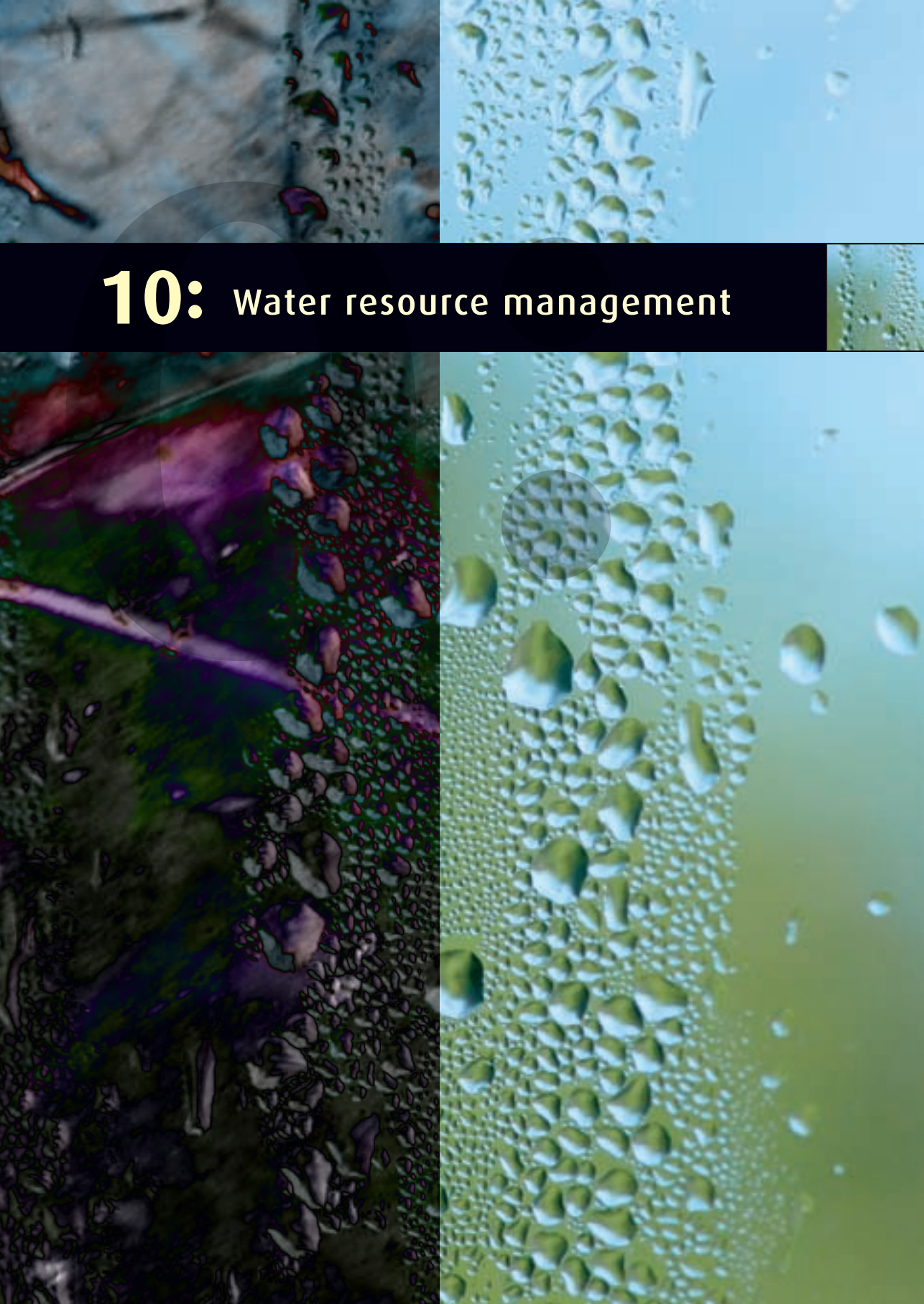

10: Water resource management

10.1. Introduction

River systems and their associated lakes and wetlands are complex systems, with a flora and fauna characterised by great diversity and numbers of species. Ecological conditions in a river system vary from the mountains to the sea. River systems support a rich algal flora and many types of bottom-dwellers (benthic species). In addition to fish and other species which live in the water, river systems are very important to many birds and mammals.

Norway has a great many rivers and waterfalls. These are very important both to commercial interests and for community purposes such as outdoor recreation. A number of local communities have developed from the commercial utilisation of rivers.

There are a number of colliding interests linked to the utilisation of river systems. Water supply is the oldest known form of utilisation, and remains important. Otherwise, fishing, timber floating, transport, irrigation, water-driven flour and sawmills and, more recently, hydropower generation are the best-known and most widespread uses. Electricity generation is the most important economic utilisation of Norwegian river systems today, see Chapter 2. The importance of the various uses varies from one river to another, and user interests have also changed over time.

A watercourse belongs to the owner of the land it runs through. However, neighbouring properties and the public interest place important limitations on a landowner's control of watercourses.

For agriculture, the use of water is vital. Irrigation and drinking water, property boundaries and natural barriers for livestock are important applications. Landowners can abstract water without a licence for household and livestock use from a river system on their property. These applications also take priority in the event of water shortages. Swimming, boating and angling are important recreational activities in river systems, and also represent nature experiences of great importance for tourism in Norway.

Watercourses have been subject to a number of changes and measures which influence the system. Human intervention can have both positive and negative effects in this context.

10.2. Administrative responsibilities

Hydrology is the study of the movement, distribution and effects of water throughout the Earth. The hydrology departement at the NVE studies the hydrological cycle, and provide basic knowledge required for water resource management.

Flood forecasting, measures to prevent erosion, construction of flood protection works and clearing watercourses are important administrative tasks. Another important job is the adjustment of biotopes, or habitat restoration, which are often required after earlier interventions. The NVE also conducts extensive research and development in disciplines within its sphere of responsibility.

Norway has many water reservoirs used for purposes as electricity generation and water supply. The water authorities are responsible for safety and inspection of such facilities and associated installations. The safety department of the NVE carries out inspections and provides advice on dam safety.

One of the most important jobs of the water resource authorities (the Ministry of Petroleum and Energy and the NVE) is processing

licence applications for measures subject to the legislation on water resources.

10.3. Legal framework

10.3.1 Water resources legislation

Legislation relating to water resources has roots which extend back to Norway's 12th-century provincial laws. These were based on the principle of private ownership, but also imposed clear restrictions on what owners could do, particularly in relation to fisheries. Most of these regulations were continued by Christian V in the Norwegian Law of 1687. Consideration of the technical and economic innovations during the 1800s led to the appointment of a commission that laid the foundations of the Watercourses Act of 1887. This is the first law that can be said to be the direct progenitor of today's laws in this area. It was replaced by the 1940 Watercourses Act. In 1990, a commission was appointed to draw up proposals for a new act. On 1 January 2001, the Water Resources Act came into effect; and is the general statute governing Norway's fresh water resources including ground water. See the more detailed discussion in Section 10.4 below.

10.3.2 The licensing system pursuant to the Water Resources Act

The special licensing systems for developements in watercourses date from the beginning of the 20th century. Advance application for whether a license is necessary ensures an individual assessment of the legality and impact of each project. The Water Resources Act is the general statute governing water resource management. The requirement to obtain a licence pursuant to this Act applies to all types of activities which might cause significant damage or nuisance to the interests of the general public.

Previously, licences were generally only needed for hydropower development. This requirement has been interpreted more widely in recent years, so that other activities which could involve damage or nuisance – such as major water supply or drainage projects or the abstraction of water for fish farms – have also become subject to the licensing process.

The Water Resources Act includes more detailed provisions on administrative procedures for licence applications. These specify the information to be included in an application and provide the legal authority to establish more detailed regulations. During the processing of an application, the applicant may be required to pay for investigations and studies needed to identify the advantages or drawbacks of the project.

An application is a public document and must be publicly notified at the applicant's expense in accordance with the provisions of the Planning and Building Act. The application is subjected to a process of public consultation before the NVE makes its recommendation. A consultation process involving affected municipal and county authorities and any other relevant ministries also takes place during the Ministry's procedural process.

The NVE has drawn up guidelines for the executive work related to activities in watercourses, such as aquaculture facilities, small power stations, refurbishment and upgrading of existing power stations, construction in or across watercourses, gravel extraction, measures to lower water levels, construction of embankments, and flood prevention and protection schemes. These guidelines distinguishes between large- and small-scale

projects in terms of the level of executive required.

In June 2007, the Ministry of Petroleum and Energy approved the guidelines for small hydropower stations. Their purpose is to facilitate regional planning of such power plants and strengthen the basis of uniform, efficient and predictable licence processing.

At the national level, the competent authorities pursuant to the Water Resources Act are as a general rule the King in Council, the Ministry of Petroleum and Energy and the NVE. At the regional and local level, the competent authorities are the NVE, the county governor, the municipality or any other body specified by the Ministry. Decisions made by the NVE can be appealed to the Ministry as the superior authority. Decisions made by the Ministry can be appealed to the King in Council.

10.3.3 Other administrative authorities and legislation

In addition to the Water Resources Act, the Watercourse Regulation Act and the Industrial Licensing Act, a number of other acts are of importance for water resource management. These are administered by authorities other than the Ministry of Petroleum and Energy and the NVE. The Planning and Building Act governs land use generally, and also applies to river systems and groundwater. The Act includes provisions relating to land use planning, environmental impact assessment and procedures for dealing with building applications. The highest administrative authority for the Act is the Ministry of the Environment. The new planning section of the Planning and Building Act was adopted on 5 June 2008, but has not taken effect. In contrast to current law this Act contains special provisions on energy measures, see more details about this in Section 4.4.1.

The Neighbouring Properties Act governs the legal relationship between neighbours, and not only between neighbouring properties. This Act is applicable unless otherwise specified by special legislation. This had been interpreted to mean that the Watercourses Act took precedence over the provisions of the Neighbouring Properties Act in matters concerning watercourses. Under the Water Resources Act, however, the Neighbouring Properties Act also applies to watercourse-related issues.

Pollution is regulated by the Pollution Control Act. The Ministry of the Environment also is the highest administrative authority for the Pollution Control Act, and the Norwegian Pollution Control Authority is the subordinate agency. The Water Resources Act defines the key concept of 'works in watercourses' in a way which excludes pollution. This will ensure that pollution of river systems continues to be governed by the Pollution Control Act, whereas other impacts are regulated by the Water Resources Act.

Many of the provisions of the Cultural Heritage Act are important for works in watercourses. Licences pursuant to the water resources legislation currently include conditions relating to steps to safeguard cultural artefacts automatically protected pursuant to the Cultural Heritage Act. Cultural heritage conservation is also taken into account in several other ways in the Water Resources Act. Such considerations may result in a requirement to obtain a licence, a refusal to grant a licence, or the inclusion of terms requiring the developer to safeguard cultural artefacts. The Ministry of the Environment is the highest administrative authority pursuant to the Cultural Heritage Act, but some powers have also been delegated to county authorities.

The Outdoor Recreation Act governs the public right of access to and passage across other people's property. The actual right to

traverse and use lakes and rivers is governed by the Water Resources Act, while other activities (swimming, landing and mooring boats) are governed by the Outdoor Recreation Act. The Ministry of the Environment is the highest administrative authority for this Act as well, and the Directorate for Nature Management is the subordinate agency.

In addition, the Nature Conservation Act, the Wildlife Act, the Act relating to Salmonids and Fresh-Water fish, and the Aquaculture Act may all be applicable to works in watercourses.

10.4. The Water Resources Act

10.4.1 General principles

The Act no. 82 of 24 November 2000 relating to River Systems and Ground Water (the Water Resources Act) came into effect on 1 January 2001.This statute is intended to ensure that river systems and ground water are used and managed in accordance with the interests of society. It takes a balanced view of natural resources and users, and is more resource-oriented than its predecessor.

Water resources themselves are renewable, but parts of the ecological system along and within watercourses are not. Nature conservation has an important place in the Water Resources Act. General provisions cover conduct in watercourses, and general requirements and restrictions are set out for watercourse use and for planning and implementation of works in them. Most of the requirements follow from the general provisions, and seek to take account of prevailing conditions in a watercourse.

The main objectives of the Water Resources Act are to promote sustainable development and to maintain biological diversity and natural processes in river systems. The intrinsic value of river systems, both as landscape elements and as habitats for plants and animals, is of central importance.

Several the provisions of the statute reflect the principle of sustainable development. These include the rules on conservation of waterside vegetation and on the minimum permitted rate of flow in watercourses. Both of these provisions are intended to provide good conditions for biological production and diversity in watercourses. In the long term, the amount of ground water abstracted may not exceed the inflow.

Sanctions have been substantially strengthened by comparison with earlier legislation. More severe penalties, for instance, have been introduced to deal with environmental crime in watercourses.

10.4.2 The licensing system

As a general rule, nobody can initiate works in watercourses which may cause any significant damage or inconvenience to any public interests there or in the sea without first obtaining a licence. This provision reflects the important position assigned to public interests in the Act. The expression ‘public interests’ is intended to be interpreted widely, and may include nature conservation, outdoor recreation, the landscape, fish stocks, cultural artefacts, economic activity and local communities.

The decision was taken not to transfer authority for large-scale hydropower projects, so that the competent authorities remained the same as before the Water Resources Act came into force. However, authority to issue licences for projects of more regional or local interest could be delegated to the county governor and municipality. This must be done gradually to allow these bodies to develop the necessary

competence. The expertise of the Geological Survey of Norway is being applied to the management of ground water resources.

10.4.3 Special provisions relating to works in protected watercourses

The purpose of including watercourses in the protection plans for water resources has been to prevent any reduction of their conservation value through hydropower developments. Even if a watercourse is protected against hydropower development, however, other types of developments may reduce its conservation value. To prevent this from happening, the Water Resources Act includes several special provisions relating to the management of protected watercourses. The most important of these is the statutory principle that whenever a decision of importance to protected watercourses is made pursuant to the Water Resources Act, considerable weight must be given to the conservation value of the watercourse. This will result, for example, in stricter treatment of licence applications for protected watercourses than for others.

10.5. Ground water

Before the Water Resources Act entered into force, there were no provisions on the abstraction of ground water. Ground water must be protected against pollution and excessive use and, if resources are scarce, they must be distributed in accordance with the interests of society. Since the Pollution Control Act deals mainly with the qualitative aspects of environmental pressures, the Water Resources Act focuses primarily on quantitative issues.

The Act has retained the general rule which gives the landowner rights to watercourses, and has introduced provisions conferring similar rights to groundwater. These provisions form part of the ordinary rights of ownership. Nevertheless, certain general restrictions on the right to utilise ground water have been imposed. The watercourse authorities are bound by these statutory constraints when processing licence applications.

One principle of the Watercourses Act which has not been retained in the Water Resources Act is that the first person to establish facilities for abstracting ground water is protected against all subsequent facilities which could reduce the amount of water available to them. Provisions relating to priorities for use and empowering the watercourse authorities to make further decisions on the distribution of water in the event of shortages both apply to ground as well as surface water. Abstraction of groundwater must not contravene the provision on the minimum permitted rate of flow. A licence has been made mandatory for abstracting ground water or for activities with an impact on ground water.

10.6. Watercourse safety

The Water Resources Act contains rules for both protecting against damage from watercourse programmes and to protect against damage from a watercourse.

Norway has a large number of dams. A dam break could have very serious consequences. The large dams in Norway have a high degree of structural safety and are followed up by owners and the NVE through supervision and contingency planning. Regulations (with subregulations) have been issued pursuant to the

Water Resources Act on the safety and supervision of watercourse installations. These regulations are currently undergoing revision.

The NVE also has a main responsibility to protect life and property located along river systems against damage from flood, erosion and landslides. It issues flood warnings, identifies the risk of flood and watercourse-related landslides, and administers public funds for the prevention of damage caused by flooding and quick clay landslides. It is the national expert authority on watercourses, watercourse safety and watercourse installations in connection with land use planning, and provides contingency assistance. Pursuant to the Water Resources Act, the NVE may also issue directives to owners of watercourse installations to carry out measures to limit damage, or itself initiate measures when there is a particular risk of serious damage.

Beginning 1 January 2009, the NVE will be able to provide local governments and society in general with expertise and resources relating to the prevention of damage resulting from landslides in the same way that the NVE currently provides assistance relating to floods and watercourse-related landslides.

10.7. Preserving installations in watercourses as part of cultural heritage

Many cultural artefacts are associated with the utilisation of water resources and are often found in the immediate vicinity of river systems. They include timber flumes, watermills, hydropower plants and canals.

The Ministry of Petroleum and Energy discharges its responsibility for the industry's cultural heritage through a permanent museum scheme administered by the NVE. This project aims to document, systematise and disseminate the history of Norway's water resource and energy administration and to conserve cultural artefacts which reflect that past. As part of this work, the NVE has established a long-term partnership with the Norwegian Hydropower and Industry Museum at Tyssedal and the Norwegian Museum of Forestry in Elverum. Another part of this work is the preparation of a national preservation plan for the sector's cultural artefacts in cooperation with the NVE, the Directorate for Cultural Heritage and owner groups. The national preservation plan is organised as theme projects, and shall present a selection of preservation-worthy power production and transmission plants, dams and technical facilities for watercourses. A third priority area is systematising and organising historical records in the NVE, so that they can be utilised in documentation and public education projects. Overall, this program will help increase awareness of and the importance of watercourse and energy management.

10.8. The EU Water Directive

The EU Water Framework Directive came into force on 22 December 2000, and the bill to incorporate the water directive into the EEA Agreement has been submitted to the Storting. The Directive is an environment and resource directive that through the EEA Agreement will lay the fundamental future framework for Norwegian and European water resource management. The Directive is a framework directive to which the relevant countries' laws, regulations and administrative follow-up must be adjusted. Its require-

ments are likely to affect management in relation to several statutes and must be taken into account by various government agencies and users of water resources. The Directive is not considered to confer any need for new or changed statutes in Norway.

It will help to maintain, protect and improve water quality and the aquatic environment, and ensure sustainable water use. The Directive gives great weight to a unified consideration of the various factors which affect river basins and ground water. Water resource management will therefore be based on catchment areas independent of municipal, county, or national borders. The Water Framework Directive places greater emphasis on biological conditions and deviations from natural states rather than on analyses of total emissions and chemical content of water. The Directive has a long-term perspective with rolling plans for follow-up at regular intervals.

The minimum environmental goal to be attained, designated 'good water status', is to be achieved no later than 15 years after the Directive comes into force. Nevertheless, the Directive permits national adjustments both through exemption provisions and the option of nominating water sources as so-called 'strongly modified'. This includes water resources that will not be able to achieve good water status due to physical intervention, but where it is desirable to uphold the measure because of the considerable societal benefit. These could be subject to a slightly milder environmental requirement, defined as 'good ecological potential'. Typical interventions could be similar to Norwegian hydropower regulation.

In Norway, implementation of the Water Framework Directive has been directed by a Ministerial Group and a Directorate Group. In October 2004, the Ministry of the Environment was given responsibility for the overall coordination of implementation of the Directive in Norway. The county governor was appointed as the coordinating authority at the regional level. Today's division of responsibility with respect to law and instruments is presumed to still apply.

The Directive has already been implemented in Norwegian law by the regulations of 15 December 2006 concerning the framework for water management (Water Regulations), which entered into force on 1 January 2007. The regulations are pursuant to the Planning and Building Act, Pollution Control Act and the Water Resources Act, and can be amended by the Ministry of the Environment and the Ministry of Petroleum and Energy.

The Water Regulations are meant to reflect the Directive's requirements and do not impose obligations beyond those following from the Directive. The regulations nevertheless represent an acceleration of certain timetables in comparison with the obligations that will follow from the incorporation of the Directive into the EEA Agreement. Through the regulations Norway has chosen to follow EU member deadlines for just under 20 per cent of the water areas. For the remaining water areas the regulations call for implementation in Norway in step with the second planning period in the EU countries. This means that the monitoring programme will be implemented from 2013 and that management plans with associated program of measures will be laid down in 2015 in line with the deadlines for the EU countries' second planning period. If the Directive is incorporated into the EEA Agreement in 2008, the binding deadlines for establishment of the monitoring programme and management plans with associated program of measures will be 2014 and 2017, respectively.