life years (DALYs) per 100 000 population.¹¹¹ This DALYs value is influenced by a number of dietary factors. Also, Estonia has a low consumption of fruits and vegetables¹¹². The overweight rates¹¹³ reported in Estonia currently stand at 56.1% (EU average 52%), obesity rates are 21.8% (EU average 14.9%), thus both are high, pointing towards the necessity for changes of behaviour in consumption. Efforts should focus on shifting towards healthy sustainable diets, in line with national recommendations, in order to contribute to reducing rates of overweight, obesity and the incidence of non-communicable diseases while simultaneously improving the overall environmental impact of the food system. This would include moving to a more plant based diet with less red meat and more fruits and vegetables, whole grains, legumes, nuts and seeds.

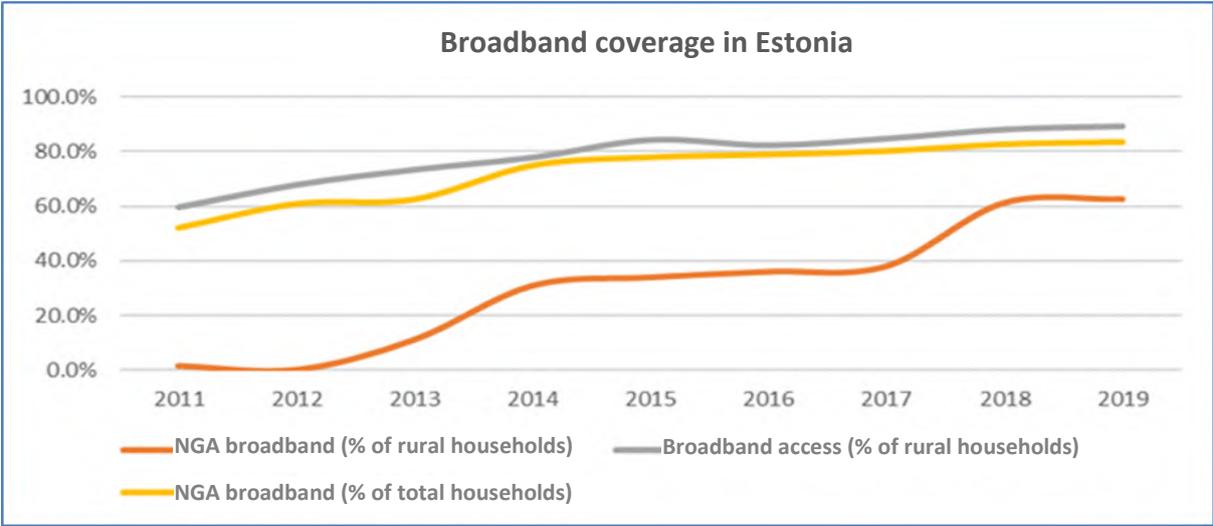
(2023 target being 4000), and 4511 beneficiaries had been advised (64% of planned 7000). In addition, also the number of supported cooperation projects exceeded the target value (43 projects supported instead of planned 17). As regards cooperation for innovation, only two European Innovation Partnership Operational Groups (EIP-OGs) have been planned.

Agricultural Research Centre manages the National Rural Network (NRN) in Estonia. NRN’s main tasks are the collection and dissemination of project examples, information exchange and training activities, support to the cooperation measure and promotion of innovation-related networking.

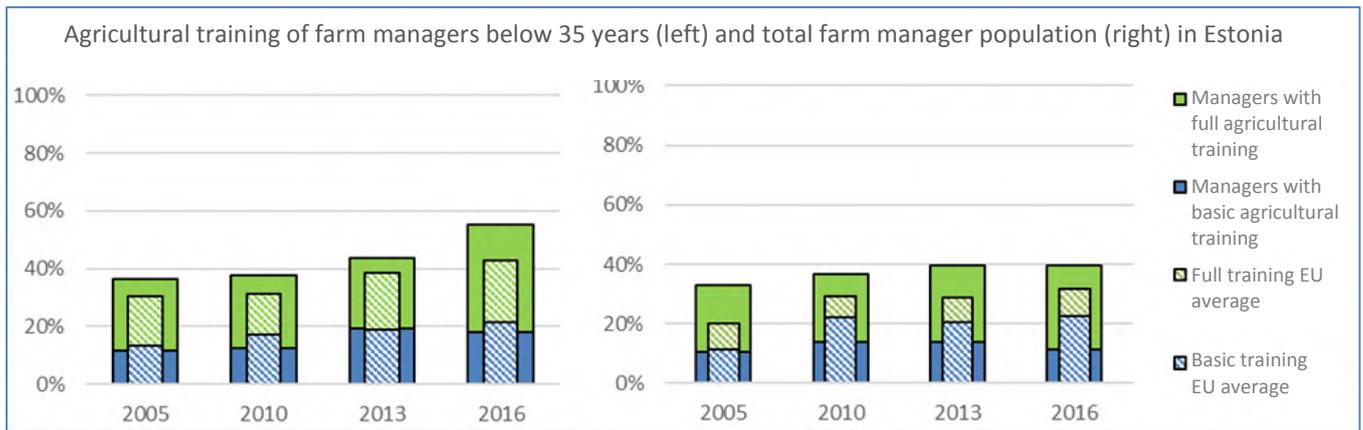
Based on data prior to the pandemic, Estonia ranks seventh out of the 28 EU Member States in the 2020 edition of the European Commission’s Digital Economy and Society Index (DESI). While Estonia ranks 1st place in the EU on Digital public services (with its well-developed e-government and e-health systems, with all central government services, as well as municipalities providing services online), it scores slightly below the EU average on the Integration of digital technology. To boost the digital transformation of the Estonian economy, it is important that Estonia continues and strengthens its efforts to raise awareness of the benefit of better integrating digital technologies, particularly for SMEs.¹²³ Estonia has not yet opted for the use of satellite-based means to monitor CAP implementation but is currently part of an EU project dealing with the uptake of new technologies.

As regards broadband, 62% of rural households in Estonia are covered by next generation access (NGA) broadband (EU average in rural areas is 59%; total coverage in Estonia 84%). Very-high capacity networks (VHCN) cover 20%¹²⁴ of rural households (total 57%; EU average 44%¹²⁵). Ultra-fast broadband coverage in rural areas in Estonia increased to 32.8%.¹²⁶ The level of digital skills in Estonia is above the EU average: 62% of the population has basic or above basic digital skills (the EU average is 56%); in rural area the percentage is lower (57%), but still well above the corresponding EU average (48%).¹²⁷

In 2016, the number of farm managers that had attained basic training was lower than EU average (11% and 23% respectively). On the other hand, Estonia has higher than average number of farm managers with full agricultural training: 29% against EU average of 9% (for managers under 35 the share was 37% and 22% respectively).¹²⁸



Source: European Commission. *Digital Economy and Society Index*. DESI individual indicators – 1b1 Fast BB (NGA) coverage [[desi_1b1_fbbc](#)].



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

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- ¹ GAEC = Good agricultural and environmental conditions
- ² European Commission. *CAP context indicator C.25 Agricultural factor income*. Based on EUROSTAT [[aact_eaa04](#)], [[aact_ali01](#)] and [[aact_eaa06](#)].
- ³ AWU = Annual work unit
- ⁴ European Commission. *CAP context indicator C.24 Agricultural training of farm managers*. Based on EUROSTAT [[ef_mp_training](#)] and *CAP context indicator C.26 Agricultural entrepreneurial income*. Based on EUROSTAT [[aact_eaa04](#)] and [[aact_ali01](#)].
- ⁵ European Commission. [CAP indicators – Data explorer](#). CAP Result indicator RPI_01 Share of direct support in agricultural income.
- ⁶ Directorate General for Agriculture and Rural Development own calculations based on Farm Accountancy Data Network (FADN) data (up to 2018).
- ⁷ Directorate-General for Agriculture and Rural Development own calculations based on Farm Accountancy Data Network (FADN) data (2015) and CATS (Clearance of Accounts Trailing System) data (up to 2017).
- ⁸ Mainly pigs, poultry, rabbits etc
- ⁹ Within the programming period 2014-2020, the former category of ‘LFA other than mountains’ had to be newly designated pursuant to Article 32(3) of Regulation (EU) No 1305/2013, based on common bio-physical criteria, whereas the former categories ‘LFA mountain’ and areas facing specific constraints could stay unchanged. All three categories are now grouped under the term ‘ANC’.
- ¹⁰ Directorate-General for Agriculture and Rural Development, ECORYS, Wageningen Economic Research, *Study on risk management in EU agriculture*, Final Report, 2018.
- ¹¹ Annual Implementation Report (AIR) of Rural Development Programme of Estonia, 2019.
- ¹² EUROSTAT. [[tag00025](#)].
- ¹³ EUROSTAT. [[ef_m_farmleg](#)].
- ¹⁴ EUROSTAT. [[tag00025](#)].
- ¹⁵ European Commission. *Statistical Factsheet Estonia*, June 2020, p. 6.
https://ec.europa.eu/info/sites/info/files/food-farming-fisheries/farming/documents/agri-statistical-factsheet-ee_en.pdf
- ¹⁶ European Commission. *CAP context indicator C.14 Labour productivity in agriculture*. Based on EUROSTAT [[aact_eaa01](#)] and [[aact_ali01](#)].
- ¹⁷ fi-compass, 2020, *Financial needs in the agriculture and agri-food sectors in Estonia*, Study report, 78 pages.
- ¹⁸ European Commission. *Statistical Factsheet Estonia*, June 2020, p. 13.
https://ec.europa.eu/info/sites/info/files/food-farming-fisheries/farming/documents/agri-statistical-factsheet-ee_en.pdf
- ¹⁹ Maaeluministeerium. *Põllumajanduse, kalanduse ja toiduainetööstuse ülevaade 2019, 2020*.
<https://www.agri.ee/sites/default/files/content/ylevaated/ulevaade-pokat-2019-02.pdf>
- ²⁰ Võlli, L., Värnik, R., Laaneväli, K., *Ülevaade põllumajandustootjate tulundusühistutest Eestis*. Maaeluministeerium, Tallinn, 2018, p.4.
- ²¹ Directive (EU) 2019/633 of the European Parliament and of the Council of 17 April 2019 on unfair trading practices in business-to-business relationships in the agricultural and food supply chain, *OJ L 111, 25.4.2019, p. 59–72*
- ²² European Commission. [Climate Change & Air Quality – Data Explorer](#).
- ²³ European Environment Agency (EEA). [EEA greenhouse gas - data viewer](#).
- ²⁴ Idem.
- ²⁵ Ministry of Environment. *Estonia’s Fourth Biennial Report under the United Nations Framework Convention on Climate Change*, 2019.
- ²⁶ Tanneberger et al., *The peatland map of Europe*, 2017. http://mires-and-peat.net/media/map19/map_19_22.pdf
- ²⁷ Food and Agriculture Organization of the United Nations (FAO). *2020 Global Forest Resources Assessment*. (<https://fra-platform.herokuapp.com/EST/assessment/fra2020/extentOfForest/>).
- ²⁸ Ministry of Environment. *Estonia’s Fourth Biennial Report under the United Nations Framework Convention on Climate Change*, 2019.
- ²⁹ Idem.
- ³⁰ Estonia's Communication to the European Commission. *Estonia’s 2030 National Energy and Climate Plan (NECP 2030)*, 2019.
- ³¹ EUROSTAT. [[nrg_ind_ren](#)].
- ³² European Commission. *CAP context indicator C.43 Production of renewable energy from agriculture and forestry*. Based on EUROSTAT [[nrg_bal_c](#)] and [[nrg_cb_rw](#)], and Strategie Grains

- ³³ European Commission. *CAP context indicator C.44 Energy use in agriculture, forestry and food industry*. Based on EUROSTAT [[nrg_bal_s](#)].
- ³⁴ Idem, 2017 data.
- ³⁵ Annual Implementation Report (AIR) of Rural Development Programme of Estonia, 2019.
- ³⁶ Idem.
- ³⁷ LIFE Agri Adapt. EU climate change risks for Nordic countries (<https://awa.agriadapt.eu/en/>).
- ³⁸ Republic of Estonia, Ministry of the Environment. *Climate Change Adaptation Development Plan until 2030*.
- ³⁹ European Commission. *Communication from the Commissions to the European Parliament, the Council, the European Economic and Social Committee of the Regions – Environmental Implementation Review 2019: A Europe that protects its citizens and enhances their quality of life*. COM(2019) 149 final.
- ⁴⁰ Ministry of the Environment, *The National Air Pollution Control Programme*, 2019. Available at <https://ec.europa.eu/environment/air/reduction/NAPCP.htm>
- ⁴¹ European Environment Agency (EEA). *Use of Freshwater Resources in Europe*. Figure 3. <https://www.eea.europa.eu/data-and-maps/indicators/use-of-freshwater-resources-3/assessment-4>
- ⁴² EUROSTAT. [[aei_ef_ir](#)].
- ⁴³ European Commission. *Communication from the Commissions to the European Parliament, the Council, the European Economic and Social Committee of the Regions – Environmental Implementation Review 2019: A Europe that protects its citizens and enhances their quality of life*. COM(2019) 149 final.
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