



ENVIRONMENTAL PERFORMANCE OF AGRICULTURE IN OECD COUNTRIES SINCE 1990:

Full List of Agri-Environmental Indicators

This Full List of Agri-Environmental Indicators is related to the OECD publication (2008) *Environmental Performance of Agriculture in OECD countries since 1990* which is available at: <http://www.oecd.org/tad/env/indicators>

ANNEX II.A1

*List of indicators in Chapter 1**

Theme	Indicator title	Indicator definition (trends over time for all indicators)
I. Soil	<i>i. Soil erosion</i>	1. Area of agricultural land affected by water erosion in terms of different classes of erosion, <i>i.e.</i> tolerable, low, moderate, high and severe.
		2. Area of agricultural land affected by wind erosion in terms of different classes of erosion, <i>i.e.</i> tolerable, low, moderate, high and severe.
II. Water	<i>ii. Water use</i>	3. Agricultural water use in total national water utilisation.
		4. Agriculture's use of groundwater in total national groundwater utilisation.
	<i>iii. Water quality</i>	5. Area of irrigated land in total agricultural land area.
6. Nitrate and phosphate contamination derived from agriculture in surface water and coastal waters.		
7. Monitoring sites in agricultural areas that exceed recommended drinking water limits for nitrates and phosphorus in surface water and groundwater (nitrates only).		
8. Monitoring sites in agricultural areas that exceed recommended drinking water limits for pesticides in surface water and groundwater.		
9. Monitoring sites in agricultural areas where one or more pesticides are present in surface water and groundwater.		
III. Air	<i>iv. Ammonia emissions, acidification and eutrophication</i>	10. Share of agricultural ammonia emissions in national total ammonia (NH ₃) emissions.
	<i>v. Methyl bromide use and ozone depletion</i>	11. Agricultural methyl bromide use expressed in tonnes of ozone depletion potential.
	<i>vi. Greenhouse gas emissions and climate change</i>	12. Gross total agricultural greenhouse gas emissions (carbon dioxide, methane and nitrous oxide), and their share in total greenhouse gas emissions.
IV. Biodiversity	<i>vii. Genetic diversity</i>	13. Plant varieties registered and certified for marketing for the main crop categories (<i>i.e.</i> cereals, oilcrops, pulses and beans, root crops, fruit, vegetables and forage).
		14. Five dominant crop varieties in total marketed production for selected crops (<i>i.e.</i> wheat, barley, maize, oats, rapeseed, field peas and soyabean).
		15. Area of land under transgenic crops in total agricultural land.
		16. Livestock breeds registered and certified for marketing for the main livestock categories (<i>i.e.</i> cattle, pigs, poultry, sheep and goats).
		17. Three dominant livestock breeds in total livestock numbers for the main livestock categories (<i>i.e.</i> cattle, pigs, poultry, sheep and goats).
		18. Livestock (<i>i.e.</i> cattle, pigs, poultry and sheep) in endangered and critical risk status categories and under conservation programmes.
		19. Status of plant and livestock genetic resources under <i>in situ</i> and <i>ex situ</i> national conservation programmes.

* All of the indicators listed in this annex are those which relate to agri-environmental issues faced by most OECD countries, and are based on the best available science and data available for a representative group of countries, as shown in Chapter 1.

Theme	Indicator title	Indicator definition (trends over time for all indicators)
	viii. Wild species diversity	20. Wild species that use agricultural land as primary habitat.
		21. Populations of a selected group of breeding bird species that are dependent on agricultural land for nesting or breeding.
	ix. Ecosystem diversity	22. Conversion of agricultural land area to (land exits) and from (land entries) other land uses (<i>i.e.</i> forest land; built-up land, wetlands, and other rural land).
		23. Area of agricultural semi-natural habitats (<i>i.e.</i> fallow land, farm woodlands) in the total agricultural land area.
		24. National important bird habitat areas where intensive agricultural practices are identified as either posing a serious threat or a high impact on the area's ecological function.
V. Farm management	x. Nutrient management	25. Number (area) of farms (agricultural land area) under nutrient management plans.
		26. Farms using soil nutrient testing (agricultural land regularly sampled and analysed for nutrient content).
	xi. Pest management	27. Arable and permanent crop area under integrated pest management.
	xii. Soil management	28. Arable land area under soil conservation practices.
		29. Agricultural land area under vegetative cover all year.
	xiii. Water management	30. Irrigated land area using different irrigation technology systems.
	xiv. Biodiversity management	31. Agricultural land area under biodiversity management plans.
	xv. Organic management	32. Agricultural land area under certified organic farm management (or in the process of conversion to an organic system).
VI. Agricultural inputs	xvi. Nutrients	33. Gross balance between the quantities of nitrogen (N) inputs (<i>e.g.</i> fertilisers, manure) into, and outputs (<i>e.g.</i> crops, pasture) from farming.
		34. Gross balance between the quantities of phosphorus (P) inputs (<i>e.g.</i> fertilisers, manure) into, and outputs (<i>e.g.</i> crops, pasture) from farming.
	xvii. Pesticides	35. Pesticide use (or sales) in terms of tonnes of active ingredients.
		36. Risk of damage to terrestrial and aquatic environments, and human health from pesticide toxicity and exposure.
	xviii. Energy	37. Direct on-farm energy consumption in national total energy consumption.

ANNEX II.A2

Indicators in Chapter 1 assessed according to the OECD indicator criteria*

Section numbers in Chapter 1 ¹	Soil erosion (1.5)		Water use (1.6.1)		
	1. Area of water erosion	2. Area of wind erosion	3. Quantity of water use	4. Quantity of groundwater	5. Area of irrigated land
Figure ²	1	3	1	4	2
Policy relevance					
1. Number of countries ³	28	16	21	23	25
2. Contribution of agriculture to environmental impact ⁴	n.a.	n.a.	45	55	n.a.
Analytically sound					
1. Science of calculation methodology ⁵	Sound	Sound	Average	Weak	Sound
2. Certainty of indicator estimate ⁶	High	High	Average	Low	High
Measurable					
1. Number of years of data 1990-2004 ⁷	4	3	14 (to 2003)	1-5	14 (to 2003)
2. Frequency of data collection ⁸	Every 5 years	Every 5 years	Annual	Infrequent	Annual
3. Method of primary data collection ⁹	Survey/model	Survey/model	Field/model	Field/model	Census
4. Data coverage (<i>i.e.</i> agriculture + forestry + fisheries) ¹⁰	Agriculture	Agriculture	Agriculture	Agriculture	Agriculture
5. Institution collecting data ¹¹	Government	Government	Government	Government	Government
Interpretation					
1. Easy to interpret ¹²	High	High	High	High	High
2. Cross-country comparability ¹³	Yes	Yes	Yes	No	Yes

* The indicators included in this annex are those listed in Annex II.A1 (only abbreviated definitions are provided here for each indicator, but see Annex II.A1 for full definitions), which are assessed according to the OECD indicator criteria of: policy relevance; analytical soundness; measurability; and ease of interpretation.

Section numbers in Chapter 1 ¹	Water quality (1.6.2)							
	6. Nitrate and phosphate water pollution		7. Nitrate concentrations in water		8. Pesticide concentrations in water		9. Presence of pesticides in water	
Figure ²	1 + 2		3 + 4		6		5	
Policy relevance								
1. Number of countries ³	Surface	Coastal	Surface	Ground	Surface	Ground	Surface	Ground
N	17	8	12	22	7	14	5	5
P	18	7	9	n.a.	7	14	5	5
2. Contribution of agriculture to environmental impact ⁴	N	25-80	35-80	n.a.	n.a.	n.a.	n.a.	n.a.
P	20-70	20-50	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Analytically sound								
1. Science of calculation methodology ⁵	Sound		Sound		Average		Average	
2. Certainty of indicator estimate ⁶	High		High		Average		Average	
Measurable								
1. Number of years of data 1990-2004 ⁷	N	1-5	1-5	1-5	1-5	1-5	1-5	1-5
P	1-5	1-5	1-5	1-5	1-5	1-5	1-5	1-5
2. Frequency of data collection ⁸	Infrequent		Infrequent		Infrequent		Infrequent	
3. Method of primary data collection ⁹	Sample survey		Sample survey		Sample survey		Sample survey	
4. Data coverage (<i>i.e.</i> agriculture + forestry + fisheries) ¹⁰	Agriculture		Agriculture		Agriculture		Agriculture	
5. Institution collecting data ¹¹	Government		Government		Government		Government	
Interpretation								
1. Easy to interpret ¹²	High		High		High		High	
2. Cross-country comparability ¹³	Yes		Yes		Yes		Yes	

Section numbers in Chapter 1 ¹	Ammonia (1.7.1)	Methyl bromide (1.7.2)	GHGs (1.7.3)	Genetic diversity (1.8.1)	
	10. Quantity of ammonia emissions	11. Quantity of methyl bromide use	12. Gross total agricultural GHG emissions	13. Plant varieties marketed	14. Dominant crop varieties
Figure ²	2	1	1	2	3
Policy relevance					
1. Number of countries ³	24	30	28	19	9
2. Contribution of agriculture to environmental impact ⁴	93	8	8	n.r.	n.r.
Analytically sound					
1. Science of calculation methodology ⁵	Sound	Sound	Sound	Weak	Weak
2. Certainty of indicator estimate ⁶	High	High	Low	Low	Average
Measurable					
1. Number of years of data 1990-2004 ⁷	14 (to 2003)	15	15	1-5	1-5 (to 2002)
2. Frequency of data collection ⁸	Annual	Annual	Annual	Infrequent	Infrequent
3. Method of primary data collection ⁹	Model	Model	Model	Survey	Survey
4. Data coverage (<i>i.e.</i> agriculture + forestry + fisheries) ¹⁰	Agriculture	Agriculture + agro-food sector	Agriculture, forestry, fisheries	Agriculture	Agriculture
5. Institution collecting data ¹¹	UNECE	UNEP	UNFCCC	Government	Government
Interpretation					
1. Easy to interpret ¹²	Average	Average	High	Low	Low
2. Cross-country comparability ¹³	Yes	Yes	Yes	Yes	Yes

Section numbers in Chapter 1 ¹	Genetic diversity (<i>cont.</i>)				
	15. Area of transgenic crops	16. Livestock breeds marketed	17. Dominant livestock breeds	18. Number of livestock endangered	19. Status of genetic resources
Figure ²	Table 1	4	5	6	Tables 2 + 3
Policy relevance					
1. Number of countries ³	30	16	13	16	17
2. Contribution of agriculture to environmental impact ⁴	n.r.	n.r.	n.r.	n.r.	n.r.
Analytically sound					
1. Science of calculation methodology ⁵	Sound	Weak	Weak	Sound	Sound
2. Certainty of indicator estimate ⁶	High	Low	Low	High	High
Measurable					
1. Number of years of data 1990-2004 ⁷	16 (to 2005)	1-5 (to 2002)	1-5 (to 2002)	1-5 (to 2002)	1-5 (to 2002)
2. Frequency of data collection ⁸	Annual	Infrequent	Infrequent	Infrequent	Infrequent
3. Method of primary data collection ⁹	Survey	Survey	Survey	Survey	Survey
4. Data coverage (<i>i.e.</i> agriculture + forestry + fisheries) ¹⁰	Agriculture	Agriculture	Agriculture	Agriculture	Agriculture
5. Institution collecting data ¹¹	ISAAA (NGO)	Government	Government	Government/NGO	Government
Interpretation					
1. Easy to interpret ¹²	High	Low	Low	High	Average
2. Cross-country comparability ¹³	Yes	Yes	Yes	Yes	Yes

Section numbers in Chapter 1 ¹	Wild species diversity (1.8.2)		Ecosystem diversity (1.8.3)		
	20. Wild species using farmland	21. Populations of breeding birds	22. Conversion of agricultural land	23. Area of semi-natural habitats	24. National bird habitat areas
Figure ²	7	8	9	Table 5	13
Policy relevance					
1. Number of countries ³	11	17	8	18	22
2. Contribution of agriculture to environmental impact ⁴	n.c.	n.c.	n.c.	n.c.	n.c.
Analytically sound					
1. Science of calculation methodology ⁵	Average	Sound	Sound	Average	Sound
2. Certainty of indicator estimate ⁶	Average	High	High	Average	High
Measurable					
1. Number of years of data 1990-2004 ⁷	1-5	15	5	14 (to 2003)	1-5
2. Frequency of data collection ⁸	1-5	Annual	1-5	Annual	1-5
3. Method of primary data collection ⁹	Survey	Survey	Census	Census	Survey
4. Data coverage (<i>i.e.</i> agriculture + forestry + fisheries) ¹⁰	Agriculture	Agriculture	Agriculture	Agriculture	n.r.
5. Institution collecting data ¹¹	Government	BirdLife International (NGO)	Government	Government	BirdLife International (NGO)
Interpretation					
1. Easy to interpret ¹²	High	High	High	Average	Average
2. Cross-country comparability ¹³	No	Yes	No	Yes	Yes

Section numbers in Chapter 1 ¹	Nutrient management (1.9.2)		Pest management (1.9.3)
	25. Nutrient plans	26. Soil nutrient testing	27. Integrated pest management
Figure ²	1.1 + 1.2	1.3	2.1
Policy relevance			
1. Number of countries ³	16	12	12
2. Contribution of agriculture to environmental impact ⁴	n.a.	n.a.	n.a.
Analytically sound			
1. Science of calculation methodology ⁵	Average	Sound	Average
2. Certainty of indicator estimate ⁶	Average	High	Average
Measurable			
1. Number of years of data 1990-2004 ⁷	1-5	1-5 (to 2003)	1-5
2. Frequency of data collection ⁸	1-5	1-5	1-5
3. Method of primary data collection ⁹	Sample survey	Sample survey	Sample survey
4. Data coverage (<i>i.e.</i> agriculture + forestry + fisheries) ¹⁰	Agriculture	Agriculture	Agriculture
5. Institution collecting data ¹¹	Government	Government	Government
Interpretation			
1. Easy to interpret ¹²	Average	Average	Average
2. Cross-country comparability ¹³	No	Yes	No

Section numbers in Chapter 1 ¹	Soil management (1.9.4)		Water management (1.9.5)	Biodiversity management (1.9.6)	Organic management (1.9.7)
	28. Soil conservation	29. Vegetative cover	30. Irrigation technologies	31. Biodiversity management plans	32. Organic farming
Figure ²	3.1	3.2	4.1	5.1	6.1
Policy relevance					
1. Number of countries ³	13	10	14	9	30
2. Contribution of agriculture to environmental impact ⁴	n.a.	n.a.	n.a.	n.a.	n.a.
Analytically sound					
1. Science of calculation methodology ⁵	Average	Sound	Sound	Weak	Sound
2. Certainty of indicator estimate ⁶	Average	High	High	Low	High
Measurable					
1. Number of years of data 1990-2004 ⁷	1-5 (to 2003)	1-5 (to 2003)	1-5 (to 2003)	1-5 (to 2003)	9
2. Frequency of data collection ⁸	1-5	1-5	1-5	1-5	Annual
3. Method of primary data collection ⁹	Sample Survey	Sample Survey	Sample Survey	Sample Survey	Survey
4. Data coverage (<i>i.e.</i> agriculture + forestry + fisheries) ¹⁰	Agriculture	Agriculture	Agriculture	Agriculture + Forestry	Agriculture
5. Institution collecting data ¹¹	Government	Government	Government	Government	Government + IFOAM (NGO)
Interpretation					
1. Easy to interpret ¹²	Average	High	High	Low	High
2. Cross-country comparability ¹³	No	Yes	Yes	No	Yes

Section numbers in Chapter 1 ¹	Nutrients (1.2)		Pesticides (1.3)		Energy (1.4)
	33. Nitrogen balance	34. Phos-phorus balance	35. Pesticide use	36. Pesticide risk	37. Farm energy consumption
Figure ²	2	8	1	3-9	2
Policy relevance					
1. Number of countries ³	30	30	26	7	30
2. Contribution of agriculture to environmental impact ⁴	n.a.	n.a.	n.a.	n.a.	2
Analytically sound					
1. Science of calculation methodology ⁵	Sound	Sound	Average	Average	Average
2. Certainty of indicator estimate ⁶	High	High	Average	Average	Average
Measurable					
1. Number of years of data 1990-2004 ⁷	15	15	14 (to 2003)	10	14
2. Frequency of data collection ⁸	Annual	Annual	Annual	Annual	Annual
3. Method of primary data collection ⁹	Model	Model	Census	Model	Census
4. Data coverage (i.e. agriculture + forestry + fisheries) ¹⁰	Agriculture	Agriculture	Agriculture, Forestry	Agriculture	Agriculture, Forestry, Fisheries
5. Institution collecting data ¹¹	Government	Government	Government	Government	Government
Interpretation					
1. Easy to interpret ¹²	Average	Average	High	Low	Average
2. Cross-country comparability ¹³	Yes	Yes	Yes	No	Yes

n.a.: Not available. n.r.: Not relevant. n.c.: Not calculated.

- Section numbers shown in brackets refer to those included in Chapter 1.
- Figure numbers refer to the figures in each respective section of Chapter 1.
- "Number of countries" – the number of countries for which data are available in the indicators of each respective section of Chapter 1 (e.g. 28 of the 30 OECD member countries provided data in the report on agricultural soil water erosion).
- "Contribution of agriculture to environmental impact" – the contribution of OECD agriculture to respective environmental impacts, where relevant, for example, OECD agriculture accounts for 45% of total water use in 2001-03.
- "Science of calculation methodology" – a qualitative assessment – sound, average, weak – of the scientific rigour of each respective indicator's method of calculation.
- "Certainty of indicator estimate" – a qualitative assessment – high, average, low – of the certainty of the estimate made for each indicator.
- "Number of years of data 1990-2004" – the average number of years covered in the figures/tables of each respective section of Chapter 1. Where the time series covers a different period this is indicated.
- "Frequency of data collection" – the frequency (e.g. annual to every 5 years) of primary data collection used in the calculation of the indicators.
- "Method of primary data collection" – the method (e.g. survey, census) used to collect the primary data to calculate the indicators.
- "Data coverage (i.e. agriculture + forestry + fisheries)" – the sectoral (e.g. agriculture or agriculture and forestry) coverage of the indicators.
- "Institution collecting data" – the main institution with primary responsibility for collecting data to calculate the indicators.
- "Easy to interpret" – a qualitative assessment – high, average, low – of the ease of interpreting the indicators by policy makers and the wider public.
- "Cross-country comparability" – identification (yes or no) of whether the indicators are comparable across countries.