

Greek CAP Strategic Plan 2023-2027

Strategic Environmental Assessment (SEA)

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Abbreviations

AFI	Agricultural Family Income
AKIS	Agricultural Knowledge and Innovation Systems
ANC	Natural or other area-specific constraints
BISS	Basic income support for sustainability
BoG	Bank of Greece
CAP	Common Agricultural Policy
CAP SP	CAP Strategic Plan
CBD	United Nations Convention on Biological Diversity
CDDA	Common Database on Designated Areas
CIS	Couple income support
CIS-YF	Complementary income support for young farmers
CLC	Corine Land Cover
COOP	Cooperation
CRF	Common Reporting Format
CRISS	Complementary redistributive income support for sustainability
CSPC	Crop-specific payment for cotton
EAP	Environmental Action Programme
Eco-schemes	Schemes for the climate and the environment
EEA	European Environment Agency
ENVCLIM	Environmental, climate and other management commitments
EPR	Extended Producer Responsibility
ETS	Emission Trading System
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
FRMP	Flood Risk Management Plan
GAEC	Good Agricultural and Environmental Condition
GDP	Gross Domestic Product
GHG	Greenhouse Gas emissions
GVA	Gross Value Added
HNV	High Nature Value
INSTAL	Setting up of young farmers and new farmers and rural business start-up
INVEST	Investments, including investments in irrigation
JMD	Joint Ministerial Decision
KNOW	Knowledge exchange and information
LUCAS	Land Use and Land Cover Survey
LULUCF	Land Use, Land-Use Change and Forestry
MAES	Mapping and Assessment of Ecosystems
MED	Mediterranean Biogeographic Region
MoEE	Ministry of Environment and Energy

MRDF	Ministry of Rural Development and Food
MS	Member State
NAPCP	National Air Pollution Control Programme
NBS	National Biodiversity Strategy
NCCAS	National Climate Change Adaptation Strategy
NEC	National Emission Ceilings
NECP	National Energy and Climate Plan
NIR	National Inventory Report
NWMP	National Waste Management Plan
NWPP	National Waste Prevention Programme
OECD	Organisation for Economic Co-operation and Development
OGG	Official Gazette of Government
PAF	Prioritised Action Framework for Natura 2000
PDO	Protected Designation of Origin
PECBMS	PanEuropean Common Bird Monitoring Scheme
PGI	Protected Geographical Indication
RAAP	Regional Adaptation Action Plans
RBMP	River Basin Management Plan
RDP	Rural Development Programme
RES	Renewable Energy Sources
RTDI	Research, Technological Development and Innovation
SAC	Special Areas of Conservation
SCI	Sites of Community Importance
SDG	Sustainable Development Goal
SEA	Strategic Environmental Assessment
SMR	Statutory Management Requirements
SO	Specific Objective of CAP
SoER	State of Environment Report for Greece
SPA	Special Protection Areas
SPR	Strategic Plan Regulation (Regulation (EU) 2021/2115)
TSG	Traditional Speciality Guaranteed
UAA	Utilised Agricultural Area
UNEP	United Nations Environmental Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFCCC	United Nations Framework Convention on Climate Change
VNR	Voluntary National Review on the Implementation of the 2030 Agenda for Sustainable Development
WFD	Waste Framework Directive
WHO	World Health Organisation

Preface

Strategic Environmental Assessment (SEA) is a mechanism for considering and assessing the likely significant effects of a proposed plan or programme, and the reasonable alternatives considered as part of its development, on the environment, with a view to avoiding and mitigating adverse impacts and maximising the positives. The environmental aspects can therefore be fully integrated and addressed at the earliest appropriate stage of decision making of the plan or programme with a view to promoting sustainable development. The SEA process follows the provisions set out under the Directive 2001/42/EC of the European Parliament and of the Council (SEA Directive), as transposed to national law by the Joint Ministerial Decision 107017/2006 (OGG 1225/B/05-09-2006), which was amended by the Joint Ministerial Decision 40238/2017 (OGG 3759/B/28-09-17) (SEA-JMD).

The SEA of the Greek CAP Strategic Plan (CAP SP) for the programming period 2023-2027 is a mandatory process according to article 3 of the SEA Directive concerning EU-financing programmes and it also constitutes a legal precondition for the approval of the national CAP SP 2023-2027 of Greece under the SEA-JMD. It is also a requirement under Article 107 of Regulation (EU) 2021/2115. The specific tasks of the SEA consist in providing an environmental assessment of the CAP SP and developing recommendations for the CAP SP formulation. In accordance with the EU and Greek legislation, the strategic environmental assessment must be carried out during the preparation of the CAP SP and before its adoption.

Against this background, the present deliverable constitutes the SEA report, which was prepared as part of the SEA process and structured in accordance with Annex III of SEA-JMD. The report contains the scope and main objectives of the Greek CAP SP, the relationship of CAP SP with other relevant plans and programmes, the description of the Greek CAP SP and its alternative options, the environmental baseline, and the assessment of the likely significant effects of the CAP SP on the environment accompanied with the mitigation measures of the identified adverse effects and the monitoring requirements.

1 Non-technical summary

1.1 General information

The national Common Agricultural Policy Strategic Plan (CAP SP) of Greece for the programming period 2023-2027 is developed on the basis of a Strategic Environmental Assessment, which is a valuable ex ante process for evaluating the environmental consequences of the strategic plan to ensure environmental considerations are fully integrated at the earliest appropriate stage of decision making, ensuring thus that potentially conflicting objectives and likely significant adverse environmental effects are addressed.

The overall objective of the Greek CAP SP 2023-2027 is to implement the new European Commission's Common Agricultural Policy in the country, which is designed to support European farmers and ensure Europe's food security and a resilient, sustainable and competitive agricultural sector, focusing thus on the economic viability, the resilience and income of farms, on an enhanced environmental and climate performance, and on the strengthened socio-economic fabric of rural areas. The Greek CAP SP will be financed by the European Agricultural Guarantee Fund (EAGF) and by the European Agricultural Fund for Rural Development (EAFRD). The Ministry of Rural Development and Food (MRDF) is assigned the responsibility for the planning and the preparation of the strategic plan.

The SEA process follows the provisions set out in the Directive 2001/42/EC of the European Parliament and of the Council that was transposed into Greek law by the Joint Ministerial Decision 107017/2006 (OGG 1225' B), as amended by the Joint Ministerial Decision 40238/2017 (OGG 3759' B). The approval of the SEA report for the Greek CAP SP 2023-2027 is a regulatory act, at which detailed terms are set, so that the necessary actions to address and monitor the Plan's environmental effects are integrated into it. The competent authority responsible for coordinating, evaluating and approving the SEA results for the Greek CAP SP is the Directorate for Environmental Licensing of the Ministry of Environment and Energy (MoEE).

1.2 Geographical area covered by the plan

Greece will implement a single national CAP SP for the programming period 2023-2027 for its entire territory. Out of the total area of the country, around 94.7% is considered rural area on the basis of the urban-rural typology of the European Union, out of which 2/3 are characterised predominantly rural. Rural areas are home to around 5.9 million people, about half of the total population of Greece.

1.3 Objectives of the plan

The Greek CAP SP 2023-2027 has been drafted by taking into consideration the Regulation (EU) 2021/2115 (hereafter referred to as SPR), with the overall aim to further improve the sustainable development of farming, food and rural areas and to contribute to achieving three general objectives (Article 5 of SPR):

- (a) to foster a smart, resilient and diversified agricultural sector ensuring food security;
- (b) to bolster environmental care and climate action and to contribute to the environmental and climate related objectives of the Union;
- (c) to strengthen the socio-economic fabric of rural areas.

The achievement of the general objectives will be pursued through nine specific objectives, covering all three dimensions (economic, environmental and social) of sustainability (Article 6 of SPR):

- SO1. support viable farm income and resilience across the Union to enhance food security;
- SO2. enhance market orientation and increase competitiveness, including greater focus on research, technology and digitalisation;
- SO3. improve the farmers' position in the value chain;
- SO4. contribute to climate change mitigation and adaptation, as well as sustainable energy;
- SO5. foster sustainable development and efficient management of natural resources such as water, soil and air;
- SO6. contribute to the protection of biodiversity, enhance ecosystem services and preserve habitats and landscapes;
- SO7. attract young farmers and facilitate business development in rural areas;
- SO8. promote employment, growth, social inclusion and local development in rural areas, including bio-economy and sustainable forestry;
- SO9. improve the response of EU agriculture to societal demands on food and health, including safe, nutritious and sustainable food, food waste, as well as animal welfare.

Those objectives are to be complemented by the cross-cutting objective of modernising the sector by fostering and sharing of knowledge, innovation and digitalisation in agriculture and rural areas, and encouraging their uptake.

The CAP SP's specific objectives are already in line with the European Green Deal objectives for sustainable growth (COM/2019/640), which are reflected to its associated strategies: the Farm to Fork Strategy (COM/2020/381), the Biodiversity strategy (COM/2020/380), the 2030 Climate Target Plan (COM/2020/562) and the new Action Plan for the Circular Economy (COM/2020/98), including the new EU Strategy on Adaptation to Climate Change (COM/2021/82), the Zero Pollution Action Plan (COM/2021/400), the EU Soil Strategy (COM(2021)699) and the EU Forest Strategy (COM/2021/572), all of which address issues relevant to the agricultural sector and the challenges of creating sustainable food systems and recognise the links between healthy people, healthy societies and healthy nature.

The main legal framework concerning the environment and climate to which the Greek CAP SP must be aligned with is already defined in Annex XIII of SPR regulation, covering 12 EU Directives/Regulations. These requirements have been taken into consideration under the SWOT analysis and needs assessment, to ensure consistency and complementarity of the Greek CAP SP's objectives and interventions.

The national plans and programmes relevant to the plan are emerging from the EU environmental and climate legislation listed in Annex XIII of SPR, which constitute the key national plans and programmes that are linked to the formulation of the Greek CAP SP. These policy documents, together with those interrelated to the specific objectives SO8 and SO9 of the plan, are outlined below:

- National Energy and Climate Plan
- National Climate Change Adaptation Strategy
- National Air Pollution Control Program
- National Biodiversity Strategy and its action plan
- Prioritised Action Framework for Natura 2000
- National Strategy for Forests
- River Basin Management Plans
- Action Programme for the Nitrate Vulnerable Areas
- National Action Plan for Sustainable Use of Pesticides

- Flood Risk Management Plans
- National Circular Economy Strategy and its action plan
- National Waste Management Plan
- National Waste Prevention Programme
- National Action Plan for Combating Desertification
- National Framework for Spatial Planning and Sustainable Development

To this respect, the Greek CAP SP for the next programming period is expected either to support or to be supported by the aforementioned national policy documents through similar objectives.

1.4 Description of the plan

The CAP SP for Greece is prepared in accordance with the European Commission's legislative package on the CAP for the programming period 2023-2027. These legislative acts aim to make the EU's agricultural policy more responsive to current and future challenges, while continuing to support the active needs of European farmers. The pursuit of the new CAP for economic, environmental and social sustainability is based for the first time on a single approach, which seeks the joint contribution of its two Pillars in achieving its specific needs. In this light, the proposed CAP SP is drawn upon the types of interventions that the Member States may use to implement their plans, incorporating interventions under both Pillar I and Pillar II.

Based on the outcomes of the last programming period to be implemented till 2022, the new Greek CAP SP has been developed after an extensive SWOT analysis and needs assessment work, which enabled to establish the country's own specific targets, while complying with the general and specific objectives set by the CAP within EU. To deliver on these objectives, the interventions are designed according to the country's circumstances and are based on the types of interventions referred to in the SPR regulation. In this context, the proposed Greek CAP SP has also taken into consideration the Commission's recommendations for Greece (SWD/2020/372), which identify key strategic issues that need to be tackled for the implementation of the specific objectives of the CAP in Greece and provide guidance on how to address them in the strategic plan. The proposed intervention strategy of the CAP SP 2023-2027 is outlined below per specific objective of the CAP.

SO1: "Support viable farm income and resilience across the Union to enhance food security"

The interventions aim to continue the production of quality agricultural products, while contributing to the sustainability of rural areas but also to their social and economic well-being, on the other hand to improve the economic viability of small and medium holdings.

SO2: "Enhance market orientation and increase competitiveness, including greater focus on research, technology and digitalization"

The interventions aim at ensuring high quality and stable production in the sectors considered important for the Greek agri-food system, as well as enhancing competitiveness and extroversion through private investment in agricultural holdings and manufacturing companies.

SO3: "Improve the farmers' position in the value chain"

The interventions aim at strengthening of the farmer's position in the value chain, resulting from the creation of economies of scale, cost reduction and quality upgrade of production, as well as certification, marking, standardization and verticalization. Participation in collective schemes is encouraged for addressing the new conditions and challenges that are emerging in the global market for agricultural products and food.

SO4: "Contribute to climate change mitigation and adaptation, as well as sustainable energy"

SO5: "Foster sustainable development and efficient management of natural resources such as water, soil and air"

SO6: "Contribute to the protection of biodiversity, enhance ecosystem services and preserve habitats and landscapes"

The environmental and climate objectives of the CAP SP are reflected in its environmental and climate architecture, which operates under the following components:

- The enhanced conditionality that sets the baseline requirements for farmers in receipt of CAP payments, consisting of the SMRs requirements and GAEC standards, with the improvement of the already existing GAECs and parallel integration of some existing requirements of "greening" of the previous programming period.
- The interventions for environment and climate across both Pillars to achieve a coherent overall approach: the voluntary eco- schemes of Pillar I and agri-environmental and climate-related interventions of Pillar II, which are built on baseline improvements achieved through conditionality and form a palette of multiple options, indicatively related to adaptation to climate change, protection of soil and water resources, promotion of organic production, application of precision farming methods, and conservation of biodiversity and landscape; with the overall objective to maximise farmer participation to achieve climate and environmental improvements according to its own needs and capabilities.

SO7: "Attract young farmers and facilitate business development in rural areas"

The demographic renewal of the rural population and sustainable rural development is achieved through the interventions that aim to provide incentives for young people to enter the primary sector and to encourage young entrepreneurship, in combination with interventions for their education, strengthening their business plans, their participation in collective schemes, the use of consulting services, etc.

SO8: "Promote employment, growth, social inclusion and local development in rural areas, including bio-economy and sustainable forestry"

This specific objective will be achieved mainly through the implementation of local strategies (LEADER) that promote sustainable development of rural areas by tackling economic, social and environmental problems, while at the same time being an innovative approach to EU rural development policy through a bottom-up approach. The philosophy of planning and implementation is maintained through the support of local business development, but also through the strengthening of public infrastructure and investments to serve rural population.

SO9: "Improve the response of EU agriculture to societal demands on food and health, including safe, nutritious and sustainable food, food waste, as well as animal welfare"

The interventions would support the increase of agricultural areas where organic production is applied, the agri-environmental interventions and the eco-schemes, which aim to reduce fertilization and

pesticides, but also with the implementation of interventions aimed at improving animal welfare, enhancing bio-safety and the rational /limiting use of antibiotics.

Cross-Cutting Objective “The modernization of the agricultural sector by promoting and disseminating knowledge, innovation and digitization in agriculture and rural areas and encouraging their adoption”

The modernization and digitization of Greek agriculture and rural areas will be facilitated by the establishment of the Agricultural Knowledge and Innovation System (AKIS). The Agricultural Advisory Services, the European and National CAP Networks and the European Innovation Partnership will jointly contribute to the integrated approach / strategy for modernization, the promotion of innovation and the dissemination of knowledge in the agri-food sector. Through interventions in the field of digitization, the strategic approach lays the foundations for the digital transformation of agriculture and the increase of the competitiveness of the Greek farms.

1.5 Alternatives

The alternative options that have been considered for the plan are the business-as-usual option, which assumes that the Rural Development Programme (RDP) for 2014-2020 will continue and be extended to the next programming period up to 2027, with the current priorities and measures continuing, and the proposed CAP SP 2023-2027, which is formulated under the new CAP’s orientation and follows the provisions set out in the Regulation (EU) 2021/2115. The zero option, that is the non-implementation of the plan, is not considered a reasonable alternative, given that the CAP SP is prepared under the CAP, and it is not something the Government cannot do, yet it was used as the baseline scenario for comparative analysis.

The proposed CAP SP 2023-2027 is considered to best integrate the requirements of actual environmental policy in agriculture and rural development and contribute to the pursuit of sustainable development in the country as a whole, given that the new CAP sets specific objectives for the preparation and implementation of the national CAP SPs, which envision the sustainable development of farming, food and rural areas and demand interventions to bolster environmental care and climate action and to contribute to the environmental and climate-related objectives of the European Union. It is stressed that the proposed CAP SP ensures that the country’s target needs address environmental and climate goals in coherence with EU and national policies and the proposed interventions of the plan will help achieve the EU and national environmental and climate objectives and support the farmers for environment and climate relevant management practices, investments, knowledge-building, innovation and co-operation. In all, the suggested option for the CAP SP for the programming period 2023-2027 is the best alternative option.

1.6 Current state of environment

According to the EU CAP, a healthy natural environment is essential to sustaining the agricultural sector and on the other hand agricultural policies and practices also play an important role in sustaining a healthy natural environment. Agriculture may have adverse effects on natural resources, such as air, water, soil and biodiversity, while contributing to climate change, yet it is also highly exposed to climate change challenges. The key baseline data and existing environmental problems that are relevant to the implementation of the CAP SP are presented in the following paragraphs.

Greenhouse gas emissions have dropped, ambitious new climate and energy targets have been adopted, while the national adaptation strategy will be downscaled at regional level. The decrease of total GHG continued due to the gradual transition of the energy system to a lower-emission system and the reduced emission-related activities because of the economic crisis. In 2019, the share of agricultural sector was 9.2% of total GHG emissions and RES production from agriculture and forestry reached 31.9% of total RES production, with a relative downward trend for forestry which is the main contributor. The National Energy and Climate Plan sets ambitious targets for 2030 and has incorporated actions for reducing GHG emissions in the agricultural sector. Agriculture is the sector expected to be most severely affected by climate change in Greece. The National Climate Change Adaptation Strategy, which sets priorities that will be downscaled in regional plans with a 7-year planning cycle, gives particular emphasis on agriculture and forestry through the conservation and sustainable use of land resources and management practices.

National air emissions have declined significantly, expecting to meet the national commitments. The national reduction commitments imposed by the NEC Directive for 2020 have been met for most pollutants as early as in 2016. According to national projections, Greece is also expected to meet its 2030 emission reduction commitments. The share of agriculture in air pollution mainly involves emissions of ammonia that reached 91.4% in 2019, with a steady decrease of 1-4% per year over the last five years. These reductions are mainly attributed to the decreased use of synthetic fertilizers and to the spread of organic farming along with the declining livestock population. The National Air Pollution Control Program, that was recently adopted, gives emphasis on the continuation of the existing measures for agriculture or measures that are mandatory from other legal instruments.

Water quality is generally good, while water abstraction remains high. Most of the surface water bodies achieve good chemical status (89%) and most groundwater bodies reach good status, both in qualitative (85%) and quantitative (80%) terms. Regarding nitrate concentrations, 84.5% of surface waters are classified as high quality, whereas groundwater quality has been improved over time, with exceedances of nitrates falling by 14.2% between the reporting periods 2012-2015 and 2016-2019. Greece adopted an action plan in 2019 to protect waters against pollution caused by nitrates from agricultural sources for all 30 designated vulnerable zones. As for water demands, Greece is mainly dependent on groundwater resources. According to the 1st revision of RBMPs, the agricultural sector exerts the highest pressure and is responsible for about 80% of total water abstraction in 2017. About 80% of abstracted water is used for irrigation, which is though attributed to the climatic conditions of the country. Freshwater resources are under moderate stress at national level, with an increasing trend in the last years. This indication yet cannot reflect uneven spatial and seasonal distribution of water resources and may therefore mask water scarcity that occurs on a seasonal or regional basis.

Soil erosion by water is higher than EU average, while land take has gradually decreased. According to the 2018 land cover data, agricultural ecosystems (including grassland) and forest ecosystems (including woodland shrub) cover 46.4% and 28.3% of the land territory, respectively, while urban areas represent 3.3% of the land territory. Land take has been gradually reduced in the last decade, especially in the period 2012-2018. The share of agricultural area at risk of soil erosion by water has an upward trend and is above the EU average (10.2 % vs 7% in 2016). According to estimates, about half of the agricultural areas face a serious risk, with significant variations among regions. In 2015, the mean soil organic content in arable land, important for all soil processes, is well below the EU average (15.8 vs 43.1 gC/kg soil); yet, according to relevant studies, it is noted that Mediterranean regions of Europe exhibit distinctively smaller values of organic content than those of other regions.

Greater efforts are required to enhance the conservation status of protected habitats and species, to manage protected areas and to preserve landscape, while knowledge and monitoring need to be strengthened. About half of habitats and species of European interest have unfavourable status, and agriculture is one of the pressures with high frequency of occurrence. The conservation status of grassland and forest habitats of European interest is of favourable status by 40% and 68.3% respectively. The most persistent threats of grassland habitats are not differentiated from those for habitats in general, with the development, construction and use of residential, commercial, industrial and recreational infrastructure to be ranked on top, whilst the most significant threat of high impact to forest habitats is forestry. Birds of European interest are less threatened than species, with a 7.5% showing a decreasing short-term trend. On the other hand, the common bird indicator declined by 19.8% in the period 2007-2016, similar to that of EU. The same period, the farmland bird index shows a slight decrease (2.6%), whereas an unwelcome decline is recorded for the forest bird index (38.1%). Nationally protected areas are the main regulatory instrument to protect biodiversity in the country, which cover around 34.8% of the country's land area. The Natura 2000 network has been expanded and covers 27.3% of the land territory, with a share of agricultural areas at 18.7% and forest areas at 40%. Yet, few protected areas have management plans. Landscape elements of special value are also protected under the national system of protected areas. As for agricultural landscape, the density of linear features on agricultural land varies a lot among the regions of the country and the share of High Nature Value farming areas is above 1/3 of utilised agricultural area.

Concrete national policy steps towards a circular economy and turning waste into resource are in place, yet waste management in practice is still the most challenging environmental area. The agenda of the National Waste Management Plan and the National Waste Prevention Programme beyond 2020 is in line with the mandate of the EU waste policy, yet Greece will need to put more effort into shifting waste away from landfilling and boosting waste hierarchy into practice to pursue the transition to a more circular economy as shaped in the National Circular Economy Strategy. Regarding food waste from primary production and food processing/manufacturing, the 2013 FAO estimate of the corresponding index for Greece is 5.1%, and ranked 5th among the member states. Concrete steps need to be made to monitor effectively agricultural waste management, whilst Greece must speed up to establish all the necessary procedures and monitoring mechanism to measure regularly the progress in the reduction of food waste generation.

More than half of the population in the country lives in rural areas and report to be in good health status, whilst unemployment is an issue for young people and the ageing farmer population persists. Rural areas are home to around 5.9 million people in 2019, about half of country's population. The distribution of population by degree of urbanisation is rather stable over the last decade, with the population living in rural areas showing a decreasing trend. Rural population is ageing, with a decline in youth by 5.4% between 2014 and 2019. The health status of the Greek population shows constant improvement in the last decades, with a total life expectancy at birth to be recorded at 81.7 in 2019, whilst about three out of four people living in rural areas perceived their health as very good or good. The employment rate of the population living in rural areas is 64.1%, below the EU27 average, whilst unemployment remains an issue for young people, yet it is lower than that in semi-urban and urban areas. Over the last decade, the ageing farmer population in Greece persists, with about 3/5 of farmer managers older than 55 years, whose basic agricultural training is quite below the EU27 average. Greece has one of the lowest shares of young farmers within EU27, who have though at least a basic level of agricultural training similar to the EU27 average.

1.7 Environmental assessment, mitigation measures and monitoring

At strategic level, the overall appraisal of the effects of the CAP SP for Greece on the environment is positive, having regard that the proposed design of the strategic plan responds to the environmental and climate objectives of the CAP for the next programming period, with its specialized Environmental and Climate Architecture, which incorporates an enhanced conditionality system and interventions under both pillars that seek to integrate the requirements of EU and national environmental policy in agriculture and rural development. Significant negative effects on the environment are anticipated to be largely avoided or not actively promoted by the plan, whilst uncertain or adverse environmental effects cannot be ruled out. The likely adverse effects are typically linked to the establishment of new infrastructures that are regarded as rather localized side effects of agricultural and rural development, while there are still opportunities for enlarging the already identified environmental benefits of the CAP SP that could minimize the uncertain effects closely linked to the efficiency of agricultural land uses and could boost the incentivization of beneficiaries towards a higher environmental protection. In this light, the consideration of measures and recommendations to prevent, reduce and as fully as possible offset any significant adverse effects on the environment of implementing the CAP SP of Greece is complemented by proposals to optimize the anticipated positive effects of the plan that seek to enhance its overall environmental performance for the next programming period.

▪ ***Measures and recommendations to minimise significant adverse effects on the environment***

The addressed measures are built upon the mechanisms already in place for the protection of the environment that are relevant to the implementation of the CAP SP: (a) the planned control and penalty system for the beneficiaries of the interventions that are linked to conditionality measures on the protection of environment (SMRs and GAECS), (b) the environmental permitting process that must be followed by the beneficiaries for those interventions that involve projects and activities pursuant to the provisions of Law 4014/2011 (OGG A' 209), and (c) the planned monitoring mechanism of the implementation of the CAP SP, that will enable to evaluate the progress towards the achievement of the environment and climate-related objectives over the whole CAP SP period and identify needs for remedial actions, incorporating for that purpose a core set on environmental indicators already laid down in Annex I of Regulation (EU) 2021/2115.

In order to minimise any likely adverse environmental effects for all new agricultural activities, changes in agricultural activities or management practices that are not subject to environmental permitting process and do not pursue environmental objectives, the following measures need to be sufficiently realised:

- compliance with local spatial planning and provisions of the relevant national environmental legislation, taking into account the specific conditions set out by the statutory plans for the concerned areas (e.g. action programme for the nitrate vulnerable areas, river basin management plans, statutory specific environmental studies, Natura 2000 management plans, pasture management plans).
- provision of tailored-made technical assistance/ advisory services, where required, that would enable to respond to high environmental protection, with particular consideration of applications on environmentally stressed areas or areas with environmental degradation trends that are closely interrelated to agricultural activities.

- provision of dedicated understanding and training to farmers or other beneficiaries on the environment, addressing key environmental challenges facing agriculture, especially water, soil, biodiversity, landscape and climate change.

The above measures are complemented by recommendations and guidelines to support the implementation of interventions in the right place and pursue the most appropriate measures in the most appropriate places, focusing on the interventions that do not target environmental purposes or are not connected with environmental- related restoration activities:

- Assessment of the potential to prioritise applications with lower land use effects on the environment or better efficiency in agricultural land uses, especially in relation to the effects and the interactions on water, soil, biodiversity, landscape and climate change.
- Consideration of the national strategic priorities stipulated in Law 2742/1999 (A' 207) on strategic spatial planning, related to agriculture and rural development, for high productivity rural areas, suburban rural areas and mountainous and semi-mountainous areas, including insular areas with a rural character.
- Consideration of the existing environmental situation in the approval process at regional level, e.g. in nitrate vulnerable areas, water stressed areas, protected areas with species or habitats with unfavorable conservation status or decreasing trends, etc, and the cohesion with the planned actions for the concerned areas emerging from relevant plans and programmes.
- Consideration of incorporation of minimum environmental standards or targets as requirements for the applicants in environmentally stressed areas or areas with environmental degradation trends; these standards or targets should be sought by priority to be achieved with the CAP SP's interventions that pursue environmental purposes.
- Establishment of a governmental coordination mechanism to effectively liaise with the competent authorities in charge of implementing the actions of the national/regional plans and programmes of high relevance, especially those derived from Annex XIII of Regulation (EU) 2021/2115; the applications that contribute to the achievement of these actions would need to be prioritised.
- The CAP SP's monitoring mechanism should allow an annual assessment of the significant environmental effects of the plan; the outcome of the assessment should be used to (a) conclude on the annual environmental performance of the plan in quantitative terms and remark possibilities and opportunities of improvements to achieve the stated environmental and climate related objectives of the plan, (b) direct the planning of the interventions in the right place to contribute to a higher environmental protection and (c) enable corrective actions where required, especially when cumulative adverse environmental effects may arise.

■ ***Proposals to increase the environmental benefits of the plan***

Having regard to the fact that the level of significance of the positive effects that are anticipated from the Environmental and Climate Architecture of the CAP SP practically depends on the level of uptake and the synergies that could be sought among the various interventions geared towards environmental goals, but also on the type of agricultural and rural activities and the local environmental conditions, the following proposals and recommendations are suggested to boost the environmental benefits of the CAP SP to the extent feasible:

- Apply a steering mechanism to incentivize the beneficiaries over environmental targets and increase the level of uptake of interventions that pursue environmental purposes; establish a help desk devoted to candidate beneficiaries for the opportunities and possibilities embedded in the interventions of the Environmental and Climate Architecture of the CAP SP (e.g. eco-schemes, environmental and climate-related commitments) and the available combinations of interventions that are best applicable and feasible to the beneficiaries.
- Assess the potential to reward farmers and other beneficiaries (e.g. through the introduction of bonus payments) for:
 - o a minimum set of environmental actions that are based on pre-defined environmental target values, tailored made to the needs and consistent with the planned actions of the concerned areas
 - o the use of best applicable techniques and practices with the lower environmental impact
 - o long-term actions on the environment, beyond the programming period of the CAP SP
- Explore the possibilities of delivering a spatial focus in the monitoring of the CAP SP that would best direct the planning of interventions in the right place, by capturing and making use of spatial data, where available, especially in relation to quantitative and qualitative status of water resources, soil and climatic data and status of protected species and habitats.
- Assess the potential to make prerequisite to advisors and trainers to make use of scientific literature and official studies on the direct and indirect environmental impacts of agricultural activities, to deliver, encourage and direct best available agricultural practices and to preliminary document broad practical solutions, especially in areas that are under Natura 2000 sites, nitrate vulnerable zones or other environmentally sensitive/ stressed areas; all the documentation could be also made available on a dedicated web-repository for all beneficiaries.

▪ ***Envisaged environmental monitoring system***

The environmental monitoring of the CAP SP is proposed to be integrated in the performance, monitoring and evaluation framework that will be established as part of the implementation of the CAP SP for the next programming period to avoid duplication of monitoring and to minimize administrative burdens. The responsibility for the monitoring of the effectiveness of the implementation of the CAP SP lies between the national Managing Authority and the national Monitoring Committee of the plan, in close collaboration with OPEKEPE, that is the Accredited Paying Authority, for the programming of data collection and processing and annual reporting on the performance, monitoring and evaluation activities linked to the CAP SP.

The SEA monitoring programme will be realised on an annual basis and will be embedded in the monitoring programme of the CAP SP. It will make use of the environmental impact indicators already enlisted in Annex I of SPR Regulation with complementary impact indicators to cover fully the likely significant environmental effects of the plan. Certain additional arrangements would be needed for the SEA monitoring of the plan: the setting up of an environmental monitoring working team, the development of a solid framework for the necessary gathering, compilation and processing of data to feed in the SEA indicators, the establishment of coordination mechanism to liaise with the authorities entitled for monitoring official environmental-related obligations of the country and the progress of relevant national/regional plans, including the consideration of the planning for a spatial analysis of the significant environmental effects of the interventions as part of the SEA monitoring regime, where practicable and feasible.

2 General information

The new European Commission's Common Agricultural Policy (CAP) is designed to support European farmers and ensure Europe's food security and a resilient, sustainable, and competitive agricultural sector, setting higher ambitions on environment and climate objectives for the agricultural sector. The implementation of the new CAP mandates each member state to carry out an extensive analysis of its specific needs and develop a Strategic Plan (CAP SP), which will set out how it will use CAP funding to meet its needs in the next programming period, establishing its own specific targets while complying with the overall objectives set by the EU.

In accordance with Article 104 of Regulation (EU) 2021/2115 (referred to as SPR), Greece is preparing a single CAP SP in the programming period 2023-2027 for its entire territory, after analysing extensively the country's specific needs. The main aim of the Greek CAP SP for the new programming period is to further improve the sustainable development of farming, food and rural areas and to contribute to achieving the general and specific objectives addressed in Articles 5 and 6 of SPR regulation.

The Greek CAP SP is developed on the basis of a thorough Strategic Environmental Assessment (SEA), which is a valuable ex ante process for evaluating the environmental consequences of a proposed plan to ensure environmental issues are fully integrated and addressed at the earliest appropriate stage of decision making with a view to promoting sustainable development. The overall scope of the SEA is to provide a high level of protection of the environment and to contribute to the integration of environmental considerations into the preparation and adoption of the Greek CAP SP, ensuring thus that potentially conflicting objectives and likely significant negative environmental impacts are addressed.

The SEA process follows the provisions set out in the Directive 2001/42/EC of the European Parliament and of the Council (SEA Directive) that was transposed into Greek law by the Joint Ministerial Decision 107017/2006 (Official Gazette 1225/B/05.09.2006), as amended by the Joint Ministerial Decision 40238/2017 (Official Gazette 3759/B/28.09.17) (referred to as SEA-JMD). It is a legal precondition for the approval of the Greek CAP SP, which is carried out during the formulation of the Plan and before its adoption in order to identify possible negative impacts on the environment of the measures included in the Plan and the corrective measures to be added to avoid and mitigate them.

The SEA process includes the preparation of a study for Strategic Environmental Assessment (SEA Report), its information and consultation, its approval by the competent authority, including the monitoring requirements during the implementation of the Greek CAP SP. It is an autonomous process and is performed in parallel to the CAP SP programming process and its ex-ante evaluation. Though not a mandatory requirement by the national legislation (SEA-JMD), a SEA scoping report was also prepared for MRDF as part of the SEA process to better define the issues that need to be addressed and further developed in the SEA report, considering the specific context in which the CAP SP is being developed and is likely to be implemented.

The SEA report contains the elements described in SEA-JMD: a non-technical summary; the scope and objectives of the Greek CAP SP, along with the environmental objectives and the CAP SP's relations to other relevant programmes and plans; a detailed description of the Greek CAP SP and its reasonable alternatives; the environmental baseline; the assessment of the likely environmental impacts associated with the plan, and the mitigation measures and monitoring requirements.

A fundamental step of the SEA process is to give the authorities with responsibilities on certain aspects of the environment and the public the opportunity to express their opinion on the SEA report, which may lead to additional information or views that should be taken into account to ensure the integration of the environmental concerns into the Greek CAP SP. Following consultation, the collected information will provide feedback for the finalisation of the SEA report.

The approval of the SEA report for the Greek CAP SP is a regulatory act, at which detailed terms are set, so that the necessary actions to address and monitor the Plan's environmental effects are integrated into it. Pursuant to article 4 of the JMD-SEA, the competent authority responsible for coordinating, evaluating and approving the SEA results for the Greek CAP SP is the Directorate for Environmental Licensing of the Ministry of Environment and Energy (MoEE).

In addition, according to Articles 107(2a) and 115(1) of the SPR on the content of the CAP SPs, the Greek CAP SP will include the summary of the main results of the SEA and how they have been addressed or a justification of why they have not been taken into account, and a link to the complete SEA report.

The formulation of the SEA report follows the provisions set out in the relevant EU and national legislation, by taking also into account the EU guidelines for SEA and any related guidance from the European Evaluation Helpdesk for Rural Development. It is structured in accordance with Annex III of the SEA-JMD.

2.1 Planning authority

The Ministry of Rural Development and Food (MRDF) is assigned the responsibility for the planning and formulation of the Greek CAP SP for the programming period 2023-2027.

The implementation of the Greek CAP SP will be carried out by the institutions defined in the Regulation (EU) 2021/2115 (referred to as SPR Regulation) and the Regulation (EU) 2021/2116 (referred to as CAP Horizontal Regulation), these being:

- the Managing Authority, responsible for managing and implementing the CAP SP in an efficient, effective and correct way (article 123 of SPR Regulation)
- the Monitoring Committee, responsible to monitor the implementation of the CAP SP (article 124 of SPR Regulation)
- the Accredited Paying Agency, responsible for the management and control of EAGF and EAFRD expenditure, and a Public Coordinating Body where more than one paying agency is accredited (article 9 and 10 of CAP Horizontal Regulation)
- the Certification Body, for a minimum three-year period, without prejudice to national law (article 12 of CAP Horizontal Regulation)
- the Competent Authority at ministerial level, responsible for matters related to the Accredited Paying Agency and the Certification Body (article 8 of CAP Horizontal Regulation)

The Managing Authority of the Greek CAP SP 2023-2027 is entitled "Special Managing Authority of the CAP Strategic Plan", that is operated under the auspices of the General Secretary of European Funds and Infrastructure of MRDF.

Pursuant to Law 3508/2006 (OGG 249 A/16-11-2006), there is a single Accredited Paying Authority, which is the “Payment and Control Agency for Guidance and Guarantee Community Aid”, referred to as OPEKEPE. It is a private legal entity operating since 2001 for the public interest and is supervised by MRDF.

According to Article 123 of the SPR regulation, one or more intermediate bodies may be designated to carry out the management and implementation of CAP SP interventions, including local authorities, regional development bodies or nongovernmental organisations. When a part of its tasks is delegated to another body, the Managing Authority retains full responsibility for the efficiency and correctness of the management and implementation of those tasks. The Managing Authority is also assigned to ensure that appropriate provisions are in place to allow the other bodies to obtain all necessary data and information for the execution of those tasks.

2.2 SEA consultant

The strategic environmental assessment (SEA) report of the national CAP SP of Greece for the programming period 2023-2027 is carried out by the World Bank technical team under the Strategic Planning for Agriculture and Rural Transformation and Action (SPARTA) advisory project between the World Bank and the Ministry of Rural Development and Food (MRDF) of Greece. The SEA process constitutes one of the components of the SPARTA project that provide advisory support to the Ministry related to the preparation of the Greek CAP SP 2023-2027:

- (i) an ex-ante evaluation of the draft CAP SP 2023-2027;
- (ii) a Strategic Environmental Assessment (SEA) of the draft CAP SP 2023-2027;
- (iii) a risk management framework for agriculture; and
- (iv) a climate smart agriculture investment plan.

Through these activities, the World Bank technical team will provide agricultural policy advice to MRDF and support the consolidation of the Greek CAP SP in alignment with the EU guidance on the CAP Strategic Plan formulation for the programming period 2023-2027. The advisory services also involve capacity-building of sector stakeholders for evidence-based decision making and strong outreach to sector stakeholders and the public in general, to ensure a broad participatory approach for the formulation of key policy recommendations.

The SPARTA project has a total duration of 24 months and is financed by the European Agricultural Fund for Rural Development (EAFRD) and the national budget.

3 Scope and objectives of the plan

This section describes the scope of the CAP SP of Greece for the programming period 2023-2027 and its wider objectives. Moreover, according to the contents of Annex III of SEA-JMD, this section includes the international, EU and national environmental protection objectives related to the Greek CAP SP, the manner in which these objectives and environmental issues have been considered in the preparation of the Greek CAP SP and its relationship with other relevant plans and programmes.

3.1 Scope of the Greek CAP SP

The scope of the CAP SP of Greece is to implement the new proposal of the European Commission's CAP in the country for the programming period 2023, which is designed to support European farmers and ensure Europe's food security and a resilient, sustainable and competitive agricultural sector, focusing thus on the economic viability, the resilience and income of farms, on an enhanced environmental and climate performance, and on the strengthened socio-economic fabric of rural areas. The Greek CAP SP will be financed by the European Agricultural Guarantee Fund (EAGF) and by the European Agricultural Fund for Rural Development (EAFRD).

The Greek CAP SP has been drafted by taking into consideration the Regulation (EU) 2021/2115 (referred to as SPR). The overall aim of the plan is to further improve the sustainable development of farming, food and rural areas and to contribute to achieving three general objectives (Article 5 of SPR):

- (a) to foster a smart, resilient and diversified agricultural sector ensuring food security;
- (b) to bolster environmental care and climate action and to contribute to the environmental and climate related objectives of the Union;
- (c) to strengthen the socio-economic fabric of rural areas.

The achievement of the general objectives will be pursued through nine specific objectives, covering all three dimensions (economic, environmental and social) of sustainability (Article 6 of SPR):



SO1. support viable farm income and resilience across the Union to enhance food security



SO2. enhance market orientation and increase competitiveness, including greater focus on research, technology and digitalisation



SO3. improve the farmers' position in the value chain



SO4. contribute to climate change mitigation and adaptation, as well as sustainable energy



SO5. foster sustainable development and efficient management of natural resources such as water, soil and air



SO6. contribute to the protection of biodiversity, enhance ecosystem services and preserve habitats and landscapes



SO7. attract young farmers and facilitate business development in rural areas



SO8. promote employment, growth, social inclusion and local development in rural areas, including bio-economy and sustainable forestry



SO9. improve the response of EU agriculture to societal demands on food and health, including safe, nutritious and sustainable food, food waste, as well as animal welfare.

Those objectives are to be complemented by the cross-cutting objective (SO10) of modernising the sector by fostering and sharing of knowledge, innovation and digitalisation in agriculture and rural areas, and encouraging their uptake.

Based on the outcomes of the previous programming period 2014-2020, the draft Greek CAP SP has been developed after an extensive SWOT analysis and needs assessment, which enabled to establish the country's own specific targets, while complying with the general and specific objectives set within EU. To deliver on these objectives, the interventions are designed according to the country's circumstances and are based on the types of interventions mentioned in the SPR regulation.

In this context, the draft Greek CAP SP has also taken into consideration the Commission's recommendations for Greece, published in the form of a Commission Staff Working Document (SWD/2020/372), which identify key strategic issues that need to be tackled for the implementation of the specific objectives of the CAP in Greece and provide guidance on how to address them in the strategic plan.

3.2 International, EU and national objectives for environmental protection

The review of the relationship of the proposed CAP SP 2023-2027 with the existing framework of the international commitments and the EU and national policy containing environmental objectives is a key part of the SEA process. These requirements involve the consideration of the international, EU and Greek

environmental and climate policy documents, which are relevant to the implementation of the Greek CAP SP. It is herewith important to note that since the new CAP sets specific objectives to be applied in the national CAP strategic plans with the aim to trigger environmental and climate action, especially in regards to the objectives SO4, SO5 and SO6, the Greek CAP SP is in line with the respective EU and national policies. In all, the Greek CAP SP is expected to support or be supported by these policy documents through similar objectives.

3.2.1 International objectives

Besides national legislation, international conventions which Greece has ratified, provide requirements for the protection of the environment. The main international objectives that are relevant to the implementation of the CAP SP are summarised in the table below.

Table 1: International environmental objectives

Aspect	International Agreement	Environmental objectives
Climate	United Nations Framework Convention on Climate Change (UNFCCC) - Law 2205/1994 (OGG 60/A/15-04-1994) Kyoto Protocol - Law 3017/2002 (OGG 117/A/30-05-2002) Paris Agreement - Law 4426/2016 (OGG 187/A/06-10-2016)	Reduction of global emissions of GHGs; keeping global warming to well below 2, preferably to 1.5 degrees Celsius, compared to pre-industrial levels
Air	United Nations Convention on Long-range Transboundary Air Pollution (CLRTAP)- Law 1374/1983 (OGG 91/A/08-07-1983)	Reduction of air pollution, including long-range transboundary air pollution
Biodiversity	United Nations Convention on biological diversity (CBD) - Law 2204/1994 (OGG 59/A/15-04-1994) Nagoya Protocol -Law 4617/2019 (GG/A/10-06-2019)	Conservation of biodiversity; sustainable use of the components of biodiversity; fair and equitable sharing of the benefits arising out of the utilization of genetic resources
	Bern Convention - Law 1335/1983 (OGG 32/A/14-03-1983)	Conservation of European wildlife and natural habitats
	Bonn Convention - Law 2719/1999 (OGG 106/A/26-05-1999)	Conservation of migratory species of wild animals
	Barcelona Convention - Law 855/1978 (OGG 235/A/23-12-1978) SPA protocol - Law 1634/1986 (OGG 104/A/18-07-1986)	Protection of special protected areas of the Mediterranean
	Ramsar Convention - Legislative Decree 191/1974 (OGG 350/A/20-11-1974), as amended by Law 1950/1991 (OGG 84/A/31-05-1991)	Protection and conservation of wetlands of international importance
	CITES Convention - Law 2055/1992 (OGG 105/A/30-06-1992)	Regulation and monitoring of international trade in certain species of animals and plants
Land /Soil	United Nations Convention to Combat Desertification (UNCCD) - Law 2468/1997 (OGG 32/A/06-03-1997)	Combating desertification and land degradation
Heritage	UNESCO World Heritage Convention - Law 1126/1981 (OGG 32/A/10-02-1981)	Protection of world cultural and natural heritage

3.2.2 EU objectives

3.2.2.1 European Green Deal

In December 2019, the European Commission adopted the Communication on “The European Green Deal” (COM/2019/640), which is the EU strategy for sustainable growth by turning climate and environmental challenges into opportunities across all policy areas and making the transition just and inclusive for all. The European Green Deal provides an action plan to boost the efficient use of resources by moving to a circular economy, to restore biodiversity and cut pollution as well as to be climate neutral by 2050.

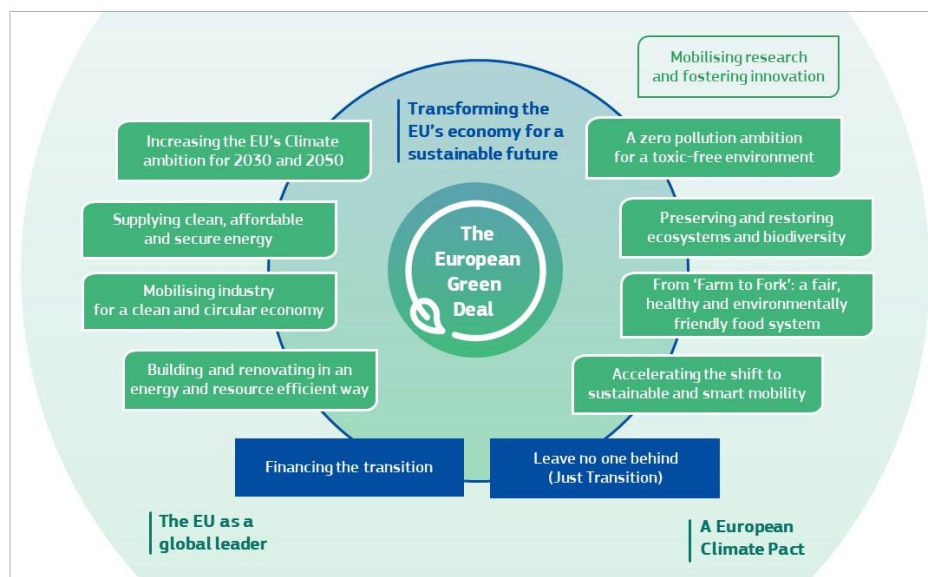


Figure 1: The European Green Deal

Source: COM/2019/640

In order to advance in this direction, the European Commission adopted associated strategies: the Farm to Fork Strategy (COM/2020/381), the Biodiversity strategy (COM/2020/380), the 2030 Climate Target Plan (COM/2020/562) and the new Action Plan for the Circular Economy (COM/2020/98), including the new EU Strategy on Adaptation to Climate Change (COM/2021/82), the Zero Pollution Action Plan (COM/2021/400), the EU Soil Strategy (COM(2021)699) and the EU Forest Strategy (COM/2021/572). These strategies address issues relevant to the agricultural sector and the challenges of creating sustainable food systems and recognise the links between healthy people, healthy societies and healthy nature.

The CAP, which plays a key role in supporting Europe's agriculture and food systems, is also an important policy instrument in managing the sustainability transition of the food production systems and strengthen the efforts of European farmers to tackle climate change and protect the environment. The contribution of the new CAP to the EU's environmental and climate protection commitments set in the European Green Deal is analysed in the Commission Staff Working Document (SWD/2020/93), which stresses that the specific objectives of the CAP, that are addressed by the Member States via their strategic plans, are already in line with the European Green Deal, especially when it comes to:

- Increased contribution of EU agriculture to climate change mitigation and adaptation;
- Improved management of natural resources used by agriculture, such as water, soil and air;
- Reinforced protection of biodiversity and ecosystem services within agrarian and forest systems;

- Effective sustainability of food systems in accordance with societal concerns regarding food and health on e.g. animal welfare, use of pesticides and antimicrobial resistance; and
- Ensuring a fair economic return and improving the position of farmers in the food supply chain.

The Greek CAP SP will thus be able to put CAP instruments into practice (e.g. direct payments, rural development and sectorial interventions) and fulfil the objectives of the CAP and the ambition of the European Green Deal with its detailed strategies in a holistic way.

In particular, the corresponding links between the European Green Deal and the CAP SP are outlined below:

- The CAP strategic plans must be in coherence with the environmental and climate related needs identified in the planning instruments emerging from the EU legislation listed in Annex XIII of the SPR regulation. This will allow the Commission to consider the needs identified in the European Green Deal and ensure that CAP support is not targeted at practices that are considered environmentally harmful in its decision to approve the plan.
- As the CAP strategic plans will need to reflect an increased level of ambition to contribute to reaching the Green Deal targets, the SPR regulation includes a range of provisions which are relevant to progress in these areas:
 - within the proposed specific objectives, through the conditionality requirements for support (Annex III);
 - in available types of intervention through which Member States are expected to design concrete interventions to deliver on Green Deal ambitions;
 - in the list of indicators provided to steer and monitor the policy implementation and performance (Annex I), in particular result indicators which will also serve to set milestones for the Plans;
 - in the list of environmental and climate legislation (Annex XIII), which Member States must consider when drawing up their Plan;
 - the new specific objective on societal concerns requires Member States to target the risk and use of chemical pesticides, and the use of antibiotics, ensuring these major concerns will be tackled in the Plans

The Green Deal targets that would be incorporated in EU legislation listed in Annex XIII of the SPR regulation (e.g. GHG emission reductions) would influence CAP SP content through that Annex. Quantified targets will also be set in the corresponding strategies adopted at EU level (Farm to Fork Strategy and Biodiversity Strategy). The SPR regulation already provides a set of indicators associated to these new EU targets.

In addition, expanding the use of sustainable practices is specifically mentioned in the Green Deal, including the increased EU ambition over climate change and preserving and restoring ecosystems and biodiversity, as well as those aimed at strengthening the resilience of the European agriculture, inter alia, by promoting diversification of agricultural production (agro-diversity). According to the Commission's document, the new CAP provides for specific elements which can help bring about the necessary transition in the farm (and forestry sector), these being:

- An improved system of conditions ("conditionality"), of which the mandatory standards would set a baseline for making farming more sustainable. Key obligations would include those on crop rotation, soil protection, maintaining permanent grassland, protecting wetlands and peatlands, Natura 2000

Directives and the need to protect existing landscape features or devote an area on each farm to “non-productive” features;

- A complementary set of (voluntary) tools to be offered to farmers to help achieve the CAP environmental and climate objectives:
 - A new stream of funding for the environment and climate ("eco-schemes") to support precision farming, organic farming, agro-ecology and agro-forestry – as well as other approaches or specific practices relevant to climate change, management of natural resources, and biodiversity;
 - Continued support from the CAP's rural development budget for environment- and climate-relevant management practices, investments, knowledge-building, innovation and co-operation.

Finally, in view of the Green Deal's aim not only to improve sustainability of production methods in the EU farming sector, but to transform Europe's food systems in the broadest sense, the Commission's document highlights that the new CAP provides a range of instruments to support the response of EU agriculture to this wider objective in terms of income and competitiveness, position of farmers in the food supply chain, rural jobs and growth for sustainable food.

3.2.2.2 Environment Action Programme

The EU environmental policy reflects a diversity of instruments, from targeted regulatory interventions on specific issues to a stronger focus on integrating the environmental dimension into sectoral policies, such as the agricultural sector, as well as to a broader sustainability perspective. It is framed around three priorities, as outlined in the 7th Environment Action Programme (7th EAP, Decision 1386/2013/EU):

- (1) to protect, conserve and enhance the EU's natural capital;
- (2) to turn the EU into a resource-efficient, green and competitive low-carbon economy; and
- (3) to safeguard the EU's citizens from environment-related pressures and risks to their health and well-being

The 7th EAP provides a vision for 2050 of “Living well, within the planetary boundaries” as well as an overarching framework for shorter term objectives targeting mainly the time horizon 2020. Environmental integration is specifically pursued for the agricultural sector. In particular, the 7th EAP notes that cross-compliance is particularly important in contributing to the sustainability of agriculture, which plays a major role in maintaining natural resources, especially water and soil as well as biodiversity and diverse cultural landscapes. Greening of the agricultural sector will also promote ecologically valuable farmland and forest areas, and it will increase the land use, land-use change and forestry sector's capacity to act as a carbon sink. Agriculture has also a key role to play in achieving the objectives related to air pollution and greenhouse gas emissions, as well as responsible production and consumption.

In December 2021, the proposal for the 8th EAP (COM/2020/652) was endorsed by the European Parliament and the Council, and aims at accelerating the transition to a climate-neutral, resource-efficient and regenerative economy in a just and inclusive way, with the 2050 long-term objective already established in the 7th EAP. Building on the European Green Deal, the 8th EAP guides EU environmental policy to 2030 and has the following six priority objectives:

- i. achieving the 2030 greenhouse gas emission reduction target and climate neutrality by 2050
- ii. enhancing adaptive capacity, strengthening resilience and reducing vulnerability to climate change
- iii. advancing towards a regenerative growth model, decoupling economic growth from resource use and environmental degradation, and accelerating the transition to a circular economy

- iv. pursuing a zero-pollution ambition, including for air, water and soil and protecting the health and well-being of Europeans
- v. protecting, preserving and restoring biodiversity, and enhancing natural capital (notably air, water, soil, and forest, freshwater, wetland and marine ecosystems)
- vi. reducing environmental and climate pressures related to production and consumption (particularly in the areas of energy, industrial development, buildings and infrastructure, mobility and the food system)

3.2.2.3 EU environmental policies

The Environment Action Programme is supported by a range of EU policy packages, which are more integrated and attempt to better address the interlinkages between the environment, society and the economy. Table 2 outlines the existing EU environmental policy and its wider objectives, setting the framework within which the CAP SP 2023-2027 will operate. Most of the EU environmental policies include legal policy instruments for their implementation, which constitute binding requirements for the Member States and thus Greece. As shown in the table below, the EU environmental objectives are interrelated to the specific objectives SO4, SO5 and SO6, including SO8 and SO9, of the CAP SP. It is noted that certain EU policy documents have been recently updated (e.g. new EU Climate Adaptation Strategy) or added (e.g. Zero Pollution Action Plan), which will possibly define new commitments by the Member States beyond 2020.

Table 2: EU environmental objectives

Aspect	Key strategic policy documents	Main legal policy instruments	Objectives
Climate and energy	<ul style="list-style-type: none"> ▪ Clean Planet for all (COM/2018/773) ▪ 2030 Climate Target Plan (COM/2020/562) ▪ EU Strategy on Adaptation to Climate Change (COM/2021/82) 	<ul style="list-style-type: none"> ▪ European Climate Law ▪ Regulation on Energy Union and Climate Action ▪ Emissions Sharing Regulation ▪ RES Directive ▪ Energy Efficiency Directive ▪ LULUCF Regulation 	Meet climate neutrality and achieve net zero greenhouse gas emissions; Implement adaptation strategies to strengthen resilience and reduce vulnerability to the effects of climate change
Air	<ul style="list-style-type: none"> ▪ Clean Air Programme for Europe (COM/2013/918) ▪ Action Plan towards Zero Pollution for Air, Water and Soil (COM/2021/400) 	<ul style="list-style-type: none"> ▪ Air Quality Directive ▪ NEC Directive 	Achieve air quality levels that do not result in unacceptable impacts on, and risks to, human health and the environment
Biodiversity	<ul style="list-style-type: none"> ▪ EU Biodiversity Strategy for 2030 (COM/2020/380) ▪ EU Pollinators Initiative (COM/2018/395) ▪ EU Forest Strategy for 2030 (COM/2021/572) 	<ul style="list-style-type: none"> ▪ Habitats Directive ▪ Birds Directive 	Effectively manage protected areas, reduce pressures on biodiversity and restore degraded ecosystems; Tackling causes of pollinators decline; Protection, restoration and sustainable management of forests
Water	<ul style="list-style-type: none"> ▪ Blueprint to Safeguard Europe's Water Resources (COM/2012/673) 	<ul style="list-style-type: none"> ▪ Water Framework Directive ▪ Nitrates Directive ▪ Directive on the Sustainable Use of Pesticides 	Secure the availability of good-quality water for sustainable and equitable water use;

Aspect	Key strategic policy documents	Main legal policy instruments	Objectives
	<ul style="list-style-type: none"> ▪ Action Plan towards Zero Pollution for Air, Water and Soil (COM/2021/400) 	<ul style="list-style-type: none"> ▪ Water Reuse Regulation ▪ Floods Directive 	Reduce nutrient losses; the use of chemical pesticides; Reduce and manage the risks that floods pose to human health and the environment
Waste and resources in a circular economy	<ul style="list-style-type: none"> ▪ Action Plan for the Circular Economy (COM/2020/98) ▪ Action Plan towards Zero Pollution for Air, Water and Soil (COM/2021/400) 	<ul style="list-style-type: none"> ▪ Waste Framework Directive 	Transition to a circular economy and resource efficient Europe; Reduce significantly total waste generation
Soil	<ul style="list-style-type: none"> ▪ Action Plan towards Zero Pollution for Air, Water and Soil (COM/2021/400) ▪ EU Soil Strategy for 2030 (COM(2021)699) 	-	Protect and enhance soil quality and fertility; Remediate degraded land
Landscape	<ul style="list-style-type: none"> ▪ European Landscape Convention (referred to as Florence Convention) 	-	Promote the protection, management and planning of the landscapes

The key policy pillars interlinked to the CAP and the corresponding CAP SPs of the member states are mostly the strategies associated with the implementation of the European Green Deal, such as the Biodiversity Strategy for 2030. Additional key policy pillars linked to the CAP SP are the EU water policy, the EU climate and energy framework and the EU air policy, which are predominantly implemented through EU legal policy instruments, with objectives that are binding requirements for Greece and for which relative national plans and programmes apply (see section 3.4). It is noted that the EU environmental policy has been updated with the EU Soil Strategy and the EU Forest Strategy for 2030, as well as the Zero Pollution Action Plan, which are initiatives of the European Green Deal, relevant to the implementation of the CAP SP.

In addition, while not being environmental policies per se, two frameworks of particular relevance to the environment and the implementation of the draft CAP SP are the 2020 Farm to Fork Strategy (COM/2020/381) and the 2018 Bioeconomy Strategy (COM/2018/673).

The outline and objectives of the major EU policy pillars strongly linked to the CAP SP are described in the following paragraphs.

A. Biodiversity Strategy

With an objective to put Europe's biodiversity to recovery by 2030, the biodiversity strategy (COM/2020/380) sets out new ways to implement existing legislation more effectively, new commitments, measures, targets and governance mechanisms. These include:

- Transforming at least 30% of Europe's lands and seas into effectively managed protected areas. The goal is to build upon existing Natura 2000 areas, complementing them with nationally protected areas, while ensuring strict protection for areas of very high biodiversity and climate value.
- Restoring degraded ecosystems across the EU that are in a poor state, as well as reducing pressures on biodiversity. The Strategy proposes a far-reaching EU Nature Restoration Plan that includes:

- Subject to an impact assessment, developing a proposal for a new legal framework for nature restoration, with binding targets to restore damaged ecosystems, including the most-carbon-rich ones;
 - Improving the conservation status or trend of at least 30% of EU protected habitats and species that are not in a favourable status;
 - Restoring at least 25,000 km of rivers to be free flowing;
 - Halting and reversing the decline in farmland birds and insects, particularly pollinators;
 - Reducing the overall use of and risk from chemical pesticides, and reducing the use of the more hazardous/dangerous ones by 50%;
 - Manage at least 25% of agricultural land under organic farming, and significantly enhance the uptake of agro-ecological practices;
 - Reducing the losses of nutrients from fertilisers by at least 50% and fertiliser use by at least 20%;
 - Planting at least 3 billion trees, in full respect of ecological principles and protecting the remaining primary and old-growth forests;
 - Eliminating bycatch of protected species or reducing it to a level that allows full species recovery and does not threaten their conservation status.
- Improving biodiversity governance, ensuring Member States integrate the commitments of the strategy into national policies. A Biodiversity Knowledge Centre and a Biodiversity Partnership will support better implementation of biodiversity research and innovation in Europe. The Strategy seeks to stimulate tax systems and pricing to better reflect real environmental costs, including the cost of biodiversity loss, and that biodiversity is truly integrated into public and business decision-making.

Some of the above objectives, such as the organic farming and fertilizer and pesticides uses, target specifically the agricultural sector. It is also underlined that the Biodiversity Strategy, together with the Farm to Fork Strategy published at the same time, includes commitments to reverse the decline of pollinator insects. The Commission proposes that 10% of agricultural land should consist of 'high-diversity landscape features', for instance in the form of hedges or flower strips, and the environmental impacts of the agricultural sector should be significantly reduced by 2030. The progress towards the target will be under constant review, and adjustment if needed, to mitigate against undue impact on biodiversity, food security and farmers' competitiveness.

B. Zero Pollution Action Plan

On 12 May 2021, the European Commission adopted the EU Action Plan "Towards a Zero Pollution for Air, Water and Soil", a key deliverable of the European Green Deal. The zero-pollution vision for 2050 is for air, water and soil pollution to be reduced to levels no longer considered harmful to health and natural ecosystems, that respect the boundaries with which our planet can cope, thereby creating a toxic-free environment. This is translated into key 2030 targets to speed up reducing pollution at source. These targets include:

- improving air quality to reduce the number of premature deaths caused by air pollution by 55%;
- improving water quality by reducing waste, plastic litter at sea (by 50%) and microplastics released into the environment (by 30%);
- improving soil quality by reducing nutrient losses and chemical pesticides' use by 50%;
- reducing by 25% the EU ecosystems where air pollution threatens biodiversity;
- reducing the share of people chronically disturbed by transport noise by 30%, and
- significantly reducing waste generation and by 50% residual municipal waste.

The action plan provides a compass to mainstream pollution prevention in all relevant EU policies, to step up implementation of the relevant EU legislation and to identify possible gaps. It will be based on initiatives in the fields of energy, industry, mobility, agriculture, biodiversity and climate.

The targets of the plan with relevance to the agricultural sector are interrelated with the targets of the Biodiversity Strategy and the Farm to Fork Strategy. In addition, the focal action on water will be the stricter implementation of relevant legislation to promote sustainable water consumption, discourage water pollution and present a socially fair water bill to all water users and polluters (including agriculture). As for the actions to cut air pollution related to agriculture (ammonia emissions), apart from the Farm to Fork Strategy that will support the efforts to build a sustainable food system and a more sustainable livestock farming, the plan also envisages the revision of the Industrial Emissions Directive (which among others establishes Best Available Techniques for the intensive rearing of livestock). In all, it is also underlined that the CAP will also have a crucial role to play in incentivising Member States to support the zero pollution ambition.

C. Climate Target Plan

The Climate Target Plan delivers on the commitment made under the European Green Deal to put forward a comprehensive plan to increase the European Union's target of reducing net greenhouse gas emissions by at least 55% by 2030, compared to 1990 levels. It is also in line with the Paris Agreement objective to keep the global temperature increase to well below 2°C and pursue efforts to keep it to 1.5°C. The objectives of the plan are to:

- Set a more ambitious and cost-effective path to achieving climate neutrality by 2050
- Stimulate the creation of green jobs and continue the EU's track record of cutting greenhouse gas emissions whilst growing its economy
- Encourage international partners to increase their ambition to limit the rise in global temperature to 1.5°C and avoid the most severe consequences of climate change

On 14 July 2021, the European Commission adopted a series of legislative proposals to achieve the additional emission reductions, that will revise several EU legal instruments on climate, including the EU ETS and Effort Sharing Regulation, whilst it adopted the European Climate Law (Regulation (EU) 2021/1119) to enshrine the 2050 climate-neutrality target into law.

D. Climate Adaptation Strategy

The European Commission adopted a new EU strategy on adaptation to climate change (COM/2021/82) on 24 February 2021, which is built on the 2018 evaluation (SWD/2018/461) of the 2013 EU Adaptation Strategy (COM/2013/216). The new strategy outlines a long-term vision for the EU to become a climate-resilient society, fully adapted to the unavoidable impacts of climate change by 2050. Complementing the EU's ambitious goal to become climate neutral by mid-century, this strategy aims to reinforce the adaptive capacity of the EU and the world and minimise vulnerability to the impacts of climate change, in line with the Paris Agreement and the proposal for the European Climate Law. The new strategy seeks to step up action across the economy and society in synergy with other Green Deal policies such as biodiversity protection and sustainable agriculture. Financial support for adaptation will be made available through various financial instruments, including the CAP.

In particular, the adaptation strategy post 2020 aims to build a climate resilient society by improving knowledge of climate impacts and adaptation solutions, by stepping up adaptation planning and climate

risk assessments, by accelerating adaptation action and by helping to strengthen climate resilience globally. It pursues three objectives and proposes a range of actions in order to meet them:

- Smarter adaptation: Improving knowledge and managing uncertainty, that are available to all – from families building homes, businesses in coastal regions and farmers planning their crops; including:
 - Pushing the frontiers of adaptation knowledge;
 - More and better climate loss data; and
 - Enhancing and expanding Climate-ADAPT as the European platform for adaptation knowledge.
- Faster adaptation: Speed up adaptation implementation across the board.
- More systemic adaptation: Supporting policy development at all levels and all relevant policy fields (incl. agriculture); including three cross-cutting priorities to integrate adaptation into:
 - Macro-fiscal policy;
 - Nature-based solutions; and
 - Local adaptation actions.

The strategy integrates international action for climate resilience into its framework through the provision of resources, by prioritising action and increasing effectiveness, through the scaling up of international finance and through stronger global engagement and exchanges on adaptation.

E. Circular Economy Action Plan

The new circular economy action plan (COM/2020/98) is one of the main building blocks of the European Green Deal, that aims to the EU's transition to a circular economy in order to reduce pressure on natural resources and to create sustainable growth and jobs. It is also considered a prerequisite to achieve climate neutrality and to halt biodiversity loss. The measures of the new action plan aim to:

- make sustainable products the norm in the EU
- empower consumers and public buyers
- focus on the sectors that use most resources and where the potential for circularity is high such as: electronics and ICT, batteries and vehicles, packaging, plastics, textiles, construction and buildings, food, water and nutrients
- ensure less waste
- make circularity work for people, regions and cities
- lead global efforts on circular economy

One of the sectorial actions of the plan that is strongly related to the CAP is the food sector, taken into account that the biological resources are a key input to the economy of the EU, whilst the food value chain is responsible for significant resource and environmental pressures and a significant amount of the total food produced is lost or wasted in the EU. The Commission will thus propose a target on food waste reduction, as a key action under the EU Farm-to-Fork Strategy, which will address comprehensively the food value chain. The Commission also aims at ensuring the sustainability of renewable bio-based materials, including through actions following the Bioeconomy Strategy and Action Plan.

F. Soil Strategy

The EU Soil Strategy for 2030 that was released in November 2021 (COM(2021)699), an important deliverable of the EU Biodiversity Strategy for 2030 that will contribute to the objectives of the European Green Deal, sets out the framework and measures to protect and restore soils and endure that they are

used sustainably. It sets a vision and objectives to achieve healthy soils by 2050 with concrete actions by 2030. The key actions refer to:

- make sustainable soil management the new normal to increase soil biodiversity, fertility and resilience;
- boost circular economy through circular use of excavated soil, closing the nutrient and carbon circle, and applying a 'land take hierarchy' to achieve no net land take by 2050;
- prevent desertification and achieve land degradation neutrality;
- prevent soil pollution, restore degraded soils and remediate contaminated sites;
- mitigate and adapt to climate change by proposing legally binding objectives to halt the drainage of wetlands and organic soils, and to restore managed and drained peatlands.

The strategy consolidates, complements and steer action in the different policy areas that affect and depend on soil, such as agriculture, which will be realised in close coordination and complementarity with other European Green Deal initiatives, such as the EU Biodiversity Strategy for 2030 and the Farm to Fork Strategy.

G. Forest Strategy

The European Commission has adopted a new EU forest strategy in July 2021 (COM/2021/572), that covers the whole forest cycle and promotes the many services forests provide. The strategy is a flagship initiative of the European Green Deal and builds on the 2030 Biodiversity Strategy. In particular, the strategy will contribute to achieving the EU's biodiversity objectives as well as greenhouse gas emission reduction target of at least 55% by 2030 and climate neutrality by 2050. The strategy supports the socio-economic functions of forests for thriving rural areas and boosting forest-based bio-economy within sustainability boundaries, whilst it strives to protect, restore and enlarge the EU's forests to combat climate change, reverse biodiversity loss and ensure resilient and multifunctional forest ecosystems by:

- promoting the sustainable forest bioeconomy for long-lived wood products
- ensuring sustainable use of wood-based resources for bioenergy
- promoting non-wood forest-based bioeconomy, including ecotourism
- developing skills and empowering people for sustainable forest-based bioeconomy
- protecting all remaining EU primary and old-growth forests
- ensuring forest restoration and reinforced sustainable forest management for climate adaptation and forest resilience
- re- and afforestation of biodiverse forests, including by planting 3 billion additional trees by 2030
- providing financial incentives for forest owners and managers for improving the quantity and quality of EU forests

H. Farm to Fork Strategy

Within the framework of the European Green Deal, the European Commission launched in May 2020 the EU Farm to Fork Strategy (COM/2020/381) that aims to ensure a sustainable food value chain. It sets out the regulatory and non-regulatory measures needed to accelerate the transition to a sustainable food system, with the common agricultural and fisheries policies as key tools to support a just transition. Its goals are to:

- Have a neutral or positive environmental impact;
- Help to climate change mitigation and adaptation;
- Reverse the loss of biodiversity;

- Ensure food security, nutrition and public health, making sure that everyone has access to sufficient, safe, nutritious, sustainable food;
- Preserve affordability of food while generating fairer economic returns, fostering competitiveness of the EU supply sector and promoting fair trade.

The strategy has 27 concrete actions to transform the EU's food system by 2030, taking into account the following targets:

- a reduction by 50% of the use and risk of pesticides;
- a reduction by at least 20% of the use of fertilizers – including animal manure;
- a reduction by 50% in sales of antimicrobials used for farmed animals and aquaculture;
- a reduction by 50% of nutrient losses, while ensuring that there is no deterioration in soil fertility;
- reaching 25% of agricultural land under organic farming.

Among its actions is to propose legally binding targets by 2023 to reduce food waste across the EU, supporting thus the Commission's commitment to halving per capita food waste at retail and consumer levels by 2030 (SDG Target 12.3).

Certain of the above targets are also incorporated in the Biodiversity Strategy which came out the same day as the Farm to Fork Strategy. These two strategies are interlinked and the complementarity between biodiversity and agriculture is therefore particularly relevant.

The Farm to Fork Strategy also underlines that the transition to a sustainable food system must be supported by the new CAP that focuses on the Green Deal and aims to help farmers to improve their environmental and climate performance through a more results-oriented model, better use of data and analysis, improved mandatory environmental standards, new voluntary measures and an increased focus on investments into green and digital technologies and practices.

I. Bioeconomy Strategy

Bioeconomy is one of the EU's largest and most important sectors encompassing agriculture, forestry, fisheries, food, bio-energy and bio-based products. New ways of producing and consuming need to be sought to face challenges like climate, ecosystem degradation, coupled with a growing demand for food, feed and energy. In this regard, the EU launched its bioeconomy strategy in 2012 to stimulate knowledge development, research and innovation, and streamline existing policy approaches in this area such as the CAP. The 2018 update of the bioeconomy strategy (COM/2018/673) aims to accelerate the development of a sustainable circular bioeconomy, setting five goals:

- Ensure food and nutrition security;
- Manage natural resources sustainably;
- Reduce dependence on non-renewable, unsustainable resources;
- Limit and adapt to climate change; and
- Strengthen European competitiveness and create jobs.

It is underlined that the Bioeconomy Strategy also contributes to the European Green Deal, as well as circular economy and clean energy innovation strategies, as they all highlight the importance of a sustainable, circular bioeconomy to achieve their objectives.

3.2.3 National objectives

The environmental policy in Greece is mostly shaped by the EU policy framework on environmental protection, which is implemented through several EU environmental legislations. Where it is required to establish these in Greece, there are also corresponding national regulations. Table 3 presents the main national legal instruments that set the environmental objectives in Greece, along with the corresponding EU legislation, and their relevance with the specific objectives of the Greek CAP SP on the programming period 2023-2027.

The main legal framework concerning the environment and climate to which objectives the Greek CAP SP 2023-2027 aligns with is the one defined in Annex XIII of Regulation (EU) 2021/2115, covering 12 EU Directives/Regulations, and which are explicitly related to the specific objectives SO4, SO5 and SO6 of the plan. These requirements have been taken into consideration under the SWOT analysis and needs to ensure consistency and complementarity of the Greek CAP SP's objectives and interventions (article 109 of SPR regulation).

The implementation of the national environmental objectives usually dictates the elaboration and implementation of national plans and programmes, the outline of which are described in section 3.4, emphasizing on the linkages with the Greek CAP SP.

Table 3: National environmental objectives

Aspect	EU legislation	Annex XIII of SPR	Corresponding national legislation	Key objectives	Relevance with the objectives of CAP SP
Climate and energy	Regulation (EU) 2018/1999 on the Governance of the Energy Union and Climate Action (<i>Regulation on Energy Union and Climate Action</i>)	✓	(binding legislative act)	reduction of greenhouse gas emissions; support of sustainable energy; preparedness for and resilience to climate change impacts	SO4 & SO8 (bioeconomy)
	Regulation (EU) 2021/1119, (European Climate Law)		(binding legislative act)		
	Directive (EU) 2018/2001 on the promotion of the use of energy from renewable sources (<i>RES Directive</i>) [Dir. 2009/28/EC was valid till 6/2021]	✓	Law 4062/2012 (OGG 70/A/30-03-2012) Law 3851/2010 (OGG 85/A/04-06-2010) <i>The draft Greek Law for transposing Directive 2018/2001/EU is due to be under public consultation</i>		
	Directive (EU) 2018/2002 amending Directive 2012/27/EU on energy efficiency (<i>Energy Efficiency Directive</i>)	✓	Law 4342/2015 (OGG 143/A/09-11-2015) transposing Directive 2012/27/EU Law 4843/2021 (OGG 193/A/20-10-2021) transposing Directive 2018/2002/EU		
	Regulation (EU) 2018/841 on the inclusion of greenhouse gas emissions and removals from land use, land use change and forestry in the 2030 climate and energy framework (<i>LULUCF Regulation</i>)	✓	(binding legislative act)		
	Regulation (EU) 2018/842 of the European Parliament and of the Council of 30 May 2018 on binding annual greenhouse gas emission reductions by Member States from 2021 to 2030 contributing to climate action to meet commitments under the Paris Agreement and amending Regulation (EU) No 525/2013 (<i>Emissions Sharing Regulation</i>)	✓	(binding legislative act)		
	-		Law 4414/2016 (OGG 149/A/09-08-2016) on climate adaptation		

Aspect	EU legislation	Annex XIII of SPR	Corresponding national legislation	Key objectives	Relevance with the objectives of CAP SP
Air	Directive 2008/50/EC on ambient air quality and cleaner air for Europe (<i>Air Quality Directive</i>)	✓	JMD 14122/549/E.103/2011 (OGG 488/B/30-03-2011)	improvement of air quality and reduction of air emissions	SO5
	Directive (EU) 2016/2284 on the reduction of national emissions of certain atmospheric pollutants, amending Directive 2003/35/EC and repealing Directive 2001/81/EC (<i>NEC Directive</i>)	✓	JMD 67467/3577/2018 (OGG 4740/B/23-10-2018)		
Biodiversity	Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (<i>Habitats Directive</i>)	✓	JMD 33318/3028/1998 (OGG 1289/B/28-12-1998), as amended by JMD 14849/853/E103/2008 (OGG 645/B/11-04-2008)	preservation of protected habitats and species; protection and conservation of biodiversity	SO6
	Directive 2009/147/EC on the conservation of wild birds (<i>Birds Directive</i>)	✓	JMD 37338/1807/E103/2010 (OGG 1495/B/06-09-2010), as amended by JMD 8353/276/E103/2012 (OGG 415/B/23-02-2012)		
	-		Law 3937/2011 (OGG 60/A/31-03-2011) on biodiversity		
	-		Ministerial Decision 30339/982/2021 (OGG 1375/B/7-4-2021) on national targets for the conservation status of protected habitats and species		
Water	Directive 2000/60/EC establishing a framework for Community action in the field of water policy (<i>Water Framework Directive</i>)	✓	Law 3199/2003 (OGG 280/A/09-12-2003) Presidential Decree 51/2007 (OGG 54/A/08-03-2007)	provision of sufficient quantity of good-quality water; protection against extreme hydrological conditions	SO5 & SO9 (pesticides)
	Directive 91/676/EEC on the protection of waters against pollution caused by nitrates from agricultural sources (<i>Nitrates Directive</i>)	✓	JMD 161690/1335/1997 (OGG 519/B/25-06-1997)		

Aspect	EU legislation	Annex XIII of SPR	Corresponding national legislation	Key objectives	Relevance with the objectives of CAP SP
	Directive 2009/128/EC on the sustainable use of pesticides (<i>Directive on the Sustainable Use of Pesticides</i>)	✓	Law 4036/2012 (OGG 8/A/27-01-2012)		
	Directive 2007/60/EC on the assessment and management of flood risks (<i>Floods Directive</i>)		JMD 31822/1542/E103/2010 (OGG 1108/B/21-07-2010) as amended by JMD 177772/924/2017 (OGG 2140/B/22-06-2017)		
	-		JMD 145116/2011 (OGG 354/B/08-03-2011) on reuse of treated wastewater, as amended by JMD 191002/2013 (OGG 2220/B/09-09-2013) and JMD 100079/2015 (OGG 135/B/22-01-2015)		
	Regulation (EU) 2020/741 on minimum requirements for water reuse (<i>Water Reuse Regulation</i>)		(<i>binding legislative act</i>)		
Waste	Directive (EU) 2018/851 amending Directive 2008/98/EC on waste (<i>Waste Framework Directive</i>)		Law 4819/2021 (OGG 129/A/23-07-2021)	implementation of waste hierarchy and turning waste into a resource	SO8 & SO9
Landscape	European Landscape Convention (referred to as Florence Convention)		Law 3827/2010 (OGG 30/A/25-02-2010)	promotion of landscape protection and management	SO6

3.3 Environmental issues that have been considered in the preparation of the plan

The overall aim of the new CAP is to continue supporting farmers and rural communities, by leading the sustainable development of EU agriculture and rural areas and reflecting the EU's ambition on environmental care and climate action. Climate change, natural resources, biodiversity, habitats and landscapes are all addressed in the EU-wide objectives. Farmers' income support is already linked to the application of environment and climate-friendly practices and the new CAP will require farmers to achieve a higher level of ambition through both mandatory and incentive-based measures:

- Direct payments will be conditional on enhanced environmental and climate requirements;
- Each Member State will have to offer eco-schemes to support farmers in going beyond the mandatory requirements, funded with a share of their national direct payments' allocations;
- At least 35% of each rural development national allocation will be dedicated to environmental and climate measures;
- The possibility to transfer 15% from Pillar 1 to Pillar 2 for spending on climate and environment measures.

The proposed CAP SP is designed to implement the new proposal of the European Commission's Common Agricultural Policy in Greece after 2020, focusing among others on an enhanced environmental and climate performance of rural areas. The Greek CAP SP has been drafted by taking into consideration the Regulation (EU) 2021/2115. One of the three general objectives of the CAP SP is to bolster environmental care and climate action and to contribute to the environmental and climate related objectives of the Union, which is reflected in its three specific objectives:

- Contribution to climate change mitigation and adaptation, as well as sustainable energy (SO4)
- Fostering of sustainable development and efficient management of natural resources such as water, soil and air (SO5)
- Contribution to the protection of biodiversity, enhance ecosystem services and preserve habitats and landscapes (SO6)

In addition, the CAP SP will pursue two other specific objectives that will enable it to contribute to the objectives on circular economy, bioeconomy and food waste prevention, along with the enhancement of socio-economic environment of the rural areas, these being:

- Promotion of employment, growth, social inclusion and local development in rural areas, including bio-economy and sustainable forestry (SO8)
- Improvement of the response of EU agriculture to societal demands on food and health, including safe, nutritious and sustainable food, food waste, as well as animal welfare (SO9)

The proposed Greek CAP SP has also taken into consideration the Commission's recommendations for Greece, published in the form of a Commission Staff Working Document (SWD/2020/372), which identifies key strategic issues that need to be tackled for the implementation of the abovementioned specific objectives of the CAP in Greece.

Based on the outcomes of the last programming period 2014-2020 that will be implemented till 2022, the proposed Greek CAP SP has been developed after an extensive SWOT analysis and needs assessment, which enabled the formulation of the country's own specific targets on the environment and climate,

while complying with the general and specific objectives set within EU and seeking consistency with the corresponding environmental legal framework. To deliver on the specific objectives that will contribute to the environmental and climate objectives of the country, the interventions of the proposed CAP SP are designed according to the country's circumstances and are based on the types of interventions referred to in the SPR regulation.

3.4 Relevant national plans and programmes

The national environmental and climate policy documents which are relevant to the CAP Strategic Plan of Greece for the programming period 2023-2027 are listed in Table 4. A distinctive indication is provided for the national plans and programmes emerging from the EU environmental and climate legislation listed in Annex XIII of the SPR regulation (see also Table 3), which constitute the key national plans and programmes that should be taken into consideration during the formulation of the CAP SP of Greece.

Table 4: National environmental and climate policy documents

Aspect	National policy documents	National plans to be taken into account (Art 108 of SPR)
Climate and energy	National Energy and Climate Plan (<i>OGG 4893/B/31-12-2019</i>)	✓
	National Climate Change Adaptation Strategy	
	Regional Climate Change Adaptation Plans (<i>under development</i>)	
Air	National Air Pollution Control Program (<i>JMD ΥΠΕΝ/ΔΚΑΠΑ/5615/121/2021, OGG 182/B/22-01-2021</i>)	✓
Biodiversity	National Biodiversity Strategy and its action plan (<i>Ministerial Decree 40332/2014 OGG 2383/B/8-9-2014</i>)	
	Prioritised Action Framework for Natura 2000, for the programming period 2023-2027	✓
	National Strategy for Forests (<i>JMD 170195/758/2018, OGG 5351/B/21-11-2018</i>)	
Water	2nd River Basin Management Plans (<i>OGG, Issue B, 4664, 4665, 4666, 4672, 4673, 4674, 4675, 4676, 4677, 4678, 4679, 4680, 4681, 4682, institutionalised on 29/12/2017</i>)	✓
	Action Programme for the Nitrate Vulnerable Areas (<i>JMD 38552/265/2019 (OGG 1496/B/03-05-2019)</i>)	✓
	National Action Plan for Sustainable Use of Pesticides (<i>JMD 9269/246316, OGG 4032/B/21-09-2020</i>)	✓
	Flood Risk Management Plans (<i>OGG, Issue B, 2640, 2691, 2692, 2686, 2684, 2693, 2682, 2685, 2689, 2638, 2690, 2688, 2687, 2683, 2639 institutionalised on 10-07-2018</i>)	
Waste	National Circular Economy Strategy and its updated action plan for 2021-2025	
	National Waste Management Plan (<i>OGG 185/A/29-09-2020</i>)	
	National Waste Prevention Programme for 2021-2030	

Aspect	National policy documents	National plans to be taken into account (Art 108 of SPR)
Soil	National Action Plan for Combating Desertification (OGG 974/B/27-07-2001)	
Land	National Framework for Spatial Planning and Sustainable Development (Law 6876/4871, OGG 128/A/03-07-2008) Regional Spatial Planning Frameworks (<i>OGG 248/AAP/25-10-2018, OGG 181/D/16-04-2019, OGG 286/AAP/28-11-2018, OGG 269/AAP/15-11-2018, OGG 16 AAP/05-02-2019, OGG 260/AAP/08-11-2017, OGG/299 AAP/14-12-2018, OGG 485/D/20-08-2020, Law 4277/2014, Law 1561/1985, the remaining regional spatial plans are under revision</i>)	

These plans, programmes and strategies are addressed in the following paragraphs. Overall, the CAP SP is expected either to support or to be supported by these policy documents through similar objectives.

3.4.1 National Climate Change Adaptation Strategy

The National Climate Change Adaptation Strategy (NCCAS) that was endorsed with the Law 4414/2016 outlines the government's strategic approach to adaptation to climate change in Greece. The Greek NCCAS is an overarching policy document, which defines the goals, principles and priorities of adaptation and lists potential adaptation measures for all environmental and socio-economic sectors that are likely to be significantly affected by climate change. As such, it provides guidance, insight and priorities, which should be further downscaled (i.e. detailed) at regional level and translated into 13 Regional Adaptation Action Plans -RAAP (required by Law 4414/2016) that will be implemented within a 7-year planning cycle. Vertical coordination (i.e. between the national and the regional level) is achieved through the MoEE, on the basis of the NAS priorities. The NCCAS includes indicative actions and adjustment measures for 15 sectoral policies including agriculture and stock farming, forest ecosystems, biodiversity and ecosystems.

It should be noted that the diversity of climate, socio-economic and environmental conditions vary substantially across the country; as such detailed plans can only be developed and implemented at regional level to address regionally and locally vulnerable sectors and hotspots. To this end, each RAAP will define priority actions on the basis of the specificities and characteristics of each Region. The Ministerial Decision 11258/2017 which provides the detailed specifications/template for the content of the RAAPs requires Regional Authorities to perform a detailed assessment of potential climate change impacts for a short, mid-term and long-term time horizon, to identify and map relevant climate related risks, vulnerabilities and hotspots, to prioritise adaptation action on the basis of their cost-effectiveness and benefits, to identify synergies with other policies and regional plans (e.g. land-use plans, water management and flood risk management plans) and to integrate, as needed, priority measures into regional planning. The effects of climate vary significantly not only depending on the crop type but also between the 11 climatic zones examined, with the most positive effects being found in Northern and Western Greece and the most negative in Southern, Eastern and island Greece. Each RAAP will define priority adaptation actions on the basis of the specificities and characteristics of each Region.

The National Strategy for Adaptation to Climate Change places particular emphasis on agriculture and forestry in terms of sectoral climate change adaptation policies. Priority is given to synergies between adaptation and mitigation actions, through the conservation and sustainable use of edaphic resources

and land management practices. To this respect, the potential adaptation actions that are suggested by NCCAS for agriculture and forestry are outlined below:

Agriculture

- Acquisition of innovative knowledge especially as regards the effects of climate change to traditional crops such as olive growing and viticulture and dissemination to trainers and final recipients (rural professionals).
- Promote regional planning based on vulnerability levels and new data acquired through the development of appropriate indices and systematic monitoring of critical parameters.
- Improvement of the national system for monitoring the quantity and quality of surface water and groundwater aquifers.
- Sustainable management of natural resources (soil, water resources and biodiversity) to prevent desertification and to protect against physical corrosion using appropriate cultivations practices, and to prevent degradation of soil structure by compression, reduction of organic matter (with measures such as substitution of chemical fertilizers to organic ones, reduction of burning the reed etc.), salination of the soil and the groundwater bed (by using better water quality and proper irrigation techniques, reasonable fertilization etc.).
- Reduced use of water with measures such as the rationalization of irrigation by aligning it to the real needs of plants, the adoption of more efficient irrigation systems, the minimization of water transfer losses through improved maintenance of existing collective irrigation and drainage networks as well as the setting up of upper water limit per hectare in areas where with water-consuming plant species are cultivated.
- Changes in cultivation techniques and crop selection (e.g. crops that require less water) due to increased temperatures.
- Creation of new varieties resistant to biotic and abiotic stresses by utilizing the domestic genetic material and accelerating its adjustment to the evolving climatic conditions.
- Risk management of climate change disasters, especially extreme weather events.
- Adapting, if necessary, the housing and management systems of rearing animals under the new environmental conditions shaped by climate change so as to remain technically feasible, economically viable, environmentally acceptable and to avoid adverse effects on the welfare of farmed animals.
- Protection against overgrazing and undergrazing by determining the grazing capacity of pastures and by preserving and enhancing natural flora with plants of suitable varieties that show better adaptability to new environmental conditions.

Forestry

- Acquisition and exploitation of innovative knowledge.
- Ensure biodiversity of forest ecosystems actions such as:
 - Promotion of agroforestry systems.
 - Selection of varieties of forest species for planting or favoring species of natural regeneration, resistant to the expected drier and warmer environment as well as to extreme weather phenomena.
 - Compilation and implementation of regional studies for forest complexes (not only for forests), which aim to improve the composition and architectural structure of forest ecosystems, taking

into account the level of vulnerability, to conserve biodiversity at the level of genetic diversity, plant and animal diversity, ecosystem diversity and natural landscapes. This goal can be achieved by implementing special cultivation, more intense than in the past, to restrict competition to the desired species.

- Actions to locate and control invasive alien species (weeds).
- Sustainable management of natural resources with measures such as:
 - Creation of structures of forest stands, preferably in the form of a mixture of species, avoidance of deforestation for increased biodiversity and stability of ecosystems, taking also care of the management of groundwater vegetation in order to optimize the relationship between production - usable water and runoff.
 - Adaptation of forestry interventions to create thinner forest stands, able to produce with limited soil moisture, higher temperatures and to respond to extreme weather events.
 - Management of the lower vegetation with clearings and controlled grazing, in order to reduce competition for soil moisture in the trees as well as the risk of fires.
 - Implementation of rational grazing of forest meadow ecosystems (grazing equal to grazing capacity) to optimize biodiversity and the production of multiple products and services.
- Limitation of fires with actions such as:
 - Establishment of forest registry (recording of land uses, vegetation composition and property status) that will reduce fires related to the encroachment of public land.
 - Modernization of the legislative framework for prevention, restoration of damages from fires but also for their extinguishing.
 - Ensuring that, within 10 days after the fire, the most eroded burned areas are sown with grass so that during the first critical period after the fire, the soil is protected and stabilized so that costly hydraulic projects are avoided and the usable water balance is improved.
 - Emphasis on prevention by ensuring accessibility and limiting flammable vegetation through crop interventions and controlled grazing.
 - Upgrading of forest firefighting equipment and guidance for the restoration of natural ecosystems.
 - Cultivated forestry interventions, in combination with controlled grazing to reduce the flammable lower vegetation.
- Production of usable water by constructing dams to retain sediments, normalize water runoff, enrich underground aquifers and reduce erosion and flooding.

3.4.2 National Energy and Climate Plan

The National Energy and Climate Plan (NECP) (adopted by the Decision of the Government Economic Policy Council 4/31.12.2019, OGG 4893/B) encompasses in a holistic manner all the climate change mitigation measures foreseen for the period 2020-2030 and serves as the strategic policy document that has replaced the National Renewable Energy Action Plan and the National Energy Action Plan.

The NECP is a balanced mix of ambitious and rational national energy policy, aiming primarily to ensure the attainment of the EU's Climate and Energy Union goals by 2030. Such an energy transition requires a higher objective for reducing GHG emissions, increased penetration of RES in gross final energy consumption, improved energy efficiency for higher energy savings, and lignite phase-out in power generation, to make sure that this radical energy sector transformation does lead to a climate neutral

economy by 2050. Besides the flagship initiative to phase out all lignite power plants by 2028, the main climatic quantitative objectives of NECP for 2030 is the reduction of greenhouse gas (GHG) emissions by more than 42% compared to 1990 (more than 56% compared to 2005). This 56% reduction corresponds to 33% reduction in the non ETS sectors by 2030 compared to 2005. There is no sectoral target for agriculture (or for any other sector). With regard to renewable energy sources (RES), the target for their share in gross final energy consumption is to reach 35% by 2030 whereas RES share in electricity consumption, is anticipated to exceed 60%. With regard to improving energy efficiency the goal is to achieve final energy consumption in 2030 lower than that recorded in 2017, i.e. 38% energy efficiency improvement achieved in final energy consumption mainly through measures for the building and the transport sectors.

The NECP specifically promotes RES and energy efficiency in agriculture for the period 2021-2030, setting the following priorities:

- Handling and utilising agricultural and livestock residues following the waste hierarchy.
- Developing domestic production of advanced biofuels for transport and supply chains for their use by utilizing waste and farm residues while ensuring that 2nd generation biofuels are produced so that competition with food supply chain is avoided.
- Promoting the use of RES and energy efficiency improvement actions in the agricultural sector.

Specific measures are proposed to promote biomass for energy production, such as:

- the organisation of the supply chain and land planning of sites for temporary storage of agricultural/forest residual biomass including support for the development of infrastructure for the temporary storage, pre-treatment and storage of residual biomass (public or private), which will help to address the inappropriate practice of open burning sites observed in the countryside,
- the maintenance and extension sustainability certification scheme for biofuels to ensure that only sustainable biofuels are produced in Greece,
- sustainable forest management including rational logging of forests, update of forest management plans to ensure a sustainable cycle of periodic logging operations, enhancing the role of cooperatives in cleaning up forests to protect them against fires and utilising the woody biomass removed for energy purposes,
- increase afforestation and maximize the absorption contribution to the transition to a future of climate neutrality (based on LULUCF rules),
- promotion of energy crops of woody biomass or coppice plantations so that the primary sector also contributes to the production of biomass from the cultivation of short-rotation forest species and other perennial plants,
- development of the bioethanol market by enhancing “conventional” bioethanol, i.e. derived from the processing of corn, wheat, beet, etc. according to the applicable sustainability criteria, and
- development of biomethane market both for its injection into the natural gas network (green gas) and its use as a transport fuel by developing an appropriate regulatory framework.

Regarding the promotion of RES, measures include the installation of photovoltaic systems through the energy offsetting and virtual energy offsetting scheme in both agricultural and livestock holdings and pumping stations. It is noted that RES installation is also allowed on high productivity land in a cautious manner to ensure that energy production does not compete with the economic activities of the agricultural and livestock sector. Finally, in terms of energy efficiency improvement, measures will be promoted to replace existing (especially high energy consuming) machinery and installations used in both agricultural and livestock holdings.

3.4.3 National Air Pollution Control Program

According to Article 6 of Directive 2016/2284, the National Air Pollution Control Program (NAPCP) is adopted (JMD ΥΠΕΝ/ΔΚΑΠΑ/5615/121/2021 OGG 182/B/22-01-2021) in accordance with Part 1 of Annex III in order to limit the annual anthropogenic emissions of sulphur dioxide (SO₂), nitrogen oxides (NO_x), non-methane volatile organic compounds (NMVOC), ammonia (NH₃) and fine particulate matter (PM_{2.5}) to the levels described in Annex II, Table A of Directive 2016/2284 for the period between 2020 and 2029 and for 2030 onwards, using 2005 as a base year. It also requires that national air pollution control programmes be drawn up, adopted and implemented and that emissions of those pollutants and the other pollutants referred to in Annex I of Directive 2016/2284, as well as their impacts, be monitored and reported.

The content of the NAPCP includes a) the national air quality and pollution policy framework in which context the programme has been developed, including: (i) the policy priorities and their relationship to priorities set in other relevant policy areas, including climate change and, when appropriate, agriculture, among others; (ii) the responsibilities attributed to national, regional and local authorities; (iii) the progress made by current policies and measures in reducing emissions and improving air quality, and the degree of compliance with national and EU obligations; (iv) the projected further evolution assuming no change to already adopted policies and measures; (b) the policy options considered to comply with the emission reduction commitments and to contribute to further improve the air quality; where available, the individual or combined impacts of the policies and measures on emission reductions, air quality and the environment and the associated uncertainties; (c) the measures and policies selected for adoption, including a timetable for their adoption, implementation and review and the competent authorities responsible; (d) where relevant, an explanation of the reasons why the indicative emission levels for 2025 cannot be met without measures entailing disproportionate costs; (e) where relevant, an account of the use of the flexibilities foreseen in Article 5 and any environmental consequences arising from such use; (f) an assessment of how selected policies and measures ensure coherence with plans and programmes set up in other relevant policy areas.

Among the five pollutants for which emission reduction targets have been determined, the one that is strongly affected by agriculture is ammonia (NH₃), where the reduction target for 2030 has been set to 10% from 2030 onwards (compared to 7% for the period of 2020-2029). The contribution of agriculture to the other four pollutants varies from negligible to marginal (less than 10%).

The declining trend in ammonia emissions is mainly attributed to the declining livestock population and the reduced use of synthetic nitrogen fertilizers because of the respective increases in organic farming and the impact of initiatives to promote good practices in the use of fertilizers. Hence, the NAPCP in practice does not include any of the voluntary measures proposed in Annex III, Part 2 of Directive 2016/2284 unless they were already included in the Code of Good Agricultural Practices (JMD 1420/82031/22.7.2015) and does not foresee any real new measures. It rather describes existing measures or measures that are mandatory because of other legal requirements and reduce also the emissions as a “side effect”. Based on the above-mentioned Annex, the following measures are included:

- A national advisory code of good agricultural practices to control ammonia emissions will be developed by the Ministry of Rural Development and Food, taking into account the UNECE Framework Code for Good Agricultural Practice for Reducing Ammonia Emissions of 2014, covering at least the following items:
 - nitrogen management, taking into account the whole nitrogen cycle;
 - livestock feeding strategies;

- low-emission manure spreading techniques;
- low-emission manure storage systems;
- low-emission animal housing systems;
- possibilities for limiting ammonia emissions from the use of mineral fertilisers.
- The use of ammonium carbonate fertilizers is prohibited. According to statistics from the Association of Producers and Traders of Fertilisers, there is no production or import of ammonium carbonate in Greece for use as a fertiliser.
- The following approaches are used to reduce ammonia emissions from inorganic fertilisers:
 - where urea-based fertilisers continue to be applied, 45% of annual urea consumption is used with urease inhibitions (data 2017), according to data from the Association of Producers and Traders of Fertilisers);
 - Organic farming is promoted and where inorganic fertilisers continue to be applied, spreading them in line with the foreseeable requirements of the receiving crop or grassland with respect to nitrogen and phosphorus, also taking into account the existing nutrient content in the soil and nutrients from other fertilisers.
- The ammonia emissions from livestock manure are reduced from slurry and solid manure application to arable land and grassland by employing measures such as:
 - for all zones vulnerable to nitrate pollution in the country (30 zones) action programmes were established with the JMD 38552/265/25.04.2019;
 - only spreading manures and slurries in line with the foreseeable nutrient requirement of the receiving crop or grassland with respect to nitrogen and phosphorous, also taking into account the existing nutrient content in the soil and the nutrients from other fertilizers (Art. 7 of Good Agricultural Practices);
 - not spreading manures and slurries when the receiving land is water saturated, flooded, frozen or snow covered (Art. 7 of Good Agricultural Practices);
 - applying slurries spread to grassland using a trailing hose, trailing shoe or through shallow or deep injection (Art. 7 of Good Agricultural Practices);
 - covering stores for solid manure (Art. 6 of Good Agricultural Practices);
 - ensuring farms have sufficient manure storage capacity to spread manure only during periods that are suitable for crop growth (Art. 6 of Good Agricultural Practices).

3.4.4 National Biodiversity Strategy

In 2014, based on Article 6 of the Convention on Biological Diversity, Greece adopted the National Biodiversity Strategy 2014-2029 and its 5-year action plan by the Ministerial Decree 40332/2014 OGG 2383/B/8-9-2014).

The general objectives of the National Biodiversity Strategy are the halt of biodiversity loss, the promotion of biodiversity as a national natural capital and the intensification of the contribution of Greece to the prevention of the loss of global biodiversity. The strategy sets 13 strategic targets, as presented below, which are unfolded to specific targets, outlining those mostly related to the CAP SP.

1. Increasing scientific knowledge about the assessment of biodiversity status
2. Conservation of national natural capital and ecosystem restoration
3. Organisation and operation of a National System of Protected Areas and enhancement of the benefits from their management, setting a specific target of the application of exemplary and innovative

practices in the productive sectors, based on the management plan of each area for biodiversity conservation and management

4. Conservation of genetic resources - Facilitating access to genetic resources – Fair and equitable sharing of the benefits arising from their utilisation
5. Enhancing the synergies among the main sectoral policies for the conservation of biodiversity, setting a specific target of ensuring the compatibility of agricultural, fisheries and forestry activities with biodiversity conservation
6. Conservation of landscape diversity
7. Prevention and minimisation of the impacts of climate change on biodiversity, setting a specific target of enhancing the role of forests in mitigating the effects of climate change
8. Protection of biodiversity from invasive alien species
9. Enhancing international cooperation for biodiversity conservation
10. Upgrading the quality and efficiency of public administration on biodiversity conservation
11. Integrating biodiversity conservation in the value system of society
12. Inspiring citizen participation in biodiversity conservation
13. Gaining appreciation of ecosystem services and promoting the value of Greek biodiversity

According to the strategy, agriculture has been identified as a very important pressure on the Greek natural ecosystem, not only because of the diffused pollution attributed to it but also because of the land use change to accommodate the increased need for farmland. On the other hand, the variability of abiotic conditions in Greece, in combination with the long history of traditional agriculture, has contributed to the high diversity of agricultural ecosystems. Land reforms lead to the homogenisation of the landscape and the further loss of diversity. In contrast, traditional agricultural practices and organic farming have many beneficial effects on biodiversity.

For the implementation of the specific target on enhancing the synergies of the agricultural and forestry activities for biodiversity conservation, the action plan of the biodiversity sets the following measures:

- Promoting production methods that contribute to maintaining the biodiversity of natural ecosystems and rural landscapes
- Reforming existing standards for forest management plans in order to meet the needs of biodiversity conservation in modern socio-economic conditions and the need to adapt to climate change with proper management practices
- Updating the regulations of forest harvesting operations – Developing and implementing a modern system of forest exploitation in the context of multi-functional management
- Preparing for the Forest Registry
- Preparing for and implementing sustainable management of forest and agricultural ecosystems
- Preparing forestry regulations, based on the conservation needs of species and habitat types
- Ensuring the completion of the national Cadastre and preparation, correction and finalization of forest maps
- Promoting certified systems of sustainable natural resource management
- Establishing rules regarding methods, tools and practices of primary production, in order to reduce the impact on endangered species
- Establishing a monitoring system using biodiversity indicators per activity sector
- Achieving the development of a national plan for prevention and risk management of pathogens for forest ecosystems
- Preparing forest fire prevention plans at the level of Forest Directorate and spatial responsibility of the Forest Service

3.4.5 Greek Prioritised Action Framework

The Greek Prioritised Action Framework (PAF), based on Article 8 (1) of the Habitats Directive, is a strategic planning tool that focuses on the identification of the measures that are needed to implement the EU-wide Natura 2000 network (including Special Protection Areas, SPAs) and its associated green infrastructure, as well as the financing needs for these measures and linking them to the corresponding EU funding programmes. In line with the objectives of the Habitats Directive, the measures identified in the PAFs are designed *"to maintain and restore, at a favourable conservation status, natural habitats and species of EU importance, whilst taking account of economic, social and cultural requirements and regional and local characteristics"*.

The Greek PAF for the period 2023-2027 foresees the establishment of a National Certification System for agricultural and livestock produced within the Natura 2000 network and capacity building actions for its implementation, a study for the utilization of marginal agricultural lands for the production of animal feed with the use of native species of flora and indigenous varieties, the establishment of management plans for agriculture in the Natura 2000 protected areas, aiming not only at the production phase but also the distribution and marketing phase, in close collaboration with all relevant stakeholders, whilst one of its quantitative targets is the reduction of water pollution.

Furthermore, some concrete measures are described distinctively for agriculture and forestry focusing on Natura 2000 areas, but not exclusively. They are categorized in measures destined for conservation / protection of protected areas and those that are meant for rehabilitation. More specifically:

A. Agriculture

Regarding agricultural land, the following conservation/protection and rehabilitation actions are included:

- Management actions, inside or outside Natura 2000 network, aimed at increasing agricultural biodiversity for the improvement / conservation of bird species (such as special crops).
- Actions for the creation of new hedges along arable land in the lowlands of the Natura 2000 network to improve the habitats of agricultural fauna.
- Actions to improve habitats of Community interest in cultivated areas, located in Natura 2000 network, and their gaps: restoration/creation of stone blocks, stone walls, terraces and maintenance of open places for these structures which are not shaded.
- Organic crops and agri-environmental measures in croplands adjacent to rivers and lakes, inside or outside Natura 2000 network, in order to reduce the negative impacts on habitat types and species.
- Establishment of agroforestry systems to increase rural biodiversity and reduce the fragmentation of habitats of species of Community interest.
- Establishment and maintenance of forestry, forest-pasture systems.
- Food habitat improvement (parcel rental and grain sowing).
- Development of ecological corridors in agro-ecosystems in areas outside Natura 2000 network to improve its cohesion and facilitate the movement of species.

The expected benefits for the targeted species and habitat types are the following:

- Reducing the adverse effects of agricultural activity on habitat types and species of Community interest, including birds (e.g. reducing pollution and the use of pesticides and fertilizers) to more than 300.000 hectares within and outside the Natura 2000 network.
- Improving the connectivity of Natura 2000 sites by creating eco-corridors in rural areas outside the network.

- Contribute to the integrity of fauna habitats by creating hedges in 50 Natura 2000 areas.
- Improvement and increase of habitat available for soil fauna of Community interest in 50 Natura 2000 sites.
- Improving the conservation status of species of Community interest as well as farm birds that use rural ecosystems as their habitat.
- Increase agricultural biodiversity using organic farming methods.
- Improve / maintain the status of 29 habitat types, 6 plants, 16 invertebrates, 1 amphibian, 17 reptiles, 11 mammals, 48 fish and 98 birds.

Other expected benefits:

- Improving the resilience of rural ecosystems (including arable land) to climate change.
- Proper management of agricultural activities and promotion of mild agricultural practices (reduction of pesticides and fertilizers, organic crops, etc.) to reduce their impact on non-targeted habitat types, species of Community interest and farm birds.
- Raising awareness and informing the general public and the stakeholders about the biodiversity of rural ecosystems and the negative and positive effects of crops on species and habitats of Community interest.
- Enhancing entrepreneurship, primary production and the promotion of locally produced products
- Improving water and soil quality.
- Strengthen and create green infrastructure to reduce the fragmentation of habitats of species of Community interest.
- Reducing the impact of agriculture on pollinators due to insecticides, pesticides and other plant protection products.

B. Forestry

Regarding forestry, the linking of pasture management plans and forest management plans with Natura 2000 site management plans is foreseen as well as support of forest fire prevention strategies in terrestrial habitats of Community Interest by combining fire propagation models and high definition satellite data at operational level in Greece.

The following concrete conservation/protection actions are included:

- In Natura 2000 areas, management of forest habitats of invertebrates, plants and birds using dead wood and old trees including actions such as study, recording and preservation of mature trees, increase / conservation of dead wood in the ground, change of management practices for commercial forests, training of forest services' staff, installation of artificial nests.
- Habitat protection from grazing of the targeted plant species in forested areas by creating small fences, monitoring, etc, in Natura 2000 areas.
- Actions to restrict / exclude access via illegal roads by installing permanent or temporary barriers for fragmented forest areas and forests, appropriate marking signals, environmental information etc., in forest areas inside or outside Natura 2000 network.
- Conservation of ecological corridors outside Natura 2000 areas for specific forest habitat types to improve the cohesion of the Natura 2000 network in order to facilitate the movement of species of Community interest, the conservation of biodiversity and adaptation to climate change.
- Actions, outside Natura 2000 areas, to protect specific habitat types from phytopathogens such as information campaigns, scientific and financial support for the implementation of control measures, treatment or prevention of expansion of phytopathogens.

The following rehabilitation actions are included for Natura 2000 areas:

- Specific habitat restoration actions such as restriction / exclusion of access, appropriate marking signals, environmental information, removal of alien species, actions to prevent tree infections, ex-situ seed conservation, plant growth in nurseries, restoration actions of structural elements and functions, restructuring actions by removal of broadleaf species, planting of dominant forest species and herbaceous layer, monitoring of pressures and threats.
- Restoration of degraded forest habitat types via reforestation, mainly in areas affected by forest fires.
- Restoration actions targeting of Natura 2000 forest areas that are fragmented by illegal roads.

Expected benefits for targeted species and habitat types

- Improving the conservation status of habitat types with unfavorable conservation status (improvement of structures and functions).
- Conservation /restoration of habitats of bird species of Community interest with unfavorable conservation status.
- Protection (prevention, protection, control) of targeted forests from phytopathogenic microorganisms and maintenance of healthy forest stands.
- Adaptation of the targeted forest habitat types to climate change.
- Proper management of forest habitat types.
- Control of invasive alien species in targeted habitat types.
- Conservation of genetic material of important forest species for restoration actions.
- Restoration of forest habitats after fire.
- Reducing the fragmentation of forest ecosystems through actions of creation / restoration of ecological corridors and restriction of access with permanent or special barriers inside and outside Natura 2000 areas.

Other expected benefits:

- Improvement of the resilience of forests and forests areas, especially to climate change and forest fires
- Promotion of ecotourism activities in forest habitats of birds and species of Community interest.
- Proper management of human activities in forests and forest areas to reduce their impact on habitat types and species of Community interest.
- Informing and raising awareness of the general public and stakeholders about the need to protect grasslands and the importance of relevant habitat types.
- Protecting producers from loss of income due to diseases caused by phytopathogenic organisms.
- Creation / strengthening of green infrastructure to improve the connectivity of fauna habitats.

3.4.6 National Strategy for Forests

In 2018, the National Strategy for Forests (NSF) was adopted by Ministerial Decision No 170195/758/2018 (OGG 5351/B/28-11-2018). Its vision is to “ensure the sustainability and increase the contribution of forest ecosystems to the country's economy through multifunctionality, adaptability and strengthening of their socio-economic role, in the light of climate change”. The NSF will be implemented through the Action Plan for Forests, that is still pending. It endorses the ‘Mediterranean Forestry Model’ in the management of forest ecosystems, adapted to biotic and abiotic conditions in Greece at national and regional levels, which includes a clear technical and economic plan and provides for increased flexibility in order to strengthen the multifunctional role of forest ecosystems. The NFS stresses the obligation to interconnect with relevant national, international and EU strategies for forest ecosystems.

In particular, the NFS defines the principles and guidelines of forest policy for the period 2018-2038, identifies specific objectives of this policy as well as the necessary resources and the means of its implementation. Among others, it examines the contribution of forests to the (economic) sustainable development of the country. It recognizes that timber remains the main source of revenue from forest ecosystems and wood is a raw material for a long chain of commercial and manufacturing enterprises. Additionally, the use of forest biomass in the production of energy from renewable sources has many prospects. Last but not least, the NFS recognizes that apart from wood, forest ecosystems also produce a number of non-wood products such as resin, mushrooms, honey, aromatic and medical plants, etc.

The NSF comprises three horizontal and four vertical axes, including their general objectives, courses of action and monitoring indicators. The most relevant axes to the implementation of the CAP SP are the first vertical axis on forest economy and the second vertical axis on climate change.

The forest economy vertical axis aims at increasing the contribution of the forestry sector to the country's GDP, improving the methodology of recording the produced forest products and services with emphasis on employment and the socio-economic role of forest ecosystems, identifying, recording, evaluating and promoting ecosystem services with emphasis on those that can and should be included directly in the calculation of the country's GDP and recognizing the value and enhancing the contribution of forest ecosystems to the bioeconomy and the circular economy.

The vertical axis on climate change foresees targets such as the assessment of the vulnerability of forest ecosystems to climate change, the management aimed at adapting forest ecosystems to climate change, the mitigation of climate change by increasing carbon capture and storage in forest ecosystems and for addressing extreme phenomena (e.g. forest fires). Furthermore, emphasis is placed on coordinating actions for preventing and combating forest fires, protecting from insects and diseases and preventing flooding and water scarcity.

3.4.7 Water River Basin Management Plans

The 1st Update of the Water River Basin Management Plans (RBMPs) for the total of 14 River Basin Districts of the country was completed by the end of 2017, with the approval of the National Water Committee in accordance with the provisions of Article 13 of the Directive 2000/60/EC, covering the period up to the end of 2021.

As per Annex VII of Directive 2000/60, the RBMPs consist of:

- a general description of the characteristics of the river basin district including the mapping of the location and boundaries of surface and ground water bodies and the identification of reference conditions for the surface water body types as well as the identification of protected areas of Art. 6 of Directive 2000/60;
- a synopsis of significant pressures and impact of human activity on the status of surface and ground water on the qualitative and quantitative status of water including an estimation of point source and diffuse source pollution, a summary of land use, abstractions etc.;
- a map of the monitoring networks for the surface waters, the ground waters and the protected areas and a presentation of the monitoring results;
- a list of the environmental objectives for surface waters, groundwaters and protected areas;
- a summary of the economic analysis of water use;
- a summary of the programmes of measures, including measures for:

- o the prevention of water pollution
- o the prevention of marine water pollution from land sources
- o rationalizing abstractions
- o ensuring cost recovery
- o controlling point source discharges
- o reducing priority substances
- o minimizing accidental pollution incidents

In general, the updates of the RBMPs include additionally an assessment of the progress made towards the achievement of the environmental objectives and a summary of, and an explanation for, any measures foreseen in the earlier version of the RBMPs which have not been undertaken, as well as a summary of any additional interim measures adopted since the publication of the previous version of the RBMP.

The main goals of RBMPs related to agriculture are the rationalization of the water management, the improvement of the efficiency of water irrigation and the reduction of nitrates pollution. It is noted though that no quantitative targets have been adopted at country level through the RBMPs.

The measures for the rationalization of water management include:

- the rationalization per geographic area of the maximum amount of water per crop type and hectare,
- the upgrading of water service providers by training and capacity building so that they improve water management,
- the improvement of the cost calculation of the irrigation water so that, gradually, a higher percentage of financial costs is recovered and
- the review of the drought and water scarcity plan that was established in the 1st WRBMP.

The measures for the improvement of the efficiency of water irrigation include actions to:

- reduce irrigation losses, control leakages and improve irrigation,
- operate hydrometers to measure the water abstraction and water losses,
- licensing of water drillings and prohibition of new drillings where the quantitative status is not good,
- promote water reuse from wastewater treatment installations (a manual is foreseen to be drafted based on the new EU Regulation 2020/741).

The measures for the reduction of diffuse pollution, not only in vulnerable areas but in all areas where there is intense agricultural production, besides promoting organic farming, mainly focus on nitrate pollution but also aim at reducing pollution from illegal plant protection products by carrying out targeted groundwater measurements for substances contained in these products. The measures for tackling nitrate pollution of vulnerable areas are further developed in the relevant Action Programme for the Nitrate Vulnerable Areas (see section 3.4.8).

3.4.8 Action Programme for the Nitrate Vulnerable Areas

The Action Programme for the Nitrate Vulnerable Areas (JMD 38552/265/2019, OGG 1496/B/03-05-2019) was adopted in 2019 in conformity with the Nitrates Directive (91/676/EEC) and covers all the 30 areas that were designated as vulnerable zones to pollution caused by nitrates from agricultural sources. Pursuant to Article 5 of the Nitrates Directive, the Action Programme takes into account all available scientific and technical data, mainly with reference to respective nitrogen contributions originating from

agricultural and other sources, and the environmental conditions of the areas concerned. It consists of the following:

- the mandatory measures in Annex III of Nitrates Directive;
- those national measures that Greece has prescribed in the established code of good agricultural practice, except those which have been superseded by the measures in Annex III;
- additional measures or reinforced actions as Greece considers necessary if the aforementioned measures are believed not to be sufficient, taking into account their effectiveness and their cost relative to other possible preventive measures;
- monitoring programme to assess the effectiveness of the action programme.

The action programme includes measures aiming at:

- limiting the amount of nitrogen fertilizer (nitrogen fertilizers and fodder waste) that may be dispersed in the soil, in the context of good agricultural practice by setting maximum permissible levels of nitrogen fertilization by soil-climatic conditions, soil class, soil slope, soil use and agricultural practices, nitrogen crop needs, nitrogen mineralization, nitrogen inputs from the environment, residual nitrogen and nitrogen loss rate of the rhizome;
- determining the manner and time of application of the necessary lubrication units per crop, taking into account the prevailing soil class and hydrological conditions;
- determining the period of prohibition of the dispersion of certain types of fertilizers;
- adapting cultivation practices in order to reduce nitrate pollution;
- adapting efficient irrigation practices in order to reduce nitrate pollution;
- reducing pollution from nitrogenous compounds in the context of livestock waste management and determining the capacity of storage tanks of this waste;
- monitoring and inspection mechanism as well as sanctions.

Regarding the management of crop residues, depending on local conditions, there should be incorporation into the soil, reed grazing or cutting and covering the soil with the residues and incorporating them into the soil the following spring. Reeds can be burned only in exceptional cases (for plant protection reasons) following permission by the competent authorities and only for areas outside the "Natura 2000" network.

Regarding livestock waste management the application of the livestock waste in the field should be done evenly with the use of appropriate technical equipment in order to ensure accuracy and uniformity of disposal of an equal amount of solid or liquid waste per plant or square meter of arable land. Specific measures are also described for the management (including storage) of solid and liquid livestock waste on the farm (such as a safety distances from water bodies and water abstractions for potable water), if it is not to be dispatched to waste treatment plants.

3.4.9 National Action Plan for Sustainable Use of Pesticides

In 2020 (JMD 9269/246316/2020, B' 4032), the National Action Plan for Sustainable Use of Pesticides was updated with a view to achieving the sustainable use of pesticides. The National Action Plan refers to:

- the training on sustainable use of pesticides;
- the procedure for granting certificate which will evidence of sufficient knowledge of sustainable use of pesticides;
- awareness-raising and information to the public;
- the inspection of equipment used for pesticide applications;

- the specific measures to protect the aquatic environment and drinking water;
- the reduction of pesticide use or risks in specific areas (around hospitals, schools, national parks, hotels, touristic places, towns, etc.);
- the specific measures for handling and storage of pesticides and treatment of their packaging and remnants;
- integrated pest management, and
- the setting of the targets (e.g. increase of low drift nozzles usage 5% annually, reduction 5% every year of incidents of poisoning caused by professional use of pesticides etc.) and indicators of the plan.

The measures to protect the aquatic environment and drinking water from the use of pesticides include the following:

- inform producers through the agricultural warning system or through local inspection authorities about promoting the use of low-drift nozzles;
- inform professional users of the risk reduction measures adopted and of the incentives under the agri-environmental measures of the CAP;
- establish procedures for pesticides substances, application techniques and mitigation measures which minimise the risk of off-site pollution;
- inform the Ministry of Health's department responsible for drinking water quality of the active substances in formulations of plant protection products placed on the market in each regional unit in Greece during the previous year, so that targeted laboratory analysis of these substances can be carried out by water supply operators, in accordance with the requirements of JMD Π(δ)/Γ.Π.ΟΙΚ.67322/6.9.2017;
- based on data of plant protection product sales, data on analyses of the country's groundwater, surface water and drinking water, and on sampling results under national and EU programmes for residue control in plant products, MRDF shall propose:
 - a restriction or even a ban on the use of active substances in specific areas;
 - the monitoring of specific active substances of plant protection products to be included in the current programmes for the monitoring of Greece's groundwater, surface water and drinking water;
 - official controls of residues in plant products.

3.4.10 Flood Risk Management Plans

Regarding flood risk management, pursuant to the provisions of the Floods Directive 2007/60/EC (transposed with JMD 31822/1542/E103/2010, B' 1108), the general targets which were determined at a national level during the 1st cycle of the Directive's implementation are the moderation of the exposure to flood, the reduction of the possibility of flood, the enhancement of preparedness for flood response and the improvement of restoration mechanisms for the affected areas. The strategic documents on flood reduction and mitigation are the Flood Risk Management Plans (FRMPs) per river basin district (i.e. 14 FRMPs), which have been developed in the 3rd stage of the Directive's implementation and adopted in July 2018. It is noted that the 2nd cycle of the Directive's implementation has already initiated and the 1st update of the flood risk assessment has been completed in November 2020.

Taking into account the provisions of Directive 2007/60/EC, in the 1st implementation cycle of Directive 2007/60/EC the following General Objectives were defined at national level:

- Mitigation of flood exposure - 7 Prevention Measure
- Reduction of the possibility of flooding – 10 Protection Measures

- Strengthening the preparedness to deal with floods - 6 Preparedness Measures
- Improving the recovery mechanisms of the affected areas - 3 Recovery Measures

The above general objectives of the 1st cycle of implementation of Directive 2007/60/EC, as incorporated in FRMPs in each Water District correspond to the four action axes of Flood Risk Management (Prevention, Protection, Preparedness, Recovery) in order to establish a common understanding and policy on issues related to impacts of flood risk. To determine the measures, in addition to the results of the Flood Hazard Maps and Flood Risk Maps in each Water District, a) the costs and benefits of the measures, b) the environmental objectives of Directive 2000/60/EC c) the existing practices for flood protection, d) soil and water management and e) spatial planning as well as the existing responsibilities of the stakeholders were also taken into account.

In relation to agriculture, the main target of the FRMPs is the reduction of the damages caused by floods, but no quantitative targets have been established. The relevant measures are:

- educational/informational, such as training of farmers and stockbreeders for flood risk management, awareness raising campaigns, completion of field data, etc;
- non-structural interventions, such as early warning systems, land use management measures and best practices in forestry, animal husbandry and agriculture in torrent basins flowing into flood risk zones, appropriate zoning, etc;
- technical, such as masterplan for flood protection projects, flood protection infrastructure, the modernization and rehabilitation of drainage networks in agricultural areas, stream/creek cleaning actions promotion of flood restraint practices and retention of sediments, the construction of reservoirs for the containment of flash floods, green infrastructure measures mainly for the protection of environmentally sensitive areas, etc, and
- restoration of agricultural holdings from damage.

3.4.11 National Circular Economy Strategy

In December 2018, Greece endorsed the National Circular Economy Strategy with its two-year action plan (later extended to 2023), with the overall aim to unlock growth potential towards circular economy. Its pillars are sustainable resource management, support of circular economy and circular consumption. The priority actions of the action plan that are strongly related to the agricultural sector are:

- regulatory proposals for the reduction of food waste,
- the establishment of a regulatory framework to facilitate the production of biogas from organic waste and
- the reinforcement of the bioeconomy sectors along with the drafting of a national action plan on bioeconomy to promote nature-based solutions.

It is noted that the actions on food waste complement the provisions foreseen under the Waste Framework Directive and which are required to be implemented in Greece. An Inter-ministerial Working Group has been set up to coordinate the implementation of the strategy and its action plan, steered by MoEE and composed by representatives from other Ministries, including MRDF.

The revised National Action Plan that was approved in November 2021 by the Council of Ministers actually adopted the foreseen actions for the agricultural sector. With regards to food waste, it incorporates actions that are in line with the National Waste Prevention Programme post 2020 and the new Waste Management Law (Law 4819/2021).

3.4.12 National Waste Management Plan

The National Waste Management Plan (NWMP) for the period 2020-2030 (approved by Act of Council of Ministers 39/2020, A' 185) is a strategic document based on the mandatory requirements of Article 28(3) of the Waste Framework Directive (2008/98/EC, as amended) as well as the additional optional elements listed in Article 28(4). The drafting of the 13 Regional Waste Management Plans to specify further the implementation of the NWMP is in progress.

The NWMP takes stock of the existing situation for all waste streams, defines objectives and strategies and identifies the necessary implementation measures to improve waste management and support the waste hierarchy. Although its main focus is the municipal waste, it deals with all the main waste streams, having classified them in 7 different generic categories of wastes, one of which is agricultural waste. No quantitative targets are included regarding this category. The new NWMP has practically prolonged the measures foreseen in the previous NWMP (for the period 2015-2020) since most, if not all of them, were not implemented, with the overall aim of supporting the integrated management of agricultural waste, which constitutes one of the largest waste categories in the country, accounting to about 40% of total generation of waste. These measures focus on organization schemes, including Producers Responsibility Organization (PROs) systems, for its collection to be dispatched for further processing, giving priority to products resulting in benefit to agriculture, including composting.

The targets for agricultural waste of NWMP are the following:

- Full development of a collection network for biodegradable agricultural waste to be recovered for the benefit of agriculture, the production of products (especially animal feed) and / or the production of energy from biogas or biomass with grazing of crop residues, cutting of crop residue and use them for soil cover, pruning perennials and incorporating them into compost piles, further development of composting units, biogas installations and biomass power units as well as the foreseen (in the draft General Waste Framework Law based on the transposition of Directives 2008/98 and 94/62 that is expected to be adopted by the end of May) requirement for all installation of intensive rearing that fall under the scope of the IED Directive 2010/75 to collect their biowaste and recover them either in biogas installations or in composting plants.
- Separate collection and recovery of agricultural plastics with emphasis on greenhouse plastic sheets and packaging through the existing or new PROs based on the foreseen (in the draft General Waste Framework Law based on the transposition of Directives 2008/98 and 94/62 that is expected to be adopted in due course) JMD to establish EPR for greenhouse plastic sheets in order to stop its illegal burning that still remain the predominant waste (mis)management practice.
- Separate collection and proper management of plastic packaging that contains hazardous substances (typically biocides and pesticides) by establishing a dedicated PRO.

There are no specific objectives and actions for the waste resulting from the agri-food processing industry apart from those of the industrial waste in general, which promote the implementation of waste hierarchy, the use of best available techniques where applicable, the co-processing of waste and industrial symbiosis. The actions on the reduction of food waste are not covered with the NWMP, but in the revised National Waste Prevention Programme (NWPP) post 2020.

3.4.13 National Waste Prevention Program

The new National Waste Prevention Programme (NWPP) for the period 2021-2030 has set food waste as one of the main priority waste streams. The strategic goal of the NWPP is to reduce by 2030 the per capita

food waste generated at the retail and consumer level by thirty percent (30%) compared to the food waste produced in 2022 and to reduce food waste generation in primary production, processing and processing, retail and other forms of food distribution, in restaurants and catering services and in households, as well as food losses along the production and supply chain. In order to achieve the above, the measures envisaged for food waste are aimed at preventing their creation throughout the food supply chain, from production to consumption. Also, given the great importance of food waste prevention actions, a special prevention program will be developed (also referred to as the national action plan in the NWMP), by June 2021. The main pillars of measures adopted by the NWPP for food waste are the following:

- Improving knowledge about food waste production;
- Support for the donation of food for human consumption;
- Promoting the reduction of food waste in the primary sector;
- Activating the food processing sectors for the reduction of food waste;
- Apply the circular economy to the catering and related food services sector (e.g. restaurants, hotels, cafes), including canteens (eg schools, universities, hospitals, courts, public services) to reduce food waste;
- Informing and raising awareness of households and catering to behaviour change in consumption and food management.

The target of 30% food waste reduction by 2030 as well as the main measures related to the food processing sector, the catering and the food service sector are included in the waste framework law that was adopted in June 2021.

3.4.14 National Action Plan for Combating Desertification

According to the National Action Plan for Combating Desertification, adopted in 2001, by the JMD 99605/3719/2001 (B' 974), soil is severely stressed by agricultural intensification. Whilst this action plan has not been updated, Greece is one of the very few European countries that do not have legislation for the protection of soil. The National Action Plan includes measures to tackle soil erosion, depletion of the available water supplies and secondary salinization of soils. In particular, the action plan includes the following:

- Determining the extent of endangered areas;
- Evaluate the effectiveness of the measures and policies implemented;
- Formulation of a national strategy for the prevention of desertification and the mitigation of its phenomena;
- Promoting the sustainable use of soil and water;
- Promoting public information while encouraging active participation;
- Selection of priorities and pilot areas;
- Rehabilitation of affected areas, provision of guidelines and implementation mechanisms.

Especially for agriculture, the proposed measures in the JMD with which the Action Plan for Combating Desertification was adopted aim at:

- identifying criteria for inclusion of land in sustainable agriculture;
- combating soil erosion by means of technical and cultivation measures;
- reducing losses and increase groundwater storage;
- providing incentives for the development and expansion of arid crops;
- implementing irrigation systems that reduce the risk of secondary soil salinization and seawater infiltration into groundwater aquifers;

- encouraging traditional practices, especially for olive growing;
- introducing incentives for the implementation of sustainable agricultural practices.

For livestock farming, the plan proposes to prepare plans for the management and exploitation of pastures per prefecture, to prepare inventories of the pastures in each municipality and to lift the common use regime that is applied today and to promote alternative feed sources.

3.4.15 General Framework for Spatial Planning and Sustainable Development

The land use/spatial planning of the country is formulated by the General Framework for Spatial Planning and Sustainable Development (A' 128 of 2008), which has a 15-year implementation horizon and which was developed in accordance with the Law 2742/1999 (A' 207) on strategic spatial planning. In Article 9, entitled "Spatial organization and development of the mountain, coastal, island and rural areas, as well as border areas" there are specific references to the so called "agricultural space". With regards to agriculture, the aim is the development of quality primary sector in conjunction with tourism and the prudent management for preserving the landscape, the natural ecosystems, and the traditional agro-ecosystems. More specifically:

- For high productivity rural areas: implementation of policies and effective measures for the sustainable management of soil and water resources, by rationalizing the use of agrochemicals and irrigation systems.
- For suburban rural areas: measures to prevent the loss of fertile land due to uncontrolled urban sprawling and to maintain them as free and leisure areas (appropriate adjustment of the urban planning to preserve the agricultural land).
- For mountainous and semi-mountainous areas as well and for island areas with a rural character: encouraging multiple primary sector activities with environmentally friendly crops, with strengthening livestock and emphasis on quality products in combination with alternative mild touristic activities.

In Article 10, entitled "Conservation, protection, enhancement of the national natural and cultural wealth, conservation and enhancement of the rural diversity and sustainable management of natural resources", related policies and other measures are foreseen. These provisions are structured in five axes:

1. Priority areas of natural wealth;
2. Management of natural and cultural wealth;
3. Land-use guidelines for the protection of the landscape and rural areas from uncontrolled urban sprawl;
4. Guidelines for the sustainable management of natural resources in regional and local planning;
5. Prevention – control of natural and technological risks-restoration of affected areas.

The spatial planning system also comprises sector-specific frameworks in order to provide guidelines, rules and criteria for the spatial structure, organisation and development of economic activities of national importance but agriculture is not among these sectors. Furthermore, 13 regional plans have been adopted gradually in various legal forms (by law for the Region of Attica entitled as Attica Master-plan, by Presidential Decrees for the other 12 Regions) and they are regularly updated when necessary, that attempt to implement the national priorities that have been established in the General Framework for Spatial Planning and Sustainable Development, taking into account the specific characteristics and strengths and weaknesses of every Region. At the level of goal setting, these plans are promoting the establishment of a spatial development model in accordance with sustainability principles.

4 Description of the plan

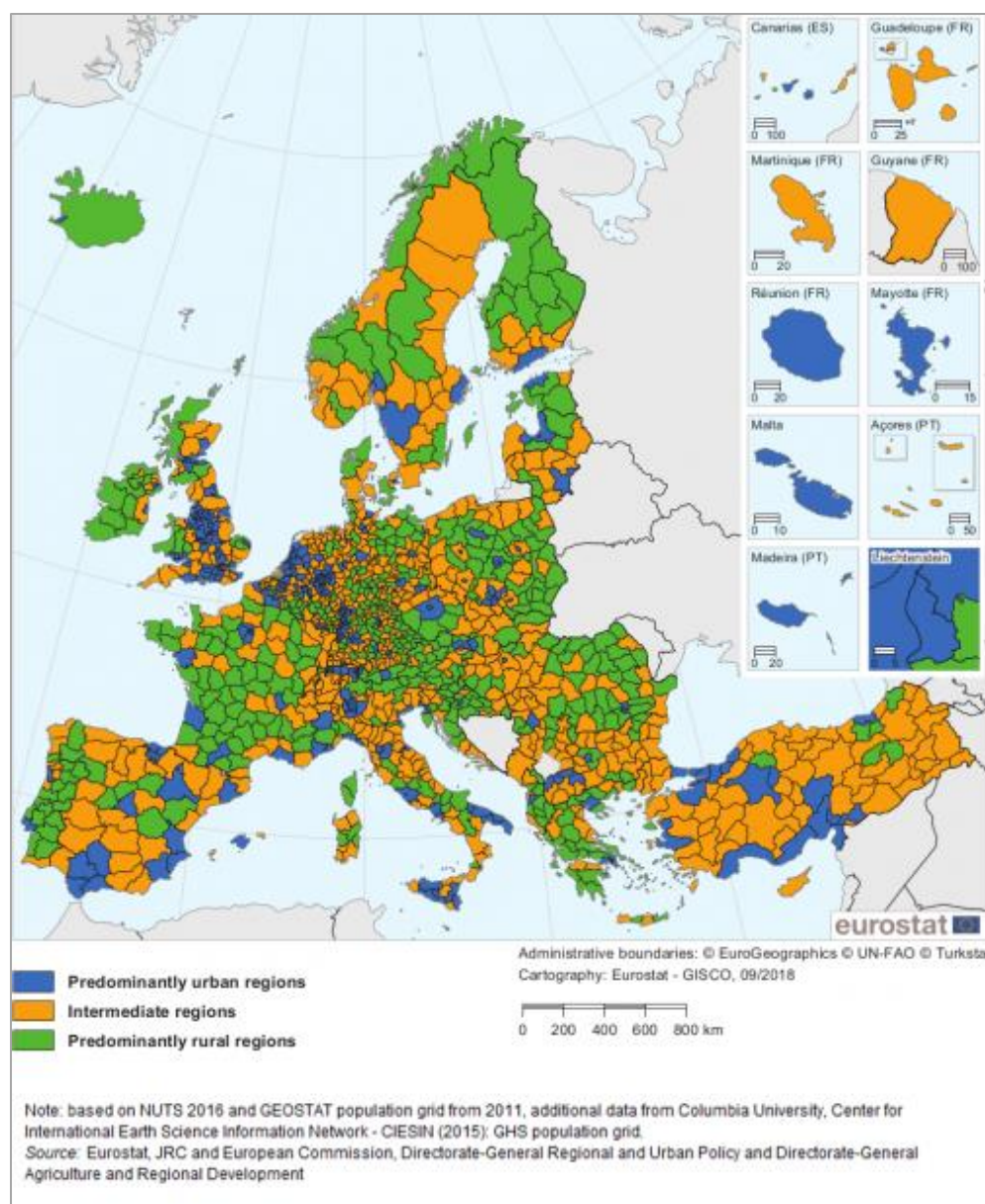
This section contains the description of the proposed CAP SP for Greece with particular reference to its geographical scope and its contents with the interventions that will arise from its implementation.

4.1 Geographical area covered by the plan

Greece will implement a single national CAP SP for the programming period 2023-2027 for its entire territory.

Greece is a unitary State organised on a decentralised basis. It comprises two levels of governance, the central governance and the local self-government. The former is exercised centrally (government-ministries) as well as at a decentralised level (Decentralised Administrations), while the latter is exercised at regional (Regions) and municipal level (Municipalities). Since 1 January 2011, when the Kallikratis Programme (Law 3852/2010, OGG 87/A/07-06-2010) entered into force, there are seven (7) Decentralised Administrations, thirteen (13) Regions and 325 Municipalities. With an amendment to Article 1 of Law 3852/2010 (via Law 4600/2019) enacted on March 2019, the total number of municipalities was increased to 332. The 54 old prefectures and prefecture-level administrations have been largely retained as sub-units of the regions. The decentralised administrations group one to three regions for administrative purposes on a regional basis.

The determination of the country's rural areas is based on the urban-rural typology of the European Union, which identifies two types of rural areas according to the share of the rural population (by using the 2011 population census): predominantly rural areas and intermediate rural areas. The next major update is foreseen to take place for the 2021 reference year, after the conduction of the 2021 population census by the Hellenic Statistical Authority which is planned for the next autumn.



Source: Eurostat, JRC and European Commission, Directorate-General Regional and Urban Policy and Directorate-General Agriculture and Regional Development

Figure 2: Rural areas of Greece (predominantly rural and intermediate regions) according to the EU urban-rural typology

According to 2016 data, the rural areas in Greece cover 94.7% of the total land area, of which 66.4% is predominantly rural and 33.6% is intermediate rural area (DG AGRI, CAP Indicator- [C03](#)). As of 2019, rural areas are home to around 5.9 million people, about half of the total population (54.8%) (DG AGRI, CAP Indicator- [C01](#)).

4.2 Content of the plan

In June 2018, the European Commission presented legislative proposals on the CAP for the period 2021-2027. These proposals aimed to make the EU's agricultural policy more responsive to current and future challenges, while continuing to support the active needs of European farmers. By setting out a more intuitive and innovative policy, the Commission aims to ensure that the CAP can continue to provide strong support for European farming, enabling prosperous rural areas and the production of high-quality food for years to come. The overall goal is to foster a sustainable and competitive agricultural sector that can contribute significantly to the European Green Deal, especially regarding the Farm to Fork strategy and Biodiversity strategy, focusing on securing a fair deal and a stable economic future for farmers, setting higher ambitions for environmental and climate action and safeguarding agriculture's position at the heart of Europe's society. Due to negotiations between the European Parliament and the Council of the EU, the provisional start date of the CAP reform has been pushed back to 1 January 2023. After reaching political agreement on the reform package, the respective legal texts have been finalised and adopted in December 2021.

As set out in articles 5 and 6 of the Regulation (EU) 2021/2115 (referred to as SPR), the new CAP Strategic Plan for Greece is structured around the achievement of three general objectives, which will be pursued through nine specific objectives, as schematically presented below. These objectives are complemented and interconnected with a cross-cutting objective of modernising the sector by fostering and sharing of knowledge, innovation and digitalisation in agriculture and rural areas, and encouraging their uptake.

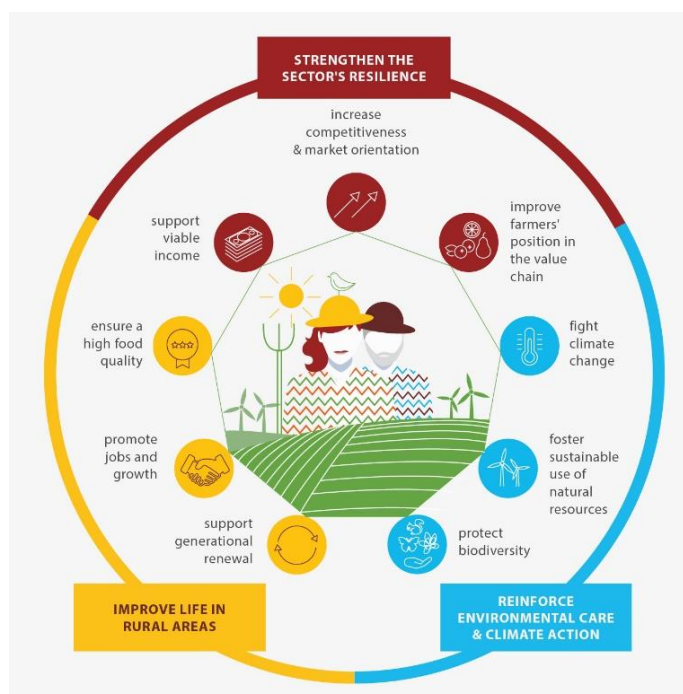


Figure 3: General and specific objectives of the CAP

The targeting of the new CAP and consequently the planning of the framework of interventions that are included in the CAP SP of Greece, is called to respond to the new needs and challenges, and to take into account the EU and national policy of relevance, especially the strategic priorities reflected in the two EU

Green Deal Strategies, "Farm to fork" and "Biodiversity", towards a smart and sustainable agriculture, with enhanced concern for the environment and climate and with integrated development strategies to stimulate the socio-economic fabric of rural areas. Adding to these challenges, is tackling the coronavirus pandemic crisis, which is severely testing the resilience of the national agri-food system and creating increased funding needs.

The pursuit of the new CAP for economic, environmental and social sustainability is based for the first time on a single approach, which seeks the joint contribution of its two Pillars in achieving its specific priorities. To this respect, the proposed CAP SP is drawn upon the types of interventions that the Member States may use to implement the CAP strategic plans, incorporating interventions under both Pillar I and Pillar II. As for Pillar I support, they cover direct payments and sectoral interventions, whereas Pillar II refer to the rural development support.

The types of interventions for direct payments that have been selected in the CAP SP include:

- basic income support for sustainability (BISS)
- complementary redistributive income support for sustainability (CRISS)
- complementary income support for young farmers (CIS-YF)
- schemes for the climate and the environment (Eco-schemes)
- couple income support (CIS)
- crop-specific payment for cotton (CSPC)

The sectoral interventions of the CAP SP involve three mandatory sectors: the fruit and vegetable sector, the apiculture sector and the wine sector and one selected by the country, the olive oil and tabled olives sector. These interventions are drawn upon predefined objectives in these sectors and a set of potential types of interventions that could receive support, such as investments in tangible and intangible assets, advisory services, training, quality schemes and certification systems.

The types of interventions under rural development that have been used for the interventions of CAP SP are:

- environmental, climate and other management commitments (ENVCLIM)
- natural or other area-specific constraints (ANC)
- investments, including investments in irrigation (INVEST)
- cooperation (COOP)
- setting up of young farmers and new farmers and rural business start-up (INSTAL)
- knowledge exchange and information (KNOW)

The actions supported under knowledge exchange and information are based on and consistent with the description of the Agricultural Knowledge and Information System (AKIS) provided in the CAP Strategic Plan.

The interventions have been identified on the account of the assessment of the identified needs that have arisen from the SWOT (Strengths, Weaknesses, Opportunities and Threats) analysis and are indicatively related to the support of agricultural income and ensuring the food security of the country, in increasing competitiveness, with greater emphasis on research, technology and digitalization, empowering farmers in the value chain, tackling climate change and protect the environment, attracting young farmers and facilitating business development in rural areas.

The content of the CAP SP is structured to the strategic statement, the assessment of needs and intervention strategy, the consistency of the strategy, the elements common to several interventions, the interventions, the target and financial plan, the governance systems and coordination systems, modernisation and simplification and the inclusion of ex-ante and SEA recommendations. The following sections present (a) the needs addressed by the plan, which form the strategy for the implementation of the CAP SP's specific objectives, (b) the proposed interventions which build the intervention strategy of the plan and which are linked to at least one of the identified needs and (c) the financial plan and budget allocation among the pillars and groups of types of interventions (direct payments, sectoral interventions and rural development). The interventions are essentially the individual measures for the implementation of the CAP SP 2023-2027 and which are under SEA assessment.

4.3 Needs addressed by the plan

The needs assessment, undertaken as part of the development of Greece's CAP Strategic Plan 2023-2027, identified and prioritised the needs that are addressed by the plan, which constitute the plan's overall strategy for the implementation of the specific objectives. The assessment was based on the evidence provided in SWOT Analysis, the feedback provided by stakeholders, and the recommendations provided by the European Commission with regards to the formulation of the CAP SP.

➤ SO1 "Support viable farm income and resilience across the Union to enhance food security"

The SWOT analysis of SO1 revealed important findings regarding the evolution of agricultural income over time, with a series of specialized indicators, both from 'macro' data and from data at the level of agricultural holding. Among other things, it was found that the Agricultural Family Income (AFI) per holding corresponds to 59% of the European average, as well as significant differences in the income performance of the individual productive specializations of Greek agriculture. On average, 54% of AFI comes from direct payments, while the economic operation of about 78% of the country farms depends to a large extent or even exclusively, on the existence of the direct payment system. There was also a significant differentiation in the amount of direct payments between farms (because the number of rights held by each holding differs on the one hand and the unit value of rights within each agronomic region on the other), as well as an increase in direct payments inequalities over time. More specifically, it is stated that 10% of the holdings account for 48% of the total direct payments, while 45% of the total population of the holdings that can be considered as small farmers, receive 10% of the total amount of direct payments. In addition, 19 different coupled payments are granted to about 1/3 of all holdings eligible for direct payments, with five of them accounting for 72% of total payments. An important part of the analysis concerns the various categories of direct income support, as well as the assessment of the effects of the possible implementation, during the transition period 2020-2022, of various scenarios of partial internal convergence or equalization of the unit value of all rights per agronomic region.

In total, seventeen (17) needs have been identified and following their prioritization under consultation, out of which fourteen (14) are addressed by the plan and are presented into three broad categories, together with their prioritisation (high, medium, low priority).

Needs Group 1 - Fair and efficient implementation of direct payments

- Reduction of risks associated with climate change (investment incentives, training, advisory services) (*high*)
- Targeted support for settlement in agriculture of young people and newcomers (*medium*)
- Protection of animal breeding from risks associated with the appearance of epizootics (*low*)
- Redesign of support for holdings located in areas with natural or other constraints (*low*)
- Development of ruminant animals' sector with definitive delineation of pasture areas (*low*)
- Best targeting of optional coupled payments (*low*)
- Reduction of inequalities in the distribution of direct payments per holding (*low*)

Needs Group 2 - Strengthening / development of specific production sectors

- Improvement of Gross Production Value on holdings of productive specializations: cereals, other arable crops, olive cultivation and viticulture (*low*)
- Increase of Agricultural Family Income per holding in productive specializations: cereals, olive cultivation, viticulture, other arable crops, fruit trees, combination of permanent crops, mixed crop production (*low*)
- Development of sheep breeding and the promotion of domestic breeds (*low*)
- Increase in the value of productivity in bovine breeding for meat production (*low*)
- Reduction in the income variability of specific crops (risk management tools) (*low*)

Needs Group 3- Improvement of holdings resilience

- Maintaining a high agricultural income in the holdings of mountainous areas (*high*)
- Reduction of production costs on labour-intensive agricultural holdings (*high*)

➤ SO2 “Enhance market orientation and increase competitiveness, including greater focus on research, technology and digitalization”

The SWOT analysis for Specific Objective 2 examined the multidimensional issue of improving the competitiveness of Greek agriculture and the agri-food sector in general, as well as strengthening market orientation. Based on the findings of this detailed analysis, twelve (12) specific needs subsequently emerged, out of which eleven (11) are addressed by the plan. These needs are grouped into seven categories, with their prioritisation (high, medium, low), and which reflect the range of issues covered by this specific objective and what needs to be implemented by the plan.

Needs Group 1- Achieving a sustainable agricultural income

- Increase of investments and improvement of the targeting of the investment interventions of Pillar 2 (*medium*)
- Further increase of the economic size of the holdings (*low*)
- Improving the relationship between the amount of invested capital and the size of holdings (*low*)

Needs Group 2-Improving the productivity of the agri-food sector

- Support to increase productivity in all sectors with a declining trend in the previous period (other arable crops, viticulture, bovine animals, mixed crop production, cereals and oilseeds, fruit trees, olive cultivation, other permanent crops, mixed crop - livestock production) (*low*)
- Support to increase total factor productivity (TFP) in sheep and goat farming and horticulture (*low*)

Needs Group 3- Development of export strategy and improvement of the agricultural trade balance

- Reduction of the deficit in livestock products (pork, beef, cow's milk) and animal feed (livestock cereals and soybeans) (*low*)

Needs Group 4- Strengthening/ development of specific sectors

- Increase in the production of aromatic / medicinal plants and production of domestic certified propagating material (*low*)
- Strengthening the competitiveness of the poultry sector for meat production (*low*)

Needs Group 5- Improving the position of farmers in the agri-food chain through the production of high value-added products

- Increase the added value of agricultural products, especially in the sub-sectors of processing: fruit and vegetable processing, production of juices, ice cream, ready meals, brewing and soft drinks (*low*)

Needs Group 6- Strengthening networks and collaborations between all sectors of the agri-food chain

- Strengthening and expanding the network of intra-sectoral and inter-sectoral relations of the domestic agri-food sector, with targeted actions, at sectoral and spatial level (*medium*)

Needs Group 7- Establishment and operation of a national Agricultural Knowledge and Innovation System (AKIS 2.0) in relation to the national policy for the strengthening of Research, Technological Development and Innovation (RTDI)

- Creation and effective operation of the AKIS system on a large scale for training and consulting (*high*)

➤ SO3 “Improve the farmers' position in the value chain”

The SWOT analysis recorded the structure and changes that have taken place in the last decade in the agri-food value chain, the current situation regarding the production of high value-added agricultural products such as products with European quality labels (PDO, PGI, TSG) and organic products, the degree of organization of producers in collective schemes, the structure and progress of implementation of sectoral programs and the progress of implementation of those related to improving the position of producers in the agri-food value chain. The analysis highlighted the very limited degree of organization of producers in collective schemes, the lack of utilization of the significant number of PDO-PGI products available in the country, while all of the above was examined in the light of developments in the world agricultural trade.

The analysis identified a total of nine (9) needs, all of which are addressed in the plan, categorised into three groups with their prioritisation (high, medium, low), as prescribed below:

Needs Group 1- Production of high value-added products

- Utilization of the increased demand for safe and quality food that is labelled (*medium*)
- Adaptation measures to address the effects of climate change on extroverted agri-food products (*medium*)
- Strengthening the position of agri-food products in foreign markets through economies of scale, standardization, certification (*medium*)
- Utilization of alternative distribution channels and e-commerce (*low*)

Needs Group 2- Strengthening networks and collaborations

- Strengthening of networks / collaborations between the sectors of the agri-food chain, especially between the sectors of the agri-food chain of PDO / PGI products (*high*)
- Strengthening the interventions of CAP that promote the cooperation / networking / collective organization of the agri-food producers and sectors (*high*)
- Increase participation in collective / networking networks to improve the negotiation position of farmers in the agri-food value chain (*high*)
- Strengthening networking - collaborations between the sectors of the agri-food chain to increase added value and extroversion (*high*)

Needs Group 3- Increasing the participation of farmers in collective schemes

- Increasing the participation of farmers in collective schemes in order to increase the production of branded products (*medium*)

➤ SO4 “Contribute to climate change mitigation and adaptation, as well as sustainable energy”

The strategy for the specific objective 4 is based on the identified needs emerged by the SWOT analysis, which were prioritized following consultation. The SWOT analysis recorded the relative low contribution of agriculture to greenhouse gas emissions, the need to enhance the land use, land use change and forest sector (LULUCF) as a carbon-sink contributor, including the opportunities and efforts that should be taken in the course of climate change mitigation and support of sustainable energy, taking into account the National Energy and Climate Plan. As for boosting to sustainable energy efforts, it is taken into consideration that while the energy consumption per hectare in agriculture and forestry is much lower than the EU average, the share of renewable energy production in agriculture and forestry is well below the EU average.

Regarding climate change adaptation, agriculture is more vulnerable than most other sectors of the economy to climate change. The National Climate Change Adaptation Strategy suggests actions that can strengthen systems and areas that are expected to face increased problems due to climate change which relate to changes in practices. The possibilities of localized application of such schemes will be well defined after the completion of the Regional Climate Change Adaptation Plans, taking into account that the degree of resilience of the regions to the pressures of climate change varies.

To this respect, the analysis identified a total of five (5) needs, all of which are addressed by the plan, which are presented into four groups of needs, with their prioritisation (high, medium, low).

Needs Group 1- Improving the environmental and climate footprint of agriculture and forestry

- Enhancing land use and agricultural / livestock practices that help reduce greenhouse gas emissions e.g. organic farming (*high*)
- Design and taking measures to increase carbon sequestration in agriculture and forestry, with an emphasis on fire forest protection, pasture management and agroforestry (*medium*)

Needs Group 2- Agriculture adaptation to climate change

- Restructuring of the policy for the adaptation of agriculture and forestry to climate change, based on the latest data, but also on the national and regional climate adaptation plans. Emphasis on the intensification of droughts and flood risk (*high*)

Needs Group 3- Promotion of bioeconomy and circular economy in rural areas

- Strengthening efforts for energy production from renewable sources in agriculture and forestry. (*low*)

Needs Group 4- Establishment and operation of a national Agricultural Knowledge and Innovation System

- Inclusion of information, training and advice on mitigation and adaptation to climate change in AKIS (*medium*)

➤ SO5 “Foster sustainable development and efficient management of natural resources such as water, soil and air”

The strategy for the Specific Objective 5 is structured by eleven (11) identified needs that were derived by the SWOT analysis and were prioritized following stakeholder consultation (high, medium, low priority). The SWOT analysis revealed the necessity to improve the system for monitoring the irrigation water intakes in the territory and the system for the management of irrigation resources. The data analysis also highlighted the fact that the existing risk of soil erosion is not the same for the entire agricultural area of the country. While more than a third of the land is at low risk of erosion, there is a significant percentage (over 50%) of the country's agricultural land facing a significant problem. For the pastures and the grazing areas of the country, the lack of data and analyses is expected to be covered by the foreseen regional pasture management plans. Of utmost importance are the synergies with the revised River Basin Management Plans, which also contain drought management plans and are supplemented by the Flood Management Plans, that include measures and actions, a large part of which relate to agricultural activities. Synergies with the National Climate Change Adaptation Strategy need to be identified, to be gradually complemented by Regional Climate Change Adaptation Plans, which are expected to contain measures and actions for water use.

All of the identified needs are addressed by the plan, which are categorised into four groups: (i) Rational water resources management, (ii) Protecting soil resources from erosion and improving soil fertility, (iii) Adaptation to climate change and (iv) Establishment and operation of a national Agricultural Knowledge and Innovation System (AKIS) in line with national policy to strengthen Research, Technological Development and Innovation (RTDI).

1. Rational water resources management

- Emphasis on reducing irrigation losses (*medium*)
- Improvement of water resources management by strengthening the irrigation water management system at local and regional level. Utilization of the experience gained by the National Water Quality Monitoring System with the aim of improving the monitoring /control system for water abstraction (*medium*)
- Pursuit of synergies and complementarity with the practices encouraged in the enhanced conditionality but also the restrictions for the protection of water resources (*medium*)
- Priority to measures for the protection of water systems with a low qualitative status (*low*)

2. Protecting soil resources from erosion and improving soil fertility

- Wisely designed policy with a strong spatial dimension for the protection of soil resources (*low*)
- Timely preparation of reliable and functional pasture management plans (*low*)
- Pursuit of synergies and complementarity with the practices encouraged in the enhanced conditionality but also the restrictions for the protection of soil resources (*low*)

3. Adaptation to climate change

- Mitigation to the impact of intensified floods and drought on agriculture and forestry (*high*)
- Incorporation of measures referred to the revised River Basin Management Plans and the National Climate Change Adaptation Strategy (including the foreseen Regional Adaptation Plans) (*medium*)

4. Information, training and advice on natural resources protection actions

- Information, training and advice (AKIS) on actions for natural resources protection – water resources (*medium*)
- Information, training and advice (AKIS) on actions for natural resources protection – soil (*medium*)

➤ SO6 “Contribute to the protection of biodiversity, enhance ecosystem services and preserve habitats and landscapes”

The strategy for the Specific Objective 6 is structured by ten (10) needs that were identified from the SWOT analysis and needs assessment and were prioritized following consultation. The needs emerged from the recorded data on the conservation status and threats of the habitats and species of European interest, related and/or affected by agricultural activities, the agriculture and forest areas that are within Natura 2000 areas, the progress made to support high nature value areas, and the situation over the management of pasture areas. The analysis highlighted the coordination efforts that are required to be established between the national and EU policies on biodiversity and protected areas and the CAP SP, along with the associated actions and synergies that need to be supported and strengthened.

A prerequisite for the implementation of the Strategic Plan is the effective overcoming of obstacles and inhibiting factors such as the lack of management plans for the protected areas and / or the lack of specialized directions for the agricultural areas within the protected areas. Efforts are also needed to focus on the intensification of measures to protect species and habitats but also to better target them as well as the connectivity between protected areas and adjacent to agricultural areas for the protection of biodiversity. Due to the recorded negative trend of the forest birds index, which comes to support the finding on the poor condition of forest ecosystems, actions are required to strengthen fire prevention and protection and the restoration of forests and forest areas. In addition, the rich genetic biodiversity, especially of phytogenetic material, on the one hand, but also the observed shift of markets at European and international level to products of high quality, on the other hand, highlight the need to strengthen the existing domestic genetic material.

Nine (9) out of the ten identified needs are addressed by the plan, which are presented with their prioritisation (high, medium, low) into three categories of needs.

Needs Group 1 - Production of environmental public goods and services from agriculture

- Promotion of practices in agriculture and forestry that will maintain and enhance biodiversity in agricultural and forest areas (*high*)
- Strengthening the protection and promotion of domestic genetic resources (*high*)
- Planning to achieve synergies with National and EU Policy on Biodiversity (Green Deal, Biodiversity Action Plan 2030, Natura Prioritised Action Framework, Species and Habitat Action Plans, Pollinators Initiative) (*medium*)
- Strengthening the restoration, conservation and improvement of protected areas, habitats and species related to agriculture (*medium*)

- Completion and improvement of the monitoring system of the species and habitats (*medium*)
- Increase in the conservation of landscape elements on agricultural land (*medium*)
- Emphasis on the protection of forest ecosystems - Prevention and remediation of the impacts of forest fires (*low*)

Needs Group 2- Agriculture adaptation to climate change

- Coordination with national climate change policy (e.g. National Energy and Climate Plan, National and Regional Adaptation Plans as well as climate change related provisions of the National Forest Strategy) (*medium*)

Needs Group 3- Establishment and operation of a national Agricultural Knowledge and Innovation System

- Training and advice to producers within AKIS on the interaction between agriculture / forestry and biodiversity (*medium*)

➤ SO7 “Attract young farmers and facilitate business development in rural areas”

The SWOT analysis of the specific objective 7 highlighted the intensity of the problem of aging of employed farmers, which records the demographic composition of employees in the primary sector, but also the structural backwardness and divergence of the level of knowledge and skills compared to the EU average. At the same time, it highlighted factors that act as a deterrent to age renewal, such as the difficulty of accessing agricultural land and bank lending for investment financing, the importance of the two pillars of the CAP in the slow age renewal that exists and the special dynamics (based on the structural characteristics of Greek Agriculture) that the agricultural holdings of young farmers have.

There is a total of six (6) needs, prioritized in the context of the stakeholders consultation (high, medium, low), out of which five (5) are addressed by the plan, that have been categorised into three groups of needs, as outlined below:

Needs Group 1- Improving and upgrading the skills of human resources

- Upgrading of education and training as well as provision of advice focusing on young farmers (*high*)

Needs Group 2- Age renewal of the employed agricultural potential

- Access to investment funds on favourable terms, considering the specifics and needs of agricultural production (*high*)
- Maximization of horizontal (between the pillars) and vertical (sub-categories of interventions) synergies (*high*)
- Strengthening of measures to facilitate the initial establishment of young farmers particularly in disadvantaged areas (*high*)

Needs Group 3- Achieving a sustainable agricultural income

- Support for young farmers to lead to the creation of sustainable and competitive agricultural holdings (*medium*)

➤ SO8 “Promote employment, growth, social inclusion and local development in rural areas, including bio-economy and sustainable forestry”

The SWOT analysis of specific objective 8 was structured in sub-sections due to the multitude of structural features that had to be analysed in order to determine on the one hand the factors that have led to their developmental lag and on the other hand the possibilities and consequently their utilization for the development of "emerging" economic activities, such as the bioeconomy, which can contribute to the creation of new jobs as well as income. It is noted that the development delays of rural areas are a common feature throughout the EU with varying degrees of intensity between urban and rural areas. For many rural areas of the EU, the lag in growth rates is accompanied by an aging population that is exacerbated by the outflow of young people to urban areas due to lack of employment opportunities, poverty, difficulty accessing quality health services, education, etc.

The examination of many and distinct parameters (e.g. structure of the economy, employment, unemployment, demographic composition, level of education) led to the identification of 22 needs that have been prioritized in the consultation process (high, medium, low). Fifteen (15) needs are fully and one (1) need is partially addressed by the plan, as grouped below into 6 categories of needs:

Needs Group 1- Strengthening and diversifying the economy of rural areas

- Strengthening of the productive base of rural areas and the interdisciplinary relationships between sectors of the economy (*medium*)
- Increasing labour productivity in all sectors of economic activity in rural areas (*low*)
- Reducing the dependence of rural economy from the primary sector (*low*)

Needs Group 2- Retention and attraction of the population in rural areas

- Coverage of all inaccessible rural areas with broadband infrastructure (*medium*)

Needs Group 3- Improving the level of infrastructure and services in rural areas

- Create new jobs in rural areas (*low*)
- Improvement of the level of provision of basic services (*low*)

Needs Group 4- Improving and upgrading the skills of human resources

- Education and training of the inhabitants of the rural areas in digital services (*high*)

Needs Group 5- Promotion of bioeconomy and circular economy in rural areas

- Promotion and financing of bioeconomy, circular economy and RES investments (*high*)
- Promotion of valorisation of biomass from agricultural waste, biogas production and water reuse (*high*)
- Support for technology transfer / know-how actions between industry and research (*medium*)
- Farmers' education / information actions on bioeconomy and circular economy (*medium*)
- Creation of a favourable investment environment for the promotion of bioeconomy (*medium*)
- Organization and development of agricultural waste collection networks for their valorisation at regional level (*medium*)
- Targeted information / awareness-raising actions of local communities for the benefits of circular economy and bioeconomy (*medium*)
- Strengthening of investments for reduction / treatment / reuse of agricultural waste and biorefinery (*medium*)

Needs Group 6- Tackling poverty and social exclusion in rural areas

- Informing the population and the socio-economic stakeholders about the priorities of CAP and integrate them into local strategies (*medium*)
- Focusing on actions to help integrate young people into the labour market (*medium*)
- Enriching local strategies with actions to address poverty and social exclusion (*low, partially addressed*)

➤ SO9 “Improve the response of EU agriculture to societal demands on food and health, including safe, nutritious and sustainable food, food waste, as well as animal welfare”

The incorporation of the goals of the EU Farm to Fork strategy and more broadly of the EU Green Deal to the CAP Strategic Plan is largely served exclusively by the interventions of SO9 (healthy nutrition, food waste, reduction of antibiotic use, reduction of animal welfare), while the reduction in the use of nutrients and pesticides is directly related to the environmental – climate objectives of the CAP SP. Organic products and PDO – PGI products are a separate unit in the SWOT analysis of SO9 due to their role in promoting healthy nutrition and food safety.

The country's performance in the priority areas of the Farm-to-Fork strategy is described as “moderate”. According to the SWOT analysis, the increase of utilized agricultural areas with organic farming practices is not accompanied by an increase in the consumption of organic products, while the per capita expenditure for the consumption of organic products in Greece is one of the lowest in the EU. The SWOT analysis also showed the relatively satisfactory performance of the country regarding the use of antibiotics in productive animals, but with an increasing trend. The performance of the use of pesticides is satisfactory, with fluctuations in certain individual categories. On the other hand, the reduction of food waste is a new policy area for CAP, which was introduced mainly through the Farm to Fork strategy. The SWOT analysis emerged the synergies with the national waste policies through the forthcoming action plan on food waste prevention and a mechanism for measuring food waste generation that will enable to conclude on the necessary interventions. As for the CAP's emphasis on promoting healthier eating habits, it is considered an opportunity for Greek agriculture due to the fact that the "Mediterranean diet" is synonymous with healthy eating. The SWOT highlighted the worrying increase in the obesity index in Greece and the intensity of the problem in children, but also in the inhabitants of rural areas.

To this end, the recommendations of the European Commission set specific priorities for SO9 that are reflected in all 24 needs with their prioritisation (high, medium, low), out of which 15 are fully and 1 is partially addressed by the plan. These needs are classified into five groups, as presented below:

Needs Group 1- Strengthening the demand for organic products and products with quality labels

- Development of a strategy for the promotion of organic products in the domestic and international market (*high*)
- Strengthening the promotion actions of organic products in the domestic and international market (*high*)
- Increasing the production / standardization / processing of PDO-PGI products that have market accessibility (*high*)
- Development of a strategy for the promotion of PDO - PGI in foreign market (*high*)
- Strengthening the actions to promote PDO – PGI and especially wine in foreign markets (*high*)
- Labelling of Greek products with labels of high recognition in foreign markets (*high*)

Needs Group 2- Reduction of the risk from the use of plant protection products in plant production

- Strengthening training / advisory actions for farmers on the rational use of plant protection products (*high*)
- Informing producers about their obligations under the new National Action Plan for plant protection (*high*)
- Strengthening food safety control mechanisms with human resources and equipment (*high*)

Needs Group 3- Implementation of standards for well-being and limiting the use of antibiotics

- Strengthening training / advisory actions of producers for animal welfare and the use of veterinary medicine (*medium*)
- Adopting measures to improve animal welfare conditions while strengthening the control mechanisms (*medium*)
- Strengthening producers to adopt measures to improve animal welfare conditions (*medium*)
- Increasing information - awareness of citizens on issues of animal welfare (*low*)

Needs Group 4- Integrated management of food waste

- Utilization of good international practices and the transfer of know-how for the implementation of relevant actions on food waste (*low*)
- Participation of NGOs and private sector in the planning and implementation of relevant actions (*low*)

Needs Group 5- Changing dietary standards and adopting the Mediterranean diet

- Taking advantage of the opportunities provided by the Farm to Fork Strategy to increase the demand for fruit and vegetables (*low, partially addressed*)
- Informing the population about the benefits of healthy nutrition (*low*)

➤ **Cross-Cutting SO10 “The modernization of the agricultural sector by promoting and disseminating knowledge, innovation and digitization in agriculture and rural areas and encouraging their adoption”**

Modernizing the agricultural sector by promoting and disseminating knowledge, innovation and digitization in agriculture and rural areas and encouraging their adoption is a cross-cutting objective of the new CAP. According to previous research findings concerning AKIS, presented in the SWOT analysis and needs analysis (including consultation), the need for immediate (re)establishment of AKIS in Greece arises effortlessly as key links between the system’s actors are missing. Moreover, all recent documents on EU policies as well as the domestic and international research clearly indicate AKIS as a priority in the EU, in general, and in Greece, in particular. Through the Strategic Plan, CAP aims to strengthen targeted and comprehensive plans for the digitization of agricultural production and knowledge dissemination, trying to bridge the gap between knowledge and innovation production centres and farmers and alleviate the problem of technological shortages to the daily challenges facing Greek agriculture, with the integration of technologies and best practices that will make Greece more productive and competitive in the context of the globalized market.

Accelerating the country's digital adaptation and promoting an effective transmission of innovative knowledge and optimum practices in agricultural production are major challenges for the country so that Greece will be at the forefront of growth in Europe. Important elements are also training, demonstrations, information exchange, introduction of new technologies and innovations and the creation of partnerships and synergies between the actors of the agri-food chain. For the general operation of AKIS, it is considered necessary to attract the interest of the research and academic community. In addition, the strengthening

of collaboration networks can be achieved through the creation of platforms and forums in which stakeholders and research centres can be in direct communication for the exchange of views and experiences on digital technology issues. Particularly important is also the need to strengthen the partnerships between high-tech companies and contract farming.

Twenty-four (24) needs have been identified and prioritised following stakeholder consultation (high, medium, low), out of which twenty (20) are addressed by the CAP SP and presented below:

- Providing training for the abandonment of outdated practices in the agricultural sector and processing (*high*)
- Improving educational services, training opportunities and technological infrastructure (*high*)
- Strengthening actions related to the diffusion and exploitation / adoption of innovations through partnerships (*high*)
- Strategy for the production, dissemination and productive utilization of innovations - promotion of collaborations (*high*)
- Timely preparation of requirements / specifications to meet the needs of the new CAP (*high*)
- Large-scale operation of the AKIS system for training and counseling (*high*)
- Interconnection of research bodies with companies and improvement of cooperation networks (*high*)
- Increasing collaborations with companies of high technological level (*high*)
- Strengthen resources dedicated to research and innovation in the agri-food system (*high*)
- Promotion of knowledge and innovation in small units-strengthening of agricultural collaborations (*high*)
- Investment financing for application and systems development (*high*)
- Strengthening partnerships with high-tech companies and contract farming (*high*)
- Establishment of networking structures and consulting services to deal with introversion (*high*)
- Functionality improvement-extensions / upgrades of existing information systems (*high*)
- Implementation of IT projects of immediate priority of Digital Reform Book for the agricultural sector (*medium*)
- Development of new management applications for schemes that are not computerized (*medium*)
- Strengthen research to increase the level of technological capabilities and productivity (*medium*)
- Compilation of a consolidated Register of beneficiaries - Unified Business Register of the MRDF (*low*)
- Homogenization of registries of MRDF through the Register of Farmers and Agricultural Holdings (*low*)
- Organization of data collection with own means, until the implementation of information systems by third parties (*low*)

4.4 Proposed interventions

The proposed interventions of the CAP SP are designed in accordance with the relevant articles of Regulation (EU) 2021/2115 (SPR regulation), which lays down rules in support of the Strategic Plans to be drawn up by the Member States under the CAP SPs and to be financed by the European Agricultural Guarantee Fund (EAGF) and the European Agricultural Development Fund (EAFRD). The interventions are presented according to the groups of intervention types under pillar I (Direct Payments and Sectoral Interventions) and Pillar II (Rural Development).

1. Direct Payment Interventions

The proposed direct payment interventions are 15 in total, by making use of the 4 types of decoupled payments (BISS, CRISS, CIS-YS and Eco-Schemes) and the 2 types of coupled payments (CIS and CSPC), as presented below in tabular format. There are 8 interventions for eco-schemes and 3 for CIS, whilst 1 intervention is dedicated for each of the remaining intervention types.

Table 5: Direct payment interventions

Code	Type of intervention	Ref. to SPR	Name of intervention
Π1-21	Basic income support (BISS)	Art. 21	Basic income support for sustainability
Π1-29	Complementary redistributive income support for sustainability (CRISS)	Art. 26	Complementary redistributive income support for sustainability
Π1-30	Complementary income support for young farmers (CIS-YS)	Art. 30	Complementary income support for young farmers
Π1-31.1	Schemes for the climate, the environment and animal welfare (Eco-schemes)	Art. 31	Use of resilient and adapted species and varieties
Π1-31.2			Extension of the application of ecological focus areas
Π1-31.3			Application of ecological focus areas in tree crops
Π1-31.4			Conservation of agroforestry ecosystems rich in landscape elements
Π1-31.5			Supporting producers to apply precision farming methods using tool / application for input management and monitoring of environmental parameters
Π1-31.6			Environmental management-improvement of permanent pastures
Π1-31.7			Maintenance and protection of crops in areas with terraces
Π1-31.8			Maintenance of organic agriculture and livestock farming
Π1-32.1	Coupled income support (CIS)	Art. 32	Coupled Income Support - Crop production
Π1-32.2			Coupled Income Support - Animal production
Π1-32.3			Coupled Income Support - Silk worms
Π1-36	Crop-specific payment for cotton (CSPC)	Art. 34-38a	Crop-specific payment for cotton

2. Sectoral Interventions

The proposed sectoral interventions are 28 in total, grouped to the 4 sectors that have been defined for support: fruit and vegetable (8 interventions), apiculture (7 interventions), wine (5 interventions) and olive oil and table olive (8 interventions). The interventions are designed to contribute to the predefined set of objectives under the intervention types that can be supported by the CAP SP for each individual sector.

Table 6: Sectoral interventions

Code	Type of intervention	Ref. to SPR	Name of intervention
Sectoral programme for fruit and vegetables sector			
Π2-47.1-1a	Investments in tangible and intangible assets (INVRE)	Art. 47(1a)	Investments in tangible and intangible assets, research and experimental and innovative production methods in the

Code	Type of intervention	Ref. to SPR	Name of intervention
			Operational Programmes of Fruit and Vegetable Producers Organizations
Π2-47.1-1b	Advisory services and technical assistance (ADV11)	Art. 47(1b)	Advisory services and technical assistance in the Operational Programmes of Fruit and Vegetable Producers Organizations
Π2-47.1-1c	Training, coaching and knowledge exchange (TRAINCO)	Art. 47(1c)	Training, including coaching and exchange of best practices in the Operational Programmes of Fruit and Vegetable Producers Organizations
Π2-47.5	Sustainability and efficiency of transport and storage (TRANS)	Art. 47(1e)	Actions to increase sustainability and efficiency of transport and storage of products in the Operational Programmes of Fruit and Vegetable Producers Organizations
Π2-47.6	Promotion, communication and marketing (PROMO)	Art. 47(1f)	Promotion, communication and marketing in the Operational Programmes of Fruit and Vegetable Producers Organizations
Π2-47.1-1g	EU and national quality schemes (QUAL)	Art. 47(1g)	Quality schemes in the Operational Programmes of Fruit and Vegetable Producers Organizations
Π2-47.8	Traceability and certification (TRACE)	Art. 47(1h)	Traceability and certification systems in the Operational Programmes of Fruit and Vegetable Producers Organizations
Π2-47.9	Market withdrawal (WITHD)	Art. 47(1f)	Withdrawal action from the market for free-distribution or other destinations in the Operational Programmes of Fruit and Vegetable Producers Organizations
Sectoral programme for apiculture			
Π2-55.1	Advisory services and technical assistance (ADVIBEES)	Art. 55(1a)	Advisory services, training & technical assistance to beekeepers and beekeepers' organizations
Π2-55.2	Investments in tangible and intangible assets (INVAPI)	Art. 55(1b)	Enemies and Diseases of Bees - Targeted Surveillance Program and early detection of the small hive beetle (<i>Aethina tumida</i>)
Π2-55.3			Rationalization of the seasonal movement of bee colonies
Π2-55.4	Laboratory analysis of products (ACTLAB)	Art. 55(1c)	Actions to increase the number and scope of analyzes of honey and apiculture products by accredited laboratories to facilitate beekeepers in marketing and to upgrade the value of their products
Π2-55.5	Cooperation for research programmes (COOPAPI)	Art. 55(1e)	Cooperation with specialized bodies for the implementation of applied research programs in the field of beekeeping and apiculture products
Π2-55.6	Promotion, communication and marketing (PROMOBEES)	Art. 55(1f)	Promotion, communication and marketing, including market monitoring actions and activities aiming in particular at raising consumer awareness about quality of the apiculture products and the importance of healthy diets
Π2-55.7	Enhance product quality (ACTQUAL)	Art. 55(1g)	Actions to enhance the quality of beekeeping and apiculture products
Sectoral programme for wine			
Π2-58.1	Restructuring and conversion of vineyards (RESTRVINEY)	Art. 58(1a)	Restructuring and conversion of vineyards
Π2-58.2	Investments in tangible and intangible assets (INVWINE)	Art. 58(1b)	Investments in tangible and intangible assets in wine-growing farming holdings
Π2-58.3	Green harvesting (GREENWINE)	Art. 58(1cc)	Green harvesting

Code	Type of intervention	Ref. to SPR	Name of intervention
Π2-58.4	Information and encouragement of responsible consumption or promotion of quality systems (INFOR)	Art. 58(1h)	Information actions to encourage responsible consumption of wine or the promotion of quality systems covering designations of origin and geographical indications
Π2-58.5	Promotion in third countries (PROMOWINE)	Art. 58(1k)	Promotion of wines in third countries
Sectoral programme for olive oil and table olive			
Π2-47.2.1a	Investments in tangible and intangible assets (INVRE)	Art. 47(1a)	Investments in tangible and intangible assets in the framework of Operational Programmes of Olive Oil Organizations
Π2-47.2.1b	Advisory services and technical assistance (ADV11)	Art. 47(1b)	Advisory services and technical assistance in the Operational Programmes of Olive Oil Organizations
Π2-47.2.1c	Training, coaching and knowledge exchange (TRAINCO)	Art. 47(1c)	Training, including coaching and exchange of best practices in the Operational Programmes of Olive Oil Organizations
Π2-47.2.1e	Sustainability and efficiency of transport and storage (TRANS)	Art. 47(1e)	Actions to increase sustainability and efficiency of transport and storage of products in the Operational Programmes of Olive Oil Organizations
Π2-47.2.1f	Promotion, communication and marketing (PROMO)	Art. 47(1f)	Promotion, communication and marketing in the Operational Programmes of Olive Oil Organizations
Π2-47.2.1g	EU and national quality schemes (QUAL)	Art. 47(1g)	Quality schemes in the Operational Programmes of Olive Oil Organizations
Π2-47.2.1h	Traceability and certification (TRACE)	Art. 47(1h)	Traceability and certification systems in the Operational Programmes of Olive Oil Organizations
Π2-47.2.2d	Replanting of orchards or olive groves (WITHD)	Art. 47(1d)	Replanting of olive groves in the Operational Programmes of Olive Oil Organizations

3. Rural Development

The proposed interventions under rural development are 23 in total, grouped to 5 types of interventions, as presented below in tabular format. There are 7 interventions for environmental, climate-related and other commitments, 1 intervention for areas facing natural constraints, 8 interventions for investments, including irrigation needs, 5 interventions for cooperation and 2 interventions under knowledge exchange and dissemination of information.

Table 7: Rural development interventions

Code	Type of intervention	Ref. to SPR	Name of intervention
Π3-70-1.1	Environmental, climate-related and other management commitments (ENVCLIM)	Art. 70	Wildlife protection within protected areas
Π3-70-1.2			Protection of rural landscape
Π3-70-1.3			Application of alternative methods of plant protection to reduce pesticides
Π3-70-1.4			Protection and conservation of genetic resources
Π3-70-2.1			Conversion into organic practices and methods (new entrants to organic farming and livestock farming)
Π3-70-3.1			Improve welfare of productive animals
Π3-70-4.1			Afforestation and creation of forest areas

Code	Type of intervention	Ref. to SPR	Name of intervention
Π3-71	Natural or other area-specific constraints (ANC)	Art. 71	Support areas characterized by natural or other area-specific constraints
Π3-73-1.1	Investments, including investments in irrigation (INVEST)	Art. 73-74	Land improvement infrastructure projects
Π3-73-1.2			Improving access to agricultural land and livestock farms
Π3-73-1.3			Prevention and restoration of forest damage due to forest fires, natural disasters and catastrophic events
Π3-73-2.1			Agricultural improvement plans that contribute to competitiveness
Π3-73-2.2			Digital and green investments in agricultural holdings
Π3-73-2.3			Support for investments in processing / marketing and / or development of agricultural products
Π3-73-2.4			Investments in the prevention and protection of livestock against transmissible diseases and improvement of living conditions
Π3-73-2.5			Investments in agricultural holdings for protection against natural disasters
Π3-75.1	Setting up of young farmers and new farmers and rural business start-up (INSTAL)	Art. 75	Installation of young farmers
Π3-77-1.1	Cooperation (COOP)	Art. 77	Establishment of producer groups and organizations and interprofessional organizations in the field of agriculture
Π3-77-2.1			Agricultural products and food quality systems
Π3-77-3.1			Development of collaborations to link research with production through Operational Teams of the European Innovation Partnership for Agricultural productivity and Sustainability (EIP-AGRI)
Π3-77-4.1			Support for local development through LEADER
Π3-78.1	Knowledge exchange and dissemination of information (KNOW)	Art. 78	Education - training of farmers and other stakeholders
Π3-78.2			Advisory services to farmers and other stakeholders

As underlined in the strategic statement of the CAP SP, the key contribution of the proposed interventions to the specific objectives of the plans is outlined below:

SO1: The interventions that are activated to support viable farm income and resilience of the agricultural sector aim to continue the production of quality agricultural products, while contributing to the sustainability of rural areas but also to their social and economic well-being, on the other hand to improve the economic viability of small and medium holdings.

SO2: The objective to increase competitiveness and market orientation is achieved through the interventions that aim of ensuring high quality and stable production in the sectors considered important for the Greek agri-food system, as well as enhancing competitiveness and extroversion through private investment in agricultural holdings and manufacturing companies.

SO3: The objective to improve the position of farmers in the value chain is achieved through the interventions that aim to the strengthening of their position, resulting from the creation of economies of scale, cost reduction and quality upgrade of production, as well as certification, marking, standardization and verticalization. Participation in collective schemes is a prerequisite for addressing the new conditions and challenges that are emerging in the global market for agricultural products and food.

SO4 to SO6: The environmental and climate ambition within the CAP SP addressing its specific environmental and climate objectives a) by contributing to mitigation and adaptation to climate change, b) sustainable and efficient management of natural resources, and c) biodiversity and landscape protection and preservation is reflected in the environmental and climate architecture of the plan, which operates under the following components:

- The enhanced conditionality established in the plan that sets the baseline requirements for farmers in receipt of CAP payments, consisting of the Statutory Management Requirements (SMRs) and standards for maintenance of land in Good Agricultural and Environmental Conditions (GAEC standards) listed in Annex III of SPR regulation, with the improvement of the already existing GAECs and parallel integration of some existing requirements of "greening" of the previous programming period implemented until 2022.

- The prioritization of actions for climate and the environment that operates across both Pillars to achieve a coherent overall approach: the voluntary eco- schemes of Pillar I and the agri-environmental and climate-related interventions of Pillar II, which are built on baseline improvements achieved through conditionality and form a palette of multiple options, indicatively related to adaptation to climate change, protection of soil and water resources, the promotion of organic production, the application of precision farming methods, the conservation of biodiversity and landscape, with the overall objective to maximise farmer participation to achieve climate and environmental improvements according to its own needs and capabilities.

SO7: The demographic renewal of the rural population and sustainable rural development in rural areas is achieved through the interventions that aim to provide incentives for young people to enter the primary sector and to encourage young entrepreneurship, in combination with measures for their education, strengthening their business plans, their participation in collective schemes, the use of consulting services, etc.

SO8: The promotion of employment, growth, gender equality, including women's participation in agriculture, social inclusion and local development in rural areas is achieved mainly through the implementation of local strategies (LEADER) that promotes sustainable development of rural areas by tackling economic, social and environmental problems, while at the same time being an innovative approach to EU rural development policy through a bottom-up approach. The philosophy of planning and implementation is maintained through the support of the development of local businesses, but also through the strengthening of public infrastructure and investments to serve rural population.

SO9: The objective of producing healthy and high nutritional value products is served through interventions that would support the increase of agricultural areas where organic production is applied, the agri-environmental interventions of Pillar II and the eco-schemes of Pillar I, which aim to reduce fertilization and pesticides, but also with the implementation of interventions aimed at improving animal welfare, enhancing bio-safety and the rational use / limitation of antibiotics.

SO10 (cross-cutting objective): The modernization and digitization of Greek agriculture and rural areas will be facilitated by the establishment of the Agricultural Knowledge and Innovation System (AKIS). The Agricultural Advisory Services, the European and National CAP Networks and the European Innovation Partnership will jointly contribute to the integrated approach / strategy for modernization, the promotion of innovation and the dissemination of knowledge in the agri-food sector. Through interventions in the field of digitization, the strategic approach lays the foundations for the digital transformation of agriculture and the increase of the competitiveness of the Greek farms.

4.5 Financial planning

The agreement on the EU Multiannual Financial Framework budget provides for a total allocation of European funding of around €14 billion for Greece over the 5 years, split-year period 2023-2027. This is divided between Pillar I (Direct Payments and Sectoral Interventions) and Pillar II (Rural Development measures). The CAP SP emphasizes the strengthening of Pillar II, to which double resources from Pillar I (10%) are transferred, compared to the previous programming period, in order to stimulate its developmental contribution to the improvement of its agriculture competitiveness and sustainability, providing strong incentives for its green and digital modernization, the collective organization of producers and the age renewal of the primary sector. Support for Pillar I interventions will be provided via the European Agricultural Guarantee Fund (EAGF), whilst support for Pillar II interventions will be co-funded by the European Union via the European Agricultural Fund for Rural Development (EAFRD). The table below presents the budget allocation of the CAP SP among pillars and types of interventions for the programming period 2023-2027.

Table 8: CAP SP budget allocation

Pillar	Type code	Type of intervention	EU funding 2023-2027 (€)	%	% of total
P-I	BISS	Basic income support for sustainability	4,473,976,402	44.9%	32.6%
	CRISS	Complementary redistributive income support for sustainability	870,163,618	8.7%	6.3%
	CIS-YF	Complementary income support for young farmers	140,000,000	1.4%	1.0%
	ECO-SCHEMES	Schemes for the climate and the environment	2,490,484,300	25.0%	18.1%
	CIS	Couple income support	1,061,002,875	10.7%	7.7%
	CSPC	Crop-specific payment for cotton	919,980,000	9.2%	6.7%
	Direct payments		9,955,607,195	100.0%	72.5%
	SECTORAL	Sectoral programme for olive oil	53,330,000	21.4%	0.4%
	SECTORAL	Sectoral programme for fruit and vegetables	50,000,000	20.0%	0.4%
	SECTORAL	Sectoral programme for apiculture	30,988,225	12.4%	0.2%
	SECTORAL	Sectoral programme for wine	115,150,000	46.2%	0.8%
	Sectoral interventions		249,468,225	100.0%	1.8%
PILLAR I			10,205,075,420	74.4%	
P-II	ENVCLIM	Environmental, climate and other management commitments	683,628,417	19.4%	5.0%
	ANC	Natural or other area-specific constraints	829,000,000	23.6%	6.0%
	INVEST	Investments, including investments in irrigation	946,000,000	26.9%	6.9%
	COOP	Cooperation	326,376,240	9.3%	2.4%
	INSTAL	Setting up of young farmers and new farmers and rural business start-up	590,000,000	16.8%	4.3%
	KNOW	Knowledge exchange and dissemination of information	145,000,000	4.1%	1.1%
	Rural development		3,520,004,657	100.0%	25.6%
PILLAR II			3,520,004,657	25.6%	
TOTAL			13,725,080,077		100.0%

5 Alternatives

The consideration and evaluation of alternative planning scenarios is an important step of the strategic environmental assessment in order to demonstrate that the selected alternative is the option that performs best environmentally. In accordance with the SEA Directive (article 5(1) and Annex I(h)), as transposed to SEA-JMD, the alternatives should be realistic, taking into account the objectives and the geographical scope of the plan. In practical terms, the reason for assessing alternatives to the draft plan is to determine if the significant adverse effects of the proposed plan can be reduced or avoided.

5.1 Approach for selecting the alternatives

A common approach to alternatives in SEA is to identify a 'do-nothing' scenario (zero option), an alternative following the usual practice (business-as-usual option) and the alternative(s) being considered during the preparation of the draft CAP SP, which are prescribed in the following sub-sections.

5.1.1 Zero option (alternative 1)

The zero option, that is the non-implementation of the CAP SP for Greece on the programming period 2023-2027, would result in the immediate cancellation of the EU financial assistance in Greece and the loss of EU financial support for agriculture and rural development under the CAP over the period 2023-2027. In this case, the expected negative environmental effects are estimated to be much higher, due to the absence of continuation of the programming framework that would allow coordination of actions for the joint protection of the environment that require special support in agriculture and rural development. In any case, the zero option is not considered a reasonable alternative, given that the CAP SP is prepared under the CAP, and thus it is not something the Government cannot do. Yet, it is used as a baseline scenario for the comparative analysis among alternatives.

5.1.2 Business-as-usual option (alternative 2)

This possible alternative option assumes that the Rural Development Programme (RDP) for 2014-2020 will be extended to the next programming period up to 2027, with the current priorities and measures continuing. Thus, the plan will be based on a vision of RDP 2014-2020 for integrated development and sustainable competitiveness of rural areas and it will aim to enhance the competitiveness of the agri-food sector, promote the multifunctional role of rural areas and protect the ecosystems related to agriculture and forestry. It will be structured around three interdependent and complementary key objectives:

- Creating a strong, competitive, and viable agri-food system
- Promoting sustainability of the agri-food system and rural areas
- Creating viable and multifunctional rural areas

In particular, the plan will serve and implement the following EU priorities:

- P1 Knowledge transfer and innovation in agriculture, forestry and rural areas.
- P2 Enhancing farm viability and competitiveness in agriculture and promoting innovative farm technologies and the sustainable management of forests.
- P3 Promoting food chain organisation, including processing and marketing of agricultural products, and risk management in agriculture.
- P4 Restoring, preserving and enhancing ecosystems related to agriculture and forestry.

- P5 Promoting resource efficiency and supporting the shift towards a low carbon and climate resilient economy in agriculture, food and forestry sectors.
- P6 Promoting social inclusion, poverty reduction and economic development in rural areas.

The plan will fund measures under all six abovementioned priorities as prescribed below:

- M01 Knowledge transfer and information actions
- M02 Advisory services, farm management and farm relief services
- M03 Quality schemes for agricultural products, and foodstuffs
- M04 Investments in agricultural holdings; Investments in the processing, marketing and/or development of agricultural products; Investments in infrastructure projects related to the development, modernization or adaptation of agriculture and forestry; Other investments in infrastructure projects
- M05 Restoring agricultural production potential damaged by natural disasters and catastrophic events and introduction of appropriate prevention actions
- M06 Farm and business development
- M07 Basic services and village renewal in rural areas
- M08 Investments in forest area development and improvement of the viability of forests
- M09 Setting -up of producer groups and organisations
- M10 Agri-environment and climate payments
- M11 Organic farming
- M12 Natura 2000 and Water Framework Directive payments
- M13 Payments to areas facing natural or other specific constraints
- M14 Animal welfare
- M16 Co-operation
- M19 CLLD/LEADER

As the EU requirements for the national CAP Strategic Plans of 2023-2027 of the member states have changed under the Regulation (EU) 2021/2115 (SPR regulation), certain measures in the RDP 2014-2020 may no longer be equally implementable or viable. In addition, in some cases, it may not be feasible to continue with 2014-2020 measures because they did not perform well enough and thus need modifications and improvements to justify funding, whilst others were established due to a need that may be no longer there.

5.1.3 Suggested option (alternative 3)

The suggested option is the formulation of the CAP SP 2023-2027 for Greece that is analytically presented in section 4. This alternative is considered to best integrate the requirements of actual environmental policy in agriculture and rural development and contribute to the pursuit of sustainable development in the country as a whole, given that the CAP's orientation was reformed by providing specific objectives for the preparation and implementation of the national CAP SPs, which demand interventions to bolster environmental care and climate action and to contribute to the environmental and climate-related objectives of the European Union, and whose legal instruments have been transposed into national legislation. In addition, the suggested option enhanced the previous conditionality system (referred to as cross-compliance) and will for the first time apply to both "pillars" of the CAP together for environmental related interventions as well, strengthening thus the environmental benefits of the plan under the new programming period.

5.2 Assessment of alternatives

The evaluation of the CAP SP's alternatives is performed with the use of a high-level assessment matrix to conclude on the likely effects of each of these options against the SEA objectives (see also section 7). The zero option is included as baseline scenario to facilitate the comparative assessment of the alternatives and conclude on the alternative that performs best environmentally.






Table 9: Comparative environmental assessment of alternatives

Environmental aspect	SEA Objective	Comparative assessment of alternatives			
		A1	A2	A3	Descriptive details
Climate and energy	Minimise contribution to climate change, adapt to its predicted effects and support sustainable energy				<p>A1 will not support the implementation of the actions foreseen under the National Energy and Climate Plan and the National Climate Adaptation Strategy (that is to be downscaled at regional level), while agriculture is anticipated to be more vulnerable to climate change.</p> <p>Climate resilience and low carbon economy are priorities of both A2 and A3. Yet, A3 strengthens the contribution to climate change adaptation and the mainstreaming of the climate and energy policy into the plan.</p>
Air	Reduce air pollution and improve air quality				<p>Though, according to projections, Greece is expected to meet its 2030 emission reduction commitments, A1 will not support the implementation of the National Air Pollution Control Programme to ensure continuation of the existing measures for agriculture.</p> <p>The reduction of ammonia emissions is a focus area of A2, served indirectly from interventions of other needs. Ais is also included as a specific objective of A3, anticipating thus to address the sustainable and efficient air management, with interventions indirectly targeting air emission reductions as well.</p>
Biodiversity and ecosystem services	Protect biodiversity, enhance ecosystem services and preserve protected habitats and species				<p>A1 will not support the implementation of the National Biodiversity Strategy nor the PAF for the next programming period that include specific actions for the biodiversity mainstreaming into agriculture and forestry, while the pressures on biodiversity from agricultural and forestry activities are anticipated to be increased.</p> <p>Restoring, preserving and enhancing ecosystems related to agriculture and forestry is a priority of A2, especially for Natura 2000 areas, whilst A3 aims higher with interventions that could also strengthen the support of on farm biodiversity protection.</p>

Environmental aspect	SEA Objective	Comparative assessment of alternatives			
		A1	A2	A3	Descriptive details
Landscape	Preserve and improve the landscape				<p>A1 will not support actions for the preservation of agricultural landscape features, anticipating thus no improvements and probably increasing pressures on the landscape. There is likely to be an increase in rate of decline in linear features and HNV areas.</p> <p>A2 includes a focus area on the preservation of HNV areas and European landscape. On the other hand, landscape is particularly included as a specific objective of A3 anticipating with its group of needs that are addressed in interventions to better target the conservation of landscape elements on agricultural land.</p>
Land uses and material assets	Rationalise land uses and use material assets efficiently				<p>A1 will not support investment in rural infrastructure, while there is an increased potential that rural development and agricultural land uses will be managed in a non-sustainable way that may result in natural grassland and forest land losses, productive arable land losses and conversion to non-agricultural uses or even land abandonment.</p> <p>Both A2 and A3 are anticipated to continue investment in rural infrastructure and services, to support areas with natural or other specific constraints and to preserve grassland and forest areas. A3 will also support delineation and rational management of pasture areas. Yet, it is uncertain whether A2 and A3 will contribute to the rationalisation of land uses and the sustainable land take by built-up areas.</p>
Soil	Protect and enhance soil quality				<p>A1 will not contribute to the protection and enhancement of soil health, while existing problems on soil erosion may or will be deteriorated.</p> <p>A2 includes interventions targeting the improvement soil management and/or prevent soil erosion. On the other hand, soil is particularly included as a specific objective of A3, better mainstreaming the EU and national soil related objectives and thus anticipating more positive effects on the protection of soil resources from erosion and improvement of soil fertility.</p>

Environmental aspect	SEA Objective	Comparative assessment of alternatives			
		A1	A2	A3	Descriptive details
Water	Protect, enhance and sustainably manage water resources and quality				<p>A1 will not support the implementation of the actions foreseen under the River Basin Management Plans, the Action Programme for Nitrate Vulnerable Zones, the Action Plan for Sustainable Use of Pesticides, and the Flood Risk Management Plans, while pressures on water resources and quality will be significantly increased.</p> <p>While water management and water use efficiency, along with the rational use of fertilisers and pesticides, are focus areas of A2, fostering a sustainable development and efficient management of water is strengthened as a specific objective of A3 in full alignment with the EU and national water-related objectives. Though A2 includes interventions for water, A3 via its dedicated group of needs for water is anticipated to have higher positive effects and better mainstream the water policy aspects into the plan, emphasizing also on resilience to droughts and advisory services on water resources protection.</p>
Waste	Integrate agricultural waste management; reduce and turn food waste into a resource				<p>A1 will not support the implementation of the actions foreseen under both the National Waste Management Plan and the National Waste Prevention Programme as well as the National Circular Economy Strategy, and thus pressures from the waste arisings and mismanagement problems are anticipated to persist.</p> <p>Resource efficiency is a priority of A2, targeting also into waste to energy interventions and waste management. This aspect is enforced under A3 with the overall goal to a transition to a circular economy and the implementation of bioeconomy to turn waste into a resource. An additional objective of A3 is the contribution to prevention and valorisation actions associated with the agricultural and agri-food processing sectors.</p>
Cultural heritage	Protect and enhance cultural heritage				<p>A1 will not support the interrelations of tourism - culture with the agri-food sector.</p> <p>A specific need of A2 is dedicated to the enhancement of the cultural heritage and the local identity of the rural areas that is served by the support of the local development in rural areas. On the other hand, A3 may indirectly contribute to the enhancement of the cultural heritage under the interventions for the strengthening and diversifying the development of rural areas.</p>
Population & human health	Improve health and quality of life of rural population and promote employment and local development in rural areas				<p>A1 will not contribute to the local development and job creation in rural areas nor the improvement of the quality of life of rural population.</p> <p>While both A1 and A2 are anticipated to have positive effects on rural development and employment with benefits on quality of life and health, A3 will also serve a specific objective for the improvement of the response of agriculture to societal demands on food and health.</p>

Symbols for the comparative assessment of alternatives

	likely major positive effect (expected to have significant improvements)
	likely positive effect (expected to have improvements)
	neutral or uncertain effect (expected to have limited improvements)
	likely negative effect (expected to have no improvements or to pressure existing problems)
	likely major negative effect (expected to deteriorate existing problems)

As can be drawn upon the table, apart from the fact that the zero option (A1) is not a realistic alternative, it would result in the absence of support for tackling the environmental pressures of agriculture and rural development.

Continuing with the present plan - the RDP 2014-2020 (alternative A2) - may have certain benefits, but the proposed CAP SP of the next programming period (alternative A3) is formulated under the new CAP beyond 2020 that strengthens the vision for the sustainable development of farming, food and rural areas and is also required to align with the ambitions of the European Green Deal and its related strategies. The proposed CAP SP has an explicit commitment to "aim higher" with regard to the environment and climate, with three of its nine "specific objectives" concerning the environment (SO4, SO5 and SO6), including the incorporation of the goal to the transition to a circular economy and the reduction of food waste generation (related to SO8 and SO9). As such, based on the analysis of the situation (strengths, weaknesses, opportunities and threats - SWOT) and its related needs in respect to these objectives, the suggested option (alternative A3) has formulated the interventions (types of actions) that are specifically derived from target needs dedicated to ensure the high protection of the environment and to deliver higher environmental benefits than the present plan (alternative A2).

In numbers, the intervention strategy of the suggested option (alternative A3) has included at least thirteen groups of needs, that are transposed to interventions, specifically related to the environment, whereas the present plan (alternative A2) is limited to three groups of measures for the environment. In particular, the areas with the greater positive effects of the suggested option are: climate and energy (related to Specific Objective 4), air, water and soil (related to Specific Objective 5), biodiversity and landscape (related to Specific Objective 6) and waste (related to Specific Objectives 8 and 9).

It is also stressed that in pursuing these Specific Objectives, the suggested option (alternative A3) is also expected to make a better contribution to achieving the objectives of various items of EU and national environmental legislation (e.g. biodiversity, water and air quality, greenhouse gas emissions, energy). To this respect, the suggested option (alternative A3) clearly shows a higher ambition than the present plan (alternative A2) regarding care for the environment in alignment with the objectives arising from EU and national legislation on the environment.

In addition, the overall approach of the suggested option (alternative A3) geared towards environmental protection will for the first time apply to both "pillars" of the CAP together: not only to support for wider rural development (CAP Pillar II) as at the present plan (alternative A2), but also to direct income support payments to farmers (part of CAP Pillar I), which take the biggest share of CAP funding. As such, the suggested option (alternative A3) is expected to pursue the environmental objectives, covering both CAP pillars together, with a much more joined-up and targeted response than at the present plan (alternative A2). In all, the suggested option for the CAP SP on the programming period 2023-2027 (alternative A3) is the best alternative option that will be taken forward for further assessment in the SEA report.

6 Description of the current state of environment

The description of the current state of environment aims at highlighting key environmental issues and provide an evidence base for current and likely future environmental conditions without the implementation of the proposed CAP SP 2023-2027. According to the requirements of SEA Directive, as defined in Annex III of the SEA-JMD, information on the environmental baseline includes the following:

- the relevant aspects of the current state of the environment and the likely evolution thereof without the implementation of the plan or programme;
- the environmental characteristics of areas likely to be significantly affected;
- any existing environmental problems which are relevant to the plan or programme including those relating to any areas of environmental importance, such as the Natura 2000 sites.

This involves providing information of both the current state of the environment and a description of how it might change in the future in the absence of the Greek CAP SP 2023-2027. While the former is reasonably straightforward to establish using existing evidence base, the latter is a rather theoretical exercise given that this plan is prepared under the CAP, and thus it is not something the Government cannot do. In light of this, establishing the “likely evolution of the environment without the CAP SP” involves the description of the key likely future trends on the environment associated with the trends that reflect the past period.

The drafting of the environmental baseline of the CAP SP 2023-2027 seeks to be based on well-established evidence with special consideration on the quantification of data, where available. To this respect, the information will at least reflect the common context indicators and impact indicators in relation to the implementation of the CAP SP for which data is available to date (DG AGRI data portal on CAP indicators), whilst taking into account the information provided for the SWOT analysis of the plan. The information is enhanced with available data from European and national databases (e.g. Eurostat, EEA Dashboards, Hellenic Statistical Authority), including any relative national reports, such as the State of Environment Report (SoER) for Greece.

6.1 Identification of areas and characteristics that may be affected

The SEA Directive does not set out to prescribe particular environmental aspects that should and should not be a focus, beyond requiring a focus on “the environment, including on issues such as biodiversity, population, human health, fauna, flora, soil, water, air, climatic factors, material assets, cultural heritage including architectural and archaeological heritage, landscape and the interrelationship between the above factors”, which are particularly referred to in Annex III of the JMD-SEA. In addition, the SEA report should provide detailed information for the environmental aspects that the particular plan or programme will affect, while it may omit or go into little detail for the environmental aspects that are not relevant to the plan or programme.

Pursuant to the provisions of Regulation (EU) 2021/2115 (SPR regulation), the key environmental aspects of utmost concern for the CAP SP which are integrated into the specific objectives of the CAP, seeking consistency with the EU legislation on environment and climate change mentioned in Annex XIII of SPR regulation, are climate change, energy, water, soil, air, biodiversity, ecosystem services and landscape, including food waste.

To this respect, the proposed key environmental aspects relevant to assessing the CAP SP's environmental impacts are those prescribed in Annex III of the JMD-SEA, taking into special consideration the aspects set out in the SPR regulation. Climate and energy are addressed together to explore their interactions, whereas aspects on the socio-economic environment, with regard to rural economy, are integrated in "population and health".

- Climate and energy
- Air
- Biodiversity (including flora, fauna) and ecosystem services
- Landscape
- Land use & material assets (excluding resource uses which are covered in separate environmental aspects)
- Soil
- Water (water resources and quality)
- Waste (agricultural waste, focusing on food waste from the agricultural sector)
- Cultural heritage (including architectural and archaeological heritage)
- Population and human health (including aspects of the socio-economic environment)

The level of detail of the description of the environmental baseline in the SEA report depends on the availability of information on each environmental aspect, whilst the governing factor is the extent of the plan or programme. Due to the fact that the CAP SP 2023-2027 of Greece is to be established for the entire territory, and will be implemented within and across a wide range of rural environments, the current state of environment is described at the national level, with consideration to specific environmental aspects that need to be addressed at the regional level or for specific areas.

6.2 Analysis of environmental baseline

6.2.1 Climate and energy

6.2.1.1 *Climate profile*

The climate in Greece is broadly typical of the Mediterranean climate, with mild and wet winters and relatively warm and dry summers. A great variety of climate subtypes, always in the Mediterranean climate frame, are encountered in several regions, due to the influence of topography (mountain chains along the central part of the country) on the air coming from the moisture sources of the central Mediterranean Sea. As a result, the dry climate of Attiki (the great area of capital, Athens) and of the east part of Greece in general, changes significantly towards a wet one in North and West Greece. In terms of temporal variations, the year can be broadly divided into two seasons. The cold and rainy period lasts from mid-October until the end of March, and the warm and non-rain season lasts from April until September.

According to Mariolopoulos (1938, 1982), Greece's climate can be broken down into four main sub-types:

- (i) a maritime Mediterranean climate, with pleasant temperate characteristics, encountered along Greece's western coast and on the Ionian Islands;
- (ii) a lowland Mediterranean climate, found in SE Greece, part of Eastern-Central Greece, parts of the Eastern Peloponnese, the islands and coastal areas of the Central Aegean and Crete, with drier summers and colder winters than at respective latitudes around the Ionian Sea;

- (iii) a continental Mediterranean climate, over the larger part of Thrace, Macedonia and Epirus and part of Thessaly, with some of the continental climate characteristics typical of Balkan regions further north; and
- (iv) a highland Mediterranean climate, encountered in the mountain ranges running through Greece. These mountain ranges include woodlands with a forest climate, as well as small high- altitude areas with an alpine climate during winter.

The islands of the Northern Aegean have a transitional type of climate (continental-to-lowland), whereas the climate of the Dodecanese islands has temperate maritime characteristics.

Air temperature

Air temperature in Greece varies not only with latitude, but also with the topography. Winters are milder in regions where the mountain configuration blocks the inflow of cold winds from the North, and much colder in areas where the geomorphology allows these cold air masses to penetrate. The tempering influence of the sea also accounts for the milder climate (milder winters and cooler summers) of the coastal regions and islands, compared with nearby regions situated inland.

During the first period the coldest months are January and February, with a mean minimum temperature ranging between 5 to 10 °C near the coasts and 0 to 5 °C over mainland areas, with lower values (generally below freezing) over the northern part of the country. As regards to the summer period, the warmest days usually include the last days of July up to the first week of August, when the typical mean maximum temperature lies in the range of 29 and 35 °C.

Precipitation

Greece's geographic position, the fact that the country is on most sides surrounded by sea, together with the presence of high mountains and mountain ranges spanning in different directions make for considerable regional differences in rainfall distribution and levels. The rainfall pattern typical of Mediterranean coastal areas is predominant, with dry spells in summer and a rainy season from mid-autumn to mid-spring. Rainfall distribution throughout the year tends to be more even in Northern Greece.

Mean annual precipitation for Greece as a whole is roughly estimated at 800 mm, but the geographical distribution of the annual amount of precipitation and of the yearly rainy season generally follows Greece's geomorphology. The annual pattern of precipitation can present particularities in terms of maxima and minima depending on proximity to the sea, altitude, latitude, etc., without ever deviating too much from the typical characteristics of a Mediterranean climate. Generally, annual precipitation in Greece generally declines from west to east and from north to south.

Air humidity, evaporation, dew, frost, snowfall

The annual course of absolute air humidity follows the annual temperature cycle, with maxima in summer and minima in winter. The mean annual absolute humidity is higher along the coast of Western Greece, and decreases as one moves inland; the values then increase again towards the coast of Eastern Greece and on the Aegean islands, but remain lower than in Western Greece. Mean annual relative humidity ranges around 60% in Attica-Boeotia and Argolis and around 75% along the coast of Western Greece and the islands. The climate is, generally speaking, more humid in Western Greece than in the SE regions.

Evaporation in Greece broadly follows the annual and daily air temperature range, with lower rates recorded in the west and north and higher rates in the south and east. Average annual evaporation amounts to roughly 1,650 mm in Athens and 1,350 mm in Thessaloniki.

Dew is recorded almost year-round in most parts of Greece, with maximum occurrence in winter and minimum occurrence in summer.

Frost is less frequent than dew and recorded only in the cold season, when ground surface temperature is below 0°C.

Snowfall increases from south to north, from coast to inland and from low-lying to high-lying regions. The snow season can last from end-September to end-May in the mountainous regions of Northern Greece, but is far shorter —starting later and ending earlier— in the southern regions and along the coast. Snow accounts for 0 to 20% of Greece's total annual precipitation.

Winds

Winter winds are variable in direction and intensity due to the fact that the Mediterranean winter is determined by high pressure systems over Eurasia and the North Atlantic, which steer respectively cold dry or warm moist air masses towards the Mediterranean, thereby creating centres of cyclogenesis or rejuvenation of low-pressure systems. The same conditions roughly prevail in autumn and spring.

The winds prevailing in summer are predominantly northerly (northwesterly in the Ionian and Greece's western coast, north-easterly in the Northern Aegean, becoming northerly in the Central and Southern Aegean), known as Etesians. The intensity of these winds usually peaks at midday and then subsides, sometimes almost entirely, at night. They reach their highest intensity and frequency in July- August, particularly in Cyclades. On summer days without Etesians, the air in the inland areas is quite still, with light mountain and valley breezes, while the coastal areas and the islands enjoy sea breezes at daytime, alternating with land breezes at night.

6.2.1.2 Climate change trends

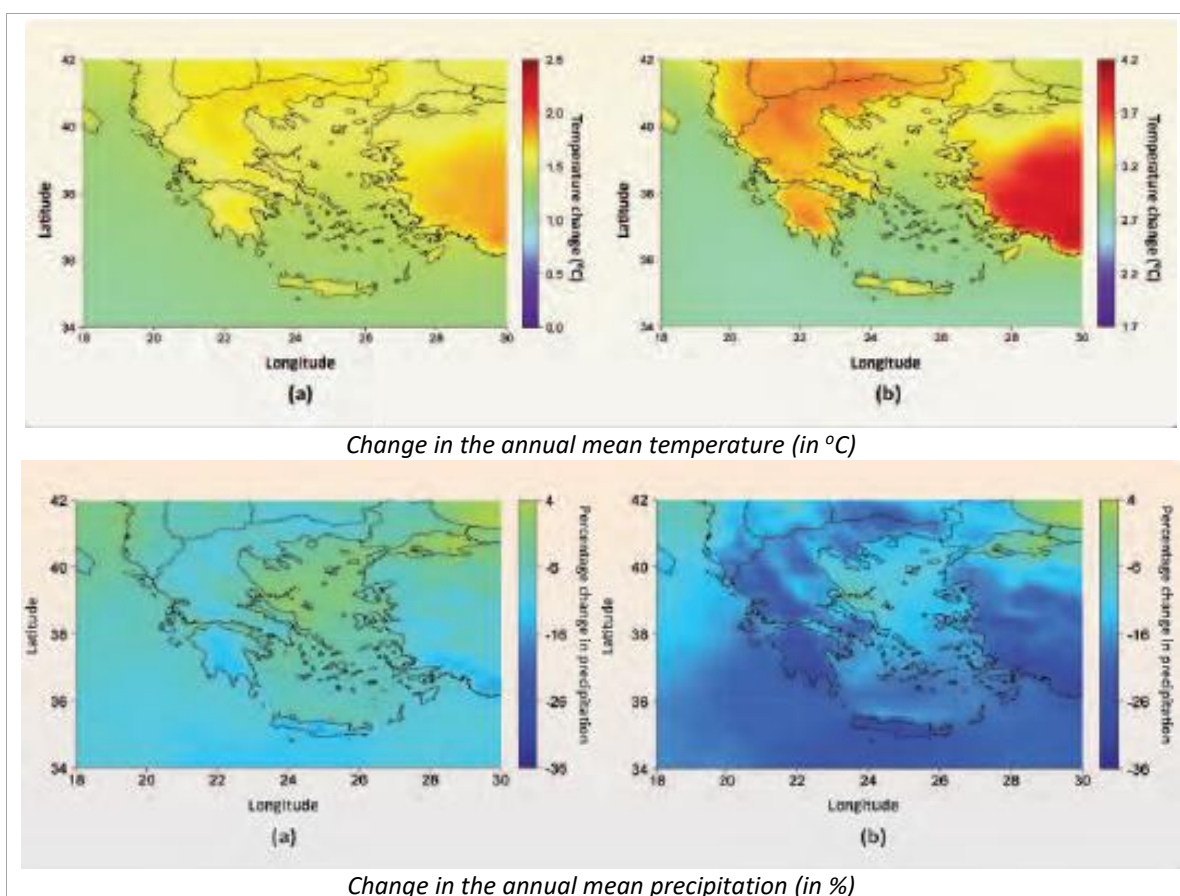
From the late 19th century to the 1970s, the mean air temperature time series for the Eastern Mediterranean and Greece has been consistent with the upward trend recorded for the Northern Hemisphere (NH). However, the cooling recorded in the NH in the period 1940-1970 was more pronounced in the Eastern Mediterranean: thus, whereas mean temperatures in the NH soon rebounded and from the early 1980s exceeded the values of the previous 100 years, in the Eastern Mediterranean they only began to rise again in the 1980s and 1990s. In terms of precipitation levels, most regions of Greece experienced a negative trend in rainfall in the second half of the 20th century, statistically significant in some regions. This negative trend in annual rainfall ranges from 20% in Western Greece to 10% in Eastern Greece.

A report by the Bank of Greece (BoG) published in 2011, was the first to assess “the environmental, social and economic impacts of climate change in Greece”, that has served as a basis for the National Climate Change Adaptation Strategy in Greece that was endorsed in 2016, an overarching policy document for the country's resilience against climate change impacts, which provides guidance, insight and priorities that will be analysed at regional level into the foreseen Regional Adaptation Action Plans on the basis of the specificities and characteristics of each Region. An update of this assessment report is planned in due

course that will be elaborated in the framework of the EU-funded [LIFE-IP AdaptInGR project](#), coordinated by the Ministry of Environment and Energy (MoEE).

According to the BoG study, the climate model RACMO2, developed by the Royal Meteorological Institute of the Netherlands (KNMI), was used with datasets of a 30-year reference period, 1961-1990, for the current climate, and two future periods, 2021-2050 and 2071-2100, for the study of climate change using Scenario A1B of the IPCC, which is a mid-line scenario in terms of carbon dioxide emissions and economic growth. The first future period, 2021-2050 is used for the nearer-term planning, whereas the second period, 2071-2100, serves to underscore the extent of the changes toward the end of the 21st century.

The results of the climate model simulations point to an overall mean warming in Greece over the coming decades, while annual precipitation levels countrywide are projected to decline (Figure 4).



Source: Bank of Greece 2011

Figure 4: Estimated change in annual mean temperature & precipitation in (a) 2021-2050 and (b) 2071-2100 relative to 1961-1990

All of Greece's regions will have 1.5°C higher annual mean temperatures in 2021-2050, with small spatial variations that are expected to be greater in the continental regions than in the islands, and greater in summer and autumn than in winter and spring. The warming trend increases throughout the 21st century. During the decade 2091-2100, the mean temperature countrywide is anticipated to be higher than in the reference period by 3.2°C in winter, 4.2°C in summer and ~3.5°C in spring and autumn.

Regarding annual mean precipitation, the levels countrywide will decrease in 2021-2050. It is expected to decrease most in Crete and the Peloponnese (close to 15%), followed by the rest of Greece (between 5% and 10%), but to increase slightly in the Northern Aegean period by about 5%. The decrease in precipitation countrywide is projected to be greatest toward the end of the century.

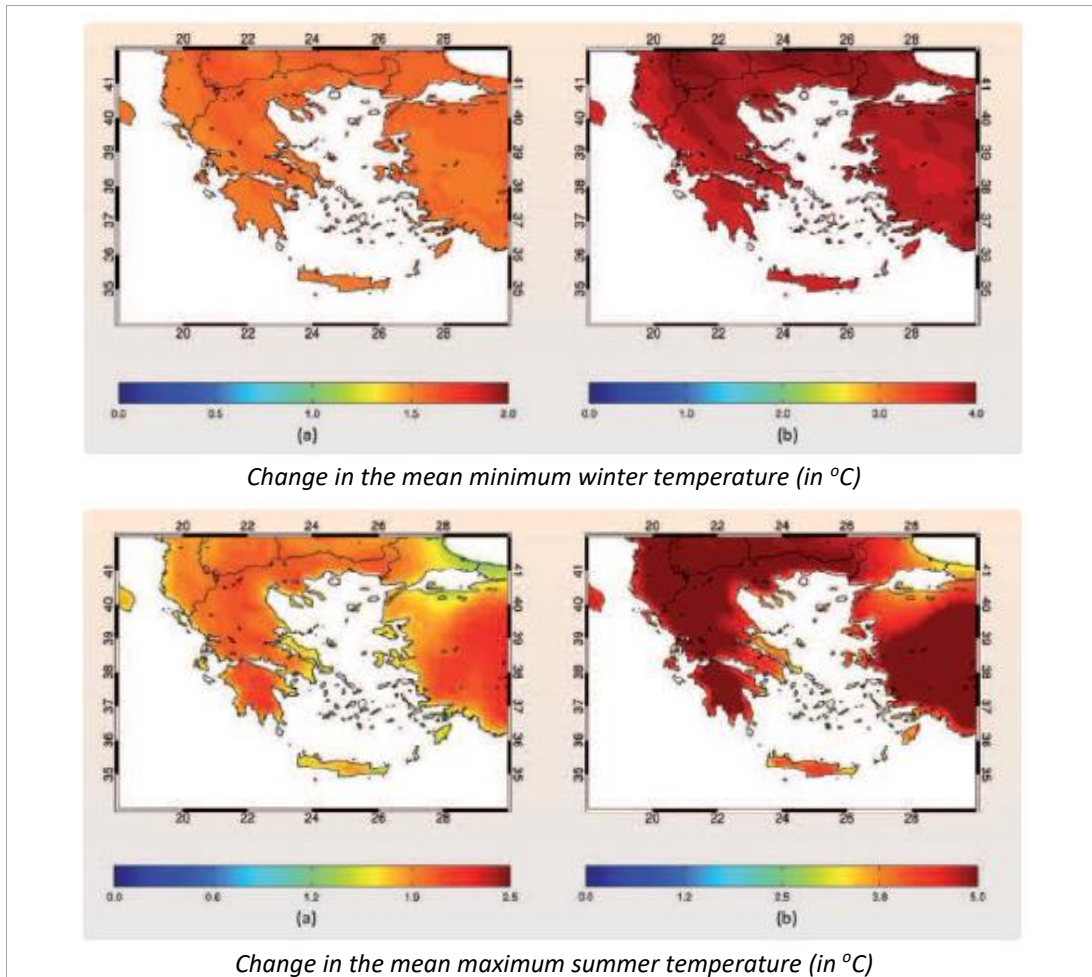
The severity of the climate change impact is more likely to be associated with changes in the frequency of extreme weather events than with a drawn-out 'average' climate evolution, given that, in the case of extreme events, a simple change in mean value above a critical threshold can bring about a disproportionate, non-linear impact.

As can be seen from the projected changes in mean minimum winter temperature (Figure 5), minimum winter temperatures in all of Greece's regions will be $\sim 1.5^{\circ}\text{C}$ higher in 2021-2050 and $\sim 3.5^{\circ}\text{C}$ higher in 2071-2100, than in the reference period 1961-1990. These results concur with large-scale findings, which have recorded a significant upward trend in minimum temperatures over the past few decades. The warming trend will be more pronounced in the more mountainous areas, especially in the mountain ranges of Pindos and of Northern Greece, where it is projected to reach 2°C in 2021-2050 and 4°C in 2071-2100. This increase is likely to have an impact on forests, presently adapted to colder weather conditions.

The projected changes in mean maximum summer temperatures (Figure 5) revealed that the increase in the period 2021-2050 will be greater than that of the winter minimums and will exceed 1.5°C and in some cases reach as much as 2.5°C . In the period 2071-2100, the increase in mean maximum summer temperatures may be as much as 5°C . Most affected will be the continental inland regions, situated far from the cooling effects of the sea, whereas regions with strong sea breezes (Crete, Aegean islands) will experience a significantly smaller variation in maximum summer temperatures.

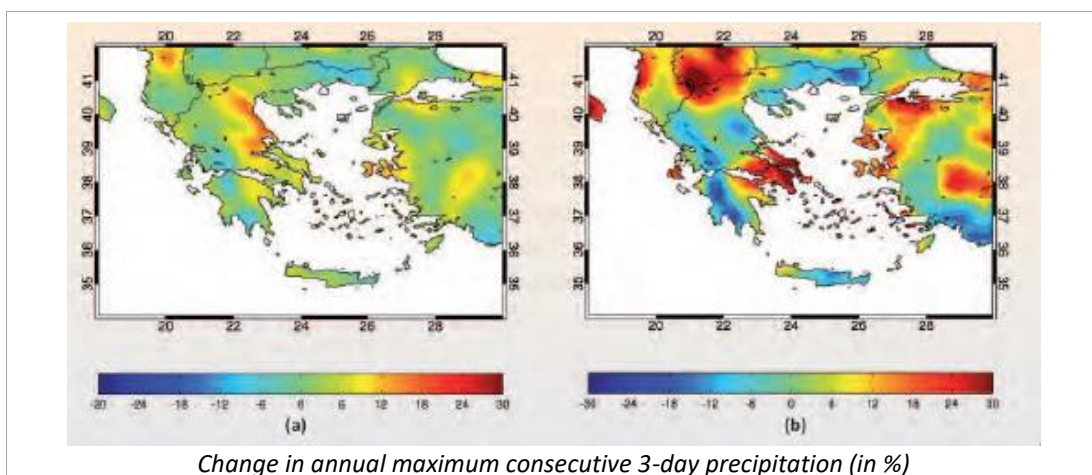
Apart from maximum temperature extremes, another source of concern is flash flooding, especially if its frequency were to increase on account of climate change (Figure 6). According to the climate simulation results, the maximum consecutive 3-day precipitation period during 2021-2050 will remain essentially unchanged, relative to the reference period 1961-1990, in regions like Western Greece, Eastern Macedonia-Thrace and Crete, but will increase significantly in others. In the eastern continental regions, in particular, maximum consecutive 3-day precipitation is projected to increase by 20%. These contrasts become even more pronounced toward the end of the 21st century, with the amount of extreme rainfall projected to decrease by 10-20% in regions of Western Greece and Thrace, but to increase by 30% in the Eastern Central Greece and the NW Macedonia. Small variations are projected for the rest of the country.

The smallest variations in dry spell length (consecutive dry days, defined as days with no or less than 1 mm precipitation) are projected for Greece's western regions in 2021-2050 (less than 10 more consecutive dry days) and for Western and Northern Greece in 2071-2100 (less than 20 more consecutive dry days). The largest increases in dry spell length are projected for the eastern continental regions (Eastern Central Greece, the Eastern Peloponnese and Euboea) and Northern Crete, which will have more than 20 additional consecutive dry days in 2021- 2050 and as many as 40 more consecutive dry days in 2071-2100.



Source: Bank of Greece 2011

Figure 5: Estimated change in mean maximum summer temperature in (a) 2021-2050 and (b) 2071-2100 relative to 1961-1990



Source: Bank of Greece 2011

Figure 6: Estimated change in annual maximum consecutive 3-day precipitation in (a) 2021-2050 and (b) 2071-2100, relative to 1961-1990

Overall, according to the BoG report, the impact of climate change on all sectors of the national economy is found to be adverse and often extremely adverse. As climate is key for agricultural production, and largely determines the type, quantity and quality of agricultural production, agriculture is the sector expected to be most severely affected by climate change in Greece, while the impacts on tourism and coastal systems would have major consequences on household incomes and the economy as a whole.

Of particular significance is also the water reserves sector, given its implications for agriculture and water supply. The impact on fir, beech and pine forests would be considerable, while fire-fighting costs are expected to shoot up on account of the increasing number and extent of forest fires. Meanwhile, species abundance and biodiversity are expected to decline.

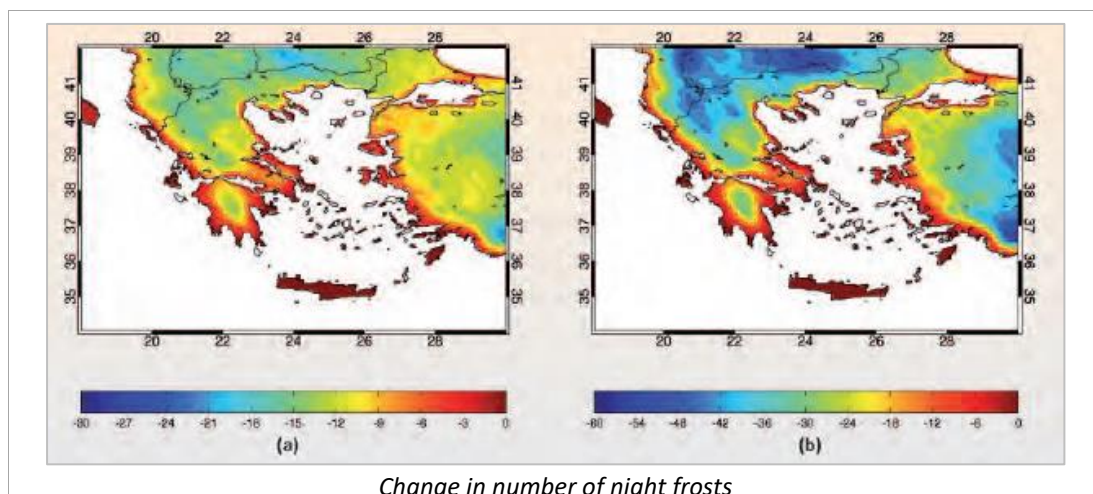
Furthermore, climate change, as measured by its projected impact on the tourism climatic index by the end of this century, is expected to have serious repercussions on Greek tourism, mainly on the seasonal and geographical patterns of tourist arrivals, hence also tourism receipts.

The consequences of climate change on the built environment, transportation, health and mining are also important.

Vulnerability of agriculture to climate change

Apart from the anticipated changes of the key climatic parameters, temperature and precipitation, the BoG study examined the changes in the frost patterns at regional level, as frost is an important parameter for agricultural regions, especially the areas where frost-sensitive crops, like citrus fruit, are grown.

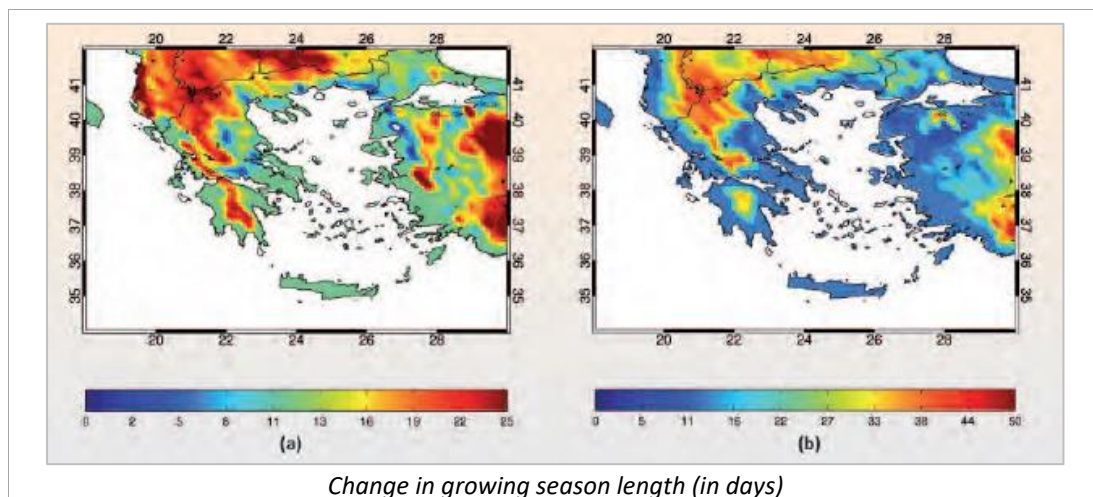
According to the projections, the number of frost days per year is expected to decrease in Macedonia and Thrace by 15 in 2021-2050 and by 40 in 2071-2100, and in the continental regions of Thessaly and the Peloponnese by 10 to 15 in 2021-2050 and by 25 in 2071-2100. Smaller decreases are projected for the rest of Greece, mainly because of the small number of frost days that these regions have even today.



Source: Bank of Greece 2011

Figure 7: Estimated change in number of night frosts in (a) 2021-2050 and (b) 2071-2100, relative to 1961-1990

In addition to the number of frost days, the BoG study also examined the length of the growing season, defined as the period favourable to plant and crop growth between the last spring frost and the first autumn frost. The observable lengthening can be attributed to the earlier occurrence of the last spring frost and to the later occurrence of the first autumn frost. The largest increases in growth season length (in the order of 25 days for 2021-2050 and 45 days for 2071-2100) are anticipated for the country's continental mountain regions. Length increases of 10-15 days for 2021-2050 and 15-25 days for 2071-2100 are expected for the rest of the country.



Source: Bank of Greece 2011

Figure 8: Estimated change in growing season length in (a) 2021-2050 and (b) 2071-2100, relative to 1961-1990

Regarding the effects of climate change to crop yields, according to a recent research paper (Georgopoulou et. al. 2017), a projection analysis was carried out to estimate these effects under no adaptation measures for the period 2021-2050, by using 1961–1990 as reference period. The regional figure for each crop simulated by agronomic models corresponds to the median of yield changes estimated for the different combinations of soil types-cultivars retained for this region.

The simulation results revealed a decrease of yield in all regions for certain crops (maize, beans, sunflower), whereas an increase of yield is anticipated for wheat, rice, cotton, orange and peach trees. In between, one can find:

- Crops for which the effect of climate change is mostly negative (tomato, pepper, potato, olive trees);
- Crops which will be mostly benefited from climate change (cabbage, tobacco);
- Crops with mixed regional effects (barley, grapevine, cucumber).

The impacts of climate change become increasingly 'less negative to positive' the further one moves north and east. Taking into account the median case scenario, northern and central Greece, including Sterea Ellada and Attiki are considered climate-winners, while west and southern Greece are climate-losers. Cotton is the principal reason for climate-winners, assuming that irrigation water supply will continue to be available despite the reduction of precipitation (which will probably have adverse impacts on groundwater replenishment and consequently on the supply of irrigation water). If this assumption does not hold, then the results showed that Thessalia and Sterea Ellada join the group of climate-losers, thus

leaving only two regions in the north of the country in the group of climate-winners. The regional differences remain large as the effects are crop type dependent. At cultivation level, the situation is mixed, with benefits for some cultivations and adverse effects for others.

It is worth noting that the anticipated warmer climatic conditions will generally favour the proliferation of pests. Warmer winters will allow crop-threatening insects to survive the winter in places where this is not possible today, thereby giving them a 'head start' during the next growing season.

Overall, the agricultural sector in Greece will as a whole be affected adversely, with significant differences between crops and regions in terms of economic benefits and losses. This is not surprising in view of the diversity of both the terrain and the diverse climatic conditions found in Greece, which obviously are reflected also in the cultivations and practices found there.

Vulnerability of forests to fire risk

Forest fires are highly sensitive to climate change, as fire behaviour responds immediately to fuel moisture, which in turn is affected by precipitation, relative humidity, air temperature and wind speed. The projected rise in temperature as a result of climate change should therefore increase fuel dryness and reduce relative humidity, more markedly in those regions where rainfall will decrease. The increased frequency of extreme climate events is expected to have a significant impact on the fire vulnerability of forests.

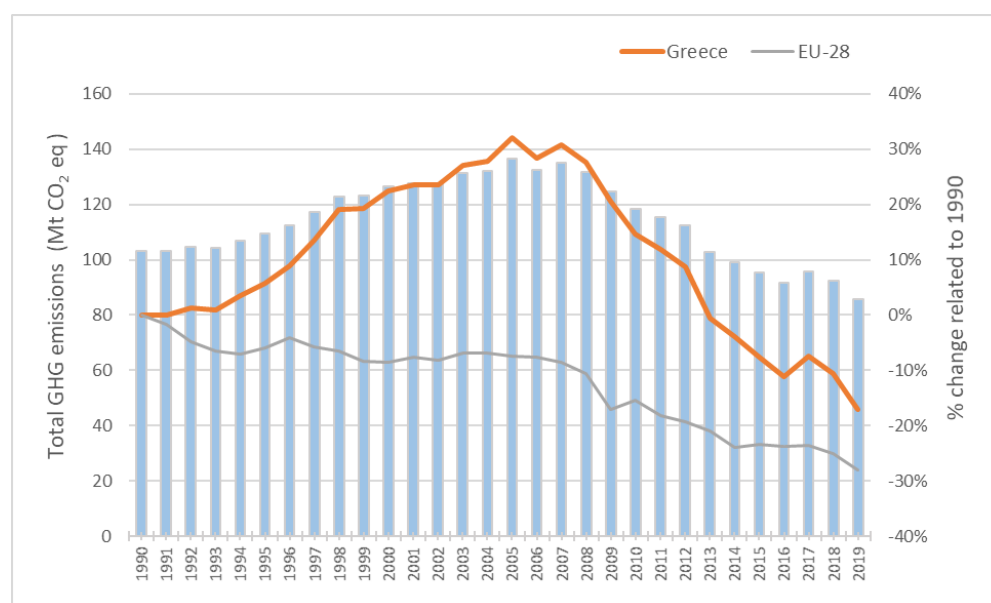
According to the BoG report, the Forest Fire Weather Index (FWI), a daily meteorological-based index designed in Canada and used worldwide, was used to estimate the difficulty of fire control. FWI values over 15 are indicative of an elevated fire risk, while FWI values over 30 indicate extreme fire risk. Apart from forest regions, this parameter is equally important to agricultural areas. In all of Eastern Greece, from Thrace down to the Peloponnese, extreme fire danger days are likely to increase by 20 in 2021-2050 and 40 in 2071-2100. Smaller increases are projected for Western Greece, mostly on account of the higher humidity conditions.

6.2.1.3 Greenhouse gas emissions

Within the framework of the UNFCCC, and having achieved its objectives under the Kyoto Protocol for the period 2008-2012, Greece is on track to meet the 2020 and 2030 targets the 2nd commitment period. The EU and its Member States will implement the international commitments jointly. In order to achieve these targets, an upper limit has been set for the EU Emissions Trading Scheme (ETS), while individual national emission targets have been established in areas not covered by the ETS. The national target is set at -4% for 2020 (Effort Sharing Decision 406/2009/EC) and -16% for 2030 (Effort Sharing Regulation 2018/842/EU) compared to 2005 levels. The National Energy and Climate Plan ([NECP](#)) for the period 2020-2030 aims to reduce GHG emissions not covered by the EU ETS by 36% by 2030 from 2005 levels, more than twice the binding commitment by the EU Effort Sharing Regulation. Although there is no specific target for the agricultural sector, the NECP has set measures for the agricultural sector that are expected to contribute to non ETS national target.

Based on the data of the released National Inventory Report of Greece in April 2021, Figure 9 shows the total GHG emission trends in Greece, excluding the contribution of land use, land use change and forestry (LULUCF). Specifically, in 2019 the total GHG emissions in the country without LULUCF was 85.6 Mt CO₂ equivalent, reduced by 17.1% since 1990. If emissions / removals from LULUCF were to be included then

the decrease would be 18.68%. It is noted that Greece recorded an increasing trend until 2007, after which there was a steady downward trend, with a total decrease of 31.3% over the last decade (2009-2019 period).

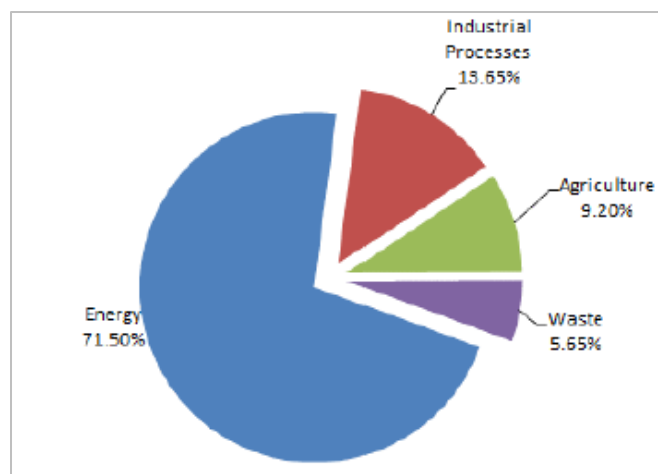


Source: [NIR 2021 of Greece](#) & [NIR 2021 of EU27](#)

Figure 9: Total GHG emissions trends (without LULUCF) in Greece for the period 1990-2019

Carbon dioxide emissions accounted for 76.8% of total GHG emissions in 2019 (without LULUCF) and decreased by approximately 21.2% from 1990. Methane emissions accounted for 11.7% of total GHG emissions in 2019 and decreased by 9.3% from 1990, while nitrous oxide emissions accounted for 5.0% of the total GHG emissions in 2019 and decreased by 42.4% from 1990. Finally, f-gases emissions (from production and consumption) that accounted for 6.5% of total GHG emissions in 2019 were increased by 32.3% from 1995 (base year for F-gases).

In terms of the sector contribution to GHG emissions (without LULUCF), the most important sector in terms of emissions is energy (i.e. combustion and fugitive emissions), which accounted for 71.5% of total GHG emissions in 2019 (Figure 10). The second largest sector is industrial processes (13.6%), followed by agriculture (9.2%).



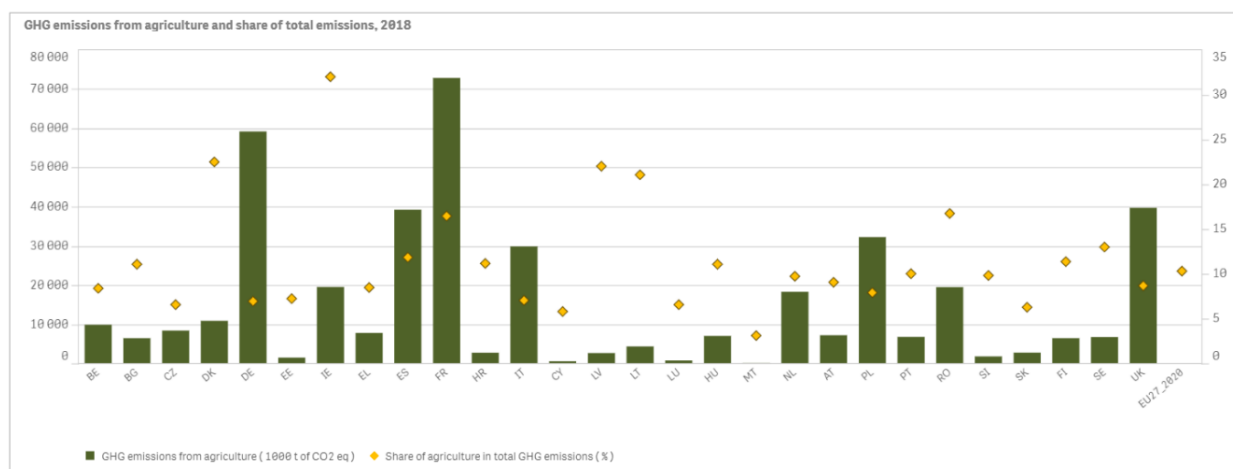
Source: [NIR 2021 of Greece](#)

Figure 10: Contribution of sectors to total GHG emissions (without LULUCF) in 2019

In Greece, the greenhouse gas (GHG) emissions that are directly related to the agricultural sector, as defined in the Common Reporting Format (CRF) of the United Nations Framework Convention on Climate Change (UNFCCC), derive from enteric fermentation of livestock, manure management, managed agricultural soils, rice cultivation, urea application and field burning from agricultural residues. The main GHG pollutants are methane (in the range from 48.5% to 58.1%) and nitrous oxide emissions (in the range from 41.6% to 50.9%), while dioxide carbon emissions have a minor contribution (in the range of 0.3-0.7%). The sources of GHG emissions in agriculture, in order of priority, are:

- Enteric fermentation, which is responsible for methane emissions, produced during the normal digestion of food by herbivorous animals and the amount emitted depends on the animal species, their digestive system and feed intake. Enteric fermentation of sheep and other animal are key categories for methane emissions in the country.
- Agricultural soils, which constitute the largest anthropogenic source of nitrous oxide emissions and are produced either directly from nitrogen inputs to soils or indirectly, after the removal of nitrogen from soils.
- Manure management, which is responsible for methane and nitrous oxide emissions. Methane is produced during the anaerobic decomposition of manure, while nitrous oxide is produced during the storage and treatment of manure before its use as fertilizer.
- Field burning of agricultural residues, which is responsible for methane and nitrous oxide emissions as a result of the farming practices used. Disposal practices for residues include ploughing them back into the ground, composting, landfilling and burning on-site. According to the IPCC Guidelines, 10% constitutes an indicative value of the residues burned annually on the field.
- Urea application during fertilisation leads to a loss of CO₂ that was fixed in the industrial production process.

In 2018, GHG emissions from agriculture amounted to 7.8 Mt of CO₂ equivalents, below by 2% compared to the corresponding share in EU27 (10.5%) (Figure 11).

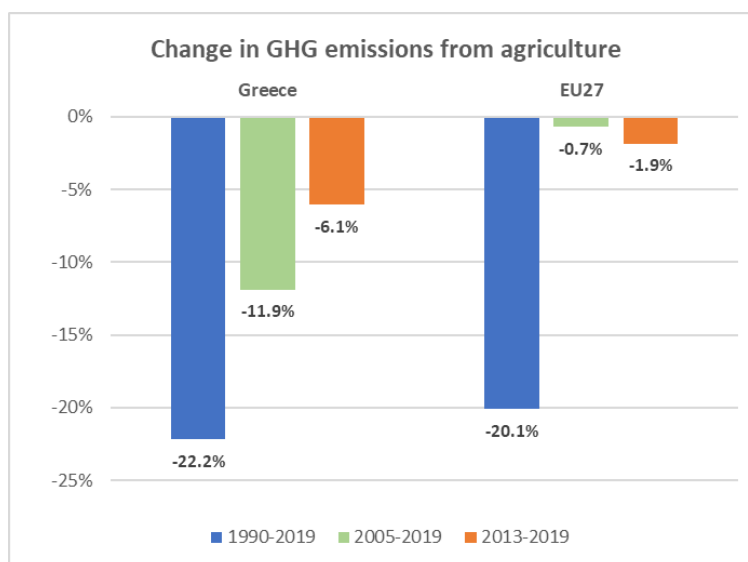


Source: DG AGRI, Agri-food Data Portal, CAP Indicators

Figure 11: Share of agriculture in total GHG emissions at MS level for 2018

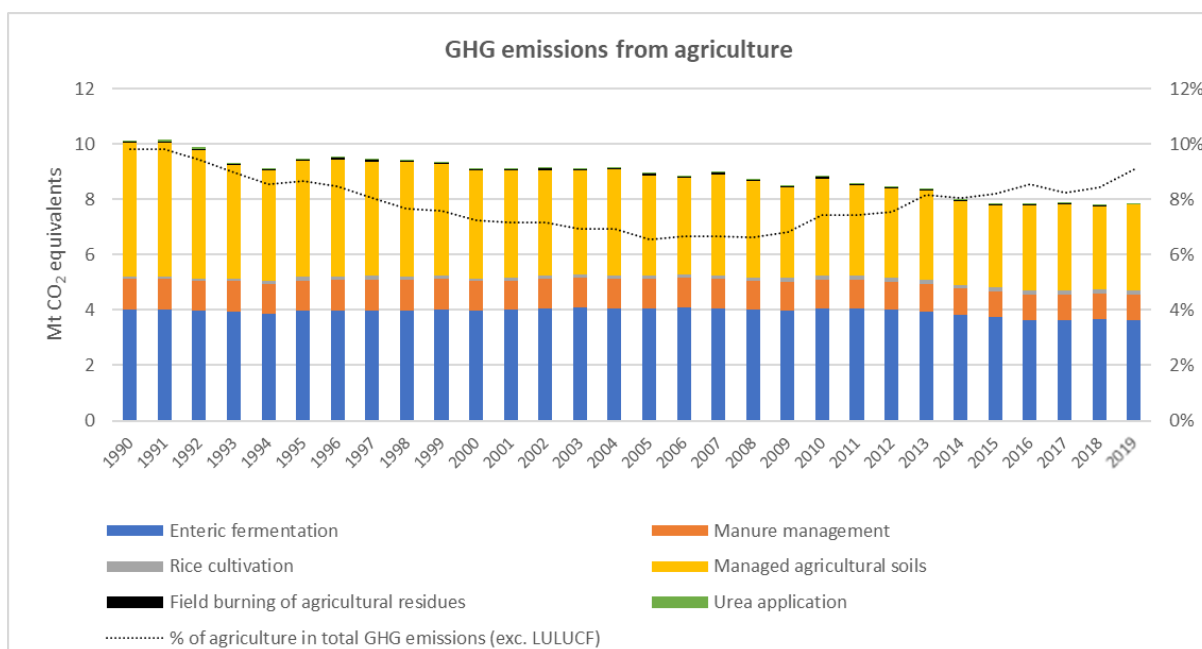
According to the NIR report of Greece 2021, GHG emissions from agriculture in 2019 practically remained the same. Most GHG emissions stem from enteric fermentation (46.3%) and managed agricultural soils (39.1%), followed by manure management (11.8%) and rice cultivation (1.9%), while field burning of agricultural residues and urea application have a very small share (0.4% and 0.4% respectively).

The change in GHG emissions from agriculture over time is shown in Figure 12 by using aggregated data. Between 1990 and 2019 GHG emissions decreased by 22.2%, with an average annual rate of decrease of 0.77%, whereas between 2005 and 2019 by 11.9%, well below the binding national targets for 2020. The period of 2013-2019 the change in GHG emissions was -6.1%, while the corresponding change was 1.9% in EU27.



Source: [NIR 2021 of Greece](#) & [NIR 2021 of EU27](#)

Figure 12: Change in GHG emissions from agriculture



Source: [NIR 2021 of Greece](#)

Figure 13: GHG emissions from agriculture per source category

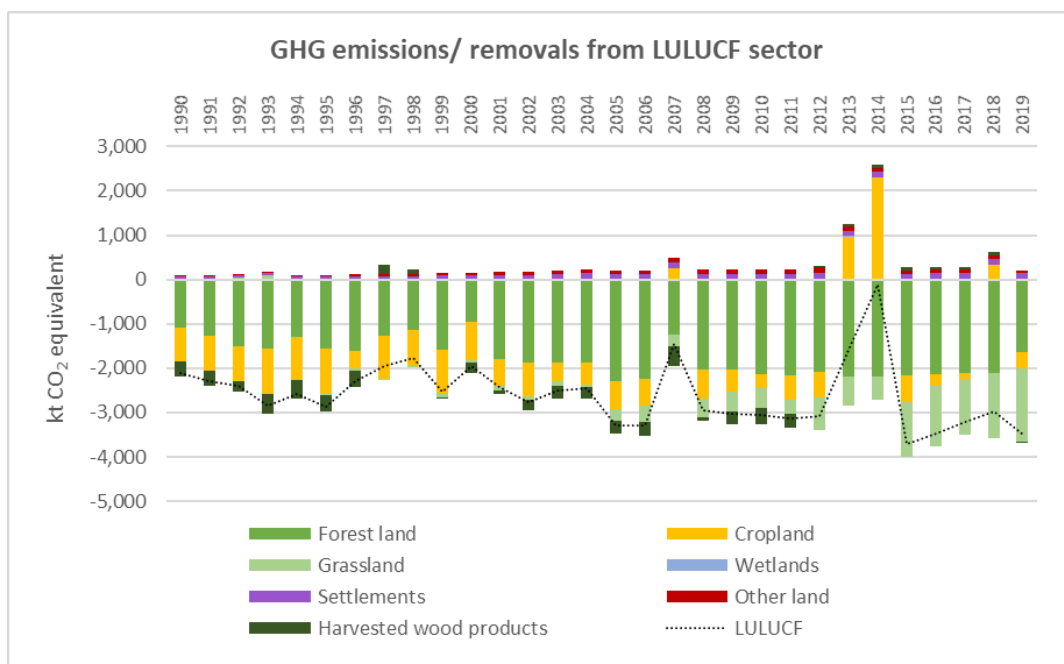
The decrease of enteric fermentation, which encompasses methane emissions, was 9.4% in 2019 compared to 1990 levels, with an average annual rate of decrease of 0.32% for the period 1990 – 2019.

The emissions from agricultural soils decreased by 36.1% with significant fluctuations during the period 1990 - 2019. The reduction of N₂O emissions from agricultural soils is mainly due to the reduction in the use of synthetic nitrogen fertilizers, that could probably be attributed to an increase in non-fertilized farming, the price of fertilizer and the impact of initiatives to promote good practice in fertilizer use. The annual changes in the amount of fertilizers used and the agricultural production are the basic factors that account for the fluctuation of emissions during the period 1990 – 2019.

CH₄ and N₂O emissions from manure management in 2019 accounted for 8.2% and 3.7% of total GHG emissions from agriculture respectively. During the period 1990-2019 the emissions from agricultural soils decreased by 15.4%. In 2019, CH₄ emissions decreased by 17.0% compared to 1990 levels, with an average annual rate of decrease estimated at 0.6%, whereas N₂O emissions decreased by 11.4%, with an average annual rate of decrease estimated at 0.4%.

In all, the emissions reduction from agriculture during the period 1990-2019 is mainly due to the reduction of N₂O emissions from managed agricultural soils, while the last decade a gradual decrease in CH₄ emissions from enteric fermentation is also shown. The changes of the rest agricultural sources of GHG emissions have a minor effect on GHG emissions trend.

The Land Use, Land-Use Change and Forestry (LULUCF) sector has been a net sink of GHG emissions during the period 1990 - 2019, fluctuating between 0.15 Mt CO₂ eq. and about 4.09 Mt CO₂ eq, showing a significant time-varying contribution to the removal of CO₂ emissions. Compared to 1990, the net sink has increased by 41.3%, sequestering about 2% of total emissions. Forest land is the main contributor of GHG sink in the LULUCF sector and grassland plays also an important role in the last five years, while cropland's contribution has significant fluctuations.



Source: [NIR 2021 of Greece](#)

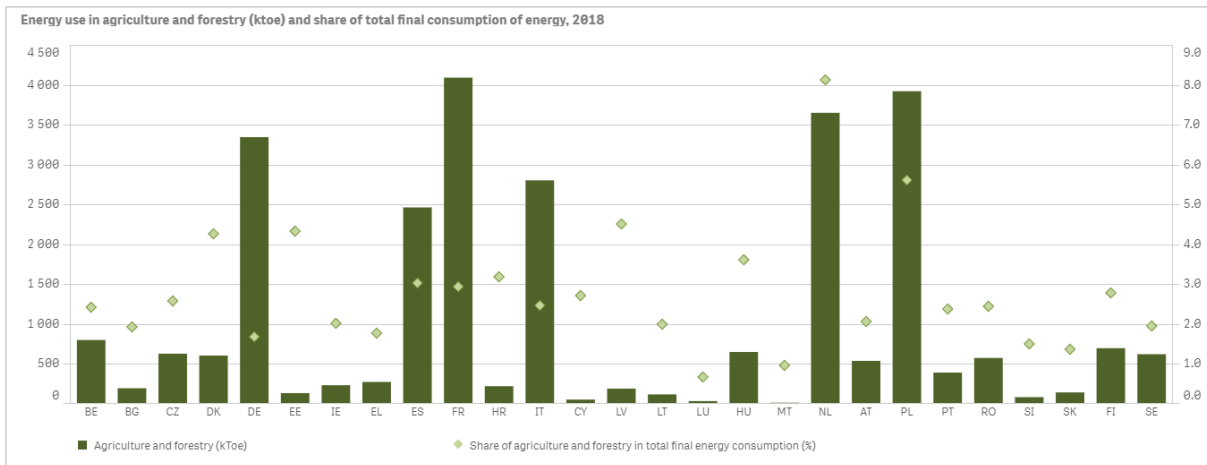
Figure 14: GHG emissions / removals from the LULUCF sector by source category

6.2.1.4 Energy

As required by EU legislation, Greece released a National Energy and Climate Plan (NECP) in 2019, in line with the Paris Agreement, which outlines an evolution scenario for the energy system and proposes policies and measures for achieving the national energy and climate targets for 2030 and enabling the transition to a climate-neutral economy by 2050. As for energy, the plan aims to limiting final energy consumption to 16.5 million tonnes of oil equivalent (Mtoe) and reaching at least 35% of renewables in gross final energy consumption. The plan does not set specific targets for agriculture and forestry nor for the food industry sector, however, it does propose measures for their contribution to the transition to a more sustainable energy production and consumption.

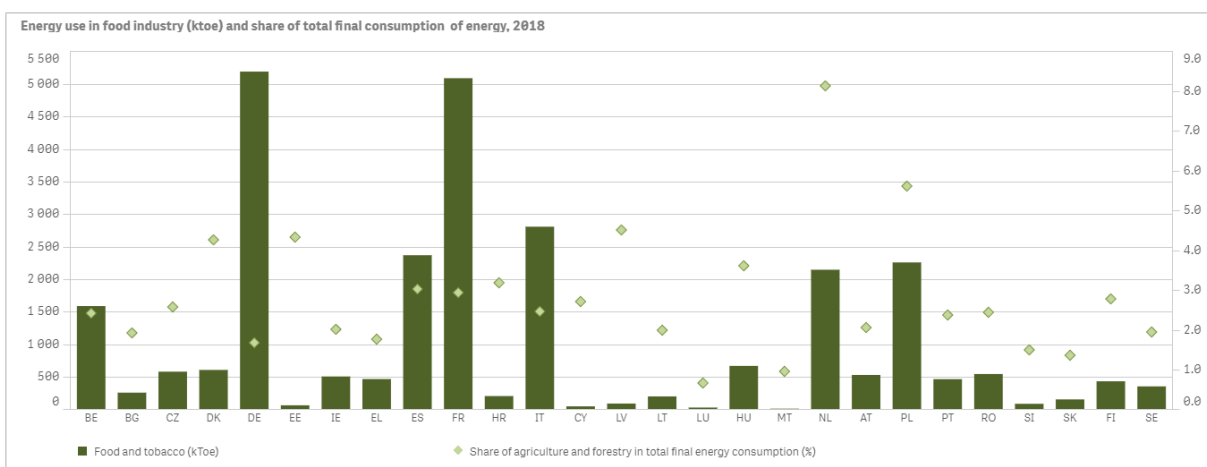
In Greece, total energy supply dropped significantly during the economic crisis and has remained stable since 2013. Oil is the dominant fuel, accounting for half of final energy consumption, while domestic coal is the major electricity generation source. Over the last decade there has been a clear shift from oil and coal to natural gas and renewables, reducing thus the share of fossil fuels (excluding natural gas) in the energy mix by at least 20%. (OECD 2020, Eurostat, [[nrg_bal_s](#)])

Both the agriculture/forestry sector and food industry sector have a very low share in the total final energy consumption of the country. The share of agriculture and forestry sector is 1.7%, which is also one of the lowest shares in total final energy consumption among member states, well below the 2.9% of EU27 in 2018 (Figure 15). The corresponding share of food industry sector in direct energy use is 3%, about the same levels as the EU27 average of 2.9% (Figure 16) (DG AGRI, [C44](#)).



Source: DG AGRI, Agri-food Data Portal, CAP Indicators

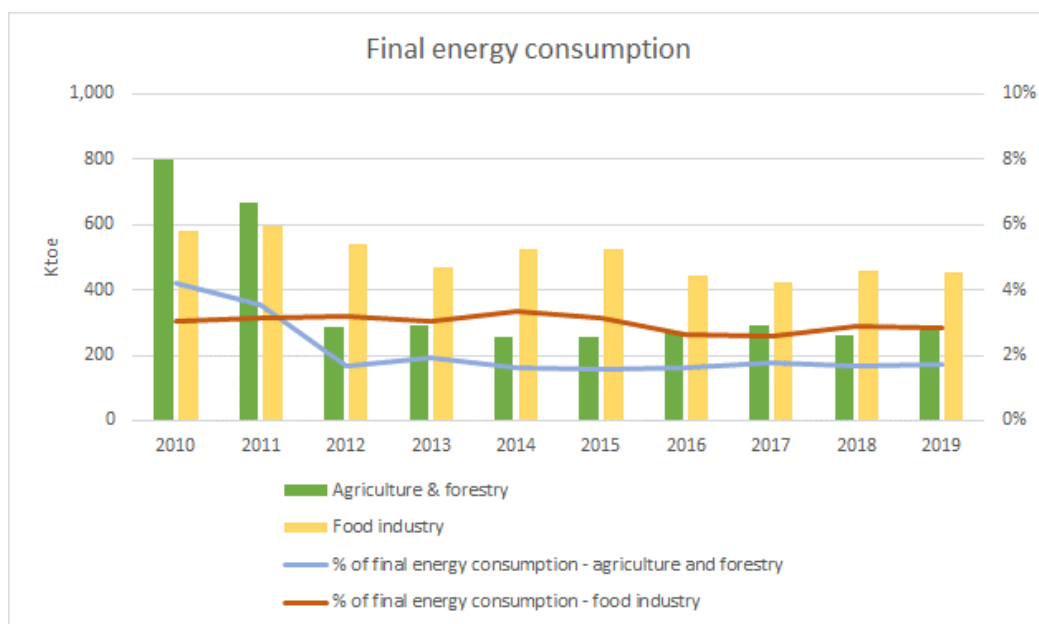
Figure 15: Share of agriculture and forestry in total energy consumption at MS level for 2018



Source: DG AGRI, Agri-food Data Portal, CAP Indicators

Figure 16: Share of food industry in total energy consumption at MS level for 2018

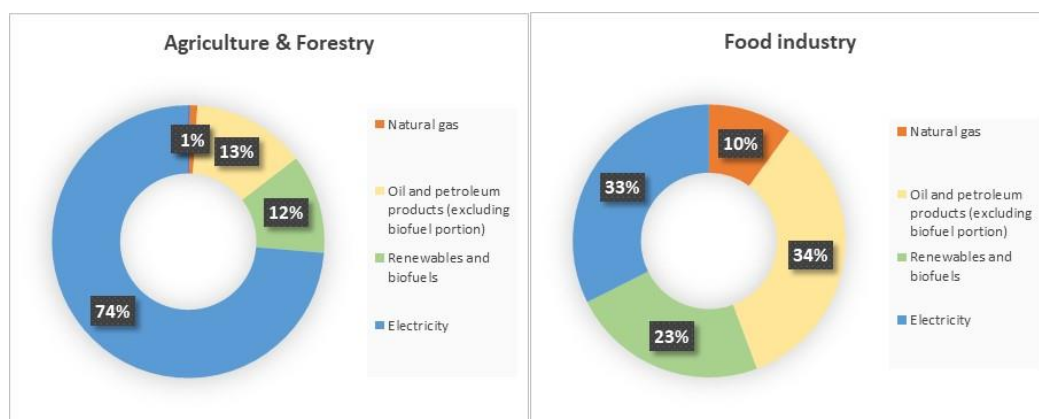
Between 2010 and 2019 the final energy consumption in agriculture /forestry declined by 65.8%, that actually reflects the decline between 2010 and 2012 during the economic crisis, while the trend from 2012 onwards is relative steady as well as the corresponding share in final energy consumption. In 2019 the energy supply per hectare of utilised agricultural area is 53.84 KgOE, well below the EU27 average (169.8 KgOE/ha in 2018), and follows the same trend with the energy consumption (it was decreased by 62.4% during the period 2010-2012 and practically stabilised after 2012). As for the food industry, its direct use of energy fluctuates over the last decade with a decreasing trend, while the share in final energy consumption fluctuates with a stabilised trend. (Eurostat, [\[nrg_bal_s\]](#) & [\[TAI04\]](#))



Source: Eurostat, [\[nrg_bal_s\]](#)

Figure 17: Direct use of energy in agriculture and forestry & food industry

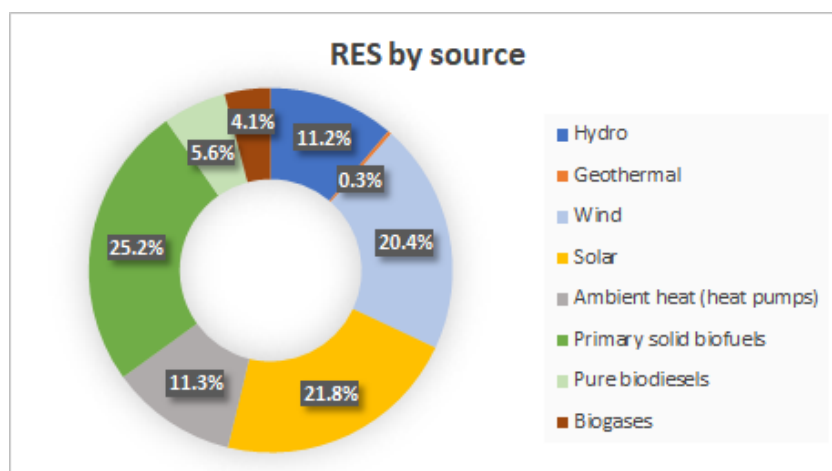
Electricity is the primary energy source for the direct energy use in agriculture / forestry, while petroleum products and electricity are evenly used in the food processing industry (Figure 18). Between 2010 and 2012, the share of renewables increased in agriculture / forestry and from 2012 onwards it remained stable in the range of 11-12%. The share of renewables in the food processing industry fluctuates over the last decade with a range of 23-28% in the last five years.



Source: Eurostat, [\[nrg_bal_s\]](#)

Figure 18: Final energy consumption in agriculture and forestry & food industry by source for 2019

Greece has made significant progress in deploying renewable energy sources in the last decade. In 2019, the share of energy from renewable resources accounted for 19.7%, contributed mainly by primary solid biofuels (forestry sector), solar (photovoltaic and thermal) and wind energy (Eurostat [\[nrg_ind_ren\]](#) & [\[nrg_bal_c\]](#)).

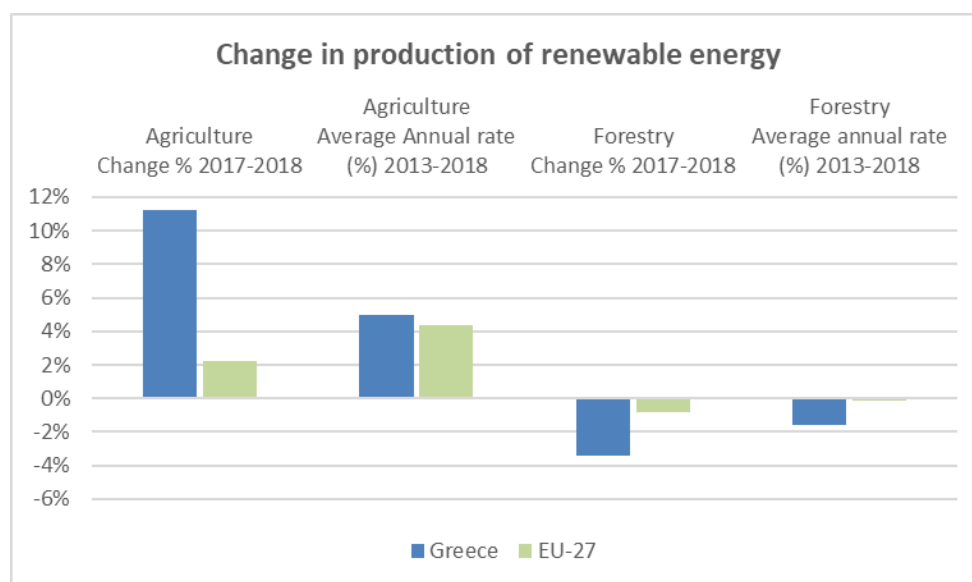


Source: Eurostat, [\[nrg_bal_c\]](#)

Figure 19: Renewable energy by source for 2019

In 2018, the share of agriculture (biodiesel, biogas and bioethanol) and forestry in the production of total renewable energy in Greece is 31.9%, below the EU-27 average of 53.5%. The forestry sector is the main contributor with over 80%.

Greece shows a downward trend in the production of renewable from agriculture and forestry, that lies below the EU-average. For the period 2013-2018, while the average annual rate was 5% for agriculture, the corresponding annual rate for forestry is -1.6% for forestry, showing an overall declining trend in the production of renewable energy from agriculture and forestry.



Source: DG AGRI, Agri-food Data Portal, CAP Indicators

Figure 20: Change in production of renewable energy from agriculture and forestry

6.2.2 Air

The EU's clean air policy requires significant further improvement of air quality in order to reduce the effects on biodiversity and ecosystem services and, on the other hand, approach the quality of the atmosphere gradually at the recommended quality levels of the World Health Organization (WHO) to address the long-term and short-term effects on public health.

To date, Greece's air management policy is shaped by the 2013 Clean Air Programme for Europe. A National Air Pollution Monitoring network has been established to assess the air quality and examine the compliance with the limit values provided by the corresponding air quality directives (Directives 2008/50/EU and 2004/107/EU). According to the State of Environment Report for Greece of 2019, the evolution of measured concentrations of air pollutants over time shows that there is a downward trend or stabilization tendency, depending on the air pollutant. This progress can be attributed to the reduction of air emissions due to measures adopted in the previous decades which mainly concerned the technological upgrading of the passenger car fleet, the mandatory introduction of exhaust emission inspection and certification, the emission control measures from various sources, the use of fuels with higher quality standards/specifications, the expansion of metro lines and the introduction of tram in the public transport, the facilitation of circulation of public transports, the penetration of the natural gas in all sectors and the completion of large road traffic projects.

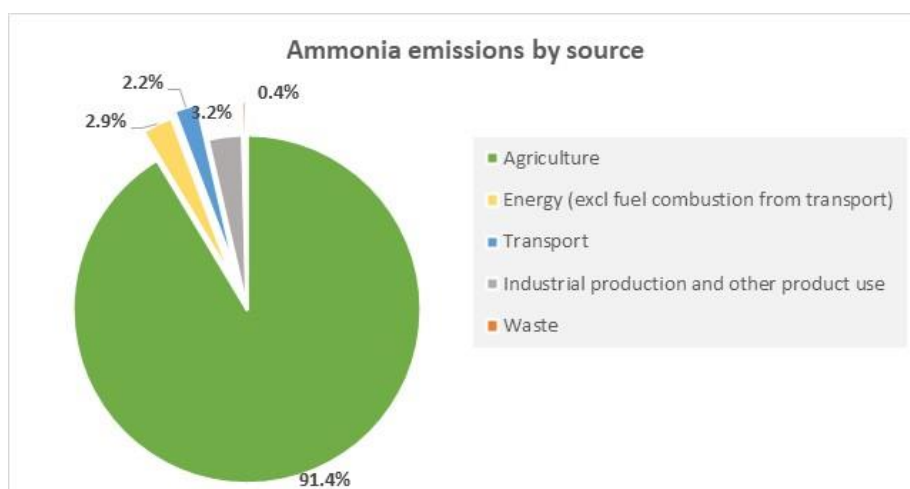
However, despite the improvement of the air quality, there are some exceedances of the air quality limit values of certain pollutants. Exceedances of EU air quality standards are still recorded for daily mean PM₁₀ concentrations in urban areas. Like other Mediterranean countries, Greece regularly records high levels of ozone concentrations, especially during warm periods of the year, which are exacerbated in the greater area of Athens by topography (basin surrounded by mountains) and meteorological conditions (temperature inversions, low wind speed, high temperature). The main characteristics of the country's air quality are summarized as follows (SoER, 2019):

- ozone remains almost stable whereas exceedances of limit values are frequent mainly in Athens, largely due to the country's climatic conditions
- PM₁₀ suspended particulates exceeded daily limit values (steady trend over time) in Athens and Thessaloniki, mainly at traffic monitoring stations, which are largely due to natural contribution (e.g. African dust)
- PM_{2.5} and SO₂ suspended particles do not exceed the limit value set by the EU in any monitoring station
- NO₂ exceedances of the limit values are monitored only in Athens and in road traffic monitoring stations
- benzene exceeds the limit value in a single traffic monitoring station in Athens
- no exceedances of benzo(a)pyrene are recorded in Athens

With regards to the national air emission targets pursuant to the provisions of the NEC Directive, Greece has already met its 2020 emission reduction commitments and is on track to meet the ones for 2030. The reduction in the national air emissions was achieved mainly due to the reduction in energy consumption, abatement measures and changes in the electricity mix (increased use of gas and renewables, decommissioning of old coal power plants), reduction of the sulphur content of liquid fossil fuels and vehicles with newer technology cleaner engines (SoER 2019, OECD 2020).

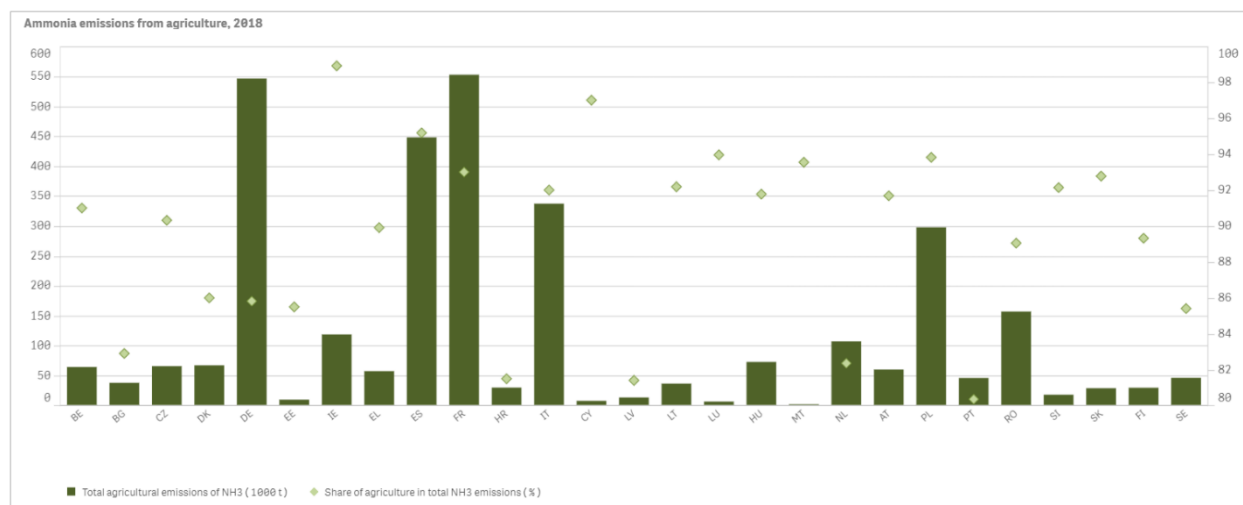
The air pollutant of main concern related to agriculture is ammonia (NH₃), which has recently become the focus of much debate because of the effects that the deposition of atmospheric nitrogen can have on ecosystems, thereby leading to eutrophication and increased acidity. Ammonia is also associated with the formation of secondary particulate matter with adverse effects on human health.

According to 2019 national data in accordance with the NEC Directive and the Convention on Long-Range Transboundary Air Pollution (CLRTAP) that are also remitted to the European Environment Agency (EEA), agriculture remains the major source of ammonia emissions in Greece (91.4%), with the remaining associated with industrial production and other products use (mainly chemical industry), energy (fuel combustion), transport (mostly road transport) and waste (aerobic and anaerobic digestion of waste).



Source: [NECD National Emission Inventory 2021](#)

Figure 21: Total ammonia emissions by source category for 2019

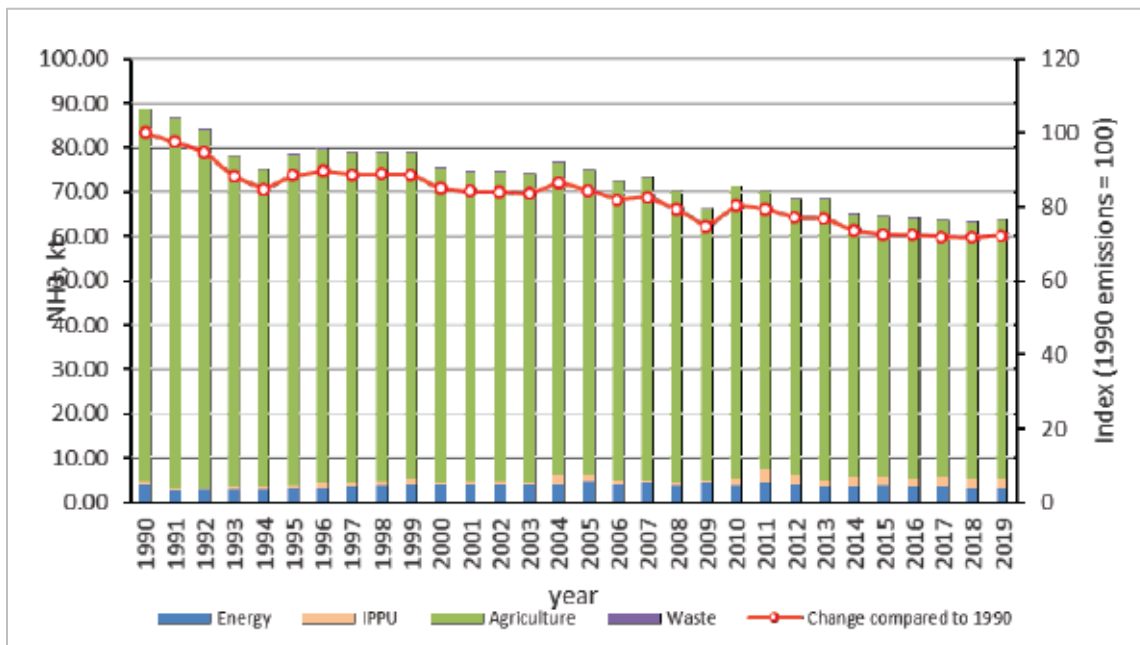


Source: DG AGRI, Agri-food Data Portal, CAP Indicators

Figure 22: Ammonia emissions from agriculture at MS level for 2018

The share of agriculture in total ammonia emissions is below the EU average of 92.9% (Figure 22). The total emissions levels of ammonia have been relatively stable during the last decade, with a steady decrease of 1-4% per year over the last five years (Figure 23), in opposite trend than in the EU.

According to the Informative Inventory Report (IRR) of Greece that was submitted in March 2021 under the obligations of UNECE Convention on Long-range Transboundary Air Pollution (LRTAP) and the NEC Directive, the national ammonia emissions decreased from 88.57 kt in 1990 to 63.90 kt in 2019. The emissions in 2019 have been decreased by 27.9% and 14.5% compared to 1990 and 2005, respectively.



Source: [Greece's IIR 2021](#)

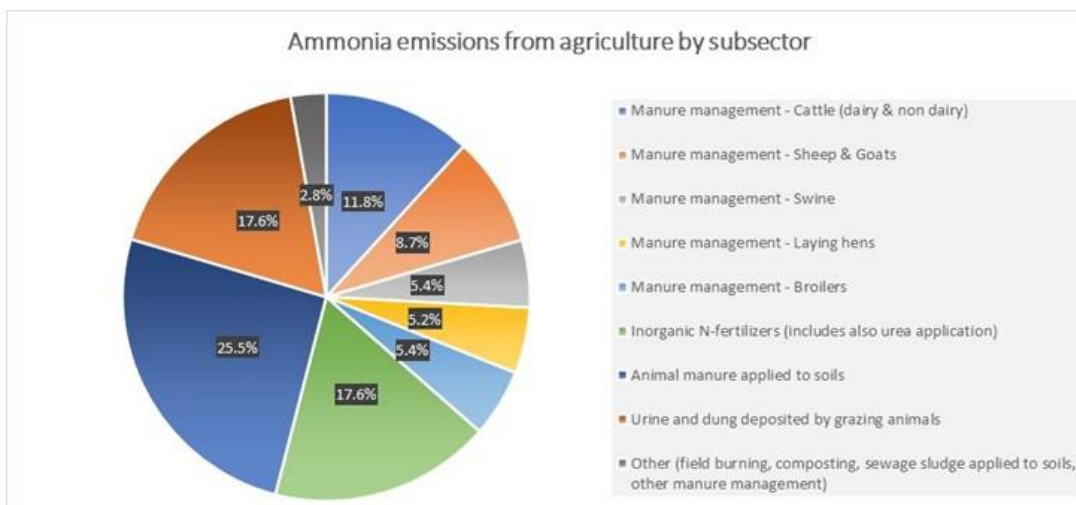
Figure 23: Total ammonia emissions by source for the period 1990-2019

The decreasing trend of ammonia emissions is mainly attributed to the decrease in animal population and the use of synthetic nitrogen fertilizers, which is due to the increase of organic farming and the impact of initiatives to promote good practice in fertilizer use. The national target of reducing ammonia emissions, compared to 2005, as described in the new NEC Directive, is 7% by 2020 and 10% by 2030 and onwards. As such, the country has already achieved both the 2020 and 2030 targets for ammonia emissions.

Livestock contributes more than crops to the ammonia emissions, with a share of 63% of emissions in agriculture. The total annual ammonia emissions are derived mainly from manure management, animal manure applied to soils, synthetic N-fertilisers and urine and dung deposited by grazing animals, the share of which is presented in Figure 24.

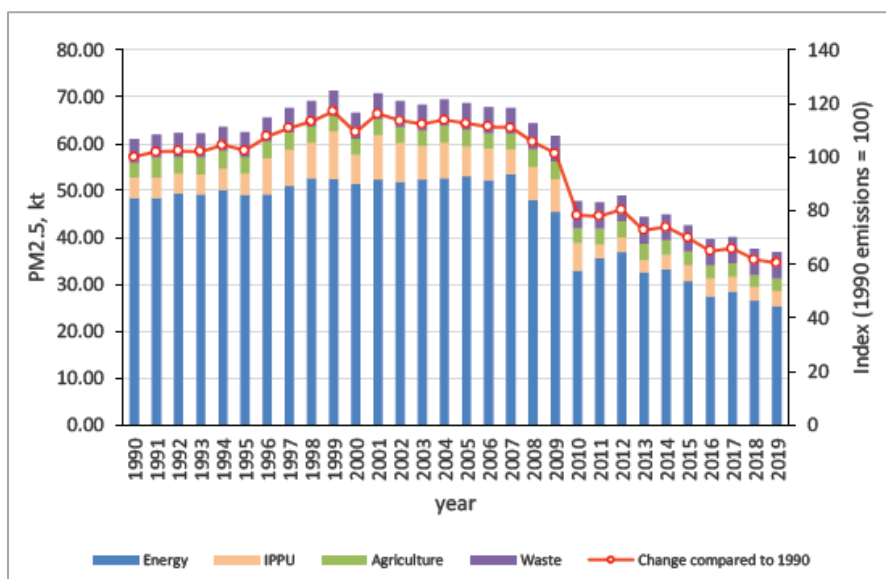
Apart from ammonia emissions, agriculture contributes to PM_{2.5} emission arisings mainly from field burning of agricultural residues, with a share of 7.2% in 2019, while at least 2/3 of total PM_{2.5} emissions derive from energy as a result of stationary and mobile fuel combustion.

The total PM_{2.5} emissions in 2019 have been decreased by 39.4% and 46.2% compared to 1990 and 2005, respectively. This decrease is attributed to the increasing share of natural gas and RES technologies in energy mix; energy efficiency improvements of the conventional power production plants; and the renewal of vehicle fleet. Other reasons are the reduction of consumption of electricity and other fuels, due to the economic recession of the years after 2007. As for agriculture, PM_{2.5} emissions declined by 26.5% the last decade.



Source: [NECD National Emission Inventory 2021](#)

Figure 24: Share of ammonia emissions in different subsectors of agriculture for 2019



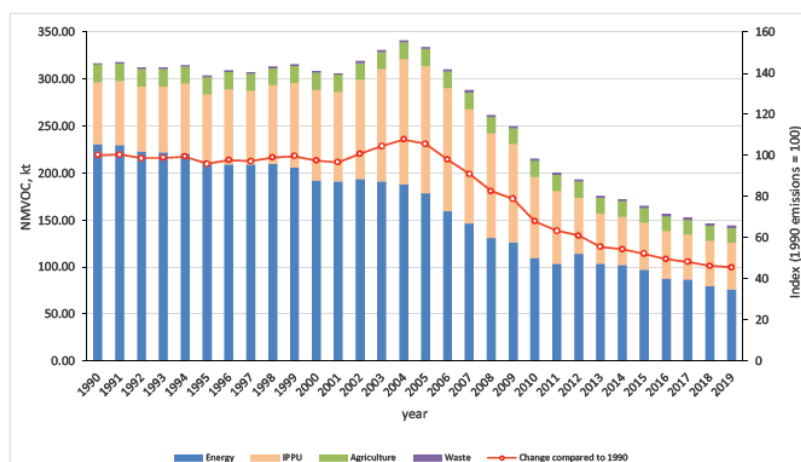
Source: [Greece's IIR 2021](#)

Figure 25: Total PM_{2.5} emissions by source for the period 1990-2019

It is noted that the national target of reducing PM_{2.5} emissions compared to 2005, according to the NEC Directive, is 35% by 2020 and 50% by 2030. The target of 2020 has already been met, whilst the achievement of the national target for 2030 is expected to be achieved provided that additional measures may need to be implemented.

Agriculture also contributes to NMVOC and NO_x emissions, with a share of 10.9% and 7.3% in 2019 respectively. The key source of NMVOC emissions from agriculture is manure management, whereas NO_x emissions result mainly from inorganic-N fertilisers and urine and dung deposited by grazing animals. The contribution of agriculture to SO₂ emissions, due mainly to field burning of agricultural residues, is considered negligible (0.07% in 2019).

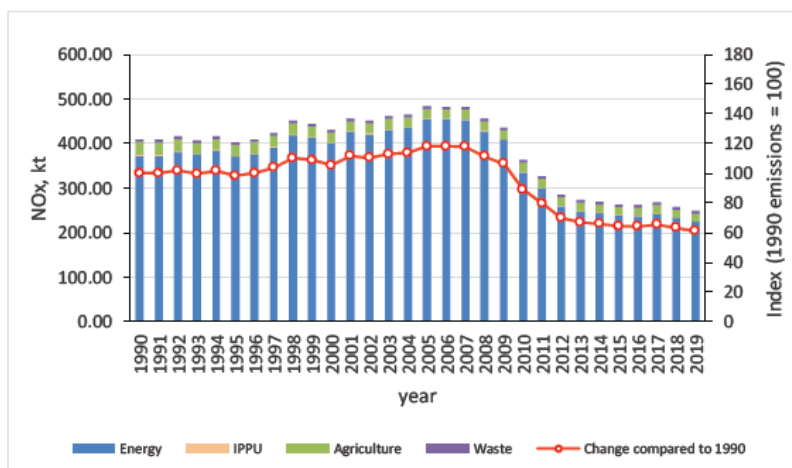
The total NMVOC emissions in 2019 decreased by 54.5% and 56.8% compared to 1990 and 2005, respectively. The decrease is mainly attributed to the implementation of the EU legal instruments on the limitation and control of NMVOCs due to the use of organic solvents and the storage and distribution of petrol along with the renewal of vehicle fleet that contributed to the reduction of emissions in the road transport sector. NMVOC emissions from agriculture also decreased by 6.8% the last decade. Overall, the national target of reduction for 2020 (54% compared to 2005) has already been met, whilst it is estimated that the target of 62% reduction by 2030 can be achieved, taking into account the foreseen measures.



Source: [Greece's IIR 2021](#)

Figure 26: Total NMVOC emissions by source for the period 1990-2019

The NO_x emissions in 2019 decreased from by 38.9% and 48.3% compared to 1990 and 2005, respectively, due to the increasing share of natural gas and RES technologies in energy mix, energy efficiency improvements of the conventional power production plants and the renewal of vehicle fleet. Another significant cause of this decline was also the reduction of energy consumption due to the economic recession of the years after 2007. NO_x emissions from agriculture show a decrease by 4.6% the last decade. The national target of reduction for 2020 (31% compared to 2005) has already been met, whilst it is estimated that the target of 55% reduction by 2030 can be achieved, taking into account the foreseen measures.



Source: [Greece's IIR 2021](#)

Figure 27: Total NO_x emissions by source for the period 1990-2019

6.2.3 Biodiversity and ecosystem services

Greece is a Mediterranean country of exceptional biological wealth, with a high species diversity and extensive coverage of natural areas. The geographical position of the country, its topographic heterogeneity and the co-existence of several micro-climatic conditions explain the high biodiversity value of the country and its high degree of endemism ([SoER 2018](#)).

Flora

Greek flora includes 5752 species and 1893 subspecies of vascular plants, which cumulatively represent 6600 taxa that belong to 1072 genera and 185 families. Greece is also one of the world's hotspots for endemic plants, with 1278 endemic species (22.2% of all species present) and 452 endemic subspecies, which cumulatively represent 1461 taxa (22.1% of all taxa present in Greece).

Of the endemic flora in Greece, 258 species (or 18% of all endemics) are considered threatened (i.e. are classified in one of the IUCN categories: critically endangered, endangered or vulnerable). Two of the endemic species are considered as extinct.

Fauna

Greek fauna is estimated to include 50,000 species, of which over 27000 are invertebrate species. Until now 23130 animal species have been recorded in the country's terrestrial and freshwater ecosystems, of which 3956 are characterised as Greek endemics. Furthermore, 3500 animal species have been recorded in the Greek marine environment. In regards to the bird species, 442 have been recorded, of which 60% are considered resident species.

Overall, 13.4% of vertebrate species (1273 selected species under evaluation) are considered threatened, while 40% of invertebrate species (591 selected species under evaluation) are considered threatened (i.e. classified as critically endangered, endangered or vulnerable according to the IUCN criteria).

Table 10: Conservation status of vertebrate species in Greece according to IUCN criteria (based on the results of Greek Red Book, 2009)

Category	Regionally extinct (RE)	Critically endangered (CR)	Endangered (EN)	Vulnerable (VU)	Near Threatened (NT)	Least Concern (LC)	Data Deficient (DD)	Not Evaluated (NE)	Total number of species	% of species threatened (CR,EN,VU) out of the total number of species
Marine fishes	0	5	4	5	0	0	0	453	476	2.9
Freshwater fishes	5	14	12	23	3	60	15	0	154	31.8
Amphibians	0	1	2	3	3	13	0	0	22	27.3
Reptiles	0	2	4	6	6	46	0	0	64	18.8
Birds	1	14	17	31	16	26	17	227	442	14.0
Mammals	0	3	12	13	11	10	20	69	115	24.3
Total	6	39	51	81	41	159	45	718	1273	13.4

Source: National Biodiversity Strategy

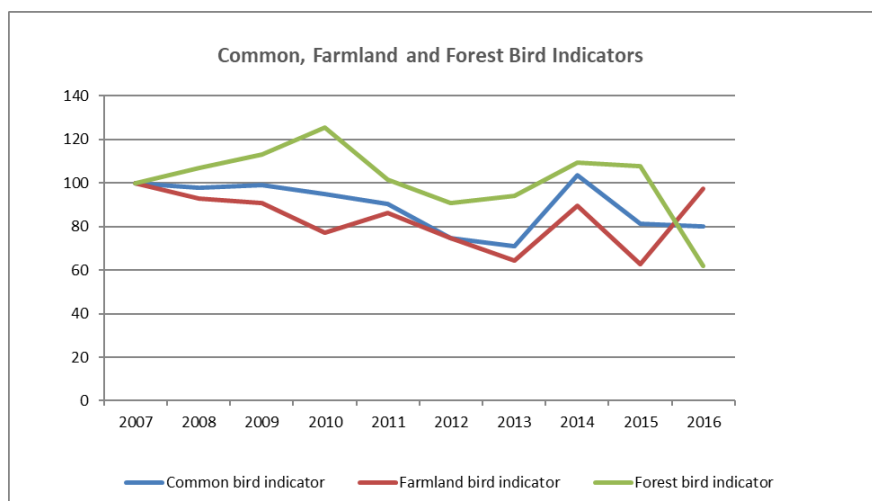
Table 11: Conservation status of invertebrate species in Greece according to IUCN criteria (based on the results of Greek Red Book, 2009)

Category	Regionally extinct (RE)	Critically endangered (CR)	Endangered (EN)	Vulnerable (VU)	Near Threatened (NT)
Porifera				10	
Cnidaria			2	28	
Polychaete			1	3	
Polyplacophora				1	
Bivalvia			1	4	
Gastropoda (marine)				10	
Gastropoda (terrestrial)	70	28	63		211
Cephalopods				1	
Aranea	20	9	4		
Amphipoda				3	
Isopoda	41	2	4		
Decapoda		1		11	
Chilopoda	3	3			
Odonata	2		5		
Orthoptera	1		1		
Lepidoptera	4	19	16		
Coleoptera		2	3		
Echinodermata			1	4	
Ascidacea				1	
Total	141	64	99	76	211

Source: National Biodiversity Strategy

6.2.3.1 Population status of common, farmland, and forest bird species

The total common bird indicator in Greece has a downward trend (19.8% for the period 2007-2016), a similar trend to that in EU (-13% for the period 1980-2018). Farmland bird populations are considered to be a good indicator of changes in farmland biodiversity because birds play a significant role in the food chain and are found in many varied habitats. Between 2007-2016 the farmland bird indicator shows a slight decline in Greece by 2.6% ([SoER 2018](#)), whereas an unwelcome decline by 34% is recorded in south Europe for the period 1989-2018 ([PECBMS](#)). In the same period, the forest bird indicator, which is a barometer for the forest biodiversity, shows a decline in Greece by 38.1% ([SoER 2018](#)), while the trend of south Europe is also negative by 25% ([PECBMS](#)).



Source: [SoER 2018](#)

Figure 28: Common bird indices

6.2.3.2 Species and habitats of European Interest

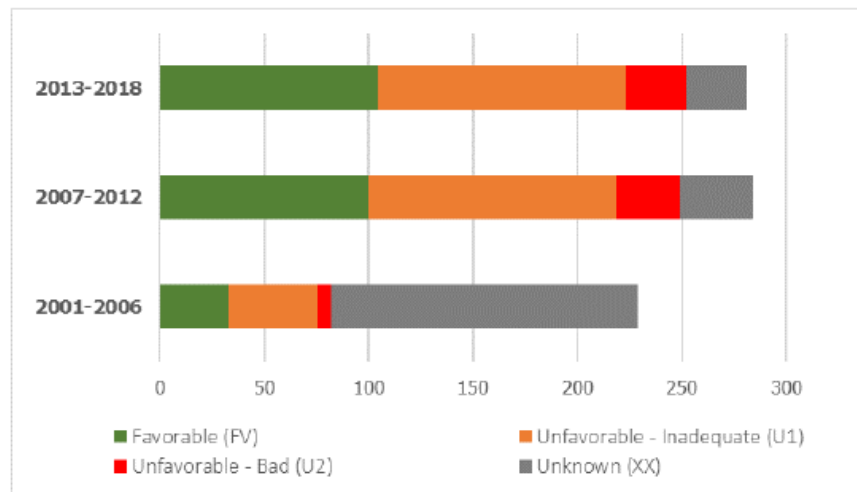
Species of European Interest

Species of European interest refer to the species in Annexes II, IV and V of the Habitats Directive (Directive 92/43/EEC) and the species in Annex I of the Birds Directive (Directive 2009/147/EC). According to the National Report on Species of European Interest of the Habitats Directive in the reference period 2013-2018, there are 308 species (in Annexes II, IV and V of the Directive). The species distribution by taxonomic group and biogeographical area is listed in Table 1. Among the 308 species, 286 are found in the Mediterranean Biogeographical Area (MED).

There is no significant change in the conservation status of the species of European interest in the MED region over the last decade, showing though a slight improvement in the scientific knowledge base. More than half of species (53%) still have unfavourable status, of which about 80% is recorded as inadequate and 20% as bad. Regarding the trend of species in unfavorable conservation status, it is recorded as unfavorable, but improving for only 2%, constant for 7%, deteriorating for 18%, while for 26% of species the trend is unknown ([SoER 2019](#)).

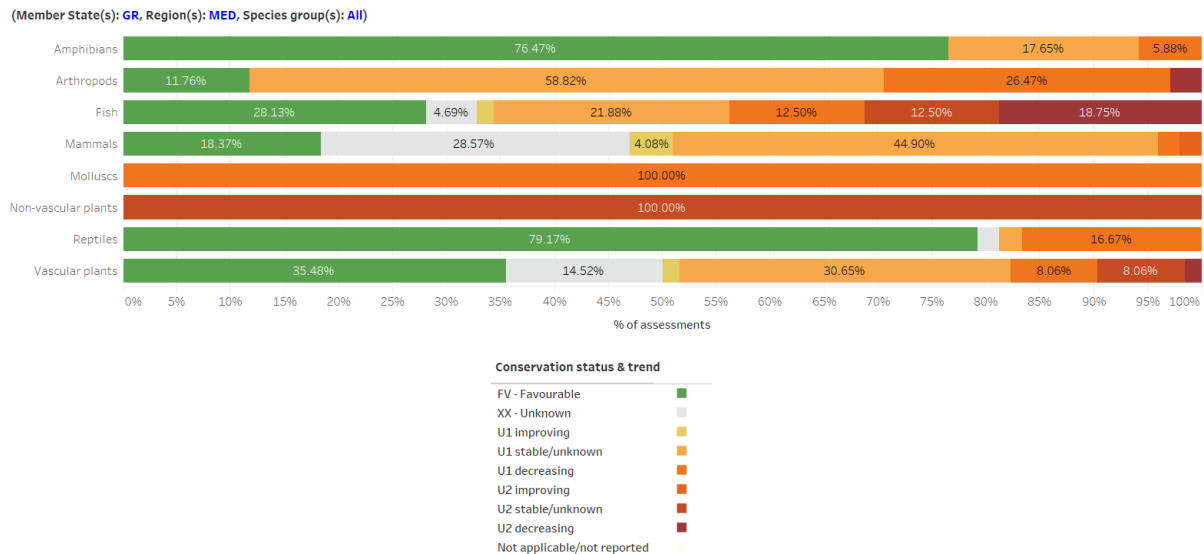
Examining the conservation status by species group in MED, it is observed that most amphibians and reptiles and a significant number of species of vascular plants are in favorable conservation status. The highest percentages in unfavorable conservation status are recorded for invertebrates, fish and mammals. Regarding trends, these are recorded as unknown or deteriorating for the majority of species being in unfavorable conservation status ([SoER 2019](#)).

Overall, the pressures and threats are mainly of medium impact (~65%). Fish species receive most of the pressure and threats, at a percentage greater than 45%, followed by reptiles and mammals at percentages of the order of 12-16%. Agriculture together with 'human induced changed in water regimes' are recorded as the major threats, followed by and 'development, construction and use of residential, commercial, industrial and recreational infrastructure and areas'. No threat was recorded in 38 MED species (13.2% of species). Among the high intensity pressures and threats recorded in the species of the MED region, the hierarchy of the main categories with the highest frequency of occurrence is practically not differentiated, ([SoER 2019](#)).



Source: [SoER 2019](#)

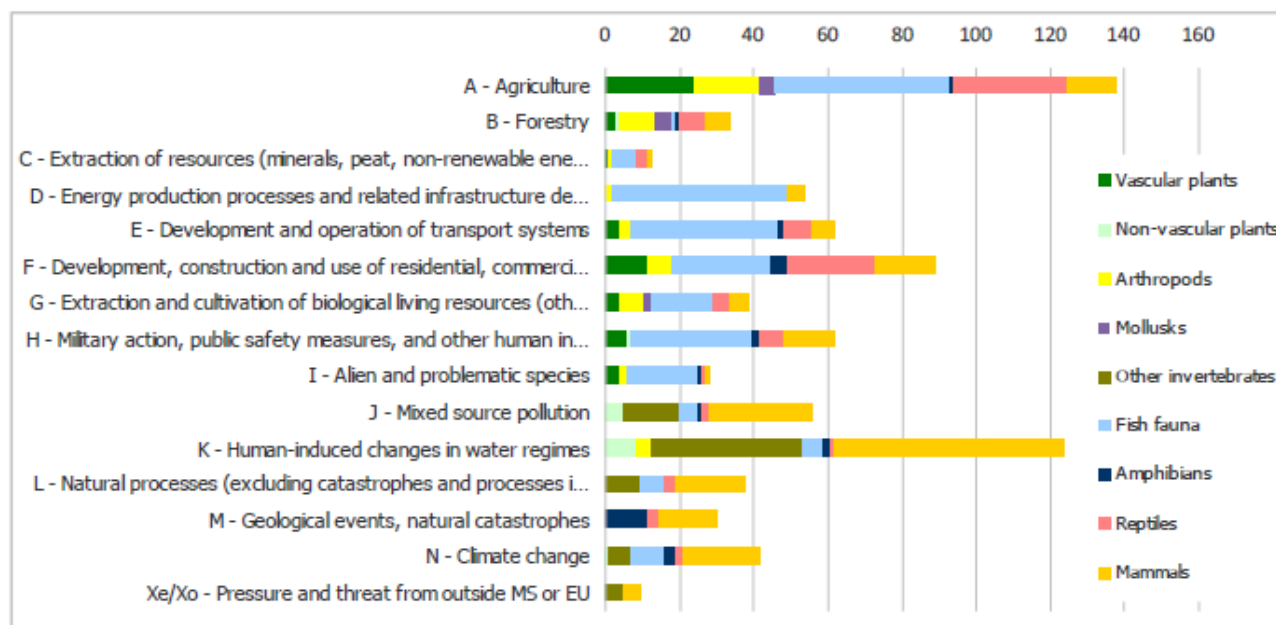
Figure 29: Change in the conservation status of species of European Interest in MED between reporting periods



Source: EEA, National Summary Dashboard, Habitats Directive – Art.17

Figure 30: Conservation status and trends by species group of European Interest in MED (2013-2018)

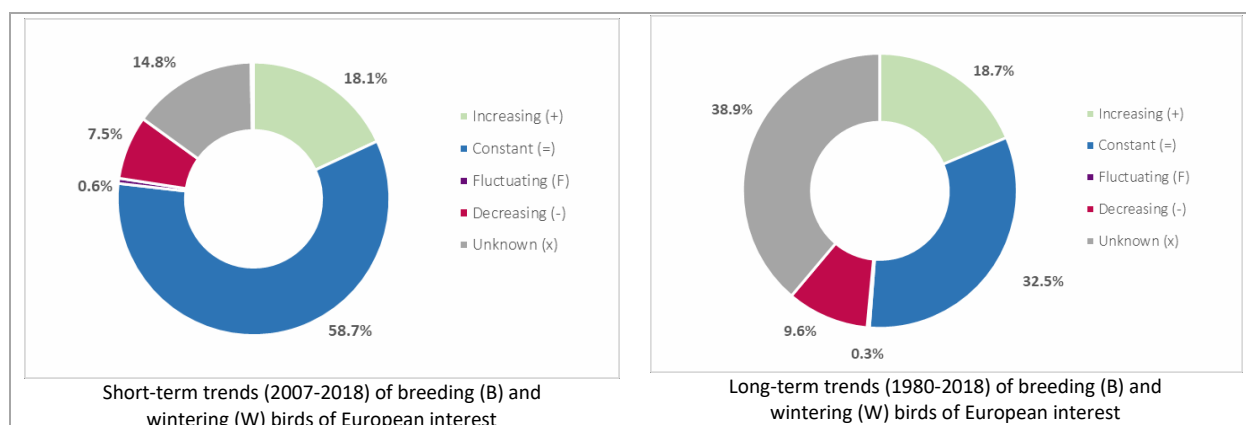
According to the national report on the species of the Birds Directive for the reference period 2013-2018, there are 321 species of birds of European conservation interest in Greece. A total of 255 species are breeding (B - Breeding), 80 species are wintering in Greece (W - Wintering) and 20 are in passage (P - Passage). It is noted that out of the 255 species that are breeding, 34 of them are wintering in Greece. Additionally, 26 species that are breeding and/or are wintering are also in passage. The assessment of the status of bird species is carried out for the breeding and wintering species, examining the population trends on two scales: short-term (period 2007-2018) and long-term (period 1980-2018).



Source: [SoER 2019](#)

Figure 31: Number of species of European interest of MED with recorded threats by species group in MED (2013-2018)

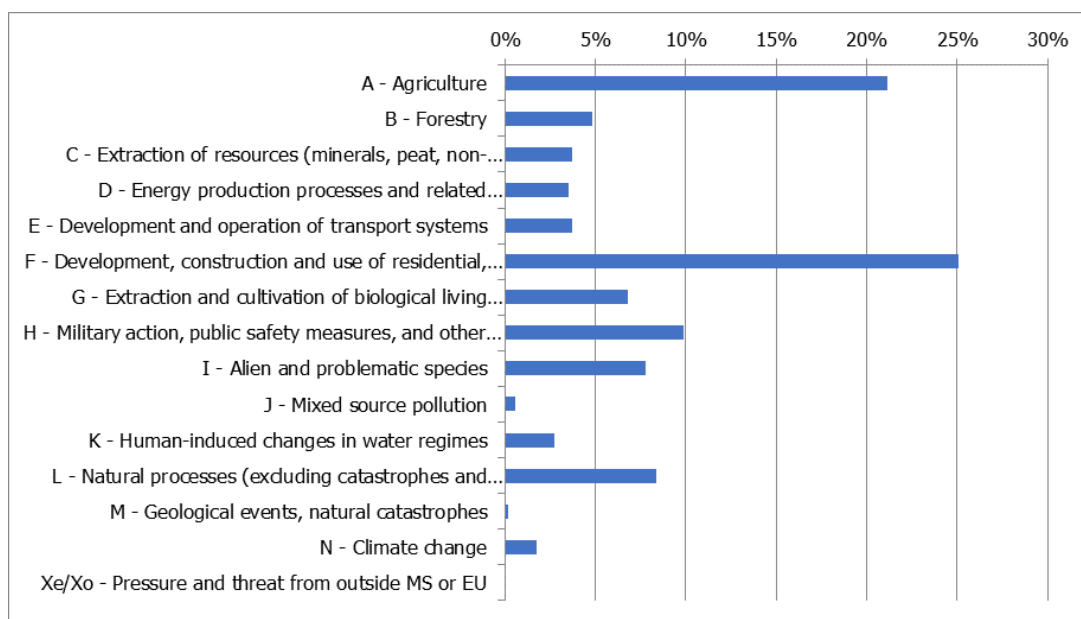
Birds of European interest are less threatened than species. According to the official data of the reporting period 2013-2018 for the short-term trends, 58.7% of bird species that are breeding and/or wintering in Greece are constant, 18.1% have an increasing trend and only 7.5% a decreasing trend. As for the long-term trends, 32.5% of bird species are recorded as constant, 18.7% have an increasing trend, while the percentage of bird species with a decreasing trend is 9.6% (increased by 2.1% compared to that of short-term trend). Unknown short-term trends are recorded for 14.8% of bird species, whereas the long-term trends remain unknown for 38.9% of bird species ([SoER 2019](#)).



Source: [SoER 2019](#)

Figure 32: Conservation status and trends of birds of European Interest (2013-2018)

Pressures and threats of high impact of the bird species of European interest were mainly reported at a percentage of about 42%. The main pressures affecting most of the bird species are 'development, construction and use of residential, commercial, industrial and recreational infrastructure and areas' and 'agriculture', that present the highest frequency of occurrence of high-intensity threats ([SoER 2019](#)).



Source: [SoER 2019](#)

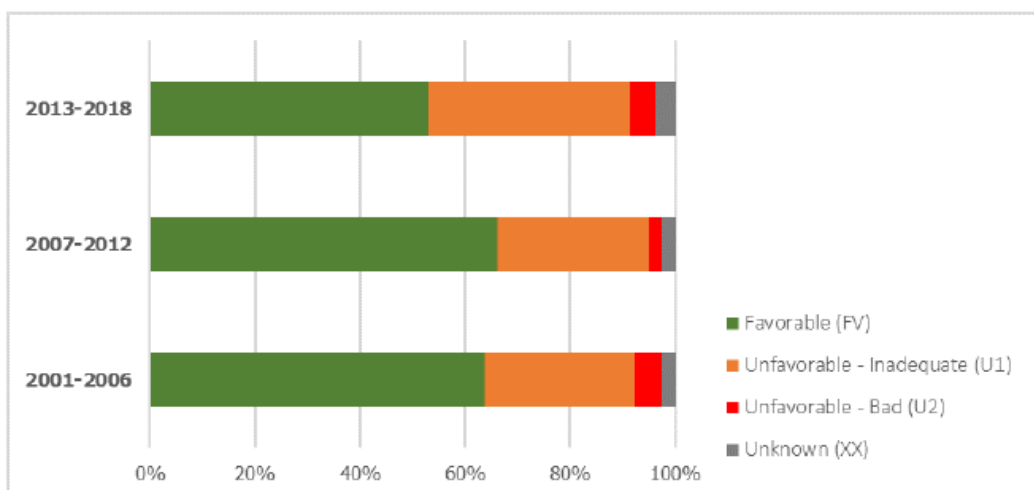
Figure 33: Frequency of occurrence of high intensity threats recorded in bird species of European interest (2013-2018)

Habitats of European interest

In Greece there are 89 habitat types of European interest in the reference period 2013-2018, which are divided into nine categories based on Annex I of Directive 92/43/EEC. The category "Forests" includes most of the habitat types (31.5%) followed by the categories "Coastal and halophytic habitats" (16.9%), "Natural and semi-natural grass formations" (11.2%) and "Freshwater habitats" (10.1%). Among the 89 habitat types, 81 belong to the Mediterranean Biogeographical Region (MED).

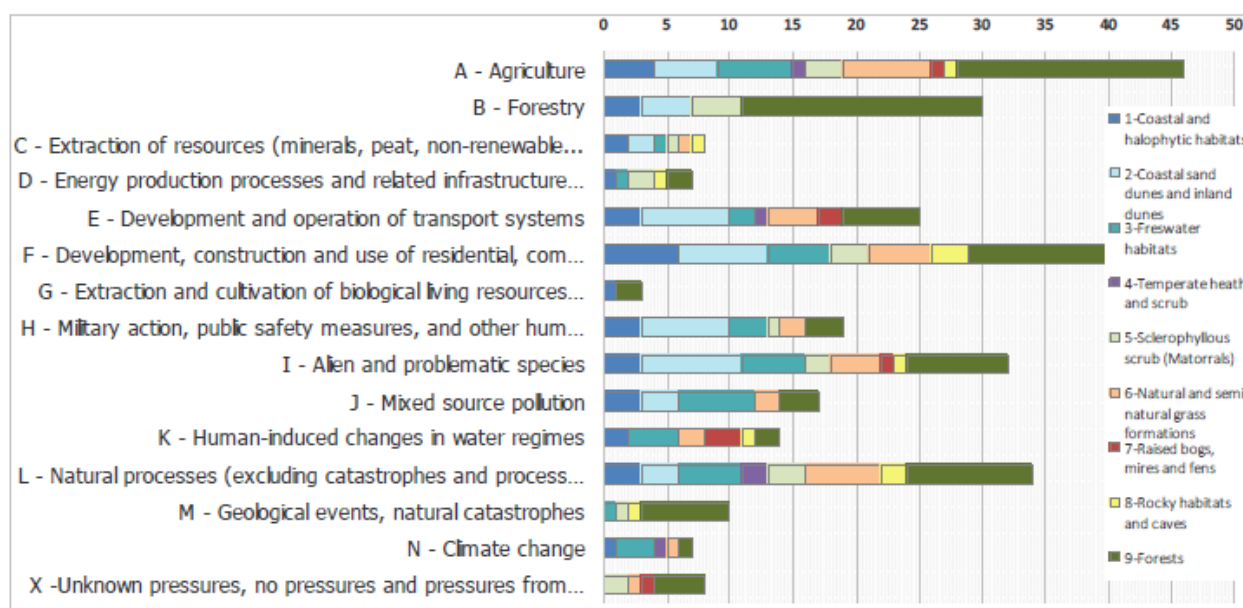
The conservation status of habitats of European interest in the MED Region shows a decline in recent years, but it still scores better than the EU27 average. According to the latest official data under the Habitats Directive, covering the reporting period 2013-2018, 53% have favourable status, 43% unfavourable/inadequate and only a small fraction (~5%) unfavourable/bad.

A significant number of pressures and threats are recorded, most of which are of medium impact (~65%). Agriculture, followed by 'development, construction and use of residential, commercial, industrial and recreational infrastructure' are recorded in 46 and 40 habitat types respectively. These types of threats are followed by natural processes (excluding catastrophes and processes induced by human activity or climate change) (34 habitat types), invasive alien species (32 habitat types) and forestry (30 habitat types). No threat was recorded in 8 out of 89 habitat types (9%). Among the high intensity pressures and threats recorded in the habitats of the MED region, the hierarchy of the main categories with the highest frequency of occurrence is practically not differentiated. ([SoER 2019](#)).



Source: [SoER 2019](#)

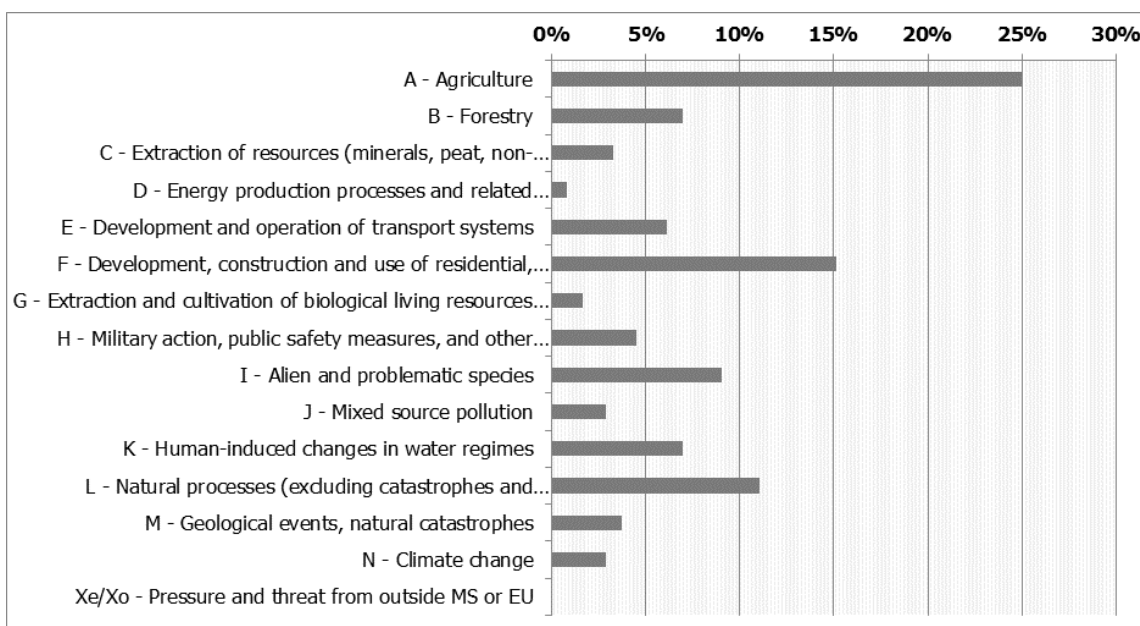
Figure 34: Change in the conservation status of habitats of European Interest in MED between reporting periods



Source: [SoER 2019](#)

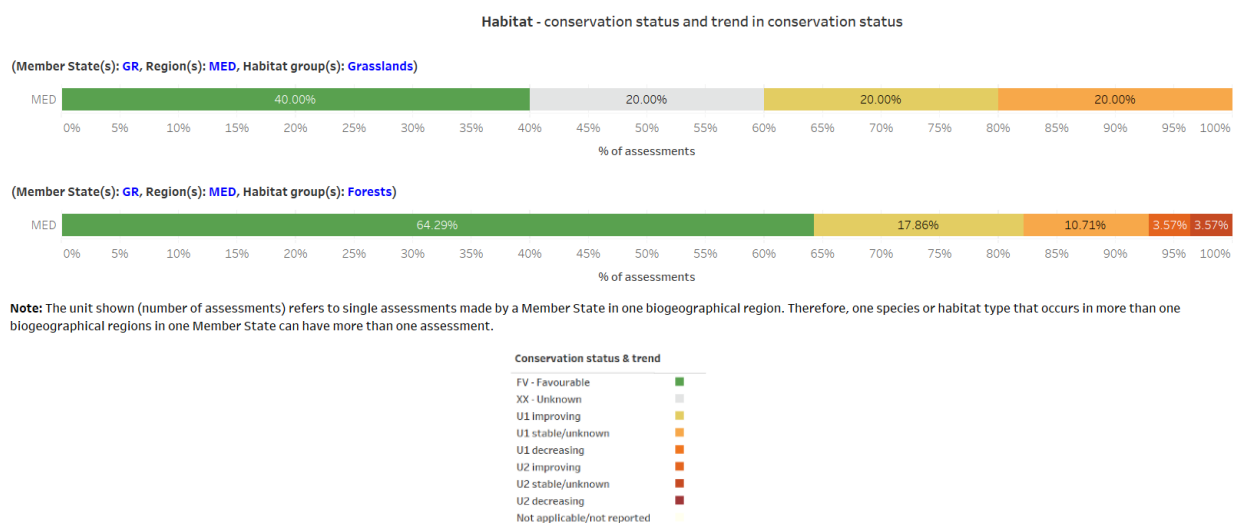
Figure 35: Number of habitat types of European interest in MED with recorded threats (2013-2018)

The conservation status of the habitats of European interest that are linked to agro- and grassland ecosystems (grassland habitats) is in favourable status by 40%, while that of forest habitats of European interest by 68.3%. For grassland habitats, the most persistent threat categories are not differentiated with those for habitats, with 'development, construction and use of residential, commercial, industrial and recreational infrastructure' to be ranked on top. On the other hand, the most significant threat of high impact to forest habitats is 'forestry', followed by 'climate change' and 'extraction and cultivation of biological living resources (other than agriculture and forestry)' ([EEA](#) Dashboard on biodiversity).



Source: [SoER 2019](#)

Figure 36: Frequency of (jointly) high intensity pressures and threats recorded in MED habitats of European interest (2013-2018)



Source: EEA, National Summary Dashboard, Habitats Directive – Art.17

Figure 37: Conservation status and trends for grassland and forest habitats of European Interest in MED (2013-2018)

6.2.3.3 Nationally protected areas

Greece has gradually built a strong institutional frame for environmental protection and nature conservation, adopting the International Conventions (since 1974) and European Directives (since 1983), and enriching them with national legislation on nature conservation (since 1930s) and a series of national environmental protection laws (since 1950s). All forests and forested areas are protected by the Greek Constitution, followed by a concrete legal framework on their protection and exploitation ([SoER 2018](#) & [VNR 2018](#)).

The declaration of protected areas in various categories of protection was, up to 1986, based mainly on provisions of the Forest Code. More specifically, National Woodland Parks, Aesthetic Forests and Natural Monuments are stipulated in Law 996/1971, which is part of the Law 86/1969 “On Forest Code”. Wildlife Refuges, Controlled Hunting Areas and Game Breeding Stations are stipulated in Law 177/75, as amended by Law 2637/1998. In 2011, Law 3937/2011 (OGG 60/A/31-03-2011) established the National System of Protected Areas, which includes the following types of protected areas:

- Strict nature reserves
- Nature reserves
- Natural parks (national or regional)
- Habitats and species protection areas: distinguished in Special Areas of Conservation (SAC) and Special Protection Areas (SPAs) (that are the Natura 2000 sites) as well as wildlife refuges
- Protected landscapes/seascapes, protected natural formations, aesthetic forests, protected forests, protected natural monuments

Table 12: Nationally designated protected areas

Nationally Designated Protected Areas	Cat. (3)	Year (4)	No. (5)	Area (km ²)(7)			
				Land	Marine	Total	% country's land area
Strict nature reserves ⁽¹⁾	A	1990	11	116	2	118	0.09%
National Forests (including peripheral zone)	A	1938	10	768	0	768	0.58%
Protected Natural Monuments	A	1975	51 ⁽⁶⁾	160	0	160	0.12%
Nature Reserves (including peripheral zones ⁽¹⁾)	A	1989	38	1967	718	2685	1.49%
Aesthetic Forests	A	1973	19	319	0	319	0.24%
Game Breeding Stations	B	1976	21	31	0	31	0.02%
Controlled Hunting Areas	B	1975	7	1115	0	1115	0.85%
Protected Forests	B	2006	3	417	0	417	0.32%
Protected Natural Formations, Protected Landscapes and Landscape Elements	B	1995	3	37	0	37	0.03%
National Marine Parks (including peripheral zone)	A	1990	2	182	2261	2443	0.14%
National Parks (including peripheral zone)	A	1977	15	11983	872	12855	9.08%
Wildlife Refuges	A	1998	603	10574	56	10630	8.01%
Other ⁽²⁾	A	1992	41	4461	2065	6526	3.38%

Nationally Designated Protected Areas	Cat. (3)	Year (4)	No. (5)	Area (km ²) ⁽⁷⁾			
				Land	Marine	Total	% country's land area
	<p>[1] Inside and outside of National and Marine Parks.</p> <p>[2] Under the designation “Other”, the protected areas are included, to which none of the other designations of the Law 1650/1986 or the forest legislation have been given. These are protection zones inside National Parks or Urban Control Zones or zones which have been designated through a Joint Ministerial Decision of precaution measures.</p> <p>[3] Cat: Protected area categories, A = for protection of fauna, flora, habitat types and landscapes, B = mainly provisions of the forest legislation, which provide adequate protection for the conservation of fauna, flora and habitat types..</p> <p>[4] Year of designating the first site to the category.</p> <p>[5] No: Number of protected sites.</p> <p>[6] These are 9 areas and 42 points with historical trees and groves.</p> <p>[7] In the reported areas, the overlaps have been excluded.</p>						

Source: [SoER 2019](#)

According to the official data of 2018, the nationally designated protected areas in Greece, excluding Natura 2000 network (SACs and SPAs) and after deduction of overlaps, cover around 17.7% of the country's terrestrial area, and rises to 34.8% with the inclusion of Natura 2000 network, well above that of 26% in EU ([EEA](#), Nationally designated areas - CDDA database).

It is noted that besides the national legislation, laws ratifying international conventions are also significant tools for the protection of biodiversity in the country (see Table 1). Such international conventions are the Convention of Bern, the Bohn, the Barcelona and the Ramsar Convention. Ten wetlands and lakes of international significance have been designated under the Ramsar Convention. Nine protected areas (out of which six are forest ecosystems) have been designated under the Barcelona Convention.

In regards to the parks designated as UNESCO Global Geoparks, and according to 2018 data, there are five geoparks in Greece, covering an area of 5294,35 km² in total. Overall, they contain 335 geosites, i.e. sites with particular geomorphological, geological, tectonic and palaeontological formations, geo-cultural heritage and remarkable natural beauty. A notable proportion of the Greek Geoparks (44.43%) includes areas that have also been designated as Natura 2000 sites, highlighting the composite geological, ecological and cultural value of these areas.

Sites designated under the EU Habitats and Birds Directives (Natura 2000 network)

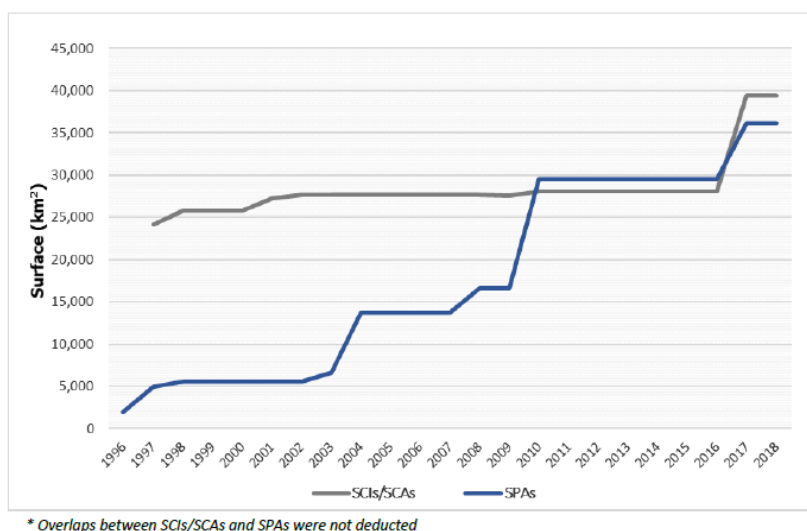
The sites of the European Network of protected areas "Natura 2000" are:

(a) "Sites of Community Importance (SCI)", as they are defined in Directive 92/43/EEC. The habitat types and species in Annexes I and II of the Directive 92/43/EEC are considered by the determination of SCIs, as well as the criteria in Annex III. The member states are obliged to declare these sites as "Special Areas of Conservation (SAC)" within six years at most and to establish priorities for the conservation in a favorable status of the habitat types and species of Community interest within these sites.

(b) "Special Protection Areas (SPA)", as they are defined in Directive 79/409/EEC "on the conservation of wild birds".

In 2017, the Natura 2000 network expanded to a total of 446 sites, adding 32 new sites and adjusting 63 existing sites. During the period 2010-2016, no substantial change is recorded, whereas in 2017 there is an important increase in the area of SCIs/SACs and SPA sites, by 40% and 22% respectively ([SoER 2019](#)).

No changes are recorded between 2017 and 2019, with the terrestrial area of Natura 2000 network to cover 27.3% of the country's land area, whereas the corresponding one in EU is far lower, covering 18.5% of the EU27 land area ([EEA](#), Natura 2000 barometer).



* Overlaps between SCIs/SCAs and SPAs were not deducted

Source: [SoER 2019](#)

Figure 38: Surface area of Natura 2000 network (1996-2018)

Table 13: Number and area of Natura 2000 sites in 2019

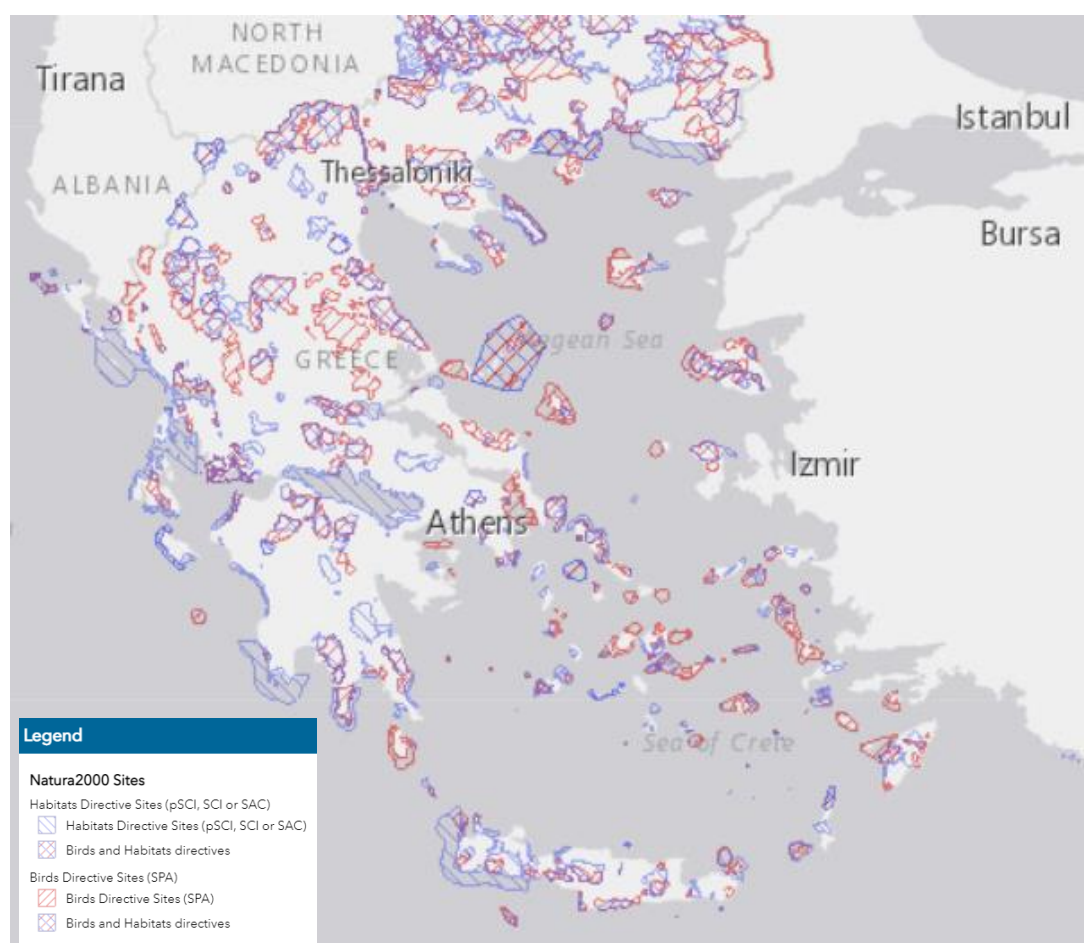
Natura 2000 network	SCI/SAC	SPA	Natura 2000
Number of sites	265	207	446
Land area (km ²)	21912	27761	35982
Marine area (km ²)	17528	10764	22796
Total area (km ²)	39440	38525	58778
Proportion of the country's land area	16.6%	21.0%	27.3%

Source: [Natura 2000 Barometer](#)

The share of agricultural areas (including natural grassland) under Natura 2000 areas is around 18.7% (11.2% in EU27), whereas that of forest areas is 40% (31% in EU27), (DG AGRI, [C34](#)). The corresponding share at regional level highlights the uneven distribution of agricultural areas (including natural grassland) under Natura 2000 across regions, ranging from 4.6 to 33.7%, while the share for forest area (incl transitional woodland-shrub) under Natura 2000 ranges from 18.7 to 68.5%.

For the management of Natura 2000 areas, the Law 4519/2018 (OGG 25/B/20-02-2018) ensures that all areas have a responsible management body. Yet, few protected areas have management plans. The completion of management plans for all protected areas with legal force and sufficient resources for implementation is considered of top importance, which is expected to be completed by 2022. With the recent Law 4685/2020 (GG 92/A/07-05-2020), the process is expected to be accelerated. A single body called Natural Environment and Climate Change Organisation ("OFYPEKA"), has been established that is responsible for implementing the policy set by the MoEE for the management of the protected areas in Greece, for tackling climate change and for promoting and implementing sustainable development actions. Pursuant to Article 44 of the Law, protected areas are categorised into zones according to their primary management objectives. In addition, under the Ministerial Decision 30339/982/2021 (OGG

1375/B/7-4-2021) national targets for the conservation status of protected habitats and species have been set that must be taken into account in the formulation of the Natura 2000 management plans and the environmental permitting process for projects and activities within Natura 2000 areas.



Source: EEA, [Natura 2000 network viewer](#)

Figure 39: Natura 2000 network in Greece

Table 14: Share of utilized agricultural areas and forest area under Natura 2000 at regional level

Region	UAA under Natura 2000		Forest area under Natura 2000	
	Agricultural area	Agricultural area (including natural grassland)	Forest area	Forest area (including transitional woodland-shrub)
	% of UAA		% of forest area	
Attiki	4.2	4.6	29.9	23.8
Voreio Aigaio	19.7	33.7	59.9	52.4
Notio Aigaio	23.0	32.9	60.4	46.1
Kriti	10.4	20.7	67.0	68.5
Anatoliki Makedonia, Thraki	17.5	19.6	45.2	44.3
Kentriki Makedonia	18.7	20.2	55.8	52.9

Region	UAA under Natura 2000		Forest area under Natura 2000	
	Agricultural area	Agricultural area (including natural grassland)	Forest area	Forest area (including transitional woodland-shrub)
	% of UAA		% of forest area	
Dytiki Makedonia	4.8	10.8	18.9	18.7
Ipeiros	16.7	27.1	42.0	43.1
Thessalia	25.0	27.2	53.4	50.4
Ionia Nisia	6.4	9.4	34.0	34.3
Dytiki Ellada	7.0	9.4	23.0	24.0
Stereia Ellada	9.2	13.7	22.5	24.1
Peloponnisos	9.6	11.3	36.2	32.8
Greece	14.3	18.7	40.0	38.4

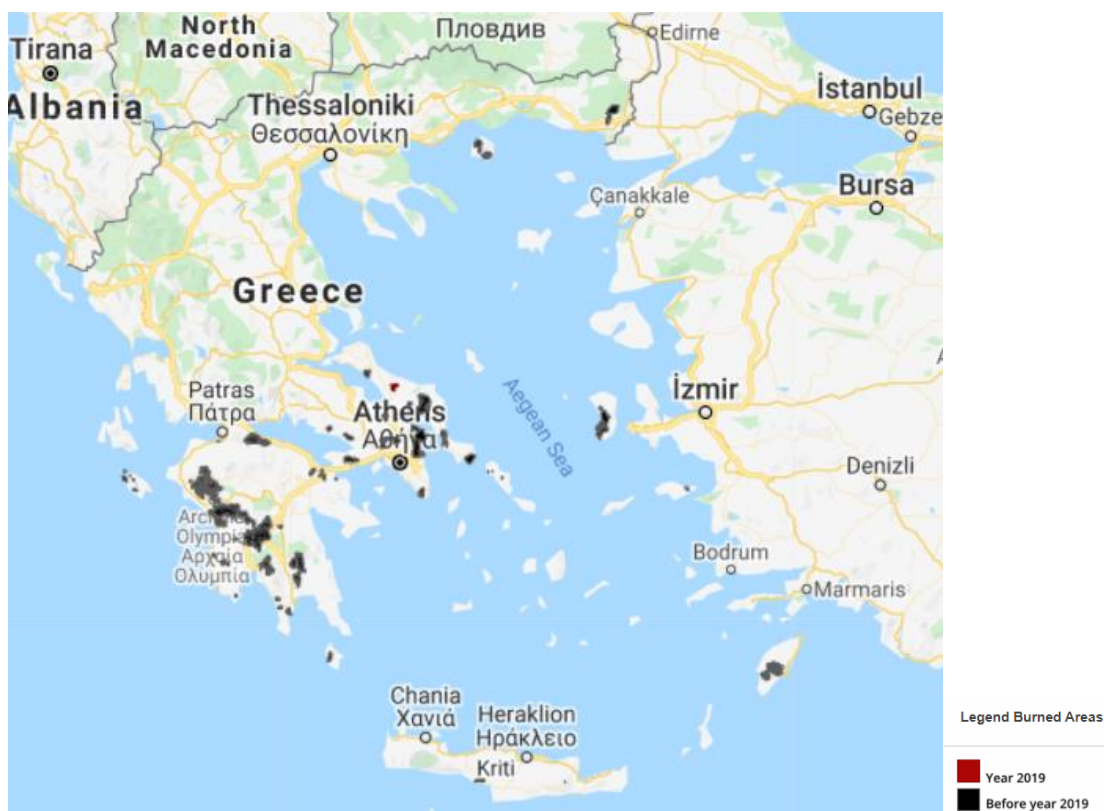
Source: [DG AGRI, CAP Context Indicators, C34](#)

6.2.3.4 Forests

Apart from the provisions of Habitats Directive for forest habitats of European interest and the forest areas that are under Natura 2000 sites, forests and forested areas are managed by Forest Services through the implementation of forest -management plans aiming to ensure their preservation and protection. Their updated technical specifications put emphasis on the multifunctional role of forests, taking into consideration ecosystem services and specific protective measures for the conservation of biodiversity during silvicultural and harvesting operations. In addition, both the annual national forest protection program and the annual program for illegal logging ensure the protection of forest and forested areas. In 2018, a National Forest Strategy (NFS) has been adopted in Greece (Ministerial Decision 170195/758/2018, OGG 5351/B) that sets the principles and guidelines of forest policy for the period 2018-2038, including specific objectives and the means of its implementation. Forest mapping, a significant instrument to monitor and protect the Greek forests, is almost complete, though with delays in their ratification. Detailed information on the posting and ratification progress of the forest maps is available at the [National Cadastre's website](#).

It is herewith underlined that wildfires on forest land and generally landscape areas are another threat to biodiversity. As shown in Figure 40, the burned areas up to 2019 are distributed mainly in Attica and Peloponnese regions, including Evia and various Greek islands. According to the [GFMC report of 2019](#), 98% of wildfires are related to human causes, of which agricultural practices play a vital role. As regards the reasons for the deterioration of the problem, the increase of accumulation and continuity of burnable vegetation (wildfire fuels) as a consequence of the abandonment of intensive land-use in the countryside and the lack of forest management due to limited availability of funds and institutional strength, is crucial.

In November 2020, after the completion of a study for the identification and prioritization of the reforestation needs of the country, the Ministry of MoEE presented to the Council of Ministers the National Reforestation Plan, setting the organization framework and the actions that need to be realized for the restoration of forest areas by 2030. It specifically provides for the afforestation and reforestation of a total area of 500,000 acres that have been burned, deforested or degraded and it will enrich the country with 30 million certified trees.



Source: WWF, [Oikoskopio](#)

Figure 40: Burned areas in Greece

6.2.3.5 Ecosystem services

Pursuant to the previous EU Biodiversity Strategy 2020 to map and assess the state of ecosystems and their services (MAES) in the country's territory, Greece has started the necessary preparatory actions since 2014. The European project [LIFE-IP 4 NATURA](#) (LIFE16 IPE/GR/000002), kicked off in 2017 and coordinated by MoEE, after the development of a technical-methodological guide on the determination and assessment of the ecosystem types in Greece and their ecosystem services in 2019, proceeded to the identification, recording and mapping of main ecosystem services at national and regional level in 2020.

Data were collected from official bodies and resources on the main categories of ecosystem services (i.e. Provisioning, Regulating and maintenance, Cultural). For the categorization of the collected data, the main categories of the National Set of Ecosystem Services Indicators were used, i.e.: Biodiversity, Environmental Quality, Food, material and energy, Forestry, Recreation, Water resources. The results of the analysis highlighted areas where a) simultaneous occurrence of data for the various categories of ecosystem services is observed and b) data gaps are evident. Consequently, a series of relevant thematic maps have been created, which form the basis for the selection and identification of areas where further research and prioritization for the implementation of MAES is required. The final thematic maps (Ecosystem services' priority areas maps of Greece, form the basis for further research and the communication of the until-now results towards the decision- and policy- making centers. These maps also contribute and support the efforts towards implementation of national and European policies for the environment and sustainable development. In addition, the drafting of ecosystem types map of Greece within and outside the Natura 2000 SACs has been carried out. A dedicated site has also been developed ([maes.gr](#)) to register

data on MAES in Greece, structured in three thematic areas, ecosystem types, ecosystem condition and ecosystem services, whereas the relative data are not available yet.

It is also noted that while ecosystem services are discussed in the National Biodiversity Strategy as part of Greece's obligations under the Convention on Biological Diversity, this has not translated into cross-sectoral regulatory and institutional frameworks to date (OECD, 2020).

6.2.3.6 Biodiversity and agriculture

Biodiversity mainstreaming into agriculture is mostly done so far by the Rural Development Program of Greece 2014-2020, through organic farming and biodiversity-related protection measures.

Though there are no quantitative national targets, organic farming increased from 7% to 9.3% between 2005 and 2018, with a EU27 average of 8% in 2018, but the average annual growth rate is low at 1.1% for the period 2012-2018, while the corresponding EU average is 5.4% (DG AGRI, [C19](#)). According to 2018 data, the area fully converted to organic farming is 64.3%, while the area under conversion to organic farming is 35.7% of the total organic farming area. The regions with the largest areas under organic farming are Central Makedonia, Thessaly and Western Makedonia, followed by Eastern Makedonia and Thrace and Crete.

The share of agricultural land under management contracts supporting biodiversity and/or landscapes is 10.4% in 2018 (15% in EU27), while there is no share of forest land (0.36% in EU27) (DG AGRI, [Thematic indicators - Biodiversity](#)).

6.2.4 Landscape

The country consists of a peninsular mainland jutting out into the Mediterranean Sea at the southernmost tip of the Balkans, and two smaller peninsulas projecting from it: Chalkidiki and Peloponnese. The mainland has rugged mountains, forests, and lakes, but the country is well known for the thousands of islands dotting the Aegean Sea to the east, the Mediterranean Sea to the south, and the Ionian Sea to the west.

The mountains divide the mainland into a series of small habitable valleys and plains, determining the distribution of villages and towns across the landscape and shaping rainfall patterns and road networks. The largest mountain range of Greece is the Pindus range, the southern extension of the Dinaric Alps, which forms the spine of the Greek mainland, separating Epirus from Thessaly and Macedonia. The country's tallest mountain is Mount Olympus, which also separates Thessaly from Macedonia. Its highest peak rises to 2,918 m above sea level, making it the second highest of the Balkan peninsula.

Greek islands are of various sizes, the largest being Crete, Euboea, Lesbos and Rhodes. The Aegean islands are divided into a series of different groups: the Argo-Saronic, the Cycladic, the Sporades, the Dodecanese and the islands of the North Aegean (Samos, Chios, Lesbos etc.). The Ionian Islands consist of six major islands strung out down the west coast of Greece, and in terms of climate they are much closer to this part of the mainland than the islands in the Aegean.

Due to its unique geomorphological features of the country, Greece has a complex landscape heterogeneity. Its key landscape features are the mountainous character (66% of total land), the extensive length of coastline (18,400 km) and the pronounced island character (9,800 islands) ([SoER 2018](#)).

Acknowledging the assets of landscape, Greece has ratified the European Landscape Convention (Law 3827/2010, OGG 30/A/25-02-2010), which defines landscape as “an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors” and its objective is to further the protection, management and planning of European landscapes, and to organise European co-operation for these purposes. The conservation of landscape diversity is also incorporated in the National Biodiversity Strategy of the country as one of its thirteen general targets.

In 2011, Law 3937/2011 (OGG 60/A/31-03-2011), which has established the National System of Protected Areas, recognises the need for protection and conservation of the landscape, in line with biodiversity and nature, in order to ensure natural processes, natural resources and ecosystems, as well as diversity, the specificity or the uniqueness of their components. There is an emphasis to protected landscape elements as parts or components of the landscape with special ecological, aesthetic and cultural value, or which contribute to the protection of natural resources, due of particular natural or manmade characteristics. In protected landscapes, names may be given according to their main characteristics (aesthetic forest, Geopark, rural landscape, urban landscape, e.tc.), while landscape is also referred as an important parameter for the protection of Nature Reserves and Natural Parks. The protected landscapes under the National Designation Protected Areas are presented in Table 12. Also, there is a mention to the ratifying Law of European Landscape Convention and its specification to the goals of biodiversity and protection of the natural landscapes. This Law is the main attempt of the Greek State to incorporate in the legislation the principles and measures of European Landscape Convention.

It is noted that landscape is referred as a separate parameter to spatial planning legislation, by setting provisions for the protection of any natural, cultural or architectural landscape elements and the enhancement of various types of landscape (e.g. agricultural landscape, urban landscape, micro landscape). Both regional and special frameworks of spatial planning include landscape as a parameter in spatial planning.

Regarding agricultural landscape, Law 3937/2011 particularly refers to landscape structural elements for their protection in the agricultural landscape, giving a particular emphasis to landscape elements of manmade characteristics (e.g. traditional crops, farmhouses, paths, stone fences, stone walls terraces, fountains, e.tc.).

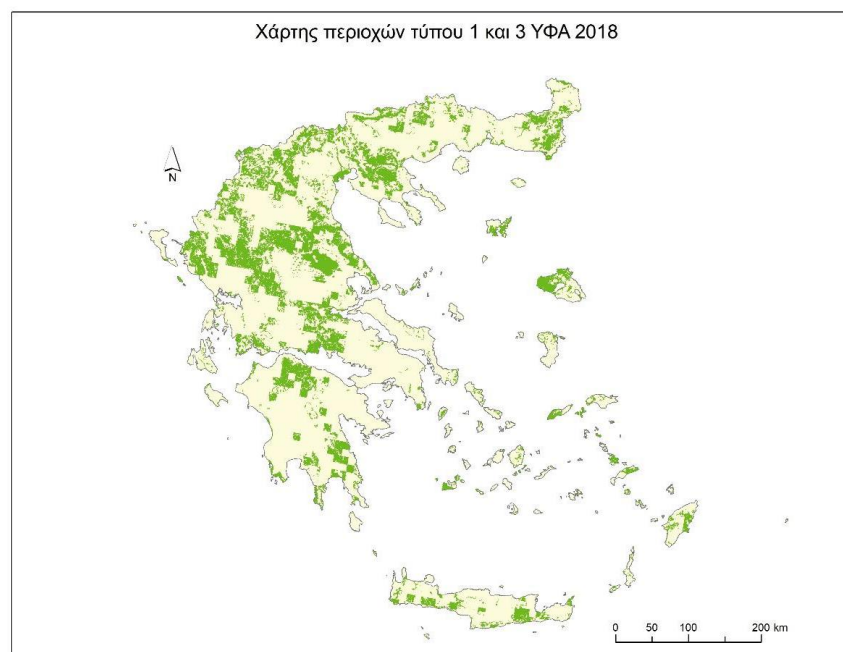
In regards to the landscape characteristics of the agricultural area of the country, 2.8% of agricultural area is fallow land, lower than the EU average of 4.1%, while 0.2% is landscape elements, also lower than the EU average of 0.5% (SWD/2020/372).

Farm landscape features are physical field boundaries of various kinds (e.g. hedges, stone walls, individual trees). A key difficulty in recording landscape features is that it has not been tracked systematically in the EU over the long term. The indicator on the share of utilised agricultural area (UAA) covered with landscape features is under development.

An attempt at building a clearer picture has been made through the concept of high-nature-value (HNV) farming that was developed in the early 1990s. It “refers to the causality between certain types of farming activity and corresponding environmental outcomes, including high levels of biodiversity and the presence

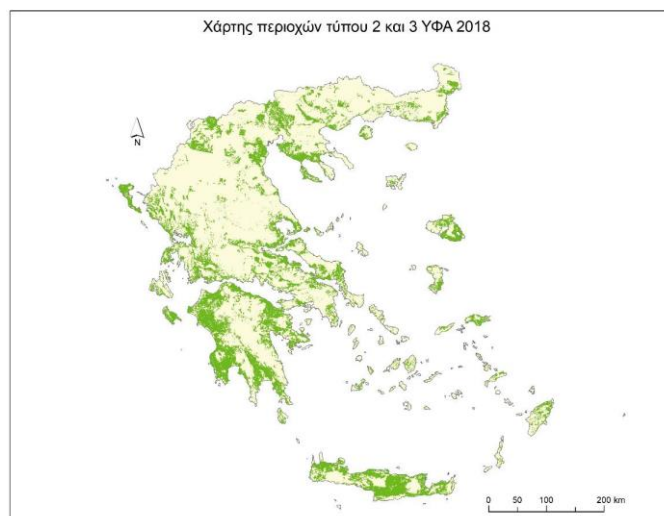
of environmentally valuable habitats and species”. The dominant feature of HNV farming is low-intensity management, with a significant presence of semi-natural vegetation, in particular extensive grassland. Diversity of land cover, including features such as ponds, hedges, and woodland, is also a characteristic.” High Nature Value (HNV) farmland areas and features have been widely recognised as a valuable asset of European agricultural landscapes, providing highly varied living conditions for a wide range of species and thereby contributing to biodiversity. (DG AGRI, CAP Indicator- [C37](#)). Data on the percentage share of HNV farming in total UAA have been submitted by Member States to DG AGRI in the Rural Development Programmes (RDPs) 2014-2020, including Greece. It is though noted that in November 2017 a survey on the methodological approach towards the HNV indicator was released that was documented in the working document “HNV Farming indicator in RDPs 2014-2020: Overview from a Survey – Final version” that summarises the approaches used by Member States. For Greece the document mentions that the provided information was considered insufficient.

According to the ex-post evaluation study of the Greek RDP 2014-2020, in which estimations are provided for the common context indicator “HNV farming” (C37), in 2014 the share of HNV farming areas on the total utilised agricultural area was estimated at 38.25%, which is close to the EU average of 32.3%. Between 2014 and 2018, an increase by 45.2% was observed for the HNV cultivated farmland (type 2 and 3), whereas a decrease by 18.1% was estimated for the HNV semi-natural farmland (type 1 and 3), which is probably due to differentiations in the CORINE Land Cover mapping features for 2018. Regarding the areas with RDP measures that contribute to high natural value areas, there was an increase by 16.6% between 2015 and 2018. In general, there is an increase in the areas of RDP measures of 2015 that fall in the HNV areas of 2018. The total increase of these areas is estimated to be 1.97%.



Source: Ex-post evaluation study of the Greek RDP 2014-2020, indicator C37

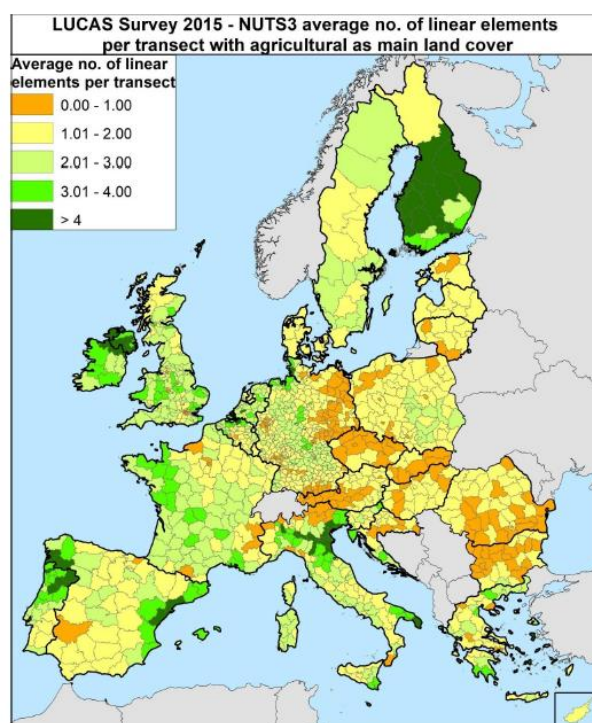
Figure 41: HNV areas of types 1 & 3 for 2018



Source: Ex-post evaluation study of the Greek RDP 2014-2020, indicator C37

Figure 42: HNV areas of types 2 & 3 for 2018

Another attempt at improving available information on farm landscapes has come through the Land Use and Land Cover Survey (LUCAS), a European field survey program funded and executed by Eurostat. The LUCAS survey provides information on the presence and evolution of linear elements and allows to assess them at a regional level. According to Figure 43, mapping the density of linear features on agricultural land for 2015, the density varies a lot among the regions of Greece.



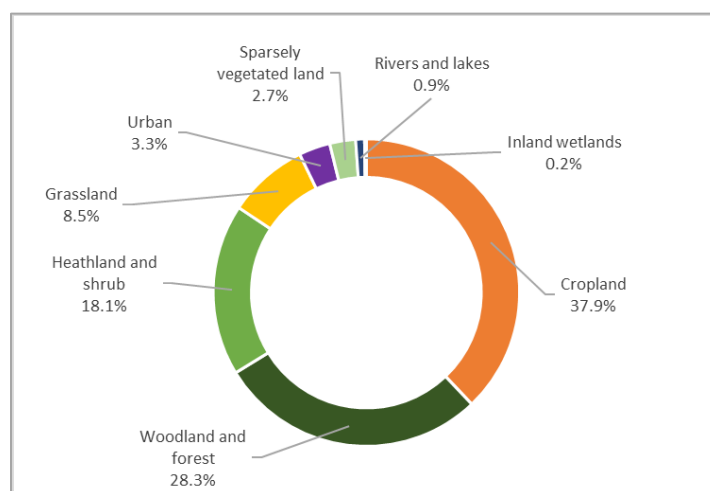
Source: Analytical factsheet for Greece: Nine objectives for a future Common Agricultural Policy, Sep 2019

Figure 43: Average number of linear elements per transect with agriculture as main land cover, LUCAS survey 2015

6.2.5 Land use and material assets

A multilevel management of spatial planning and sustainable development exists in Greece, through national and regional spatial planning frameworks and local spatial plans. The land use/spatial planning of the country is formulated by the General Framework for Spatial Planning and Sustainable Development (No 6876/4871, GG 128/A/3.7.2008), which has a 15-year implementation horizon and which was developed in accordance with the Law 2742/1999 (GG 207/A/07.10.1999) on strategic spatial planning. In its Article 10, entitled “Conservation, protection, enhancement of the national natural and cultural wealth, conservation and enhancement of the rural diversity and sustainable management of natural resources”, related policies and other measures are foreseen. In the last five years, the spatial planning system has been revised thoroughly, to enable the country to take a comprehensive and rational approach to organizing its regional and local territories. Law 4447/2016 (OGG 241/A/23-12-2016) constitutes the new law for spatial planning in the country, which simplifies and clarifies the way land uses are imposed. It provides for the “National Spatial Strategy” to be formed by the Government, which must set the basic principles and axes, the medium- and long-term development goals of the country and the proposed measures and actions for the realization of the sought development. The Law introduces two basic categories of plans: the strategic spatial plans and the regulatory spatial plans. The strategic spatial plans are the National Special Spatial Frameworks and the Regional Spatial Frameworks, whereas the regulatory spatial plans may be Local Spatial Plans, Special Spatial Plans or Urban Planning Application Plans. At the moment, there are four sector specific frameworks on renewable energy, on aquaculture, on industry and on tourism, which are currently under revision, whereas, a new spatial planning framework for the mining sector will be also developed. There are also 12 regional spatial frameworks for the 12 regions of the country (while for the Attica region, the Regulatory Master Plan of the Metropolitan Regions of Athens applies). The evaluation and review of the existing Regional Spatial Planning Frameworks has been finalized and the frameworks of 8 out of 12 regions have been revised up to date.

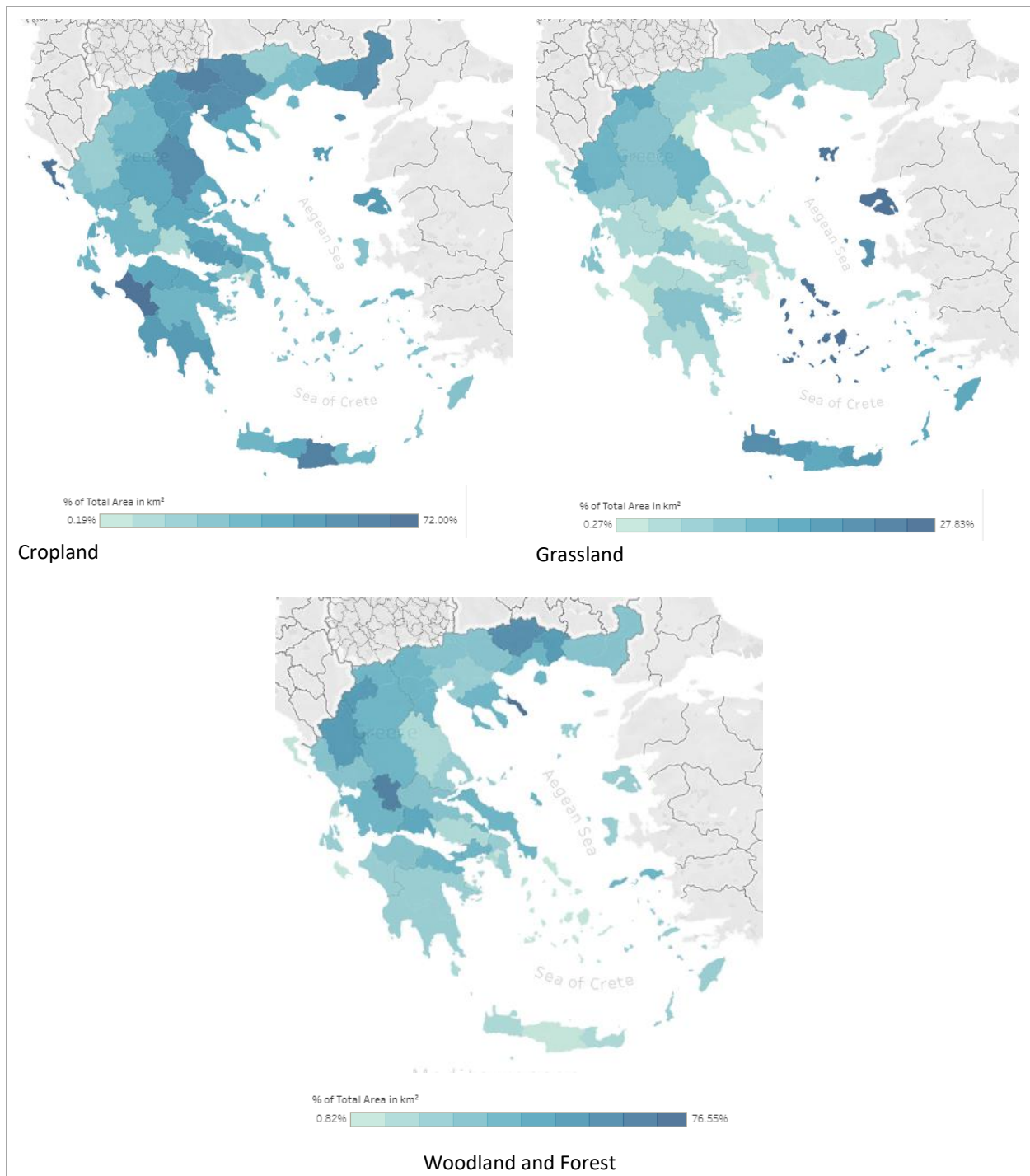
In 2018, land cover in Greece by using MAES classification is presented in Figure 44, excluding marine inlets and transitional waters. Agricultural ecosystems (including grassland) and forest ecosystems (including woodland shrub) cover 46.4% and 28.3% of the land territory respectively, whereas semi-natural areas (heathland and shrub together with sparsely vegetated land) cover 20.8% of the total land. Urban land represents 3.3% of the total land area of the country.



Source: [EEA Dashboard on Land cover and change](#)

Figure 44: Land cover of 2018 by using MAES classification

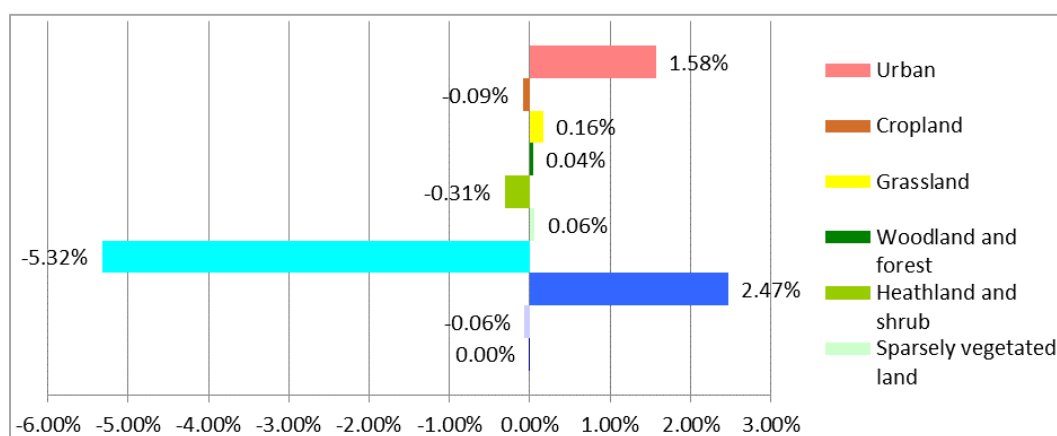
At regional level, the prefectures with cropland above 50% of their total area are recorded in Kerkyra, Elis, Heraklion and Kilikis, followed by Thessaloniki, Serres, Evros and Larissa. The prefectures with grassland above 20% of their total area are found in Cyclades, Lesbos, followed by Chios and Chania. As for the forest ecosystems, the prefectures with woodland and forest above 50% of their total area are recorded in Evrytania and Drama, followed by Ioannina and Kastoria.



Source: [EEA](#) Dashboard on Land cover and change

Figure 45: Land cover of agricultural and forest ecosystems by region for 2018

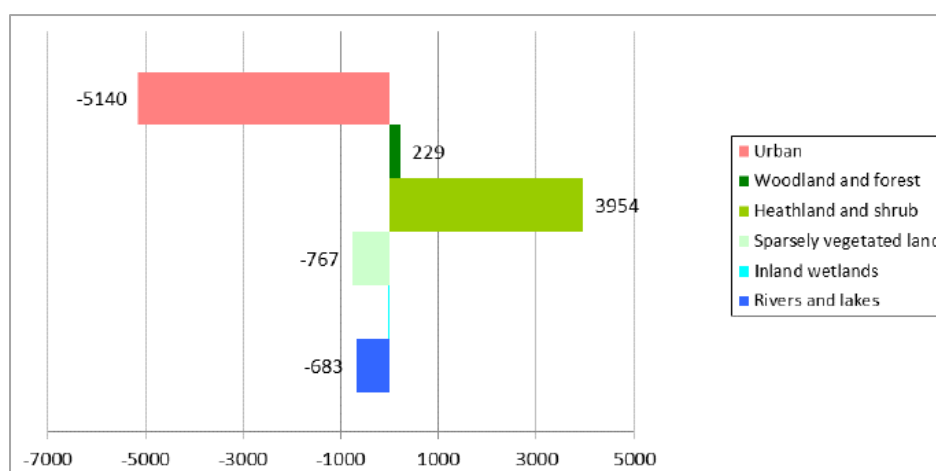
Land use changes during the period 2012-2018 correspond to the 0.2% of Greek land territory (excluding marine inlets and transitional waters). The greatest land use change appears in inland wetlands (-5.32%) and rivers & lakes (2.47%), followed by urban land (1.58%). Regarding the decrease in inland wetlands, which is mainly attributed to the 'rivers and lakes' class, the change seems to be caused by adjustments in the classification of land cover categories between 2012 and 2018 ([SoER 2019](#)).



Source: [SoER 2019](#)

Figure 46: Changes in the area of ecosystem types the period 2012-2018

Regarding the land area of agricultural ecosystems (cropland and grassland), there is a decrease of 0.04% during the period 2012-2018 (the same as the EU27 average), which is caused by a decrease of cropland by 0.09% and an increase of grassland by 0.16%. The main land use changes are primarily due to the conversion of agricultural to urban land (78%), sparsely vegetated land (12%) and water bodies (10%, involving mainly rivers & lakes), while, on the other hand, the increase is mainly related (by 95%) to the conversion of heathland and shrub to agricultural land ([SoER 2019](#)).

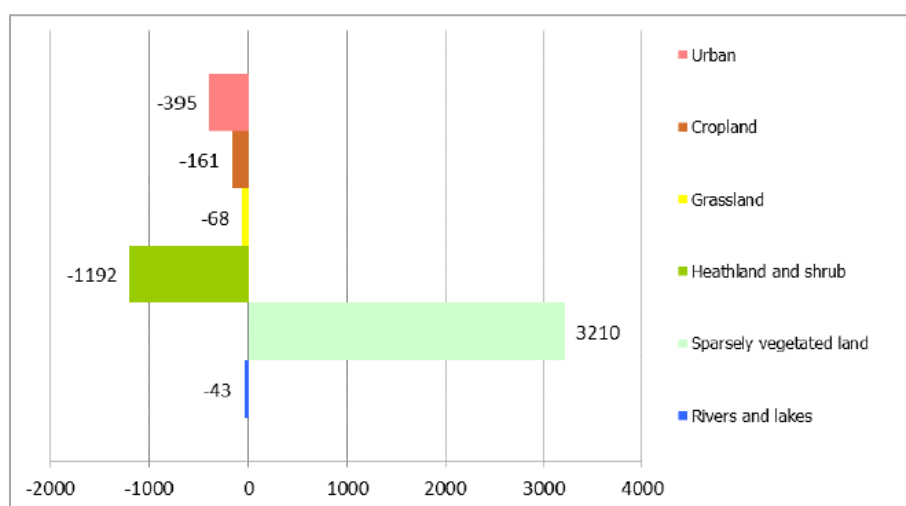


Source: [SoER 2019](#)

Figure 47: Changes in the area of agricultural ecosystems the period 2012-2018

There is an increase in the area of forest ecosystems (woodland and forests) by 0.04% during the period 2012-2018, which is caused by the conversion of the sparsely vegetated land to woodland and forests,

while at the same time losses of forest areas are recorded, mainly due to their conversion to heathland and shrub (66%), followed by urban land (22%), cropland (9%) and grassland (4%) ([SoER, 2019](#)). In EU27 the corresponding increase is much lower than in the EU27 average (0.27%).



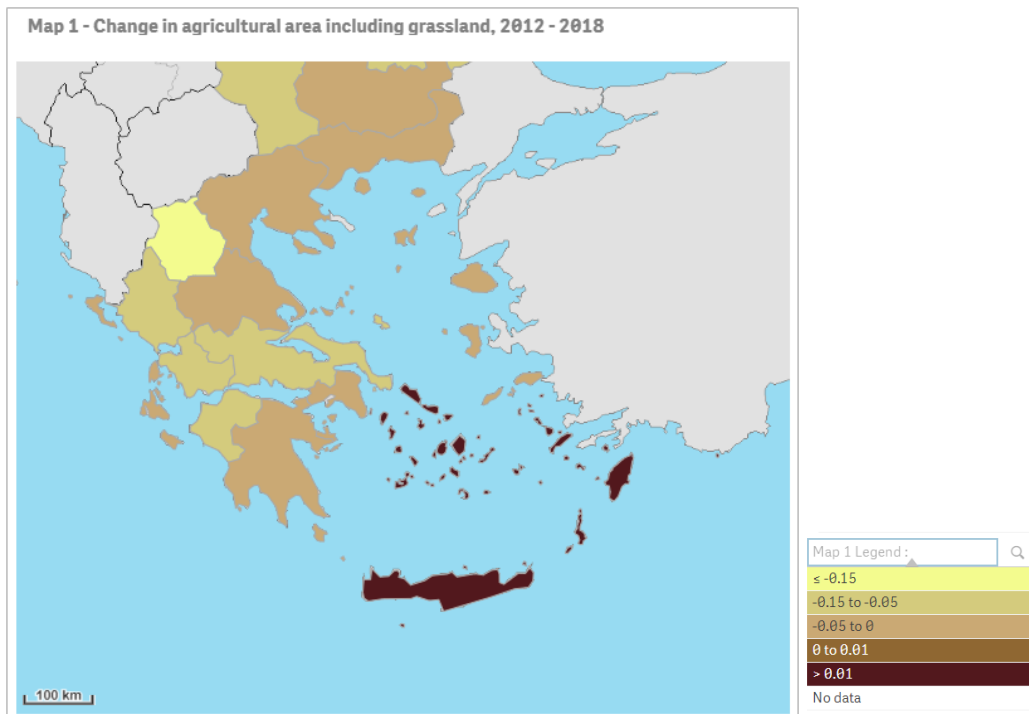
Source: [SoER 2019](#)

Figure 48: Changes in the area of forest ecosystems the period 2012-2018

The above figures represent national average values. Therefore, higher or lower land use changes may occur at regional level. The regional distribution of land use changes in agricultural and forest areas is presented in Figure 49 and Figure 50 respectively. The greatest decrease of the agricultural area is recorded in Western Macedonia region, whereas that of the forest area in North Aegean region. On the other hand, the higher increase of the agricultural area is recorded in Crete and South Aegean regions, while that of the forest area is in Peloponnese and Ionian Aegean regions (DG AGRI, [C31](#)).

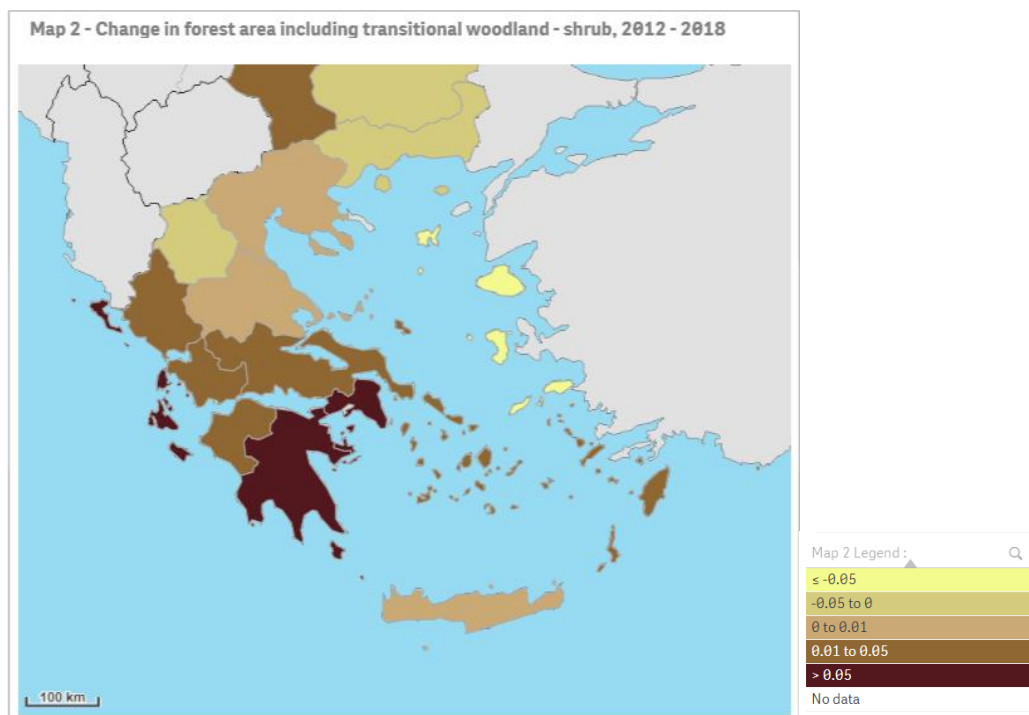
In 2018, the total utilized agricultural area (UAA) is estimated at approximately 5.3 million hectares, of which 35% is arable land, 41.1% permanent grassland and 23.8% permanent crops. The categories of UAA vary a lot among the regions of the countries. The UAA of the northern part of the country, including South Aegean region, is mainly arable land and grassland, the southern part, including North Aegean and Ionian Islands, is mainly grassland and permanent crops, whereas the central part has mixed categories of agricultural land use. Attica region has mainly permanent crops, while Epirus region mainly permanent grassland, (DG AGRI, [C18](#)).

In the context of strengthening the countryside's social fabric, the national RDP provides support for areas with natural or other specific constraints. In 2019, the areas facing natural or other specific constraints (ANCs) account for 70.8% of the country's UAA, well above the EU27 average of 57.9% (DG AGRI, [C32](#)). Mountainous agricultural areas have the largest share of about 62.5%. These areas are characterized by limited land use potential and high production costs. For this reason, support is foreseen to offset additional costs and/or income foregone caused by agricultural activity under such adverse conditions.



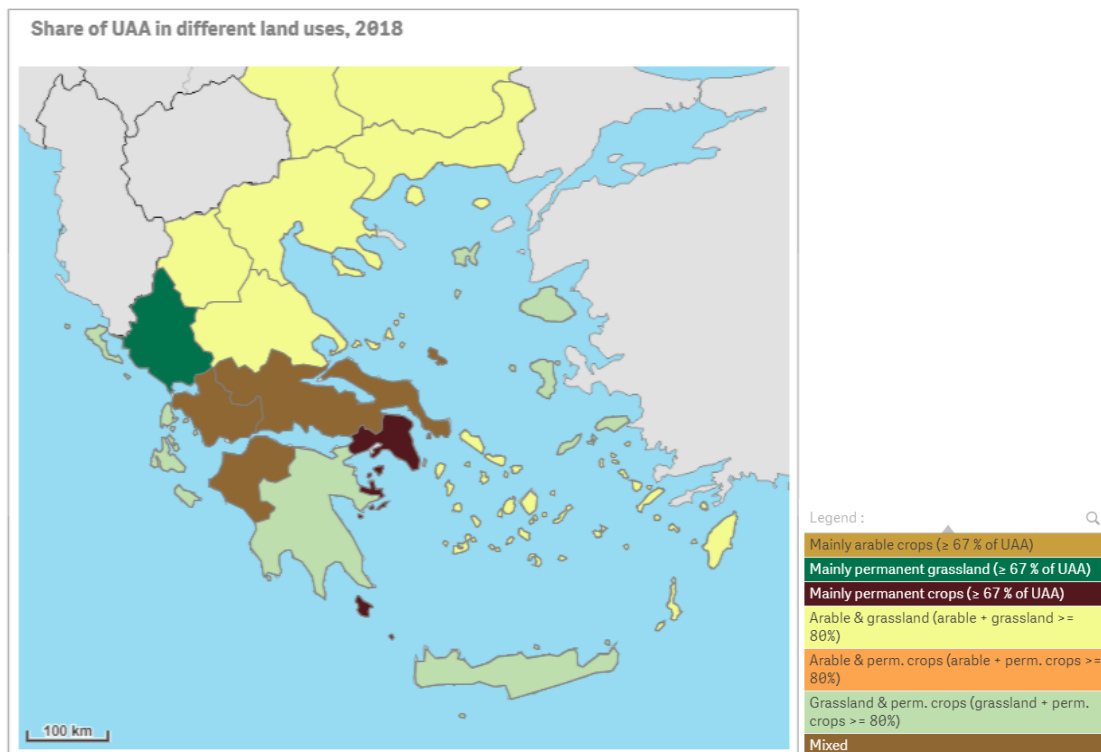
Source: DG AGRI, Agri-food Data Portal, CAP Indicators

Figure 49: Land use changes in agricultural area, including grassland, at regional level for the period 2012-2018



Source: DG AGRI, Agri-food Data Portal, CAP Indicators

Figure 50: Land use changes in forest area, including transitional woodland -shrub, at regional level for the period 2012-2018



Source: DG AGRI, Agri-food Data Portal, CAP Indicators

Figure 51: Share of UAA in different agricultural land uses for 2018

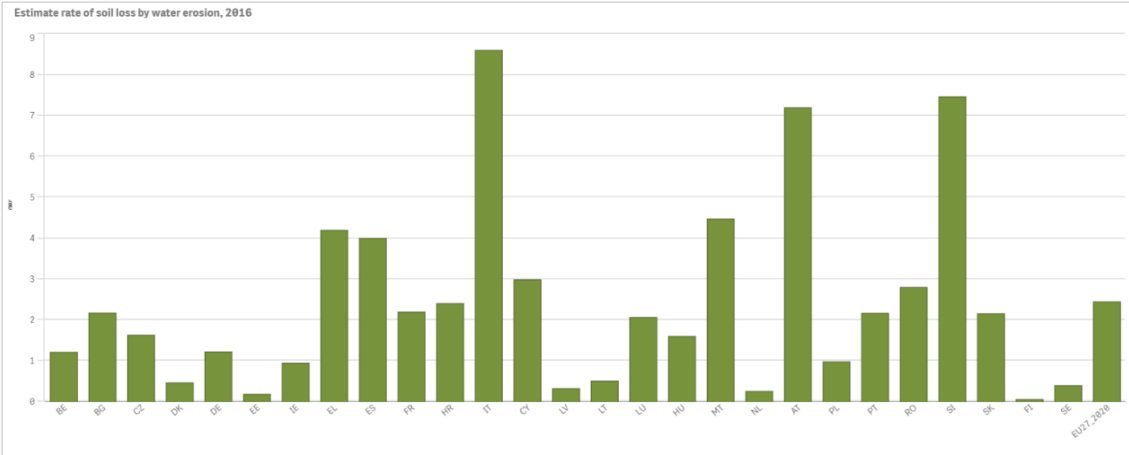
6.2.6 Soil

Soil is defined as the top layer of the earth's crust. It is a natural substance composed of weathered rock particles (minerals), organic matter, water and air. A healthy fertile soil is at the heart of food security. Soil is also essential for water and ecosystem health, serves as a platform of human activities, landscape and heritage and acts as a provider of raw materials. It is additionally noted that soil is second to the oceans as global carbon sink, with an important role in the potential slowing of climate change. Soil functions depend on a multitude of soil organisms, which makes soil an important part of biodiversity. Despite its importance, there is no EU or national legislation specifically targeting the protection of soil. Yet, other EU and national legislation, such as for water, waste, nature protection, industrial pollution, fertilisers, and land use planning, explicitly reference soil threats or soil functions, or implicitly offer some form of protection for soils (JRC, 2012).

Soil quality of the agricultural area is mainly assessed by using two key indicators, soil erosion by water and soil organic matter in arable land.

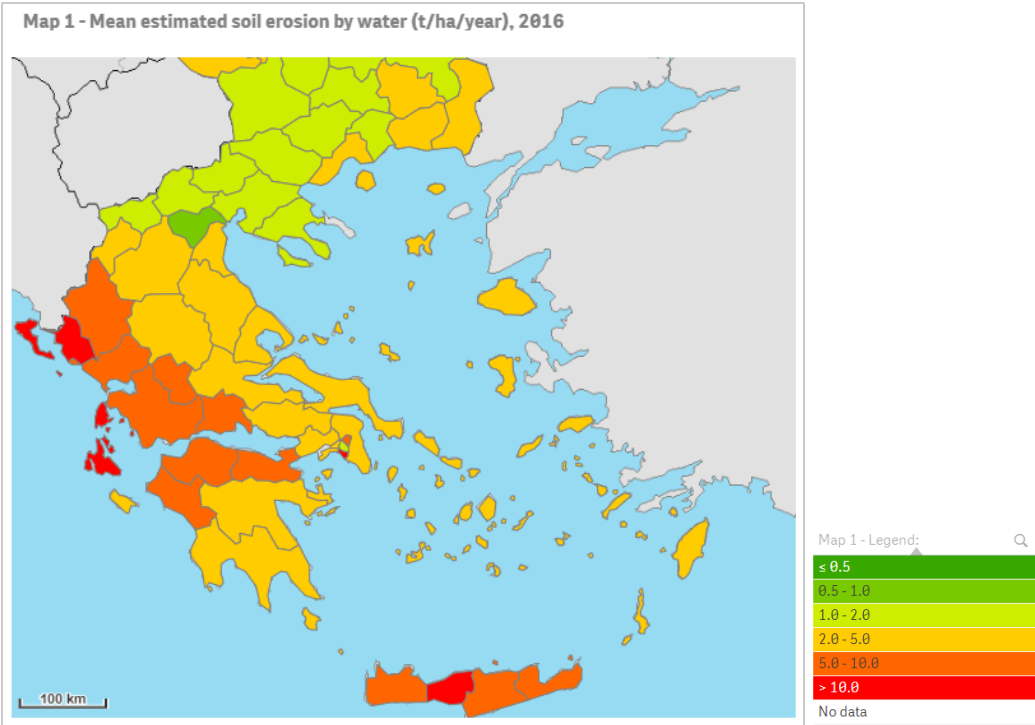
Soil erosion by water is a natural process, but this can be aggravated by climate change and human activities such as agricultural practices, deforestation, forest fires or construction work. On the other hand, high levels of soil erosion can reduce productivity in agriculture and can have adverse effects on water systems and biodiversity. Agricultural area is considered to be at risk of soil erosion processes (rain splash, sheetwash and rills) if the rate of soil erosion is moderate to severe (more than 11 tonnes per hectare per year in the OECD definition). In 2016, the share of agricultural area at risk of soil erosion in 2016 in Greece is 10.2%, above the EU27 average (7%), while the average soil loss rate by water is 4.2

t/ha/yr, well above the EU27 average (2.5 t/ha/yr). Between 2010 and 2016, the change in the rate of soil loss by water erosion is 1.6 t/ha/yr, whereas the EU27 average is -0.4 t/ha/yr (DG AGRI, [C42](#)).



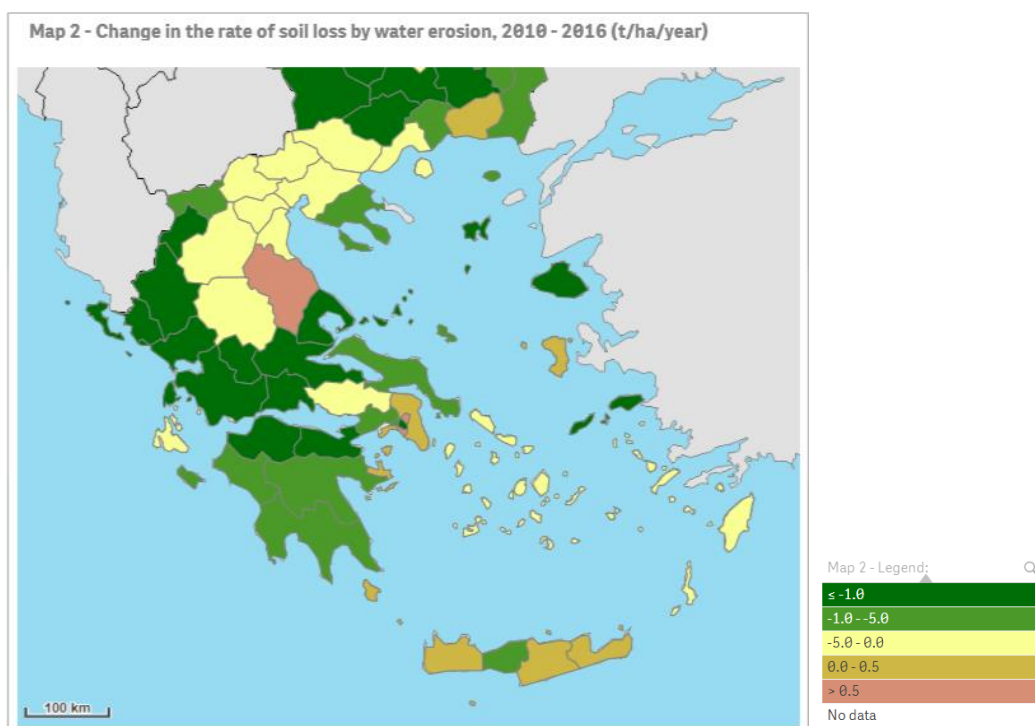
Source: DG AGRI, Agri-food Data Portal, CAP Indicators

Figure 52: Annual rate of soil loss by water erosion at MS level for 2016



Source: DG AGRI, Agri-food Data Portal, CAP Indicators

Figure 53: Annual rate of soil loss by water erosion at regional level for 2016



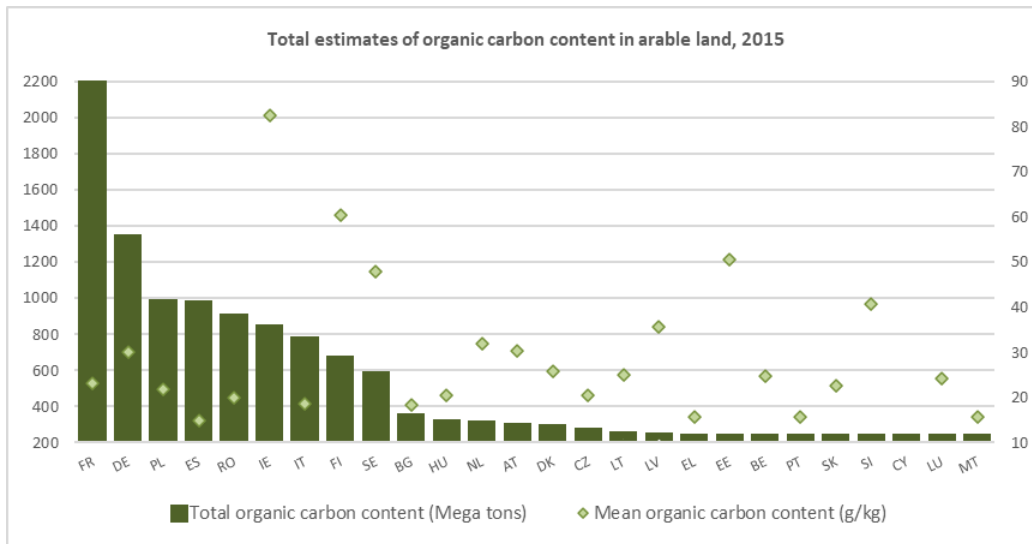
Source: DG AGRI, Agri-food Data Portal, CAP Indicators

Figure 54: Change in the rate of soil loss by water erosion for the period 2010-2016

According to the study that was elaborated for the SWOT analysis of the current situation (MRDF, 2020), the results from the estimation of the risk to soil erosion by using the model RUSLE (Revised Universal Soil Loss Equation) are the following:

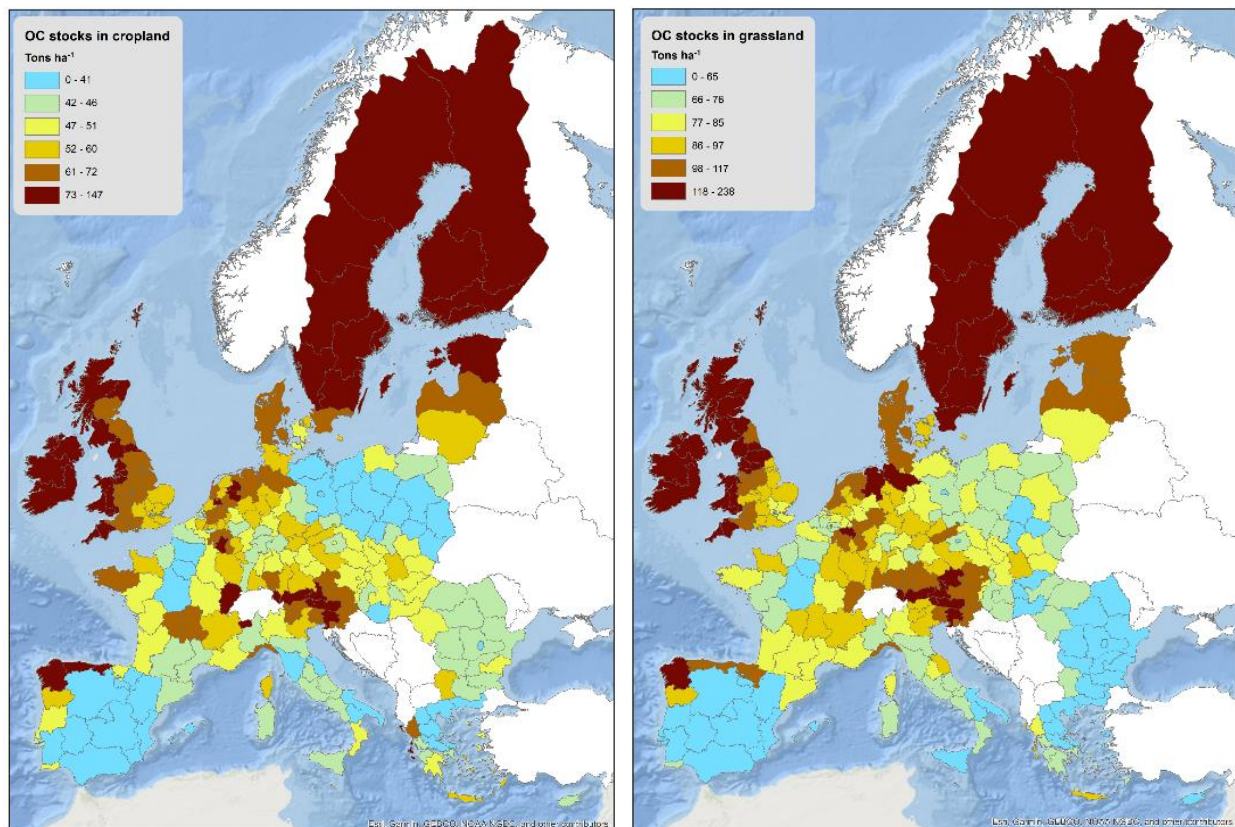
- 52% of the country's agricultural lands (17,851 km²) face a serious risk, 13% of the country's agricultural lands (4,316 km²) face a moderate, while 35% of the country's agricultural lands (12,113 km²) have a low risk of soil erosion.
- The regions that present the highest percentages of serious risk of soil erosion in their agricultural lands are Crete (92.2%), Ionian Islands (91.07%), South Aegean (90.13%), North Aegean (79.83%) and Peloponnese (78.04%), followed by the regions of Attica (66.4%), Western Macedonia (65.14%) and Western Greece (59.79%).
- There are cases of regions where the differentiation between regional units is significant. Such examples are Central Macedonia where in the prefectures of Imathia and Pella the areas at serious risk of soil erosion constitute 5.37% and 14.84% of their agricultural area respectively, while in the prefecture of Chalkidiki the areas at serious risk exceeded 58% of its geographical area. Similar results are obtained for the regions of Epirus, Thessaly and Central Greece.

In 2015, the mean soil organic content in arable land, which is extremely important for all processes, is estimated at 15.8 gC/kg soil, which is comprised by 41% grassland, 30% cropland and 29% permanent crops. It is much below the average of EU28 of 43.1 gC/kg soil, yet, it is underlined that according to relevant studies, Mediterranean regions of Europe exhibit distinctively smaller values of organic content than those of other regions ([EIP-AGRI Focus Group](#), 2015). The level of soil organic carbon stocks in both cropland and grassland is much lower in the northern part of Greece. The regional distribution of soil organic carbon stocks changes between 2009/12 and 2015 is more or less the same.



Source: DG AGRI, Agri-food Data Portal, CAP Indicators

Figure 55: Organic carbon content in arable land at MS level for 2015



Source: DG AGRI, Agri-food Data Portal, CAP Indicators

Figure 56: Organic carbon content in cropland and grassland land at regional level for 2015

Specific Mediterranean characteristics contribute to increased risk of soil erosion, with rainfall patterns and drought leading to loss of soil organic matter while sloping land, especially for pasture, increases the risk of soil erosion. The type of cultivated crops and other management practices such as reduced tillage,

cover crops and agroforestry can contribute to soil protection. 51% of total arable land was subject to crop diversification (EU average is 77%), with 10% of the agricultural land being under rural development contracts to improve soil. In 2017, 61% of the 2023 target was reached. Despite the above efforts, the change in soil characteristics is slow, with certain support measures (e.g. for areas with natural constraints) lacking environmental targeting (SWD/2020/372).

It is noted under the recently adopted EU Zero Pollution Action Plan (COM/2021/400) that the Commission will work towards integrating a zero pollution module in the future LUCAS soil survey to better understand the issue of diffuse soil pollution in the EU.

6.2.7 Water

As in other environmental areas, the water policy of the country is mostly shaped by the EU water policy, with the overall goal to ensure that a sufficient quantity of good-quality water is available for both people's needs and the environment through an integrated water resources management as well as to provide adequate protection of urban and rural areas against extreme hydrological conditions such as floods and droughts. It also aims to ensure that the nutrient cycle (nitrogen and phosphorus) is managed in a more sustainable and resource-efficient way. Law 3199/2003 (OGG 280/A/09-12-2003), the main national legislation on water protection and management, along with the Presidential Decree 51/2007 (OGG 54/A/08-03-2007) transposed into the national law the Water Framework Directive (Directive 2000/60/EC), which is complemented by legal acts transposing all water-related EU Directives.

In particular, water management is regulated per river basin district, to ensure high standards for the water bodies of the respective river basins within the district, and the competent authority is the Decentralised Administration in the territory of which the district is located. The River Basins Districts and the River Basins have been designated in 2010 by the Ministerial Decision 706/2010 (OGG 1383/B/02.09.2010). Greece has 14 river basin districts, out of which 5 are international sharing water courses (Figure 57).

The first River Basin Management Plans (RBMPs) for the 14 River Basin Districts were finalised between 2013 and 2015 and the second RBMPs were adopted at the end of 2017. The programme of measures of the RBMPs include basic measures, common for all RBMPs and supplementary measures for all water bodies with lower than good status.

In compliance with the Water Framework Directive, Greece established a national monitoring network for qualitative and quantitative water status in 2012 and a national water abstraction register in 2014.

In general, the RBMDs identify diffuse pollution and agricultural abstraction as the main pressures on water. In addition to diffuse pollution, groundwater is threatened by salinisation caused by intensive groundwater pumping in coastal areas, leading to seawater intrusion. The RBMPs identified a range of measures to address pressures from agriculture, focusing mostly on improving irrigation efficiency, including regulatory changes and information improvement.



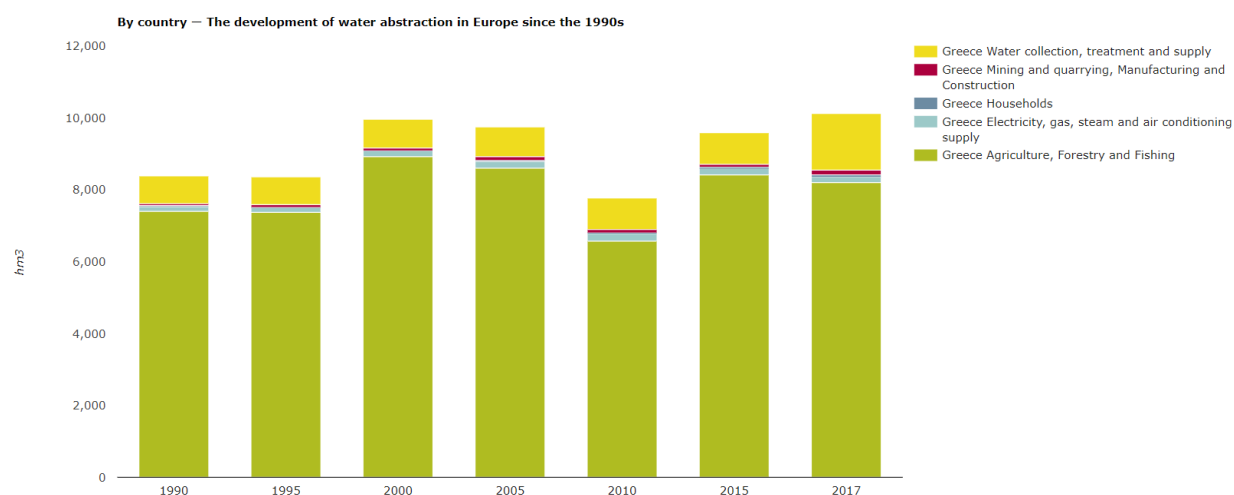
Source: MoEE

Figure 57: River Basin Districts and River Basins of Greece

6.2.7.1 Water resources

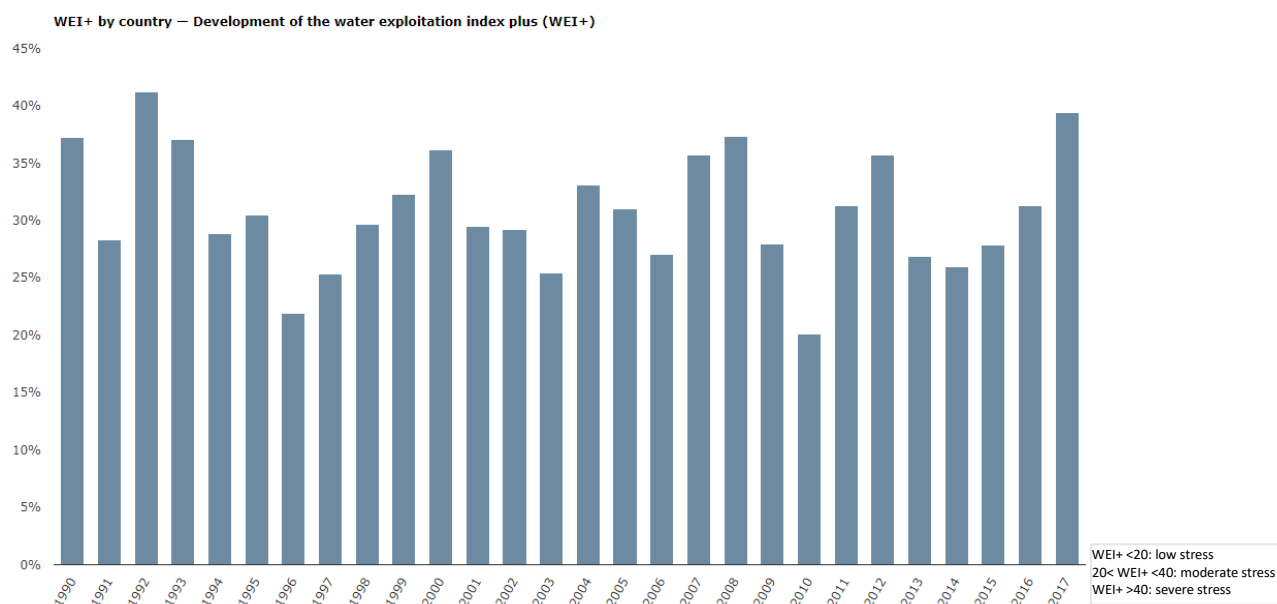
Greece is mainly dependent on groundwater resources for its water demands via numerous wells and boreholes. Agriculture remains the sector exerting the highest pressure on renewable freshwater resources overall, being responsible for about 80% of total water abstraction in 2017, mostly due to

irrigation which has a share of about 80% (Eurostat [[env wat abs](#)]). Freshwater resources are under moderate stress at the national level due to high abstraction levels, with an increasing trend the last years, that could eventually turn to severe stress (Figure 59). This indication though cannot reflect uneven spatial and seasonal distribution of resources and may therefore mask water scarcity that occurs on a seasonal or regional basis.



Source: EEA, [CSI 018 - WAT 001](#)

Figure 58: Water abstraction by economic sector for the period 1990-2017

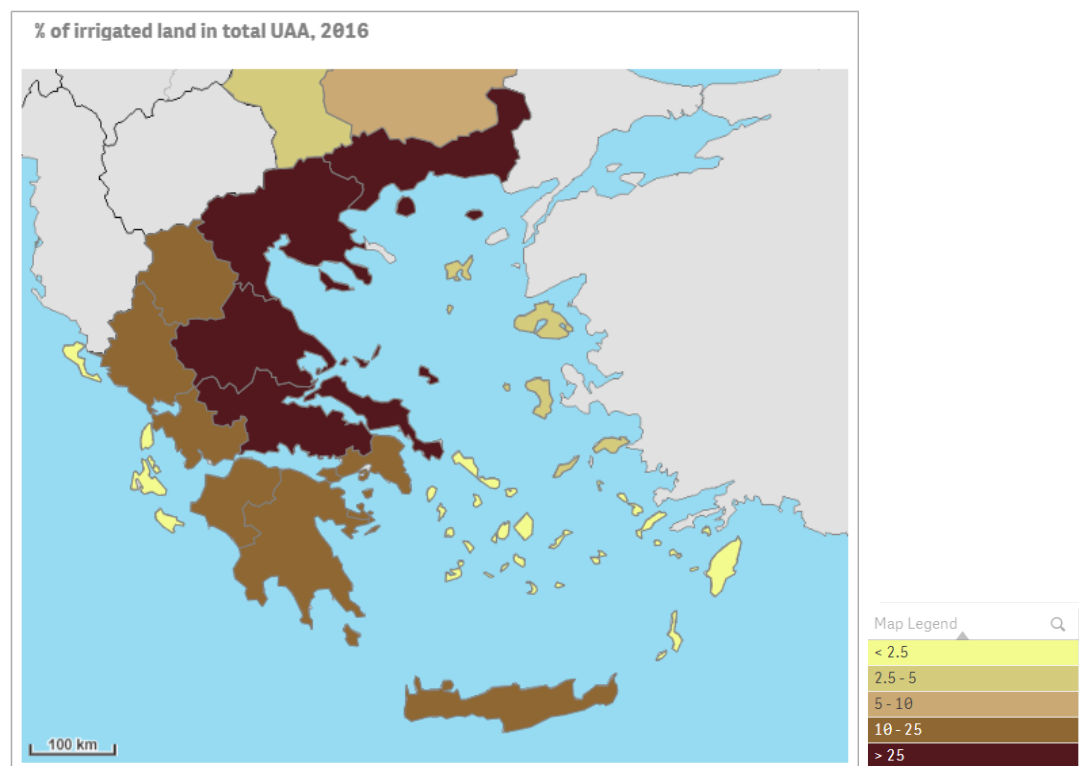


Source: EEA, [CSI 018 - WAT 001](#)

Figure 59: Water exploitation index, plus (WEI+) for the period 1990-2017

Crop irrigation is particularly intensive between April and August, when crops grow, precipitation decreases and evapotranspiration increases. In 2016, the irrigable areas represent 29.7% and the irrigated

areas 23.6% of the total utilized agricultural area (UAA) in Greece with the central and northern part of Greece having the biggest share (Eurostat [[aei ef ir](#)], DG AGRI [C20](#)).

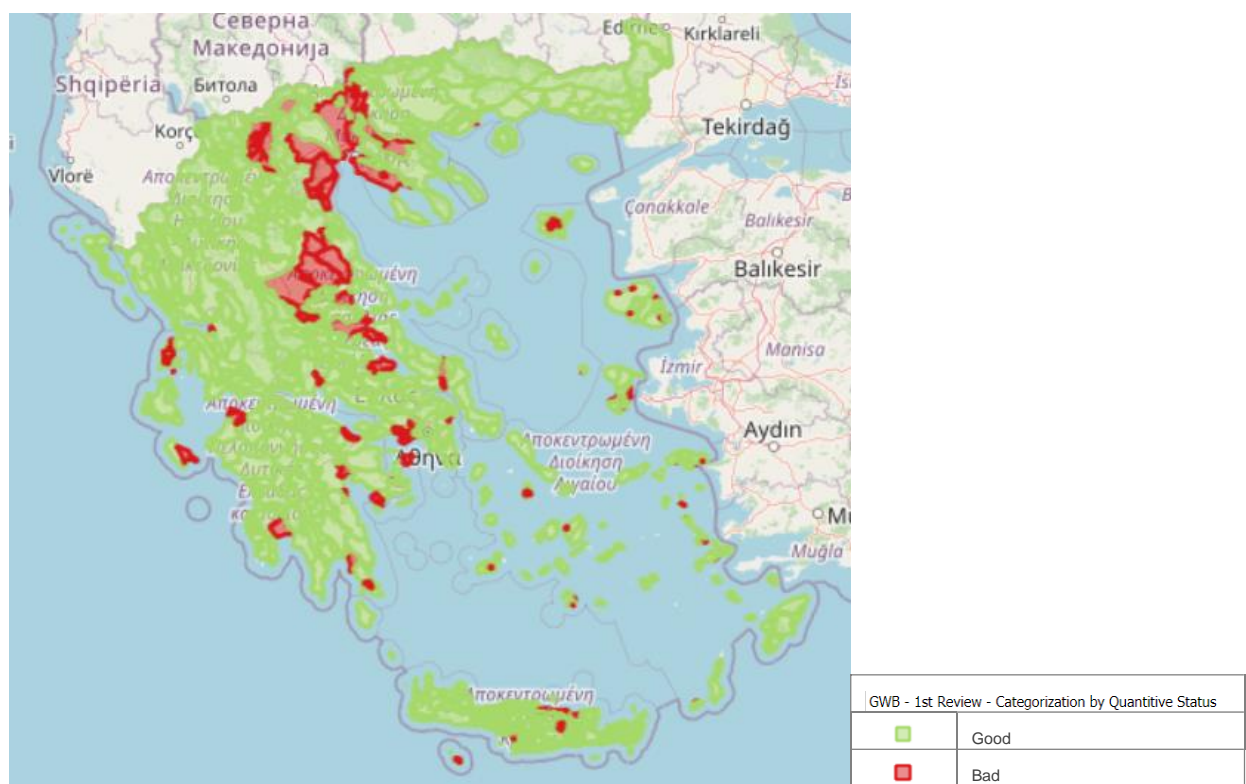


Source: DG AGRI, Agri-food Data Portal, CAP Indicators

Figure 60: Share of irrigated land in total UAA at regional level for 2016

The public irrigation networks mainly use surface water resources through water storage reservoirs, whereas private irrigation mostly uses groundwater resources. The water use approval and monitoring for public and private irrigation is subject to a specialised licensing procedure for water uses and exploitation works, which was introduced in 2014 (Ministerial Decision 146896/2014). For the issuance of a water use license, the compatibility and necessity for its issuance as well as the availability of the necessary water quantities must be evidenced on the basis of the relevant River Basin Management Plans and their Programme of Measures.

According to the second RBMPs, the quantitative status of groundwater is good by 84%, with lower rates in Thessaly region, Central Macedonia and Aegean islands. It is though noted that there is a great inequality in water resource distribution, both regionally and seasonally. The water pressures or deficit by region are expected to be analysed and defined by the Regional Adaptation Action Plans that are currently being elaborated. The basic measures that have been incorporated in the RBMPs for irrigation aims at rationalizing water management and improving water use efficiency.



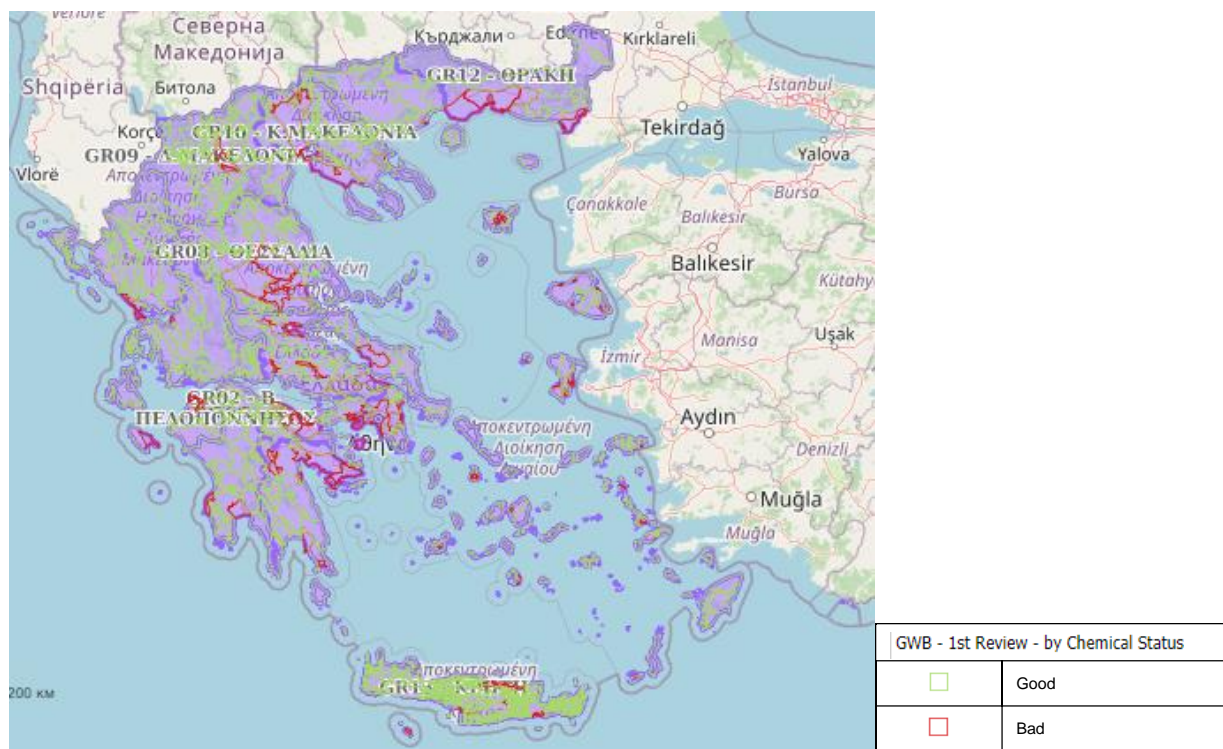
Source: MoEE, <http://wfdgis.ypeka.gr/>

Figure 61: Groundwater quantity status by ground water body (1st review of RBMPs)

6.2.7.2 Water quality

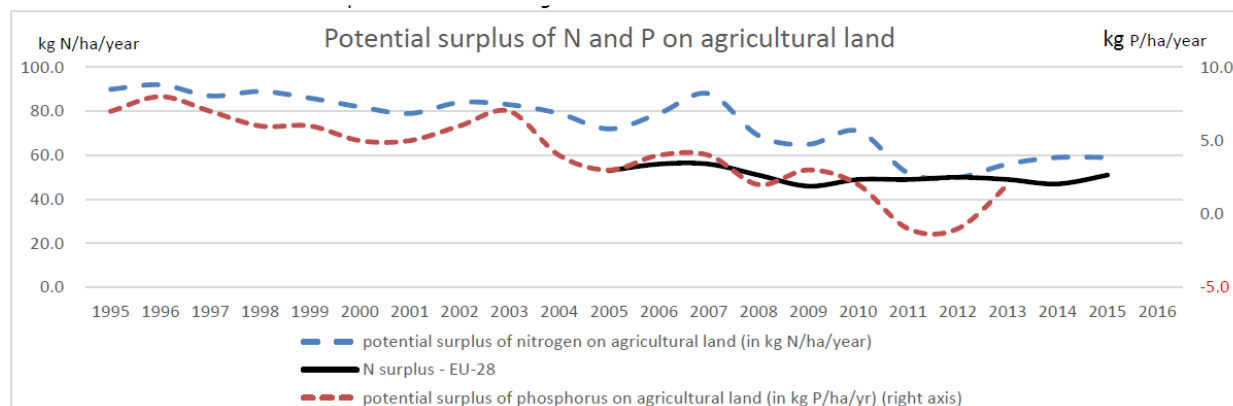
The second RBMPs show that slightly more than 60% of surface water bodies have good or better ecological status, 30% do not achieve good status and the status of 9% is unknown. Rivers have better status than lakes and transitional waters, whose status is mostly unknown. About 89% of surface water bodies (by number of water bodies) have good chemical status, while about 2% fail to achieve good status. Groundwater quality is relatively high, as about 85% of groundwater bodies achieve good chemical status. (OECD, 2020). According to the second RBMPs (1st review), lower rates in the chemical status of groundwater bodies at river basin level (above 20% of total river basin area) are observed in Attica, Thessaly and Central Macedonia.

The potential impact of agriculture on water quality is due to pollution by nitrates and phosphates. Where N and P are applied in excess, they can cause surface and groundwater pollution and eutrophication. The trend of gross nutrient balance in Greece is declining over time (Figure 63). However, while the potential surplus of phosphorus is low, the surplus of nitrogen is still higher (57.3 kg-N/ha) than the EU27 average (47 kg-N/ha) between 2013-2015.



Source: MoEE, <http://wfdgis.ypeka.gr/>

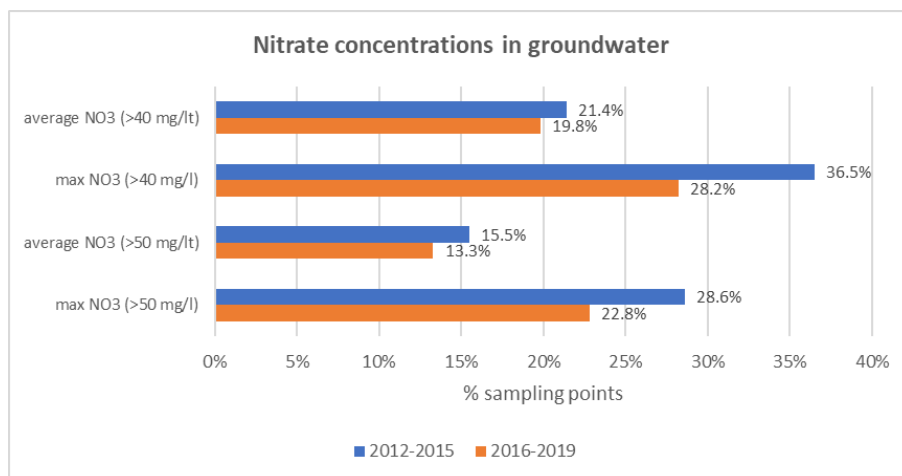
Figure 62: Groundwater chemical status by ground water body (1st review of RBMPs)



Source: Analytical factsheet for Greece: Nine objectives for a future Common Agricultural Policy, Sep 2019

Figure 63: Potential surplus of N and P on agricultural land (1995-2015)

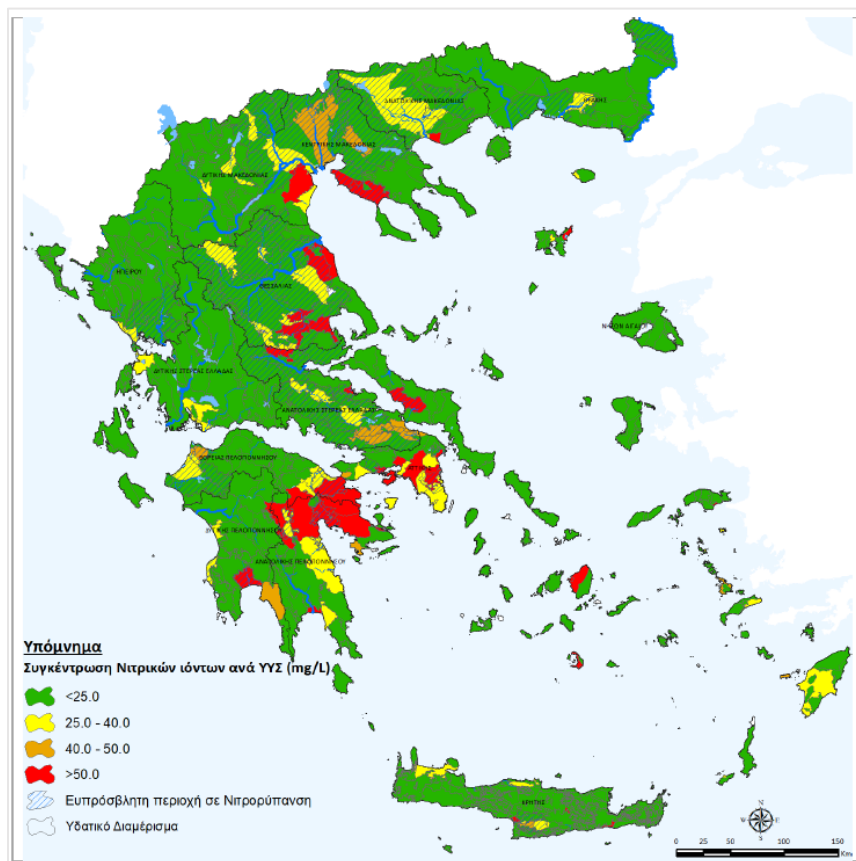
Regarding nitrate concentrations, 84.5% of surface waters are classified of high quality, whereas only 2.9% of poor quality in 2017 (DG AGRI, [C40](#)). As for groundwater, according to the Nitrates Directive implementation report for the period 2016-2019, 13.3% of the groundwater monitoring stations have average concentrations above 50 mg/l NO_3 and 19.8% above 40 mg/l NO_3 . Groundwater quality has been improved between the reporting periods 2012-2015 and 2016-2019, since the recorded levels of nitrates fell by 14.2% for average concentrations above the limit of 50 mg/l NO_3 and by 7.5% above 40 mg/l NO_3 (EEA, CDR, [Nitrates Report 2020](#)).



Source: EEA, CDR, [Nitrates Report 2020](#)

Figure 64: Nitrate concentrations in groundwater (periods 2012-2015 and 2016-2019)

Overall, about 84.6% of groundwater systems have low annual concentrations of nitrates (25mg/L). The groundwater systems with high annual concentrations (>50mg/L) are located in plain areas with intensive agricultural activities.



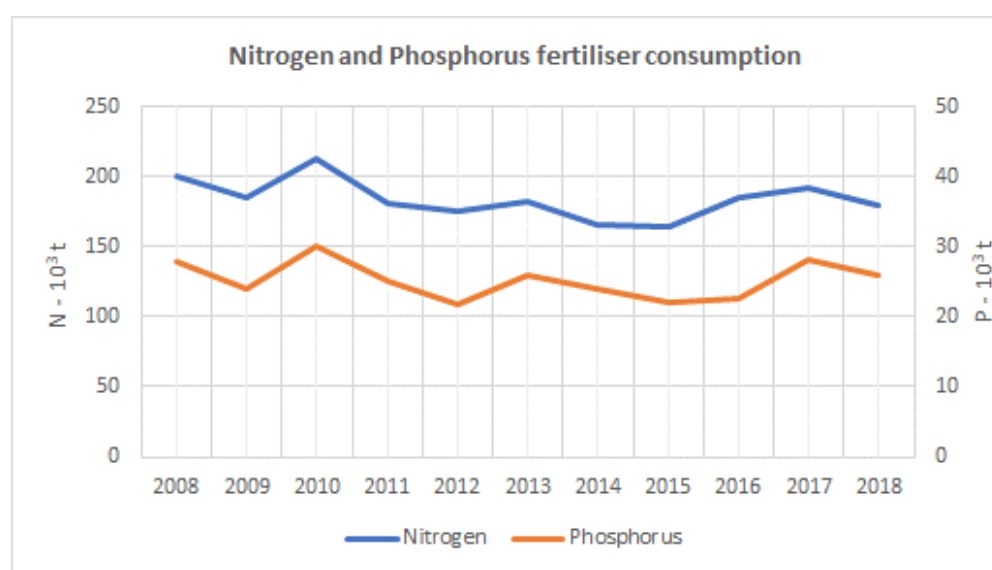
Source: EEA, CDR, [Nitrates Report 2020](#)

Figure 65: Nitrate concentrations in groundwater (periods 2012-2015 and 2016-2019)

Pressures from agricultural activities

There is broad recognition that above-optimal applications of fertiliser nutrients (nitrogen and phosphorus) lead to an enhanced risk of pollution to watercourses, and associated problems with water quality. Over the past decade, it is noted that the nitrogen and phosphorus fertiliser consumption remained practically the same, showing a declining trend and a slight increase over the last years. Between 2008 and 2018 there was a decrease in nitrogen and phosphorus consumption by 10.7% and 7.5% respectively ([Eurostat](#)), with fluctuations over the years taking also into account the dependency with the application areas and the types of crops that require different application rates.

In 2018, the intensity of nitrogen fertilizer consumption per hectare of fertilized agricultural area is relative low, 70.5 kg N/ha (77.2 kg N/ha in EU), whereas the intensity of phosphorus fertilizer consumption is moderate to high and reaches 10.2 kg P/ha (8.6 kg P/ha in EU) ([Eurostat](#)).



Source: [Eurostat](#)

Figure 66: Fertiliser consumption (2008-2018)

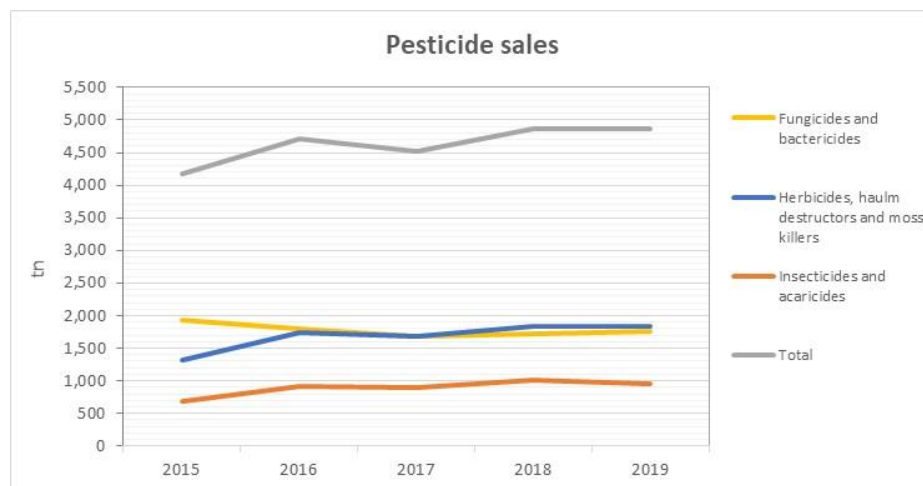
In the framework of the Nitrates Directive, 30 areas were designated as vulnerable to pollution caused by nitrates from agricultural activities, with a total area of 43,185.02 km². In 2019, Greece adopted an action programme to protect water from agricultural pollution covering all the vulnerable areas of the country in conformity with the Nitrates Directive (JMD 38552/265/2019, OGG 1496/B/03-05-2019).



Source: EEA, CDR, [Nitrates Report 2020](#)

Figure 67: Vulnerable areas to nitrate pollution

Greece also updated the National Action Plan for Sustainable Use of Pesticides in September 2020 (JMD 9269/246316, OGG 4032/B/21-09-2020) that will enable the reduction of adverse effects of the use of pesticides. Over the period 2015-2019, the sales of pesticides, which are used as an indicator of pesticide consumption in agriculture, increased by 16.5% that is mostly related to the increase of sales for the category ‘Herbicides, haulm destructors and moss killers’ by about 39%, whereas the sales of the category ‘Fungicides and bactericides’ were decreased by around 9%, (Eurostat [\[aei_fm_salpest09\]](#)).

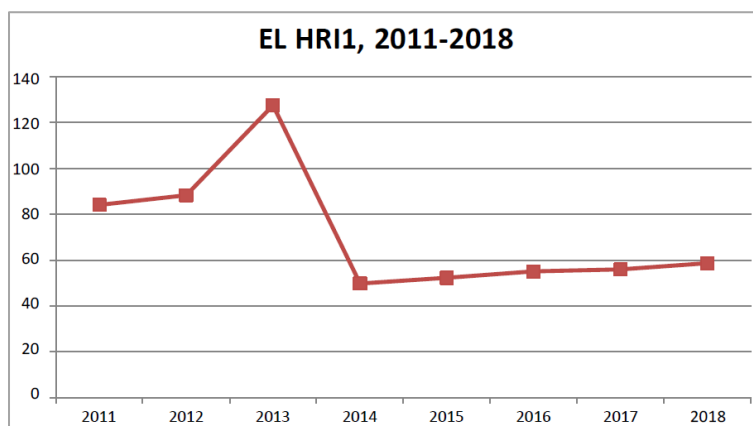


Source: Eurostat [\[aei_fm_salpest09\]](#)

Figure 68: Pesticide sales (2015-2019)

In 2018, the harmonised risk indicator 1 (HRI1), measuring the use and risk of pesticides, shows a decrease of 41% since the baseline period 2011-2013, well above the decrease of 17% in EU27, but with a relative

upward trend after 2015. The corresponding HRI2, which is based on the number of emergency authorisations, shows an increase of 314% since the baseline period in 2011-2013 and an increase of 29% compared to 2017, (Eurostat [\[aei_hri\]](#) & MRDF [HRI 2011-2018](#)).

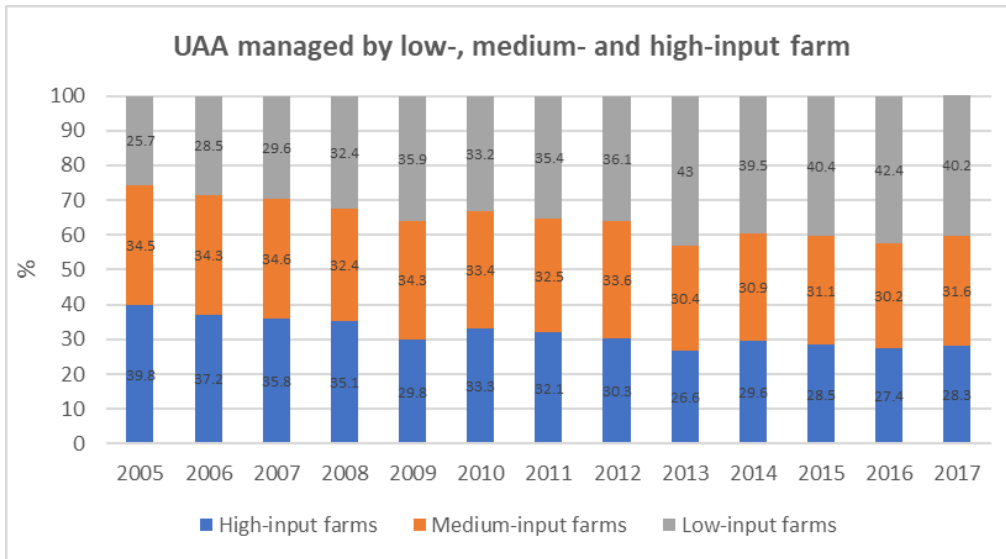


Source: Eurostat [\[aei_hri\]](#) & MRDF [HRI 2011-2018](#)

Figure 69: Harmonised Risk Indicator 1 (2011-2018)

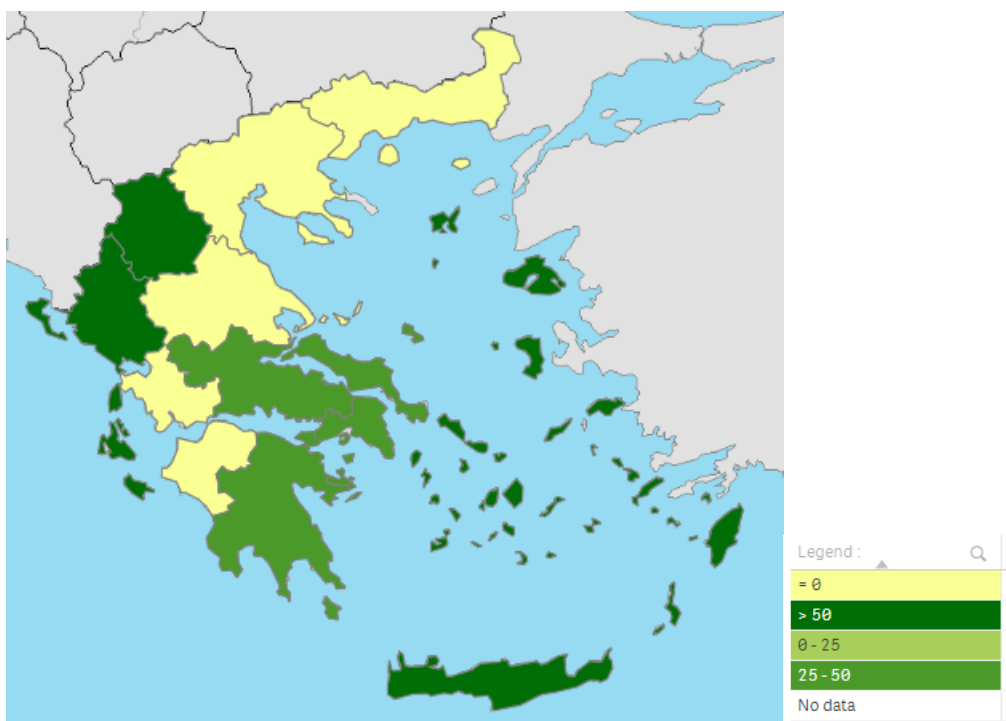
The above figures have to be assessed in combination with farm intensity coverage, as the land use indicator for the areas of extensive farming is a barometer of the pressure of agriculture to water resources, including biodiversity. In 2017, the agricultural area managed with low input intensity (considering the inputs of fertilizers, pesticides, other crop protection products and purchased feed) is 40.2%, whereas for the rest agricultural area the medium and high input intensity is relatively evenly distributed. Between 2005 and 2017, areas with low input intensity have a definite increasing trend, whereas areas with high input intensity show a declining trend; these trends have remained practically stable the last few years.

Regarding the areas of extensive grazing, taking into account a livestock density of less than 1 livestock unit (LU) per ha of forage area, the national level is 32.5% of total utilized agricultural area (DG AGRI, [C33](#)), with differentiations among regions. The highest rates, above 50%, is recorded in South Aegean, Epirus and Crete, followed by North Aegean and Western Makedonia (Figure 71). In the context of the protection of agricultural and forestry land and the preservation of natural resources from intensive agricultural activities, Greece adopted in 2015 a national legislation (Law 4351/2015 OGG 164/A/04-12-2015 as amended) on the development of management plans for all the pasture areas of the country, which will be developed under the specifications set by the JMD 1058/71977/2017 (OGG 2331/B/07-07-2017). This legal instrument will contribute substantially to the rational management, exploitation and distribution of grasslands, as well as to the support of livestock farming. In this connection, a national geographic information database of the country's grasslands is planned to be established.



Source: Eurostat [[aei ps inp](#)]

Figure 70: Farming intensity (2005-2017)



Source: DG AGRI, Agri-food Data Portal, CAP Indicators

Figure 71: Proportion of UAA where livestock density < 1 LU/ha of forage area for 2016

Under RDP 2014-2020, water use targets (2023) for the RDP stood at 61% for water management improvement and 87% for switching to more efficient irrigating systems. The overall goal to improve water management at 17.5% of agricultural land and water efficiency for 5% of irrigated land through irrigation infrastructures, even though important steps have been taken, is hampered by lack of appropriate training

and advisory services to farmers, measures that were not properly implemented (SWD/2020/372). Finally, it is recorded that 10% of agricultural land in Greece is under contracts to improve water management in 2018, slightly below the average of EU27 of 12% ([DG AGRI](#)).

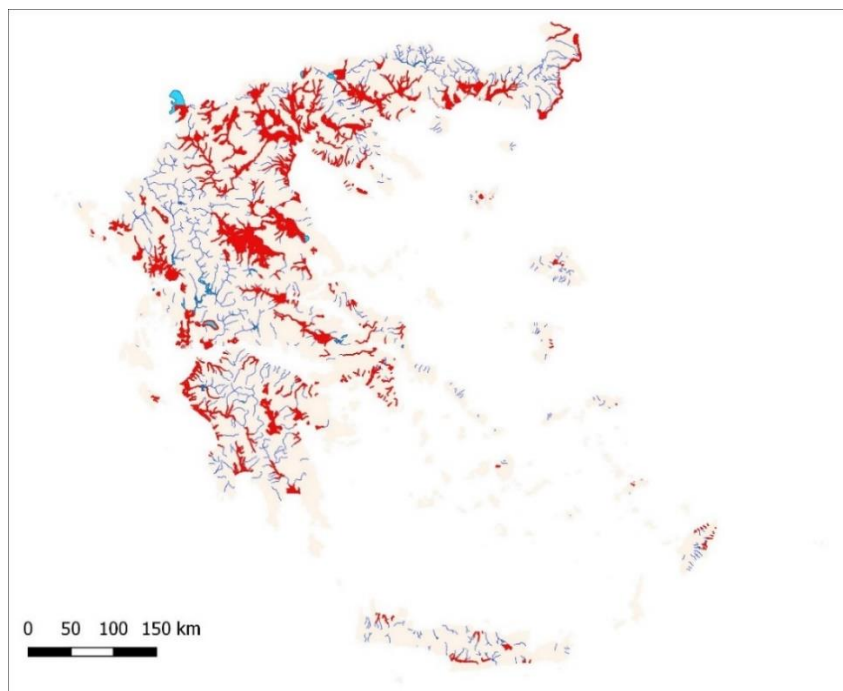
6.2.7.3 Flood risk management

In Greece, the framework for the assessment and management of flood risks has been established by transposing the Floods Directive into national legislation with JMD 31822/1542/E103/2010 (OGG 1108/B/21-07-2010), which aims at the reduction of the adverse consequences associated with significant floods. The general targets which were determined at a national level during the 1st cycle of the Directive's implementation are the moderation of the exposure to flood, the reduction of the possibility of flood, the enhancement of preparedness for flood response and the improvement of restoration mechanisms for the affected areas. The strategic documents on flood reduction and mitigation are the Flood Risk Management Plans per river basin district, which have been developed in the 3rd stage of the Directive's implementation and adopted in 2018. The 2nd cycle of the Directive's implementation has been already initiated and the 1st update of the flood risk assessment has been completed in November 2020. According to the findings of the 1st update of the flood risk assessment, the area with high potential of flood risk is estimated at 20% (vs 18% in the 1st cycle of implementation) of the total land area at national level, with significant variations among the river basin districts. The river basin districts with areas of high potential of flood risk above 30% of their total area are Eastern and Central Macedonia and Thessaly, whereas above 20% is estimated for the Attica, Western Macedonia and Thrace river basin districts.

Table 15: Surface area and proportion of river basin district with potential high flood risk

River basin district	Area with potentially high flood risk (km ²)		% of river basin district	
	1 st cycle (2012)	2 nd cycle (2019)	1 st cycle (2012)	2 nd cycle (2019)
Western Peloponnese (EL01)	637	749	9%	10%
Northern Peloponnese (EL02)	1227	1373	17%	19%
Eastern Peloponnese (EL03)	606	844	7%	10%
Western Mainland Greece (EL04)	874	1022	8%	10%
Epirus (EL05)	1004	1204	10%	12%
Attica (EL06)	675	829	21%	26%
Eastern Mainland Greece (EL07)	1939	2065	16%	17%
Thessaly (EL08)	4171	4316	32%	33%
Western Macedonia (EL09)	3098	3750	23%	28%
Central Macedonia (EL10)	3733	4166	37%	41%
Eastern Macedonia (EL11)	2815	2879	38%	39%
Thrace (EL12)	2352	2468	21%	22%
Crete (EL13)	220	353	3%	4%
Aegean Islands (EL14)	389	685	4%	8%

Source: [CDR Eionet- Floods Directive Reporting 2019-2022](#)



Source: [SoER 2018](#)

Figure 72: Flooded area for 100-year return period

In the context of preparing the Flood Risk Management Plans, an estimation of the flooded areas for different return periods (T50, T100 and T1000) was carried out in the 1st cycle of the Floods Directive's implementation, and corresponding maps have been prepared, by taking into account the flood hazardousness (depths, flow rate) and the vulnerability (on the basis of potential impact) of the uses and activities in flood areas.

Pursuant to the provisions of the Floods Directive, the flood hazard and risk maps, which were prepared for watercourses, lakes and coastal areas that are within the Areas with High Potential of Flood Risk, depict the negative consequences of floods (for human health, environment, cultural heritage and economic activities). The maps are available at the relative website of MoEE (floods.ypeka.gr) and at the database of the European Committee (European Environment Information and Observation Network). These maps are expected to be updated during the 2nd cycle of the Directive's implementation.

6.2.8 Waste

The national policy on waste requires to increase resource efficiency, prevent waste generation and use waste as a resource to facilitate the transition to circular economy, which is reflected in the National Waste Management Plan (NWMP) and the National Waste Prevention Programme, that have been revised for the period beyond 2020 and are due to be downscaled at regional level. The plans are in close synergy with the National Circular Economy Strategy and its new national action plan for 2021-2025, with the overall aim to unlock growth potential towards circular economy.

The agenda of these policy documents is in line with the strategic priorities and goals of the EU waste policy, yet Greece will need to put more effort into shifting waste away from landfilling and boosting waste hierarchy into practice to pursue the circular economy context. According to the State of Environment Report of 2019, as also depicted in relevant EU reviews and the evaluation for the current situation under

the NWMP post-2020, waste management in Greece is identified as the most challenging environmental area, especially for municipal waste for which legal binding recycling targets are in place. The majority of the generated municipal waste is still dispatched to landfills (77.7% in 2019), while the per capita municipal waste generation practically returned to the same levels before the economic crisis (524 kg/cap in 2019). Of particular concern are the continuous delays in the construction of the required infrastructure for municipal waste treatment. In addition, due to the unsolved problem of illegal landfills and the lack of adequate infrastructure for hazardous waste disposal, Greece is paying significant fines till to date.

The recently revised national legislation on waste, especially the framework law on waste (Law 4819/2021, OGG 129/A/23-07-2021) transposing the amended Waste Framework Directive (WFD) 2008/98/EC, has incorporated a range of legal binding measures to promote waste reuse, to increase recycling rates and the efficiency of waste-collection systems and to improve the outcome of waste management in line with the waste hierarchy and the implementation of the polluter pays principle, enhancing also the use of economic instruments such as the Extended Producer Responsibility schemes and the landfill tax. The Electronic Waste Registry (EWR) that operates from 2017 onwards is also expected to gradually improve waste statistics and traceability.

The following paragraphs present the current situation on waste management related to the activities of the primary and agri-food processing sector, with emphasis on food waste.

Waste from primary and agri-food processing sector

According to the official statistical data, waste from the primary sector reached 485 thousand tonnes in 2018 (Eurostat, [\[env wasgen\]](#)), whilst the estimations addressed in the NWMP 2020-2030 are much higher. At least 75% of agricultural waste is manure that is usually spread on land or processed in individual facilities to produce compost / biogas or disposed off site. While no quantitative reduction or recovery target has been set for agricultural waste, the NWMP of the period 2015-2020 incorporated specific actions to ensure its rational management, focusing on organization schemes for its collection to be dispatched to waste recovery facilities, giving priority to products resulting in benefit to agriculture, including composting and other biological treatment processes, followed by waste-to-energy products. No monitoring mechanism has been established to conclude on the progress made so far. The new NWMP has practically prolonged these measures for the period 2020-2030, with the overall aim of encouraging the integrated management of agricultural waste.

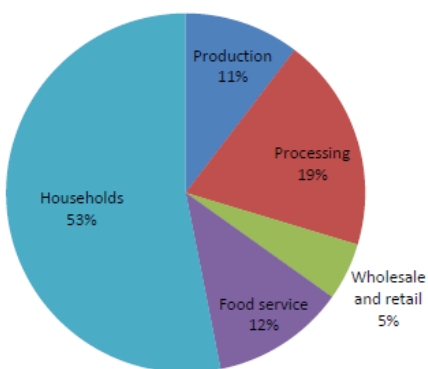
Waste derived from the agri-food processing industry amounts to about 778 thousand tonnes in 2018, the majority of which is animal and vegetal waste (Eurostat, [\[env wasgen\]](#)). Though no official quantitative data are readily available, the usual management practices are the recycling to products in benefit to agriculture, the recovery into waste-to-energy facilities and landfilling. Both the past and the new NWMPs do not explicitly set out actions for the agri-food processing sector, but provide with measures to encourage the establishment of the order of preference for the industrial waste management.

The measures on waste are in synergy with the actions foreseen in the National Action Plan on Circular Economy 2021-2025, especially in relation to the valorisation of valuable resources such as crop residues and by-products and the development of bioeconomy.

Food waste

Food waste has been gaining attention in the last years and EU policy is being put in place to contribute to the reduction thereof. It is one of the priority areas of the EU Circular Economy Action Plan and Farm to Fork Strategy, with the commitment to contribute to the target set by 2030 under the Sustainable Development Goal 12.3 of the United Nations to halving per capita global food waste at the retail and consumer levels and reduce food losses along production and supply chains, including post-harvest losses. In Greece, the new framework law on waste (L. 4819/2021) has set a target of 30% reduction of food waste at the retail and consumer levels and specifies the food waste hierarchy options in line with the amended WFD. Food waste is also a priority stream in the revised National Waste Prevention Programme for the period 2021-2030 that sets out measures and initiatives for food waste prevention at each stage of the food supply chain, which includes primary production and agri-food processing.

According to the findings of the [EU FUSION project](#), an estimated 20% of the total food produced is lost or wasted in the EU within 2012, with primary production and agri-food processing to account for 30% of the EU food waste, although there is considerable uncertainty around the estimate for the processing sector compared to all the other sectors due to the unavailability of data of sufficient quality.

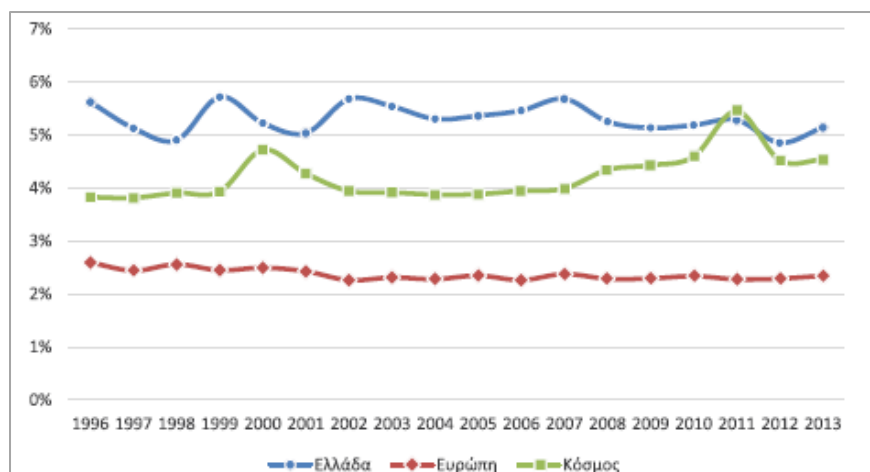


Source: [EU FUSION project](#)

Figure 73: EU28 food waste by sector for 2012

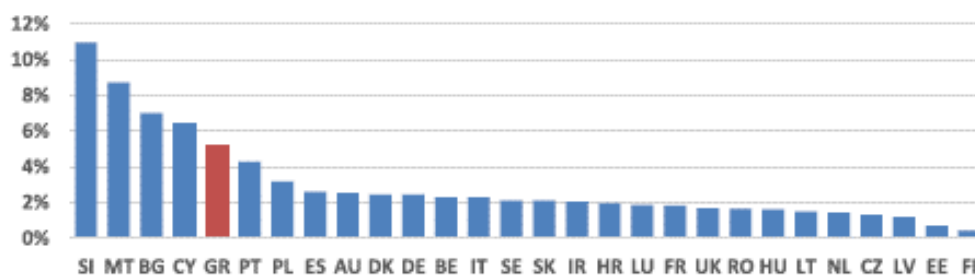
Based on the results of the aforementioned project, the quantification of food waste of the primary production and the agri-food processing industry, that is derived from the Greek waste statistics, is assessed to be of insufficient quality to be considered. There is almost a complete knowledge gap of compositional characteristics of food waste given that the legislation encouraging bio-waste separate collection and treatment has only been recently put into practice.

According to Food and Agriculture Organization of the United Nations (FAO) estimates on food loss index, which focuses on food waste that occur from primary production and the agri-food processing industry, Greece fluctuates in the range of 4.9-5.9% in the period 1996-2013, which is more than double of the EU average of 2.3-2.6% and higher than the global average of 3.8-5.4% (Figure 74). In 2013, the food loss index of Greece is estimated at 5.1%, which is one of the highest within EU and ranked 5th among the member states (Figure 75).



Source: Foundation for Economic & Industrial Research (IOBE), 2017

Figure 74: Estimated food loss index for Greece for the period 1996-2013



Source: Foundation for Economic & Industrial Research (IOBE), 2017

Figure 75: Estimated food loss index per Member State for 2013

The recently released report of United Nations Environment Programme (UNEP) for the food waste index in 2021, which comprises food waste from the retail, foodservice and household consumption, points out that the amount of food waste in Europe is high, a standard case in highly developed countries in which standard of living is also high. The estimation of food waste index for Greece was based on studies with a medium confidence level. According to the findings of these studies, food waste from households is the highest among member states.

Table 16: Estimated food waste index for Greece

Stage	kg/cap estimate
Retail	7
Food service	<i>no available data</i>
Households	142

Source: [UNEP, 2021](#)

Pursuant to article 9 of WFD, and in accordance with the common EU methodology for such measurement that was established in 2019, Greece must speed up to establish all the necessary procedures and monitoring mechanism in order to be able to measure progress made in the prevention of food waste on an annual basis. The amount of food waste generation for the first reporting year (that is 2020) is required to be provided by 2022. The Commission will then examine the data on food waste with a view to

considering the feasibility of establishing a Union-wide food waste reduction target to be met by 2030, and which will be interrelated with the actions set under the EU Farm to Fork strategy and in line with the EU Action Plan on Circular Economy.

In addition, a specific food waste prevention programme is required to be adopted within the national waste prevention programmes of the Member States, considering that waste prevention is the most efficient way to improve resource efficiency and to reduce the environmental impact of waste.

Additionally, within the European project [LIFE-IP CEI Greece](#), that is coordinated by MoEE, a dedicated action on food waste is anticipated to measure national food waste generation annually along the entire food supply chain, involving thus the primary production and agri-food processing sector as well. The project also includes demonstration actions on food waste prevention together with actions for the promotion of circular management of waste of the agri-food processing sector throughout the country. Under the project, a monitoring mechanism has been established for the mobilization of complimentary funding related to the project's actions for the period from 2020 to 2027, which is in line with the programming period of the Greek CAP SP.

Finally, it is noted that under the previous programming period of the RDP of 2014-2020, no particular interventions or specific measures have been established for agricultural or food waste resulted from the primary production or the agri-food processing sector.

6.2.9 Cultural heritage

Greece has one of the richest cultural heritages in the world. This heritage today makes its presence felt with a number of archaeological sites, monuments, museums and traditional settlements throughout the country. There is a number of national legal instruments that protect cultural heritage in Greece, the main of which are outlined below:

- Law 2039/1992 (OGG 61/A/13-04-1992), which has ratified the Convention for the Protection of Architectural Heritage of Europe
- Law 3028/2002 (OGG 153/A/28-06-2002) on the protection of antiquities and the cultural heritage in general, which broadens the concept of cultural assets and considers them to be evidence of individual and collective human activities, whereas it defines as monuments the cultural goods that are material evidence of the cultural heritage of the country
- Law 3378/2005 (OGG 203/A/19-08-2005), which has ratified the European Convention for the Protection of the Archaeological Heritage

The Ministry of Culture and Sports hosts an interactive database and mapping for the cultural monuments, the archaeological sites and the museums of Greece (http://odysseus.culture.gr/index_en.html).

According to the data of the Hellenic Statistical Authority, an increase in the number of museums is recorded, from 115 in 2010 to 178 in 2019. Respectively, the number of visits to museums during this period increases from 3.1 thousand in 2012 to 5.9 thousand visitors in 2019. The number of archeological sites also increased from 81 to 146 during this period while the number of visitors to these sites increased from 5.5 thousand to 13.3 thousand visitors.

Table 17: Museums and archaeological sites for the period 2010-2019

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Museums	115	156	165	150	153	161	164	172	173	178
Visitors (thousands)	3,136	3,061	2,975	3,376	4,154	4,405	4,516	5,191	5,702	5,894
Archaeological sites	81	94	97	117	123	136	139	154	154	146
Visitors (thousands)	5,547	6,517	6,693	8,167	9,953	10,320	9,564	11,332	12,901	13,337

Source: [Hellenic Statistical Authority, 2021](#)

In addition, Greece has ratified on 17 July 1981 the UNESCO World Heritage Convention, that was established in 1972. The World Heritage Sites are places of importance to cultural or natural heritage. As of 2021, there are 18 properties in Greece inscribed on the World Heritage List, 16 of which are cultural sites and 2 are mixed, listed for both their natural and cultural significance. There are also 14 additional sites on the tentative list that are considered for nomination.

An important part of the cultural heritage of the country are also the traditional settlements that are protected through urban planning and legislation. Traditional settlements are considered those settlements that have retained their unchanged image of the past, as well as their local character. They are mostly small-scale villages that are under legislative protection due to their significant architectural and urban features. Depending on the local geographical and environmental conditions, their architectural characteristics and urban form varies considerably.



Source: [UNESCO](#)

Figure 76: UNESCO World Heritage Sites in Greece

The first traditional settlements were designated in 1978 (with Presidential Degree 594) and up to date they exceed 900. Most of the traditional settlements that have been declared to date are evenly distributed in the Greek territory (mainland and insular), while most of them are located in coastal and mountainous areas. The characteristic regions with traditional settlements are South Aegean, North Aegean, Ionian Islands, Crete, Peloponnese and Epirus.

6.2.10 Population and health

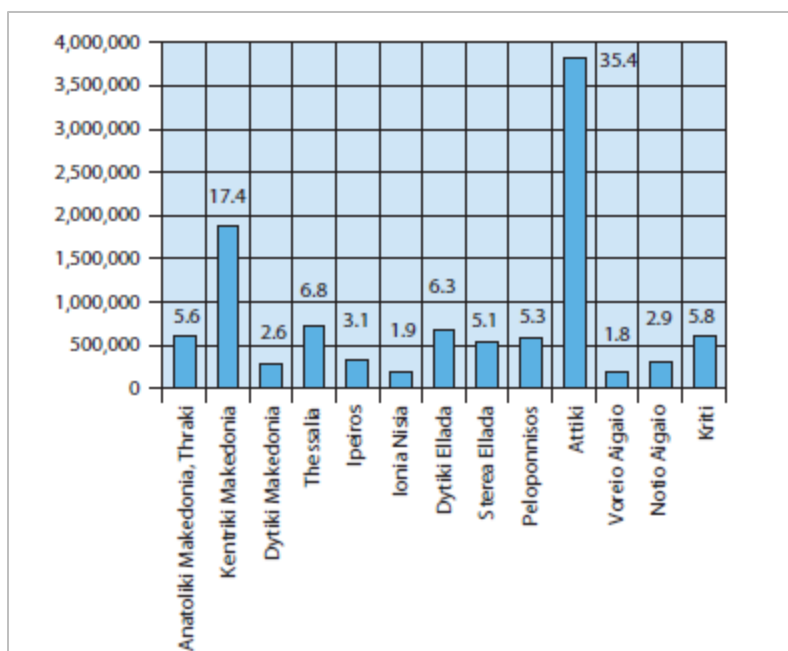
6.2.10.1 Population profile

The latest population-housing census of the country was conducted in 2011, according to which the resident population of Greece amounted to 10.8 million people, out of which 49% are males and 51% females. More than half of the resident population live in the region of Attika (35.4%) and the region of Central Macedonia (17.4%), in which the capital of Athens and the city of Thessaloniki are located respectively. The next census is for the 2021 reference year that was carried out by the Hellenic Statistical Authority in the last autumn, whilst no official data are available to date.

Table 18: Resident population by gender and region (census 2011)

Region	Total	Male	Female	% over total region	
				Male	Female
Greece, total	10,816,286	5,303,223	5,513,063	49.0	51.0
Eastern Makedonia & Thrace	608,182	299,643	308,539	49.3	50.7
Central Makedonia	1,882,108	912,693	969,415	48.5	51.5
Western Makedonia	283,689	141,779	141,910	50.0	50.0
Thessaly	732,762	362,194	370,568	49.4	50.6
Epirus	336,856	165,775	171,081	49.2	50.8
Ionian Islands	207,855	102,400	105,455	49.3	50.7
Western Greece	679,796	339,310	340,486	49.9	50.1
Mainland Greece	547,390	277,475	269,915	50.7	49.3
Peloponnese	577,903	291,777	286,126	50.5	49.5
Attika	3,828,434	1,845,663	1,982,771	48.2	51.8
North Aegean	199,231	99,984	99,247	50.2	49.8
South Aegean	309,015	155,865	153,150	50.4	49.6
Crete	623,065	308,665	314,400	49.5	50.5

Source: [Hellenic Statistical Authority, 2021](#)

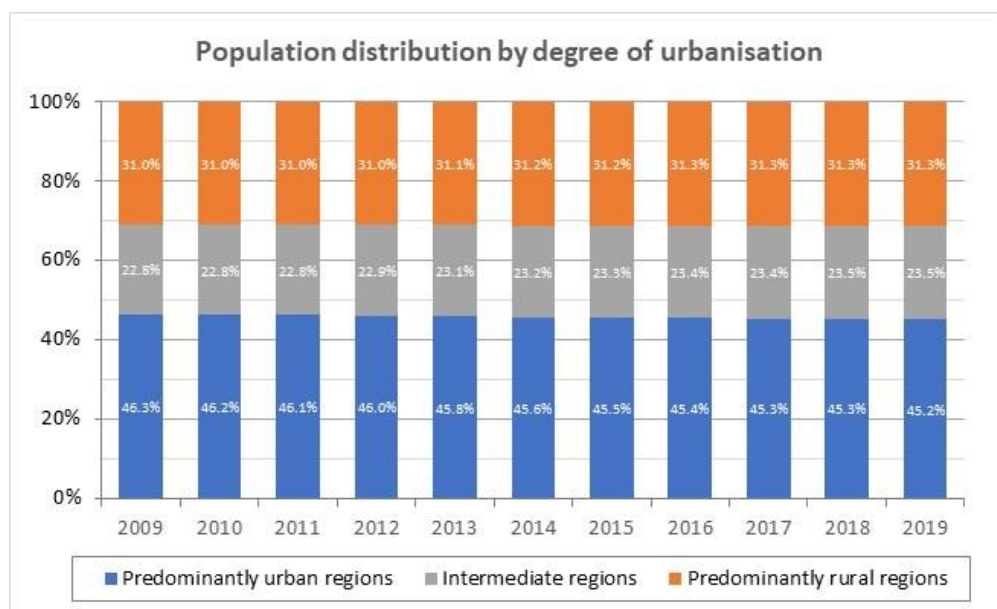


Source: [Hellenic Statistical Authority, 2021](#)

Figure 77: Distribution of resident population by region

According to the urban-rural typology of the European Union, that identifies two types of rural areas according to the share of the rural population, the predominantly rural regions and the intermediate rural regions, rural areas are home to around 5.9 million people in 2019, which constitutes more than half of the total population (54.8%) (DG AGRI, CAP Indicator- [C01](#)). The distribution of population by degree of urbanisation is rather stable, as per data for the last decade, while the demographic trend of the population living in rural areas shows a decrease, which is also interrelated to the corresponding decrease of the total population of the country. During the period 2014-2019, the total population of the country declined by 1.9%, while the population of the rural areas by 1.0%, with a decrease of 1.5% of the population of predominantly rural regions and 0.4% of the population of intermediate regions.

According to 2016 data, the population density in predominantly rural and intermediate rural regions is 41 and 61 inhabitants/km² respectively, below the corresponding EU27 average of 51 and 93 inhabitants/km², whereas the population density in urban areas is much higher than in EU27, above 600 inhabitants/km², (DG AGRI, [C04](#)).



Source: Eurostat [[urt_pjanaggr3](#)]

Figure 78: Distribution of population by degree of urbanisation

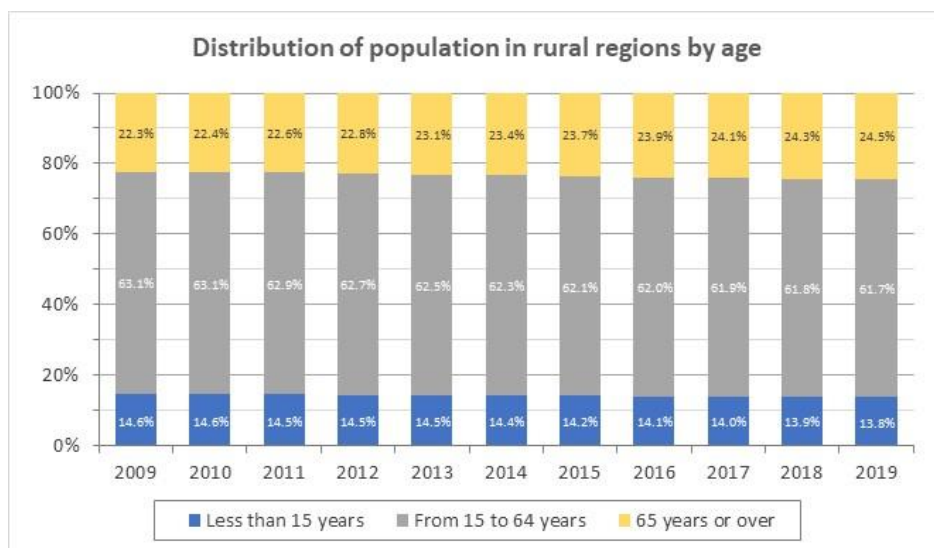
According to the age structure of the population for 2019, about 1/5 of the population is elderly people (22.0% in 2019), by 2.2% higher than the EU27 average (20.2% in 2019). Rural population is relative older, with a decline in youth people (less than 15 years) by 5.4% between 2014 and 2019. On the other hand, a larger increase in the ageing population is recorded in the intermediate and urban regions than in the predominantly rural regions over the last years.

As shown in Figure 79, there is an increasing trend of ageing population in predominantly rural regions over the past decade, with the elderly people (over 65 years) to increase by 2% between 2009 and 2019 and by 3.1% between 2014 and 2019, having a relative high proportion of elderly people (24.5% in 2019) compared to the EU27 average (21.4% in 2019), (Eurostat, [[urt_pjanaggr3](#)]).

Table 19: Age structure by type of region

Age structure, 2019			
Region	Less than 15 years	From 15 to 64 years	65 years or over
Predominantly rural	13.8%	61.7%	24.5%
Intermediate	14.9%	63.6%	21.5%
Predominantly urban	14.4%	65.0%	20.6%
Total	14.3%	63.6%	22.0%
Change in age structure, 2014 to 2019			
Region	Less than 15 years	From 15 to 64 years	65 years or over
Predominantly rural	-5.4%	-2.4%	3.1%
Intermediate	-4.4%	-1.7%	7.0%
Predominantly urban	-2.7%	-5.6%	6.9%
Total	-3.9%	-3.7%	5.6%

Source: Eurostat, [[urt_pjanaggr3](#)]

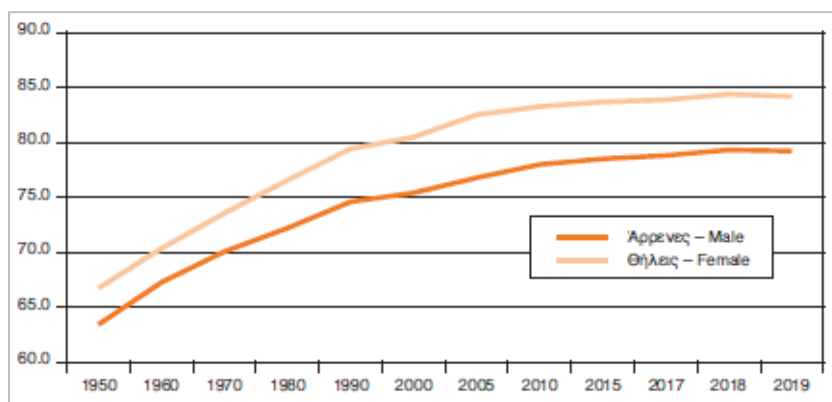


Source: Eurostat [[urt_pjanagqr3](#)]

Figure 79: Distribution of rural population by age

6.2.10.2 Human health

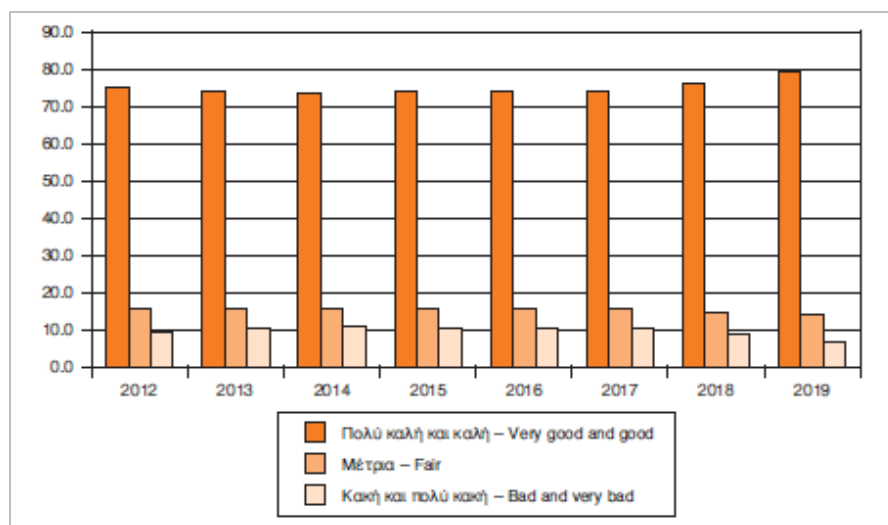
The health status of the Greek population shows constant improvement in the last decades, with a total life expectancy at birth to be recorded at 81.7 in 2019, quite similar to the EU27 average (81.3 years). The difference in life expectancy between the two sexes remains and amounts to six years in 2019 (79.2 for males and 84.2 for females). The corresponding indicator of the healthy life years is recorded at 66.4 years in 2019, higher by 1.3 years compared to the EU27 average (Eurostat [[hlth_hlye](#)]).



Source: [Hellenic Statistical Authority, 2021](#)

Figure 80: Life expectancy at birth by gender

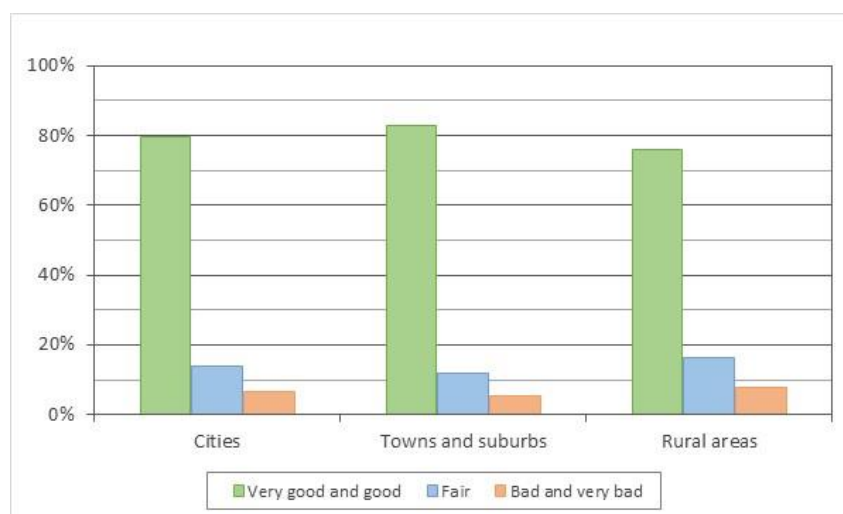
The distribution of population by health status shows an improvement over the years, with 79.5% of the population to report being in good or very good health in 2019 and only 6.6% in bad or very bad health.



Source: [Hellenic Statistical Authority, 2021](#)

Figure 81: Distribution of population by health status

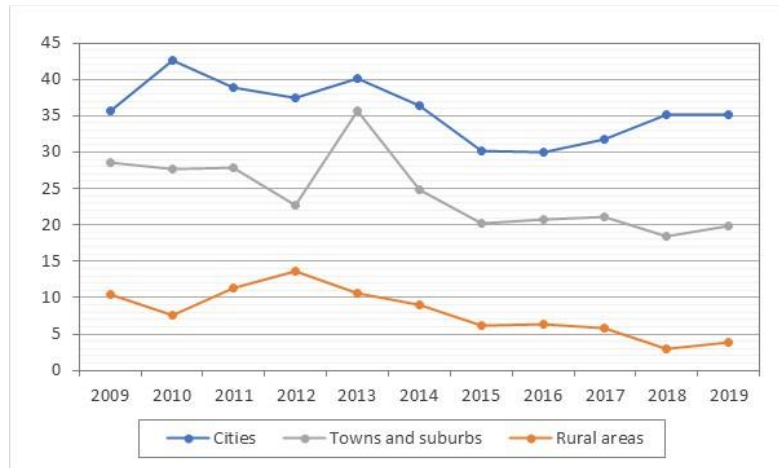
By taking into account the degree of urbanisation, in 2019 about three out of four people living in rural areas perceived their health as very good or good (76%), whilst the corresponding self-perceived health for the population living in towns and suburbs is higher by 6.7% (Eurostat [\[hlth_silc_18\]](#)).



Source: Eurostat [\[hlth_silc_18\]](#)

Figure 82: Distribution of population by health status and degree of urbanization for 2019

Pollution, grime and other environmental problems is a concern of only 3.8% of rural population, lower by 4.7% of the EU27 average, whereas the concern of population living in cities is high at 35.1%, well above the 21.7% of EU27 average (Eurostat [\[ilc_mddw05\]](#)). There is a downward trend of the perception of environmental problems for the population living both in rural and sub-urban areas, while the opposite applies for the population living in cities over the last four years.



Source: Eurostat [[ilc_mddw05](#)]

Figure 83: Perception of environmental problems by degree of urbanisation

6.2.10.3 Economic features

After a deep recession over 2008-2016 during which the GDP fell by 26%, the Greek economy has started to recover, with GDP growth to strengthen at 1.6% in 2017 and 1.9% in 2019. The pace of reforms has accelerated and broadened in recent years, with major fiscal adjustments reversing imbalances in public finances and the current account. In 2017, Greece returned to the international debt market after a three-year hiatus, signalling investors' increasing confidence in its prospects and improved fiscal credibility, with services (mostly trade, transport, accommodation and food, and real estate activities) to contribute at about 4/5 of total value added. Structural reforms, high primary budget surpluses and debt measures by European partners had sustained recovery and rebuilt confidence. Rising goods and tourism exports had supported growth and employment. The key economic features of the country for the period 2015-2019 are presented in the table below. ([OECD, 2020[a,b](#)], [[Hellenic Statistical Authority, 2021](#)]).

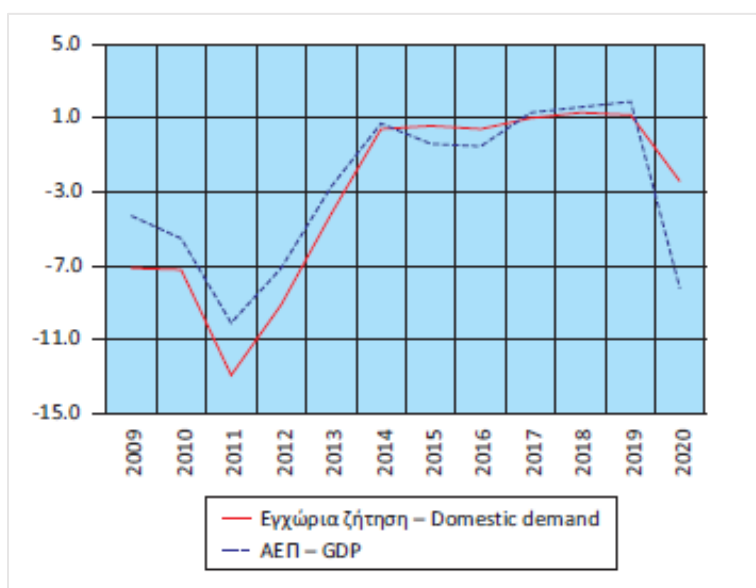
Table 20: Selected key economic indicators for the period 2015-2019

(% change, unless otherwise indicated)	2015	2016	2017	2018	2019
GDP at constant prices of 2015	-0.4	-0.5	1.3	1.6	1.9
Total domestic demand (contribution)	0.6	0.4	1.0	1.3	1.2
Private consumption	-0.3	-0.5	1.9	2.3	1.9
Public consumption	1.6	-0.2	-0.1	-4.2	1.2
Gross value added at basic prices	-0.2	-0.8	2.0	1.1	1.4
Agriculture, hunting and forestry, fishing	-2.4	-7.4	13.1	-1.4	5.1
Industry, incl. energy and construction	-0.7	2.2	-1.3	0.5	1.0
Services	0.1	-1.1	2.1	1.4	1.3
Employment (annual average rate)	39.0	39.9	40.9	41.9	43.0
Unemployment (annual average rate)	24.9	23.5	21.5	19.3	17.3

Source: [Hellenic Statistical Authority, Greece in Figures, Oct-Dec 2020](#)

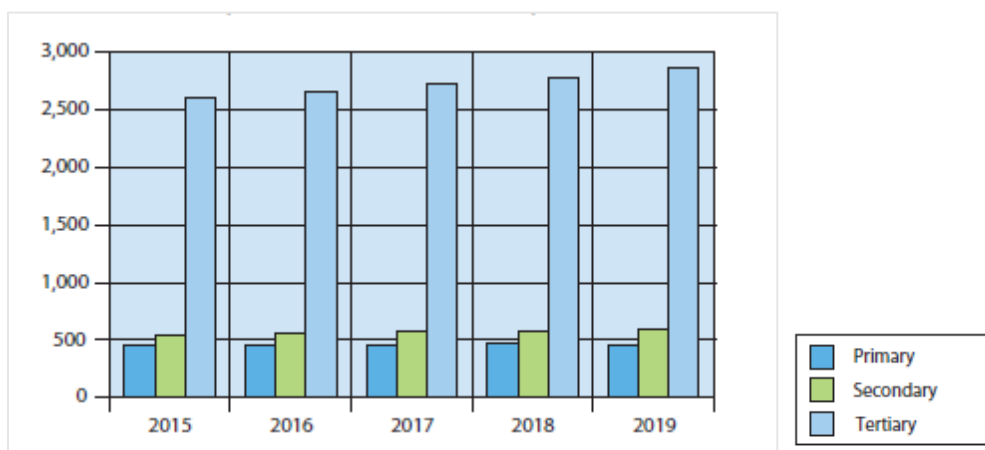
Before the pandemic, domestic demand was expected to contribute more to growth than in the recent past, offsetting moderating export growth, whereas investment was expected to start to recover as financing conditions started to improve. The covid-19 shock abruptly interrupted the country's recovery (Figure 84), adding new challenges to raising competitiveness and growth. As in other countries,

containment measures, travel restrictions, social distancing and high uncertainty have led to a temporary but extraordinary drop in production and large loss of tourism demand and employment. The government has responded with substantial packages to strengthen the sectors affected by the shock, such as tourism. To reinvigorate the recovery, the government has set out a reform programme focused on boosting growth and investment ([OECD, 2020b](#)).



Source: [Hellenic Statistical Authority, The Greek Economy, May 2021](#)

Figure 84: GDP (growth rate) and domestic demand (contribution)



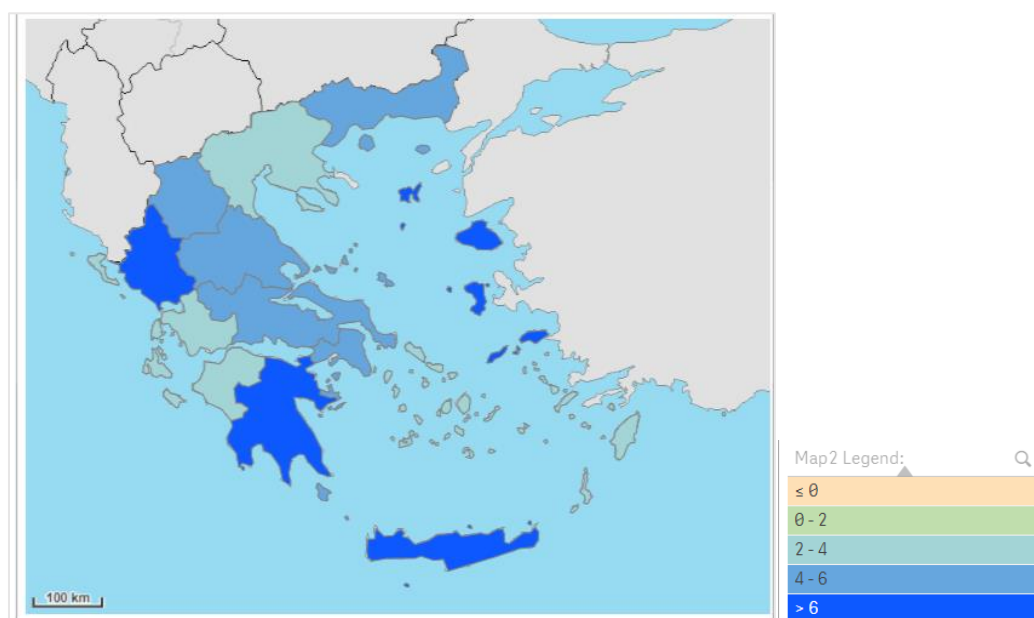
Source: [Hellenic Statistical Authority, Greece in Figures, Oct-Dec 2020](#)

Figure 85: Persons employed aged 15 years and over by main economic sector for the years 2016-2020

The persons employed in 2019 amounted to 3,911 thousand, constituting 43% of the total population of the country and showing a gradual increase between the years 2015 and 2019. Unemployment for 2019 showed a gradual decrease from 24.9% in 2015 to 17.3% in 2019. The predominant employment sector is the tertiary sector with 2,857.5 thousand employees in the year 2019, followed by the secondary sector with 599.9 thousand and the primary sector with 453.6 thousand employees. During the period 2015 - 2019, employment in the tertiary and secondary sector showed a small increase, while a small decrease was presented by the primary sector (Figure 85).

Economic features for the agricultural sector

In 2019, the contribution of the primary sector to Gross Value Added (GVA) of the country is 4.4%, higher than the EU27 average (1.8%), and has increased by 3.7% between 2015 and 2019, -(Eurostat [nama_10_a10]). The primary sector represents 11.6% of the total employment, one of the highest in EU (4.6% EU27 average), yet it has decreased by 2.6% between 2015 and 2019 (Hellenic Statistical Authority, 2020). In 2019, agriculture and forestry employed 434.2 and 1.9 thousand people respectively, whilst food industry 124.7 thousand people (DG AGRI C13). On the other hand, in 2019, the employment rate of the population living in rural areas is 64.1% (20-64 years old), below the EU27 average of 73.3%, but higher than the employment rate of population living in semi-urban (60.7%) and urban areas (59.8%), (Eurostat [lfst_r_ergau]). The change in the employment rate is positive the last four years, especially in Epirus, Peloponnese, Crete and North Aegean regions, (DG AGRI, C05, Figure 86).

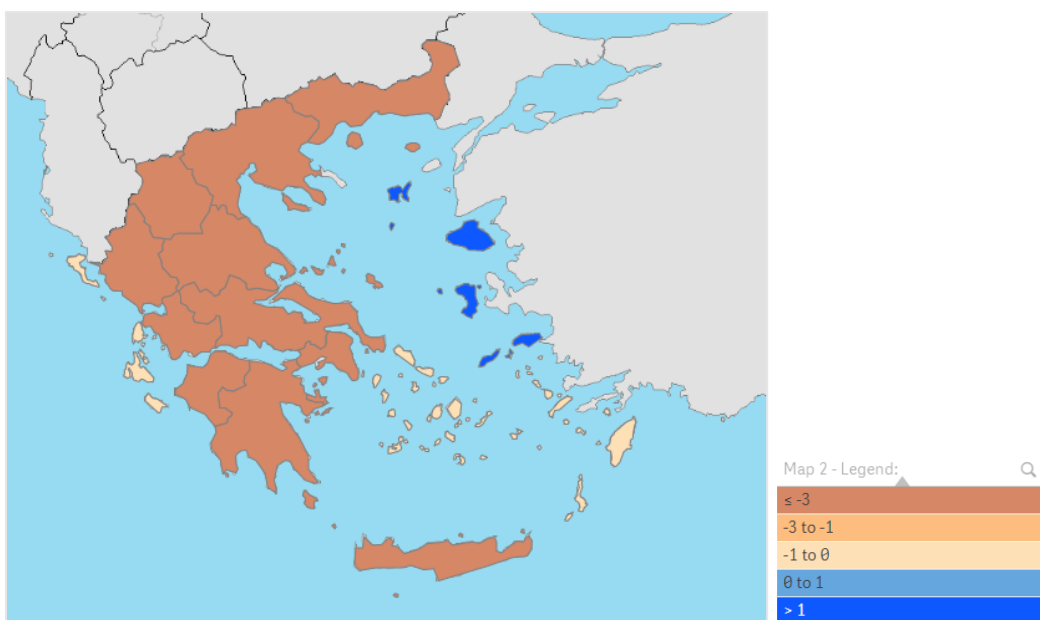


Source: DG AGRI, Agri-food Data Portal, CAP Indicators

Figure 86: Change in employment rate (age group 20-64) for the period 2016-2019

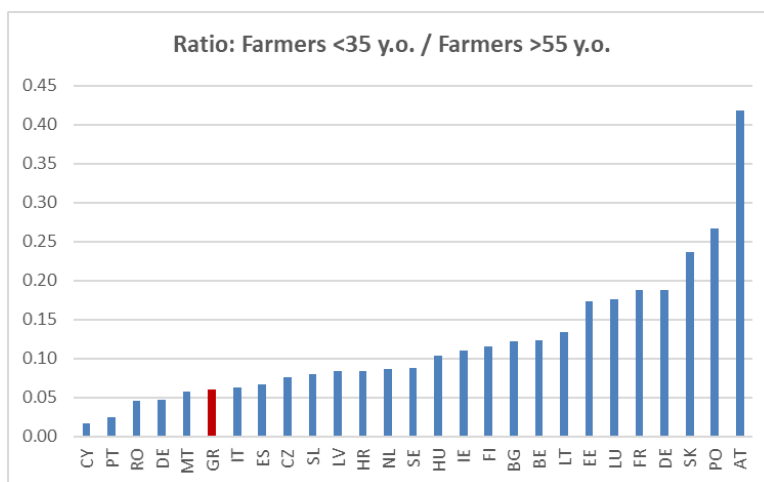
Unemployment in rural areas remains an issue, especially for young people. In 2018, Greece recorded the highest rate of unemployment in rural areas within EU27, with 16.3% of the active rural population (15-74 years old) unemployed, but lower than the unemployment rate in urban (20.5%) and semi-urban (20.4%) areas. The unemployment rate was much higher (about 40%) for the young active rural population (15-24 years old). The respective EU27 average for the same period was 6.3% (15-74 years old) and 14.6% (15-24 years old). The negative change in the unemployment rate is practically evenly distributed among regions during the period 2016-2018 with the exception of the Greek islands (DG AGRI, C07, Figure 87).

Over the last decade, the ageing farmer population in Greece persists, with about 3/5 of farmer managers to be older than 55 years old (60.9% in 2016), whose basic agricultural training is the lowest among EU27 countries (2.9% compared to the 22.4% EU27 average in 2016). In addition, Greece has one of the lowest shares of young farmers within EU27, who have though at least a basic level of agricultural training similar to the EU27 average of 21.3%. In 2016, the share of young farmers in the total number of farm managers is 3.7%, and this share decreased by about 47% from 2010 to 2016, with the farm managers older than 55 years old to increase their share by 6% (DG AGRI C23 & C24, Eurostat [ef_m_farmang], Figure 88).



Source: DG AGRI, Agri-food Data Portal, CAP Indicators

Figure 87: Change in unemployment rate (age group 15-74) for the period 2016-2018



Source: DG AGRI, Agri-food Data Portal, CAP Indicators

Figure 88: Ratio of young to elder farmers for 2016

During the period 2014-2020, the RDP was the main policy framework contributing significantly to the integrated development and sustainable competitiveness of the agricultural sector. Additionally, the Greek government adopted in 2016 a new legislative framework (Law 4384/2016) aimed at modernising and strengthening agricultural co-operatives, in a highly competitive economic environment given that sustainable agricultural co-operatives contribute to business sustainability, especially for small and scattered holdings ([VNR, 2018](#)).

6.3 Key environmental issues and likely future trends

According to the EU Common Agricultural Policy, a healthy natural environment is essential to sustaining the agricultural sector and on the other hand agricultural policies and practices also play an important role in sustaining a healthy natural environment in rural areas. Agriculture may have adverse effects on natural resources, such as air, water, soil and biodiversity, whilst contributes to climate change and is highly exposed to climate change challenges. The key existing environmental issues and their likely future trends which are relevant to the implementation of CAP SP 2023-2027 are presented in the following paragraphs.

Greenhouse gas emissions have dropped, ambitious new climate and energy targets have been adopted, whilst the national adaptation strategy will be downscaled at regional level. The decrease of total greenhouse gas emissions (GHG) continued due to the gradual transition of the energy system to a lower-emission system along with the reduced emission-related activities because of the economic crisis. In 2019, the share of agricultural sector in the total GHG emissions is 9.2%, while its share in final energy consumption is below 5%, with a rather stable trend over the last years. The production of renewable energy from agriculture and forestry reached 31.9% of total production of renewable energy sources, with a relative downward trend for forestry which is the main contributor, over 80% of RES produced by both agriculture and forestry. The National Energy and Climate Plan (NECP) sets ambitious targets for 2030 and has incorporated actions for reducing GHG emissions in the agricultural sector. Agriculture is the sector expected to be most severely affected by climate change in Greece. The increased frequency of extreme climate events is expected to have a significant impact on the fire vulnerability of forests as well. The National Climate Change Adaptation Strategy, which sets priorities that will be downscaled in regional plans with a 7-year planning cycle, gives particular emphasis on agriculture and forestry through the conservation and sustainable use of land resources and management practices.

National air emissions have declined significantly, but urban air pollution persists. The national reduction commitments imposed by the National Emission Ceilings Directive for 2020 have been met for most pollutants as early as in 2016. According to national projections, Greece is also expected to meet its 2030 emission reduction commitments. The share of agriculture in air pollution mainly involves emissions of ammonia that reached 91.4% in 2019, with a steady decrease of 1-4% per year over the last five years. These reductions are mainly attributed to the decreased use of synthetic fertilizers and to the spread of organic farming along with the declining livestock population. The National Air Pollution Control Program, that was recently adopted, gives emphasis on the continuation of the existing measures for agriculture or measures that are mandatory from other legal instruments. Regarding air quality, there is a downward trend or stabilization tendency, depending on the air pollutant. Yet, exceedances of EU air quality standards are still recorded for ozone, especially during warm periods of the year, as well as for daily mean PM₁₀ concentrations in urban areas.

Water quality is generally good, while water abstraction remains high. Most of the surface water bodies achieve good chemical status (89%) and most groundwater bodies reach good status, both in qualitative (85%) and quantitative (80%) terms. The pressure of agriculture on water quality is related to the application of fertiliser nutrients (nitrogen and phosphorus). The trend of gross nutrient balance is declining over time – while the potential surplus of phosphorus is low, the surplus of nitrogen is still high. Regarding nitrate concentrations, 84.5% of surface waters are classified as high quality, whereas groundwater quality has been improved over time, with exceedances of nitrates falling by 14.2% between the reporting periods 2012-2015 and 2016-2019. Pursuant to the provisions of the Nitrate Directive, Greece adopted an action plan in 2019 to protect waters against pollution caused by nitrates from

agricultural sources for all 30 designated vulnerable zones. Regarding water demand, Greece is mainly dependent on groundwater resources. According to the 1st revision of the River Basin Management Plans (RBMPs) under the Water Framework Directive, water abstraction is a significant anthropogenic pressure in several River Basin Districts of the country, with the agricultural sector exerting the highest pressure and being responsible for about 80% of total water abstraction in 2017. Within agriculture, the abstracted water is mostly used for irrigation (about 80%), which is attributed to the climatic conditions of the country. Freshwater resources are under moderate stress at the national level, with though an increasing trend in the last years. This indication yet cannot reflect uneven spatial and seasonal distribution of water resources and may therefore mask water scarcity that occurs on a seasonal or regional basis.

Soil erosion by water is higher than EU average, while land take has gradually decreased. According to the 2018 land cover data, agricultural ecosystems (including grassland) and forest ecosystems (including woodland shrub) cover 46.4% and 28.3% of the land territory respectively, whilst urban areas represent 3.3% of the total land area of the country. Land take has been gradually reduced in the last decade, especially in the period 2012-2018. The recorded 0.04% decrease in the land area of agricultural ecosystems is attributed mainly to the conversion to urban land, whereas the land area of forest ecosystems has increased by 0.04%. Soil erosion by water is a natural process, but this can be aggravated by climate change and human activities such as agricultural practices, deforestation, forest fires or construction work. On the other hand, high levels of soil erosion can reduce productivity in agriculture and can have negative impacts on water systems biodiversity. The share of agricultural area at risk of soil erosion by water has an upward trend and is above the EU average (10.2 % vs 7% in 2016). According to estimates, about half of the agricultural areas face a serious risk, with significant variations among regions. In 2015, the mean soil organic content in arable land, important for all soil processes, is well below the EU average (15.8 vs 43.1 gC/kg soil); yet, according to relevant studies, it is noted that Mediterranean regions of Europe exhibit distinctively smaller values of organic content than those of other regions.

Greater efforts are required to enhance the conservation status of protected habitats and species, to manage protected areas and to preserve landscape, while knowledge and monitoring need to be strengthened. Greece is a Mediterranean country of exceptional biological wealth with pronounced landscape features. The geographical position of the country and the co-existence of several micro-climatic conditions explain the high biodiversity value of the country and its high degree of endemism. About half of the habitats and species of European interest still have unfavourable status, and agriculture is one of the pressures with high frequency of occurrence. The conservation status of the grassland and forest habitats of European interest is of favourable status by 40% and 68.3% respectively. The most persistent threats of grassland habitats are not differentiated from those for habitats in general, with the development, construction and use of residential, commercial, industrial and recreational infrastructure to be ranked on top, whilst the most significant threat of high impact to forest habitats is forestry. Birds of European interest are less threatened than species, with only 7.5% showing a decreasing short-term trend. On the other hand, the common bird indicator declined by 19.8% in the period 2007-2016, similar to that of EU (14.2% for the period 1980-2015). The same period, the farmland bird index shows a slight decrease (2.6%), whereas an unwelcome decline is recorded for the forest bird index (38.1%). Nationally protected areas are the main regulatory instrument to protect biodiversity in the country, which cover around 34.8% of the country's land area. The Natura 2000 network, in particular, was expanded, covering nowadays 27.3% of the country's land area, with a share of agricultural areas within Natura 2000 areas at 18.7% and forest areas at 40%. Yet, few protected areas have management plans. The progress in establishing the forest cadastre has been particularly positive, which, when completed, will contribute towards monitoring and protecting the Greek forests. Landscape elements of special value are also protected under the national system of protected areas. As for agricultural landscape, the density of linear

features on agricultural land varies a lot among the regions of the country and the share of High Nature Value farming areas is above 1/3 of the utilised agricultural area. Over the last decade biodiversity mainstreaming into agriculture is mostly done through CAP programming measures.

Concrete national policy steps towards a circular economy and turning waste into resource are in place, yet waste management in practice is still the most challenging environmental area. The agenda of the National Waste Management Plan and the National Waste Prevention Programme beyond 2020 is in line with the mandate of the EU waste policy, yet Greece will need to put more effort into shifting waste away from landfilling and boosting waste hierarchy into practice to pursue the transition to a more circular economy as shaped in the National Circular Economy Strategy. According to official statistics, the primary and the agri-food processing sectors generate about 485 and 778 thousand tons of waste on annual basis respectively. The usual management practices of animal and vegetal waste are the recycling to products in benefit to agriculture, the recovery into waste-to-energy facilities and landfilling. Regarding food waste from primary production and food processing - manufacturing, the 2013 FAO estimate of the corresponding index for Greece is 5.1%, and ranked 5th among the member states. Concrete steps need to be made to monitor effectively agricultural waste management, whilst Greece must speed up to establish all the necessary procedures and monitoring mechanism to measure regularly the progress in the reduction of food waste generation.

More than half of the population in the country lives in rural areas and report to be in good health status, whilst unemployment is an issue for young people and the ageing farmer population persists. Rural areas are home to around 5.9 million people in 2019, which constitutes 54.8% of the country's population. The distribution of population by degree of urbanisation is rather stable, as per data for the last decade, while the demographic trend of the population living in rural areas shows a decrease, which is also interrelated to the corresponding decrease of the total population. Rural population is ageing, with a decline in youth by 5.4% between 2014 and 2019. The health status of the Greek population shows constant improvement in the last decades, with a total life expectancy at birth to be recorded at 81.7 in 2019, whilst about three out of four people living in rural areas perceived their health as very good or good and environmental problems are a concern for only 3.8% of rural population. The primary sector represents 4.4% of GVA and 11.6% of the total employment of the country, higher than the EU27 average. On the other hand, the employment rate of the population living in rural areas is 64.1%, below the EU27 average, whilst the change in the employment rate is positive in the last four years. Unemployment in rural areas remains an issue, especially for young people, yet it is lower than that in semi-urban and urban areas. Over the last decade, the ageing farmer population in Greece persists, with about 3/5 of farmer managers older than 55 years, whose basic agricultural training is quite below the EU27 average. Greece has one of the lowest shares of young farmers within EU27, who have though at least a basic level of agricultural training similar to the EU27 average.

The recommendations of relevance to the current state of the environment and decision-making at a national level for the formulation of CAP SP are based on the Commission Staff Working Document (SWD/2020/372), which aims to show the direction that the Greek CAP SP needs to take in implementing the specific objectives of the CAP relevant to the environment and climate actions, by paying particular attention to addressing the Green Deal targets and those stemming from the Farm to Fork Strategy and the Biodiversity Strategy for 2030. While maintaining the proposed flexibility for Greece in the implementation of the new policy framework, these recommendations identify key environmental issues that need to be tackled urgently for Greece and provide guidance on how to address them in the CAP Strategic Plan. In particular, the Commission considers that the Greek CAP SP 2023-2027 needs to focus its priorities and concentrate its interventions on the following points:

- **Contributing to climate change mitigation** by encouraging carbon sequestration through carbon farming, the sustainable management of the existing forests as well as the timely replacement of harvested or damaged forest. This would maximise long-term carbon capture and increase the carbon sinks in forests, their soils and harvested wood products; support and implementation not only for afforestation, agroforestry and restoration but also through advice on species selection will contribute to this direction.
- **Strengthening climate change adaptation** measures including awareness raising, introducing water efficient crops and investing in flood prevention/protection. In addition, still in the interest of adaptation to high wildfire risk, a forest cadastre and the review of the legal framework for prevention and suppression of wildfires is recommended.
- Developing the Greek bio-economy by **increasing the contribution of agricultural waste and by-products in the production of total renewable energy** through private and public investments, focusing on energy production from anaerobic fermentation, solar and wind, and by supporting farmers through training and advice and preserving at the same time the attractiveness of the rural landscapes.
- **Addressing water use efficiency**, especially in light of climate change projections for water scarcity, with practices and targeted management commitments (e.g. use of crop varieties with reduced biological cycle, use of water-resistant crops), by modernising the existing irrigation infrastructure but also switching to more efficient and sustainable irrigation systems while also providing appropriate training and advice services to farmers.
- **Contributing to the EU Green Deal target on reducing nutrient losses** and improving soil health by addressing soil erosion through effective implementation of an enhanced conditionality and by adopting agro-ecological practices, low input and soil management commitments, a better nutrient management (e.g. animal housing, fertilisation techniques) and practices such as the retention of crop residues on fields, and precision farming. Appropriate training and advice to farmers are also essential to achieve this target.
- **In line with the Green Deal/ Farm to Fork targets on pesticides**, monitoring and reducing the use and risk of pesticides by more sustainable farming practices, appropriate training and advice to farmers, taking action to decrease the use of the more hazardous pesticides and through implementation of integrated pest management.
- **Contributing to the EU Green Deal targets on biodiversity** by increasing the share of **landscape features** in agriculture and by improving the status of protected species and habitats, farmland birds and wild pollinators in line with the prioritized action framework for CAP funding and the species and habitats action plans, thereby achieving biodiversity and climate mitigation and adaptation benefits, as well as increased productivity from enhanced pollination and natural pest control.
- **Contributing to the Green Deal target on organic farming** by further increasing the area under organic farming through incentivising the maintenance and conversion to organic agriculture, especially in disadvantaged and mountainous areas where more opportunities for quality products exist and by filling research and innovation gaps in organic as well as other types of low-impact farming.

- **Improving environmental standards** by prioritising interventions in actions that promote permanent grassland and their environmental protection, including better integration of these areas into the direct payments system and better targeting support measures towards extensive production systems.
- **Tackling poverty, unemployment, employment gender gap** and ageing population and contributing to improving access to healthcare in rural areas through investments in economic and social infrastructures and services. The synergy of CAP tools with other Funds towards this direction should be ensured.
- Accelerating the digital and green transition of the farming sector by investing **its Agricultural Knowledge and Innovation System**, focusing in particular on farm advice, interactive innovation, and training to increase the knowledge level and innovative skills of farmers and advisors.

7 Evaluation, assessment and mitigation of impacts of the plan on the environment

This section presents the evaluation and assessment of the likely significant effects of the CAP SP 2023-2027 on the environment and the measures envisaged to prevent, reduce and, where possible, mitigate any significant adverse effects on the environment, including the monitoring of the identified significant environmental effects of the implementation of the plan that would enable to identify at an early stage unforeseen adverse effects and to be able to undertake appropriate remedial action.

7.1 Evaluation and assessment of the likely effects on the environment

7.1.1 Methodological approach

The environmental assessment process initially involves the setting of the SEA objectives for each of the defined environmental aspects (see section 6.1) against which the CAP SP will be assessed. The SEA objectives have been developed by taking into consideration the EU and national environmental and climate policy contexts, as well as the environmental and climate objectives that are set out in the SPR regulation. These SEA objectives are translated into key questions which are used to identify and evaluate the likely significant effects of the CAP SP, and which constitute the SEA methodological framework for assessing the CAP SP. Table 21 sets out the SEA objectives and the corresponding guiding questions that are used for the identification and evaluation of the likely significant effects of the Strategic Plan for each environmental aspect.

Table 21: Proposed SEA Objectives and Framework questions

Environmental aspect	SEA Objective	SEA Framework (guiding) questions: Will the CAP SP
Climate & energy	Minimise contribution to climate change, adapt to its predicted effects & support sustainable energy	1-improve farm resilience to climate change? strengthen climate change adaptation measures? 2-contribute to climate change mitigation, encourage carbon sequestration? contribute to the increase of GHG mitigations efforts in the LULUCF sector? 3-increase energy savings? support the use of low carbon and renewable energy? support renewable energy production from agricultural waste and by-products?
Air	Reduce air pollution and improve air quality	1-improve air quality /decrease levels of air pollutants? 2-expose new receptors to potential air pollution (e.g. odour from new areas of livestock, emissions from new road networks)? increase stress on road network? encourage use of sustainable transport?
Biodiversity & ecosystem services	Protect biodiversity, enhance ecosystem services & preserve protected areas	1-preserve the status of protected species and habitats? maintain and enhance protected areas (incl. protected forests)? 2-preserve and protect biodiversity: increase status of farmland birds? preserve and improve the status of wild pollinators? improve the status of farmland habitats associated with agro-ecosystems or grassland ecosystems and preserve agricultural habitats? promote permanent grassland and its environmental protection? support connectivity and decrease the fragmentation of habitats? 3-support afforestation and forest preservation and restoration? preserve forest habitats?

Environmental aspect	SEA Objective	SEA Framework (guiding) questions: Will the CAP SP
		4- help maintain or increase the area under organic farming? 5- preserve and increase the use of genetic resources? 6- preserve and enhance the ability to provide ecosystem services? support ecological networks in the wider countryside?
Landscape	Preserve and improve the landscape	1-help increase the share of landscape features in agriculture? encourage agricultural methods compatible with the protection and improvement of landscape? 2-help maintain, restore and upgrade rural landscapes?
Land uses & material assets	Rationalise land uses and use material assets efficiently	1-preserve land use? rationalise agricultural and forest land uses? support land take (especially land conversion of natural state) in a sustainable way? 2-support increased or new demands on infrastructure (e.g. water, heat, energy)? include sustainable management practices to meet these new demands?
Soil	Protect and enhance soil quality	1-help improve soil health? help ensure the quality of agricultural soil? 2-reduce soil erosion and degradation?
Water	Protect, enhance and manage water resources and quality	1-promote water use efficiency? reduce water abstraction? prevent over-abstraction? reduce pressure on water resources (especially groundwater)? support resilience to water scarcity? 2-reduce water pollution? especially by control inputs of phosphorus and nitrogen? reduce nutrient losses and improve nutrient management? ensure sustainable use of fertilisers? 3-encourage sustainable use of pesticides and pest control techniques? reduce risks and impacts of pesticides? minimise dangerous substances from water bodies due to pesticides? 4-minimise exposure and help adapt to flood risk by investing in flood prevention/protection?
Waste	Integrate agricultural waste management; reduce and turn food waste into a resource	1-encourage agricultural waste hierarchy? help sustain agricultural waste management practices? 2-reduce food loss and promote food waste prevention? support food waste valorisation?
Cultural heritage	Protect and enhance cultural heritage	1-protect and promote historic buildings, archaeological sites and other places of cultural interest in rural areas? 2-support intangible cultural heritage?
Population & human health	Improve health and quality of life of rural population; promote employment and local development in rural areas	1-support better quality of life for rural population? improve long-term health and wellbeing of rural population? help increase the access to services and infrastructure of the rural areas? 2-help sustain rural population? increase or maintain rural economic activities? contribute to jobs in rural areas? increase number of new farmers? 3-support education on environmental and climate matters and sustainable agriculture? 4-support agricultural practices and methods (e.g. animal welfare) that safeguard human health?

The selected methodology of the SEA process is a bottom-up approach: given the very broad range of the interventions and their potential to interact with virtually all environmental receptors, each intervention is examined for its potential likely effects on the environment, without “scoping-out” any intervention in advance.

In particular, a detailed-level assessment is carried out by determining the level of significance of the environmental effects for each intervention of the plan. All the interventions are assessed individually against the SEA objectives, identifying those interventions of the plan for which potential adverse or uncertain effects may arise for one or more environmental aspects that would enable to conclude on the possible actions to minimise these effects at their planning stage. The results of this detailed-level stage are used to conclude and document the overall environmental assessment of each intervention type (e.g. basic income support, couple income support, sectoral programmes, eco-schemes, investments, cooperation) and the CAP SP as a whole.

The environmental effects of each intervention are evaluated by taking into account the criteria that are defined in Annex II of the SEA Directive and prescribed in Annex IV of the national legislation (JMD-SEA). The evaluation includes consideration of the duration, frequency, permanence and spatial extent of the effects, which feed into the consideration of magnitude (i.e. the degree of change that the proposed intervention would have on the environment). The criteria applied for the environmental impact assessment of each intervention and their ranking are presented in the table below:

Table 22: Characteristics of the effects for the detailed-level assessment

Characteristics of effects	Ranking of significance	
Probability	!	effect is likely - probable
	!!	effect is very likely - certain
Spatial extent	●	low (<5% of utilised agricultural area, livestock units, rural population, farmers, etc)
	●	medium (5-20% of utilised agricultural area livestock units, rural population, farmers, etc)
	●	high (>20% of utilised agricultural area, livestock units, rural population, farmers, etc)
Duration	>	rather short-term (five years according to the programming period)
	>>	rather long-term (beyond intervention implementation)
Frequency - continuity	OC	temporary - occasional
	CO	continuous - ongoing
Reversibility	↔	reversible
	→	irreversible
Type of impact – magnitude	0	none - neutral - negligible effect
	+, ++	positive, very positive effect
	-, --	negative, very negative effect
	+/-	mixed (positive/negative) effect
	?	uncertain effect

The detailed-level assessment of the likely significant effects of the CAP SP on the environment at intervention level is annexed to this report. The documentation of the assessment of each intervention profile against the SEA objectives is presented in a matrix format accompanied with a descriptive summary of the evaluation results, ascertaining whether the effects are likely positive (beneficial), negative (adverse), neutral, uncertain or encompass mixed effects (positive and negative).

On the basis of the outcomes of the detailed-level assessment, the overall assessment of the potential environmental effects of the CAP SP is realised at the level of intervention type. This documentation is structured by following the architecture of the CAP SP: direct payments, sectoral interventions, and rural development interventions, including the conditionality under GAECs. A set of assessment symbols is used to demonstrate whether the CAP SP is anticipated to have positive, negative, uncertain or mixed effects against each SEA objective. The evaluation may combine certain symbols (e.g. “+/?” when the positive effect is subject to certain uncertain provisions, “+/0” when the positive effects are partially addressed).

Table 23: Symbols for the assessment matrix

++	strong positive effect
+	positive effect
+	minor positive effect
+/-	mixed positive/negative effect
-	negative effect
0	neutral or negligible – not significant effect
?	uncertain effect

In this light, every effort is made to predict the environmental effects of the CAP SP, although this is inherently challenging given the nature and broad intent of the plan and the fact that the precise spatial focus will be determined through its implementation. It is therefore generally recognised that with a plan of this nature, the precise environmental impacts are often depend on the specific projects funded under the CAP SP. This should be noted against the background that the CAP SP formulates funding offers, in the form of interventions, but is not planning any actual projects. These will emerge over the duration of the CAP SP, and hence at this stage full details, particularly regarding project locations and design features, cannot be available. It is stressed that for the infrastructure-related interventions that are likely to have uncertain or adverse effects, a project level assessment is expected to be carried out by the Environmental Impact Assessment (EIA) procedure during the implementation of the plan. For the identified adverse or uncertain effects of the CAP SP on the environment, measures and proposals are addressed to ensure that these effects will be minimized to the extent feasible.

7.1.2 Assessment of conditionality under GAECs

Conditionality aims to contribute to the development of sustainable agriculture through better awareness on the part of beneficiaries of the need to comply with predefined basic requirements concerning environment and climate, public health, plant health and animal welfare. Building on the previous system of cross-compliance, to be implemented until 2022, the system of new conditionality is enhanced and links full receipt of direct payments or annual payments of certain rural development interventions of the CAP SP (ENVCLIM and ANC) to the compliance of farmers and other beneficiaries with basic standards.

The conditionality, as addressed in Annex III of SPR regulation, encompasses a list of statutory management requirements (SMRs) and standards of good agricultural and environmental conditions of land (GAECs).

Since the SMRs already apply directly due to EU and national legislation (i.e. Water Framework Directive, Nitrates Directive, Birds and Habitat Directives, Directive on the Sustainable Use of Pesticides, Food Law Regulation), they are not anticipated to have any additional beneficial effects on the environment and public health, whilst their compliance is expected to be strengthened by the implementation of the CAP SP in the next programming period. To this respect, the assessment of SMRs is out of the scope of the SEA process.

Regarding GAECs, these standards aim to contribute to the mitigation of, and adaptation to, climate change, tackling water challenges, the protection and quality of soil and the protection and quality of biodiversity and landscape. Of particular note is the fact that the majority of GAECs can interact and have synergistic positive effects to other environmental aspects apart from their basic environmental objective, whilst the net positive effect of the interaction of certain GAECs is not necessarily much higher (e.g. GAEC 6 and 8 for soil). Compared to the last programming period, more positive environmental effects are linked to the receipt of direct payments, which could improve the environmental situation compared to the current environmental status. Yet, it should be stressed that the actual implementation of certain GAECs (i.e. GAEC2, GAEC5, GAEC8) presupposes the mapping of the concerned areas or the implementation of background studies of relevance would be carried out promptly. The potential for loss in the intervening period till the finalisation of the territorial mapping is a concern in the absence of mitigation to allow for transitional measures, where required.

Table 24: Assessment of conditionality under GAECs

Type of CAP SP intervention	Climate & energy	Air	Biodiversity & ecosystem services	Landscape	Land uses & material assets	Soil	Water	Waste	Cultural heritage	Population & human health
GAEC1: Maintenance of permanent grassland based on a ratio of permanent grassland in relation to agricultural area	++	0	+	+	+	+	+	0	0	0
GAEC2: Protection of wetland and peatland	++/?	0	++/?	+/?	+/?	+/?	+/?	0	0	0
GAEC3: Ban on burning arable stubble, except for plant health reasons	++	+	+	0	0	+	0	+	0	+
GAEC4: Establishment of buffer strips along water courses	0	0	+	+	+	+	++	0	0	+
GAEC5: Tillage management, reducing the risk of soil degradation and erosion	0	0	+/?	+/?	+/?	++/?	+/?	0	0	+/?
GAEC6: Minimum soil cover to avoid bare soil in periods that are most sensitive	0	0	0	0	0	++	+	0	0	+
GAEC7: Crop rotation in arable land, except for crops growing under water	0	0	+	0	+	++	+	0	0	+
GAEC8: Minimum share devoted to non-productive areas or features	+/?	0	++/?	++/?	+/?	+/?	+/?	0	+/?	0
GAEC9: Ban on converting /ploughing environmentally-sensitive permanent grassland in Natura 2000 sites	+	0	++	++	+	+	+	0	0	0

7.1.3 Assessment of direct payment interventions

Direct payments are the main instrument of income support to Greek farmers under the CAP SP for the next programming period, allocating at least 70% of the EU funding, in the form of decoupled and coupled payments, with the addition of a new form of decoupled direct payments for environmentally and climate friendly farming, the eco-schemes.

Around 80% of direct payments are allocated to payments decoupled from production, and the remaining funding is dedicated to payments coupled to the production targeting on specific sectors and productions important for the viability of the Greek agriculture. The overall aim of those payments is mainly to contribute to the support of long-term food security and agricultural diversity as well as the economic sustainability of agricultural production of the country, incorporating also the support of young farmers setting up for the first time as the head of an agricultural holding. In this light, the major likely effects on the environment from the implementation of the interventions related to direct payments will be the socio-economic benefits to the farmers that would eventually result to the increase of agricultural household income and the support of the rural economic activities relying on agriculture, with opportunities of further business development in rural areas, and with side benefits the sustainment of rural population and the anticipated decrease in the unemployment highly depended on agricultural activities, that could also boost generation renewal of rural population.

Based on the results of the detailed-level environmental assessment analysis, taking also into account the experience of the last programming period implemented till 2022, no particular trends on the positive or negative effects on the environment can be ascertained from the interventions on these direct payments, saving the positive effects on the socio-economic environment and the fact that the uncertain effects of abandonment or conversion of farmland to other land uses are expected to be reduced to the extent feasible. Since the income support for both the decoupled and the couple payments is not linked to productivity but to the farmed area, the interventions do not provide a general incentive for intensification which could cause increase in environmental pressures, whilst not a reduction in the intensity of production can be generally anticipated either. Since the design of these intervention types overall aims at the income viability of the farmers, no particular baseline conditions or requirements are planned for the maintenance or increase in the efficiency of agricultural land uses that would lead to significant benefits on the environment, especially in agricultural areas that existing environmental pressures persist. Yet, the new system of conditionality (SMRs and GAECs) aims to ensure that the major environmental impacts of the agricultural activities that receive direct payments will at least remain unchanged, whilst they could be milder or more moderate, their actual effect though depending highly on the location and spatial distribution of the farmland area. These requirements on direct payments particularly target carbon sequestration, protection of soils, water and biodiversity related measures derived from statutory requirements, protection of surface waters pollution, including measures for the preservation of on farm biodiversity and landscape. It is stressed that farmers are expected to positively respect the requirements of these conditionality measures, since there would be penalties and their payments will be reduced. To this respect, the overall effects of the direct payments on the environment are considered to be predominantly neutral to minor positive.

It is also noticing the fact that the intervention on the complementary income support for young farmers would also include the establishment of new agricultural holdings, encompassing uncertain effects on environmental factors highly interlinked to the type of production, the applied farming practices and the overall efficiency of agricultural land uses, whilst it is of worth noting that the young farmers are

considered to have higher environmental knowledge and awareness and may contribute to the upgrade of old farmlands, whilst the conditionality measures will provide the key environmental requirements for compliance to sustain environmental pressures.

It is additionally underlined that while the coupled income support interventions target income viability for specific sectors facing difficulties, which could cause abandonment of production and could affect other parts of the supply chain, this financial incentive may contribute to the prolongation of specific crop production in areas that are not particularly planned upon baseline agronomic requirements (e.g. climatic conditions, soil conditions, water availability), which may lead to the prolongation of inefficiencies in agricultural land uses and would therefore not support the reduction of existing environmental pressures, especially in areas with environmental degradation trends. This causal effect remains uncertain at the level of its significance, though, the majority of crop sectors would require the application of a certified seed of improved production performance and yields, the crop sectors with the higher share of farmland area seem to have milder environmental pressures (e.g. legume fodder crops, dryland crops) and production is documented to involve generally extensive or semi-extensive farming.

In the transition towards more sustainable systems of agriculture in the next programming period, the conditionality measures are complemented with the eco-schemes that are embedded to direct payments, receiving 25% of their overall funding, in order to reward those farmers who will manage land in a nature- and climate-friendly way, and to incentivize them for taking action towards a more sustainable farm and land management. These interventions, which are designed to go beyond the baseline requirements and serve the Environment and Climate Architecture of the CAP SP, incorporate a list of eight (8) voluntary agricultural practices diverse in their nature and which are overall expected to have definite environmental and climate benefits, focusing on the protection and enhancement of biodiversity, landscape, water, soil and climate, whilst the interrelationships between these environmental factors will also benefit other aspects such as air and public health. The level of uptake of the eco-schemes and the complementarities that could be delivered with the other direct payment interventions are decisive factors to ascertain the overall positive effects of the direct payment envelope.

It is also worth underlying that the level of significance of the effects can vary greatly among the interventions of direct payments, depending on the type of farmland and production (e.g. arable land, permanent grassland, permanent crops), the local environmental and climate conditions, the nature and financial structure of each intervention and their level of uptake. If the eco-scheme interventions are fully utilized and solid synergies are realized with other interventions of the environmental and climate architecture of the CAP SP (e.g. environmental and climate related commitments and investments under rural development), the environmental benefits are expected to be solid and of higher significance.

The overall environmental assessment of direct payments is presented in the table below, taking into account that the results cannot be comparable among the types of interventions, especially when there are significant variations in the objectives set, the types of production and the spatial extent of their implementation.

Table 25: Assessment of direct payment interventions

Type of CAP SP intervention	Climate & energy	Air	Biodiversity & ecosystem services	Landscape	Land uses & material assets	Soil	Water	Waste	Cultural heritage	Population & human health
BISS- Basic income support	+	+	+	+	+/?	+	+	0	0	++
CRIS- Complementary redistributive income support	+	+	+	+	+/?	+	+	0	0	++
CIS-YF- Complementary income support for young farmers	+/?	+/?	+/?	+/?	+/?	+/?	+/?	0	0	++
ECOSCHEMES - Schemes for the climate, the environment and animal welfare	++	+	++	++	+	++	++	+	+	+
CIS- Coupled income support	+	+	+	+	+/?	+	+	0	0	++
CSPC- Crop-specific payment for cotton	+	+	+	+	+/?	+	+	0	0	++

7.1.4 Assessment of sectoral interventions

The sectoral programming of the Greek CAP SP provides interventions in four sectors: fruit and vegetables, apiculture, wine & olive oil and table olives, with a comparatively small budget allocation of around 1.8% of EU funding. The overall goal of these programmes is to increase the sustainability of these sectors, especially by enhancing market orientation and competitiveness, whilst green ambitions have been incorporated to certain interventions, especially to the fruit and vegetables and olive oil and table olives sectors, aiming to serve the environmental and climate objectives of the CAP SP and to be in line with the Farm to Fork strategy.

The eight (8) interventions of the fruit and vegetables sector formulate the set of potential actions under the 3 - 5 year operational programmes that will be submitted for approval by the Producer Organisations. They include investments in tangible and intangible assets, transport and storage improvements, advisory services, training, promotion-communication-marketing actions, strengthening of quality schemes, traceability and certification systems, including market withdrawal (not putting products up for sale) to serve as a market measure to stabilise the event of drop in product prices and thus regain competitiveness. Apart from the overall objective to enhance the viability of the sector, at least 15% of the funding of the operational programmes is geared towards environmental goals, with the planned investments to be specially targeting the reduction of pesticide use, energy and water savings, waste prevention and valorisation, increase of renewable energy use and adaptation to climate change, that are complemented with technical assistance, training and the encouragement of environmental friendly, among others, quality schemes. Their application could deliver positive effects on water, biodiversity and soil, waste, energy and climate, whilst the transfer of knowledge for organic farming, sustainable input management (water, energy, nutrients, pesticides) and other environmental friendly practices along with the promotion of healthy diet to population may contribute to environmental benefits, that though would not be directly reflected during the implementation of the CAP SP. In addition, the majority of the interventions is anticipated to provide with side benefits to the socio-economic environment, since the support of the farmer's economic viability and position to the market would also contribute to the maintenance or even enhancement of the rural economic activities that rely largely on the sector. To this respect, the overall performance of the operational programmes is expected to deliver environmental benefits, saving the new infrastructures (e.g. storage and transport facilities, RES installations, irrigation systems) that may cause environmental pressures in principle more likely, but they can be mitigated since these projects are typically subject to environmental permitting process.

Seven (7) individual interventions structure the sectoral programme of the apiculture sector, which include advisory services, training, investments to protect bee colonies, actions to enhance product quality, including promotion and marketing actions. All these interventions aim at the strengthening of the competitiveness of the sector and the position of the apiculture products to the market that would thereby bring side benefits to population and health, by expecting to contribute to the maintenance of the rural economic activities that rely largely on the apiculture sector and the promotion of the positive health effects of the apiculture products. The two interventions involving investments to protect the bee colonies (surveillance of enemies and diseases and rationalisation of seasonal movement of bee colonies) will have side positive effects on biodiversity, especially the preservation of wild bees and beekeeping flora and the increase of the performance of pollinators. The overall performance of the sectoral programme of the apiculture sector is expected to have predominately neutral effects on the environment, saving the interventions that will benefit the biodiversity and population and health.

The sectoral programme for the wine sector includes five (5) interventions: restructuring and conversion of vineyards, investments, quality systems, promotion and marketing actions, including encouragement of responsible consumption to increase population awareness and green harvesting as a market measure to deal with difficult market situations such as a sudden drop in prices. All these interventions seek to enhance product quality and the position of the wine products to the market and to support competitiveness and economic viability of the sector, especially for the small and medium holdings. Hence, the interventions are anticipated to deliver side benefits to the socio-economic environment since they may eventually contribute to the maintenance of rural economic activities along the supply chain of the sector and support population wellbeing linked to the wise wine consumption behaviours. In addition, the investments on tangible and intangible assets also seek to contribute to water and energy savings and turning by-products to new products, whilst they promote the use/production of renewable energy. The restructuring and conversion of vineyards may support farm resilience to climate change and benefit water resources provided that climate resilient and water efficient crops will be selected, whilst the potential for relocation of vineyards encompasses uncertain effects on landscape and land uses that cannot be assessed ex ante. It is noted that green harvesting, though embedded to SPR regulation, would result to the increase in food losses that though are not considered food waste according to the EU and national legislation. To this respect, the overall performance of the sectoral programme for the wine sector will have predominately neutral or positive effects on the environment.

The sectoral programme of olive oil and olive tables sector has similar objectives, content and anticipated results to the sectoral programme of fruit and vegetable sector and thereby similar effects on the environment. Eight (8) interventions comprise the potential actions of the 3-5 year operational programmes of the Olive Oil Producer Organisations, which cover investments in tangible and intangible assets geared towards environmental goals, transport and storage improvements, advisory services, training, promotion, communication and marketing actions, implementation actions for quality schemes, traceability and certification systems, including the olive tree replanting action for health or phytosanitary reasons or adaptation to climate change. As similarly assessed for the fruit and vegetable sector, the environmental performance of the operational programmes for the olive oil and table olives sector would deliver positive results on the protection of environment, with the exception of the anticipated environmental pressures from new infrastructures that cannot be ruled out but they are typically undergoing the environmental permitting process and thereby would be mitigated to the extent feasible.

To this end, the sectoral interventions would broadly benefit the environment, since they incorporate investments that will seek to enhance the environmental performance of the sectors, majorly linked to energy and water efficiency and waste valorisation actions, including advisory services and transfer of knowledge and information that would increase the environmental awareness of the farmers, whilst the overall performance of the sectoral interventions could provide the impetus to maintain the rural economic activities that are interrelated to these sectors. Any negative or uncertain effects typically arise from the planning of new infrastructure that cannot be ruled out, but can be mitigated provided that these projects are legally obliged to follow environmental permitting process.

It is stressed that the sectoral interventions could act in synergy and complement other interventions of the CAP SP, especially the eco-schemes under direct payments and the environmental and climate-related commitments under rural development, such as organic farming, reduction of the use of pesticides and the application of local crop varieties, that could strengthen the positive environmental effects of the plan. The portfolio of the sectoral interventions also pursues advisory services, technical assistance and training that acts synergistically with similar interventions for rural development. Hence, if these interventions are fully utilized and solid synergies and combinations with other interventions of the

environmental and climate architecture of the CAP SP are efficiently realized, the potential of the addressed environmental benefits is expected to be of higher significance.

The overall environmental assessment of the sectoral programmes is presented in the table below, having regard that the results cannot be comparable among the programmes, especially when there are significant variations in the objectives set, the nature of interventions and the spatial extent of their implementation.

Table 26: Assessment of sectoral interventions

Type of CAP SP intervention	Climate & energy	Air	Biodiversity & ecosystem services	Landscape	Land uses & material assets	Soil	Water	Waste	Cultural heritage	Population & human health
SECTORAL- Sectoral programme for fruit and vegetable sector	+	0	+	0	0	+	+	+	0	+
SECTORAL- Sectoral programme for apiculture sector	0	0	+	0	0	0	0	0	0	+
SECTORAL- Sectoral programme for wine sector	+	0	0	0	0	0	+	+	0	+
SECTORAL- Sectoral programme for olive oil and table olive sector	+	0	+	0	0	+	+	+	0	+

7.1.5 Assessment of rural development interventions

Rural development is the core financing instrument under the CAP SP to strengthen the social, environmental and economic sustainability of the Greek rural areas, aiming to support the competitiveness of agriculture and a more sustainable development of rural economies and communities, anticipating also to contribute to a more sustainable management of natural resources and climate actions that would serve the plan's specific objectives on the environment in the next programming period. The CAP SP's envelope for rural development allocates at least 25% of EU funding to implement 23 interventions in the form of a variety of types and thus a diversity in their likely environmental effects: interventions for environmental, climate-related and other management commitments, natural or other area-specific constraints, investments, setting-up of young farmers and new farmers and rural business start-up, cooperation, and knowledge exchange and dissemination of information.

The interventions for environmental, climate-related and other management commitments that are seven (7) in total and very diverse in their objectives and results are predominately geared towards environmental goals. Since these interventions are part of the Environment and Climate Architecture of the CAP SP, they are subject to the enhanced conditionality system of the plan, whilst their scope is to complement the interventions set for eco-schemes and other environmental related interventions, either sectoral interventions or interventions from other financing instruments set for rural development. Their implementation is anticipated to have positive effects on the environment, especially in relation to biodiversity, water and soil, due to the conversion to organic farming and the reduction of pesticides use that they are expected to be applied at an adequate spatial scale. Side effects and interrelationships between the environmental factors are expected to deliver positive impact on other environmental aspects as well, such as climate, air and public health. For instance, the interventions on forest maintenance and genetic resources can be characterized as measures to preserve biodiversity, but also have positive effects on climate, through carbon sequestration and better adaptation to climate change respectively.

One (1) intervention is addressed for the type of intervention "natural or other area-specific constraints", with the overall objective to compensate farmers in disadvantaged areas resulting in positive effects on the agricultural population and economic activities of those areas, whereas its implementation is also linked to the baseline conditions of the conditionality system, ensuring thus compliance with the main requirements set for the protection of the environment related to agricultural activities. Any negative effects are considered to be negligible or low in their significance, since they can only be expected in exceptional cases and could be avoided locally, whilst the uncertain effects of farmland abandonment or conversion to other land uses will be avoided.

On the other hand, the interventions on investments, eight (8) in total, are not subjected to conditionality, and address a very wide range of topics related to several specific objectives of the CAP SP (e.g. water resources management, road network, competitiveness, safeguarding animal welfare, protection from natural disasters) for the development of rural areas. All the infrastructure-related investments are anticipated to have negative environmental impacts in principle more likely. They may increase significantly land take, disturb species and fragment habitats, cause air pollution or have aesthetic impacts that may deteriorate landscape. Yet, the impacts of those projects are legally obliged to be assessed in the EIA process and thereby compliance with mitigation measures defined in their environmental permits will ensure that the addressed environmental pressures can be reduced to the extent feasible. There are also interventions that aim to contribute to the protection of environment through the rational

management of water resources, the prevention and protection of forest and agricultural against natural disasters, and the enhancement of the environmental performance of the agricultural holdings and the agro-food processing installations. Saving the likely negative impacts related to the establishment of the infrastructures, these interventions are anticipated to have significant positive effects on the environment, especially in regards to the increase of water and energy efficiency, forest protection and restoration and efficient management of agricultural waste by turning it into energy resource. The majority of the investments are also expected to have positive effects on population, either directly or indirectly, since they will contribute to the development of rural economies and communities.

The likely effects of the one (1) intervention that is designed for the setting-up of young farmers and new farmers and rural business start-up are anticipated to be highly positive for population, in that socio-economic benefits would arise from the contribution to the development of local agricultural economy and the generation renewal of agricultural population. On the other hand, the establishment of new agricultural holdings may cause environmental pressures, especially to water resources, soil, air and biodiversity that are closely interlinked to the applied input management (fertilisers, pesticides); these pressures may be milder or minor provided that the young farmers will have increased environmental awareness and apply efficient and environmental-friendly agricultural practices. This intervention is also anticipated to give rise to land use effects that may be positive or negative; the nature and significance of those effects cannot be assessed *ex ante*, since they are strongly related to the type of production that will be applied and the local agronomic and environmental conditions of each individual implementation area.

The three (3) interventions of the financing instrument “cooperation” mostly seek to strengthen the position of the farmers and producers in the market and the agri-food value chain through the participation in collective schemes, the increase of the agricultural product value and the research on the introduction of innovative processes for farming and production practices. Their design is anticipated to support the development of rural economic activities throughout the food supply chain, whilst the intervention on research and knowledge transfer would provide awareness and deeper understanding of farmers and producers on innovative practices and methods that will address various environmental themes (e.g. reduction of fertilisers and pesticides use, water and energy saving, conservation of biodiversity, agriculture waste valorisation); since the outcome of the research and knowledge transfer could have positive environmental impacts only on the long term but with uncertainty on the level of their significance, these interventions are considered to have predominately neutral effects saving the benefits to increasing environmental education of agricultural population. It is also noted that possible negative impacts can be considered partly as of a hypothetical nature, but they cannot be entirely ruled out. For instance, the business plan of the collective schemes may deliver environmental benefits that are linked to the Farm to Fork strategy targets, yet a business optimisation may theoretically cause negative impacts at the expense of the environmental characteristics of certain areas.

Cooperation also includes one (1) intervention that supports community-led local development of rural areas, referred to as LEADER, with themes that may deliver significant environmental benefits at strategic level, such as tackling climate change, sufficient waste and water management, and promotion of cultural heritage, but uncertain to their probable environmental impact since the selection of the projects is subject to the local development strategies that will be developed, and thus the spectrum of their effects is expected to be significantly diverse. As stands for the other interventions under cooperation, possible negative impacts from the implementation of LEADER cannot be ruled out.

Rural development also encompasses the financing instrument on knowledge exchange and dissemination of information, with two (2) interventions for education and advisory services to farmers and other stakeholders, covering almost all of the CAP SP's specific objectives, and which are designed to also support training on various thematic areas on the environment and sustainable agriculture. As such, both interventions are anticipated to serve in the increase of environmental awareness and education, while their actual environmental impact is considered to be neutral during the implementation of the plan, since no actual switch to more environment friendly agricultural practices can be directly realised, yet these benefits would eventually have long term results.

To this end, the rural development envelope is anticipated to provide environmental benefits to rural areas since it will boost environmental protection and will contribute to maintaining the countryside and population welfare as well as support rural economy growth. On the other hand, there are interventions involving the establishment of infrastructures that will cause environmental pressures with mixed effects and uncertain on the level of their significance, but which can be eventually mitigated to the extent feasible provided that these projects are subject to environmental permitting process.

It is stressed that the level of significance of the aforementioned effects can vary greatly among the interventions due to the high diversity of the nature, content and expected outcomes of their application, but also the local environmental conditions, the spatial extent and their level of uptake. If the environmental related interventions are fully utilized and solid synergies and combinations with other interventions of the environmental and climate architecture of the CAP SP are efficiently realized, the addressed environmental benefits are expected to be of much higher significance.

The overall environmental assessment of interventions for rural development is presented in the table below, taking into account that the results cannot be comparable among the intervention types, especially when there are significant variations in the key objectives of the interventions, the types of production and the spatial extent of their implementation.

Table 27: Assessment of rural development interventions

Type of CAP SP intervention	Climate & energy	Air	Biodiversity & ecosystem services	Landscape	Land uses & material assets	Soil	Water	Waste	Cultural heritage	Population & human health
ENVCLIM-Environmental, climate-related & other management commitments	+	+	++	+	+	++	++	+	+	+
ANC- Natural or other area-specific constraints	+	0	+	+	+	0	0	0	0	++
INVEST- Investments, including investments in irrigation	+/-	+/-	+/-	+/-	+/-	+/-	+/-	+	0	++
INSTAL- Setting up of young farmers & new farmers & rural business start-up	+/-	+/-	+/-	+/-	?	+/-	+/-	0	0	++
COOP- Cooperation	0/?	0/?	0/?	0/?	0/?	0/?	0/?	0/?	0/?	++
KNOW- Knowledge exchange and dissemination of information	0	0	0	0	0	0	0	0	0	+

7.1.6 Anticipated cumulative effects

This section analyses the potential cumulative effects on the environment as a result of implementation of the interventions planned in the CAP SP, having regard to the fact that the effects of the interventions may be insignificant individually but they may interact with each other or act synergistically, positively or negatively, or may even result in the cancellation or reduction of certain positive or negative environmental impacts. Taking into account that the precise and conclusive assessment of those cumulative effects will be actually realised at project level since these effects are highly depended on the baseline conditions, trends and planning at local level, the essential focus is to identify and evaluate the CAP SP's internal interactions that may cause cumulative effects on the environment.

In general, the architecture of the CAP SP itself is originally designed to support synergies and complementarities emerging from the flexibility and high potential of combination of interventions and conditions set in the plan. At strategic level, the CAP SP is anticipated to have significant overall cumulative effects on the enhancement of the socio-economic environment with a high combination and positive interaction potential of its wide range of intervention types under both pillars (direct payments, sectoral interventions and rural development), since the bulk of the CAP SP's funding aims to support viable farm income and competitiveness, to improve farmer's position in the value chain, to increase regeneration renewal of farmers and to strengthen local development in rural areas.

In regards to the protection of the environment, the overall plan of the new CAP to bolster environmental care and climate action is already embedded into the specific objectives of the CAP SP that are closely linked to the SEA objectives themselves, which has been designed by taking into account that these objectives must be served by the interventions of both pillars of the plan, seeking thus to increase the synergies or otherwise induce a wider range of actions in pursuit of these objectives. This is actually reflected in the Environmental and Climate Architecture of the CAP SP, which is built upon the mandatory measures on environment/climate (conditionality system), the voluntary interventions of the eco-schemes in direct payments (pillar I) and the voluntary interventions of environment and climate-related commitments in rural development (pillar II), which are combined with certain sectoral interventions (pillar I) and other intervention types in rural development (pillar II) and all together seek to respond to a higher protection of the environment and/ or deliver more solid environmental benefits.

The interventions that are mainly geared towards environment goals may complement each other or interact synergistically, since they overall focus on the reduction of the environmental pressures emerging from the agricultural practices as well as on the transition to a more sustainable agriculture, agri-food sector and rural development. The anticipated results of a variety of interventions can trigger positively various environmental areas and support the fulfillment of the SEA objectives, and could be considered to have multi-directed environmental targets and/ or interactions, while their combinations have the potential to provide with greater benefits towards the protection of the environment. For instance, the intervention on the maintenance of agricultural land under organic farming (eco-scheme) in combination with the intervention of conversion of organic farming (environment and climate related commitment) would assist in the increase of organic farming of the country and deliver positive results to various environmental areas (e.g. water, biodiversity, soil, air, climate); these interventions have the potential to be complemented by various interventions that promote organic farming directly (e.g. advisory services, training, knowledge exchange, research actions) or indirectly (being optional eligible criteria for beneficiaries, promoting certification of organic products through the implementation of quality schemes) and may thus deliver more concrete beneficial results on the environment. Another example is the reduction in the use of harmful to environment pesticides and the support of environmental-friendly and

safer pest control techniques that may act synergistically with interventions of a lot of instruments (e.g. eco-schemes, environmental commitments, investments, sectoral interventions), which would cause positive effects on water quality, biodiversity and soil health, but also on air quality and human health. Similar synergistic effects may be emerged by interventions on better nutrient management, either directly through par example precision farming techniques or indirectly by actions that would need lower demands in fertilisers, whilst there are interventions addressing climate action related results that would also interact positively to biodiversity and other environmental areas and vice versa (e.g. application of climate resilient crops, maintenance or protection of afforested and agro-forested areas, enhancement of environmental status of permanent grasslands). It is though highlighted that the level of significance of the potential of these positive cumulative effects is highly depended on the localized environmental conditions, the interventions selected and the level and scale of uptake by the farmers and other beneficiaries.

On the other hand, there are intervention types, emerging mostly from coupled and decoupled payments, with uncertain land use effects, and which have a potential to prolong the existing environmental pressures on biodiversity, water, soil and landscape, etc, especially in the areas that are considered environmentally stressed or have degradation trends. The interactions in the combination and spatial application and scale of these intervention types may intensify these pressures, whilst their level of significance is interrelated to the types and scale of agricultural land uses, the applied agricultural practices, and the baseline environmental conditions, taking also into consideration that the intensification of agricultural production cannot be ruled out. The mandatory measures (conditionality system), in linking support to farmers to their environmental behavior for applying these intervention types, are expected to interact with each other positively at strategic level and lessen these possible adverse effects, at least for the key environmental issues highly interlinked to agriculture: climate, water, soil, biodiversity and landscape. The case of combination of the interventions under coupled and decoupled payments with interventions in eco-schemes, environment and climate-related commitments and other intervention types geared towards environmental goals could act synergistically and deliver significant opportunities and potentials to reduce these environmental pressures.

Negative interactions may arise from certain intervention types for rural development (i.e. investments, younger farmers start up and Leader) that mostly refer to infrastructure-related projects that do not necessarily pursue environmental objectives (e.g. road networks, building facilities, irrigation infrastructure, relocation of or new farming holdings), which may increase land take and trigger environmental pressures (emissions, habitat fragmentation effects, soil compaction, biodiversity loss, pressures from increased populated areas). The possibility of cumulative effects cannot be ruled out, but cannot be actually assessed ex ante, since these effects are strongly depended on the location and the spatial extent of their application in closed link to possible interactions of other intervention types; nevertheless, these effects are regarded to be of rather localized nature.

Since agricultural uses and types of production vary greatly among regions of the country, while existing environmental pressures are rather localized issues with usually wide differences in the regions as well, the level of significance and the nature of the cumulative effects is practically linked to the nature and placement of the interventions, and are highly subject to the interactions of the selection and combination of this wide range of intervention types of the CAP SP along with the actual scale of their uptake. The level of uptake of the interventions that are geared over environment goals will also play a significant role in the actual environmental impact of the cumulative effects from the implementation of the CAP SP. The high uptake of interventions attributed to mitigating environment is a decisive factor for a higher or more effective environmental mitigation potential. Conversely, the low or partial uptake in those voluntary

interventions that incorporate environmental actions may have less effective actual effects on reversing the environmental pressures of agricultural practices and rural development and thus the overall environmental positive impact of the CAP SP to be eventually rather marginal.

In this light, there is a complexity of possible positive or negative interactions, which are influenced not only by the basic architecture of the CAP SP, but also by the actual implementation of the plan. Despite the increased environmental and climate ambition of the CAP SP compared to the last programming period, synergies and interactions of the interventions that would bring co or cross cutting benefits are strongly associated with the participation and the actual incentivisation of the beneficiaries to adopt environmental-related interventions, especially in combination with the direct payments to underpin the minimum environmental requirements derived from the enhanced conditionality system. The promotion of interventions in the right place, especially in alignment with spatial-oriented environmental goals emerging from the national plans closely linked to the CAP SP, together with the effective coordination and monitoring of the environmental performance of the CAP SP, could respond to more positive environmental effects and the capturing of corrective actions should adverse cumulative effects arise.

7.1.7 Overall assessment

This section presents the overall assessment of the significant likely effects on the environment from the implementation of the CAP SP, that is built upon, with increased flexibility to set up, the combination of types of intervention in the form of direct payments, types of intervention in selected sectors and types of intervention for rural development. Responding to the CAP objectives and planning for the next programming period, the CAP SP for Greece has incorporated an Environmental and Climate Architecture that is devoted to integrate the requirements of EU and national environmental policy in agriculture and rural development, especially in relation to the environmental targets emerged from the European Green Deal and its associated strategies. As mandated by the SPR regulation, this “green” architecture sets out the minimum environmental obligations with a set of enhanced conditionality measures for the area-based interventions, in the form of direct payments and certain intervention types for rural development, and makes use of both pillars together for setting up incentive-based interventions geared towards the strategic plan’s environmental and climate objectives with actions that go beyond the conditionality measures (eco-schemes in pillar I and environment and climate-related commitments in pillar II); this architecture is also strengthened by various intervention types for rural development, including the sectoral interventions, that provide with an increased potential for a better environmental performance of the CAP SP. To this respect, the environmental and climate architecture of the CAP responds to and is in broader terms in alignment with the majority of the SEA objectives. It is noted that these interventions may either complement each other, interact or act synergistically that would have a potential for greater environmental benefits emerged from the CAP SP as a whole. The level of uptake together with the spatial scale and application of these interventions are decisive factors for the actual positive effects of the plan. At strategic level, significant negative effects are largely avoided or not actively promoted, while uncertain or adverse effects on certain environmental aspects cannot be ruled out and are mostly emerged from interventions that do not exclusively pursue environmental objectives or are linked to infrastructure-related projects that reflect the anticipated side effects of agriculture and rural development and which are usually of localised nature and typically subject to environmental permitting process. In this light, the significant environmental effects emerged by the implementation of the CAP SP are outlined against each SEA objective as follows:

Climate and energy: The needs that are addressed by the CAP SP have been drawn up by taking also into consideration the mainstreaming of the national climate and energy policy into the plan. The Environmental and Climate Architecture of the CAP strategic plan serves the plan's specific objective to support climate change mitigation and adaptation, as well as sustainable energy (referred to as SO4), which is in alignment with the SEA objective. The set of conditionality measures to tackle climate change will support the preservation of carbon stock, the protection of carbon-rich soils and the maintenance of soil organic matter for the agricultural areas that will receive direct payments, including the environmental related commitments and areas with natural constraints under the rural development instrument. In addition, there are interventions going beyond the baseline conditions, which support climate change mitigation mostly through the maintenance or enhancement of carbon sequestration, which is enriched with actions for the transition to a more sustainable energy use, by the contribution to the increase in energy savings from the agricultural holdings and agro-food processing facilities, including the encouragement of the use or production of renewable energy, primarily by making use of agricultural waste as an energy resource. The various interventions that contribute to the lower use of nitrogen fertilisers, together with the optimization of animals dietary, would also act positively in the reduction of GHG emissions. The support to climate change adaptation actions focuses on the application of more climate resilient species for crop or animal production, by making use of local species or the encouragement of the use of genetic resources, whilst there are interventions dedicated to protect agricultural holdings and forest areas against nature disasters and to restore burnt forest areas. The interventions that contribute to the better use of water resources (e.g. improvement of irrigation systems, water savings, making use of treated wastewater) and the protection from soil erosion (e.g. application of GAEC5, improvement of environmental status of pasture areas, agricultural areas) would also respond to agricultural areas to better adapt to climate change, whilst the protection/ prevention from flood risk events is partially addressed by the CAP SP through the water runoff reservoir projects and the rehabilitation of drainage networks as part of the irrigation systems. Uncertain or negative effects are anticipated due to the potential of GHG emissions arising that may result in principle from the establishment of new agricultural holdings, transport and other facilities in rural areas that are also associated with the potential increase in energy demands, which cannot be ruled out and are considered as inevitable side effects of the interventions that aim at agricultural and rural development. The establishment of a solid coordination mechanism with the actions set by the National Climate and Energy Plan and the forthcoming Regional Climate Change Adaptation Plans could favour the climate performance of the CAP SP.

Air: Despite the fact that sustainable and efficient air management is part of a specific objective of the CAP SP (referred to as SO5), no particularly needs on the improvement of air quality have been defined and addressed by the CAP SP. Nevertheless, the Environment and Climate Architecture of the plan is anticipated to contribute positively to the maintenance or enhancement of air quality due mainly to the conditionality measures and the various interventions targeting the sustainable or reduction in the use of fertilisers and pesticides (e.g. precise farming techniques, optimisation of dietary management of livestock, organic farming, lower demands or banning in the use of pesticides and fertilisers, environmental friendly pest control techniques). Since the CAP SP also includes interventions that target the strengthening of agricultural and rural development, the projects involved with the establishment or upgrade of agricultural and agro-food processing facilities and rural road networks are anticipated to give rise to air emissions in principle; the negative effects to air quality in rural areas are considered of rather localized nature and are typically anticipated to be assessed under the environmental permitting process of the planned projects. Since there is a stable decreasing trend in ammonia emissions from agriculture in the last five years, any potential increase in ammonia emissions from the new or existing agricultural holdings is not anticipated to have adverse effects on achieving the national target by 2030, provided that

an effective environmental monitoring of the CAP SP has been ascertained and in close coordination with the actions set out by the National Air Pollution Control Programme; special attention would be needed to the interventions related to animal production farming since relative actions on manure management to reduce ammonia emissions are not addressed by the CAP SP.

Biodiversity and ecosystem services: There are several needs identified for the contribution to the preservation of biodiversity, the reduction of the pressures from agricultural activities and the protection of forest areas, taking into account the EU and national biodiversity strategy and the national strategy for forests. These needs are addressed by the CAP SP with interventions that form part of its Environmental and Climate Architecture, aiming to contribute to the plan's specific objective on biodiversity (referred to as SO6) that is in principle in line with the SEA objective. The set of conditionality measures support the conservation of protected species and habitats and the improvement of on-farm biodiversity through a share devoted to non-productive areas for the agricultural areas that will receive direct payments. There are also various interventions in this "green" architecture going beyond the baseline conditions that are expected to enrich the protection of biodiversity, usually together with actions on the protection of agricultural landscape and genetic resources. This support is enhanced by other interventions that have rather multi-directed environmental goals, such as organic farming, actions on the lower use of pesticides and safer pest control techniques, and the increase in the environmental status of permanent pasture lands. The protection of forest ecosystems is mainly realized by interventions geared towards the maintenance and protection of forest areas against natural disasters. The enhancement of ecosystem services is not particularly addressed by the CAP SP, whilst it may be supported indirectly, par example through the promotion of nature-based solutions to climate change adaptation (e.g. application of local varieties) and mitigation (e.g. enhancement of permanent pasture areas) and the making use of nature as instrument and aim through organic farming and the function of farmland for the preservation of protected wildlife birds. Uncertain or negative effects on biodiversity may arise in principle mostly from intervention types for rural development (i.e. investments, younger farmers start up and Leader) that incorporate infrastructure-related projects that do not necessarily pursue environmental objectives (e.g. road networks, building facilities, irrigation infrastructure, relocation of or new farming holdings) and could result to habitat fragmentation effects and biodiversity loss. These effects are majorly of localized nature that can be mitigated through the EIA process for the planned projects, whilst the environmental monitoring of the CAP SP can ascertain that possible cumulative effects could be avoided to the extent possible, having also particular consideration to the conservation status of the agricultural and forest lands under protected areas and the conditions set by the Natura 2000 management and pasture management plans. In addition, the establishment of a coordination mechanism with the PAF post 2020 may further underpin the support and lessen any likely adverse effects on biodiversity, whilst the environmental monitoring mechanism for the implementation of the CAP SP would better plan the interventions in the right place that will be more beneficial to biodiversity and ecosystem services.

Landscape: The protection of landscape is incorporated together with the preservation of biodiversity in the specific objective of the CAP SP (referred to as SO6) and is in alignment with the SEA objective. Similar to the biodiversity-related actions, the protection and enhancement of agricultural landscape features are supported by various interventions of the Environmental and Climate Architecture of the plan, the main of which is the conditionality measure for the maintenance of non-productive features that is linked to the receipt of direct payments, complemented by incentive-based interventions on the extension of ecological focus areas, the protection of agroforestry ecosystems rich in landscape elements, the prolongation of the protection of two traditional rural landscape areas of high nature value, including the preservation of farmlands with terraces. All these interventions will also benefit rural landscape heritage, whilst there are interventions that will indirectly support or interact positively towards the maintenance

of landscape, such as those that will contribute to the reduction of uncertain effects from the possible abandonment or conversion of farmlands, the maintenance or increase in organic farming, the promotion of local varieties /traditional farming methods and the maintenance or enhancement of permanent pasture lands. Uncertain effects arise in principle from the anticipated new infrastructures that would support agriculture and rural areas development and are likely to disturb rural landscapes; these effects are rather of localized nature and are typically assessed through the EIA process for the planned projects. The monitoring of the CAP SP may further enhance its environmental performance and be beneficial to both the agricultural and rural landscape elements.

Land uses and material assets: The likely significant effects on land uses are majorly anticipated from the types of interventions for direct payments related to farmer's income support. On one hand the uncertain effects of abandonment or conversion of farmland to other land uses are expected to be avoided, whilst, on the other hand, no particular baseline agronomic conditions are planned for the maintenance or increase in the efficiency of agricultural land uses that would lead to significant benefits on the environment, especially in agricultural areas that existing environmental pressures persist. Yet, the set of conditionality measures aim to ensure that the major environmental impacts of the agricultural activities that receive direct payments will at least remain unchanged, whilst their actual effect could be milder or more moderate, depending though highly on the location and spatial distribution of the farmland area. In addition, the interventions for rural development will give rise to land take, which is considered an inevitable side effect of agricultural and rural development that would majorly be mitigated through the environmental permitting process of the planned projects. Finally, the various interventions that support water and energy savings and waste valorisation practices together with the land improvement infrastructure projects for meeting irrigation needs and enhancing irrigation efficiency in agricultural areas are regarded to be beneficial to material assets. The establishment of an effective environmental monitoring mechanism for the planned interventions of the CAP SP that would provide with the means to direct them in the right place may support the maintenance or even the increase in the efficiency of agricultural land uses.

Soil: Fostering the sustainable and efficient soil management is part of a specific objective of the CAP SP (referred to as SO5) in alignment with the respective SEA objective in principle. The corresponding needs are addressed by the plan's Environmental and Climate Architecture with a set of conditionality measures linked to the farmer's income support, attributed to land management conditions to limit the risk of soil degradation and erosion, the preservation of soil potential and the maintenance of soil organic matter. The conditionality measures are complemented by the interventions going beyond the conditionality system that primarily seek to contribute to the protection of soil from erosion in permanent grasslands and certain types of agricultural areas (e.g. agricultural areas with terraces). The "green" architecture also includes interventions that would act positively to the preservation or enhancement of soil health, such as organic farming, the rational nutrient management, the extension of ecological focus areas, the conservation of agro-forestry ecosystems and the maintenance of forest areas. Uncertain or adverse effects may arise from the anticipated new infrastructures for rural development due mainly to the soil compaction (e.g. road networks, building facilities, new or upgrading of agricultural and agro-food processing installations) that are considered inevitable side affects of agricultural and rural development; these effects are of localized nature that are assessed during the EIA process of the planned projects. It is additionally highlighted that the establishment of an effective monitoring of the CAP SP is capable to provide with the necessary information to direct the implementation of the interventions in the right place that would respond to greater environmental benefits and thus a more effective soil management in agricultural areas.

Water: There are specific needs for the contribution to the sustainable and efficient management of water resources that seek to achieve the specific objective of the CAP SP (referred to as SO5) in closed link to the corresponding SEA objective, by taking also into consideration the River Basin Management Plans and the Flood Risk Management Plans. These needs are addressed by the CAP SP under its Environmental and Climate Architecture that deliver the conditionality measures to control pollution caused by nutrients (nitrates and phosphates) and pesticides and runoff pollution of river courses from the agricultural areas that receive direct payments. These measures are complemented by a variety of interventions that seek for a better nutrient management and a more sustainable use of pesticides (e.g. optimization of nutrient management through precision farming techniques, organic farming, crops with lower demands of nutrients and pesticides, environmental friendly pest control techniques, banning of pesticides use in certain agricultural areas). There are also various interventions attributing to a better water resources management by supporting water savings in agricultural holdings and/or agro-food processing installations and planning of infrastructures that would enhance the irrigation systems efficiency either at farm level or at a greater spacial scale, which would encourage wastewater reuse and the use of water runoff (water reservoirs) instead of groundwater resources. The support to flood risk protection/prevention is addressed under the public irrigation investments through the construction of water runoff reservoirs and the restoration of drainage networks that accompany the irrigation systems. The adverse effects that may arise from the anticipated increase in irrigation areas, including the spacial scale and extent of these effects, are anticipated to be avoided to the extent feasible, since specific conditions are drawn up by taking into account the river basin status and the overall planning to be compatible with the River Basin Management Plans. Uncertain or adverse effects on water may arise in principle mostly from intervention types for rural development (i.e. investments, younger farmers start up and Leader) that do not necessarily pursue environmental objectives (e.g. relocation of or new farming holdings, facilities and establishments for local rural development) and could result to water stress or pressures to water quality. The effects that are of localized nature can be mitigated through the EIA process for the planned projects, whilst the environmental monitoring of the CAP SP can allow that possible cumulative effects on water could be avoided to the extent possible and can direct the planning of interventions in the right place, whilst a coordination mechanism with the implementation of the relevant plans (e.g. River Basin Management Plans, Action Programme for Nitrate Vulnerable Areas, National Action Plan for Sustainable Use of Pesticides) may further underpin the contribution or lessen potential adverse effects of the CAP SP on water resources.

Waste: The needs addressing the promotion of bioeconomy and food waste prevention are specific areas that are covered by two individual specific objectives of the CAP SP (referred to as SO8 and SO9), which are in alignment of the SEA objective towards the integration of agricultural waste management / reduction and turning food waste into a resource. Responding to these needs, interventions are drawn up by encouraging investments on the valorisation of agricultural waste and agro-food processing by-products into valuable resources on the basis of the bioeconomy/ circular economy context, giving special attention to waste-to-energy installations that in parallel underpin the production and use of renewable energy. Waste reduction is also encouraged without particularly addressing food waste; yet, the withdrawal market measure for the fruit and vegetable sector contributes to food waste prevention through redistribution to human consumption or else to other destinations (animal feed or reprocessing into non-food products), whilst the actions on agricultural and agri-food processing waste benefit the turning food waste into a resource. It is noted that the market measure on green harvesting for the wine sector is anticipated to give rise to food losses, that though is not regarded as food waste according to EU and national legislation. At strategic level, the CAP SP is expected to be beneficial towards an integrated management of waste derived from agriculture and agro-food processing sector, whilst the likely

coordination with the implementation of relevant actions set out by the National Waste Management Plan and the National Waste Prevention Programme could provide greater benefits.

Cultural heritage: Despite the fact that no particular needs are addressed by the CAP SP towards the maintenance and enhancement of cultural heritage in rural areas due to the nature of the strategic plan, there are certain interventions that may contribute to the protection of intangible cultural heritage, the main of which are the protection of two rural landscapes of high nature value (traditional olive orchards in Amfissa and ancient vineyards in Thira) and the support of traditional agricultural features of high aesthetic value in mountain and other areas of natural constraints. In addition, the interventions under cooperation, especially LEADER through its local management strategies, can support actions that would promote local cultural heritage, though the actual effects cannot be assessed ex ante. The farmer's income support and other investments are also expected to reduce the uncertain effects of land uses conversion or abandonment on cultural heritage, whilst uncertain effects from the new infrastructures in rural areas cannot be ruled out, including the probable relocation of vineyards and other agricultural areas that could be regarded to be of intangible cultural value. The environmental permitting process for the planned projects along with the monitoring mechanism of the CAP SP is expected to support the maintenance of cultural heritage and reduce any uncertain or adverse effects that may emerge to the extent feasible.

Population & human health: There are several specific objectives of the CAP SP that would benefit the SEA objective on population and human health (referred to as SO1, SO2, SO3, SO7, SO8 and SO9), either directly or indirectly. The farmer's income support under direct payments is anticipated to contribute to the increase of agricultural household income and thus would provide the means for the enhancement of quality of life for agricultural population, whilst it will support the sustainment of rural population and economic activities relying largely on agriculture. The interventions targeting the young farmers and the facilitation of business development in rural areas are expected to increase the number of new farmers and jobs in rural areas, whilst they will contribute to the enhancement of local agricultural economy and the generation renewal of agricultural population, especially in mountainous and sparsely populated areas. The various interventions that respond to the support of advisory services, technical assistance, training, research, cooperation and knowledge exchange, encompass the education of farmers and other beneficiaries in various thematic areas that would support the protection of environment, such as the rational input management (fertilisers, pesticides), water and energy savings, bioeconomy and circular economy, conservation of biodiversity and landscape and tackling adverse effects of climate change. The anticipated increase in the environmental awareness and training of farmers and other beneficiaries may also act synergistically or interact with other interventions and deliver greater benefits to other SEA objectives or provide potentials to reduce adverse effects that may arise. Regarding human health, the interventions that seek to more environmental-friendly agricultural practices, especially the lower use of pesticides / application of safer pest control techniques, along with interventions for the improvement of animal welfare and the marketing/ promotion/ awareness over healthy diet will be beneficial to human health. Uncertain effects may arise from the interventions that do not target environment goals or are linked to infrastructure-related projects; these effects are anticipated to be avoided by the EIA process for the planned projects and the environmental monitoring of the CAP SP.

7.2 Measures and recommendations to minimise likely adverse effects on the environment

The overall appraisal of the effects of the CAP SP for Greece on the environment is positive with a few likely adverse effects that are mostly related to the establishment of new infrastructures that are regarded as localized side effects of agricultural and rural development, while there are still opportunities for enlarging the already identified environmental benefits of the CAP SP that could minimize the uncertain effects closely linked to the efficiency of agricultural land uses and could boost the incentivization of beneficiaries towards a higher environmental protection. In this light, the consideration of measures and recommendations to prevent, reduce and as fully as possible offset any significant adverse effects on the environment of implementing the CAP SP of Greece is complemented by proposals to optimize the anticipated positive effects of the CAP SP with the aim to enhance its overall environmental performance for the next programming period.

➤ *Measures and recommendations to minimise significant adverse effects on the environment*

The addressed measures are built upon the mechanisms already in place for the protection of the environment that are relevant to the implementation of the CAP SP: (a) the planned control and penalty system for the beneficiaries of the interventions that are linked to conditionality measures on the protection of environment (SMRs and GAECs), (b) the environmental permitting process that must be followed by the beneficiaries for those interventions that involve projects and activities pursuant to the provisions of Law 4014/2011 (OGG A' 209), and (c) the planned monitoring mechanism of the implementation of the CAP SP, that will evaluate the progress towards the achievement of the environment and climate-related objectives over the whole CAP SP period and identify needs for remedial actions, incorporating for that purpose a core set on environmental indicators already lead down in Annex I of Regulation (EU) 2021/2115.

In order to minimise any likely adverse environmental effects for all new agricultural activities, changes in agricultural activities or management practices that are not subject to environmental permitting process and do not pursue environmental objectives, the following measures need to be sufficiently realised:

- compliance with local spatial planning and provisions of the relevant national environmental legislation, taking into account the specific conditions set out by the statutory plans for the concerned areas (e.g. action programme for the nitrate vulnerable areas, river basin management plans, statutory specific environmental studies, Natura 2000 management plans, pasture management plans)
- provision of tailored-made technical assistance/ advisory services, where required, that would enable to respond to high environmental protection, with particular consideration of applications on environmentally stressed areas or areas with environmental degradation trends that are closely interrelated to agricultural activities
- provision of dedicated understanding and training to farmers or other beneficiaries on the environment, addressing key environmental challenges facing agriculture, especially water, soil, biodiversity, landscape and climate change

The above measures are complemented by recommendations and guidelines to support the implementation of interventions in the right place and pursue the most appropriate measures in the most appropriate places, focusing on the interventions that do not target environmental purposes or are not connected with environmental- related restoration activities:

- Assessment of the potential to prioritise applications with lower land use effects on the environment or better efficiency in agricultural land uses, especially in relation to the effects and the interactions on water, soil, biodiversity, landscape and climate change.
- Consideration of the national strategic priorities stipulated in Law 2742/1999 (A' 207) on strategic spatial planning, related to agriculture and rural development, for high productivity rural areas, suburban rural areas and mountainous and semi-mountainous areas, including insular areas with a rural character.
- Consideration of the existing environmental situation in the approval process at regional level, e.g. in nitrate vulnerable areas, water stressed areas, protected areas with species or habitats with unfavorable conservation status or decreasing trends, etc, and the cohesion with the planned actions for the concerned areas emerging from relevant plans and programmes.
- Consideration of incorporation of minimum environmental standards or targets as requirements for the applicants in environmentally stressed areas or areas with environmental degradation trends; these standards or targets should be sought by priority to be achieved with the CAP SP's interventions that pursue environmental purposes.
- Establishment of a governmental coordination mechanism to effectively liaise with the competent authorities in charge of implementing the actions of the national/regional plans and programmes of high relevance, especially those derived from Annex XIII of Regulation (EU) 2021/2115; the applications that contribute to the achievement of these actions should be prioritised.
- The CAP SP's monitoring mechanism should allow an annual assessment of the significant environmental effects of the plan; the outcome of the assessment should be used to (a) conclude on the annual environmental performance of the plan in quantitative terms and remark possibilities and opportunities of improvements to achieve the stated environmental and climate related objectives of the plan, (b) direct the planning of the interventions in the right place to contribute to a higher environmental protection and (c) enable corrective actions where required, especially when cumulative adverse environmental effects may arise.

➤ ***Proposals to increase the environmental benefits of the plan***

Having regard to the fact that the level of significance of the positive effects that are anticipated from the Environmental and Climate Architecture of the CAP SP practically depends on the level of uptake and the synergies that could be sought among the various interventions geared towards environmental goals, but also on the type of agricultural and rural activities and the local environmental conditions, the following proposals and recommendations are suggested to boost the environmental benefits of the CAP SP to the extent feasible:

- Apply a steering mechanism to incentivize the beneficiaries over environmental targets and increase the level of uptake of interventions that pursue environmental purposes; establish a help desk devoted to candidate beneficiaries for the opportunities and possibilities embedded in the interventions of the Environmental and Climate Architecture of the CAP SP (e.g. eco-schemes,

environmental and climate-related commitments) and the available combinations of interventions that are best applicable and feasible to the beneficiaries.

- Assess the potential to reward farmers and other beneficiaries (e.g. through the introduction of bonus payments) for:
 - o a minimum set of environmental actions that are based on pre-defined environmental target values, tailored made to the needs and consistent with the planned actions of the concerned areas
 - o the use of best applicable techniques and practices with the lower environmental impact
 - o long-term actions on the environment, beyond the programming period of the CAP SP
- Explore the possibilities of delivering a spatial focus in the monitoring of the CAP SP that would best direct the planning of interventions in the right place, by capturing and making use of spatial data, where available, especially in relation to quantitative and qualitative status of water resources, soil and climatic data and status of protected species and habitats.
- Assess the potential to make prerequisite to advisors and trainers to make use of scientific literature and official studies on the direct and indirect environmental impacts of agricultural activities, to deliver, encourage and direct best available agricultural practices and to preliminary document broad practical solutions, especially in areas that are under Natura 2000 sites, nitrate vulnerable zones or other environmentally sensitive/ stressed areas; all the documentation could be also made available on a dedicated web-repository for all beneficiaries.

7.3 Environmental monitoring system

The monitoring of the significant environmental effects of the implementation of the CAP SP is a requirement of the SEA process, as mandated in article 9 of SEA-JMD, in order, inter alia, to identify at an early-stage unforeseen adverse effects, and to be able to undertake appropriate remedial action. The design of the environmental monitoring system is built upon the monitoring requirements and arrangements that are established as part of the CAP SP implementation for the next programming period to avoid duplication of monitoring and to minimize administrative burdens. The environmental monitoring features are specified in principle on the basis of the significant environmental issues that were identified through the strategic environmental assessment process.

The Regulation (EU) 2021/2115 provides for a comprehensive system for the regular monitoring of the implementation and of progress towards the established targets of the CAP SP for the next programming period by requiring a performance, monitoring and evaluation framework for the plan. As part of this monitoring framework, the progress towards the achievement of the specific objectives over the whole CAP SP period will be monitored annually by using for that purpose a set of common output, result, impact and context indicators, already laid down in Annex I of the abovementioned regulation, and which include an extensive number of environmental impact indicators. Since these environmental impact indicators are linked to the key environmental impact issues identified in the environmental assessment analysis, they will form the basis for the environmental monitoring system that is proposed to be enhanced accordingly, where required.

The responsibility for the monitoring of the effectiveness of the implementation of the CAP SP is shared between the national Managing Authority and the national Monitoring Committee that will be set up for that purpose. The Managing Authority in collaboration with OPEKEPE, the Accredited Paying Authority,

will realise the required arrangements and programming for the regular data collection from various authorities, agencies and other external sources, that will be used for the monitoring and evaluation of the CAP SP and will proceed to all necessary administrative agreements, where required (e.g. Hellenic Statistical Authority, Ministry of Environment and Energy, etc.). The monitoring mechanism also incorporates all the necessary arrangements for the compilation, processing, calculation and exporting of the monitoring indicators at regular intervals that will be used for the annual reporting to the Monitoring Committee on the performance, monitoring and evaluation activities linked to the CAP SP.

In this light, the SEA monitoring requirements are proposed to be integrated in the performance, monitoring and evaluation framework of the CAP SP. Certain additional arrangements are required to be realized for the solid coherence of the environmental monitoring of the plan, these being:

- Setting up of an environmental monitoring working team that may be embedded in or be overseen by the plan's monitoring working group; its role will be to evaluate the environmental performance of the CAP SP, taking into account the monitoring and evaluation of the progress towards the achievement of the three environmental related objectives of the CAP SP.
- Development of a solid framework for the necessary gathering, compilation and processing of data to feed in the SEA indicators, which may form part of the arrangements that are expected to be realized for the monitoring of the CAP SP.
- Establishment of coordination mechanism to liaise with the authorities entitled for:
 - o official monitoring and reporting subject to obligations of international commitments and EU and national legislation on the environment that are related to the implementation of the CAP SP (e.g. United Nations Framework Convention on Climate Change, National Emissions Ceiling Directive, Water Framework Directive, Nitrate Directive, Habitat Directive)
 - o evaluation of the implementation progress of the national/regional plans and programmes that are closely linked to the CAP SP to ensure policy coherence and implementation.
- Consideration of the planning for a spatial analysis of the significant environmental effects of the interventions as part of the SEA monitoring regime, where practicable and feasible, with special focus on the effects on water and protected areas.

The SEA monitoring programme will be realised on an annual basis and will be embedded in the monitoring programme of the CAP SP. It seeks mostly to use the impact indicators enlisted in Annex I of the Regulation (EU) 2021/2115 (referred to as SPR), which are complemented with other environmental impact indicators, where required, to cover the significant environmental effects of the plan.

Table 28: SEA monitoring indicators

Theme	Environmental issue	Monitoring indicator	Annex I of SPR	Official data sources
Climate & energy	Reduce GHG emissions	GHG emissions from agriculture (Mt CO ₂ eq/year) <i>Suggested sub-indicators: Enteric fermentation, Agricultural soils & Manure management</i>	I.10	National inventory report under UNFCCC, Eurostat- Agri-environmental indicators

Theme	Environmental issue	Monitoring indicator	Annex I of SPR	Official data sources
	Increase carbon sequestration	Net sink of GHG emissions from grassland and forest land (Mt CO ₂ eq/year) <i>Suggested sub-indicators: Grassland, and Forest land</i>	-	National inventory report under UNFCCC
		Mean soil organic content in agricultural land (g of C/kg) <i>Suggested sub-indicators: Arable land, Grassland and Permanent crops</i>	I.11	European Soil Data Centre (ESDAC)
	Increase renewable energy from agriculture and forestry	Share of agriculture and forestry in the production of total renewable energy (% of RES production)	I.12	National report under RES Directive, Eurostat-Energy statistics
	Improve adaptation to climate change	Agricultural sector resilience progress indicator (numerical score: 0, 0.5 & 1)	I.9	CAP PMEF, JRC & Eurostat (pending fiche)
Air	Reduce ammonia emissions	Ammonia emissions from agriculture (Kt/year)	I.14	National inventory report under NEC Directive, Eurostat- Agri-environmental indicators
	Maintain ambient air quality	Annual mean background concentrations of at least PM ₁₀ and NO _x at locations nearby the interventions (mg/Nm ³)	-	National report under Air quality Directive, EEA -Air quality statistics
Biodiversity	Halt and reserve biodiversity loss	Farmland bird index	I.19	Hellenic Ornithological Society, Pan-European Common Bird Monitoring Scheme (PECBMS)
		Forest bird index	-	Hellenic Ornithological Society, Pan-European Common Bird Monitoring Scheme (PECBMS)
		Percentage of assessments for protected species and habitats related to agriculture with a stable or improving conservation status trend (%)	I.20	National report under Habitats Directive, EEA Dashboard – on Habitats Directive Art.17
		Agro-biodiversity in farming system (% of holdings)	I.22	Eurostat - Farm Structure Survey
Landscape	Preserve agricultural landscape features	Share of agricultural land covered with landscape features (%)	I.21	Eurostat - LUCAS (pending from Copernicus)
Land uses	Maintain agricultural and forest ecosystems	Land cover by cropland, grassland, woodland and forests (ha or % of total land area)	-	EEA dashboard- Land cover and change statistics

Theme	Environmental issue	Monitoring indicator	Annex I of SPR	Official data sources
Soil	Reduce soil erosion	Percentage of agricultural land in moderate and severe soil erosion (%)	I.13	JRC, Eurostat- Agri-environmental indicators
Water	Reduce pressure on water resources	Water Exploitation Index Plus (WEI+)	I.17	EEA - WISE SoE, Eurostat – Water statistics
	Reduce fresh water abstraction	Fresh water abstraction for agriculture (million m ³ /year) <i>Suggested sub-indicators: Groundwater, Surface water</i>	-	Eurostat- Water statistics
	Reduce water pollution	Gross nutrient balance for nitrogen on agricultural land (kg N/ha/year)	I.15	Eurostat- Agri-environmental indicators
		Gross nutrient balance for phosphorus on agricultural land (kg P/ha/year)		
		Percentage of groundwater stations with poor quality due to pollution by nitrates (%) (i.e. >= 50 mg-NO ₃ /l)	I.16	National report under Nitrates Directive, EEA-EIONET
	Reduce use of pesticides	Harmonised Risk Indicator 1	I.18	MRDF- HRIs
Waste	Reduce disposal of agricultural waste	Recovery of agricultural waste (tn/year or %)	-	Hellenic Statistical Authority, MRDF
		Agricultural holdings that recover agricultural waste (% of agricultural holdings)	-	MRDF
	Reduce food waste generation	Food waste prevented from agricultural and agri-food processing sector (tn/year) (i.e. quantities redistributed for donation and animal feed)	-	MRDF, MEEN
Cultural heritage	Sustain cultural heritage features	Number of farmers with measures for tangible cultural heritage	-	MRDF
Population & human health	Sustain farm income	Supporting viable farm income by type of farming (Euro per Annual Working Unit)	I.4	MRDF, FADN public database
	Support generational renewal	New young farm managers (number or %)	I.23	Eurostat Integrated Farm statistics
	Enhance development and jobs in rural areas	Employment rate in rural areas (% of total population living in rural areas, age group 20-64)	I.24	Eurostat – Labour Force Survey
		New jobs supported in CAP projects (number)	R.37	MRDF
		Share of rural population covered by local development strategies (%)	R.38	MRDF

Theme	Environmental issue	Monitoring indicator	Annex I of SPR	Official data sources
	Foster environmental education	Number of persons benefitting from advice, training, knowledge exchange, or participating in European Innovation Partnership (EIP) operational groups supported by the CAP related to environmental or climate-related performance (number)	R.28	MRDF
	Safeguard human health	Harmonised Risk Indicator 1	I.18	MRDF- HRIs
		Number of hectares under environmental practices	O.34	MRDF
		Value of production under EU quality schemes and of organic production (sales in EUR or %)	I.29	MRDF

8 Elements of the regulatory act

This section provides for the core elements that are planned to be incorporated in the regulatory act under issuance for the environmental approval of the CAP SP 2023-2027 for Greece in regards to:

- the proposals, guidelines or measures to prevent, reduce and as fully as possible mitigate any significant adverse effects on the environment of implementing the plan;
- the envisaged monitoring system of the significant environmental effects from the implementation of the plan.

At strategic level, the overall appraisal of the effects of the CAP SP for Greece on the environment is positive, having regard that the proposed design of the strategic plan responds to the environmental and climate objectives of the CAP for the next programming period, with its specialized Environmental and Climate Architecture, which incorporates an enhanced conditionality system and interventions under both pillars that seek to integrate the requirements of EU and national environmental policy in agriculture and rural development. Significant negative effects on the environment are anticipated to be largely avoided or not actively promoted by the plan, whilst uncertain or adverse environmental effects cannot be ruled out. The few likely adverse effects are typically linked to the establishment of new infrastructures that are regarded as rather localized side effects of agricultural and rural development, while there are still opportunities for enlarging the already identified environmental benefits of the CAP SP that could minimize the uncertain effects closely linked to the efficiency of agricultural land uses and could boost the incentivization of beneficiaries towards a higher environmental protection. In this light, the consideration of measures and recommendations to prevent, reduce and as fully as possible offset any significant adverse effects on the environment of implementing the CAP SP of Greece is complemented by proposals to optimize the anticipated positive effects of the plan and to enhance its overall environmental performance for the next programming period.

■ ***Measures and recommendations to minimise significant adverse effects on the environment***

The addressed measures are built upon the mechanisms already in place for the protection of the environment that are relevant to the implementation of the CAP SP: (a) the planned control and penalty system for the beneficiaries of the interventions that are linked to conditionality measures on the protection of environment (SMRs and GAECs), (b) the environmental permitting process that must be followed by the beneficiaries for those interventions that involve projects and activities pursuant to the provisions of Law 4014/2011 (OGG A' 209), and (c) the planned monitoring mechanism of the implementation of the CAP SP, that will evaluate the progress towards the achievement of the environment and climate-related objectives over the whole CAP SP period and identify needs for remedial actions, incorporating for that purpose a core set on environmental indicators already lead down in Annex I of Regulation (EU) 2021/2115.

In order to minimise any likely adverse environmental effects for all new agricultural activities, changes in agricultural activities or management practices that are not subject to environmental permitting process and do not pursue environmental objectives, the following measures need to be sufficiently realised:

- compliance with local spatial planning and provisions of the relevant national environmental legislation, taking into account the specific conditions set out by the statutory plans for the concerned

areas (e.g. action programme for the nitrate vulnerable areas, river basin management plans, statutory specific environmental studies, Natura 2000 management plans, pasture management plans)

- provision of tailored-made technical assistance/ advisory services, where required, that would enable to respond to high environmental protection, with particular consideration of applications on environmentally stressed areas or areas with environmental degradation trends that are closely interrelated to agricultural activities
- provision of dedicated understanding and training to farmers or other beneficiaries on the environment, addressing key environmental challenges facing agriculture, especially water, soil, biodiversity, landscape and climate change

The above measures are complemented by recommendations and guidelines to support the implementation of interventions in the right place and pursue the most appropriate measures in the most appropriate places, focusing on the interventions that do not target environmental purposes or are not connected with environmental- related restoration activities:

- Assessment of the potential to prioritise applications with lower land use effects on the environment or better efficiency in agricultural land uses, especially in relation to the effects and the interactions on water, soil, biodiversity, landscape and climate change.
- Consideration of the national strategic priorities stipulated in Law 2742/1999 (A' 207) on strategic spatial planning, related to agriculture and rural development, for high productivity rural areas, suburban rural areas and mountainous and semi-mountainous areas, including insular areas with a rural character.

Consideration of the existing environmental situation in the approval process at regional level, e.g. in nitrate vulnerable areas, water stressed areas, protected areas with species or habitats with unfavorable conservation status or decreasing trends, etc, and the cohesion with the planned actions for the concerned areas emerging from relevant plans and programmes.

- Consideration of incorporation of minimum environmental standards or targets as requirements for the applicants in environmentally stressed areas or areas with environmental degradation trends; these standards or targets should be sought by priority to be achieved with the CAP SP's interventions that pursue environmental purposes.
- Establishment of a governmental coordination mechanism to effectively liaise with the competent authorities in charge of implementing the actions of the national/regional plans and programmes of high relevance, especially those derived from Annex XIII of Regulation (EU) 2021/2115; the applications that contribute to the achievement of these actions should be prioritised.
- The CAP SP's monitoring mechanism should allow an annual assessment of the significant environmental effects of the plan; the outcome of the assessment should be used to (a) conclude on the annual environmental performance of the plan in quantitative terms and remark possibilities and opportunities of improvements to achieve the stated environmental and climate related objectives of the plan, (b) direct the planning of the interventions in the right place to contribute to a higher environmental protection and (c) enable corrective actions where required, especially when cumulative adverse environmental effects may arise.

▪ ***Proposals to increase the environmental benefits of the plan***

Having regard to the fact that the level of significance of the positive effects that are anticipated from the Environmental and Climate Architecture of the CAP SP practically depends on the level of uptake and the synergies that could be sought among the various interventions geared towards environmental goals, but also on the type of agricultural and rural activities and the local environmental conditions, the following proposals and recommendations are suggested to boost the environmental benefits of the CAP SP to the extent feasible:

- Apply a steering mechanism to incentivize the beneficiaries over environmental targets and increase the level of uptake of interventions that pursue environmental purposes; establish a help desk devoted to candidate beneficiaries for the opportunities and possibilities embedded in the interventions of the Environmental and Climate Architecture of the CAP SP (e.g. eco-schemes, environmental and climate-related commitments) and the available combinations of interventions that are best applicable and feasible to the beneficiaries.
- Assess the potential to reward farmers and other beneficiaries (e.g. through the introduction of bonus payments) for:
 - a minimum set of environmental actions that are based on pre-defined environmental target values, tailored made to the needs and consistent with the planned actions of the concerned areas
 - the use of best applicable techniques and practices with the lower environmental impact
 - long-term actions on the environment, beyond the programming period of the CAP SP
- Explore the possibilities of delivering a spatial focus in the monitoring of the CAP SP that would best direct the planning of interventions in the right place, by capturing and making use of spatial data, where available, especially in relation to quantitative and qualitative status of water resources, soil and climatic data and status of protected species and habitats.
- Assess the potential to make prerequisite to advisors and trainers to make use of scientific literature and official studies on the direct and indirect environmental impacts of agricultural activities, to deliver, encourage and direct best available agricultural practices and to preliminary document broad practical solutions, especially in areas that are under Natura 2000 sites, nitrate vulnerable zones or other environmentally sensitive/ stressed areas; all the documentation could be also made available on a dedicated web-repository for all beneficiaries.

▪ ***Envisaged environmental monitoring system***

The environmental monitoring of the CAP SP is proposed to be integrated in the performance, monitoring and evaluation framework that will be established as part of the implementation of the CAP SP for the next programming period to avoid duplication of monitoring and to minimize administrative burdens. The responsibility for the monitoring of the effectiveness of the implementation of the CAP SP lies between the national Managing Authority and the national Monitoring Committee of the plan, in close collaboration with OPEKEPE, the Accredited Paying Authority, for the programming of data collection and processing and annual reporting on the performance, monitoring and evaluation activities linked to the CAP SP. Certain additional arrangements are required to be realized for the environmental monitoring of the plan, these being:

- Setting up of an environmental monitoring working team that may be embedded in or be overseen by the plan's monitoring working group; its role will be to evaluate the environmental performance of the CAP SP, taking into account the monitoring and evaluation of the progress towards the achievement of the three environmental related objectives of the CAP SP.
- Development of a solid framework for the necessary gathering, compilation and processing of data to feed in the SEA indicators, which may form part of the arrangements that are expected to be realized for the monitoring of the CAP SP.
- Establishment of coordination mechanism to liaise with the authorities entitled for:
 - o official monitoring and reporting subject to obligations of international commitments and EU and national legislation on the environment that are related to the implementation of the CAP SP (e.g. United Nations Framework Convention on Climate Change, National Emissions Ceiling Directive, Water Framework Directive, Nitrate Directive, Habitat Directive)
 - o evaluation of the implementation progress of the national/regional plans and programmes that are closely linked to the CAP SP to ensure policy coherence and implementation.
- Consideration of the planning for a spatial analysis of the significant environmental effects of the interventions as part of the SEA monitoring regime, where practicable and feasible, with special focus on the effects on water and protected areas.

The SEA monitoring programme will be realised on an annual basis and will be embedded in the monitoring programme of the CAP SP. The table overleaf presents the SEA monitoring indicators of the programme that makes use of the environmental impact indicators already enlisted in Annex I of the Regulation (EU) 2021/2115 (referred to as SPR) with complementary impact indicators to cover fully the likely significant environmental effects of the plan.

Theme	Environmental issue	Monitoring indicator	Annex I of SPR
Climate & energy	Reduce GHG emissions	GHG emissions from agriculture (Mt CO ₂ eq/year) <i>Suggested sub-indicators: Enteric fermentation, Agricultural soils & Manure management</i>	I.10
	Increase carbon sequestration	Net sink of GHG emissions from grassland and forest land (Mt CO ₂ eq/year) <i>Suggested sub-indicators: Grassland, and Forest land</i>	-
		Mean soil organic content in agricultural land (g of C/kg) <i>Suggested sub-indicators: Arable land, Grassland and Permanent crops</i>	I.11
	Increase renewable energy from agriculture and forestry	Share of agriculture and forestry in the production of total renewable energy (% of RES production)	I.12
	Improve adaptation to climate change	Agricultural sector resilience progress indicator (numerical score: 0, 0.5 & 1)	I.9
Air	Reduce ammonia emissions	Ammonia emissions from agriculture (Kt/year)	I.14

Theme	Environmental issue	Monitoring indicator	Annex I of SPR
	Maintain ambient air quality	Annual mean background concentrations of at least PM ₁₀ and NO _x at locations nearby the interventions (mg/Nm ³)	-
Biodiversity	Halt and reserve biodiversity loss	Farmland bird index	I.19
		Forest bird index	-
		Percentage of assessments for protected species and habitats related to agriculture with a stable or improving conservation status trend (%)	I.20
		Agro-biodiversity in farming system (% of holdings)	I.22
Landscape	Preserve agricultural landscape features	Share of agricultural land covered with landscape features (%)	I.21
Land uses	Maintain agricultural and forest ecosystems	Land cover by cropland, grassland, woodland and forests (ha or % of total land area)	-
Soil	Reduce soil erosion	Percentage of agricultural land in moderate and severe soil erosion (%)	I.13
Water	Reduce pressure on water resources	Water Exploitation Index Plus (WEI+)	I.17
	Reduce fresh water abstraction	Fresh water abstraction for agriculture (million m ³ /year) <i>Suggested sub-indicators: Groundwater, Surface water</i>	-
	Reduce water pollution	Gross nutrient balance for nitrogen on agricultural land (kg N/ha/year)	I.15
		Gross nutrient balance for phosphorus on agricultural land (kg P/ha/year)	
		Percentage of groundwater stations with poor quality due to pollution by nitrates (%) (i.e. ≥ 50 mg-NO ₃ /l)	I.16
	Reduce use of pesticides	Harmonised Risk Indicator 1	I.18
Waste	Reduce disposal of agricultural waste	Recovery of agricultural waste (tn/year or %)	-
		Agricultural holdings that recover agricultural waste (% of agricultural holdings)	-
	Reduce food waste generation	Food waste prevented from agricultural and agri-food processing sector (tn/year) (i.e. quantities redistributed for donation and animal feed)	-
Cultural heritage	Sustain cultural heritage features	Number of farmers with measures for tangible cultural heritage	-
Population & human health	Sustain farm income	Supporting viable farm income by type of farming (Euro per Annual Working Unit)	I.4

Theme	Environmental issue	Monitoring indicator	Annex I of SPR
	Support generational renewal	New young farm managers (number or %)	I.23
	Enhance development and jobs in rural areas	Employment rate in rural areas (% of total population living in rural areas, age group 20-64)	I.24
		New jobs supported in CAP projects (number)	R.37
		Share of rural population covered by local development strategies (%)	R.38
	Foster environmental education	Number of persons benefitting from advice, training, knowledge exchange, or participating in European Innovation Partnership (EIP) operational groups supported by the CAP related to environmental or climate-related performance (number)	R.28
	Safeguard human health	Harmonised Risk Indicator 1	I.18
		Number of hectares under environmental practices	O.34
		Value of production under EU quality schemes and of organic production (sales in EUR or %)	I.29

9 Difficulties in the preparation of the SEA report

During the preparation of the present SEA report, no major difficulties encountered in the availability of information for the environmental baseline, since the common context and impact indicators for the country that were received from the DG AGRI data portal cover the key environmental aspects linked to the implementation of the CAP SP, whilst all the relative official national data and reports were used (e.g. Eurostat, EEA Dashboards, Hellenic Statistical Authority, State of Environment Reports) to enhance the description of the current state of environment. It is noted that the description of the likely evolution without the implementation of the Greek CAP SP 2023-2027 is a rather theoretical exercise given that this plan is prepared under the CAP, and thus it is not something the Government cannot do. In light of this, establishing the “likely evolution of the environment without the CAP SP” focuses on the key likely future trends on the environment associated with the trends that reflect the past period. In addition, though the SEA report may omit or go into little detail for the environmental aspects that are not particularly relevant to the plan, all the environmental aspects prescribed in Annex III of JMD 107017/2006 were decided to be addressed, taking also into consideration the environmental aspects emerging from the environmental related objectives of the CAP, as prescribed in Regulation (EU) 2021/2115.

Regarding the methodological approach that was used to evaluate and assess the likely significant effects on the environment from the implementation of the CAP SP and since there are no national guidelines for the methodology that must be applied, consideration was given to take into account the SEA process that was applied in the operational programmes of the previous programming period, whereas a SEA scoping report has been prepared for MRDF as part of the SEA process, which though not a mandatory requirement, it aimed to better define the issues that need to be addressed and further developed in the SEA report, considering the specific context in which the CAP SP is being developed and is likely to be implemented. The SEA scoping report outlined the environmental aspects that would need to be addressed, described the SEA objectives in the form of key questions to be used for the environmental assessment of the plan and provided with the criteria to be applied for the assessment of each environmental aspect as defined in Annex II of the SEA Directive and prescribed in Annex IV of JMD 107017/2006. The SEA objectives have been developed by taking into consideration the EU and national environmental and climate policy contexts described in section 3, as well as the environmental and climate objectives that are set out in Regulation (EU) 2021/2115. Under the SEA report, the methodological approach for assessing the likely significant environmental effects of the CAP SP has been optimised by applying a bottom-up approach: given the very broad range of the interventions of the plan and their potential to interact with virtually all environmental receptors, each intervention was examined for its potential likely effects on the environment, without “scoping-out” any intervention in advance. The results of the detailed-level assessment of the environmental effects at intervention level were then used to deliver the overall environmental assessment of each intervention type and the CAP SP as a whole.

It is finally deemed necessary to note that since not actual alternatives in the planning of the CAP SP have been developed due to time constraints in the preparation phase of the plan that was also affected by the delays in the finalisation of the corresponding EU regulations, the continuation of the current plan for 2014-2020 has been used as a realistic alternative at strategic level. The zero option was additionally included to be particularly used as a baseline scenario for the comparative analysis among alternatives.

10 Basic studies and surveys

Having regard to the necessary basic studies and surveys that should be prepared before the approval of the projects and activities resulting from the implementation of the CAP SP 2023-2027 for Greece, the following considerations need to be taken into account:

- The prompt realisation of the background studies and mapping that are required for the application of certain GAECs (i.e. GAEC2, GAEC5, GAEC8) is prerequisite for the smooth implementation of the interventions types linked to those conditionality measures.
- Upon completion of the Natura 2000 management plans and pasture management plans, a relevant study is suggested to be carried out to effectively link the measures or specific conditions emerging from these plans that are required to be followed by the beneficiaries, where applicable.
- In case of deciding on the spatial integration of the CAP SP monitoring system, which is among the proposals to increase the environmental benefits of the plan, a relevant project may need to be carried out to gather the necessary spatial data on water, soil, climate and protected areas and deliver them in an operational spatial database; this database could also be used for the spatial planning of the interventions to optimise the environmental effects of the plan.
- Though not necessarily required, a dedicated study could be beneficial on the thorough design of the prioritisation approach in the approval process for the applications with lower land use effects on the environment or better efficiency in agricultural land uses, especially in relation to the effects and the interactions on water, soil, biodiversity, landscape and climate change.

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