Netherlands, the: SEA for the National Policy Plan on Industrial and Drinking Water Supply. *

Case study compiled for the drafting of CBD guidelines on Biodiversity in SEA.
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1. Introduction

This SEA was carried out as a part of the preparation of the National Policy Plan and includes decisions on the total infrastructure for public water supply, including
- drinking water production: reduction of water demand, development of criteria for site selection of production facilities;
- quality assurance and environmental management systems for the production and distribution of water, e.g. recommendations for the identification of appropriate water resources.

Concerning water supply, the most significant problems are soil dehydration and land use by water production facilities. These two problems severely affected biodiversity. In the Netherlands 65% of the total public water supply relies on the extraction of groundwater. Groundwater extraction is one of the main causes of desiccation of nature reserves (besides intensified land drainage and regulation of surface water levels). The tension between the need for groundwater extraction and the problem of desiccation was one of the arguments to develop a new National Policy Plan on drinking water and industrial water supply (1990-1996). The policy plan is subjected to an EIA procedure because it concerned a PKB (spatial planning core decision). The SEA was integrated in the legally obliged procedure for the PKB. This resulted in a 6-step approach:
1. 1990: notification of intent, followed by a round of public participation on the required content of the assessment;
2. preparation of the assessment as an integral part of the preparation of the preliminary core decision (PKB)
3. 1993: publication of the preliminary core decision (with assessment report)
4. public consultation
5. cabinet decision
6. approval by parliament

The goal of the SEA was to determine the ecological impacts of alternative national water production policies and to compare alternative methods of water production.

The SEA took a number of years because of the desire to have quantitative information on the environmental effects. To come to this end two computer models were developed.

2. Links to other policies, plans and programmes

In the Policy Plan for the Supply of Drinking Water and Industrial Water, national policy is formulated. This policy forms the starting point for further elaboration and decision-making on infrastructural provisions: provincial policy has to comply with the national policy. The regional Water Supply Companies receive their permits for their projects from the provincial authorities under provincial policy.

3. Biodiversity, the general meaning of biodiversity in the SEA

It is stated that "the effects of drinking water and industrial water production should not lead to the deterioration of the carrying capacity of the environment which is a prerequisite of sustainable development". Reducing the negative impacts of industrial and drinking water production is one of the main objectives. The effects (of ground- and surface water extraction) on the hydrological processes that sustain the value and distribution of terrestrial ecosystems are seriously considered, especially with regard to vegetation.

Biodiversity as such is not mentioned in the documents of the SEA. Effects on the biotic and a-biotic environment are considered as very important. A-biotic aspects considered were: use of raw materials, energy and production of (chemical) waste. Biotic aspects considered were the effects on nature and landscape.

The attention to the effects of extraction on hydrological processes is translated in the term "nature". The criterium "landscape" relates to the spatial characteristics of the water body and the way they are in harmony with the surrounding natural environment/landscape.

4. Transparency and Stakeholder involvement; Involvement of the relevant (related to biodiversity) stakeholders

Inter-agency consultation and public participation took place through the following (legally obliged) methods:

- written comments during the scoping stage of the SEA (before step 1 of the PKB procedure, which is step 3 in description above))
- written comments on the SEA and the preliminary core decision (step 2 of the PKB procedure)
- public hearings
- dedicated meetings with target groups and related agencies throughout the planning process.

The results of the participation process were published in a separate volume (part 2 of the PKB procedure). An explanation how these were used in decision making was published in the Cabinet Decision on the BDIV (part 3 of the PKB procedure). Also, results of public participation were integrated in the advises of the independent EIA Commission. In fact the SEA procedure served as a 'boost' for structuring the public discussion with respect to drinking water production in The Netherlands.

5. Biodiversity in the different stages of the SEA process

5.1 Screening

The National Policy Plan on Drinking water and industrial water supply is subjected to an EIA procedure. Studying the impacts on biodiversity are not mentioned as such. But, effects from ground- and surface water extraction on soil hydrology and land use, both influencing 'nature', gave rise to the formulation of a new national policy plan.

Biodiversity as such is not mentioned, but the tension between conservation and use of natural resources (ground- and surface water) has lead to the formulation of a new national policy plan that is subjected to an EIA on strategic level.

5.2 Scoping

Already in the notification of intent it is argued that the most important effects of groundwater extraction are changes in **hydrological processes**: that is the lowering of the groundwater level. Lower groundwater levels are considered responsible for a number of secondary effects such as subsidence of peat layers, damage to buildings with cultural historical values, decrease of drainage through brooks, desiccation, a chance in the direction of the groundwater current, and the disappearance of seepage. Changes in these natural processes can have effects on the natural vegetation. It is also realised that these changes can have effects on the regional level, effects that surpass the location of extraction.

Lesson: In relation to groundwater extraction, effects on the natural vegetation are considered as the most important (and visible) indicator of the chances in the hydrological processes.

Concerning the construction of basins use of space and the related influences on nature and landscape, such as the disappearance of terrestrial ecosystems, are considered as the most important effects. Again, attention is paid to the effects on a larger spatial level than the location of the basin.

In the advice of the independent control body (the "richtlijnen" of the independent EIA commission) biodiversity as such was not mentioned. It was stressed that attention has to be given to biotic as well as a-biotic aspects, landscape and cultural historical aspects. Besides, the commission advised to focus on an integrated approach in which the main user-functions of the environment were taken into account and coherently studied.

In relation to the natural values and ecosystems the commission advised first to use qualitative methods without going into much detail. Based on the qualitative typology more detailed or quantitative research can be done when the national plan is further elaborated. A more quantitative elaboration is also necessary for regions with important natural values that are potentially suited regions for nature development.

> *Though again biodiversity as such is not mentioned, important biodiversity issues are addressed in this stage. Focus is on the effects on natural processes (though translated into vegetation). External effects are considered and it is stressed that on the strategic level a qualitative approach should be used. Qualitative results can be elaborated in more quantitive terms on lower (spatial) levels.*

5.3 The assessment

For the various defined alternative policies, it was determined with the help of DEMNAT (Dosis-Effect Model NAtuur-Terrestrisch), a computerized model, which changes could be expected in existing natural values. For this reason the terrestrial vegetation in the Netherlands was categorized in homogeneous ecosystems (ecotope groups). Their existing natural value per square kilometre was estimated.

Natural values are presented in "natural value unities" and defined as a function of:
- the (inter)national rarity of an ecotope group
- the extensiveness (surface of the ecotope group)
- the completeness of the ecotope group: Used as measure for the occurrence and development of ecotope groups. The completeness ranges from 0 (absent) to 1 (well developed). The completeness of 15 selected ecotope groups, specific for wet and moist conditions and therefore sensitive to water-management operations, was derived from a database for plant species. Completeness has been translated into the so-called ecotope group value (nwe).

By simulating groundwater changes for the different ecological soil types, it is possible to indicate changes in the completeness of terrestrial ecosystems within a grid cell of 1 km2. (units with respects to ecologically relevant soil characteristics as moisture availability, nutrient availability, acidity). It was concluded that there exists a near-linear relation between a change in the quantity of extraction and the change in natural values. These indications were reliable for the strategic level; for each individual location the results should be tested on reliability.

Besides natural values, other biodiversity-related issues were dealt with under the umbrella "use of space" and "quality and quantity of water" (quantatively scored) and "landscape". The effects on landscape concentrated on the adoption of the spatial characteristics of water bodies to the surrounding landscape. Spatial characteristics of water bodies (surface, shape and "strangeness") are qualitatively scored.

Biodiversity, translated into 'natural values of terrestrial ecosystems' was seriously taken into account in the assessment phase. An adoption to an existing computerized model was made to be able to indicate expected changes in natural values on a strategical level. Besides, the

adoption of the various alternatives to the surrounding landscapes was measured qualitatively.

Lesson: data derived from computerized models are reliable for an indication of effects on the strategic level; for each individual location the results should be tested on reliability. This is also concluded from the case study on the routing of the Zandmaas / Maasroute.

5.4 Decision making
According to the competent authority, the SEA did influence the decision-making process. The results of the SEA were taken into account when formulating national policy for future public water infrastructure in the Netherlands. Furthermore, the methods developed as part of the SEA both stimulated and structured project EIAs in the water sector, which facilitated interpretation of the National Plan when preparing plans at the regional level.

5.5 Monitoring
A 'definition study' for the monitoring plan was included in the BDIV. Starting point was that lower tiers will have to establish their own monitoring systems, and report to the Ministry which will aggregate the information. Main items in the monitoring plan are:
- quality of water resources
- quality assurance and reliability
- environmental impact
- water saving
- choice of resource types
- production facilities.

5.6 Information
The focus of the assessment lies on the effects of changes in groundwater levels. A lack of knowledge on the effects of groundwater extraction was expected. At the same time the modelling of the effects of changing groundwater levels and the higher order effects was desired.
Therefore a new model (though based on an existing one), DEMNAT was developed to fill existing gaps in information. The information needed for the models (hydrological knowledge and florbase)already existed but was now combined to determinate the existing natural values of moist and wet ecosystems in the Netherlands.
Due to the development of this model the SEA took several years.

6. General observations
SEA showed that there exists a direct relation between drinking water production and ecological impacts. Biodiversity not mentioned as such, but the tension between the use of natural resources (water) and the environmental effects were the trigger to start the process to formulate a new National Policy Plan. Different groundwater extraction scenario's were studied on their effects on the value and distribution of terrestrial ecosystems (especially with regard to vegetation).
Biodiversity related issues were addressed through the effects of extraction and storage on "natural values" (with the focus on vegetation), and "landscape" (visual, especially in relation to construction of storage and purifying basins).

Typology:
SEA took place on the National level
SEA was executed for site selection and selection of production alternatives
An integrated approach was followed, which in this case means that the whole production chain is taken into account: extraction, cleaning, and distribution. Besides, attention is paid to measures to reduce water consumption. Criteria for the judgement of alternatives were based on 10 aspects: public health, a-biotic environment, nature, landscape, use of space, technological feasibility, flexibility to changing circumstances, vulnerability, economy and political-juridical feasibility.

SEA was comprehensive.

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* This case study is based on the following documents that are available at the Netherlands Commission for Environmental Impact Assessment (www.eia.nl).

Draft version case studies on SEA by Rob Verheem

Naar een glasheldere toekomst (1990).Beleidsplan Drink- en Industriewatervoorziening, Nota ter voorbereiding, tevens bevattende de Startnotitie ten behoeve van de milieu-effectrapportage.

Richtlijnen milieu-effectrapport Beleidsplan Drink- en Industriewatervoorziening.

Milieu-effectrapport Beleidsplan Drink- en Industriewatervoorziening. Hoofdrapport.

Milieu-effectrapport Beleidsplan Drink- en Industriewatervoorziening. Basisrapport 5: Effecten op natuur van grondwaterwinning.