Indicators on Land Use and Agriculture: Fertilizer and Pesticides

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UNSD/UNECE Joint Meeting on Environmental Indicators
(Geneva, 31 August - 2 September 2009)
Indicators on Fertilizer and Pesticides

Guidelines for the Application of Environmental Indicators in Eastern Europe, Caucasus and Central Asia/ECE/BELGRADE.CONF/2007/INF/6

- Consumption of mineral and organic fertilizers
- Consumption of pesticides
Fertilizer Items

Composed three basic nutrient components:

- Nitrogen (N)
- Phosphates (P₂O₅)
- Potash (K₂O)
Fertilizer related indicators

Brief description:

• Amount of mineral and organic fertilizers used per unit of arable land

• Land under permanent crops
Fertilizer units

Measurement units:

- Kilograms per hectare for mineral fertilizers and tons per hectare for organic fertilizers.
Fertilizer Environmental Policy

Relevance for environmental policy of fertilizer consumption indicator

- The purpose of the indicator makes it possible to assess the fertilizer pressure on the environment (the accumulation of nutrients in the soil, the resulting pollution of surface and groundwater, and the movement of nutrients through the chains of trace substances and other parts of the environment)
Fertilizer Issues

Issue of concern:

• The misuse of mineral and organic fertilizers in agriculture to increase cropping power increases environmental hazards, such as water and soil pollution, and has negative effects on other environmental components, interfering with the natural balance of soil microflora.
Fertilizer Issues

Issue of concern:

• High levels of nitrate and nitrite in drinking water are a hazard to human health

• The actual environmental effects will depend on pollution abatement methods, soil and plant types, and meteorological conditions.
Fertilizer Issues

**Issue of concern:**

- Time series analysis of fertilizers consumption allow monitoring of its effect on the environment and enables preparation of strategies for mitigation of negative impacts of fertilizers on the environment.

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Fertilizer Agreements and Targets

International agreements and targets

• The EU Directive 91/676/EEC adopted which concerns water pollution by nitrates, establishes requirements covering the use of nitrogen and phosphate while placing on the market of fertilizers is regulated by regulation 2003/2003.

• The Helsinki Commission for the Protection of Marine Environment of the Baltic Sea (HELCOM) has developed recommendations for its Parties in this regard.
Fertilizer Methodology

Methodology and guidelines

Data collection and calculations

- Collect data on mineral fertilizer sales and fertilizers’ basic characteristics

- The indicator is assessed annually

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Fertilizer Methodology

Methodology and guidelines

• Data on the quantities of fertilizers used (sales to the final consumer) are converted into the three basic nutrient components ($\text{N}$, $\text{K}_2\text{O}$, $\text{P}_2\text{O}_5$) and aggregated.
Fertilizer Methodology

Methodology and guidelines

• Basic data on fertilizer nutrient content can be obtained directly from producers or through chemical analysis (it must be indicated clearly on labels and in all commercial documents)

• Arable land and long-term vegetation areas is defined according to cadastre information.
Fertilizer Standards

Internationally agreed methodologies and standards

ISO standards (17020 for sampling and 17025 for testing)
Fertilizer Data Sources

Data sources and reporting

• In EECCA countries, data on the use of mineral and organic fertilizers are collected by the ministries dealing with agriculture and the environment, and by statistical agencies.

• In several EECCA countries, national statistical agencies and their sub-national departments have long-term databases on the use of fertilizers at the national and sub-national levels, accordingly.
Fertilizer Data Sources

• Data on national consumption of mineral and organic fertilizers are published in annual statistical yearbooks in several countries

• FAO Member States report data to the FAOSTAT database

• Collection of the data on such organic fertilizers like compost, manure or bone meal is not being carried out in EECCA countries
Fertilizer Data Sources

Data sources and reporting

- Information on the consumption of fertilizers outside the agricultural sector is not being collected
<table>
<thead>
<tr>
<th>HS CODE</th>
<th>COMMODITY</th>
<th>Plant nutrient content %</th>
<th>FERTILIZER PRODUCTION (metric tons of nutrient content)</th>
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<tr>
<td></td>
<td></td>
<td>N</td>
<td>P2O5</td>
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<tr>
<td>014</td>
<td>Ammonium nitrate (PH 6-7) will be used if information is provided</td>
<td>80</td>
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<td>Calcium ammonium nitrate [Ca(NH₄)₂O₆] will be used if information is provided</td>
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<td>Urea (46% N) will be used if information is provided</td>
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<td>Urea and ammonium nitrate (92.5% N) will be used if information is provided</td>
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<td>Superphosphate (dilute 35% P₂O₅) will be used if information is provided</td>
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<td>Superphosphate, other (N/P/A) will be used if information is provided</td>
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<td>021</td>
<td>Phosphate rock (N/P/A) will be used if information is provided</td>
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</table>

* The time reference period is calendar year.
* Please report data in Metric Tons. If a different unit is used please indicate it, as well as any other relevant note specific to a given data, in the NOTES column.
* For item descriptions and for other important instructions please refer to the “Explanatory notes” and “Instructions” sheets.

Insert the % nutrient content if information is available. If not default values as appear in the commodity columns will be used.
### AGRICULTURAL RESOURCES - FERTILIZER DOMESTIC AVAILABILITY

- The time reference period is calendar year.
- Please report data in Metric Tons. If a different unit is used please indicate it, as well as any other relevant note specific to a given data, in the NOTES column.
- For item descriptions and for other important instructions please refer to the "Explanatory notes" and "Instructions" sheets.

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<th>IMPORTS (metric tons of product)</th>
<th>EXPORTS (metric tons of product)</th>
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### STRAIGHT PHOSPHATIC FERTILIZERS

| 16       | Superphosphate                   |                                     |                                  |                                 |                                               |
| 17       | Superphosphate above 50s         |                                     |                                  |                                 |                                               |
| 18       | Phosphate rock                   |                                     |                                  |                                 |                                               |

### STRAIGHT POTASSIC FERTILIZERS

| 30       | Potassium chloride               |                                     |                                  |                                 |                                               |

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Fertilizer calculations

Conversion from product basis to N, P, K

Calculate Consumption
Production + Imports – Exports – Non Fertilizer use
= Consumption
Fertilizer data complications

- Confidentiality of production data
- Levels of expertise in national statistics offices
- Data collection
- Double counting in calculations etc
A summary overview of EECCA countries response to 2008 fertilizer resources questionnaire

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<th>Exp.</th>
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</table>

(x) indicates no response to questionnaire or section of the questionnaire
Fertilizer References

References and links


FAO, FAOSTAT: http://faostat.fao.org/site/575/default.aspx#anchor

International Fertilizer Industry Association: http://www.fertilizer.org/

International Fertilizer Development Centre: http://www.ifdc.org/


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References contd.


Fertilizer Contacts

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