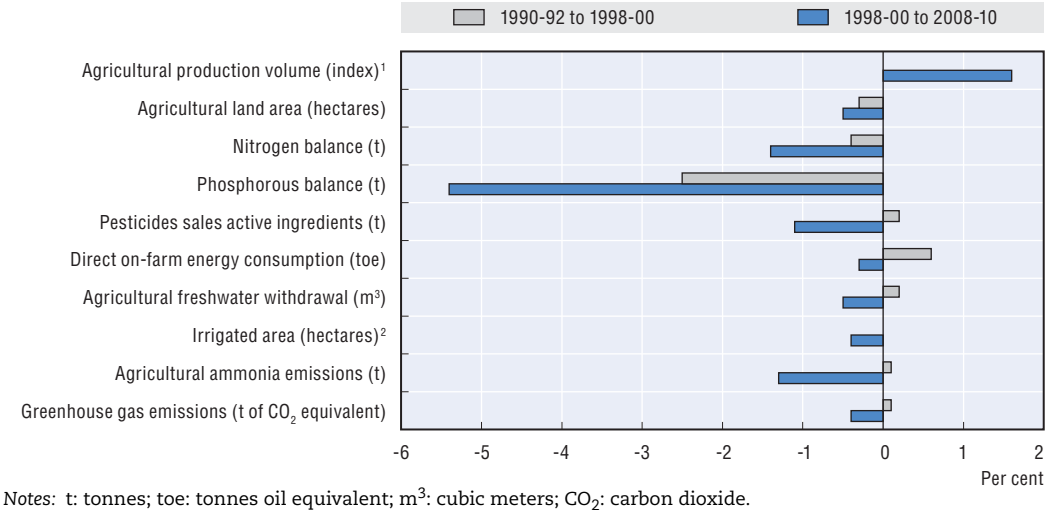
Executive summary

The recent environmental performance of agriculture provides some encouraging signs that agriculture is capable of meeting future environmental challenges (Figure 0.1). Evidence for OECD countries from 1990 to 2010 show improvements have been made in nutrient, pesticide, energy and water management, using less of these inputs per unit volume of output. Enhanced environmental performance has also flowed from the more widespread adoption of environmentally beneficial practices by farmers, such as conservation tillage, improved manure storage, soil nutrient testing, and drip irrigation.

Figure 0.1. **Key agri-environmental indicators, OECD average, 1990-2010**

% annual growth rates 1990-92 to 1998-2000 and 1998-2000 to 2008-10



Notes: t: tonnes; toe: tonnes oil equivalent; m^3: cubic meters; CO_2: carbon dioxide.
The OECD total average for the indicators listed here is the average for 34 member countries, except (figure in brackets show the number of OECD countries included in the average calculation): nitrogen and phosphorus balance (31); pesticide sales (29); on-farm energy consumption (32); freshwater withdrawals (24); irrigated area (21); and ammonia emissions (26).

1. For technical reasons, the OECD agricultural production volume annual average growth rate is not calculated for the period 1990-92 to 1998-2000.
2. The annual growth rate for irrigated area between 1990-92 to 1998-2000 was less than 0.1% per annum.

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Agriculture has a significant position with respect to the environment (Table 1.1), especially due to the amount of land and water it uses, in contrast to a much smaller role in the overall economy (e.g. share in employment and GDP). Agriculture is recognised to produce both positive (e.g. carbon sequestration) and negative environmental externalities (e.g. water pollution), that are not reflected in agricultural GDP as there are few markets for these externalities. The value of the positive and negative externalities generated by

agriculture are likely to be substantial, but no comprehensive monetary assessment of these costs and benefits currently exists.

The positive signs of environmental improvements partly originate from the better integration of environmental issues in farmers' decision making since the early 1990s. This reflects a combination of more stringent environmental regulations, increases in agri-environmental payments, and development of measures, such as market-based instruments, collective action, and technical assistance and research. Also over the past decade the slowdown in the growth of agricultural production compared to the 1990s, for most OECD countries, has in most cases tended to lower the growth in farm input use (nutrients, pesticides, energy and water) and emissions from livestock (ammonia, methane), which has enhanced environmental quality.

The total payments from OECD taxpayers to agricultural producers to generate environmental benefits and reduce environmental costs, have risen substantially since the early 1990s and now run into billions of dollars annually, although no exact estimate is available. Identifying the extent to which these budgetary payments over the past 20 years have shaped the environmental performance of OECD agriculture is complex and not fully understood. This is because payments are only one of the drivers affecting environmental change, as developments in other policies, the economy, markets, technology, knowledge, societal expectations, and the natural environment all play a part in shaping environmental outcomes in agriculture.

For some regions in OECD countries progress in improving the environmental performance of agriculture has been disappointing. More effort is required from farmers, policy makers and the agro-food chain to address water pollution and the decline in farmland breeding bird populations in these regions. Absolute levels of pollution also remain a challenge, as they continue in many regions across OECD countries to exert significant pressure on the environment. For example, high surplus levels of nitrogen and phosphorus leading to soil, water and air pollution, and excess pesticide application causing groundwater pollution.

The OECD-FAO agricultural outlook to 2021 projects an increase in agricultural production for nearly all OECD countries. Under a "business as usual scenario" the projected expansion in production could increase pressure on the environment. This poses a major policy challenge to simultaneously expand production to meet global food security demands and at the same time reduce the environmental costs and encourage the environmental benefits associated with agriculture.

To address the twin policy challenges of ensuring global food security and improving environmental performance will require raising the environmental and resource productivity of agriculture; enhancing land management practices; minimising pollution discharges; curtailing damage to biodiversity; and strengthening policies that avoid the use of production and input subsidies damaging to the environment.