

National Water Conservation Plan

- Current Central Issues -

(Resolution passed by the 107th LAWA Public Meeting on 20. 9. 1996)

Länderarbeitsgemeinschaft Wasser



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1. Foreword

Water management is defined as "targeted organisation of all human involvement with water, both above and below ground, affecting the quantity, quality and ecology of the water".

In terms of this definition, water management was traditionally understood to mean the sum of all influences on the water, with the aim of using water as a resource, protecting against the dangers water presents, and reducing or eliminating difficulties associated with water in all its many manifestations (for farmers, for example). Water management has always been and still is seen as an integral scientific approach to dealing with water. But it is clear that our understanding of water management has undergone a change over the past ten years. Instead of being exclusively or almost exclusively a matter of resources, water management now increasingly embraces the function of water in the balance of the countryside and as a natural habitat, and views the water itself as a basis for water management aims.

With this development, the confrontative relationship between water management and environmental conservation, which has become something of a tradition, loses its significance. Water management, like conservation, is a sub-strategy of a comprehensive approach to protecting nature and resources. On the basis of this modern concept of water management, the *Länderarbeitsgemeinschaft Wasser* (LAWA) or International Water Study Group set out the technical requirements and long-term objectives of water management and all its aspects in an integral approach, which is described in its paper

**LAWA 2000
- Water management requirements
for a progressive water conservation policy -**

The **National Water Conservation Plan** presented here takes the features of Germany's natural environment, the hazards threatening water in an industrial country, and the current standard of water conservation, and attempts to define

**current medium-term objectives,
to be presented as the central tasks of water conservation.**

These tasks are to be undertaken in order of priority. The basic requirements for the water conservation strategies that we must develop are described.

Water systems include

- all naturally occurring water above the ground, still and flowing, including the water bed and the ecosystems of the adjoining valley zone, inasmuch as the water is the characteristic element of these ecosystems and to the extent that they are functionally associated with the water
- ground water

The water system can be grouped into

- flowing water,
- still water,
- ground water
- coastal waters.

The climatic conditions, the water cycle, the drainage conditions, the distribution of waters and the exchange between the surface and ground water are the fundamental elements of the water system and determine the natural functions of the high-quality and abundant water ecosystems. The water ecosystems do not make up a fixed statistical structure; they change and develop constantly along with geological history, and in recent times due to the influence of mankind. Water ecosystems must be viewed in terms of all of their natural functions, and must also be protected in these terms.

Negative changes in our water systems resulting from human usage are often only recognisable in the medium or long term, and accordingly they require significant time to recover. Therefore, with regard to the requirements of water conservation, a long-term political and technical agreement independent of daily events must be our goal. The principle of prevention must remain at the core of water conservation policies, and must enter into other areas that can potentially harm the water system.

2. The Situation Now

Germany is a country with a water surplus, although it contains some regions with a shortage of water.

The major geographical areas of Germany are structured and characterised by water. To safeguard the water balance, we need water conservation policies whose aim is to establish a network of large, medium and small waterways with water of a high quality.

Germany is a central European country, and almost all of its major stream systems cross into other countries.

The coastal waters of the North Sea and the Baltic are of special economic significance for parts of Germany. The quality of the country's coastal waters is significantly influenced by discharge from Germany. However, these effects are small in relation to the total ecosystems of the North Sea and the Baltic. Much more significant is, for example, air-borne pollution coming from elsewhere.

Germany has a high density of population and industry. The demands placed on water in its many manifestations as ground water, flowing water and still water are therefore unusually high:

- Ground water and surface water is used to supply drinking and industrial water, to irrigate agricultural areas and to generate electricity.
- Surface waterways are used for transport routes, and they are polluted considerably by discharge and use. Technical measures for flood protection burden the water systems.
- Flowing water and still water, including areas of water near the coast, are used for leisure purposes and as desirable sites for accommodation, industry and commerce.

In all, these factors pose a considerable threat to the natural functions of water as the basis of life and the natural habitat for humans, animals and plants. The extent of this threat varies between urban and country areas, but the threat exists everywhere nevertheless.

3. Fundamental objectives and requirements to be satisfied by water conservation strategies

We need to look at the water systems in an integral fashion, by including their peripheral zones and the sub-zones functionally related to them, treating all these things as an indivisible unit, and taking into account the interactions between ground water and surface water. From this viewpoint we can then define the main aims of water conservation politics as follows:

- Protect the surface waters and coastal waters as the natural habitats for humans, animals and plants.
- Protect the ground water as a natural life resource.
- Ensure a lasting water supply for the population, for agriculture, for industry and commerce, for recreation and for fishing.

Following these water conservation objectives in a densely populated industrial country like Germany leads to a constant conflict of interests.

Given such a situation, the implementation of water conservation strategies - while taking into account the unavoidable economic uses of water - requires the following:

- Clear political and legal stipulations.
- A high standard of technical and scientific expertise.
- A high level of financial and manpower resources.
- Trans-media standardisation and interlinking of water conservation strategies with the strategies of other technical sectors of environmental politics, as well as those of other political spheres.

To achieve this, the following is necessary:

- Water conservation strategies must be ensured medium-term permanence, thus satisfying the internationally recognised principles of Agenda 21 of Rio.

- When dealing with water issues, a high level of consensus is vital on all political levels and among all those involved.
- When implementing water conservation strategies and strategies in support of water conservation, particular care must be taken to obtain the agreement of those affected.

Because of Germany's hydrographic situation, water conservation will only succeed if international agreements are passed that harmonise water German conservation policies with the water conservation policies of neighbouring countries. The developing supranational water laws of the European Community, combined with other international agreements in the field of water conservation, are of special importance in this respect.

4. The Risk Situation

4.1 Surface and Coastal Waters

Substance pollution of the water systems and large-scale technical interventions have considerable negative consequences for the natural functions of water and the countryside associated with it.

4.1.1 Substance Discharges

Wastewater which is unavoidably created in households, commercial operations and industrial activities pollutes our water systems with substances that:

- are broken down by organisms, using up oxygen in the process;
- act as nutrients, stimulating the excessive growth of algae locally and in particular in the lakes and coastal waters, hence upsetting the ecological balance for long periods;
- damage flora and fauna and hamper the use of water for the water supply, even in small concentrations, due to their strong toxic effects;
- proliferate in the food chains, particularly in coastal waters, and subsequently seriously affect the fauna in the water and the birds that live from this fauna.

- by proliferating in the sediment of the waters, make it difficult to find anywhere to put the sediment when it has to be dug out for reasons of transport safety, water conservation, water quality improvement or preservation of free flow.

With its high standards of production, **European farming** demands considerable usage of fertilisers (phosphates, nitrogen fertilisers, manure) and pesticides. With the current methods of farming, these substances and the products of their decomposition enter the water systems via draining water or through the air in much higher quantities than is justifiable from an ecological or water management point of view.

Combustion processes in households, commerce, industry, power stations, vehicles and ships release considerable amounts of nitric oxides and sulphur oxides. These substances are carried by precipitation and the resulting water draining off developed and undeveloped land, into flowing water systems and on into the North and Baltic Seas, or directly into them.

As a result of the undeniable successes of water conservation policies over the past few years, pollution of water with **oxygen-reducing substances** from drainage water has dropped notably, with regional exceptions.

In contrast, the **pollution of many still waters and in particular coastal waters with nutrients** remains high. Major measures towards reducing the pollution of water systems with nutrients from diffuse discharge are still on the drawing board or in the early stages of implementation. Germany's considerable efforts to reduce these substances can only have a limited effect on the coastal waters of the North and Baltic Seas, as Germany is only responsible for 21% (N) and 24% (P) of nutrient pollution in the North Sea, and 2% (N) and 8% (P) in the Baltic. Nutrient pollution, which is a crucial factor determining the ecological situation of both seas, comes mainly from outside Germany, meaning that major efforts will be required in neighbouring countries as well.

Shipping pollutes the water by releasing hazardous substances and toxic paints in its waste products and operating discharge.

Considerable pollution can also be traced back to **road traffic** as a result of oil loss and tyre wear.

The successes of national water conservation measures (construction of municipal sewage plants, reduction of indirect pollution) has reduced the **pollution of our waterways with dangerous substances** to such an extent that many of them can now be used to supply drinking water after suitable prepa-

ration processes; however, heavy pollution continues to originate from old sources such as old sewage works and sediments.

Hazardous substances that inevitably remain despite effective effluent cleaning are creating increasing problems. These exist only in traces, but they tend to proliferate in sediments and in the food chain, and their toxicological category is very high.

Pollution enters the water systems from surface run-off, be it originally from the air or from water drained off developed and cultivated land. We are in the very earliest stages of reducing this discharge through the development of targeted strategies; hardly any of the available methods of reducing these substances in our waters have been touched upon to date.

4.1.2 Hydraulic Engineering

With the standard of water conservation so far achieved in Germany, it is important to bear in mind that **interference in the natural or existing near-natural waterway structures** and the adjoining valley plains has potential consequences that are much more enduring than the consequences of substance discharge.

The demands of society regarding usage result in construction work for transport routes, agriculture and power supplies.

From the point of view of the power consumption per weight carried, **shipping** is a particularly environmentally friendly mode of transport. However, to enable modern ships to run economically, suitable construction measures are generally necessary. To be safe and functional, shipping requires the following:

- Sufficient depth of water (guaranteed where necessary by damming flowing water)
- As long a waterway as possible
- Clearly defined and sufficient cross-sections
- Reinforced banks to prevent damage from shipping.

Efforts in the past to enable **cultivation** of areas not naturally suited to agriculture have led to widespread construction development, particularly in small-area water systems. The water table was lowered as part of this development in order to lower the ground water level in areas adjoining the water systems, thus enabling intensive farming to be carried out in these areas. In the interests of the simple management of the water systems, and in order to adapt agricultural areas for mechanised cultivation, water channel cross-sections and routes were redefined almost completely according to technical criteria.

The demand for **flood and tide protection** for centres of settlement, most of which have developed historically on big rivers, has led to the development of the water bed, dyke building, and thus to the cordoning off of valley floors. Also, reservoir systems have been developed, often quite extensively, to enable high water management and the raising of low water levels. Hydroelectric power is environmentally friendly from the point of view of CO₂ emissions, but the development of this type of power generation has necessitated the building of reservoirs on large and small rivers alike. Some of these reservoirs have had serious effects on fish stocks and are of long-lasting detriment to the water's function as a natural habitat.

4.2 Ground Water

Ground water is Germany's most important resource for the supply of water; around 70% of drinking water is taken from the ground water. However, ground water is not only needed as a drinking water resource: as part of the water balance it feeds the surface water (integral networking), meaning that ground water pollution pollutes surface water too. Ground water also fulfils important ecological functions.

Relatively speaking, ground water is well protected against pollution from the surface (for example from waste and other temporary influences). However, when the ground water is affected, it is more serious than in the case of surface water. A major threat to the ground water is the permanent and large-area effect of agriculture and the unavoidable substance discharges associated with this; this pollution has already led to lasting deterioration of the ground water. Nitrates and pesticides and their products of decomposition are a particularly serious potential danger at present. This danger is nation-wide, and some waterworks have already been closed because, given the available processing techniques, the ground water pollution levels have been too high to alleviate without unreasonable expenditure (if at all).

Atmospheric pollution represents a further nation-wide threat. This leads to progressive ground water acidification and the rinsing of undesirable substances into the ground water, particularly in soils with a low chalk content.

Aside from nation-wide ground water pollution resulting from diffuse contamination, other hazards must be counteracted such as pollution from transport routes and rubbish containing substances that pollute water. Old and dangerous waste poses a considerable local threat to ground water in commercial and industrial conurbations.

It is possible to design systems so that water-threatening substances are stored and handled in such a way as to significantly reduce the potential risk for ground water.

5. Strategies

5.1 General

The aims of water conservation:

- To retain as many as possible...
- near-natural water systems...
- that flow uninterrupted from source to estuary.
- To achieve enduring reduction of hazardous substance and nutrient pollution.
- To retain the natural quality of the ground water.

These aims cannot be fulfilled using solely the traditional water management strategies of purification and ground water development. Other sectors of environmental politics and areas of politics outside environmentalism must be persuaded to cooperate with the aims of water conservation.

Water management strategies must not be developed merely as reactions to water damage which has already occurred, they must also help to forestall potential water pollution whose sources are just beginning to become visible. Therefore, it is important that these strategies are planned with prevention as the guiding principle, which means stopping all avoidable water pollution and all avoidable deterioration of water systems.

To develop and implement water management strategies we will need considerable numbers of personnel and financial resources. In terms of the distribution of resources available to environmental policies as a whole, these strategies must compete with other environmental policies and will conflict

with other, economy-oriented political objectives. Water management strategies must therefore take into account the economic setting in which they are placed, base themselves on politically determined goal priorities, and integrate with the objectives of other specialised areas of environmental politics. Central to this is the assessment of the ecological and economic efficiency of the action we take.

5.2 Water Management Strategies

5.2.1 Water Above Ground, Including Coastal Waters

Effluent prevention has basic priority over effluent treatment. The best approach for reducing the substance pollution of above-ground waters, including coastal waters, is still to use the most effective and technically advanced effluent purification methods available.

Effluent purification, which is often unjustly discriminated against as old-fashioned "end-of-the-pipe technology", cannot be replaced simply by strategies of effluent prevention and reduction. Particularly important is the fact that the purification of commercial and industrial effluent will soon have reached the limits of the technically and economically feasible.

Technical water conservation in this area will only continue to be effective if recognisable attempts to prevent, at source, hazardous substances from entering the effluent and thus the water system are given permanent support. To this end we must promote production processes with closed substance cycles (this also helps to save resources), and to encourage the prohibition of highly dangerous substances in cases where they enter the water phase as part of the production procedure.

Criticism aimed at effluent purification - especially industrial effluent purification - on the basis that it is out of date is not justified given the existing technical and economic conditions. There have been remarkable successes in recent years, particularly in the field of industrial and commercial effluent purification. Nevertheless, we must also utilise all possible ways of effectively preventing effluent at its source. Over the past few years, people's preference regarding effluent sources has shifted towards prevention and reduction. We must continue to work in this direction, and encourage the closing of substance cycles and the outlawing of particularly dangerous substances.

It is extremely difficult to develop exhaustive evaluation standards with which to quantify the effects of effluent discharge into water systems, and to

forecast the developments arising from this discharge. Therefore, in accordance with the principle of prevention, we must only permit effluent discharge if it is harmless, or if it passes through a powerful, top performance effluent purification system beforehand, regardless of whether damaging effects are proven or not. German water laws confirm this necessity in the provisions of § 7a of the WHG (**emission principle**). As efforts continue to be made to develop European water laws and to bind German water laws to European Law, one of our political objectives must be to achieve uniform and high level emission restrictions.

Despite the difficulties described, all effluent purified to a high technical standard and discharged must undergo additional tests to ensure it cannot damage the water system (**pollution effect principle**). Examinations of the water into which the effluent is discharged, undertaken near the discharge point, can be used to assess the effects on the oxygen balance of the water system. However, for nutrients and organic and inorganic hazardous substances that do not decompose easily, tests must be carried out in each individual instance to determine which zones of the affected water system is the most sensitive (the flowing wave of the water receiving the discharge, lakes, reservoirs, sediment, or finally coastal waters). The standards must then be defined according to these zones, and all pollution and measures in the catchment area must also be considered.

The development of **criteria and standards** for this kind of comprehensive observation of the effects of pollution must therefore be encouraged as much as possible. A Federal/National study group has drawn up assessment criteria for the damaging effects of an initial group of hazardous substances (28 hazardous industrial chemicals, pesticides and heavy metals). These criteria have already been recommended for application in practical water management by the Environmental Minister Conference. However, equivalent criteria for coastal waters have yet to be produced.

The necessary development strategies must take all human pollution factors equally into account. Not only the water quality, but also the quality of the structure of waterways, banks and valley plains must be considered, as must the characteristics of the catchment area. The pollution factors should be gathered together and presented in the form of models. Targeted improvement of our waterways must begin to redefine the **priorities of water conservation, seen from a holistic viewpoint**.

No-one would dispute that, in order to protect the coastal waters, a nationwide, permanent **reduction in nutrients and hazardous substances in effluents** is required, utilising the most up-to-date technology available. The

same applies to catchment areas of sensitive water regions such as lakes, reservoirs and the areas surrounding river sources.

The EC's "**Municipal Effluents**" directive has been implemented and the existing effluent discharge points have been upgraded to the highest technological level, as stipulated by the regulations associated with § 7a WHG that are not embodied legally. Consequently, most of the known effluent purification methods that effectively protect the water systems against deoxygenating substances, nutrients and hazardous substances have been employed.

As **natural habitats for a huge variety of flora and fauna, flowing waters** must be protected and developed. Their integration into the water-dependent or water-related sections of the countryside, particularly valley plains, must be secured and re-established.

The **uninterrupted biological integrity** of flowing water systems from source to estuary must be improved, and/or their natural state re-established to such an extent that animals and plants can settle naturally as far as possible in their original proportions. As this objective can only be reached one stage at a time, suitable main areas must be selected in conjunction with conservation authorities, so that they can be developed as the major components of a **biotope link system**. This includes:

- Ease of passage for migratory species
- Near-natural water system structures
- Integration into valley plains
- Promotion of the water system's own dynamic development.

Flood and tide protection strategies must be reconsidered and redeveloped in accordance with the LAWA guidelines in such a way that the functional unit between the water system and valley plain is disturbed as little as possible, and so that the retention of the water to flatten out high water peaks has priority over the quick distribution of water to the expanded water beds and between the dykes. Potential retention areas must be secured and developed for this function. Building in flood areas must become a thing of the past.

Although shipping has been acclaimed as an especially environmentally friendly mode of transport from the point of view of CO₂ emissions, **safe-guarding and development of the waterway network** must satisfy criteria that protect the passage of migratory species along the waterways and do not threaten the functional relationship between valley plain and water system.

The damming effect and other ecological drawbacks produced by **hydroelectric power stations**, which impair the water systems as natural habitats, must

be balanced against the advantages of reducing CO₂ emissions. Only if the balance is positive and a minimum of through-access and sufficient remaining water quantities are guaranteed in the water systems involved, is it justifiable to develop more hydroelectric power stations.

Usage conflicts must be resolved and the usage reversed (especially the agricultural utilisation of areas surrounding water systems) in order to reduce the necessary water management measures.

Regular and systematic monitoring of surface water systems and coastal waters is crucial. This is the only way of detecting threats to the water and existing pollution in time, and introducing counter-measures.

5.2.2 Ground Water

Ground water pollution is long-term damage which can only be rectified (if at all) over very long periods of time and at considerable technical and financial expense. Preventative measures must therefore be put into action to protect the ground water against harmful discharge, whose effects are often more serious than those afflicting above-ground water. The precautionary principle embedded in German water laws for the protection of ground water stipulates that the ground water is protected nation-wide and in accordance with the principle of prevention. The principle of prevention means that protective steps must be taken even if the harmful effects have not yet been fully and scientifically proven; a slim possibility that the ground water will be damaged suffices to necessitate protective action.

To safeguard the drinking water supply, further steps must be taken to assign water conservation zones in drinking water catchment areas. The aim of this is not to reduce remaining risks affecting the ground water, but instead to completely eradicate the threat by forbidding certain activities. We must strive to make all drinking water areas into water conservation zones.

Quantitative ground water management must ensure a lasting supply, i.e. the accumulation of new ground water and the ground water demand in the natural balance must be taken into consideration.

Qualitative ground water management is not permissible.

A necessary precondition for comprehensive and nation-wide ground water conservation is sufficient protection of the soil.

Soil must be utilised agriculturally in such a way that the nutrients discharged into the ground water are reduced to a minimum.

If used correctly and according to the directions, pesticides should not have any harmful effects on the ground water.

Technical systems that are a source of potential danger for the ground water (systems that manufacture, use, store or transport water-threatening substances) must be designed in such a way that their operation does not endanger the ground water, as must effluent channels and waste systems.

Ground water pollution originating from point sources should be purified as thoroughly as possible.

Regular and systematic monitoring of ground water is crucial. This is the only way of detecting threats to the ground water and existing ground water pollution in time, and introducing counter-measures.

5.3 Water Conservation in Other Political Areas

5.3.1 Development and Housing Policies

Development and urbanisation schemes with foresight should use their instruments (development plans, regional plans, construction plans) in order to minimise the potential for conflict between people utilising areas of land and waterways, and the objectives of water conservation. This includes:

- Making sure that retention areas and flood areas are kept clear or re-established.
- Transport routes and settlements, including industrial estates, are not developed in ecologically sensitive areas of the water systems, on account of the increased effluents produced (dirty water and precipitation).
- Ground water conservation is taken into account.

5.3.2 Transport Policies

Taking water systems and high water protection into consideration means trying not to build roads and railways in valley plains, flood areas and water conservation zones. The water pollution caused by running and maintaining these transport routes must be minimised.

The following approaches must be employed to reduce the level of water pollution coming from the air:

- Promote public transport
- Encourage goods transport to move to railways, pipelines and waterways
- Push for the reduction of nitrogen emissions
- Prioritise rail transport over air transport.

In shipping, water pollution resulting from the discharge of bilge oil and ship waste, and from toxic paint, must be reduced. The risk of accidents must be reduced by raising safety standards to suit modern technology.

5.3.3 Industrial Policies

Germany is a high-tech country with few raw materials, and its current tendency towards developing intelligent, resource-saving industrial technologies is very welcome from the water conservation standpoint. The raw materials industry is a sector in which it is particularly important to actively encourage the development of closed cycles that do not discharge substances into the water system.

A strict Europe-wide limitation of the emission of nitric oxide is central to the interests of water conservation. Any such efforts in the European Union must be given permanent encouragement and support.

4.3.4 Agricultural Policies

The objectives and tasks already defined for correct agricultural practice must be implemented consistently, especially when concerning water conservation issues.

In the interests of water conservation, the structural changes evident in agriculture must be utilised in order to withdraw linked areas from use, or to make their use extensive enough to allow them to be classified as environmentally friendly. The obligation of farmers to use solely the fertilisers and pesticides they really need (in line with "good expert practice") is essential

for water conservation. The developers of pesticides must look increasingly at the behaviour of substances used and their products of decomposition in the media of the environment, particularly water. Pesticides that can be proven to remain in the ground water even when used as instructed should be banned.

Waste created from animal rearing, to be handled correctly and not to pose a threat to the water systems, must be stored in restricted areas. Strict limits on air emissions are necessary for mass rearing in order to reduce the discharge of nitrogen compounds into the water systems. Processes must be developed for the use of manure to reduce the emission of nitrogen to a minimum.

5.3.5 Environmental Conservation Policies

Environmental conservation and water conservation should not be competitors, they should complement and support each other.

The resources of water conservation and environmental conservation must be combined in order to secure and develop the water systems as natural habitats, to protect the biotope, and to assist in biotope link planning.

The Stralsund Declaration on Water Conservation

from the LAWA Public Meeting on 20. 9. 1996

1. **Securing and re-establishing the water systems as natural habitats**

The protection and re-establishment of water systems as the foundation of life, along with their near-natural development, are at the forefront.

2. **Keeping the Ground Water in its Natural State**

Preventative measures for nation-wide protection against substance discharge have top priority. Ground water impurities should be removed as far as possible. Strict protective regulations should be imposed on the catchment areas of drinking water supply plants.

3. **Preventative Avoidance of Substance Discharge**

Production and working processes should be optimised so as to reduce substance discharge at its source. This means:

- Substitute dangerous substances.
- Invert the burden of proof for the harmfulness of substances: it must be proven that they do not damage the water systems.
- The introduction of closed cycles and recyclable products is to be encouraged in production processes that involve hazardous substances.
- The proportion of substance discharged from diffuse sources must be reduced further.
- Possible methods of prevention must be analysed and used more in practice so as to prevent accidents in the handling of dangerous substances.
- Action against water acidification must consist of limiting and reducing the emission of air pollutants.

4. Rational Handling of Water in Households, Industry, Commerce and Agriculture

The environmental medium of water should be used in moderation, and people must be trained to be aware of how it is handled. We should therefore continue to support water-saving activities.

5. Development of Effluent Processing Plants

Effluent processing plants are a main component in the water utilisation cycle, and must therefore be designed so that water used in households, industry, commerce and agriculture can be returned to the environment without damaging effects. We must continue with determination to construct new effluent processing plants and modernise existing ones, until the relevant requirements of European and national law are satisfied. In some cases, modified requirements may be necessary in accordance with the pollution effects principle.

6. Targets and Water Assessment

The targets for water quality and the methods of assessing the water are an important foundation for lasting water management. Targets in the form of threshold values relating to protected goods must continue to be developed and introduced into the work of the water authorities as a basis for the approval of discharges. To this end, water system monitoring is a vital and ongoing obligation of water management.

7. Consideration of Catchment Areas

Water management planning must concentrate more on catchment areas. We must continue to develop integrated ecological water system assessment methods which take into account the structural, chemical, biological and hydrological characteristics of the water system. These methods will provide a basis for ecology-driven water system improvement.

8. The Effects of Traffic

Steps to limit traffic emissions must be taken in order to reduce the quantity of substances entering the water systems. Improvements in vehicle technology and infrastructure and economic policy measures are considered suitable. Infrastructure modifications should also keep sight of the concerns of water system ecology.

9. The Effects of Agriculture

For agriculture we must develop and apply management principles that reduce the release of nutrients and plant treatment substances into the soil, the ground water and the air (agriculture suited to local conditions).

10. European Water Policy

Germany's experience with the pollution effect principle and nation-wide ground water conservation has been positive. Efforts are thus being made to incorporate these things into European water laws as they are developed. The combined approach of the emission principle and the pollution effect principle, together with nation-wide ground water conservation, must become major components of European water politics, and in this respect they should be grounded in European water policy. The basic demands of water conservation must also be incorporated into European agricultural, industrial and traffic policy, as well as development and housing policy.