EXECUTIVE SUMMARY

European Parliament

# Research for AGRI Committee – The impact of extreme climate events on agricultural production in the EU

This study examines how the experienced and projected increase of extreme weather and climate events throughout the EU territory impacts the agricultural production in the EU, hence triggering adaptive solutions by the sector and possible policy responses to make agriculture more climate-resilient.

It provides an overview of the impacts of extreme weather events that can be associated with climate change and available solutions for the agricultural sector.

It also examines to which extent the actual policy instruments pro-actively support the adaptation of the agricultural sector, both at EU and national levels and provides best practice examples drawn from case studies on how to further contain the adverse effects of climate change for agriculture.

The present document is the executive summary on the study requested by the Committee on Agriculture and Rural Development on The impact of extreme climate events on agriculture production in the EU.

The full study, which is available in English can be downloaded at: https://bit.ly/3yDzsLB

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# Observed trends in the occurrence of extreme climate events and impacts on EU agricultural sector

Phenomena such as heatwaves, cold spells, heavy rains, storm surges, flooding, landslides, droughts, wildfires and intense storms (wind, hail) can be termed extreme events. When such phenomena occur simultaneously, they are referred to as compound events. Climate change may influence the frequency and severity of extreme events, this attribution being particularly clear-cut for heatwaves. Historical and projected trends in the occurrence and the severity of extreme events converge towards similar pictures: an increase in extremely hot summer temperatures over all of Europe, progressively drier conditions in the south of Europe, and an increase in heavy rainfall episodes in northern and Central Europe. The magnitude of these increases is concerning. The number of climatological heatwave days will see at least a fivefold increase by the end of the century in the coolest climates, and up to thirty times more in warmer climates. Drought severity in southern Europe could triple by the end of the century.

Losses specific to the agriculture sector account for more than 60% of drought-linked losses, or around EUR 5 billion annually. This is projected to increase in the future. Extreme events also have cascading consequences on ecological functions and on farming economics. Vulnerable sub-sectors include non-irrigated cereals, and specifically maize; fruit trees and perennials; tubers grown in regions with heavy precipitation extremes; and livestock for its dependence on green fodder.

# Adaptation solutions for the agricultural sector to become more climate-resilient

To support farmers and maintain productivity, several adaptation options exist. "Top-down" adaptation options include risk management tools (insurance, mutual funds, hedging, or risk pooling), climate change observatories, and early warning systems implemented by local authorities. Farmers may also adapt autonomously ("bottom-up") by adopting one or several adaptive strategies: income stabilisation by adhering to risk management schemes or diversifying revenue sources, resilience building through improvements to soil health and healthy functioning of the agroecosystems, or asset protection through investment in specific equipment (hail nets, greenhouses, irrigation, etc.)

# Policy instruments supporting the adaptation of the EU agricultural sector

European strategies (Farm to Fork Strategy, EU Adaptation Strategy, EU Biodiversity Strategy for 2030, EU Soil Strategy for 2030, etc.) promote a systemic approach of environmental and climate issues considering the role and potential effects on the agricultural sector. However, the provisions set by EU policies (e.g. for efficient water use by the agricultural sector) are not yet sufficiently implemented by Member States to address climate change issues faced by the agricultural sector. Moreover, synergies between flood risk management policies and agricultural policies are still limited.

The new CAP reform is putting increasing emphasis on instruments supporting proactive management of the effects of extreme weather events caused by climate change. The analysis of CAP strategic plans reveals that Member States considered the need to support adaptation of the

agricultural sector to climate change as a priority. To respond to the challenges of adaptation, instruments most widely applied by Member States in their CAP strategic plans are eco-schemes, sectoral interventions, ENVCLIM interventions and INVEST interventions.

The most widely supported adaptation solutions that contribute to the prevention of flood damage are practices favourable to soil structure (promotion of rotations, increase of plant cover and limitation of tillage), but also the maintenance or establishment of landscape elements such as hedges or buffer zones. With regard to the prevention of damage due to drought and water scarcity, Member States mainly support solutions that promote a more efficient use of irrigation water, solutions that increase water retention in soils and the landscape, and measures targeting crop rotation, crop diversification and the adoption of more drought- and heat tolerant species. Some Member States are also supporting improved pasture management, for example by matching stocking densities to forage production, in order to address the risk of forage shortages in the event of drought. Finally, other adaptation solutions target the risks of frost, hail and storms, such as promoting hail protection for orchards.

However, the CAP measures implemented by Member States were generally not designed in a comprehensive approach enabling massive and general adaptation of the agricultural sector. CAP interventions promote the adoption of individual farm practices and management measures addressing specific climate risks ("1 practice = 1 payment"), rather than fostering systemic approach at farm or territorial level.

While some countries plan to adopt newly developed approaches to risk management tools, the relatively weak mobilisation of the CAP to support their deployment should be underlined. To date, risk management tools are very rarely cited as instruments that specifically address adaptation of the agricultural sector to climate change (Specific Objective 4 of the CAP on contribution to climate change mitigation and adaptation (SO4)). Rather, they are seen as tools to increase the overall resilience of the agricultural sector (Specific Objective 1 “Support viable farm income and resilience of the agricultural sector”).

Finally, as these policy instruments remain voluntary, their potential impact will depend on the allocated budgetary resources and the uptake by farmers. Member States will need to assess the effectiveness of their CAP strategic plans on climate change adaptation and implement the necessary adjustments for the achievement of SO4 objective (Contribution to climate change mitigation and adaptation).

Notably, the annual reporting of results indicators relevant to climate change adaptation (e.g. share of utilised agricultural area under supported commitments to improve climate adaptation) required by the Regulation (EU) 2022/1475[1] should enable to monitor the progress achieved.

[1] Commission Implementing Regulation (EU) 2022/1475 setting out the rules for implementing Regulation (EU) 2021/2115 on the evaluation of the CAP Strategic Plans and tho e provision of information for monitoring and evaluation.

# Recommendations

It will be crucial to analyse in the coming years which instruments have been effectively mobilised by each Member State, to support the adaptation of the European agricultural sector to climate change. The analysis highlighted that the adaptation objectives set by Member States should be defined more precisely to enable proper monitoring of the results achieved. Moreover, it will be important to assess the ability of the Performance Monitoring and Evaluation Framework (PMEF), applicable for the CAP from 2023 until 2027, to report on the contributions of each CAP Strategic Plan to this European objective.

To improve the resilience of EU farming systems to severe climate events, systemic approaches at farm level should be fostered by CAP interventions. In this regard, specific mechanisms, e.g. point-based, result-oriented, and system-based approaches, should be more developed in the CSPs, to target ambitious adaptation solutions.

More effort should be done on supporting the deployment of risk management tools. However, support for insurance schemes is an ex-post measure (supporting recovery from an adverse climate event) that should not overshadow ex-ante measures (promoting prevention, preparedness and response) at farm level.

Finally, synergies between water management policies, agricultural policies and climate policies need to be strengthened, through a better integration of flood risk management and drought risk management into CAP strategic plans.

# Further information

This executive summary is available in the following languages: English, French, German, Italian and Spanish. The study, which is available in English, and the summaries can be downloaded at: https://bit.ly/3yDzsLB

More information on Policy Department research for AGRI: https://research4committees.blog/agri/

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