working draft

EEA Core Set of Indicators - CSI 018

Use of freshwater resources

May 2005 assessment

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If you would like to see further background information about this indicator, you can see the published specification at:
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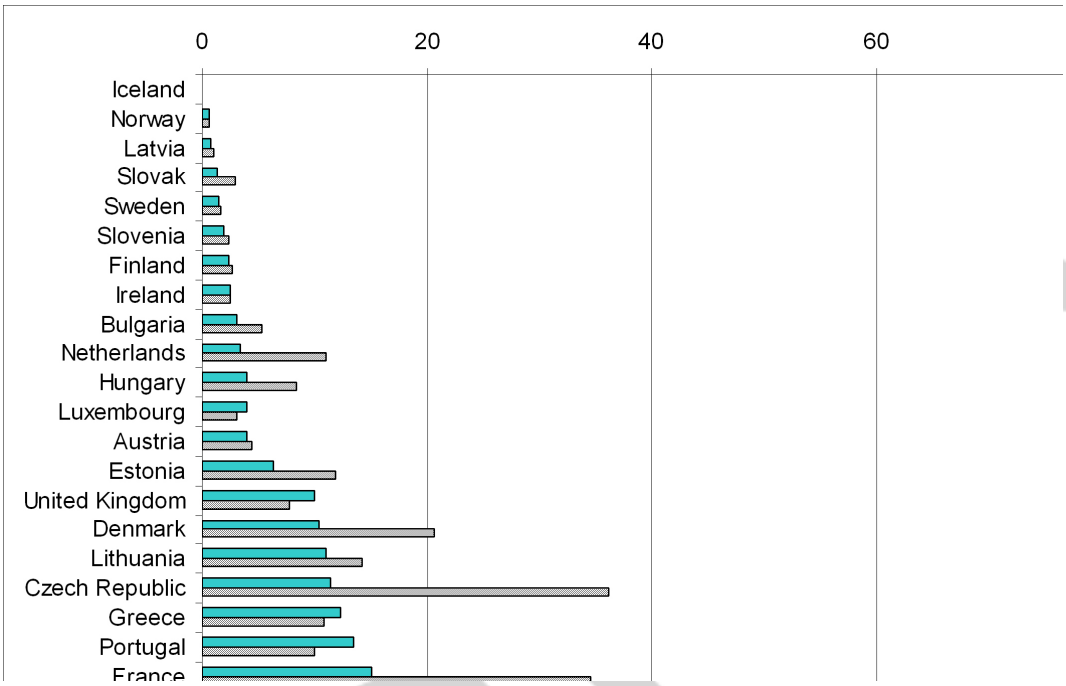
European Environment Agency

Key policy question: Is the abstraction rate of water sustainable?

Key message: The Water Exploitation Index (WEI) has decreased in 22 EEA countries during the period 1990 to 2001.

There are six countries that can be considered water stressed (Germany, Spain, Italy, Cyprus, Belgium and Malta), representing 35 % of Europe's population. The four former countries have a WEI between 20 and 40 %, and the two latter have a WEI around 45 %. However, it is necessary to take into account the high water abstractions for non-consumptive uses (energy production) in Germany and Belgium, while in the other four countries, most of the water abstracted is for consumptive uses (especially irrigation) and as a consequence there is a higher pressure on water resources. In southern European countries, the pressure on water resources increases during summer when water abstractions are higher due to agricultural uses and increased demand from the tourist sector.
The water exploitation index decreased in 22 countries during the period 1990 to 2001, representing a considerable decrease in total water abstractions. Most of the decrease occurred in the new EU countries, due to the decline of abstractions in most economic sectors. Institutional and economic changes have led to this trend. However, there are six countries (Luxembourg, United Kingdom, Greece, Portugal, Turkey and Malta) that have increased their WEI in the same period because of the increase in the total water abstraction, with the exception of Malta. In this last country, there has been a decrease in total water abstractions, but the data submitted for the last years on freshwater resources show large differences, which can explain this apparent inconsistency. In the case of UK, the higher WEI could be a combination of the increase in total water abstractions and a decrease in the reported freshwater resources.

Fig. 1: Water exploitation index. Total water abstraction per year as percentage of long term freshwater resources. 1990-2001



Data source: EEA-ETC/WTR based on data from New Cronos Database (Eurostat JQ2002)

Specific policy question: Is the use of water by sectors sustainable?

All the economic sectors require water for their development. Agriculture, industry and energy productions are not feasible if water is not available. Navigation and a variety of recreational activities also depend on water. The most important uses of water, in terms of total water abstractions, have been identified as urban use (households and industry connected to the public water supply system), industry, agriculture and energy production (hydropower and cooling of power plants). Sectoral use of water does not always reflect the relative importance of the sectors in the economy of one country. It is rather an indicator of on which sectors the environmental measures need to focus in order to enhance the protection of the environment. The main water consumptive sectors are: irrigation, urban use, and manufacturing industry.

Southern European countries use the largest percentages of abstracted water for agriculture (80 % in eastern countries, and 65 % in western countries). Irrigation is the most significant use of water in agriculture in these countries, being almost 100 %. Western and eastern (central plus nordic) countries use the largest percentages of abstracted water for urban needs and energy production.

The decrease of agricultural and industrial activities in eastern (central+northern) countries during the transition process led to decreases of about 70 % in water abstracted for agricultural and industrial uses in most of the countries. Agricultural activities reached their minima around the mid-1990s but more recently countries are increasing crop and livestock production (EC, 2002).

Water for agriculture, mainly irrigation, decreased during the 1990s in the western (southern) countries. The reform of the CAP in 1992 reduced production; the introduction of set-aside, putting in place of agri-environmental measures and the use of more efficient irrigation methods influenced this trend.

The increasing trend in the eastern (southern) countries is mainly due to the increase of irrigated land in Turkey and is expected to continue to increase with new irrigation projects. Data show a decreasing trend in water use for urban purposes in most of the European countries. This trend is more pronounced in eastern (central+northern) countries. In most countries, the new economic conditions led to water supply companies increasing the price of water and installing water meters in houses. This resulted in people using less water. Industries connected to the public systems also reduced their industrial production and hence water use. Nevertheless in most countries the supply network is obsolete and losses in distribution systems require high abstraction volumes to maintain supply.

Water abstracted for energy production is considered a non-consumptive use and it accounts for around 30 % of all the uses in Europe. Western and eastern (central+northern) countries are the largest users of water for energy production; in particular Belgium, Germany and Estonia where more than half of the abstracted water is used for energy production.

References

Aquastat (FAO) country reports

Cosgrove, W. J. and F. Rijsberman, 2000. World Water Vision. Making water everybody's business. World Water Council. Earthscan, UK

Blue Plan, 2000. Mediterranean Vision on water, population and the environmen for the 21st century. January 2000

EC, 2000. The Environmental Impacts of irrigation in the European Union. Environment Directorate of the European Commission. March 2000.

EEA. Sustainable water use in Europe. Part 1. Sectoral use of water. Environmental Assessment Report No.1. European Environmental Agency, 1999.

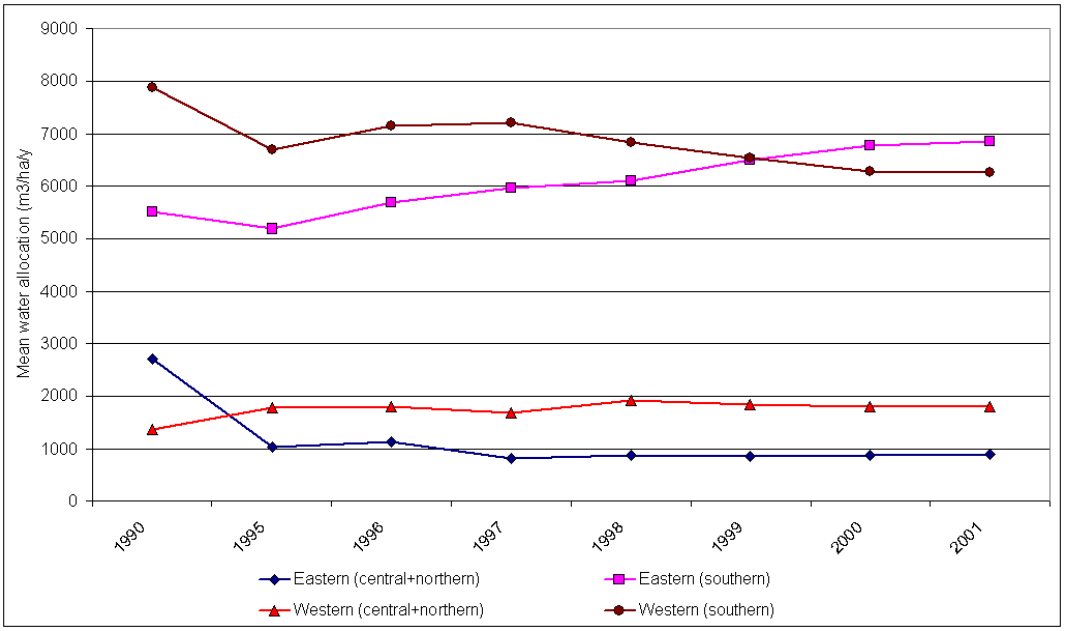
EEA, 2003. Europe's water: An indicator-based assessment. European Environment Agency, 2003

Eurostat. Agriculture, Environment, Rural Development - Facts and Figures.

EURO-MED, 1997. Water Management for sustainable agriculture in Cyprus. Conference

Euro-Mediterraneenne sur la gestion locale de l'eau. Marseille, 1997
EURO-MED, 1997. Experience of Turkey in participatory irrigation management by transfering management to users. Conference Euro-Mediterran enne sur la gestion locale de l'eau. Marseille, 1997
European Commission, 2000.The environmental impacts or irrigation in the EU. Environment Directorate of the European Commission. March 2000
Hinrichsen, D., B. Robey, and U.D. Upadhyay. 1998. Solutions for a Water-Short World. Population Reports, Series M, No. 14. Baltimore, Maryland, U.S.A.: Johns Hopkins University School of Public Health, Population Information Program
OECD, 1991. The OECD agricultural outlook (March 2001)
OECD, 1998, Household water pricing in OECD countries. Environment Directorate. OECD. 1998
OECD Environmental Performance Country reviews (Czech Rep., 1999; Germany, 2001; Greece, 2000; Ireland, 2000; Italy(draft), Portugal, 2001; Slovak Rep., 2002; Turkey, 1999)
OECD, 2001. OECD Environmental Estrategy for the first decade of the 21st Century. May 2001
Raskin, P., Gleick, P.H., Kirshen, P., Pontius, R. G. Jr and Strzepek, K. , 1997. Comprehensive assessment of the freshwater resources of the world. Stockholm Environmental Institute, Sweden.
Alcamo, J., Henrich, T., R?, T., 2000. World Water in 2025 - Global modelling and scenario analysis for the World Commission on Water for the 21st Century. Report A0002, Centre for Environmental System Research, University of Kassel, Germany.
Lane, M., Kirshen, P. and Vogel, R., 1999. Indicators of impacts of global climate change on US water resources. J. Wat. Res. Plann and Mang. July-August.
SoE and other country reports (Austria, Baltic countries, Belgium (Wallonia), Cyprus, Czech Rep., France, Germany, Iceland Italy, Malta, Poland, Romania, Slovenia, Sweden, Turkey, U.K.)
Shiklomanov. Summary of the monograph "World water resources at the beginningof the 21st century " prepared in the framework of IHP Unesco.
UN, Environmental Performance Reviews (Romania, Bulgaria, Estonia)

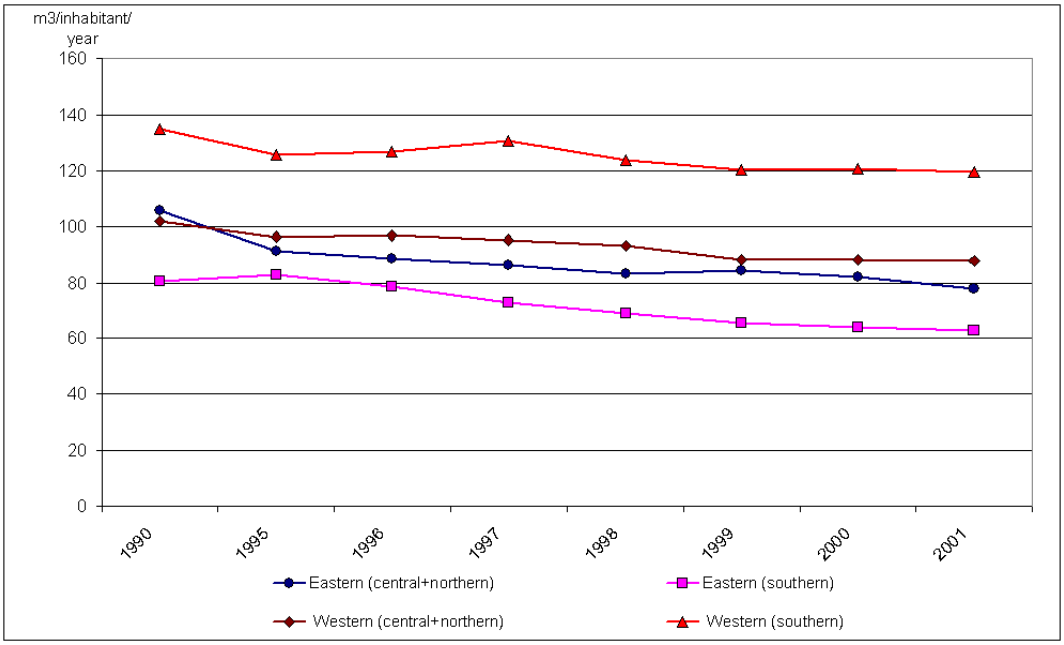
Fig. 2: Water for irrigation use (mean water allocation m3/ha/y)



Data source: Faostat and Aquastat (FAO), New Cronos Database (Eurostat-OECD JQ2002)

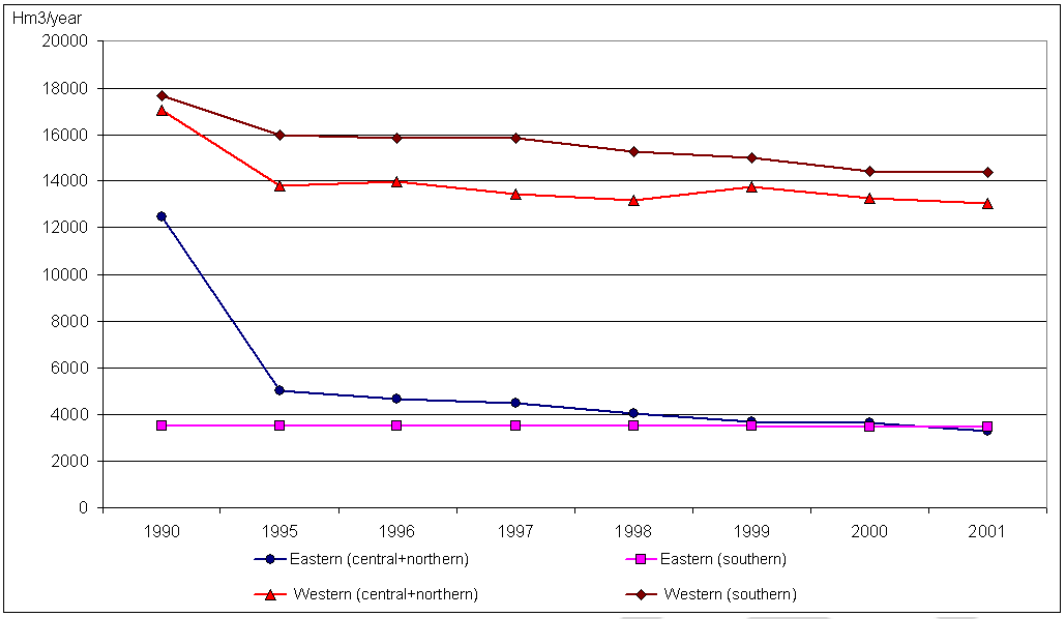
Note: Eastern (central+northern): Bulgaria, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovak Republic, Slovenia
Eastern (southern): Turkey, Cyprus, Malta
Western (central+northern): Austria, Belgium-Luxembourg, Denmark, Germany, Netherlands, Switzerland, United Kingdom, Finland, Sweden
Western (southern): France, Greece, Italy, Portugal, Spain
Sources:

Fig. 3: Water for urban use (m3 /inh./y)



Data source: Eurostat, New Cronos Database (Eurostat-OECD JQ2002)
Note: Eastern (central+northern): Bulgaria, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovak Republic, Slovenia
Eastern (southern): Turkey, Cyprus, Malta
Western (central+northern): Austria, Belgium-Luxembourg, Denmark, Germany, Netherlands, United Kingdom, Finland, Sweden, Ireland, Iceland, Norway, Switzerland
Western (southern): France, Greece, Italy, Portugal, Spain

Fig. 4: Water for industrial use (Hm3 /y)



Data source: Eurostat, New Cronos Database (Eurostat-OECD JQ2002)