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At least €30 billion in agricultural losses due to climate change

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A new econometric analysis of French crop yields between 2010 and 2024 reveals losses of €1 to €2 billion per year attributable to climate change, for just seven major crops. Taken together, these losses amount to at least €30 billion, raising the question of the State's role in the sector's adaptation.

This summer's heatwave hit French agriculture hard. While farmers consider that it is not over yet – the rain has still not arrived –, catastrophic yields are expected. But the impact of climate change on this sector is nothing new. As early as 2022, the General Council for Food, Agriculture and Rural Areas (CGAAER) estimated[1] the cost of climate change for the agricultural sector at just under €3 billion per year by 2050, taking into account all conceivable costs[2].

While this estimate was an early signal of potential future losses, these losses may ultimately turn out to be much larger than expected. Indeed, considering only 7 crops (i.e. 16.8 % of the value produced by French agriculture), losses ranging between €1 and €2 billion per year can already be computed since 2010.

This calculation is based on an econometric analysis of panel data[3] on agricultural yields by *département* over the 2010-2024 period[4]. The relative variations in yields as a function of the level and variance of temperatures and precipitation are obtained by ordinary least squares, controlling for technical progress and for time-invariant *département* characteristics. Yields obtained under the current climate[5] are then compared with those that would have been obtained under a climate with less anthropogenic influence (namely that of the years 1950-1965). The analysis covers 7 of the largest French crops (soft wheat, maize, potatoes, sugar beet, rapeseed, barley and sunflower). The main results are that

[1] See CGAAER (2022), Évaluation du coût du changement climatique pour les filières agricoles et alimentaires.

[2] Mainly water (€1 billion), climate hazards (€1 billion), and the annual renewal of 10 % of French orchards (€600 million).

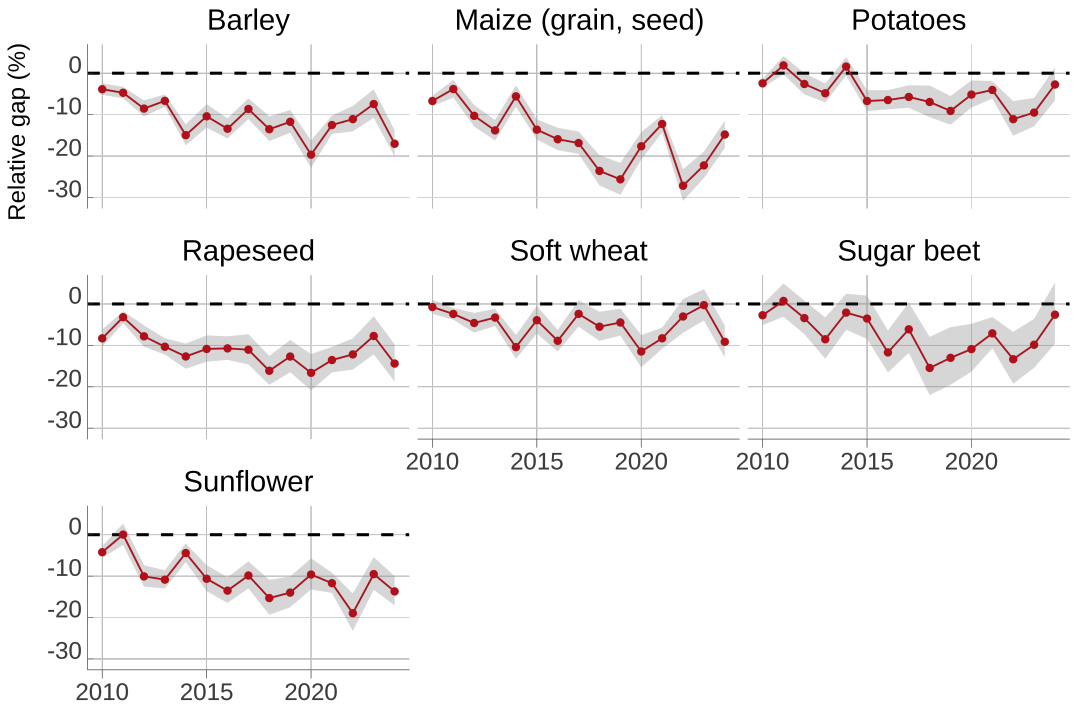
[3] That is, with observations over time and across space.

[4] The methodology follows Deschênes and Greenstone (2007) and Carter *et al.* (2018).

[5] Climate was defined as a 15-year period of weather variations. The traditional definition, corresponding to 30 years of weather variations, could not be used due to data availability.

yield losses linked to the contemporary climate are substantial, exceeding 20 % in some years, and that these losses tend to increase over time.

Graphique 1: Counterfactual gap by crop: yield predicted with 2010-2024 weather vs predicted with the average 1950-1965 climate (95% CI)

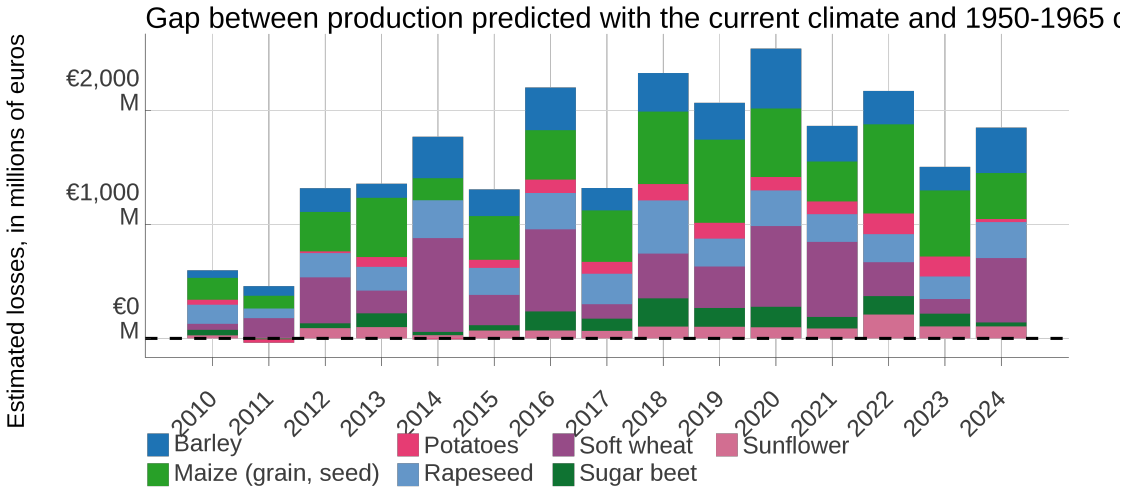


Lecture : In 2010, for soft wheat, estimated yields under the current climate are 0.7% lower than estimated yields under the 1950-1965 climate.
Sources : Agreste, CDS-Copernicus.

Valued at producer prices, these losses amount to around €1 to €2 billion[2025] per year. They have increased over the last 15 years, but seem to have levelled off or even declined over the last 5. This could support the hypothesis that the damage caused by climate change to nature is growing, but that farmers are gradually adapting to limit their losses.

The crops most affected by losses are soft wheat and maize, mainly because of the larger production volume for wheat, and because of a high yield loss (minus 25 % in some years) for maize (graphique 1).

Graphique 2: Estimated monetary losses linked to the current climate



Lecture : In 2010, for soft wheat, the gap between production predicted with the current climate and with the 1950-1965 climate represented a loss of €53.2 million for farmers.
Sources : Agreste, CDS-Copernicus, data.gouv, CGB.

Total losses[6] over the 2010-2024 period amount to €30 billion in 2024 (graphique 2).

These results are partial. To calculate the overall cost for agriculture, it is necessary, on the one hand, to calculate the damage caused by climate change to all crops. This would also capture the crop substitutions made by adapting farmers[7].

On the other hand, damage caused by natural disasters induced by climate change (damage to agricultural fixed assets from forest fires or storms, for example) should also be included. Finally, the 7 crops considered account for only 16.8 % of the value produced by French agriculture. The €30 billion in losses is therefore only a lower bound, corresponding to the case where the rest of agriculture is unaffected. Under the opposite assumption that it is affected in the same way, losses would amount to €178 billion.

Unlike material losses caused by natural disasters, yield losses are often covered neither by insurance nor by State subsidies. They will therefore encourage farmers to adapt their production. This raises the question of the State's role in this adaptation[8]. At the very least, it should not legislate against adaptation, that is, it should not implement short-term public policies that prevent or slow down adaptation. Adaptation requires heavy investment (for example to switch crops), which must be initiated as soon as possible. This calls into question, for example, the long-term relevance of "mega-basins", which constitute a form of "maladaptation": they require increasingly large investments that delay crop switching, while ultimately proving insufficient to sustain the crops they irrigate. To determine public

[6]Computed as the capitalised sum of annual losses: if the amount of losses each year had been invested since 2010 at a rate of 3.2 %, €30 billion would have been recovered in 2024. The 3.2 % rate was chosen because it is a low rate, used for public investments (see Ni and Maurice (2021)).

[7]For instance, sorghum replacing maize; this nevertheless remains too marginal to significantly reduce losses (see Agreste (2024)). This could, however, change in the future.

[8]See Dolšak and Prakash (2018).

policy at the national level or within the Common Agricultural Policy (CAP)[9], the market failure(s) justifying intervention should be identified. Are some risks uninsurable? Are there externalities (biodiversity, landscape, etc.) justifying the protection of the farming sector? And if the State intervenes, should it do so through regulation of the insurance sector[10], funding of public adaptation infrastructure, or subsidies for adaptation measures implemented by farmers?

Finally, not only will adaptation policy, like any public policy, have to take into account income heterogeneity, but it will also have to consider the heterogeneity of agents' exposure to climate risks. This makes the approach more complex, but redistributive effects must not be overlooked.

Agreste (2024). "Des surfaces de céréales orientées à la baisse depuis dix ans," Primeur, n°5.

Carter C., Cui X., Ghanem D., Mérel P. (2018). "Identifying the economic impacts of climate change on agriculture," *Annual Review of Resource Economics*, *10*, pp. 361–380.

Deschênes O., Greenstone M. (2007). "The economic impacts of climate change: Evidence from agricultural output and random fluctuations in weather," *American Economic Review*, *97*, n° 1, pp. 354–385.

Dolšak N., Prakash A. (2018). "The politics of climate change adaptation," *Annual Review of Environment and Resources*, *43*, pp. 317–341.

Ni J., Maurice J. (2021). "Guide de l'évaluation socioéconomique des investissements publics, complément opérationnel i : Révision du taux d'actualisation," France Stratégie.

OECD (2023). "Enhancing the insurance sector's contribution to climate adaptation," 26, OECD Business and Finance Policy Papers, OECD Publishing.

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[9]The proposed CAP regulation for the 2028-2034 period aims to *"improve resilience and the capacity to cope with crises and risks"*.

[10]See OECD (2023).