



ENVIRONMENTAL PERFORMANCE OF AGRICULTURE IN OECD COUNTRIES SINCE 1990:

CANADA Website Information

This Website Information 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>

CANADA

WEBSITE INFORMATION

1. National Agri-environmental Indicators Development

Institutional Arrangements

- The development of environmental indicators to help guide and evaluate agricultural policy was recommended in a major policy review of Canadian agriculture in the early 1990s (Federal-Provincial Agriculture Committee on Environmental Sustainability, 1990). In response, Agriculture and Agri-Food Canada (AAFC) began in 1993 to develop a set of agri-environmental indicators and analytical systems for this purpose. Today this work is continuing under the National Agri-Environmental Health Analysis and Reporting Program (NAHARP). The work involves a joint effort of the department's research scientists, economists and policy analysts, as well as close collaboration from many partners including other federal and provincial departments, non-government organizations and academia. NAHARP's purpose is to strengthen the capacity to develop and continuously enhance agri-environmental indicators and tools to integrate these indicators with policy development using both integrated modelling and economic valuation.

Indicator Coverage and Conceptual Framework

- The Canadian set of agri-environmental indicators is currently composed of twelve indicators developed within six categories: environmental farm management, soil quality, water quality, air quality, agri-ecosystem biodiversity, and food and beverage industry. Thirteen additional indicators are currently under development. A Driving Force–Outcome–Response Framework was used to help identify appropriate AEIs and to characterize relationships and linkages between agricultural production and environmental, economic, and social factors. Analysis of the linkages between these components is key to a good understanding of the causes and effects of agriculture's impacts on the environment.

Data Sources, Calculation Methods, Spatial and Temporal Coverage

- The indicators developed by AAFC typically focus on risk (estimate of potential environmental impact) rather than state (monitoring of the presence and degree of an impact) because they are more readily calculated at broader spatial scales and can isolate the potential contribution from agriculture on the environment. As well, detailed field monitoring data are generally not available on a national scale for most environmental issues.
- AEIs are based on integrating data on soil, climate, and landscape from AAFC's National Land and Water Information System (NLWIS), with data from the Census of Agriculture and/or custom data sets (i.e. from provincial agencies, private sector, or other sources) using existing or modified mathematical models or formulas. Calculations can be repeated over time to estimate changes and trends in the indicators.
- Wherever possible, indicators were calculated and portrayed on an ecological basis using the national ecological classification system for Canada. Indicators are calculated at the Soil Landscapes of Canada (SLC) level, which is the smallest land unit within the system that also includes ecodistricts, ecoregions, and ecozones. This enabled subsequent Geographic Information System (GIS) software roll-ups of information in either map or table format for any level in the hierarchy. Indicator results are also presented at the provincial level.

The use of AEIs in Policy Analysis

- To provide a capacity for policy analysis and environmental forecasting, an integrated modelling approach is being used by AAFC, linking an economic model with the bio-physical AEI models. Because the AEIs are sensitive to changing farm practices and reflect the intensity of agricultural production in some areas, this approach provides the ability to model the impact of agricultural production and adoption of Best Management Practices (BMPs) on the environment.
- The economic model used in the analysis is the Canadian Regional Agricultural Model (CRAM), which is a static equilibrium model for Canadian agriculture, disaggregated across both commodities and space. Adoption rates of BMP's are inputted into the CRAM model to provide an indication of the economic impact on land use and livestock production activities. Output from CRAM is then fed into the AEI models to provide the estimated impact of BMPs adoption on air, soil, water and biodiversity. The report by MacGregor (1998) is an example of using this approach.

Future Work

- Through NAHARP the AEIs and modelling capacity are continually improved, refined and updated so they can be integrated and applied to policy development, performance measurement, program evaluation and public reporting. Improvements focus in three main areas: *first*, enhance the methodology and data of existing indicators where necessary, and to develop new indicators to address key gaps; *second*, improve economic models and their linkages with environmental indicator models; and *third*, develop the capacity to understand and quantify the economic costs and benefits of environmental changes due to agriculture. A major report released in 2005 provides an update of the indicators initially reported in 2000 and introduces thirteen indicators under development, while a more comprehensive report is planned for 2008/09.

2. Databases

- The Canadian Soil Information System (CanSIS), a component of the National Land and Water Information Service provides data, maps, publications and other information on the health of Canadian soils, see: http://www.agr.gc.ca/nlwis-snite/index_e.cfm
- Environment Canada Databases: http://www.ec.gc.ca/data_e.html covering biodiversity, pollution and water use

3. Websites

- Agriculture and Agri-Food Canada (AAFC): <http://www.agr.gc.ca>
- Agricultural Policy Framework (APF): http://www.agr.gc.ca/cb/apf/index_e.php
- National Agri-Environmental Health Analysis and Reporting Program (NAHARP): www.agr.gc.ca/naharp
- National Land and Water Information Service (NLWIS): http://www.agr.gc.ca/nlwis-snite/index_e.cfm
- Advancing Canadian Agriculture and Agri-Food (ACAAF) <http://www.agr.gc.ca/acaaf/>
- Agriweb Canada: <http://hahtext.agr.ca/agriweb/default.htm> national directory of online sources relevant to Canadian agriculture and the agri-food chain.
- Environment Canada: <http://www.ec.gc.ca/>
- Natural Resources Canada http://www.nrcan-rncan.gc.ca/inter/index_e.html