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Agriculture in the era of the water challenge: how to survive drought and climate change



In Spain, drought is causing irreversible losses to over 3 million crops. Worldwide, water scarcity is expected to increase in more than 80 percent of croplands. From new irrigation systems to support funds, experts and EU schemes are testing sustainable answers to a burning question: how to let agriculture survive the challenge of global warming?

by Margherita Sforza

Spring is a season that turns our world green, but olive trees in the hills of Andalusia in southern Spain have never been so pale. For local farmers it is yet another difficult year. In five months, there has been only 27 litres of rain in the region. The soil looks dry and poor, and the herbaceous cover that supports the biodiversity of the olive groves is completely gone. Juan de Dios García is the owner of Omodeoil, a company that produces olive oil near Granada. Ordinarily, from his 200 hectares under cultivation he can obtain about 1 200 tonnes of olives. **“Last year, because of the**



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drought, we had a decrease of sixty per cent in yield and now the situation looks even worse. The yield will be very low, probably the lowest in the past 20 years on our farm”, says Juan.

Ten years ago, Juan invested in a smarter system of irrigation, deploying drones and soil sensors that tell the farmer when water is most needed. “Even if the sensors are telling us that it’s time to irrigate, the problem is that we have no water for that”. Juan added. **“People call us the ‘Garden of Europe’ but now the ‘Garden of Europe’ needs water”** he said, imploring the northern regions of Europe to show solidarity and send water through new pipelines.

[Drought now affects sixty per cent of the Spanish countryside](#), with crops like wheat and barley likely to fail entirely in four regions, according to COAG, a leading farmers’ association in Spain. COAG says **Spain’s long-term drought is causing “irreversible losses” to more than 3.5 million hectares of crops.**

To face this dramatic situation, Spain has requested emergency funds from the European Union. In April, [Spanish agriculture minister Luis Planas](#) wrote to the European Commissioner for Agriculture, Janusz Wojciechowski, to plead for aid for Spain’s 890,000 farm workers, including from the bloc’s agricultural crisis reserve and unused rural development funds.

The Commission’s Joint Research Centre has recently produced a [report in which it warns](#): **“Seasonal forecasts show a warmer than average spring over Europe”** a recent report said, which requires “close monitoring and proper water use plans” to deal with **the incoming summer season that “currently has a high risk of being critical for water resources”**.

Agriculture is notorious for its water use. Almost three-quarters of all water withdrawals are used by agriculture, compared to 16 per cent by municipalities for households and services, and 12 per cent by industry, according to a [UN study](#), UN Water 2021.

Moreover, agricultural water scarcity is expected to increase in more than 80 per cent of the world’s croplands by 2050, according to a [new study](#) in the AGU journal Earth’s Future.

“As the largest user of both blue and green water resources, agricultural production is faced with unprecedented challenges,” said Xingcai Liu, an associate professor at the Institute of Geographic Sciences and Natural Resources Research of the Chinese Academy of Sciences and lead author of the new study.

EU-funded projects have started to work on how to reduce the agricultural sector’s water use. Global warming has affected not only the south of Europe, which is traditionally drier; even in central Europe, in the regions of big rivers such the Danube, agriculture has suffered.

In Hungary last year 500,000 hectares of crops were [destroyed by drought](#), with damage estimated at more than €1 billion, and exports of cereals halved in volume.

Throughout the rural development programme “Széchenyi 2014-2020”, the Hungarian government sought to assist farmers in expanding coverage of irrigation systems from the current 90,000 to 300,000 hectares before 2030.

A transnational EU-funded project examined the possibilities for further development of this investment support scheme. The aim was to push the farmers to adopt cutting-edge irrigation systems and also to switch to techniques that make agriculture more sustainable in the long term to face climate change challenges.

Researchers in the [EFFECT project](#) submitted a questionnaire to 300 farms to see “whether participating farmers would be interested in receiving an annual subsidy in addition to investment support, in return for specific environmental commitments” explained Dr. József Fogarasi, coordinator of the project’s Hungarian case study.



Among the different options proposed to farmers were investments in drip-irrigation systems, irrigation scheduling that required coordination among farmers, crop diversification to reduce water demand, a contingency bonus for farmers who would volunteer to cease irrigation at times of water shortage and the possibility to reduce tillage practices to increase the water-holding capacity of soil.

The aim of the research was “to test the willingness to adaptation to these commitments of the farmers because these environmental commitments increase the costs of production and request changes” added Zoltán Bakucs, Senior Researcher, Phd, at the Óbuda University in Hungary. He analysed the farmers’ answers: **“The most striking result is that farmers often preferred to opt out, they preferred the status quo, not to choose among the different options, they did not wish to take extra money but they don’t want to be told how to produce. I am not sure that voluntary participation in these environmental schemes is really a good solution for the farmers. I think it would work better if it was compulsory to switch to these techniques”,** says Bakucs. Conservative attitudes among Hungarian farmers didn’t surprise Blaž Kurnik, head of group climate change impacts and adaptation at the European Environment Agency. But for him, in the transition to climate-friendly agriculture, a switch to more sustainable techniques cannot be imposed. **“It is important to work together with farmers through local advisory bodies” that can “show farmers best practices”.**

Education of the farmers, crop diversification and smart irrigation systems are priorities in the short term to face climate change but it will not be enough, he adds.

Indeed, for Blaž Kurnik, with many years’ professional experience in climate adaption, there must be some understanding about how the climate is changing, because “we will have more and more frequent extreme droughts, forest fires and floods in the coming years.” Investments and the choice of crops to plant must be carefully thought out because **“there will be some regions in Europe where agricultural practices, as they are now, will not work any more and in some cases, agriculture will no longer be feasible in a 30-to-50-year perspective. There will be parts of Europe where agriculture will need to be abandoned,”** he says.

But “farmers are an important part of society and needed to be supported,” he adds, explaining that investing in more efficient irrigation will not be enough, but **“we will need a kind of Just Transition Fund for farmers to support the social transition of farmers and their switch to other activities”**, just as is happening in central Europe with mining communities.

In a warming climate, Europe will need a long-term strategy to support the new agriculture and its farmers.

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