

Science for Environment Policy

Maximum benefit from agri-environmental measures could be gained by targeting areas with specific environmental pressures, Germany

Agri-environmental measures (AEM) are designed to encourage farmers to protect and enhance the environment on their farmland by paying them for the provision of environmental services. This study suggests that AEM would be more effective if payments were targeted to areas under the greatest environmental pressures, such as intensive agricultural regions — to gain maximum environmental benefits.

AEM are a key element for the integration of environmental concerns into the EU's Common Agricultural Policy (CAP). This study, the first nationwide research into AEM payments in an EU Member State (MS), sought to address the spatial targeting of AEM, by analysing the distribution of German AEM payments alongside selected environmental pressures and land-use indicators. Germany is a good case study MS for spatial targeting of AEM, as its landscape is similar to that of many central European regions, and it's also the MS with the highest total expenditure for AEM; around 25% of agricultural land has received AEM payments.

The researchers analysed the spatial correlation between AEM payments and environmental pressure indicators in Germany. A high spatial resolution was used to create links between landscape characteristics, policy tools and their likely impact on environmental issues at a detailed scale.

Agricultural subsidy data was used to calculate AEM payments by municipality for 2014. This was then divided by the Utilised Agricultural Area (UAA), as a proxy variable (i.e. a variable that is not in itself directly relevant, but is used in place of an unobservable or immeasurable variable) to calculate payments per hectare, as this data was unavailable. This 2014 financial data was for AEM uptake in 2013 under the EU CAP 2013–2017 programme period.

Information on environmental pressures was derived from data on Local Administrative Units (LAU), which largely mirror German municipalities. The environmental pressure indicators examined included those relating to climate change — represented by nitrous oxide emissions from agricultural land and the share of agricultural land on organic soils. There were four indicators related to landscape structure and soils: habitat fragmentation; ammonia (NH₄) deposition; soil-erosion risk of arable soil; and soil-compaction risk. The spatial data of these indicators was mapped onto the LAU level to calculate the average proxy value per municipality. Land-use attributes and local conditions were also noted for statistical analysis alongside the other data.

Payments from the EU agricultural funds for 2014 to Germany were obtained from the website of the Federal Office for Agriculture and Food using web data extraction — only data relating to direct payments and AEM was used.

The statistical analysis of the data found spatial mismatches between the distribution of AEM payments and several of the environmental pressure indicators. There was low uptake of AEM amongst farmers in areas with high ammonia deposition or high shares of UAA on organic soils, but high uptake of AEM when indicators of soil erosion and habitat fragmentation were a high risk.

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AEM payments varied significantly in relation to land-use attributes across Germany. There was greater uptake of AEM payments among farmers in regions with high shares of grassland and [Natura 2000](#) protected areas than among farmers in regions characterised by intensive agriculture.

Overall, the study's results show a trend towards spatial separation for AEM payments, with lower uptake in highly specialised, productive agricultural areas with relatively severe environmental pressures and higher uptake in regions with small-scale, low-input farming with lower environmental pressures.

The results show a strong bias in the payments for agri-environmental measures that is contrary to the actual intention. Results also reveal a weak implementation of these measures in regions with selected environmental problems. The researchers thus concluded that an integrative landscape-scale design of programmes fully accounting for regional differences in environmental and economic conditions is needed to increase the success of agri-environmental policies and to better target areas exposed to environmental pressures; such a system has been partially implemented in Bavaria and Rhineland-Palatinate. The researchers suggest future studies could explore whether these results also apply to other EU MS that differ from Germany in terms of environmental characteristics and policy schemes.

