

2. SECTORAL AND ECONOMIC TRENDS OF ENVIRONMENTAL SIGNIFICANCE

Agricultural fertilisers, land use and livestock

Agriculture's environmental effects can be negative or positive. They depend on the scale, type and intensity of farming as well as on agro-ecological and physical factors, and on climate and weather. Farming can lead to deterioration in soil, water and air quality, and to loss of natural habitats and biodiversity. These environmental changes can in turn affect the level of agricultural production and food supply, and can limit the sustainable development of agriculture. Farming can also provide sinks for greenhouse gases, conserve biodiversity and landscapes and help prevent floods and landslides.

Among the main environmental concerns related to agriculture are nitrogen (N) and phosphorus (P) runoff from excessive fertiliser use, intensive livestock farming and pesticides. N and P, while major plant nutrients, are responsible for water eutrophication and related effects on aquatic life and water quality. Nitrogen further increases soil acidification, contributes to air pollution and alters the balance of greenhouse gases. The main challenge is to progressively decrease the negative and increase the positive environmental effects of agricultural production so that ecosystem functions can be maintained and food security ensured for the world's population.

Definitions

The indicators presented here relate to:

- The intensity of use of commercial fertilisers, expressed as the apparent consumption of nitrogen and phosphate fertilisers (in active ingredients), per hectare of agricultural land.
- Livestock densities, expressed as the number of live animals (in sheep equivalent heads) per hectare of agricultural land.

The share of agricultural land under organic farming, changes in agricultural production and in agricultural land are given as complements. They reflect drivers of farm input use: nutrients, pesticides, energy and water, etc.

These indicators describe potential, not actual, environmental pressures, and may hide important spatial variations. They should be read with information on agricultural nutrient balances, water use in agriculture, soil quality, biodiversity and farm management.

Overview

The economic and social significance of the agricultural sector has been declining in most OECD countries for decades. During the 2000s, growth in OECD agricultural production has been slowing compared to the 1990s, and in nearly all OECD countries, the land area used for agricultural purposes has decreased. It has been mainly converted to use for forestry and urban development. Nevertheless, for almost two-thirds of OECD countries, agriculture remains the major land use, representing over 40% of total land area. The share of agricultural

land under organic farming remains very low, around 2%, though this masks substantial variations across countries. In countries of the European Union, where organic farming has been encouraged by conversion payments to farmers, the shares tend to be higher reaching 10 to 17% in some countries.

For many OECD countries, fertiliser consumption and nutrient surpluses relative to changes in agricultural output declined.

The rate of reduction in OECD fertiliser use was more rapid over the 2000s than the 1990s. Since the early 2000s, the OECD volume of agricultural production increased by more than 3%, whereas the intensity of use of phosphate fertilisers declined by 9% and that of nitrogenous fertilisers grew by 12%. It reflects both improvements in nutrient use efficiency by farmers and slower growth in agricultural output for many countries over the 2000s.

There are, however, sizeable variations within and between countries in terms of fertiliser use. Territorial variations within countries are explained by the spatial distribution of intensive livestock farming and cropping systems that require high nutrient inputs, such as maize and rice.

Comparability

Cross-country comparisons of changes over time should take into account the absolute levels during the reference period.

Fertiliser, agricultural land use and production data are generally of good quality. Some caution is required in interpreting the indicators related to organic farming; the definition of what constitutes organic farming may differ across countries. Data on livestock densities are estimated based on livestock numbers and coefficients to convert to sheep equivalents.

For additional notes, see the Annex.

Source

FAO (2015), FAOSTAT (database), <http://faostat3.fao.org>.

Further information

OECD/FAO (2015), *OECD-FAO Agricultural Outlook 2015*, OECD Publishing, Paris, http://dx.doi.org/10.1787/agr_outlook-2015-en.

OECD (2013), *OECD Compendium of Agri-Environmental Indicators*, OECD Publishing, Paris, <http://dx.doi.org/10.1787/9789264186217-en>.

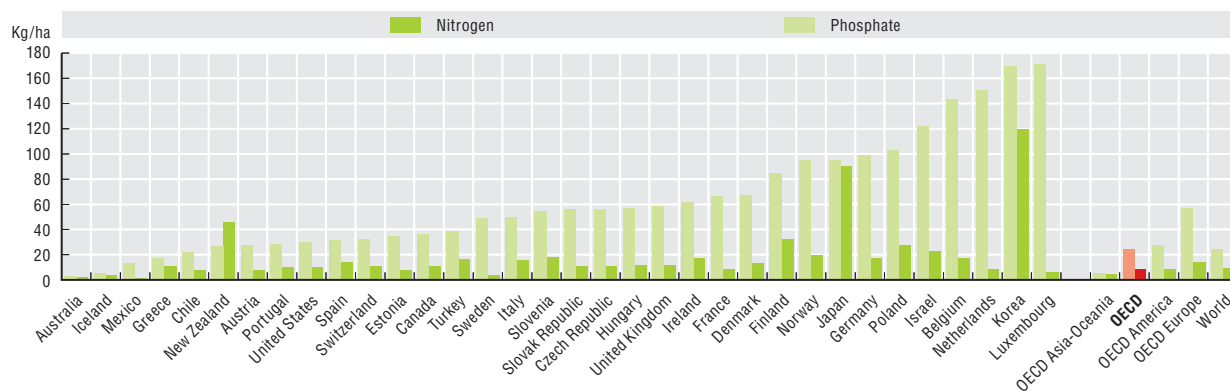
OECD (2013), "Agri-Environmental Indicators: Environmental Performance of Agriculture 2013", *OECD Agriculture Statistics* (database), <http://dx.doi.org/10.1787/data-00660-en>.

Information on data for Israel: <http://dx.doi.org/10.1787/888932315602>.

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Figure 2.16. Intensity of use of nitrogen and phosphate fertilisers, kg per hectare of agricultural land



Source: FAO (2015), FAOSTAT (database); Eurostat (2015), Agriculture Statistics (database).

StatLink <http://dx.doi.org/10.1787/888933262174>

Table 2.6. Fertiliser use, livestock and agricultural land

	Intensity of use of commercial fertilisers				Livestock density		Agricultural land		Organic farming	Agricultural production
	Apparent consumption per hectare of agricultural land				Live animals per unit of agricultural land		As a share of total area		As a share of agricultural land	
	Nitrogen		Phosphates		Heads/km ²	% change	%	% change	%	
	(Kg/ha)	% change	(Kg/ha)	% change						
	2012	Since 2002	2012	Since 2002	2012	Since 2000	2012	Since 2000	2012	Since 2000
Australia	3	24	2	-17	65	0	52	-11	3.0	9.2
Austria	27	-46	7	-68	525	-10	38	-7	17.0	2.5
Belgium	143	12	17	-55	1 788	-245	44	-4	4.5	-5.0
Canada	36	47	11	14	152	-3	7	-3	1.3	23.8
Chile	22	37	8	-23	210	-32	21	5	0.1	41.5
Czech Republic	56	24	10	8	273	-60	54	-1	11.3	-9.8
Denmark	67	13	13	531	879	-57	61	-1	6.7	2.9
Estonia	34	44	7	23	227	16	21	-3	15.1	25.3
Finland	84	5	32	47	337	-47	7	3	8.7	0.4
France	66	-11	9	-64	526	-35	53	-3	3.6	-6.7
Germany	99	-6	17	-12	709	-29	47	-2	6.2	3.2
Greece	17	-47	11	-22	263	10	62	-4	5.7	-19.4
Hungary	57	9	12	9	216	-20	57	-9	2.4	-5.1
Iceland	5	-14	4	50	68	-2	18	-1	1.0	18.9
Ireland	62	-42	17	-26	1 095	-50	64	3	1.2	-5.2
Israel	122	54	23	10	1 210	322	24	-8	1.1	26.1
Italy	50	-10	15	-27	490	18	46	-12	8.5	-9.8
Japan	95	-15	90	-33	1 156	105	12	-14	0.2	-5.5
Korea	169	-11	119	57	2 243	825	18	-10	1.4	0.2
Luxembourg	171	-16	6	-84	983	-63	51	3	3.1	-14.0
Mexico	13	53	1	-75	302	22	54	0	0.5	31.2
Netherlands	151	1	8	-67	2 404	55	44	-6	2.6	6.0
New Zealand	27	5	46	38	828	192	42	-27	0.9	23.0
Norway	95	0	19	-29	874	-31	3	-5	5.6	2.6
Poland	103	108	27	51	386	60	46	-21	4.6	4.1
Portugal	28	-34	10	-50	471	-14	39	-5	5.5	2.6
Slovak Republic	56	53	11	37	241	-35	39	-21	8.6	-3.6
Slovenia	54	-17	18	-38	732	-5	24	-7	7.3	-16.4
Spain	31	-10	14	-32	331	7	53	-10	6.4	9.7
Sweden	49	-17	3	-72	391	-31	7	-3	15.7	-7.8
Switzerland	32	22	11	4	808	30	37	-2	7.9	-1.1
Turkey	38	32	16	39	357	49	49	-5	1.8	32.1
United Kingdom	58	-17	11	-30	630	-120	71	1	3.4	-3.8
United States	30	12	10	0	193	-3	42	-3	0.5	12.7
OECD	25	12	8	-9	220	5	34	-6	2.2	..
OECD America	27	19	8	-5	208	1	26	-2	0.6	..
OECD Asia-Oceania	5	9	5	-5	106	7	50	-11	2.9	..
OECD Europe	63	2	16	-18	490	-1	39	-7	5.6	..
World	24	39	9	37	305	42	37	0	..	37.2

Note: See the Annex for country notes.

Source: FAO (2015), FAOSTAT (database).

StatLink <http://dx.doi.org/10.1787/888933262429>



From:
Environment at a Glance 2015
OECD Indicators

Access the complete publication at:
<https://doi.org/10.1787/9789264235199-en>

Please cite this chapter as:

OECD (2015), "Agricultural fertilisers, land use and livestock", in *Environment at a Glance 2015: OECD Indicators*, OECD Publishing, Paris.

DOI: <https://doi.org/10.1787/9789264235199-19-en>

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