

FRESHWATER COUNTRY PROFILE

NORWAY

Decision-Making

Programmes and Projects

- A. Integrated Water Resources Development and Management
- B. Water Resources Assessment
- C. Protection of Water Resources
- D. Drinking Water Supply and Sanitation
- E. Water and Sustainable Urban Development
- F. Water for Sustainable Food Production and Rural Development
- G. Impacts of Climate Change on Water Resources

Status

Capacity-Building, Education, Training and Awareness-Raising

Information

Research and Technologies

Financing

Cooperation

Decision-Making: *Water resource management.* The responsibility for coordinating water resource management and development is divided between several agencies.

The Ministry of Petroleum and Energy and its subordinate agency the Norwegian Water Resources and Energy Directorate are responsible for the management of Norway's water and energy resources, particularly as regards electricity generation and works that may have a significant impact on watercourses or the surrounding environment. The Ministry of the Environment and two of its subordinate agencies, the Norwegian Pollution Control Authority and the Directorate for Nature Management, are responsible for water pollution issues and for nature conservation and nature management. The Norwegian Pollution Control Authority is the competent authority for preventing water pollution, under the Pollution Control Act. The Directorate for Nature Management is the competent authority for the conservation and sustainable management of biodiversity, e.g. anadromous fish species and freshwater fish.

The Planning and Building Act (administered by the Ministry of the Environment) includes provisions on the coordination of national, county, and municipal activities and provides a basis for decisions on the use and protection of the environment. Under the Act, municipalities may establish environmental goals for their water resources and the environment in the vicinity of these resources.

At the regional level, the five regional offices of the Norwegian Water Resources and Energy Directorate and the county governors, who report to the Norwegian Pollution Control Authority and the Directorate for Nature Management, are involved in the management and development of water resources.

Water resource management is one of the areas where the subsidiarity principle applies in Norway. Decisions on emissions to water and air, land management in the catchment area of a river system, aquatic ecosystems and on regulating the water flow, affect the state of rivers, lakes and groundwater. Acidification is still a serious problem in Norway, and causes fish mortality and corrosion problems. Ninety percent of the pollution that causes acidification originates abroad and is now being sharply reduced through the Convention on Long-Range Transboundary Air Pollution (LRTAP).

The local authorities have the main responsibility for providing water and sewage services to both commercial and private users. Investment decisions for such projects are made by the developers. Prices vary, since by law, the usage fee levied by the municipality may not exceed what is needed to cover the costs of the service. There is no other charge on water use, nor is there any plan to introduce one. The Regulations relating to Water Supplies and Drinking Water (2001) lay down requirements for drinking water quality, security of supply, etc. for water works. The Regulations make the Norwegian Food Safety Authority responsible for approving water supply systems, while both the Food Safety Authority and municipal health authorities may perform quality checks on water supplies and even close down water supplies at short notice. In the case of private water supplies from streams, wells and boreholes, the owner is responsible for ensuring adequate water quality. If water is piped into a dwelling outside densely built up areas, the owner is responsible for installing approved systems for cleaning the resulting effluent. In all villages and towns, buildings must be connected to the public sewerage system.

The most important legislation relating to water resources management and development is the following: the Water Resources Act (2001), the Pollution Control Act (1981), the Municipal Health Services Act (1982) and the Act relating to Food Production and Food Safety (2003).

The Watercourse Regulation Act (1917) applies to regulatory measures such as dams etc. that even out fluctuations in water flow in watercourses during the year. Hydropower accounts for about 99 per cent of Norway's electricity production, and electricity generation is thus the most important commercial use of water resources.

The EU Water Framework Directive is currently being implemented in Norway.

Other legislation related to water resources management includes the Act relating to Salmonids and Freshwater Fish and the Act relating to Motor Traffic on Uncultivated Land and in Watercourses.

Programmes and Projects:

A. Integrated Water Resources Development and Management: There are several plans in place for integrated land and water management and development. These include a plan for improving water quality in the Oslofjord area, the most densely populated part of the country; a plan of action against floods, the Protection Plan for Water Resources, and the Master Plan for Water Resources. At present, watercourses with an estimated hydropower potential of about 35 TWh (20 per cent of Norway's total hydropower potential) are protected against hydropower development and other works that may have a significant impact on their conservation value. The protection of river systems was codified in the Water Resources Act, which entered into force in 2001.

The Master Plan for Water Resources was approved by the Storting (Norwegian parliament) in 1986 and has since then been revised twice. It is administered by the Ministry of the Environment in close cooperation with the Ministry of Petroleum and Energy. The Master Plan sets out an order of priority for all potential hydropower projects. This is based on an evaluation of costs and conflicts of interest in each case. Category I projects may be considered for licensing immediately, whereas category II projects may not be considered for licensing at present.

Further watercourses are now being considered for protection to supplement the Protection Plan for Water Resources.

In February 2003, the Storting decided to establish a system of national salmon rivers and fjords where special measures will be taken to protect wild salmon stocks. So far, 37 national salmon rivers and 21 national salmon fjords have been established, and the system is to be extended to approximately 50 salmon stocks.

Furthermore, there are plans for considerable modification and simplification of the Master Plan, in response to the changes in the framework for hydropower development that have taken place since 1993.

River systems have been designated as a target area for regional planning and land use policy as regards natural resources. Joint land use plans for major river systems have been drawn up by several counties. Coordinated water resource planning is for instance being implemented for the rivers Glomma, Numedalslågen, and Femund/Trysil Rivers. See also under Cooperation.

The implementation of the EU Water Framework Directive means that there is a process underway to develop integrated water management plans for all river basins by 2009. The principles, goals and strategies of the directive will be implemented into national law and policies in 2004.

B. Water Resources Assessment: Norway has a country-wide hydrological monitoring network which is currently being upgraded. There are about 700 stations that measure river discharge, 600 stations that measure reservoir water level, and 50 stations that measure ground water level. Data are collected at least daily, in many places continuously. In addition, the amount of water stored in snow and glaciers, water temperature and sediment transport are measured.

Water quality in rivers discharging into the sea is monitored monthly in 10 rivers, and four times a year in 36 rivers. In addition, there is short-term monitoring of clean-up and restoration works. Both water quantity and water quality are measured according to national standards based on ISO standards.

As part of the implementation of the EU Water Framework Directive in Norway, a comprehensive characterization of all river basins will be carried out during 2004, consisting of an analysis of the characteristics of the river basins, a review of the impact of human activity on the status of surface waters and groundwater, and an economic analysis of water use.

C. Protection of Water Resources, Water Quality and Aquatic Ecosystems: Although most freshwater is of satisfactory quality, the government has during the last 15 years been encouraging water works to increase the proportion of groundwater in drinking water supplies for environmental reasons, to reduce costs and to reduce the risk to public health from contamination.

Special restrictions on land use are used to protect drinking water sources from pollution. Financial compensation is provided where such restrictions are in force. Norway has built several waste water treatment plants with secondary treatment (chemical purification) over the last few years, and a secondary phase is planned for all treatment plants with a hydraulic capacity of more than 2000 population equivalents that discharge treated water to freshwater recipients.

Aquatic ecosystems are protected under the Wildlife Act and the Act relating to Salmonids and Freshwater Fish, which apply to terrestrial mammals, birds, reptiles, amphibians, fish, and other freshwater organisms.

D. Drinking Water Supply and Sanitation: Water supply and sanitation coverage is universal in Norway.

A national programme to improve water supplies was launched in 1995 with the goal of ensuring that all water works that supply more than 50 persons (these supply roughly 85 per cent of the population) provide satisfactory and safe water according to EU standards. This does not mean that 15 per cent of the population will have unsafe water, but rather that some of the parameters, for example water colour, may deviate from EU standards.

E. Water and Sustainable Urban Development: See under A. Integrated Water Resources Development and Management.

F. Water for Sustainable Food Production and Rural Development: See under Decision-Making.

G. Impacts of Climate Change on Water Resources: Important studies on the effects of ultraviolet radiation and ambient air pollution have been undertaken. A substantial amount of climate-related research is carried out to improve understanding of atmospheric processes and the relationship between oceans and the atmosphere, and between economic processes and their impacts on climate change. Several research projects in the last few years have focused on the impacts of climate change on fresh water resources, in particular changes in flood patterns and hydropower potential.

Status: *Water resources*: Norway has an abundance of water, and supply is more than adequate for domestic, agricultural and industrial uses in almost all parts of the country and at all times. Hydropower accounts for 99 per cent of the electricity generated in Norway (about 120 TWh/year). Thus, water plays a crucial role in the country's energy supply. The authorities have to balance the need for an adequate power supply against other user interests and environmental considerations. Most of the rivers with an undeveloped hydropower potential are protected from hydropower development, see part A. Precipitation varies from year to year, which in turn influences electricity generation. A large water storage capacity

ensures that hydropower production can be maintained in years when precipitation is low and in winter, when consumption is high.

Ninety percent of municipal water supplies are drawn from surface water. In 2002, withdrawals of ground and surface waters corresponded to 0.2 per cent of available water. Per capita domestic consumption was 200 l/day.

Nitrogen pollution is not a major problem in freshwater bodies in Norway. The capacity for waste water treatment is about 5.4 million PE. Eighty per cent of the population of Norway are connected to municipal waste water treatment plants with a capacity of more than 50 PE. The remaining 20 per cent are connected to smaller, individual plants. To satisfy the drinking water regulations, 260 water worksplants have to be upgraded to include a disinfection stage and about 500 to meet colour requirements. At present, 65 per cent of water is treated before use as drinking water. The target is to increase this to 100 per cent.

According to Norwegian regulations *E. coli* must not be detectable in a 100 ml sample of drinking water. All natural freshwater will occasionally exceed this level, even in the absence of man-made pollution. Critical loads of acid deposition from air pollution are still being exceeded across 43000 km² of Norway (1999), or about 13 % of the total land area. From 1960 to 1990, the total area where there was damage to fish stocks increased fivefold. Of the about 40 000 fish stocks investigated in 32000 lakes, almost 9600 have been wiped out (mainly stocks of brown trout; 8200) and nearly 5400 are depleted. Acidification is mainly caused by long-range transport of pollutants (SO₂, NO_x) from the UK and Central and Eastern Europe. Pollution of freshwater by industry is no longer a major problem. Emissions from point sources have been greatly reduced.

Information: Information on water management and development is regularly collected from the agricultural sector, the household sector and the industrial sector. The information is distributed as reports, fact sheets, and statistics from the agencies in charge. The information is stored in data banks. A classification system has been established to ensure efficient and systematic collection, processing, storage and assessment of water quality and the water resource's suitability for various uses.

Statistics Norway, the Norwegian Pollution Control Authority and the Confederation of Norwegian Business and Industry, are central sources of information on pollution at the national level.

Norwegian water institutions have a shared website, www.water-norway.org, where the institutions and some of their projects are listed.

Research and Technologies: Several institutions carry out research and provide scientific advice on issues related to water management, such as the Norwegian Institute for Water Research, the Norwegian Institute for Nature Research, the Norwegian Institute of Public Health and the Norwegian Water Resources and Energy Directorate. Research is funded by the institutions themselves, the Research Council of Norway, the EU, or others. The Research Council is currently running some research programmes in the field of freshwater management. In addition all the universities have several research projects related to water management.

Drinking Water 2000 is a research programme designed to improve drinking water quality caused by specific Norwegian (or Nordic) problems, mostly due to the impact of climate on water quality and population distribution.

Financing: Water supplies and waste water treatment are financed through annual fees payable to the municipality by every household connected to a municipal plant. The average household pays

approximately USD 200 for water supplies and USD 300 for sewage services (based on figures from 2002).

The government provided substantial financial support for the construction of new municipal waste water treatment plants in the period 1976 – 2001. This grant system has now been phased out.

The government also provided substantial financial support for the upgrading of inadequate drinking water treatment plants in the period 1995 – 2002. This grant system is now a part of general district development funding.

Investments related to water supply and wastewater treatment are normally funded through the ordinary national and international financial markets and are paid back through user charges on water, sewage or energy use. Smaller investments use loans, larger projects are often funded through bond issues. The investors themselves have to choose the level of interest and exchange rate risk they are willing to take.

Cooperation: *Water management:* Norway has a small number of river systems shared with other countries where issues of common interest are deliberated in joint river commissions. Norway is a party to the Convention on the Protection and Use of Transboundary Watercourses and International Lakes, and has concluded several bilateral agreements concerning individual watercourses.

Norway has ratified the Ramsar Convention on Wetlands.

Norway allocates approximately 0.92 per cent of GNI to development co-operation, with the aim of reaching 1 per cent by 2005. In the period 1999-2002, an average of NOK 200 million per year was used on water resources management and water supply and sanitation. This includes support for institutional development and infrastructure investments. Funds are channeled through bilateral co-operation, multilateral institutions and Norwegian, international and local NGOs.

Several projects and programmes include water resources management with a focus on strengthening institutional capacity in the recipient countries. Norway has for instance provided assistance for the Zambezi River Action Plan (ZACPLAN) in Southern Africa, and supports national water resources management programmes in Zambia and Angola. Substantial support is also being provided for the Nile River Basin Initiative and for natural resource management in the Equatorial Lakes region. Norway has assisted several countries in Africa and Asia in developing water-related legislation, and has provided expertise in hydrology and hydropower development.

On 4 - 5 November 2003, stakeholders from governments in the South, donor countries and the international donor community, civil society in the South, the international business community and water professionals met in the town of Stavanger in Norway for a conference entitled "Water for the Poorest". The conference was arranged by the International Water Academy and supported by the Norwegian government. It concentrated on how to implement the Millennium Development Goals for water and the WSSD targets on sanitation and integrated water resources management. The outcome of the conference will be reported to CSD 12.

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