

**Environmental
Quality Objectives and Action Targets
for Water Protection
- Status Report and Prospects -**

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Introduction

Since the presentation of the Report of the UN Commission for Environment and Development (Brundtland Report) in 1987 and the United Nations Conference for Environment and Development (UNCED) in Rio de Janeiro in June 1992 the concept of "sustainable development" has dominated the environmental debate world-wide. The 1994 Commission of Inquiry of the German Federal Parliament "Protection of Man and Environment" took up and further developed the concept with regard to basic principles for a policy on chemical substances.

The concept of "sustainable development" is varyingly interpreted as development that is of "lasting" value, "environmentally sound in the long-term" or "appropriate for the future". It is basically understood to represent an environmentally and socially compatible way of life and production that can be globally maintained over the course of generations.

Following the UN Conference for Environment and Development in Rio de Janeiro in 1992, Chapter 18 of AGENDA 21, that concerns itself with the quality and quantity of freshwater resources, determined that *"the general objective is to make certain that adequate supplies of water of good quality are maintained for the entire population of this planet, while preserving the hydrological, biological and chemical functions of ecosystems, adapting human activities within the capacity limits of nature and combating vectors of water-related diseases."* [BMU, 1993]. "Sustainable development", as laid down at the Rio Conference, also encompasses a convention on biological diversity, that has been signed and ratified by more than 170 States, including Germany that

ratified the convention in 1993. This convention obliges the signatories to develop implementation strategies, plans and programmes, as well as to provide reports on appropriate measures [BMU, 1995]. The preservation of biodiversity is therefore an essential aspect of environmental quality objectives and action targets in the non-pollutant related area of water protection.

The water economy and all areas of environmental and resource protection must therefore be concerned with the environmental quality that ought to be achieved in the long term without adversely affecting utilisation by future generations, and with demands for future "sustainable use" that have to be made today.

In Germany water would appear to be a sheer inexhaustible resource. Water serves not only as drinking water for human beings, it is also the essential basis for all life and economic development. Water resources serve a variety of uses, such as the supply of drinking water, cooling water, waste-water discharge, fishery, shipping, energy production, bathing and recreation, activities that often have a lasting negative effect on water quality, ecology and hydromorphological conditions. Despite the fact that drastic and conspicuous effects to surface waters, such as fish kills, is hardly evident today as a result of measures taken over the past thirty years, the results in many areas are still unsatisfactory. In terms of sustainability criteria, water-compatible land use - in farming, for instance, - will not be achieved so long as drinking water abstraction from groundwater is at risk. In order to secure all forms of water utilisation, it is therefore necessary to define the quality that corresponds with the concept of ecologically-intact water bodies to be achieved in the long term.

One possibility of implementing this very abstract concept of long-term environmentally-sound development is the derivation of specific environmental quality objectives, that in their ecological content are fundamentally harmonized with the carrying capacity of the ecosystem. The derivation of environmental quality objectives based on the carrying capacity of ecosystems is, however, not undisputed. Discussion of the carrying capacity of an ecosystem implies the more or less legitimate assumption that every ecosystem can to a certain extent tolerate or compensate negative impacts, such as increased pollutant input. This appears to be of little benefit to precautionary environmental protection, for it encourages the questionable conclusion, that efforts towards the avoidance or minimisation of pollution input or other adverse factors are only necessary at and above the impact level no longer tolerated by the ecosystem. This would not correspond with the right to protection implicit in current German law (principal of concern, precautionary principle).

The carrying-capacity approach is particularly problematic with regard to the large number of hazardous substances, of which only a proportion is known or can be analytically identified in waters. It is in fact to the credit of the

precautionary principle embodied in German law, that of around 100,000 substances manufactured and made use of, only a comparatively small number enter waters in critical concentrations. According to § 1a of the Federal Water Act [*Wasserhaushaltsgesetz (WHG, 1996)*] "*Water resources are to be secured as a constituent part of the ecosystem and as a natural environment for animals and plants*". And further: "*They are to be managed in such a way that avoidable impacts on their ecological functions are excluded*". Measures affecting water resources are to be so conceived, that "... *contamination of water or other adverse effects on its properties are prevented*".

The fact that legislation calls for protection from "avoidable" and not just from "harmful" impact, and that the "contamination of water", and not just harmful effects on water, are to be prevented, highlights that a primary concern of the precautionary principle is that technical and organisational measures be put into effect, that reflect the latest developments in technology and environmental practice, in order that - independent of specific proof of risk - pollutant input into water resources is minimised.

As a consequence, the establishment of quality objectives should be limited to those substances whose use, despite precautionary measures at source, leads to increased concentrations and adverse effects on the environment. Otherwise there is the risk that the precautionary principle will revert to that of burden of proof, according to which proof of an adverse effect or of non-compliance with the quality objective must first be established, before measures are implemented at the source of pollution.

An important function of quality objectives is to establish priorities for carrying out water protection measures. Priority substances are those whose actual concentration approaches or exceeds the corresponding quality objective. The greater the difference between actual concentration and target value the higher the priority.

It is useful to formulate quality objectives for nutrients and acidifying elements, whose current input into waters significantly exceeds carrying capacity and leads to eutrophication and water acidification. The establishment of quality objectives for sensitive ecosystems, or assessments from background reference values for determining phased reduction targets, can also be helpful.

In the non-pollutant related area, especially in the case of impacts arising from utilisation (shipping, fishery, hydropower), quality objectives provide the only means to define requirements from an ecological perspective.

Quality objectives that specify the environmental condition to be attained - for example, non eutrophication - may also serve to lay the foundations for

environmental action targets. Environmental action targets quantify the overall extent of desired long-term input reductions. In environment policy such action targets frequently provide the basis for the measures to be adopted, since it is easier to agree - especially at an international level - on pragmatic proportional pollution reductions as a common basis for action, than on quality objectives that have to be scientifically founded.

The purpose of this report is to update and summarise the status of the debate on environmental quality objectives and action targets in the field of water protection. It should serve as the basis for further development of a sustainable water protection policy.

Section 3.1.2 and the Annex provide a compilation of all quality objectives and action targets currently adopted in water protection.