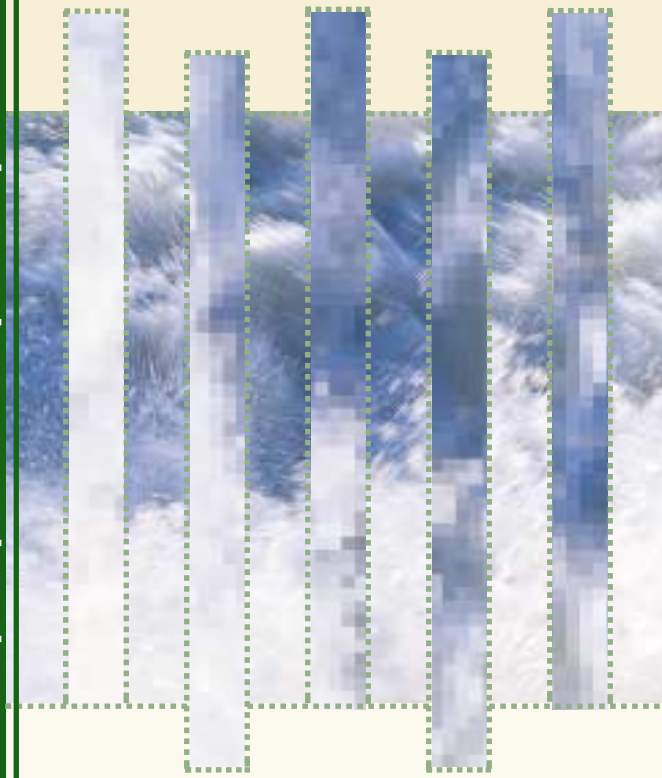
norwegian environmental assistance



environment and water resources management

· the Norwegian Way

MILJØVERNDEPARTEMENTET
Norwegian Ministry of the Environment

Directorate for
Nature Management

NORAD
DIREKTORATET FOR UTVIKLINGSHJELP
NORWEGIAN AGENCY FOR DEVELOPMENT COOPERATION

Further information:

Directorate for Nature Management
7485 Trondheim
Norway

Phone number: +47 73 58 05 00
Fax number: +47 73 58 05 01

Focal point: Section for Global Cooperation
Department for International Cooperation

Ministry of the Environment
P.O. Box 8013 Dep
NO-0030 Oslo, Norway
E-mail: postmottak@md.dep.no

http://www.dirnat.no
http://www.water-norway.org
http://www.miljo.no
http://www.norad.no

Design and production: Gazette
Photography: Bjørn Faafeng and Photodisc
Printing: Oslo Forlagstrykkeri
Circulation: 2000
July 2002

T-1411 og ISBN 82-457-0362-1

Environment and water resources management in Norway

Integrated water resources management is a critical element in achieving good water governance. Through the early development of hydropower Norway has a long recorded awareness of issues related to quantitative utilisation of watercourses. The challenges from water pollution, rural and urban land use, the increased attention being given to the ecological dimension and the need for clean drinking water have substantiated the need for co-ordinated efforts. In order to meet these challenges Norway has built up a comprehensive public administration. A broad network of institutions at various government levels covers the whole range of water management issues.

The responsibility for water resources management in Norway is divided between the national, regional and local levels. At the local level, municipalities prepare water resource plans concerning water supply and quality, land use, sewage, water pollution and fishing as a part of their ordinary planning work. At the regional level county planning is being used as a tool for management of rivers and lakes. Both long-term and corporate plans are statutory and represent important management tools for both municipalities and counties.

Conflicting water needs must be dealt with in a context of political transparency and public participation, and with full integration of the local level. Norway has a tradition for formal stakeholder participation during planning processes by way of written hearings and public meetings. Such processes include land use planning, open-air recreation, hydropower development, drinking water supply and sewage treatment. The planning

process therefore constitutes an important factor in maintaining and developing local democracy.

Tools of integrated water resources management

Promoting an ecosystem approach to the management of fresh water is a key challenge. The increasing demand for fresh water by human beings, and the demand for water by nature itself, make it necessary to recognise the role of ecosystems as users, regulators and providers of water. The role of important ecosystem elements – including groundwater basins, rivers, lakes, streams, wetlands and estuaries and forests – in the water cycle – and their importance for water quality and quantity – must be better acknowledged and factored into development planning.

The Master Plan for Water Resources and the Watercourse Protection Plan

To handle these complex issues, Norway has found it necessary to focus on infrastructure, on relevant institutional building and on capacity development.

River basins are fundamental elements in the Norwegian natural landscape, and are among the most important areas for recreation and outdoor life, economic activities, settlements and transport.

In Norway the hydropower sector is economically the most important sector related to the watercourses. For many years the development of rivers for power purposes was made on a case-by-case basis without a co-ordinated plan for the whole country. In view of increasing conflicts with other user interests it became essential to consider the exploitation of the remaining watercourses in a larger perspective. These considerations led to the preparation of a Master Plan for Water Resources, originally presented to the Norwegian Parliament in 1985, a Watercourse Protection Plan, and revised licensing procedures.

The Master Plan for Water Resources has been updated in 1988 and in 1993. The work is headed by the Ministry of the Environment (MOE), in collaboration with the Ministry of Petroleum and Energy (OED), the Norwegian Water Resources and Energy Directorate (NVE), the Directorate for Nature Management (DN), and other relevant institutions. The scope of the Master Plan is to present a priority grouping of hydropower projects to be brought forward for licensing. The priority grouping is the final result of evaluating development costs versus conflicts with other interests. In order to investigate the professional basis for the Master Plan a total of 16 user interests were defined: Hydropower, nature conservation, outdoor recreation, wildlife, water supply, protection against pollution, cultural monuments and cultural environments, agriculture and forestry, reindeer husbandry, prevention of flooding, prevention of erosion, transport, formation of ice and water temperature, climate, mapping and data, and the regional economy. For every project considered in the Master Plan, these interests are evaluated and included in a report on each river basin.

The Watercourse Protection Plan was produced in close co-operation between the energy and water authorities and the environmental authorities. The plan is administered by OED and NVE in co-operation with MOE and DN. This national conservation plan is based on an evaluation, started in 1968, of different conservation values and other interests related to the watercourses, like cultural heritage,

fish, wildlife, outdoor recreation, pollution control, agriculture, forestry and husbandry, in a collaboration between NVE, MOE/DN and the Ministry of Agriculture. The work was supervised by a committee, and the conclusions were presented in four reports; the first in 1970 and the last in 1991. The reports were prepared including a broad hearing process. The most recent plan was accepted by Parliament in 1993.

At present 341 localities with an estimated economic hydropower potential of 35 TWh, representing about 20% of the total hydropower potential, are protected against hydropower development and other types of encroachment that could destroy the protection values. A locality may be a whole river basin system, a part of a river basin system, or an area including many small river basins. The government has decided to start a new process leading to more watercourses to be protected, as well as a revision of the Master Plan.

Environmental Impact Assessment (EIA)

EIA is widely used in Norway to ensure that the effects of projects on environment, natural resources and on the community as a whole are properly evaluated. The Norwegian legislation relating to EIA, based in the Planning and Building Act, provides detailed procedures to be followed for specified types of projects. Projects related to water resources management of a certain size and with a certain potential impact are subject to EIA before a licence can be granted. Relevant authorities, including DN and NVE, co-operate during this process.

The developer must submit notification for specified types of projects. This notification shall always include a proposal for a study programme, which forms the basis for the EIA. The proposed study programme must always be submitted to MOE. The EIA process must focus on the issues necessary for further decisions on the project.

The EIA provisions allow local and regional environmental authorities, NGOs and other relevant organisations and the general public to participate in the planning process. They can also submit comments during the consultation process for the notification. Once the EIA has been drawn up there is further consultation and a public hearing, allowing all those who will be affected to evaluate whether the consequences of the project have been satisfactorily assessed. The public debate and any comments received can help the developer to adjust the plans for the project. In this way, the EIA provisions give the environmental authorities and other public authorities a greater influence and wider responsibilities.

Legal framework and licensing procedures

Norway has focused on a regulatory framework that allows transparent consultations between various stakeholders and participatory processes, leading to qualified and effective decisions. Norwegian licensing procedures are co-ordinated with the EIA provisions mentioned above.

The Planning and Building Act and the Water Resources Act constitute the most important legal framework for protection of the rivers from encroachments. In the hydropower field a licence pursuant to the Watercourses Regulation Act and/or the Water Resource Act grants permission to a specified company to develop and run power plants and dams. This will include conditions and

rules of operation of the water, as well as construction plans regarding e.g. landscaping, environmental and safety aspects. In accordance with these conditions the developer must also take precautions regarding preservation of cultural heritage, pollution and other environmental issues. This could involve constructing weirs, building fish ladders, ensure minimum waterflows, and removing vegetation from regulated zones.

The licensing procedure is also a vital element in the Pollution Control Act. The purpose of this Act is to protect the outdoor environment against pollution and to reduce existing pollution, to reduce the quantity of waste and to promote better waste management.

The Nature Conservation Act, the Cultural Heritage Act and the Act relating to Salmonids and Freshwater Fish represent other important protective measures within water resource management. The Nature Conservation Act aims e.g. at protecting the most valuable ecosystems, and distinguishes between the following protection categories: National parks, nature reserves, protected landscape areas, natural monuments, biotope protection and species protection.

Water resources assessment and monitoring

The uncertainties associated with water quality degradation caused by pollution, growing flood risks as a consequence of man-made interventions in catchments, and possible hydrological impacts of climatic change, will require improved hydrological data collection and analysis in order to support water resources management. To meet these challenges, new tools for data collection and monitoring have been adopted by the Norwegian national hydrological service. They include improved station network design, sensors, new station concepts for automatic data collection, and data bases. On the analytical side models are being developed for important applications, such as studies of the impact of climate change, and maps of water balance.

Assistance to institutional development in other countries

Institutional co-operation can increase efficiency in the development of local institutions, e.g. through the dissemination of relevant experience between institutions in Norway and partner countries. The mode of Norwegian development efforts has shifted from assistance to co-operation during recent years. In this connection, the Norwegian Agency for Development Co-operation (NORAD) has established a system whereby relevant Norwegian aid organisations, NGOs, official agencies, cultural institutions, research and educational institutions, and private enterprises are involved in Norwegian developmental co-operation. The main objective is to involve highly qualified Norwegian actors in development co-operation with similar actors in the recipient country, in order to draw upon their assistance in both planning and implementation processes. The Norwegian institutions involved in water resources management are as a part of this prepared to make active use of their Norwegian experience and competence in co-operating countries.

Main actors in environmentally related water resources management in Norway

Ministry of the Environment (MOE)

MOE has responsibility for overall environmental policy in Norway.

MOE is also the responsible Ministry for relevant Acts in this field, e.g. the Pollution Control Act, the Nature Conservation Act, the Act relating to Salmonids and Freshwater Fish, and the Planning and Building Act. MOE is the responsible Ministry for handling the EIA process in Norway.

MOE is partly responsible for administration of the Norwegian Watercourse Protection Plan, and the Master Plan for Water Resources (see further information above). MOE, together with OED, has also a main role in the implementation of the European Union's Water Framework Directive in Norway.

Directorate for Nature Management (DN)

DN is a directorate of MOE, and is the national authority for key aspects of biodiversity and nature management. Key areas include vegetation (aquatic and terrestrial), wildlife, freshwater fisheries, freshwater ecology, limnology, interactions between terrestrial and aquatic ecosystems, landscape ecology and land use planning and management, including the use of GIS methodology, monitoring of aquatic ecosystems and of alien species, outdoor recreation, and multiple use of river basins. DN has established a database on water information.

In the Master Plan for Water Resources DN is the responsible authority for new projects and upgrading, and for exceptions from the Plan. DN is also entitled to give comments in the process of developing new hydropower plants and in construction of transmission lines. DN gives advice on the EIA programme for hydropower schemes larger than 40 GWh/year or where there are significant conflicts, and proposes measures to alleviate impacts, including habitat restoration. DN is also responsible for the following up of the conditions given in the permission regarding wildlife, fisheries, aquatic ecology and outdoor recreation.

For the Watercourse Protection Plan DN is a co-responsible authority together with NVE in construction of mini-hydropower plants and for collocation and mapping of protection values.

Norway is a signatory to various relevant international agreements, and DN is the Norwegian management authority for e.g. the Ramsar Convention on Wetlands, and the Bonn Convention on Migrating Species. DN is also the main adviser to MOE on the Convention on biological diversity.

In Norway, DN is responsible for developing thematic conservation plans, e.g. on wetlands, and is also responsible for the development of management plans for conserved areas. Furthermore, DN is responsible for the assessment of conservation status for species and habitats, including red-listed species. Generally, DN gives advice on policies and legislation, and on relevant applied and basic research, and has particular competence in assessing impacts on the environment.

DN issues instructions and guidance to the County Departments of Environmental Affairs within nature conservation, and natural resource management and planning.

Norwegian Pollution Control Authority (SFT)

SFT is a directorate of MOE. Its main tasks are to combat pollution, noise and waste, and to regulate the use of environmentally hazardous substances and products. Measures to protect the environment and people's health through legislation and supervision of e.g. waste treatment, sewage and fish farming are central activities. Monitoring is an important task as SFT has the main responsibility for environmental monitoring in Norway. SFT also gives priority to work on climate change, the effects of energy consumption, and chemicals which are harmful to health and the environment. The basis for its work is the Pollution Control Act and the Product Control Act.

The Pollution Control Act establishes the principle that pollution is prohibited unless special permission has been granted. The Product Control Act shall prevent products from causing damage to health or harming the environment.

A characteristic of today's environmental problems is that they require more integrated solutions. The traditional tools of the environmental sector alone are not enough to achieve sustainable development, and more emphasis must be put on sustainable production and consumption. One example is to enforce waste minimisation while encouraging the recycling of waste from households, businesses, industry, construction activities and commercial activities.

SFT issues instructions and guidance to the County Governors with respect to pollution.

Ministry of Petroleum and Energy (OED)

The Ministry of Petroleum and Energy has a key legislative and policy responsibility for the management of the water resources in Norway. One of the most important tasks of the water resource authorities (OED and NVE) is the processing of licence applications for projects that are subject to the legislation on water resources. The Ministry is responsible for the following legislation regarding water resources management: The Watercourse Regulation Act, The Industrial Concession Act and the Water Resources Act.

The Ministry is furthermore responsible for the licensing of hydropower projects, which is an essential part of the utilisation of the water resources, with some authority delegated to NVE.

Water Resources and Energy Directorate (NVE)

NVE is a directorate that reports to OED, and carries out the main responsibility for managing Norwegian water and energy resources according to the politics laid down for the energy and water resources sector. NVE's mandate is to ensure integrated and environmentally friendly management of watercourses, to promote an efficient power market and cost-effective energy systems, and to work to achieve a more efficient use of energy. Furthermore, NVE has a central role in flood prevention work, to prevent accidents in watercourses, and has the overall responsibility for maintaining national power supplies. NVE aims to prevent damage and improve safety within river basins by implementing safety measures against flooding, erosion and landslides along watercourses and by mapping of flood prone areas.

NVE is responsible for weighing conflicting interests against each other when plans for developments in watercourses are presented. NVE assesses if new developments will have impacts

that make licensing mandatory. Furthermore, NVE administers the protected watercourses, proposes restoration in connection with former developments, and co-ordinates management duties in accordance with the Planning and Building Act.

The building of hydropower stations, dams and other installations in watercourses require a permit from the authorities. This permit is granted under the terms of one or more of following acts: the Watercourse Regulation Act, the Water Resources Act and Energy Act. The owners of the dams and other hydropower installations are responsible for the safety of the installations. NVE monitors the owners to ensure that they have prepared an emergency response to deal with potential problems. NVE is also responsible for determining optimal water flows in regulated watercourses.

As the national responsible institution for hydrology, NVE is collecting and disseminating information about surface water and ground water. This work also includes studies and providing advice about glaciers, ice and snow conditions, and sediments in watercourses. NVE is responsible for the national flood forecasting service.

NVE has five regional offices responsible for planning and carrying out work related to water resources management, hydrology, watercourse safety and licensing conditions.

NVE is involved in international development co-operation in integrated water resource management and planning, as Norway's centre of expertise in hydrology. NVE catalogues energy resources, and may carry out power supply system planning, and technical and economic analyses. NVE has established institutional collaboration directly with authorities in various developing countries. The most important support is to transfer knowledge and to play a part in developing modern legislation and institutions so that these countries in the long run can take charge of their own development.

The Geological Survey of Norway (NGU)

NGU is a governmental agency of the Ministry of Trade and Industry. NGU is the central national institution for knowledge of the bedrock, mineral resources, superficial deposits, groundwater and marine geology of mainland Norway and its continental shelf. NGU's motto is "Geology for Society".

NGU has a portfolio of international projects in Mozambique, South Africa, Eritrea, Ethiopia, Laos, Bolivia, Lithuania and Russia. Projects include practical analysis of rural water supply schemes in Southern Africa, and studies of drinking water quality in the Rift Valley in Ethiopia.

NGU has strong skills in the following fields related to groundwater and surface water:

- Hydrogeology of bedrock aquifers and sedimentary aquifers
- Assessment of groundwater resources for exploitation and energy extraction
- Geochemical modelling, including statistical analysis and health risk assessment
- Environmental assessment of groundwater, including baseline studies, long term monitoring and health risk assessment
- Hydrogeological modelling, including contaminant transport
- Hydrogeotechnical assessment (e.g. related to tunnels and mining activities)

- Regional and local scale environmental geochemistry of surface media and groundwater (e.g. in relation to urban, mining and waste disposal settings), emphasising pollution impact in relation to natural background levels and processes
- Low temperature geochemical processes, including contaminant transport and radionuclide transport
- Assessment of both water-source and rock-source thermal energy exploitation
- Development of databases and GIS applications for resource management and surveillance.

International experience

A Norwegian strategy for environment in development co-operation (1997-2002) has been published by the Ministry of Foreign Affairs, and is a basis for development co-operation related also to water resources management. This strategy focuses on enhancing the recipient country's capacity and willingness to ensure integration of environmental concerns into its own development. The co-operation is usually targeted towards programmes and actions that improve water services within a comprehensive water management regime. Much emphasis is put on the institutional and policy environment that relates to water development, including the legal and institutional framework, capacity building, and awareness raising. Norwegian development co-operation has a bold aim in contributing to the building of effective institutions, laws and regulations, and on developing suitable planning and management systems.

Norway pays special attention to the key ecological functions of forests, wetlands and streams, in order to secure stable and safe water supplies for biodiversity and people. The needs of human communities downstream are increasingly being factored into development planning upstream, and another important factor is the balance between rural and urban areas.

Sharing of knowledge – Norwegian assistance

Norwegian institutions have developed a comprehensive knowledge base both from experience and lessons learned through many years of systematic research, evaluation, refinement and management. The emphasis today is on networking, sharing of information, and collaboration with relevant institutions in river basin management, as well as providing professional assistance and services on demand. Some relevant topics and services are listed below, and further information can be provided on relevant contacts in Norway in these areas:

Topics

- Acid rain
- Aquaculture
- Awareness and education
- Biodiversity management
- Dams
- Ecotourism and recreation
- Engineering

- Environmental auditing
- Environmental data management
- Environmental impact assessment
- Environmental surveillance and monitoring
- Eutrophication
- Fish research, including genetics and breeding
- Fish stock assessment
- Flood and inundation control
- Freshwater fisheries
- Geochemical modelling
- Groundwater resources
- Habitat restoration
- Hazardous waste
- Hydrogeology
- Hydrographic surveys
- Hydrological monitoring
- Information systems
- Institutional capacity building
- Institutional co-operation
- International conventions related to water resources management
- Landscape ecology
- Legislation
- Limnology
- Management and planning
- Management of protected areas
- Mapping
- Pollution monitoring
- Regional and local governance
- Risk assessment and risk management
- Socio-economic assessment
- Training
- Transport
- Wastewater management
- Water pollution

Services

Project preparation phase:

- Needs and concept development
- Environmental and strategic impact assesments
- Licensing
- Consultative workshops
- Participatory project preparation, including hearings
- Proposal preparation
- Assistance in approaching financial agencies

Project implementation phase:

- Project administration
- Quality assurance
- Technical assistance, including engineering
- Environmental audits
- Training
- Research co-operation
- Networking
- Models and tools
- Software and equipment
- Long-term monitoring

Norwegian institutions providing assistance within water resource management

- Akvaplan – NIVA AS

  Aquaculture, environmental assessment, risk analysis, biodiversity studies, environmental data management

- Centre for International Environment and Development Studies (NORAGRIC)

  Sustainable agriculture, irrigation, food security, natural resource management and community development

- County Departments of Environmental Affairs
  Implementation of environmental policy, environmental monitoring on the regional level
- Directorate for Cultural Heritage (RA)
  Management of cultural heritage sites and monuments
- Directorate for Nature Management (DN)
  Nature management, wildlife, protected areas and outdoor recreation
- Norwegian Institute for Nature Research (NINA)
  Water resource management, fish research, limnological research, man-environment studies, restoration of habitats, landscape ecology, ecotourism and recreation
- Geological Survey of Norway (NGU)
  Hydrogeology, assessment of groundwater resources, geochemical modelling, hydrogeotechnical assessment, thermal energy exploitation
- Institute of Aquaculture Research (AKVAFORSK)
  Aquaculture, eco-friendly production, genetics and breeding, nutrition and feeding, product quality
- Mapping Authority (SK)
  Digital mapping, hydrographic surveys, geo-databases
- Ministry of the Environment (MOE)
  Policies and means for water resources management
- Norwegian Institute for Urban and Regional Research (NIBR)
  Regional research, local authority and governance, socio-economic analysis, environmental planning
- Norwegian Institute for Water Research (NIVA)
  Water resource management and research, biodiversity mapping, limnological research and monitoring, aquaculture, wastewater management, integrated information systems
- Pollution Control Authority (SFT)
  Pollution, monitoring, waste management
- SINTEF Group
  Fisheries and aquaculture
- Water Resources and Energy Directorate (NVE)
  Integrated water resources management and planning, national centre for hydrology, licencing and control, water ecology, safety related to dams and floods, hydropower, energy effciency, EIA, hydrology, water resources management, flood prevention, erosion prevention, sedimentation, protected watercourses

The website www.norad.no/environment provides more information on importantant parts of Norwegian development assistance related to environmental issues.

Examples of projects in developing countries

Country	Project
Angola:	*Development of energy and hydropower legislation*
Bhutan:	*Development of Integrated Water Resource Management, incl. water policy, water legislation and a National Hydropower Plan, as well as establishing a Ministry of Water and Energy.*
	Development of a licensing procedure for hydropower development
China:	*Restoration of the Lake Wuliangsuhai, Inner Mongolia.*
	Surveillance of Water Quality in the Songhuajiang River System in Heilongjiang Province
Ethiopia:	*Institutional co-operation between Ministry of Water Resources and NVE to strengthen the Hydrological Studies Dept.*
Laos:	*Development of Water Master Plan*
Latvia:	Assessment of pollution impact at former military bases
Lithuania:	*Assessment of pollution impact at former military bases*
Mozambique:	*Development of EIA procedures*
Namibia:	*Development of EIA procedures*
Nepal:	*Development of EIA procedures related to hydropower development.*
	Melamchi Division Scheme: Water supply to Kathmandu. Development of a legislation related to water and energy
Nile Basin Initiative:	Norwegian contribution to various Action Programmes through the WorldBank
Palestine:	*Co-operation between NVE and the Palestinian Water Authority Co-operation between MOE and the Ministry of Planning and International Co-operation within the water sector*
Russia:	*Improvement of drinking water quality*
South Africa:	*Sustainable development of groundwater resources under the Community Water and Sanitation Programme National inventory of wetlands Development of EIA procedures*
Uganda:	*Development of energy and hydropower legislation.*
	Limnological study of Murchinson Bay and Napoleon Gulf, with reference to water supply and wastewater disposal at Kampala and Jinja
Vietnam:	*Development of a National Hydropower Plan, and a Multi-purpose Plan on flood control, water supply and irrigation*
Zambezi River Action Plan:	*Norwegian support together with Swedish SIDA*
Zambia:	*Integrated pollution control prevention, including development of water guidelines for the copper industry*