Salgado I (2023) Solar photovoltaic power stations in dry cereal farmland: how to convert habitat loss into landscape heterogeneity. *The Journal of Brief Ideas* https://doi.org/10.5281/zenodo.8196218

Solar photovoltaic power stations in dry cereal farmland: how to convert habitat loss into landscape heterogeneity

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agricultural intensification *dry cereal farmland* *fallow land*
farmland birds *iberian peninsula* *landscape heterogeneity*
solar photovoltaic power stations *spillover effects*

Agricultural intensification has caused the decline of farmland bird populations across Europe (Donald et al. 2001; Rigal et al. 2023). High-intensity farming simplifies agricultural mosaics by removing non-cultivated landscape elements such as fallow land and field margins. However, birds depend on semi-natural areas for feeding and nesting in dry cereal farmland. In fact, the decline of farmland bird populations in the Iberian peninsula is linked to the loss of fallow land (Traba & Morales 2019).

The main impact of solar photovoltaic power stations (SPPSs) on farmland birds is habitat loss (Serrano et al. 2020): around 2 ha of land per MWp of power. However, if managed as large pesticide-free fallow patches, SPPSs may function as sources of seeds and invertebrates that spread along field margins throughout farmland (spillover effects; Blitzer et al. 2012): i.e. large patches (> 10 ha of fallow land) interact with linear corridors (field margins of at least 1,5 m in width) to move trophic resources for farmland birds throughout the agricultural landscape for a long time (the useful life of SPPSs is 30 years). Managing SPPSs as large pesticide-free fallow patches converts non-habitat into landscape heterogeneity in intensive farmland. Therefore, SPPSs managed as fallow land may mitigate the negative effects of agricultural intensification on farmland birds.

Attachment: GraphicalAbstract.jpg (848 KB)