

F-4: Pesticide consumption

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1) General description

1.1) *Brief definition*

This indicator presents the consumption of pesticides, as a total and per unit of agricultural area.

1.2) *Units of measurement*

Amounts of pesticides are measured in tons; pesticide consumption per unit of agricultural area is expressed as kilogram per hectare.

1.3) *Context*

Relation to other indicators from the Guidelines - This indicator does not relate to other indicators.

2) Relevance for environmental policy

2.1) *Purpose*

The indicator provides a measure of the pressure on the environment in terms of the intensity of pesticide consumption.

2.2) *Issue*

The use of pesticides (insecticides, herbicides, fungicides, plant regulators, rodenticides, and others) mainly for crop protection increases environmental hazards (soil pollution and negative effects on other parts of the environment). Pesticides can be persistent, mobile and toxic in soil, water and air, and they can affect humans and wildlife either directly when applied or indirectly through the food chain. Some pesticides can accumulate in the soil and in biota, and their residues may reach surface water and groundwater through leaching. Only detailed information on the use of pesticides makes it possible to assess the resulting environmental hazards for various regions, separate territories and crops, which are influenced by geography and other local conditions, such as the types of crops cultivated, the

timing of application and the material used. Strategies can then be devised to offset negative effects.

2.3) International agreements and targets

a) Global and regional level:

The 2001 Convention on Persistent Organic Pollutants (POPs) and the Protocol on POPs to the ECE Convention on Long-range Transboundary Air Pollution (CLRTAP) control the use of pesticides. The production and use of some pesticides are banned by international trade agreements.

b) Subregional level:

Since 1993 the European Union (EU) has been implementing a programme to establish harmonized maximum residue levels, which restrict the levels of pesticide residues in foodstuffs sold in the EU. The placing on the market of plant protection products is regulated by Directive 91/414/EEC and that of biocides by Directive 98/8/EC. Maximum levels for pesticide residues in agricultural products are regulated by specialized directives. A Thematic Strategy on the Sustainable Use of Pesticides was adopted in 2006 followed in 2009 by the Framework Directive on Pesticides.

3) Methodology and guidelines

3.1) Data collection and calculations

Data calculation is based on the amount of pesticide sales (sales volume). Data are continuously provided to national databases on pesticide consumption. Pesticide consumption is assessed annually. At the national level, government authorities aggregate pesticide consumption data by pesticide groups: insecticides, herbicides, fungicides, plant regulators, rodenticides, and others. For definitions of these groups please refer to the glossary to this indicator. Ideally, pesticide databases should describe pesticide characteristics, such as active components, to be able to relate to their toxicity and environmental behaviour. However, an analysis of pesticides' effect on the environment that is based solely on the amount of active components present cannot be considered complete. It is important to take into account factors such as broadcast methods, the climate, the season, and the types of soil and cultivated crop. Agricultural area is the sum of areas under (a) arable land; (b) permanent crops; and (c) permanent meadows and pastures. Detailed definitions can be found in the glossary to this indicator.

3.2) Internationally agreed methodologies and standards

The Food and Agriculture Organization of the United Nations (FAO), the Organization for Economic Co-operation and Development (OECD) and the European Union Statistical Office (Eurostat) collect data on the use of pesticides using reporting standards (see references).

4) Data sources and reporting

In countries of South-Eastern and Eastern Europe, Caucasus and Central Asia, ministries of agriculture and state statistical agencies collect data on pesticide consumption. FAO Member States report data on total national pesticide consumption to the FAOSTAT database. Eurostat and OECD maintain a database of member countries' data.

5) References at the international level

- Stockholm Convention on POPs: <http://www.pops.int/>;
- The ECE CLRTAP Protocol on Persistent Organic Pollutants (POPs): <http://www.unece.org/fileadmin/DAM/env/lrtap/full%20text/ece.eb.air.104.e.pdf>;
- FAO – pesticides: <http://www.fao.org/agriculture/pesticides/en/>;
- FAOSTAT database, annual updates: <http://faostat3.fao.org/home/index.html#DOWNLOAD>;
- European Commission – Agriculture and pesticides: http://ec.europa.eu/agriculture/envir/pesticides/index_en.htm;
- European Commission – Sustainable use of pesticides: <http://ec.europa.eu/environment/ppps/home.htm>;
- Council Directive 76/895/EEC of 23 November 1976 relating to the fixing of maximum levels for pesticide residues in and on fruits and vegetables;
- Council Directive 86/362/EEC of 24 July 1986 on the fixing of maximum levels for pesticide residues in and on cereals products;
- Council Directive 86/363/EEC of 24 July 1986 on the fixing of maximum levels for pesticide residues in and on foodstuffs of animal origin;

- Council Directive 90/642/EEC of 29 November 1990 on the fixing of maximum levels for pesticide residues in and on products of plant origin, including fruits and vegetables;
- Council Directive 91/414/EEC of 15 July 1991 concerning the placing of plant protection products on the market;
- Directive 98/8/EC of the European Parliament and of the Council of 16 February 1998 concerning the placing of biocidal products on the market;
- Directive 2009/128/EC of the European Parliament and of the Council of 21 October 2009 establishing a framework for Community action to achieve the sustainable use of pesticides (Framework Directive on Pesticides);
- Regulation (EC) No. 396/2005 of the European Parliament and of the Council of 23 February 2005 on maximum residue levels of pesticides in or on food and feed of plant and animal origin;
- Eurostat-pesticides: http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Agri-environmental_indicator_-_consumption_of_pesticides;
- OECD – Agriculture pesticides and biocides: <http://www.oecd.org/env/ehs/pesticides-biocides/>;
- OECD – statistics: <http://www.oecd.org/statistics/>;
- *Environmental Indicators for Agriculture. Vol. 3: Methods and Results.* (OECD, 2001);
- Wascher, D.W. (ed.). *Agri-Environmental Indicators for Sustainable Agriculture in Europe.* ECNC Technical Reports series. (European Centre for Nature Conservation, 2000);
- U.S. Department of Agriculture, Agricultural Marketing Service. Pesticide Data Program;
- Pesticide Action Network (PAN) Pesticide Database: <http://www.pesticideinfo.org/Index.html>
Toxic Release Inventory: <http://www.epa.gov/tri/>.