

IMPACT OF CLIMATE CHANGE ON OCCUPATIONAL SAFETY AND HEALTH

Background

This policy brief summarises the projected impact of climate change on occupational safety and health (OSH) and is based on a European Agency for Safety and Health at Work (EU-OSHA) report on the future of agriculture and OSH, which provides a comprehensive analysis of new and emerging risks and their impact on OSH in the sector (EU-OSHA, 2020).

Introduction

Agriculture accounts for 12 % of all greenhouse gas (GHG) emissions in the European Union (EU) (EC, 2017). Pressure on the farming and forestry sectors, as on all other sectors, to contribute further to GHG mitigation and improve environmental performance in general will continue to increase. Farmers are already responsible for ensuring cross-compliance with many environmental standards through the present common agricultural policy (CAP), and environmental compliance pressure will increase under the EU's Farm to Fork Strategy (EC, 2020)¹.

As well as contributing to the effects of climate change through GHG emissions, agricultural production is itself affected by climate change. According to the Intergovernmental Panel on Climate Change (IPCC), the main climate change effects influencing food production are changes in precipitation, temperature, and the periodicity and severity of extreme weather events, and rising sea levels. All of these factors will bring about a series of mostly negative changes to food production (IPCC, 2019). On the one hand, crop yields in northern Europe may increase as a result of higher temperatures, and certain crops may expand further north. On the other hand, drought and heat stress on plants and animals, changes in crop phenology and the extension of pests and plant diseases will impact negatively on production in other specific regions (WMO, 2020). Changing precipitation patterns will also affect the sector, further increasing irrigation needs. Farmers will need to modify the types of crops that they grow, adapting cultivation and even animal breeds to suit the changing climatic conditions. In the forestry sector, technical measures such as more effective firebreaks and the consistent clearing of brushwood are necessary to mitigate the risks of forest fires, as extreme heat increases their likelihood. Intense heat, risk of fire and changing rainfall patterns could also influence decisions on the type of trees to plant in new forests, to foster species resistant to drought and high temperatures, or even less-flammable species. Overall, climate change will contribute to increased unpredictability and risks for crops, animals and farmers.

Further environmental pressures affecting the agriculture sector include the EU's commitment to reduce pesticide use through the Pesticides Sustainable Use Directive² and the European Commission's general move towards integrated pest management (IPM)³ practices. These have been reinforced by the ambitious pesticide reduction goals in the EU's Farm to Fork strategy, aiming to reduce the use of pesticides by 50 % before 2030.

GHGs and environmental regulation (e.g. on pesticides) will add pressure on farmers and foresters, obliging them to modify farming practices to make them more environmentally friendly and to improve their environmental performance in general.

Farming and forestry practices will need to be adapted to the changing weather conditions resulting from climate change, and farmers and foresters will come under increasing pressure to implement more stringent EU environmental and regulatory measures to limit the impacts of climate change.

¹ Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions 'A Farm to Fork Strategy for a fair, healthy and environmentally-friendly food system' (COM(2020) 381 final).

² Directive 2009/128/EC of the European Parliament and of the Council of 21 October 2009 establishing a framework for Community action to achieve the sustainable use of pesticides.

³ https://ec.europa.eu/food/plant/pesticides/sustainable_use_pesticides/ipm_en

Impact of climate change on OSH

The agriculture and forestry sector is already one of the most dangerous sectors in which to work. The impact of climate change on the work environment will further increase a number of already serious risks to farmers and foresters and bring new challenges (Adam-Poupart et al., 2013; Applebaum et al., 2016; Levy and Roelofs, 2019).

As **extreme weather events** increase, this will result in more adverse and unsafe working conditions. Extreme weather events such as storms, floods and droughts, and the resulting forest fires, create risks both while they are occurring and in the aftermath. For example, clearing wind blow is one of the most hazardous operations in forestry. Accident rates constantly rise after these kinds of events. A number of studies point to a link between extreme ambient temperatures and increased risk of occupational injuries (Bonafede et al., 2016; Martínez-Solanas et al., 2018).

Figure 1: Extreme weather conditions



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Heat is a major health risk for workers working outside. It can cause dehydration, heat exhaustion and heatstroke, and can even result in loss of consciousness and heart attacks in extreme circumstances. The use of **personal protective equipment (PPE) in extreme heat** conditions is particularly challenging, especially in forestry, where it adds to the effort and stress of the job.

Farmers are among those workers at the highest risk of developing **skin cancer** because they are exposed to the sun on a daily basis (Adam-Poupart, 2013).

In the EU, farmers and foresters are increasingly exposed to **animal and insect-borne diseases** from neighbouring regions, as mild winters encourage their spread. For example, tick-borne diseases (such as Lyme disease and tick-borne encephalitis) continue to spread from central and Eastern Europe to the west. Rising temperatures are also expected to increase the development and growth of pests among plants, which will likely lead to an increase in the use of pesticides (Boxall et al., 2010). This will also likely hinder the EU's efforts to significantly reduce the amounts of pesticides used.

As the climate gets drier in Europe, there will be an increase in silicate **dust exposure** in farming. However, as advances are made in tractor technology, improved cabin ventilation and even driverless tractors and farm machinery may offer benefits for worker protection by removing or distancing the worker from the exposure area.

Studies also show that the stress that climate change places on farmers and foresters is linked to psychological disorders such as **anxiety, mood disorders, stress and depression**. Similarly, fear, despair, suicidal feelings, increased drug abuse and heat-related deaths have been linked to adverse climatic changes (Fritze et al., 2008; Honda et al., 2013; Page and Howard, 2010; Swim et al., 2011). Managing the **mental distress** caused by climate change, adapting production to the changing temperatures and rainfall patterns and, finally, coping with heat, new diseases, droughts and natural disasters are future challenges for OSH (Vins et al., 2015). The increasing uncertainty of farming and financial losses from extreme weather conditions will add to this pressure.

Implications and recommendations

Figure 2: Shade for workers



Farming and forestry work practices will need to be adapted to minimise the impact of these risks; this may include adapting workplaces to provide increased shade, sufficient ventilation and cooling systems; modifying working hours and planning work to avoid heat and extreme weather; and more hands-on or smart monitoring of workers' conditions, such as hydration (water consumption) and body heat through the use of smart PPE. Measures such as more predictive weather systems, and health promotion and awareness programmes on exposure to sun, heat and insect-borne diseases could also help. As the effects of climate change are felt across Europe through increasing temperatures and a rising number of extreme weather events, workplace risk assessments will need to be updated across Europe to take into account the emerging climate reality and the extreme seasons experienced in workplaces. As risks evolve, so

does the need for OSH resources to combat such risks. A growing number of OSH resources related to climate change risks in the sector are being published, with examples on managing heat stress from France⁴, the United Kingdom⁵ and Australia⁶; on sun/UV exposure from Australia⁷, Canada⁸, Germany⁹ ¹⁰ and the United States¹¹; and on flood recovery¹² and wildfires¹³ from the United States.

Conclusion

Climate change is increasingly having an impact on agricultural production and forestry work, and will bring added uncertainty to the planning of farm and forestry practices. These impacts will consist of the following: the need to adapt farming and forestry practices in line with both GHG mitigation and environmental protection strategies (cross-compliance rules under the CAP and the Farm to Fork Strategy); the need to adapt farming practices to changing precipitation patterns and other climate changes; increasing financial losses and insurance costs caused by extreme weather events; and the weakening of European farmers' competitiveness on world markets.

Climate change will have substantial impacts on OSH. Extreme weather events, heat and sun exposure, insect-borne diseases, dust and pesticide exposure, increased use of pesticides to combat insect growth and risks specific to forestry (e.g. extreme danger in clearing up trees damaged by the weather and insects) are just a few. Farming and forestry work practices will need to be adapted to minimise the impact of these risks, such as modifying working hours and planning work to avoid heat and extreme weather, and more hands-on monitoring of workers' conditions, such as water consumption, body heat, etc.. Cross-compliance and pressure to meet climate change targets and environmental regulations are often cited as a major stress factor by farmers in the sector. This will add to the already numerous mental health challenges resulting from the long list of psychosocial pressures that farmers and foresters are currently subjected to and will continue to experience in the future.

⁴ <https://nord-pasdecalsais.msa.fr/lfy/documents/11566/48457/D%C3%A9pliant+-+Pr%C3%A9vention+des+risques+chaleurs+et+canicule+-+m%C3%A9tiers+agricoles>

⁵ <https://www.hse.gov.uk/temperature/heatstress/index.htm>

⁶ <https://aghealth.sydney.edu.au/wp-content/uploads/2019/05/19.-Heat-Stress.pdf>

⁷ <https://aghealth.sydney.edu.au/wp-content/uploads/2019/05/20.-Sun-Safety.pdf>

⁸ https://www.ccohs.ca/oshanswers/diseases/skin_cancer.html

⁹ <https://www.svlfg.de/sonnenschutz>

¹⁰ <https://www.dguv.de/ifa/fachinfos/strahlung/genesis-uv/index-2.jsp>

¹¹ https://www.cdc.gov/niosh/topics/sunexposure/default.html?CDC_AA_refVal=https%3A%2F%2Fwww.cdc.gov%2Fniosh%2Ftopics%2Fuvradiation%2Fdefault.html

¹² <https://www.agrisafe.org/flood-clean-up>

¹³ <https://www.agrisafe.org/wildfires>

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