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BIOBIO indicator factsheet

Percentage of Semi-natural Habitats (SemiNat)

Refers to Chapter 5 ‘Habitat Indicators’ of the Guidebook ‘Biodiversity Indicators for European Farming Systems’

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Percentage of Semi-natural Habitats (SemiNat)

Description

Share of semi-natural habitats on the farm. The **unit** of measurement is percent of Utilized Agricultural Area. **Sub-indicators** can be computed such as the share of 'Semi-natural Habitats without trees', 'Semi-natural Habitats with trees', 'Semi-natural Aquatic Habitats' and for other sub-categories, depending on purpose.

Surveyor skills

The indicator is based on habitat mapping, which requires basic GIS, ecological and botanical skills.

Data collection method

The habitat mapping method is described in Deliverable 2.2[1].

Calculation method

SemiNat is obtained by dividing the total area of semi-natural habitats by the size of the farm:

$$\text{SemiNat} = \frac{\text{SNH}}{\text{UAA}} * 100$$

In which SemiNat is the percentage of semi-natural habitats, SNH is the total area of semi-natural habitats (hectares, comprising both areal and linear habitats) and UAA is the farm size (Utilized Agricultural Area in hectares).

Results from BioBio case studies

The graph shows the mean values and their distribution across the 12 BioBio case study regions. In Bulgaria and Spain (olive farms and Dehesa), the farms consist almost entirely of extensive agricultural and semi-natural habitats. The Bulgarian grasslands are relatively high (above 950 m a.s.l.) and extensively managed (sheep pastures with low stocking density <0.6 livestock units/ha), the Spanish olive farms are all traditional olive orchards with tree densities <200 trees/ha and the Dehesas are classified as Annex I habitats in the European Habitats Directive. For such farms and regions, this indicator is not very informative (does not differentiate between farms). In the other case study regions the farms differ from each other in their share of Semi-natural Habitats. Values tend to be higher in grassland case study regions (Wales, Hungary, Norway) than in arable and mixed farming regions (Austria, Germany, The Netherlands).

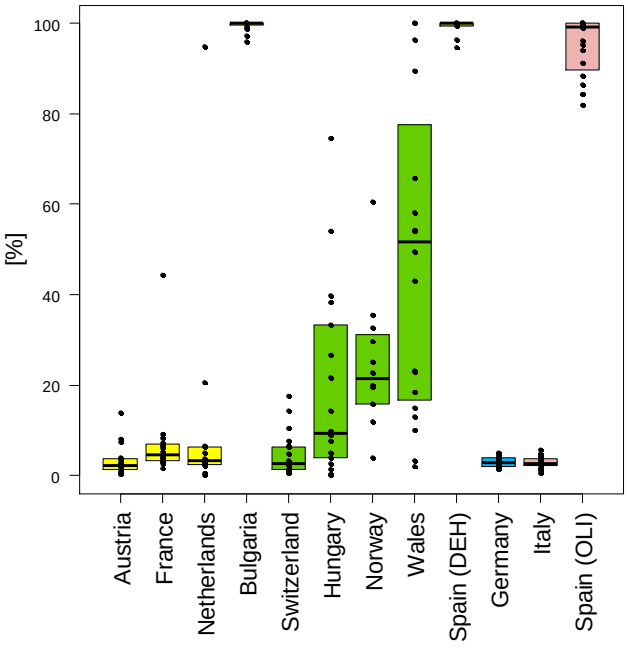
Estimated effort and costs (labour effort required, analysis)

The indicator measurement requires habitat mapping and subsequent GIS analysis. Medium effort.

Semi-natural Habitats as a change indicator

The indicator may increase as a result of endeavors to promote farmland biodiversity, e.g. in the context of agri-environmental schemes. It will be more sensitive to the conversion of areal elements to semi-natural habitats than to the planting or installation of linear elements such as hedgerows, field borders and ditches. Such measures are often promoted in arable regions and have been shown to be very effective, but as they do not cover large areas these elements will more affect the indicator 'Length of Linear Habitats (LinHab). The two indicators SemiNat and LinHab therefore complement each other.

Landscape with a rich structure of woody semi-natural elements in Norway. Photo: H. Timmermann, NFLI



Distribution of indicator 'Percentage of Semi-natural Habitats'.
Each point displays the indicator value of a farm. Farms are grouped in the respective case studies. Yellow: field crops & horticulture in Austria, France and the Netherlands, green: specialist grazing livestock in Bulgaria, Switzerland, Hungary, Norway, Wales and Dehesa in Spain, blue: mixed crops & livestock in Germany, pink: permanent crops in Italy and Olives in Spain. The colored box contains the values of 50 % of the farms of a case study. The line marks the median.

[1] Dennis P. et al. 2012. Biodiversity in organic and low-input farming systems. ALTERRA Report 2308.

Interpretation

The value of SemiNat depends on the classification of habitats as semi-natural or not. This is an extremely complicated concept to define in a standardized way for different countries across Europe. Even within a case study it may be difficult to define precisely when an agricultural habitat qualifies as "semi-natural". Whilst for some habitats it is obvious into which category they belong (e.g. dry meadow vs. maize field), there are intermediate habitats which can be classified either way. For grasslands, in particular, there is a gradient in management intensity and species richness between intensive and extensive grassland, often even within individual plots.

In BioBio the habitats mapped on the farms of the 12 case study regions were classified as semi-natural or not according to the General Habitat Categories of the EBONE mapping method and the management qualifiers that were recorded. In addition, all linear elements and all Annex I habitats qualified as semi-natural[2]. This is thus an attempt at a categorization of habitats at the European level. National categorizations may be more relevant and meaningful to farmers and stakeholders. In Switzerland, for example, ecological compensation areas (unfertilized grasslands with late cut obligation, comprising about 10% of the meadows and pastures in the Swiss case study region) are usually regarded as semi-natural, but were not included in this category here. In Norway, grazed woodlands were defined as semi-natural, being the clear result of a combination of natural and agricultural influences on the vegetation. However, the degree of agricultural influence varied with grazing pressure and time since last grazed, further complicated by the possible effects of grazing by non-domestic animals (deer and moose). Defining a precise point of transition from semi-natural to "natural" was difficult and the final mapped area may therefore not correspond to that defined as "Utilized Agricultural Area" in national agricultural statistics.

Examples of linear semi-natural elements in arable regions, hedgerows and wildflower strips. Photos: Gabriela Brändle, Agroscope

Strengths and weaknesses

The indicator requires both field work and a GIS but is easily computed once the habitat map is available. Indicator values depend strongly on the definition of semi-natural habitats and on the habitat mapping method (thematic and spatial resolution), so comparisons between farms/countries require standardization (as in BioBio). The indicator places little emphasis on linear elements and requires the use of other indicators (e.g. LinHab) to investigate the value of these habitats. When interpreting change in the indicator, care must be taken to account for areas of semi-natural habitat that are no longer managed, because if these are no longer defined as UAA they may be excluded from the mapping.

[2] Jeanneret P., *et al*. 2012. Report on scientific analysis containing an assessment of performance of candidate farming and biodiversity indicators and an indication about the cost of indicator measurements. Deliverable 4.1 of the EU FP7 Project BioBio.

This factsheet is part of the Guidelines **Biodiversity Indicators for European Farming Systems**.
More detailed information on the set of indicators developed in the EU FP7 research project BIOBIO (Biodiversity indicators for organic and low input farming systems, KBBE-227161) is given in a printed report, published as ART Publication Series Nr. 17. The report can be downloaded from the BIOBIO website.
Printed versions can be ordered at www.agroscope.admin.ch or at Agroscope, Reckenholzstrasse 191, 8046 Zurich, Switzerland

BIOBIO Indicator Factsheets

Genetic diversity	
Breeds:	Number and amount of different breeds
CultDiv:	Number and amount of different varieties
CropOrig:	Origin of crops

Species diversity	
Plants:	Vascular plants
Bees:	Wild bees and bumblebees
Spiders:	Spiders
Earthworms:	Earthworms

Habitat diversity	
HabRich:	Habitat richness
HabDiv:	Habitat diversity
PatchS:	Average size of habitat patches
LinHab:	Length of linear habitats
CropR:	Crop richness
ShrubHab:	Percentage of farmland with shrubs
TreeHab:	Tree habitats
SemiNat:	Percentage of semi-natural habitats

Indirect management indicators / parameters	
EnerIn:	Total direct and indirect energy input
IntExt:	Intensification/Extensification - Expenditure on inputs
MinFert:	Area with use of mineral fertiliser
NitroIn:	Total nitrogen input
FieldOp:	Field operations
PestUse:	Pesticide use
AvStock:	Average stocking rate
Graze:	Grazing intensity