IRENA Indicator Fact Sheet

IRENA 07 - Area under organic farming

Indicator definition

Trends in the organic farming area and the share of the organic farming area in the total utilised agricultural area (UAA)

Input indicator links:

IRENA 05.1 - Organic producer price premium (R)

IRENA 05.2 - Agricultural income of organic farmers (R)

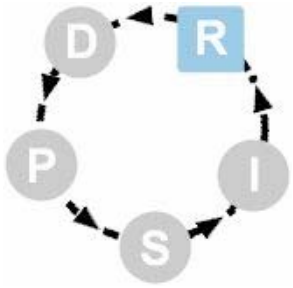
Output indicator links:

IRENA 23 - Soil erosion

IRENA 28 - Species richness

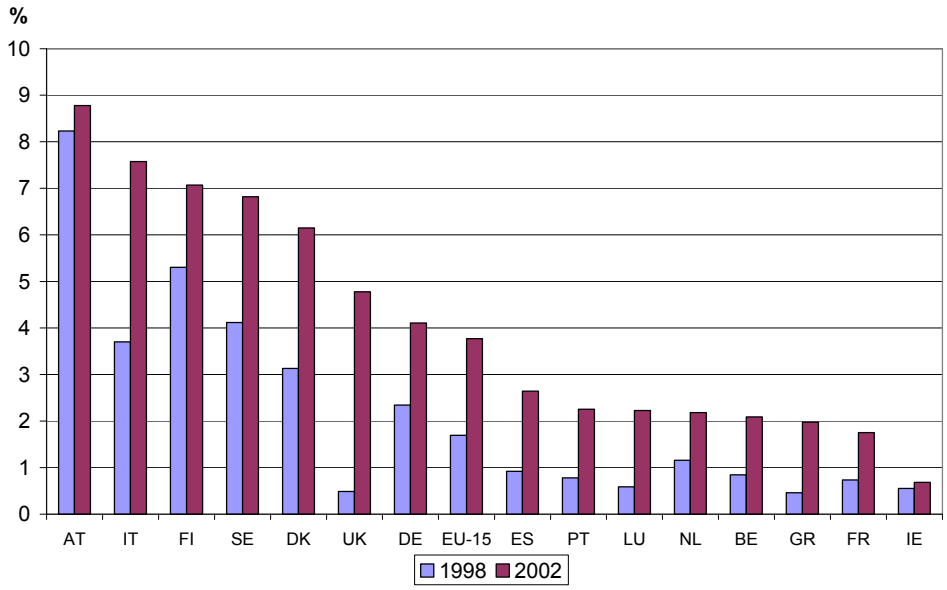
IRENA 11 - Energy use

IRENA 21 - Water contamination



By the end of 2002, the area devoted to organic farming (sum of organic and in-conversion area), certified under Regulation (EEC) No 2092/91, covered 4.9 million ha in EU-15, while in 1998 it covered only 2.3 million ha. This represents an increase of 114 % over the period 1998-2002. The organic farming area reached 3.8 % of the total utilised agricultural area (UAA) of EU-15 in 2002, up from only 1.7 % in 1998. A quarter of the EU-15 organic farming area in 2002 was located in Italy. Within the Member States there is a considerable regional variation of the indicator.

Figure 7.1 Share of organic farming area (sum of organic and in-conversion area), certified under Regulation (EEC) No 2092/91, in total UAA



Source: Organic farming questionnaire, DG Agriculture, data treated by Eurostat; ZPA1, Eurostat. Estimates for EU-15, Finland, Greece and United Kingdom regarding UAA in 2002.

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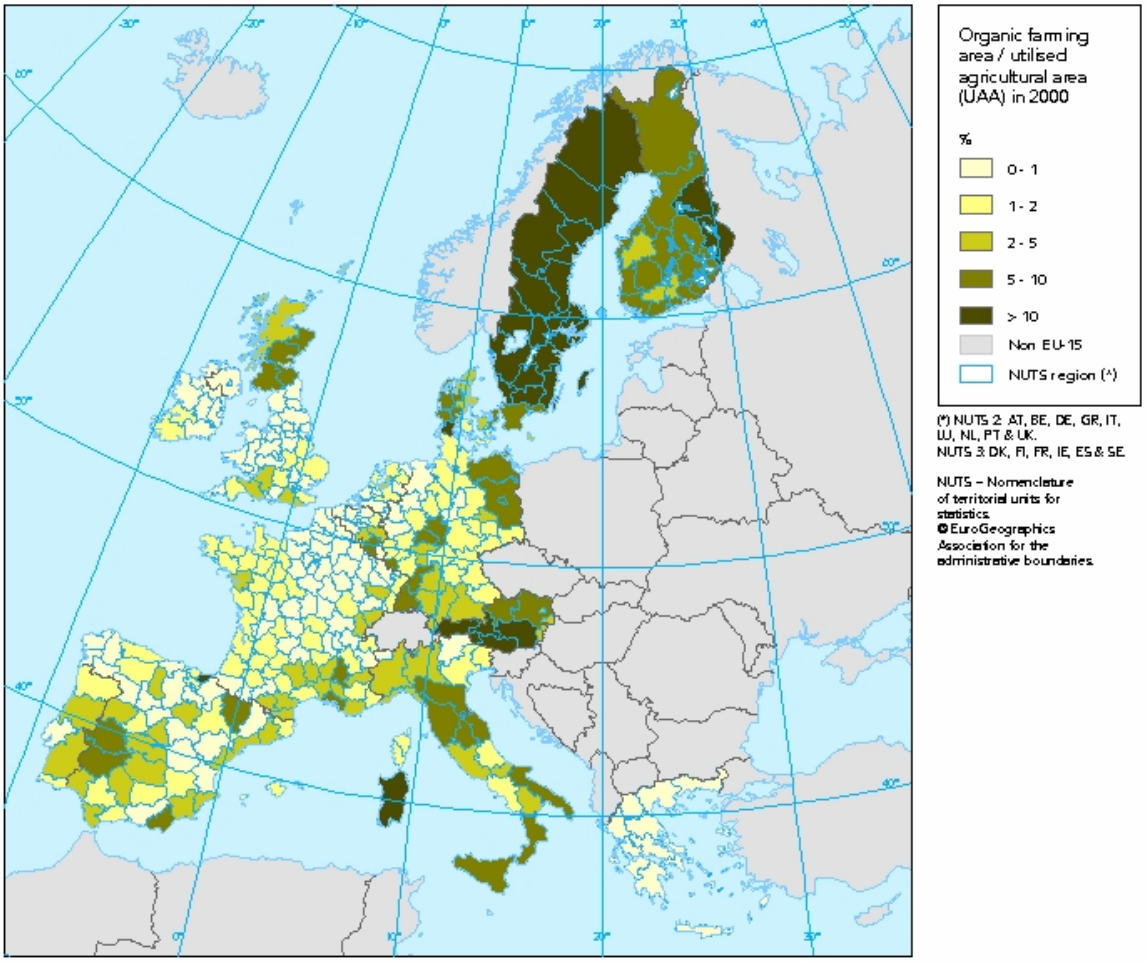
Figure 7.2 Regional map on the share of organic farming area in the total UAA in 2000



Source: Community survey on the structure of agricultural holdings (FSS), Eurostat (for some Member States this includes also areas not certified under Regulation (EEC) No 2092/91).

Results and assessment

Introduction

Organic agriculture can be defined as a production system, which puts a high emphasis on environmental protection and animal welfare by reducing or eliminating the use of GMOs and synthetic chemical inputs such as fertilisers, pesticides and growth promoters/regulators. Instead organic farmers promote the use of cultural and agro-ecosystem management practices for crop and livestock production. The legal framework for organic farming in the EU is defined by Council Regulation 2092/91 and amendments.

Policy relevance and context

Farming is only considered to be organic at EU level if it complies with Council Regulation (EEC) No 2092/91. In this framework, organic farming is differentiated from other approaches to agricultural production by the application of regulated standards (production rules), certification procedures (compulsory inspection schemes) and a specific labelling scheme, resulting in the existence of a specific market, partially isolated from non-organic foods. Council Regulation (EEC) No 1804/1999 supplements the above regulation by including livestock production.

In EU-15, area-based payments for organic farming have been a major driving factor for organic farming. The payments were originally granted through the agri-environment schemes under

Council Regulation (EEC) No 2078/92, which is now continued under Council Regulation (EC) 1257/1999 regarding support for rural development. In June 2004, the Commission presented its Communication the 'European Action Plan for Organic Food and Farming (COM(2004)415). The Action Plan sets out 21 actions in the areas of the organic food market, public policy and standards and inspection. The Action Plan does, however, not set any specific targets in relation to area or number of farmers, neither does it present funding opportunities/budget for the 21 actions.

At the national level, a number of EU-15 Member States have set targets for areas under organic farming. Sweden has set a target of 20 % of the arable land under organic farming by 2005. Germany has set a target of 20 % of agricultural land/arable land under organic production by the year 2010. Belgium (Flanders), Denmark, France, the Netherlands and the United Kingdom (Wales) all set targets between 5 and 10 % by 2005 or 2010.

Table 7.1 National organic action plans

Member State	Name of Programme	Target year	Target
EU	European Action Plan for Organic Food and Farming (2004)	None	Sets out 21 key actions regarding the organic food market, public policy, standards and inspection
Austria	Aktionsprogramm Biologische Landwirtschaft 2003-2004	2006	At least 115.000 ha of arable land in 2006 (~ 8 % of arable land)
Belgium	"Vlaams actieplan biologische landbouw" - Flemish Action Plan (2000-2003)	2010	10 % of farmland by 2010
Germany	"Bundesprogramm Ökologischer Landbau" (2000)	2010	20% of farmland by 2010
Netherlands	"An organic market to conquer" (2001-2004)	2010	10% of farmland by 2010
Sweden	Action Plan (1999)	2005	20 % of farmland by 2005 10% of all dairy cattle/beef cattle/lambs
UK	„Action Plan to develop organic food and farming in England – two years on" (2004)	2010	The UK produced share of the market for organic food products should be 70% by 2010

Agri-environmental context

Recently, some wide ranging literature reviews have attempted to bring information together on the environmental impacts of organic agriculture in comparison to conventional agriculture (e.g. Stolze *et al.*, 2000; Shepherd *et al.*, 2003; Hole *et al.*, 2004). Overall, these researchers support the general presumption of that organic agriculture produce a number of environmental benefits, although the results are sometimes ambiguous. Below the results of the reviews are summarised according to category.

Ecosystem:

This category comprise of the review of research results on floral and faunal biodiversity, habitat diversity and landscape conservation. The main findings are that organic farming is superior to conventional farming in respect to floral and faunal diversity: "Due to the ban of synthetic pesticides and N-fertilisers, organic farming systems provide potentials that result in positive effects on wildlife conservation and landscape. Potentially, organic farming leads to a higher diversity of wildlife habitats due to more highly diversified living conditions, which offer a wide range of housing, breeding and nutritional supply" (Stolze *et al.*, 2000).

This conclusion is supported by Hole *et al.* (2004) who (on the basis on a comparative assessment of 76 studies) note that organic agriculture perform better than conventional agriculture both with regard to flora species richness as well as bird abundance. The study shows, however, that for some invertebrates such as earthworms, butterflies, spiders and beetles

the tendency is not always as clear. One of the reasons for this is difference in research methodologies: "Different studies use different 'measures' of biodiversity, potentially complicating any comparison. Furthermore, there is a lack of statistical independence between and within some studies".

Soil:

Both Stolze *et al.*, 2000 and Shepherd *et al.*, 2003 look at the impact of organic farming on soil properties. The general conclusion of these studies is that organic farming tends to conserve soil fertility and system stability better than conventional farming systems. Stolze *et al.* note that this is mostly due to "higher organic matter contents and higher biological activity in organically farmed soils than in conventionally managed". In addition organic farming seems to have a high erosion control potential. However, no differences are identified between the farming systems as far as soil structure is concerned, and in addition soil performance is highly site specific (Stolze *et al.*, 2000).

Ground and surface water:

Since the use of synthetic pesticides is banned in organic farming, such natural resources as ground and surface water are protected against these pollutants (in contrast to other systems). Pesticide pollution from organic farming is therefore (of course) far less common than pesticide pollution from conventional agriculture (Stolze *et al.*, 2000 and Shepherd *et al.*, 2003). With regard to nitrate leaching, the two studies show that generally organic farming results in lower or similar nitrate leaching rates than conventional agriculture due to the management practices in place (such as green cover, straw-based manure and lower stocking densities), though variations between individual fields do exist.

Climate and air:

The study by Stolze *et al.*, 2000 shows that research on CO_2 emissions have varying results: "On a per-hectare scale, the CO_2 emissions are 40 - 60% lower in organic farming systems than in conventional ones, whereas on a per-unit output scale, the CO_2 emissions tend to be higher in organic farming systems".

In relation to N_2O emissions from manure and soil, quantitative research information is scarce. Keeping this in mind, Stolze *et al.*, conclude nevertheless that N_2O emissions per hectare on organic farms tend to be lower than on conventional farms, while the N_2O emissions per kg of milk are equal or higher, respectively.

Similarly, research results on methane emissions in different farming systems are also scarce, but Shepherd *et al.* note that: "Methane emission per unit of livestock product decreases as the intensity of animal production increases. On average, production intensity is lower in organic than conventional systems, so methane generation from organic sheep and cattle farms is likely to be greater per unit of food produced. Because of the lower stocking densities, it maybe similar or less on an area basis" (2003).

Farm input and output:

According to the study by Stolze *et al.*, 2000, nutrient balances of organic farms are in general close to zero. In all published calculations, the N, P and K surpluses of organic farms were significantly lower than on conventional farms and negative balances were found for P and K.

Table 7.2

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	Indicator	Assessment of impact		Comments
		Per unit area	Per unit yield	
Ecosystem	Biodiversity	☺	☺	Organic principles encourage a variety of habitats.
Soil quality	Organic matter content	☺/😐	☺/😐	Potential benefits from organic farming, depends on organic matter inputs on individual organic and conventional farms.
Water Quality	Nitrate leaching	☺	☺/😐	Potentially losses from ploughed leys, but smaller losses, on average, from other points in the rotation.
	Pesticides	☺	☺	Few pesticides used in organic production.
Air quality	Nitrous oxide	😐	😐	Insufficient information.
	Methane	☺	☹	Most data relate to dairy systems. Lower emissions on an area basis due to lower livestock densities
	Carbon dioxide	☺	☺	Main energy input relates to fertiliser manufacture
Resource use	Energy efficiency	☺	☺	Depends where boundaries are drawn when comparing systems, but main energy input into conventional is fertiliser production.
	Nutrient balance	☺	☺/😐	Smaller surpluses: OK if not over-depleting soil fertility.

Source: Shepherd *et al.*, 2003.

Note: ☺ Organic farming better than conventional, 😐 No difference, ☹ Organic farming worse than conventional.

Assessment

In 2002, the area devoted to organic farming (sum of organic and in-conversion area) covered 4.9 million ha in EU-15, while in 1998 it covered only 2.3 million ha. This represents an increase of 114 % over the period 1998-2002. The organic farming area reached 3.8 % of the total UAA of EU-15 in 2002, up from only 1.7 % in 1998. (Please note that Figure 7.2 only provides data from 2000). This means that while organic farming is a growing 'sector', the total size of the 'sector' is still relatively small compare to conventional agriculture.

A quarter of the EU-15 organic farming area in 2002 was located in Italy. The United Kingdom had the second largest area, followed by Germany, Spain and France. The Member States with an increase in organic farming area in the period 1998-2002 above or close to the EU-15 average were the United Kingdom, Luxembourg, Portugal, Belgium, Spain, France and Italy. From 1998 to 2000, Austria saw a status quo in its organic farming area, but during the recent years (2001 to 2003) another period of conversion have taken place, where about 700 farms and 30.000 hectares have been converted, primarily in Eastern Austria (Organic Europe, 2004). The share of the organic farming area in the total UAA of the Member States varies considerably. The Member States that were front-runners in organic farming in 2002, i.e. where the share of the UAA was higher than or equal to the EU-15 average (3.8 %), were Austria (9%), Italy (8%), Finland and Sweden (both7 %), Denmark (6%), the United Kingdom (5%) and Germany (4%). The other Member States' shares remained below the EU-15 average share. All Member States, except Austria, have seen a more or less pronounced increase in the UAA share over the period 1998-2002.

Organic farming is far more widespread in the northern and central European Member States, with the exception of Italy. This distribution seems to coincide with consumer markets for organic products, which tend to be more developed in these countries. The FSS results show a considerable regional variation of the indicator within the EU-15 Member States. The environmental benefits of organic agriculture compared to conventional management systems are widely documented but differences in methodology do cause problems in comparative analyses. Moreover, organic agriculture is likely to have a more positive environmental impact in areas with highly intensive agriculture than in low-input farming systems. However, so far the regional uptake of organic farming is concentrated in extensive grassland regions, where fewer changes are needed to convert to organic farming than is the case in intensive, arable farming dominated

regions, where the benefits would be higher.

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http://europa.eu.int/comm/agriculture/qual/organic/facts_en.pdf

Data

IRENA07.xls

Table 7.1 (for Figure 7.1) Sum of organic and in-conversion area (in ha), certified under Regulation (EEC) No 2092/91

Unit: ha	1998	1999	2000	2001	2002	% change 1998-2002
BE	11744	18515	20667	22452	29118	147.9
DK	93201	137294	157676	168372	164519	76.5
DE	414293	452327	546023	632165	696978	68.2
GR	15402	21451	26707	26707	77120	400.7
ES	269465	352164	380920	485079	665055	146.8
FR	218775	315771	369933	419750	517965	136.8
IE	24411	29360	27231	30017	29754	21.9
IT	577475	911068	1040377	1237640	1168212	102.3
LU	744	888	1074	2003	2852	283.3
NL	22268	26350	32334	35876	42610	91.4
AT	287899	272635	256443	276410	296154	2.9
PT	29533	46918	48066	73504	85912	190.9
FI	116206	136662	147268	147943	156692	34.8
SE	127329	155463	174227	202827	214120	68.2
UK	78833	425945	578803	679631	741174	840.2
EU-15	2287578	3302811	3807749	4440376	4888235	113.7

Source: Organic farming questionnaire, DG Agriculture , data treated by Eurostat. Estimates for EU-15, Finland, Greece and United Kingdom regarding UAA in 2002.

Meta data

Technical information

1. Data source:
   Agriculture DG questionnaire: 1998-2002, Organic farming questionnaire on Regulation (EEC) No 2092/91.
   Farm structure survey: Community survey on the structure of agricultural holdings (FSS), Eurostat.
2. Description of data:
   Agriculture DG questionnaire: Data are supplied by EU-15 Member States to the Agriculture DG, using the statistical tables of the organic farming questionnaire (electronic version OFIS). The data are treated by Eurostat D6. UAA is taken from the ZPA1 database of Eurostat. Only the area certified under Regulation (EEC) No 2092/91 is taken into consideration.
   Farm structure survey: Data are supplied by EU-15 Member States to Eurostat E1, conform the regulations on the survey. The regional data submitted by Member States do in some cases not only cover organic farming areas certified by Regulation (EEC) No 2092/91, but also areas receiving agri-environmental support for organic farming (for example, Sweden).
3. Geographical coverage:

Agriculture DG questionnaire: EU-15 Member States and Norway (national data).
Farm structure survey: EU-15 Member States (NUTS 2/3 data).

4. Temporal coverage:
Agriculture DG questionnaire: yearly since 1998.
Farm structure survey: 2000 and 2003.

5. Methodology and frequency of data collection:
Agriculture DG questionnaire: The organic farming regulation obliges Member States to submit yearly information on the number of organic operators and the area under organic farming. The Member States should send yearly completed questionnaires to the Agriculture DG before 31 July of the following year. Since Member States in the early 1990s used varying formats when submitting organic data, the Agriculture DG, in collaboration with Eurostat, drew up a questionnaire with harmonised tables and guidelines in order to facilitate comparison and aggregation at EU level. The present version of the yearly organic farming questionnaire asks for information on organic operators (producers, processors and importers), crop areas/yields and their economic activity (NACE) at national level. A recent revision of the questionnaire included tables on livestock production and products.
The **farm structure survey** (FSS) collects data on organic farming at regular intervals and at regional level since the 2000 survey. The representativity of the intermediate surveys (2003, 2005 and 2007) for the organic farming variable is, however, not completely assured.
The suggested indicator is the evolution in the share of the organic farming area (where possible divided into fully converted and in-conversion area) based on the results from the Agriculture DG organic farming questionnaire in the total UAA in the Member States. The FSS data are used to calculate the indicator at regional level.

6. Methodology of data manipulation:
Eurostat's Unit D6 treats the statistical data of the organic farming questionnaire. The Agriculture DG recently launched the organic farming information system (OFIS) to allow harmonised electronic reporting of data related to organic farming.
Eurostat's Unit E1 manages the Eurofarm database.

<u>Qualitative information</u>

7. Strength and weakness (at data level):
Weakness: completion of organic farming questionnaire is voluntary, long-time delay in submission of data to the Agriculture DG by some Member States.
Strength: organic farming questionnaire is harmonised, FSS variable on organic farming is compulsory.

8. Reliability, accuracy, robustness and uncertainty (at data level): Data from the Agriculture DG are reliable, data from FSS are regarded as being reliable and robust.

9. Overall scoring (give 1 to 3 points: 1 = no major problems, 3 = major reservations):
Accuracy: 2
Comparability over time: 1
Comparability over space: 1