Farmers: strategies for adapting to climate change

**Climate change could** have a significant influence on agriculture. However, the impacts will largely depend on how farms are managed to adapt to change. A recent study considers interactions between climate variability, farm management and the combined impact on productivity. It discusses how farms in different regions of Europe will have to change their farm management practices, such as fertiliser use and irrigation.

**Adaptation and vulnerability** of farms to climate change depend on 1) output (crop) type, 2) farm characteristics and 3) regional climate and socio-economic conditions. However, these strongly interact, with very large regional differences across the EU. The new research used data collected from 1990-2003 by the Farm Accountancy Data Network (FADN) database (and supplied by the EU-funded SEAMLESS project). The FADN provides harmonised accounting data on farm inputs and outputs across the pre-expansion EU15 member states.

The study results suggest that farms in North-West Europe are more efficiently managed than other regions due to greater use of technology. However, maximising crop yields increases risk. Low technical efficiency may be a risk aversion strategy, which may explain why it plays a larger role in more variable climates. Increasing farm size may increase total production, but could also make farms more vulnerable to climate change by amplifying the negative impact of higher temperatures, in countries such as France, the UK and Benelux countries.

Theoretical studies often conclude that the impacts of climate change will be higher in warmer regions. However, this study suggests that Greece and Spain will adapt better than France and suffer fewer impacts. This is because farm management in Greece and Spain appears to be already well suited to higher temperatures. For example, the irrigation systems are better suited to low rainfall, unlike in France where farmers are more dependent on fluctuations in available water.

The research suggests that the impact of adaptation strategies, such as changes to fertiliser application, pest and weed control and irrigation management, largely depend on the prevailing conditions in a region. Increasing the use of agrichemicals seems to be an important adaptation strategy in many regions, as warmer, wetter weather may increase pests. But, it only has a substantial effect on total output in Mediterranean farms where permanent cropping is very common.

It has been suggested that large farms have the capacity to overcome vulnerabilities to climate change through technology and small farms can survive the economic impact by taking on other forms of work that are not farm-related. This could imply that medium-sized farms are most vulnerable to climate change because they have lower levels of both labour and capital compared with large farms and rely less on income from additional, non-farming work.

Although changes in temperature and precipitation are expected to have the largest impact on farm output, the study does suggest that subsidies, such as those provided by the EU’s common agricultural policy (CAP), could help some regions adapt to climate change. The impact of these subsidies largely depends on the types of farms and the farm management practices used, with large farms in the Mediterranean region and Germany benefiting most.


**Contact:** pytrik.reidsma@wur.nl

**Themes:** Agriculture, Climate Change and Energy