BɪoBɪo indicator factsheet

Tree Habitats (TreeHab)

Refers to Chapter 5 'Habitat indicators' of the Guidebook 'Biodiversity Indicators for European Farming Systems'

Agroscope

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Swiss Confederation

Federal Department
of Economic Affairs FDEA
Agroscope Reckenholz-Tänikon
Research Station ART

Tree Habitats (TreeHab)

Description
Relates to fruit trees, ornamental trees, vines and pastured forest as well as to hedgerows and semi-natural woodland elements on Utilised Agricultural Area (UAA). The **unit** of measurement is % of UAA. **Sub-indicators** can be generated such as 'Percentage of intensively cultivated forage and food crops with trees', 'Percentage of extensive agriculture and semi-natural habitats with trees', 'Percentage of linear elements with trees'.

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]. Alternatively, tree habitats can easily be recognized and mapped from aerial photographs.

Calculation method
TreeHab is obtained by dividing the sum of the area of tree habitats by the size of the farm and multiplying by 100 to get the percentage:

$$TreeHab = \frac{TH}{UAA} * 100$$

in which TreeHab is Tree habitats (in %), TH the sum of the area of the tree habitats on the farm and UAA 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. Not surprisingly, farms in Italy (vineyards), and Spain (olive groves, Dehesas) are dominated by tree habitats. The indicator is probably not very useful in such case study regions, but rather in regions of intensive arable and/or grassland farming, where structural elements such as traditional orchards or hedgerows are scarce. As the BioBio project focused on organic and low-input farming, this kind of case study is underrepresented. Lowest values were observed in Germany (mixed farming) and Austria (arable farming). In France (arable farming) up to 20% of the farms consist of tree habitat. This indicates that in this region there is a relatively high share of structuring woody elements.

Estimated effort and costs
### (labour effort required, analysis)
The indicator measurement requires habitat mapping and subsequent GIS analysis. Medium effort.

Tree Habitat change as an indicator
From a biodiversity point of view TreeHab is of interest in regions where structuring, semi-natural landscape elements are scarce and in regions where elements such as traditional orchards, hedgerows, and small woods are under pressure.

---

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

Traditional orchard in the Swiss Jura, and Dehesa landscape in Extremadura, Spain. Photos: Felix Herzog & Gisela Lüscher, Agroscope
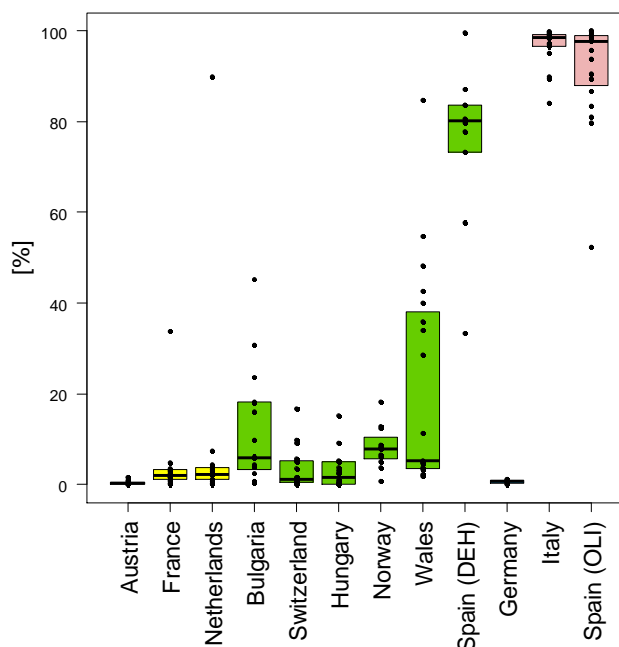
Distribution of indicator 'Tree habitats'
Each point displays the indicator value of a farm. Farms are grouped in the respective case studies. Yellow: field crops & horticulture in Austria, France and the Netherlands, green: specialist grazing livestock in Bulgaria, Switzerland, Hungary, Norway, Wales 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.

In the first case, an increase in TreeHab indicates creation of new habitats (maybe also acting to reduce erosion if hedgerows are planted). In the second case, a decrease in TreeHab indicates a further deterioration of the traditional agricultural landscape.

Interpretation

Woody elements on farmland are fundamentally different from arable fields or grassland. Trees and shrubs are permanent, overwintering plants and offer habitats for various arthropods, birds and small mammals which otherwise cannot exist on farms. The indicator is therefore of interest mostly for arable and grassland farms, which only have a relatively low share of tree habitats. In such cases it indicates the potential to host farm wildlife which depends on trees and shrubs. In contrast, it is of little interest for vineyard or olive farms, which consist mostly of tree habitats. On such farms a sub-indicator which differentiates between intensively managed tree habitats and extensive & semi-natural tree habitats is more relevant.

Tree habitats are key elements for the perception of landscapes and are highly valued by both farmers and non-farmers for aesthetic reasons[2].

Strengths and weaknesses

The indicator is easily computed once the habitat map is available. Comparison between farms/countries requires standardization of mapping methodology (as in BioBio). Sub-indicators are needed to separately evaluate intensively farmed and extensively farmed (and semi-natural) tree habitats.

---

[2] Junge X. et al., 2011. Aesthetic preferences of non-farmers and farmers for different land-use types and proportions of ecological compensation areas in the Swiss lowlands. *Biological Conservation* 144, 1430–1440.

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, Switzer-land

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 nitrogen fertiliser
NitroIn:	Total nitrogen input
FieldOp:	Field operations
PestUse:	Pesticide use
AvStock:	Average stocking rate
Graze:	Grazing intensity