Indicator Factsheet: Crop diversity

Indicator: Land use composition **Sub-indicator: Crop diversity**	
Description	The indicator describes the diversity of arable land use (crop diversity). Quantification is carried out using the Shannon-Wiener index (H). It is represented by the Shannon element count (or 'effective number of classes' or 'Hill number'). This is a measure of the number of classes (here: crop types on arable land) required, assuming an equal distribution of classes, to achieve the corresponding Shannon index value.
Data basis	**Remote sensing:** Mapping (nationwide) of open land use (Blickensdörfer et al. 2022). Field boundaries derived from image segmentation (Tetteh et al., 2021). For the class catalogue, see Appendix II (Level 3). **Agricultural data**: Crop type and other land use, including geometries (field blocks or parcels) from IACS (nationwide) and the Thünen Agricultural Atlas at the municipal level.
Calculation	(1)Shannon-Wiener Index: $H = -\sum_{i} pAL_i \cdot lnpAL_i$ mit $pAL_i = \frac{a_i}{A_{AL}}$ pAL_i = Proportion of land use class i in arable land; a_i = area of class i; A_{AL} = Area of arable land (2)Shannon Hill number: ${}^{1}D = exp\ (H)$
Report level	**Coverage**: National; **Resolution**: Administrative units; Hexagons (100 ha, proportion of open landscape > 25% & proportion of arable land > 10%); **Reference area**: Arable land
Reporting period/ interval	from 1999 (agricultural statistics), 2010 (IACS), and 2017 (remote sensing), respectively / annually
Interpretation	Higher Shannon index values or higher Shannon Hill number counts generally indicate greater habitat diversity (here: crop diversity). The Shannon index is generally sensitive to classes with moderately high area proportions and is suitable for quantifying complex land use patterns. The reference area for the calculation is the total area of arable land in the respective reference unit (e.g., hexagon).
Limitations	Although higher index values indicate more diverse land use, they do not necessarily reflect higher biodiversity, as qualitative characteristics (e.g., the value of individual land use classes) are not taken into account. The spatial scale (aggregation) of the reporting level and the thematic differentiation (number of crop types/classes) affects the index values. The indicator is only shown for reference units whose share of open landscape is at least 25%.
Latest update	2025