

Environmental Impact Assessment in the Netherlands

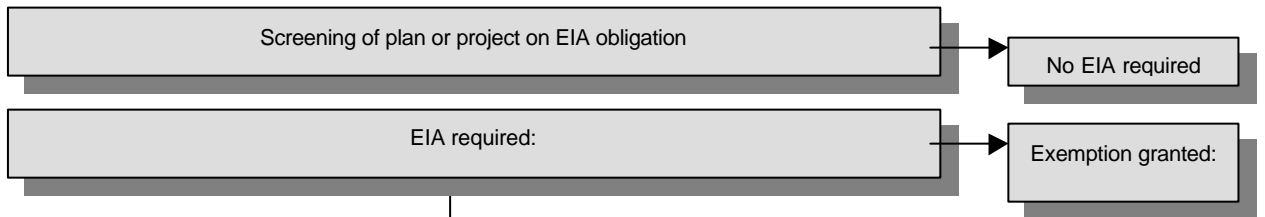
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Commission for EIA
in 2002

June 2002

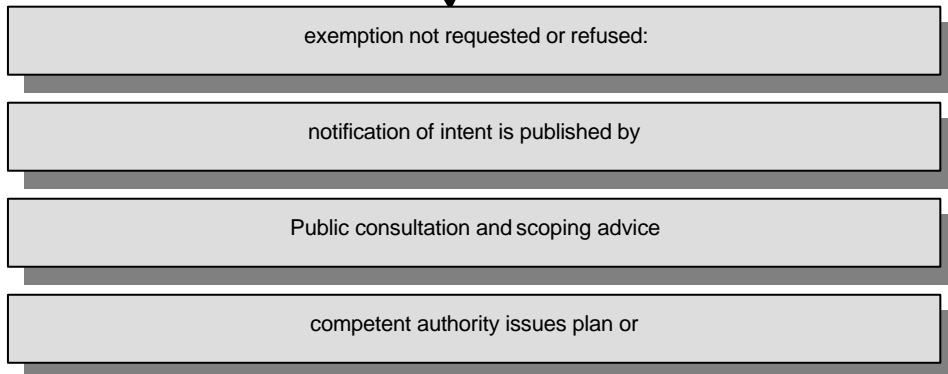


Main Steps in the Dutch SEA and EIA process¹

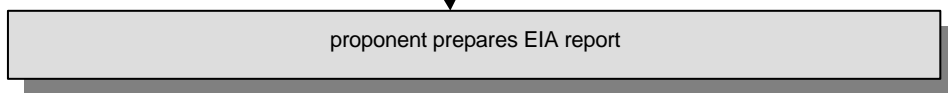
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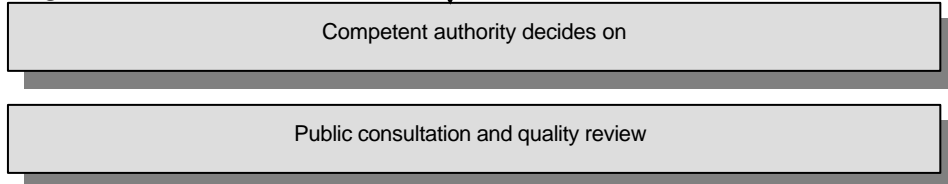
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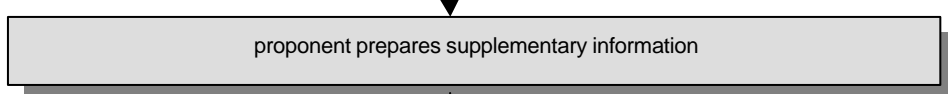
Documentation Phase



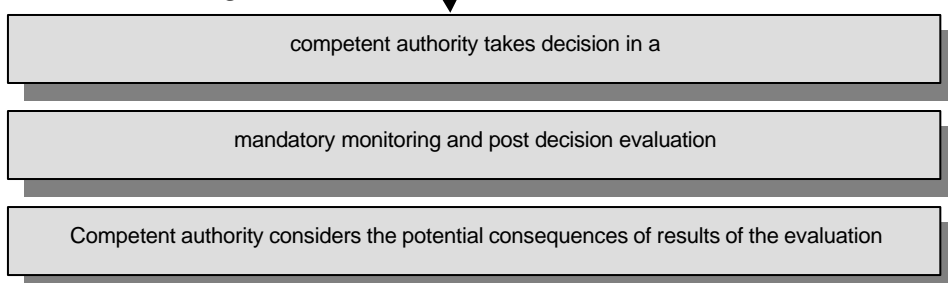
Reviewing Phase



Documentation Phase



Decision and monitoring Phase



¹ SEA of national and regional plans and programmes follows the same procedure as EIA for projects. In the flow chart the term EIA is used for both strategic and project EIA.

² Legal requirements include the description of alternatives, including the one that would be best from an environmental viewpoint. Social impacts directly stemming from environmental effects are typically included; other social impacts and economic impacts are no legally required part of an EIA.

PREFACE

This is the fifth volume in a series which presents papers in English by the Netherlands Commission for EIA to an international audience of impact assessment practitioners. The Netherlands Commission has gained considerable experience in the execution and management of EIA and SEA in The Netherlands and in developing countries as an independent advisor to the relevant competent authorities.

This volume contains five papers grouped into two categories: new developments and practical experience. The two papers on new developments deal with sustainability assessment and biodiversity in EIA. The three papers on practical experience focus attention on the added values of EIA in The Netherlands to decision making: transparency of the EIA process, importance of considering alternatives and independent review by the Commission for EIA and following decision making by the judiciary.

The Commission hopes that this new volume will contribute to the international exchange of experiences and strengthen the conviction that good quality environmental information plays an important role in decision making.

Utrecht, June 2002

A handwritten signature in black ink, appearing to read 'Niek Ketting'. The signature is stylized and written in a cursive-like font.

Niek Ketting
Chairman
Netherlands Commission for EIA

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ABSTRACTS

NEW DEVELOPMENTS

Recommendations for sustainability assessment in The Netherlands

Rob A.A. Verheem

The Netherlands Commission for Environmental Impact Assessment has taken the initiative of forming a working group of representatives from various sections of society to reflect on sustainability assessment. Is it possible to assess the sustainability of plans and large projects in a way that is useful for administrators in government and the business community?

This article first sets out the definition of sustainability the working group took as the basis of its thinking. The contours of the assessment framework are then presented: what should the concept include and what should it not include? The article then discusses the process and content of sustainability assessment and presents the working group's recommendations.

The working group concludes that the best way to proceed now is for government and the private sector to conduct experiments with sustainability assessment of plans and large projects, and makes recommendations for setting these up.

Biodiversity in EIA – general guidelines for describing species

Arend Kolhoff

This article examines the response by the Commission for Environmental Impact Assessment in the Netherlands to the recommendation in the Convention on Biological Diversity (CBD) on integrating biodiversity into environmental impact assessment (EIA). Using the definitions and concepts in the CBD, an indication is given of the type of information on species and ecosystems (consisting of a biotic component - communities and an abiotic component - abiotic processes and service) that should be included in an environmental impact statement (EIS). A set of general guidelines for species is presented. This is used by the Commission for EIA when it prepares specific advisory guidelines for an EIS. Further research is needed before a set of general guidelines can be prepared for plant and animal communities. It is recommended that a start be made now with identifying the 'free' services provided by ecosystems.

PRACTICAL EXPERIENCE

SEA on the introduction of a new system of environmental standards for Amsterdam Airport Schiphol: the importance of considering alternatives

Jules J. Scholten

Amsterdam Airport Schiphol (AAS), the national airport of the Netherlands, has grown considerably in the last ten years. It is the fourth largest airport in Europe, with a capacity that far exceeds domestic requirements, and caters for many ongoing passengers and much cargo in transit. Growth in aircraft movements is permitted on condition that noise nuisance declines and external risks and air pollution levels do not rise. The reference year is the situation in 1990.

To allow the airport to continue to grow, a fifth runway is planned so that noise nuisance and external risks will be diluted and spread over a wider area. In addition, older and noisy aeroplanes have been barred from the airport and various technical mitigation measures have been and will be taken. The decisions on these developments taken during the last ten years have been supported by several Strategic Environmental Assessments (SEAs). After the completion of the first SEA in 1995, it soon became apparent that the current system of environmental standards does not permit the proper enforcement of all the environmental regulations. This is a cause of much annoyance and uncertainty among the population living around the airport and for the airport management. A new system has been designed in which the standards for noise exposure and emission of pollutants to the air will not only be calculated but monitored as well, and which anticipates new European Union noise standards. External safety cannot be measured; the risk of residents living near the airport being killed by a plane crash can only be calculated using a computer model.

The subject of this paper is the recent SEA on the introduction of the new system of environmental standards, which is compared with the current system. It appears that the decision made at the beginning of the procedure to not consider alternatives in the SEA report has been detrimental to the value of the report. A valuable feature of the SEA process is that the public review of the SEA report brought this shortcoming into the open.

The Dutch courts and EIA: troubleshooter or troublemaker?

Marcel Soppe (KienhuisHoving Lawyers) and Steven Pieters

The obligation to carry out an EIA under Dutch law is not backed up by a power to impose a penalty – a fine or other punishment. At the time the regulation came into force this seemed to indicate that it was optional. Despite this, the Dutch EIA regulation does work in practice. One of the reasons why the Dutch EIA regulation can be enforced well without the sanction of legal penalties is the presence of an independent, pragmatic but above all meticulous judiciary. The important role played by the judiciary in EIA is the subject of this article. Administrative judges determine whether the EIA regulation applies or not in every case in which this is questioned and ensure, when necessary, that the obligation to carry out an EIA is imposed. The Dutch courts are rigorous and usually logical in their interpretation of the law and have been reasonably consistent in deciding when an EIA is required under the regulation. Suspending or quashing a planning or licensing decision leads to a considerable waste of time and money, something that every project proponent wants to avoid at all costs. This sanction has proved to be sufficient for ensuring efficient application of the EIA regulation.

Despite this, a few decisions by the courts have made EIA less popular among some administrators. We should point out, though, that this can be put down to a lack of clarity in the wording of the Act, and so the ultimate responsibility in these cases lies with the legislature. The European Court has also made a positive contribution to the enforcement of the EIA legislation. Developers not only have to check whether they meet national regulations, they also need to be sure that they are complying with the European regulations. By not meeting European requirements, developers run the risk of the plan or permit being nullified and having to start the procedure again right from the beginning. Besides the judiciary, other conditions for effective application of the Dutch EIA regulation are mentioned: active participation by the general public, pressure groups and the press, combined with a statutory EIA procedure that is geared to openness, genuine public participation at an early stage, and provisions for an independent and expert review of EIAs.

EIA for the Bujagali hydropower project in Uganda

Ineke Steinhauer

AES Nilepower plans to build and operate a 250 MW hydroelectric power plant at the Bujagali Falls on the Victoria Nile in Jinja province, Uganda. A 451 hectare reservoir will be created and about 100 km of transmission lines will be built to deliver the electricity to Kampala. AES is pursuing part of the financing through the International Finance Corporation (IFC, World Bank Group). An environmental impact assessment (EIA) was conducted on behalf of AES and was reviewed and approved by Uganda's National Environmental Management Authority (NEMA). In April 2001 an expanded EIA containing studies that meet IFC and World Bank standards was published and also approved by NEMA.

In June 2001 the Dutch development cooperation minister invited the independent Netherlands Commission for EIA to review the environmental impact statements (EISs). This article explains why the Netherlands was involved in the EIA for this project, discusses the controversial character of the project and describes the approach taken by the Commission in reviewing the EISs. The Commission found the statements to be incomplete and recommended action to rectify six shortcomings in the reports before the relevant decision are taken. These recommendations were agreed by the minister, but in the meantime additional information had been gathered which remedied most of the identified omissions. The World Bank approved the project in December 2001, adopting the Commission's recommendation to maintain continuous consultations with all the interested parties. NEMA will play a prominent role in this process.

NEW DEVELOPMENTS

1. RECOMMENDATIONS FOR SUSTAINABILITY ASSESSMENT IN THE NETHERLANDS

Rob A.A. Verheem

1.1 Abstract

The Netherlands Commission for Environmental Impact Assessment has taken the initiative of forming a working group of representatives from various sections of society to reflect on sustainability assessment. Is it possible to assess the sustainability of plans and large projects in a way that is useful for administrators in government and the business community?

This article first sets out the definition of sustainability the working group took as the basis of its thinking. The contours of the assessment framework are then presented: what should the concept include and what should it not include? The article then discusses the process and content of sustainability assessment and presents the working group's recommendations.

The working group concludes that the best way to proceed now is for government and the private sector to conduct experiments with sustainability assessment of plans and large projects, and makes recommendations for setting these up.

1.2 Introduction and objective

In its day-to-day work providing advice on the inclusion of environmental aspects in decision making, the Commission for Environmental Impact Assessment has observed that sustainable development has become increasingly important as an objective for both government and the business community in the Netherlands, as part of a wider international trend. The Commission, therefore, has initiated an examination of the degree to which a sustainability assessment can contribute to this as part of the preparations for decision making and the decision making process itself.

To this end a working group of experts was established, composed of representatives from all sectors relevant to sustainable development: experts with knowledge of social, economic and environmental issues from both government, science and business. The working group has made recommendations on sustainability assessment to the cabinet, and these are presented below.

In this context sustainability assessment is defined as a structuring of the decision making process so that administrators can develop projects and plans from a sustainability perspective (the 'internal' aspect) and justify them on the grounds of their contribution to sustainable development (the 'external' aspect). The outcome should be plans and activities that make an optimal contribution to sustainable development.

The recommendations do *not* apply to instruments that are not geared to decision making on concrete proposals, such as corporate social and environmental annual reports. Like sustainability assessment, one of the aims of these reports is to justify company activities to society in general. Thought has been given, though, to how these types of reports relate to sustainability assessment to avoid overlaps in the information they contain.

1.3 What is sustainable development?

There are many different ideas about what 'sustainable development' means. The first thing the working group did was to reach agreement on a common understanding of this term as a basis for their discussions.

According to the working group, the essential feature of sustainable development is that it leads to an 'adequate' social and cultural, economic and environmental situation for future generations.² 'Adequate' is not a qualification that can be objectively defined, but rather has to be determined on the basis of current *preferences* as an estimate of future preferences.³ These preferences are, or should be, established in policy: 'What must be preserved at what price for the long term?' In some cases it will be possible to define 'firm' limits. These, of course, should be included in the sustainability assessment.

The general absence of objectivity does not prevent a practical application of the concept of sustainability. There is sufficient consensus in the Netherlands about the meaning and desirability of the concept to allow it to be used as a guiding principle for action.

1.4 The contours of sustainability assessment

The starting point for an effective sustainability assessment is that it should not be an *ex post* evaluation. The assessment should facilitate consultation and the weighing up of the pros and cons of a proposal *during the process of coming to a decision*. The main aim of sustainability assessment is to stimulate *thinking* and encourage *action*, not just the production of another report. It must not become just a case of '*crossing off*' items from a list; the assessment process itself is just as important as the material considerations.

Moreover, sustainability assessment cannot be 'imposed' and its application cannot be guaranteed by just drawing up a set of regulations. It has to be felt to be *useful* and meet a perceived *need*. To ensure these requirements are met, sustainability assessment should be based on the following principles:

- Administrators must feel the need to be *accountable* for the sustainable character of their decisions, both from within (internalisation) and in response to external pressures (public demand and regulations).
- Sustainability assessment must not be a substitute for political judgements. In other words, decision makers must have political *room for manoeuvre*. Better still, the assessment process should encourage this.

² Examples are:

Social and cultural conditions: good provisions for old age and health care; reasonable technological and educational standards; public safety; adequate individual freedoms.

Economic conditions: full employment; adequate material welfare; sustainable production; sufficient resilience and innovative capacity for solving problems.

Environmental conditions: adequate environmental quality; sufficient reserves of natural resources and biodiversity; stable natural ecosystems.

³ See for example WRR (Scientific Council for Government Policy) study 44 (1994): *Duurzame risico's: een blijvend gegeven* (Sustainable risks: a durable fact, (in Dutch only)).

- Administrators should have the feeling that sustainability assessment is *possible*. It must be a pragmatic instrument, the basic requirement being that it is 'good enough'.

Sustainability assessment should preferably not be a separate instrument or process, but be integrated into *existing* instruments to lower the threshold for application. The most appropriate instruments to use can be identified as soon as it is sufficiently clear what sustainability assessment can and should be.

The initial stage of the assessment can best be incorporated into the development of *plans and programmes* and *large projects* of a strategic nature. These are the processes in which important decisions that shape future developments are made and where opportunities can be found to guide developments in the short term.⁴ This is where sustainability assessment will probably be most effective.

We should note here, though, that planning processes in *industry and commerce* do not, in principle, take place in the public arena. For private initiatives, therefore, the most important *public* forum for sustainability assessment will be at the level of the individual project.⁵ This does not detract from the fact that a pragmatic sustainability assessment can play an important role in the *internal* corporate planning processes. Sustainability assessment must, in principle, be suitable for these applications as well.

1.5 Process

As stated above, sustainability assessment must not be an ex post evaluation. What it should be can best be described as follows: 'Sustainability assessment is an aid to structured and well informed consultation between interested parties during the development of a plan or project. The assessment must guarantee that the parties involved have sufficient insight into the risk that a plan or project will lead to negative impacts being transferred to future generations⁶ and provide an overview of the possibilities of preventing this.'

Little is to be gained by drawing up a fixed procedure for sustainability assessment because the decision making procedures at the various administrative levels and for different activities will be too dissimilar. On the other hand, the sustainability assessment must not be entirely optional – sustainable development is too important an issue for that. For 'sustainable decision making', therefore, the minimum requirement should be the application of the principles of 'good governance': sufficient transparency, participation and reliable information at all stages of the process leading up

⁴ At the macro level change takes a long time to occur. Social and cultural transformations, for example, often take decades.

⁵ This also applies to government projects for which no (adequate) decision making has taken place at the strategic level.

⁶ This can, of course, also show that the plan or project has *positive* impacts.

to the decision. The following process elements can help to meet this requirement:

1. *Transparency*: the results of the assessment should be public and accessible to everyone before the decision is taken. All the steps leading up to the decision and the decision making itself must be accountable.
2. *Participation*: in all cases the parties with an interest in the outcome of the decision should be sufficiently involved in the planning process; public consultation exercises should be included at various stages of the process.
3. *Information*: the information used for the sustainability assessment must be seen by all parties to be reliable. Openness and the opportunity to make representations are important elements in this. However, this may not be enough when the decision to be made is highly controversial. An *independent* quality control of the sustainability assessment procedure, as part of the decision making process, may be desirable in certain cases. This should be ascertained in advance.

Sustainability assessment also implies co-operation between disciplines. In practice, this has not always been easy. The reasons for this include the different ways in which people are used to dealing with problems and expressing results, and differences in terminology. An important first step in developing a sufficiently integrated assessment is to ensure that the representatives of the various disciplines involved all take part in making choices at key moments in the decision making process. This applies to administrators, planners and specialists in the various fields. Co-operation should be ensured during the early stages of the decision making process, such as the problem analysis and the definition of alternatives, as well as in the later stages, such as the comparison of alternatives and reporting.

1.6 Content

At the heart of sustainability assessment is the question of whether a plan or project will lead to improvements on all fronts, or whether there is a risk of a *transfer of impacts* into another *domain*⁷ – either in *time* or *place*.⁸ If there is such a risk, sustainability assessment is designed to provide an overview of the possibilities for reducing this risk.

The final outcome of a sustainability assessment, therefore, must not be a description of impacts. This is merely a means to gain insight into the more important question *'How can the risk of an undesirable transfer of impacts be reduced as much as possible?* This focus on risk management is a better indication of the nature of the information and level of detail required. Sustainability assessment involves an examination of risks, not a calculation of impacts to an accuracy of three decimal places. This also means, by the way, that sustainability assessment does not necessarily result in a quantitative appraisal. It is often enough to indicate whether one option

⁷ Three domains are distinguished: the economic, environmental and social/cultural domain.

⁸ In most cases, sustainability assessments will concentrate on information about the Netherlands. In some cases the interrelations with developments in other parts of the world should also be brought to light.

scores 'better' or 'worse' than another from a risk management perspective, and to state the arguments on which this is based.

It is not possible to draw up a standard list of required information for general use. The information needed for a sustainability assessment will depend to a large extent on the strategic level or the subject of decision making. But it is possible and desirable to draw up a *standard format* for sustainability assessment. This is valuable for ensuring that the 'weaker' interests are always given sufficient attention. Use of a standard format also improves the chances of learning from past experience when carrying out a new assessment.

A suitable standard format has been developed as part of the Dutch preparations for Johannesburg (Rio+10 conference): the National Strategy for Sustainable Development (NSSD). In this format the three types of impact transfer are summarised in a matrix (see Figure 1). Sustainability assessment can then be seen as a process of 'filling in the boxes'. The emphasis should not be on the boxes themselves, but on the possible links between the boxes, the *less obvious connections*. For example, to what degree can a development in 'one domain/now' contribute to or inhibit a development in 'another domain/later'? These are the types of linkages that often go unnoticed in practice, but which can turn out to have the most unexpected effects.

Figure 1: assessment framework for sustainability⁹

	Economy	Ecology	Society/Culture
Here and now			
Later			
There			

Sustainability assessment becomes more *practicable* when it is made more concrete in the form of a limited set of indicators. As mentioned above this is not possible at a general level, but it is possible for specific categories of plans and projects, such as regional spatial plans and site selection for new branch offices by multinational companies. The preferred procedure when selecting indicators is to draw on relevant existing activities and proposals, such as the NSSD and the indicators mentioned in the *Global Reporting Initiative*.

The practicability issue also demands that the scope of the information required is carefully considered in each individual case. Particularly for information on social and cultural impacts and impacts outside the Netherlands it is important to determine whether any impacts will lead to risks and how detailed the information should be.

The level of *motivation* to actually use sustainability assessment will be greatest if the final report does not concentrate so much on indicators, but on

⁹ Source: Ministerie van Volkshuisvesting, Ruimtelijke Ordening en Milieubeheer: 'Nationale Strategie voor Duurzame Ontwikkeling - Verkenning van het Rijksoverheidsbeleid' (Ministry of Housing, Spatial Planning and the Environment: 'National Strategy for Sustainable development - Exploring government policy'), January 2002.

a discussion of concrete topics of importance to administrators. This may be the contribution a plan or project makes to solving real problems or the degree to which a development forms an obstacle to or stimulates another desired development.

1.7 Conclusions and recommendations

The most effective way of gaining experience with sustainability assessment is to carry out a number of experiments. The working group recommends undertaking experiments in accordance with the following *principles*:

The experiments must generate information on both the *process* and the *substance* of an effective sustainability assessment.

Central to the process must be the *principles of good governance*: how to guarantee sufficient transparency, participation and provision of reliable information during the decision making process.

The subject matter of the assessment can be derived from the assessment framework developed for the *National Strategy for Sustainable Development*.

In the first instance, experiments can best concentrate on *public sector decisions*. This will set an example for later experiments with private sector decision making (companies).

The *business community* should be involved in these experiments so that they can prepare for future experiments in the private sector.

The experiments have more chance of success if they meet the following *conditions*:

- The government authorities involved in the experiments are *motivated* to actually carry out the sustainability assessment. They must make *sufficient time, space and resources* available and be prepared to make *clear use* of the results in the planning process.
- Sustainability assessment plays a role in the planning process *from the start*. Decisions that are largely predetermined by previous decisions are not suitable as subjects for the experiments.
- The results of the sustainability assessment are *made public* during the various stages of decision making to ensure an adequate learning process.
- Proposals that are subject to experimentation contain *sufficiently concrete* elements whose contribution to sustainability can be illustrated and for which there are *alternatives*. The *scale* of the proposal is large enough to make a visible contribution to sustainable development.
- The decisions are expected to have *economic, environmental and social or cultural impacts*, certainly when these will affect *future generations*.
- The experiments can be completed within a *reasonable timeframe*. A period of one to two years is considered suitable, depending on the subject of the assessment.
- The *criteria* for evaluating the success of the experiments and *who* will be evaluating them are made clear beforehand.

As stated earlier in this advice, it is not possible to force planners and decision makers to effectively apply sustainability assessment. This means that suitable experiments must be proposed by the government authorities responsible for the decisions for which the assessment will be carried out.

2. BIODIVERSITY IN EIA – GENERAL GUIDELINES FOR DESCRIBING SPECIES

Arend Kolhoff

2.1 Abstract

This article examines the response by the Commission for Environmental Impact Assessment in the Netherlands to the recommendation in the Convention on Biological Diversity (CBD) on integrating biodiversity into environmental impact assessment (EIA). Using the definitions and concepts in the CBD, an indication is given of the type of information on species and ecosystems (consisting of a biotic component - communities and an abiotic component - abiotic processes and service) that should be included in an environmental impact statement (EIS). A set of general guidelines for species is presented. This is used by the Commission for EIA when it prepares specific advisory guidelines for an EIS. Further research is needed before a set of general guidelines can be prepared for plant and animal communities. It is recommended that a start be made now with identifying the 'free' services provided by ecosystems.

2.2 Introduction

The integration of biological diversity into environmental impact assessment is one of the practical objectives of the Convention on Biological Diversity (CBD). In response to this, the Commission for Environmental Impact Assessment ('the Commission') began in 2000 to evaluate how biodiversity is treated in EISs in the Netherlands and has started to develop a new set of general guidelines. The starting point for the evaluation was the definition of biodiversity in the CBD: 'the variability among living organisms from all sources, inter alia terrestrial, marine, aquatic ecosystems and the ecological complexes of which they are a part, this includes diversity within species, between species and of ecosystems.' The goals of the CBD are:

- the conservation of biological diversity
- the sustainable use of its components
- the fair and equitable sharing of the benefits arising from the utilisation of genetic resources.

This definition of biodiversity, therefore, comprises more than nature, flora and fauna. The first two goals can be addressed by environmental impact assessment. Appraisal of the third goal is not relevant for EIA in the Netherlands.

The CBD distinguishes three levels of biodiversity: genetic diversity, species diversity and ecosystem diversity. This paper discusses these three levels and their significance for EIA. Genetic diversity is not relevant for EIA projects in the Netherlands. Regarding the assessment of impacts on the conservation of species diversity the Commission has drawn up a set of general guidelines. Guidelines for assessing impacts on ecosystem diversity are in preparation.

2.3 Genetic diversity

Genetic diversity is a product of natural mutations and is the raw material of natural selection. It also provides the basis for selection by humans; all cultivated and domesticated species are collectively known as 'agro-biodiversity'. In the Netherlands, information on genetic diversity is not (or almost never) relevant to EIA because the country contains no subpopulations of animal species sufficiently isolated from other populations to have led to the formation of subspecies. A possible exception is the Northern or Tundra vole, a relict species from the Ice Ages. In the Netherlands there are no old indigenous cultivated varieties or animal breeds (land races) that could be threatened by proposed development for which an EIA is obligatory.

2.4 Species diversity

Species diversity is the variety of taxonomic species. The Netherlands is home to about 36,000 species of plants and animals. In addition, a large number of unicellular and smaller organisms have still not been classified. To establish whether the survival of a species will be endangered by a proposed development or activity it is necessary to know what part of the (world) population will be affected. The key questions are:

Which plant and animal species should be described in the EIS?

What is the probability that a (sub)population of a species will be affected or become extinct?

2.4.1 Which species?

It is impossible, and not even meaningful, to describe all the species that will be affected, either significantly or not, by a proposed development. The Commission has decided that the consequences of a proposed activity should be described for a selection of species: the 'target species' identified by the Ministry of Agriculture, Nature Management and Fisheries. Obviously, only those target species should be considered that are present in the study area and will be affected by the proposed activity. The ministry's Species Policy Action Plan (*Plan van aanpak soortenbeleid, 1996*) states that target species should receive special attention in its species policy. The 650 target species have been identified on the basis of three criteria:

- The size of the population in the Netherlands is declining.
- The species is rare in the Netherlands.
- The Netherlands has a relatively important position for the conservation of the species worldwide.

All the target species are protected species. Some may be suitable as indicator species, in which case they can be used to assess whether the survival of other protected or non-protected species will be endangered if the proposed activity goes ahead. It should be stressed that the requirement is not to describe the consequences for Red List species. The Red Lists provide information on the degree to which a species is threatened in the

Netherlands; they do *not* indicate the significance the Netherlands has for its conservation worldwide. Moreover, the number of species on the Red List is so large that including them all in an EIA would add little of real value. All the target species are also on the Red Lists.

2.4.2 The probability of extinction of a population

A species consists of a large number of individuals, which are generally members of a metapopulation. A metapopulation is a set of populations in a habitat network that are connected by pathways of immigration and emigration, allowing an exchange of individuals between the subpopulations. A key population is a relatively large population in a network of a metapopulation which is persistent under the condition of one immigrant per generation. The disappearance of a few individuals from one population will seldom have an effect on the survival of this metapopulation and has no effect on the survival of the species. However, a development or activity may endanger the survival of a population or even a metapopulation because either it is broken up into smaller elements or because the species habitat is largely destroyed. In theory, such an impact could threaten the survival of a species in the Netherlands, although no examples of this are known. For this reason the population of a species affected by a proposal should be studied and the EIS should include information on the probability that the population of the species will become extinct in the study area, either because the individuals die or because they migrate elsewhere. The survival of a (meta)population is endangered if the size of the population falls to below the minimum viable (meta)population size {MV(M)P}¹⁰ (see example below).

The advisory guidelines for the EIS for the Sluis aan Zee marina in Zeeuws-Vlaanderen (part of the Dutch province of Zeeland, bordering on Belgium) prepared by the Commission for EIA state that isolated populations of the tree frog, which is found in the study area, are highly likely to die out if they include fewer than 10 singing males. These populations are smaller than a key population. The impact of the marina on this population should be described in the EIS.

Precise MV(M)P sizes are known for only a few species, though, which makes expert judgements necessary. Recent research in the Netherlands¹¹ provides a rule of thumb that can be used when making such judgements (see Table 1).

¹⁰ The minimum viable (meta)population size has a probability of 95% that it will survive 100 years, assuming one immigrant per generation.

¹¹ J. Verboom et al. (2001) Introducing the key patch approach for habitat networks with persistent populations: an example for marshland birds. *Biological Conservation* 11, pp 89–101.

Table 1: Proposed standards for key population size (KP) and for Minimum Viable Metapopulation (MVMP) sizes with and without a key population

Species group	Key population	Minimum viable metapopulation size	
		Network with a key population	Network without a key population
Long-lived/large vertebrates	20	80	120
Medium lifespan/medium-sized vertebrates	40	120	200
Short-lived/small vertebrates	100	150	200

Figures represent number of pairs/territories/families (depending on species group).
Source: Verboom et al., 2001.

Explanatory remarks on Table 1: The table shows that the size of key populations of large long-lived vertebrates is larger than those of small, short-lived vertebrates. The second and third columns give the minimum viable metapopulation size, which is always larger than the key population size. This is logical because this is the size of the metapopulation. The characteristic of a metapopulation is that various populations (often smaller populations that are in themselves not viable) are linked together in a network. The metapopulations of a number of species in the Netherlands consist of a network of these somewhat smaller populations without there being a larger key population. In such cases, as indicated in the right-hand column, the MVMP must be significantly larger if it is to have a 95% probability of surviving for 100 years.

In general, a complex combination of factors is responsible for the degradation and eventual extinction of a population. Given the fact that it is very difficult to make any reliable predictions, it is sufficient to indicate the probability of this occurring and present the relevant trends in the EIS (also for the autonomous development). We have ascertained the minimum information required to determine the probability that a population will become extinct (trend) as a result of expected environmental impacts. The general guidelines for the EIS given in Box 1 are designed to generate this information.

The EU Habitats and Birds Directives deal with significant (environmental) impacts for the species (read: population). 'Significant' can be interpreted scientifically in two ways: environmental impacts are significant if the survival of a population of a species is endangered; or, environmental consequences are significant if extinction of a population endangers the survival of the species as a whole. The approach proposed above and the general guidelines in Box 1 generate information in the EIS which can be used to assess both interpretations of significance. It is up to the competent authority (and in the last instance the courts) to decide what is the acceptable probability that a species will become extinct.

Box 1

General guidelines for species descriptions in EISs

Area-based nature conservation policies

The aim of the description of current nature conservation policies is (i) to assess whether the proposal is incompatible with the policies, (ii) to assess whether the legal ecological protection formulas¹² apply, and (iii) provide insight into the opportunities for and constraints on the development of alternatives.

The EIS should contain descriptions of the following:

- Location in the region of areas designated under the Habitats and Birds Directives (and in future the national Nature Protection Act areas).
- Location in the region of the National Ecological Network¹³ and the areas designated by the provinces within this.
- Location and details of the municipal ecological network.

Current situation and autonomous development

The EIS should identify the target species present in the study area which will be affected by the proposal. The following information should be given for each target species.

Characteristics of the target species:

- The degree to which the target species is threatened in the Netherlands. This information is needed to assess the seriousness of the potential consequences for a population. The Red Lists categories are used to determine the degree to which the species are threatened.
- The degree of protection (under national and international regulations). This information is needed to be able to evaluate the consequences for the population.

Characteristics of the population:

- The size, distribution and density of the population in the study area.
- The changes in the size of the population in recent years (historical trend). This information can be used for the description of the autonomous development.
- The function and quality of the habitat of the population (including food supply for animal species).
- The degree of exchange of individuals between the affected population(s) and other populations of the metapopulation.
- The significance of the population for the conservation of the species in the Netherlands. This information is needed to be able to determine the seriousness of the potential loss of a population(s) for the continuing survival of the species (in the Netherlands).

Environmental impacts:

The following information must be provided for each target species:

- The probability that the population in the study area will become extinct. This can be a qualitative assessment. If the probability is very high an assessment of the same probability for the population(s) with which there is an exchange of individuals is also required. If there is a chance of extinction an indication should be given of what this means for the conservation of the species in the Netherlands.
- The most important causes of the threats to the continued survival of the population.

¹² Legal protection formulas are statutory measures that state how designated species and areas should be protected.

¹³ The National Ecological Network is a network of large nature conservation areas linked together by ecological corridors for the exchange of individuals between species populations.

2.5 Ecosystem diversity

An ecosystem is defined as a dynamic complex of plant and animal communities and their abiotic environment, which together function as a unit. Ecosystems provide a large number of free (environmental) functions, goods and services which are exploited by society. Plant and animal communities consist of collections of populations of various species, which influence each other and are found in a certain area, for example carr (fenland alder woods). A small proportion of activities in the Netherlands for which an EIA is obligatory has such an impact on ecosystems that these functions can be damaged. For example, the construction of an offshore port and industrial development will affect the processes of sedimentation and erosion, which may lead to coastal erosion, thus damaging the function of protecting the land against flooding. The key questions are:

- Which abiotic processes are of vital importance for the conservation of biodiversity?
- Which communities should be described and what is the probability that these will change and/or disappear?
- Which 'free' functions (goods and services) provided by an ecosystem are used by people and which functions are of significance for the continued existence of species?

2.5.1 Which abiotic processes?

To describe the potential changes in the abiotic environment the key processes have to be identified and the habitats of species and communities must be listed. Key processes are processes that play a dominant role in the conservation of habitats – and therefore in the conservation of species and of plant and animal communities – and in the conservation of the functions of ecosystems. These processes may be abiotic and/or biotic in nature. Biotic processes such as predation and competition are usually so complex and so little is known about them that they provide an insufficient basis for predicting impacts. In general, more is known about abiotic key processes. These are more suitable for predicting impacts because a limited number of them in each ecosystem are responsible for determining biodiversity. Examples are desiccation/falling water tables and salination, processes which are caused by hydrological changes and which, via habitat changes, have important consequences for the continued survival of plant species and the animal species that depend on them.

The Commission's view is that EISs should contain descriptions of the consequences of a proposed activity that lead, directly or indirectly via key processes, to changes in the abiotic environment. Impacts on hydrological processes in particular are described in many EISs in the Netherlands. This is clearly a consequence of the fact that the Netherlands can be considered as one large delta of the rivers Rhine, Meuse and Scheldt.

2.5.2 Which communities and probabilities of change/extinction?

Plant and animal communities together with the abiotic environment on which they depend for their survival make up an ecosystem. Plant and animal communities are affected by most activities for which an EIA is obligatory. In general it is much easier to predict impacts on plant communities than

animal communities because plants react to changes in the abiotic environment, while animals generally react indirectly to these changes and are able to move elsewhere. There is at least one exception to this rule, namely wetland bird communities. There is considerable knowledge worldwide about changes in the quality of wetlands and the consequences for the species composition of the bird communities that live in them.

It is not possible or meaningful to describe the impacts on all the species that make up a plant community. Much information has already been gathered on the functioning of plant communities in the Netherlands and it is possible to identify indicator species for a number of these communities. An ideal situation arises when these species are also target species because judgements can be made about the likelihood of changes occurring or the survival of the community concerned using a minimum of information.

The Commission believes that potential changes in existing plant communities, where these are present in protected areas, should be described in EISs. Further work is in progress on how plant communities outside protected areas and animal communities in general should be dealt with. The role that indicator species can play also needs to be clarified.

For plant communities that have to be described in an EIS, the following information should be provided: the type, status, species composition and stage of succession (the degree to which the community is natural and complete) in the existing situation and the expected changes as a consequence of the proposed activity.

2.5.3 Which functions (goods and services) are provided by an ecosystem?

Ecosystems provide a number of 'free' functions (goods and services). Examples include fish production, the self purification capacity of surface waters, flood protection by dune systems and the fixation of greenhouse gases such as CO₂. Until now the consequences of proposed activities for these functions have only rarely been mentioned or described in EISs in the Netherlands. Damage to these functions usually only becomes clear if the long-term effects are considered. It is important that consideration of these long-term impacts is stimulated and that they are taken into account when drawing up EISs. Initial attempts to include sustainability assessment in EIA offer an excellent opportunity to do just that.

2.6 The way forward

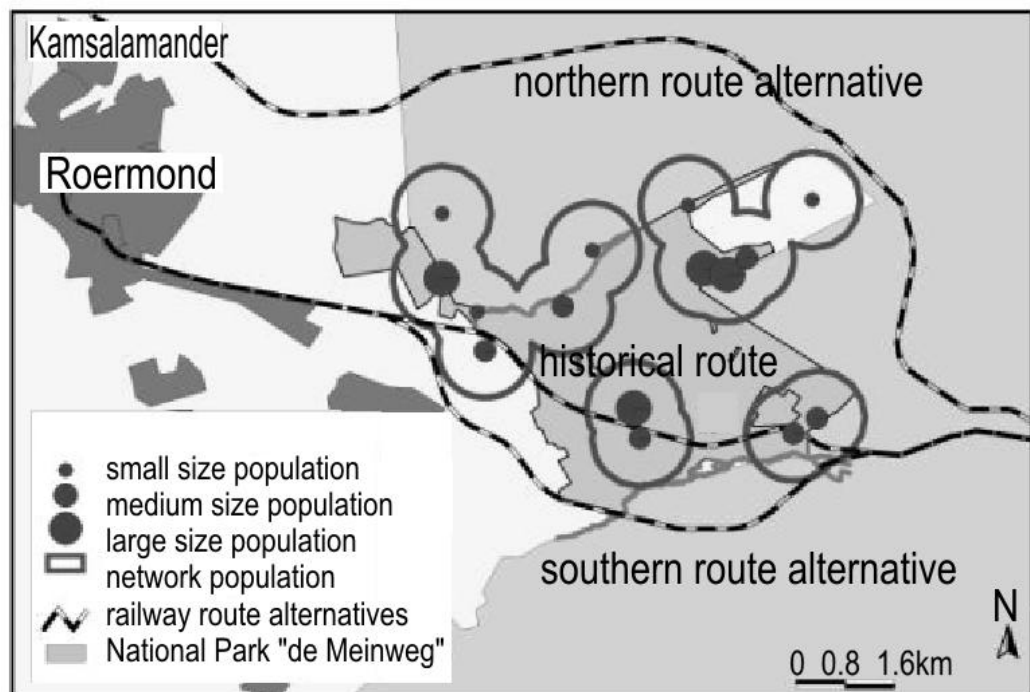
General guidelines for describing species, such as those presented in Box 1, are now being applied by the Commission for EIA. They will be evaluated and if necessary adapted. General guidelines for describing plant and animal communities, abiotic processes and ecosystem functions for EIA in the Netherlands are being prepared and will be completed in 2002. The preparation of general guidelines for assessing the second goal of the CBD in EISs, the sustainable use of the components of biological diversity, has yet to begin.

Box 2: Application of the guidelines for impact assessment on species

The "Iron Rhine" is an international railway out of use since 1991. The idea is to reactivate this railway. In the Netherlands the railway crosses "De Meinweg" a National Park (NP) of 1600 hectare which is designated under the Habitats Directive. Therefore, the impacts of three potential railway routes are studied in an EIA: reactivating the historical line and a northern and a southern alternative. This NP is unique because it is the habitat of five out of the seven types of reptiles and twelve of the fifteen types of amphibians which exist in the Netherlands. To determine the impacts of the alternatives in total 11 target species were selected (two amphibians, three reptiles, five birds, mammals one). All target species are protected and sensitive to the main impacts caused by a railway: mortality, habitat loss, quality loss and fragmentation of habitat.

For one target species, an amphibian *Triturus cristatus cristatus* ("Kamsalamander"), the probability of extinction due to the impacts will be described. It is a Red lists species categorised as vulnerable. In the direct neighbourhood a total of 15 populations of this species occur, ranging in size from small to large. None of these populations are a key population. Populations are linked together in a network. In total four viable but nearly isolated networks of populations exist. It is known that the migration distance of this species between habitats is limited to about 400 meters. Reactivating of the historical railway route means that 6 populations will be affected and the probability of extinction will increase. Three out of the four networks become fragmented but the probability of extinction for the species in the NP does not change due to the fact that the North-eastern network population is large and highly viable. It is expected that colonisation of the other networks by this network takes place incidentally, increasing the viability of the other three networks. The other two railway routes do not affect one of the populations.

Distribution of populations and network populations of the "Kamsalamander" (Crested Newt).



From: Alterra, Research Instituut voor de Groene Ruimte, Wageningen 2000

PRACTICAL EXPERIENCE

3. SEA ON THE INTRODUCTION OF A NEW SYSTEM OF ENVIRONMENTAL STANDARDS FOR AMSTERDAM AIRPORT SCHIPHOL: THE IMPORTANCE OF CONSIDERING ALTERNATIVES¹⁴

Jules J. Scholten

3.1 Abstract

Amsterdam Airport Schiphol (AAS), the national airport of the Netherlands, has grown considerably in the last ten years. It is the fourth largest airport in Europe, with a capacity that far exceeds domestic requirements, and caters for many ongoing passengers and much cargo in transit. Growth in aircraft movements is permitted on condition that noise nuisance declines and external risks and air pollution levels do not rise. The reference year is the situation in 1990.

To allow the airport to continue to grow, a fifth runway is planned so that noise nuisance and external risks will be diluted and spread over a wider area. In addition, older and noisy aeroplanes have been barred from the airport and various technical mitigation measures have been and will be taken. The decisions on these developments taken during the last ten years have been supported by several Strategic Environmental Assessments (SEAs). After the completion of the first SEA in 1995, it soon became apparent that the current system of environmental standards does not permit the proper enforcement of all the environmental regulations. This is a cause of much annoyance and uncertainty among the population living around the airport and for the airport management. A new system has been designed in which the standards for noise exposure and emission of pollutants to the air will not only be calculated but monitored as well, and which anticipates new European Union noise standards. External safety cannot be measured; the risk of residents living near the airport being killed by a plane crash can only be calculated using a computer model.

The subject of this paper is the recent SEA on the introduction of the new system of environmental standards, which is compared with the current system. It appears that the decision made at the beginning of the procedure to not consider alternatives in the SEA report has been detrimental to the value of the report. A valuable feature of the SEA process is that the public review of the SEA report brought this shortcoming into the open.

3.2 Background

Amsterdam Airport Schiphol (AAS) has a special position in the Netherlands (41,160 km², more than 16 million people). It is the home base for the national carrier, KLM Royal Dutch Airlines, and serves as the national airport. AAS is located just to the south-west of Amsterdam within the Randstad, the ring of cities that also includes Haarlem, Leiden, Delft, The Hague, Rotterdam and Utrecht (see Fig. 1). The airport is also of wider significance, serving as it does as a transit airport for continental and intercontinental travellers, who prefer to stop over at Schiphol airport because they appreciate the efficient operation and ambience of the airport and its attractive shopping arcades. Almost half of all the passengers passing through the airport are in transit: the Netherlands is not their point of origin or final destination. With about 40 million passengers each year, AAS is the

¹⁴ Paper prepared for presentation at the IAIA annual meeting in June 2002, The Hague.

fourth largest airport in Europe (after London Heathrow, Paris Charles De Gaulle and Frankfurt). To maintain its reputation as an efficient and reliable (transit) airport, AAS must ensure there are no delays; transit passengers must be able to catch their connecting flights on time and not lose their baggage in the transit process. The airport's favourable reputation and position in Western Europe have encouraged air traffic movements to grow spectacularly over the past decade. The number of aircraft movements doubled from 207,000 in 1990 to 416,000 in 2001¹⁵. This has benefited the national economy and AAS has become the centre of many economic activities that rely on the airport. The airport has also attracted a good number of activities that do not primarily depend on the airport for their business. This economic development in turn stimulates the continuing development of AAS.

Fig. 1 The location of Amsterdam Airport Schiphol and the tangential system of its five runways



¹⁵ In the SEA (Strategic Environmental Assessment) on the long-term development of AAS prepared in 1995 it was predicted that the new five runway system would allow the number of aircraft movements to grow to 432,000 in 2015. At that time no one could have thought that this number would be reached as early as 2003.

3.3 Balancing economic development and environmental quality

What effect does the growing number of aircraft movements have on the environment around the airport? The decision in 1995 to allow a considerable expansion of AAS was made on the condition that further development only takes place if noise impacts are reduced and the impact of the airport on external safety and air quality, including odours, are frozen. The reference point against which these are to be measured is the situation in 1990. The reductions in noise impacts have to be made while operating with the current four runway system, whereas the standstill requirement for external safety and air quality only comes into force in 2003 when the five runway system becomes operational.¹⁶ The reasoning behind these stipulations was that AAS will be able to control the environmental risks and emissions once the fifth runway is available for use. In allowing AAS to grow in a controlled manner while keeping the environmental impacts in check, the government has adopted a policy that gives equal weight to two objectives: accommodating economic development and improving or maintaining environmental quality. This policy is attractive because it aims to create a situation in which all stakeholders are winners. Nevertheless, it is obvious that trying to maintain a balance between these two conflicting interests will cause considerable friction. Although in principle the two objectives have been assigned equal strength, it is clear that economic development and growth of the airport is the dominant driving force in the struggle to maintain a balance.

3.4 Enforcement of standards and maintaining environmental quality under the current system of environmental standards

Despite the policy of balancing economic development and environmental quality, problems with maintaining and enforcing the environmental standards arose almost immediately following the decision in 1995 that AAS could grow in a controlled manner. The standstill principle for **odour** nuisance had to be abandoned as unfeasible. The odours are caused by unburned or partially burned kerosene, a fuel used only in aircraft, and a continuous rise in the number of aeroplanes taking off and landing can only aggravate the odour problem. Odour nuisance will further increase when the fifth runway becomes operational. The new runway will be located further from the arrival and departure halls than the other four runways, which means that aircraft taking off and landing on this runway will have to taxi for longer distances to and from the terminals. In the new system the only obligation on the aviation sector will be to keep odour emissions as low as possible.

Air quality around the airport has not deteriorated since 1990, but this is due to a considerable reduction in emissions by road traffic, whereas aircraft

¹⁶ In the tangential system of five runways the runways radiate to all four corners of the compass from the central handling area, consisting of the arrival and departure halls and shopping arcades. The fifth runway is planned to become operational in 2003 and will be built to the north-west of the other four runways (see Fig. 1).

emissions for most substances actually increased.¹⁷ There have been improvements in emissions from individual aircraft due to the introduction of cleaner and more fuel-efficient engines; however, these gains have been overtaken by the sharp increase in the number of aircraft movements. In the new system of standards the standstill principle for aircraft emissions will be replaced by permissible maximum levels for individual exhaust gases, to be established periodically.

The enforcement of the standards for aircraft noise and external safety is even more complicated. In the current system, standards are enforced by a system of noise and safety zones. There are two **noise** zones: a *twenty-four hour zone* and a *night zone*.¹⁸ The existing system of standards is enforced by calculating noise levels at 250 and 375 points respectively on the noise exposure contours that enclose the *twenty-four hour zone* and the *night zone*. The permitted noise levels may not be exceeded outside the zones. Problems arose almost immediately after the introduction of this zoning system in 1995 and noise levels in some areas were exceeded each year. In response, the government, with the approval of Parliament, decided to design a new system of standards that would be easier to enforce and that would at least offer an equal degree of protection to the people living around the airport. There was an additional reason for changing the noise standards. In the near future the European Union will adopt a new directive on noise, prescribing the application of two new calculation and measurement units: L_{den} and L_{night} .¹⁹ The new system, therefore, had to take account of the situation when the new EU directive comes into force.

In the current system two units are used to describe external safety: individual and group risk. Both units can only be calculated. Individual risk is the annual chance that a person permanently residing in one place will die as a result of a plane crash. Individual risk is expressed and plotted as IR (individual risk) contours: 5×10^{-5} , 10^{-5} , 10^{-6} and 10^{-7} . In the current system the 5×10^{-5} and the 10^{-5} IR contours have planning implications. Within the

¹⁷ From 1990 to 2001 emissions of CO, NO_x, SO₂ and fine particles approximately doubled. Only VOS (Volatile Organic Substances) emissions rose by a much smaller amount.

¹⁸ The noise load related to disturbance caused by aircraft is currently expressed in 'Kosten eenheden'(Ke). This unit takes into account the maximum A-weighted noise levels (L_{AMax}) of aircraft, the total number of overflying aircraft per year and weighting factors for early morning, evening and night-time flights. The percentage of the population highly disturbed by aircraft noise roughly equals the Ke value minus 10 (e.g. within the 35 Ke contour 25 per cent of the population suffers high noise disturbance). Ke contours are computed for values between 20 and 65 Ke with intervals of 5 Ke. The twenty-four hour Ke noise zone around airports encloses all annual 35 Ke contours, to take account of meteorological conditions, which differ from year to year. The construction of new houses is prohibited within this zone. Buildings within the 40 Ke contour must be insulated. The noise load related to sleep disturbance caused by night time flights is currently expressed in the A-weighted equivalent noise level (L_{Aeq}) experienced inside bedrooms (windows closed) by aircraft movements between 23.00 in the evening and 06.00 in the morning during the course of one year. The limit for the night-time noise zone is set at L_{Aeq} 26 d(B)A inside bedrooms (which equals about 48 d(B) outside). At this level, about 20 per cent of the people residing within that zone experience sleep disturbance by overflying aircraft. Inside the night zone but outside the 40 Ke contour only bedrooms are insulated.

¹⁹ L_{den} (Level day-evening-night) is based on the noise situation in the open air during the entire twenty-four hour period. There are weighting factors for the periods during the day, evening and night, although these factors are more widely spaced over the twenty-four hour period than in the Ke system. In L_{den} no use is made of peak levels of the overflying aircraft as in the Ke system. Instead, the average noise level of the entire passage of overflying aircraft is used: increase, maximum and decrease (L_{AX}). L_{night} is similar to L_{den} but it applies only to the period between 23.00 p.m. and 07.00 a.m. Also, L_{AX} is applied. The noise level is calculated (or measured) for the situation in the open air and not inside bedrooms as with L_{Aeq} .

10⁻⁵ contour no new construction is permitted and within the 5 * 10⁻⁵ contour buildings must be demolished. Group risk is defined as the annual chance that a certain number of people will die as result of a plane crash. This cannot be expressed in contours but is expressed in FN Diagrams (F = chance, N = number of fatally wounded victims). There is no formal standard for group risk. Soon after its adoption in 1995 the system for external safety showed that standstill would be difficult to achieve for the simple reason that the number of aircraft movements is growing and the mean take-off weight of the fleet of aircraft using AAS is growing as well. The chance that an aeroplane will crash after take-off or before landing will increase in proportion to the growing number of aircraft movements. In addition, heavier aircraft will have a larger impact area than lighter aircraft and so there is a greater risk that more people will die as a result of a crash. This was sufficient reason to review the external safety situation around AAS when the decision was made to design a new system of environmental standards for the airport.

3.5 SEA for the decision making on the new system of environmental standards

When in 1999 it was concluded that the current system of environmental standards was inadequate and the decision was made to replace it by a new system, it was agreed that the proposals would be subject to an SEA, although the national EIA regulation does not require this. The SEA would be carried out in the interests of transparency and would enable people to comment on the design of the system. However, when in February 2001 the specific guidelines for the preparation of the impact statement were adopted by the competent authorities,²⁰ they stipulated that the SEA should follow a special procedure in which not all the requirements of the EIA regulation would apply; in particular, the requirement to consider and compare alternatives for the design of the new system of standards was dropped.²¹ In practice this meant that in the SEA only the new system of standards designed by the government was presented, and this was drawn up by the two ministries that represent the competent authorities in the decision making process. In fact, that system had already been outlined in the notification of intent that marked the start of the SEA procedure in July 2000. The impact statement has now been prepared and subjected to public scrutiny, but the formal decision to adopt the system of new standards for the operation of AAS with five runways from 2003 has not yet been made. The new system of standards for noise and external safety is discussed below and possible alternative approaches are indicated.

²⁰ The minister for Transport, Public Works and Water Management and the minister for Housing, Spatial Planning and Environmental Management

²¹ The reason given for this remarkable deviation from the formal standard approach is that, according to the competent authorities, the environmental assessment does not deal with a proposed physical activity. The guidelines ignored the fact that a consideration of alternatives is also possible for the introduction of a new system of standards, which would contribute to the desired transparency of the process. A motion in Parliament in October 2001 to consider alternatives was defeated.

3.6 The new system of environmental standards for noise and external safety and possible alternative approaches

The specific guidelines for the SEA stipulate that the new system of standards are more enforceable than the current system. Moreover, the new system must offer an equal degree of protection to the environment and the people around the airport. The current policy of pursuing the twin objectives of accommodating the growth in air traffic as well as maintaining environmental quality will be continued.

The **noise** indicators in the new system are L_{den} and L_{night} . The zoning system will be replaced by a number of enforcement points located on or near the equivalent noise exposure contours of 35 Ke and 26 dB L_{Aeq} , that is around 58 dB L_{den} and 49 dB L_{night} . In the current system there are 250 enforcement points on the 35 Ke contour and 375 enforcement points on the 26 dB L_{Aeq} contour. The new system contains much fewer enforcement points: 35 and 25 for the twenty-four hour period and the night period respectively. Evidently, a total of 60 enforcement points cannot offer the same degree of protection as the current 625 points. A report by the National Aerospace Laboratory, included in an annex to the SEA, confirms that more than the proposed 60 enforcement points are needed to enable an equal degree of protection against noise disturbance around the airport.²² The SEA suggests that this difference is made up by the introduction of an additional noise standard, the 'Total Volume of Noise Immission'.²³ However, this is not clarified in the SEA and still needs to be substantiated.

The public review of the proposed system of noise standards raised a general concern that the combination of the 60 enforcement points and the calculated Total Volume of Noise Immission will not offer an equal degree of protection against noise disturbance compared with the current system. Many objectors point to the lack of alternatives. They demand that the number of enforcement points is increased considerably before the new system comes into operation and that this should not wait until monitoring indicates that the number should probably be increased. Moreover, according to these representations, the enforcement points should not be restricted to the vicinity of the current 35 Ke and 26 dB L_{Aeq} contours, but should be distributed over a wider area in order to offer adequate protection to population centres outside the current noise zones. Alternatives to the Total Volume of Noise Immission have been proposed that are based on the real (and not a virtual) situation around the airport. The Commission for EIA argued that such alternatives offer a good way of determining the total number of people who experience serious disturbance from aircraft noise.

²² Report NLR-CR-2001-373: *Resultaten onderzoek beschermende werking van het huidige en het nieuwe geluidsstelsel Schiphol* (Results of the investigation into the scope of protection offered by the current and the proposed system of noise standards for Schiphol Airport). Unfortunately, this investigation does not reveal how many more enforcement points would be needed.

²³ A virtual model is selected to calculate the Total Volume of Noise Immission. In this model there is only one virtual runway and all aircraft movements are assumed to take place along one flight path. The 33 reference points for the calculation are placed in a grid of 10 x 2 km, starting at a distance of 7 km from the head of the runway. The distance between the reference points is 1 km. The Total Volume of Noise Immission is calculated as the arithmetical average of all L_{den} values of the 33 reference points. Clearly, the Total Volume of Noise Immission in this virtual model can only be calculated and not measured.

This is possible as there is a direct relationship between L_{den} and L_{night} values and the percentage of people that experience such disturbance in stable or gradually changing situations.²⁴ In connection with this, the Commission for EIA has pointed out that the new EU Directive on noise, when it comes into force in a few years time, will require noise mapping and monitoring of the number of people around airports who suffer serious stress from noise.

In the new system of environmental standards, **external safety** is characterised by two indicators: individual risk (IR) and a new indicator called Total Weight of Risk (TWR). In the SEA report it is claimed that IR decreases by a factor 5 in spite of a threefold increase in the number of aircraft movements. This reduction is used to lower the standard for IR from $5 * 10^{-5}$ to 10^{-5} per year. According to the SEA the decrease in IR is caused by a reduction in the chance that an accident may occur per aircraft movement, a reduction in the mean take-off weight and the lethality. Accordingly, the IR decreases by 65 per cent. This threefold increase in the number of aircraft movements is offset by the reduction of 65 per cent, and so the SEA report concludes that there is standstill for IR. However, the reduction of 65 per cent is not substantiated in the report.

In the SEA, the TWR is defined as the total aircraft weight that may crash in a certain year around the airport. This indicator depends on the average chance of an accident per aircraft movement, the number of movements and the weight of the aeroplanes that make up these movements. In its review of the SEA report, the Commission for EIA concluded that the TWR is not a good indicator for characterising external safety around the airport. This indicator expresses the degree of occurrence of a safety problem and not the potential loss of human life because the geographical distribution of the population is not taken into account. The following example illustrates this. The TWR would be no different if all flights were directed over the city of Amsterdam, but the Group Risk (GR) would increase considerably. In the SEA report the GR has not been calculated and FN diagrams are not presented. The reason given is that there is no formal standard available for GR.

The public review is critical of the claim that standstill for external safety has been achieved. In its review the Commission for EIA questions why the GR has not been calculated and the reason for introducing the new TWR indicator.

3.7 Conclusion

Looking back on the way the process has evolved, the intention of voluntarily preparing the SEA offered an excellent opportunity to develop a new system of standards, especially for noise and external safety, and to explain the operation of this system to all stakeholders in offering an equal degree of protection to the environment and the people around AAS.

²⁴ H.M.E. Miedema and C.G.M. Oudshoorn: Annoyance from transportation noise, relationships with exposure metrics DNL and DENL and their confidence intervals. Environmental Health, Vol. 109 : 4, 2001, pp. 409-416.

In evaluating the impact of this SEA a distinction must be made between the impact of the SEA report and the impact of the SEA process on decision making. There would have been no problem if the SEA report had been able to demonstrate that the proposed new system offers an equal (or even better) degree of protection to the people around the airport compared with the current system of standards. However, several stakeholders, including local government and groups of affected people, as well as the noise and risk experts of the Commission for EIA, are not convinced that the SEA report substantiates the claim of equal protection. They conclude that essential information is lacking and call for a supplement to the SEA report that presents alternatives, particularly concerning the number of enforcement points for monitoring noise levels and the calculation of group risk as an effective way of controlling the development of risks. The merit of the SEA process is that the public review of the report has brought this into the open. The result of the review will certainly have an impact on the final decision making on the new system of standards.

4. THE DUTCH COURTS AND EIA: TROUBLESHOOTER OR TROUBLEMAKER? *Marcel Soppe (KienhuisHoving Lawyers) and Steven Pieters*

4.1 Abstract

The obligation to carry out an EIA under Dutch law is not backed up by a power to impose a penalty – a fine or other punishment. At the time the regulation came into force this seemed to indicate that it was optional. Despite this, the Dutch EIA regulation does work in practice. One of the reasons why the Dutch EIA regulation can be enforced well without the sanction of legal penalties is the presence of an independent, pragmatic but above all meticulous judiciary. The important role played by the judiciary in EIA is the subject of this article. Administrative judges determine whether the EIA regulation applies or not in every case in which this is questioned and ensure, when necessary, that the obligation to carry out an EIA is imposed. The Dutch courts are rigorous and usually logical in their interpretation of the law and have been reasonably consistent in deciding when an EIA is required under the regulation. Suspending or quashing a planning or licensing decision leads to a considerable waste of time and money, something that every project proponent wants to avoid at all costs. This sanction has proved to be sufficient for ensuring efficient application of the EIA regulation.

Despite this, a few decisions by the courts have made EIA less popular among some administrators. We should point out, though, that this can be put down to a lack of clarity in the wording of the Act, and so the ultimate responsibility in these cases lies with the legislature.

The European Court has also made a positive contribution to the enforcement of the EIA legislation. Developers not only have to check whether they meet national regulations, they also need to be sure that they are complying with the European regulations. By not meeting European requirements, developers run the risk of the plan or permit being nullified and having to start the procedure again right from the beginning.

Besides the judiciary, other conditions for effective application of the Dutch EIA regulation are mentioned: active participation by the general public, pressure groups and the press, combined with a statutory EIA procedure that is geared to openness, genuine public participation at an early stage, and provisions for an independent and expert review of EIAs.

4.2 Introduction

On 1 September 1987 the Netherlands introduced a statutory requirement for EIA in response to a European directive on EIA. In addition to this statutory procedure, a list of activities was drawn up for which an EIA must be prepared before the relevant decision – on a spatial plan or licence application – may be taken. From then on the competent authority had to determine, on the basis of the new law and the EIA Decree, whether an EIA was required. The Act did not include a provision for imposing penalties – a fine or other punishment – which suggested at the time that the regulation was optional. There was a statutory obligation, but no explicit penalty for non compliance with the law. So how has this worked out in practice?

This article examines the following questions: Can an EIA regulation that contains no provisions for imposing penalties be made to work in practice? How is the EIA regulation enforced in the Netherlands? And is the Dutch EIA regulation effective?

4.3 The role of the Dutch courts in enforcement

The effectiveness of the Dutch EIA regulation is due mainly to the work of the judiciary. Concerned citizens and (environmental) pressure groups fight every decision on new development or activities which, in their eyes, should have been subject to an EIA. As a result many rulings have been issued by the highest administrative court in response to the question: 'Should this proposed activity be subject to an EIA?'. Concrete decisions have been tested against the Dutch EIA legislation, and later against European law. This exposed many projects for which an EIA should have been carried out – particularly in the initial years – and were subsequently put through the EIA procedure. Dutch courts are rigorous in their interpretation of the law, usually logical in their reasoning and have therefore been reasonably consistent in answering the question of whether an EIA should be undertaken or not. In this respect the administrative judges have been, and still are, the most important enforcers of the EIA legislation.

4.3.1 The judge as troubleshooter

Administrative judges determine whether the EIA regulation applies or not in every case in which this is questioned and ensure, when necessary, that an obligation to carry out an EIA is imposed. They make these decisions even when the relevant parties have not considered the obligation to carry out an EIA at all. This check has become possible since a decision by the European Court of Justice of the EU. In a Dutch case – the Kraaijeveld ruling of 24 October 1996 – the European Court ruled that it is incumbent on each judge in the European Union to decide, as new cases arise, whether an EIA has to be carried out or not. Since then, this has been done in a reasonably consistent manner in the Netherlands. We know of very few cases in which a Dutch judge has clearly forgotten to raise this issue. By consistently enforcing the duty to carry out an EIA via court rulings, the judiciary makes an important contribution to enforcing the EIA legislation. Suspending or quashing decisions on new development or activities leads to a considerable waste of time and money, something that every project proponent wants to avoid at all costs. Looked at from the perspective of EIA itself, this means that administrative judges solve many of the problems relating to EIA in a consistent manner. Each project that should be subject to an EIA is highly likely to be 'exposed', making it almost impossible for developers to avoid the legally required EIA procedure.

4.3.2 The judge as troublemaker

Environmental impact assessment is not very popular with some administrators and planners in the Netherlands. In their eyes, EIA takes up a lot of time while increasing legal uncertainties and is highly expensive. They believe that the environment is well protected without EIA anyway. Each time EIA as a policy instrument is seen to be damaged by such opinions it becomes less effective because it reduces the chance that the competent authority will start EIA procedures at the earliest possible stage in the life of a development proposal. In the Netherlands EIA is most effective if it is initiated at an early stage when many options are still open and alternative options can be compared.

Unfortunately, Dutch judges have also occasionally contributed to the creation of an inaccurate view of EIA. The real cause, though, lies in a lack of clarity in the wording of the legislation, and so the ultimate responsibility for this lies with the legislature. In a number of recent decisions, house building projects for which a correct EIA procedure had been conducted have been suspended and the permissions nullified because the environmental impact statement was, with hindsight, linked to the wrong decision. Such judgements damage EIA as a policy instrument and only serve to make some officials more hesitant about embarking on an EIA.

4.4 The role of the European Court

The European Commission (which issues notices of default) and the European Court of Justice have seen to it that the member states implement the EIA directive properly. Various EU countries have been called to account, including the Netherlands. The European EIA regulations set out certain basic requirements which all EU member states have to meet, but they are free to legislate for additional requirements if they so wish. The European judiciary ensures uniform application of the law throughout the Union. Through default cases and by making preliminary rulings on questions raised by a national judge to the European Court of Justice about the interpretation of European law, the European Court plays an increasingly important role in the application and enforcement of EIA regulations.²⁵ This is clearly illustrated by the Afrikahaven ruling, again a Dutch case. The Netherlands had incorrectly interpreted the EIA requirement under European regulations and was reprimanded; an EIS had to be prepared to rectify the situation. This shows that the European Court makes a positive contribution to the enforcement of the EIA regulations. Developers not only have to check whether they meet national regulations, they also need to be sure that their project complies with the European regulations. By not meeting European requirements, developers run the risk of the plan or permit being nullified and having to start the procedure again right from the beginning.

4.5 Conditions for an effective EIA regulation without direct sanctions

Finally, we present some questions and conclusions. Is an EIA carried out for every project in the Netherlands that meets the requirements for EIA? The answer to this is: almost all. Both developers and government authorities, but particularly alert citizens and pressure groups, ensure that EIAs are actually carried out for projects that require them. The Dutch press plays an active role as informant and many individuals and pressure groups find out about projects that require an EIA from the news. The risk that the courts will suspend or quash a decision on a project is reason enough for developers to take more or less immediate action to follow the EIA procedures. Individuals and pressure groups in particular play a significant role in bringing projects

²⁵ Unfortunately, environmental organisations or individual citizens cannot appeal directly to the European Court. If an individual or (environmental) organisation thinks that the national EIA regulations do not correctly implement the EIA directive, they can submit a complaint to the European Commission. The European Commission then decides whether they will declare the member state in question to be in default.

for which no EIS has been prepared to the attention of the courts. But judges have also played an important role in this. Many cases of 'salami tactics' – breaking down large projects into smaller elements, each with much less significant impacts – have generally been dealt with severely by the Dutch courts, but unfortunately not always. Decisions have regularly been suspended or quashed, and many developers have had to go through the planning process from the beginning again as a result. A strict, independent judiciary is a necessary condition for an effective EIA regulation.

Besides deciding on whether an EIA is required in specific case, judges must also regularly decide on the quality of an EIS. Does a published EIS contain all the information needed to inform the decision making? In performing this role, judges also check the work of the Commission for Environmental Impact Assessment. If the Commission has not done its job properly, the courts can pass judgement on this. In this task, the Dutch judiciary is supported by a foundation which can call upon experts in the field of spatial planning and the environment (Stichting Advisering Bestuursrechtspraak). These experts make a judgement on the quality of the contents of an EIS. The courts can then use this information when coming to their decisions, which are based on both legal and material environmental considerations. When doing this, Dutch courts often choose to take a pragmatic approach. This Dutch approach works very well when applied to the practical world of EIA because little time is lost in formal procedures, allowing everyone to concentrate on the material issues involved. Apart from a number of particularly difficult decisions, which have made EIA less popular among some administrators, Dutch judges have contributed to the development of a practical EIA system that focuses on quality. As well as the active role played by citizens and pressure groups and an alert media, Dutch judges deserve special praise for their efforts and the way they have approached the whole issue of EIA.

4.6 Conclusion

The necessary conditions for effective enforcement of the EIA regulation in the Netherlands, where the legislation contains no provisions for imposing penalties, are:

1. an active, free press
2. alert citizens and pressure groups
3. a pragmatic, but rigorous judiciary
4. expert and pragmatic advisers on material information.

These conditions should be combined with a statutory EIA procedure geared to a) openness, b) early public consultation procedures open to all, and c) independent and expert review.

5. EIA FOR THE BUJAGALI HYDROPOWER PROJECT IN UGANDA

Ineke Steinhauer

5.1 Abstract

AES Nilepower plans to build and operate a 250 MW hydroelectric power plant at the Bujagali Falls on the Victoria Nile in Jinja province, Uganda. A 451 hectare reservoir will be created and about 100 km of transmission lines will be built to deliver the electricity to Kampala. AES is pursuing part of the financing through the International Finance Corporation (IFC, World Bank Group). An environmental impact assessment (EIA) was conducted on behalf of AES and was reviewed and approved by Uganda's National Environmental Management Authority (NEMA). In April 2001 an expanded EIA containing studies that meet IFC and World Bank standards was published and also approved by NEMA.

In June 2001 the Dutch development cooperation minister invited the independent Netherlands Commission for EIA to review the environmental impact statements (EISs). This article explains why the Netherlands was involved in the EIA for this project, discusses the controversial character of the project and describes the approach taken by the Commission in reviewing the EISs. The Commission found the statements to be incomplete and recommended action to rectify six shortcomings in the reports before the relevant decision are taken. These recommendations were agreed by the minister, but in the meantime additional information had been gathered which remedied most of the identified omissions. The World Bank approved the project in December 2001, adopting the Commission's recommendation to maintain continuous consultations with all the interested parties. NEMA will play a prominent role in this process.

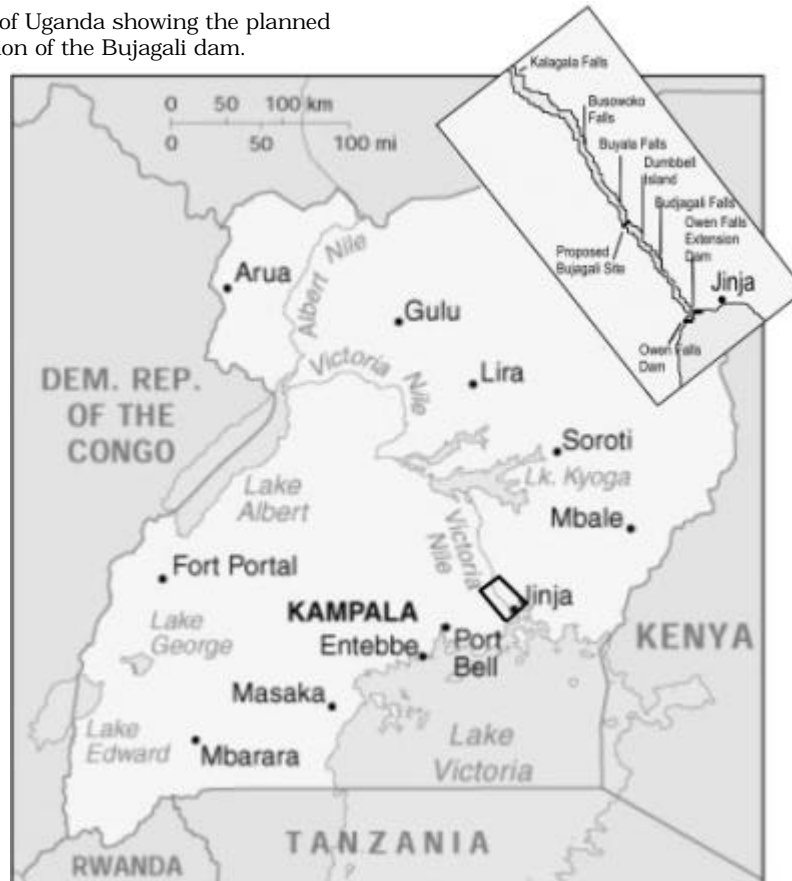
5.2 Introduction

Applied Energy Systems Nilepower (AES), a private company, is proposing to build and operate a 250 MW final capacity hydroelectric power plant at Bujagali Falls on the Victoria Nile in Jinja province, Uganda. It will be located approximately 8 km downstream from the existing Owen Falls hydro facility (built in 1954). The reservoir will cover an area of 451 hectares, of which 296 hectares will be within the existing riverbanks. The project also includes the construction of about 100 km of transmission lines to Kampala and associated substations. AES will sell electricity to the Uganda Electricity Board under a 30 year Power Purchase Agreement. The total investment amounts to USD530 million. AES is pursuing financing through the International Finance Corporation (IFC, World Bank Group) and other development finance institutions.

An Environmental Impact Assessment (EIA) was conducted on behalf of AES and reviewed publicly by Uganda's National Environmental Management Authority (NEMA). NEMA approved the EIA and the Ugandan Parliament granted the government guarantee required for the project in November 1999. In accordance with World Bank Group policies the IFC and World Bank fulfilled their own EIA requirements, which led to the publication of an expanded EIA in April 2001, also approved by NEMA.

In June 2001, the Dutch development cooperation minister invited the independent Netherlands Commission for Environmental Impact Assessment to review the environmental impact statements (EISs). This article discusses the approach taken by the Commission and the results of its review.

Map of Uganda showing the planned location of the Bujagali dam.



5.3 Dutch involvement in the project

The Netherlands is a shareholder in the World Bank and has a vote in decision making on the project. The project is controversial and the development cooperation minister was questioned about it in Parliament. The Netherlands Finance Corporation, the Dutch equivalent of IFC, was also asked to contribute financially to the project. Uganda is one of the countries with which the Netherlands maintains a bilateral relationship and the environment is one of the priority areas for cooperation. For these reasons the development cooperation minister asked the Commission to conduct an independent quality review of the EISs on the project. The aim of the review was to check whether the EISs contain sufficient and adequate information to guarantee full consideration of the environmental and social considerations during the decision making.

5.4 A controversial project?

There is no possible doubt about the importance to the Ugandan economy of expanding the limited electricity grid, which today serves only a limited part of the population; only about 3% of the total population now has access to electric power. The electricity supply system is in a critical condition, power cuts are almost a daily occurrence and about 30% of all power generated is

lost because of technical shortcomings and illegal connections. Current capacity is inadequate to support urgently needed economic development and satisfy demand from domestic consumers. Nevertheless, there are doubts about the project.

The proposed dam will be built on the spectacular rapids at the Bujagali Falls, which are important for tourism and fish populations and are held sacred by the local population as the home of the spirits of their ancestors. About 2200 people will have to move and a further 10,000 will be affected in other ways by the project. Just a fraction of the country's homes have electricity and so the project is unlikely to help alleviate poverty. According to some stakeholders, improving the existing inefficient electricity grid and reducing losses could be given greater priority than constructing a new dam. Alternative energy sources and alternative locations have not been studied adequately. There is also doubt about the hydraulic safety of building the dam 8 km downstream from the existing (old) Owen Falls dam. Corruption, intimidation and a lack of transparency have been reported as well.

5.5 The approach taken by the Netherlands Commission for EIA

5.5.1 Working group and site visit

The Commission formed an international working group of experts in freshwater ecology, dam/hydropower engineering, sociology, community development and public participation. The working group visited the site for a week. The purpose of the site visit was to collect information on the project and the site for use in formulating the advisory review of the EISs study relevant project reports and data and discuss matters with several government authorities and non-governmental organisations in Kampala and the project area listen to the opinions of people affected by the proposal and a cross-section of the stakeholders involved.



The Commission's working group visits the site. The Bujagali rapids can be seen in the background.

5.5.2 **Review framework**

The EIA for this project was designed to meet the requirements of NEMA and the World Bank. The Terms of Reference for the EIA for the hydropower facility and for the EIA for the transmission system were prepared by NEMA. These project and site-specific Terms of Reference were not available to the Commission and so could not be used as a review framework by the Commission. When constructing its own assessment framework the Commission drew on:

- conditions included in the NEMA approvals
- the World Bank's EIA guidelines for dams and electricity transmission lines and World Bank operational policies, for example on 'resettlement', 'cultural heritage' and 'indigenous people'
- guidelines by the World Commission on Dams and the International Commission on Large Dams
- its own advisory reports on comparable projects in Pakistan, Nepal and Laos.



Mr. Budhagali, the ritual chief of the Bugosa clans, performs a ritual at specific sites at the rapids where the spirits of the ancestors of the local population reside. If the dam is built here, this holy area will be flooded, angering the spirits. A suitable ceremony must be performed to enable the holy sites and spirits to move to a new location acceptable to the chief.

5.5.3 **'Scope' of the review**

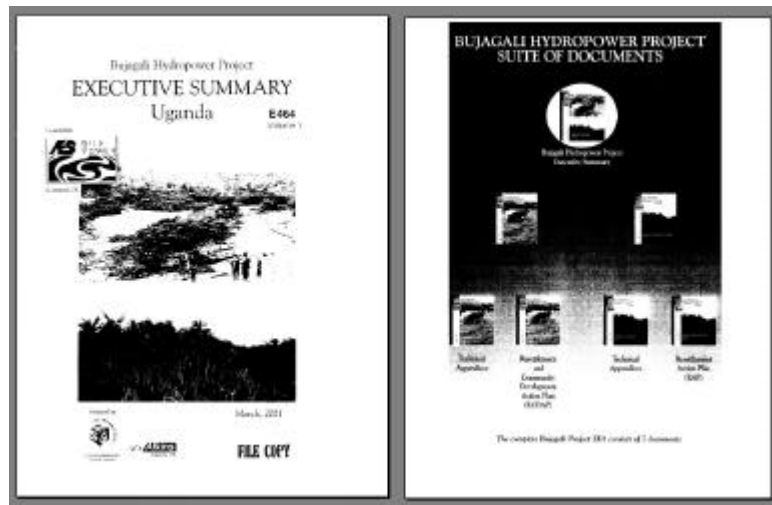
The Commission's review of the EISs was not limited to the project itself but also addressed strategic questions, such as the need for the Bujagali hydropower project, how it fits into the electricity supply situation, and why this site was chosen. These are issues which deal with the justification of the project and are normally part of an EIA. In addition, the review was integrated; in other words, it paid just as much attention to social impacts as to environmental impacts and made recommendations in both areas. Finally, the advisory review addressed the EIA process and its transparency.

5.5.4 **Review findings and recommendations**

While recognising and appreciating the virtues of the EISs, the Commission concluded that the impact statements published in April 2001 were incomplete, contained serious gaps in information, and therefore did not

provide a sufficient basis for decision making. Important studies that addressed some of these shortcomings were undertaken between April and October 2001. However, as these studies were prepared after completion of the EISs, the normal EIA procedure for putting information on display for public consultation was not applied. This is one of the reasons why the issue of the lack of transparency was frequently raised by different segments of society. Moreover, some issues, mainly at the strategic level, have still not been addressed in the EISs. The Commission recommended that the following action be taken to remedy these shortcomings before decisions on the project are made:

- completion and approval of a master plan for expansion of the electricity sector, taking into account the possible primary sources of energy, constraints and priorities to be satisfied, and clarification of the role of Bujagali in this master plan
- a specific assessment of the economic and financial implications of Bujagali, including the consequences for energy prices to the consumer
- a complete definition of hydraulic operating conditions and the hydraulic safety of the cascade of dams on the Victoria Nile
- justification of the site selection using an improved and quantified approach applied uniformly to all alternative locations, in which equal consideration is given to economic, social and environmental arguments
- a comparison of possible alternative layouts for the dam, power station and transmission system, with appropriate reporting.



The cover of the EIS, illustrating its broad scope.

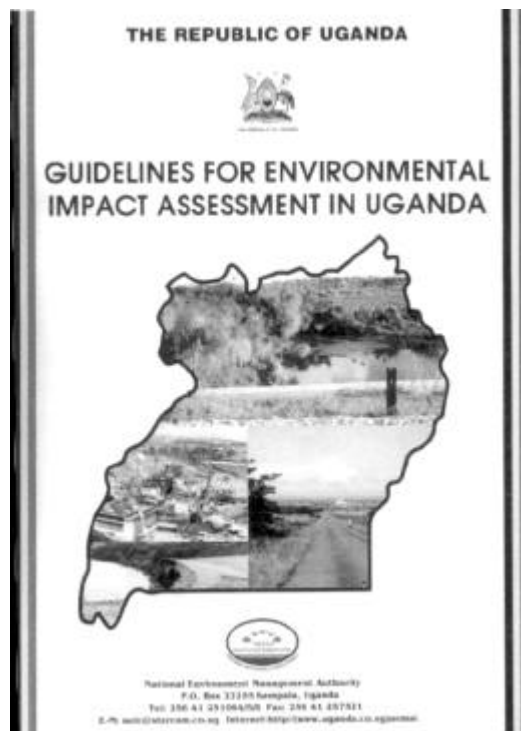
The Commission felt that it would not be a very time-consuming task to follow up on these recommendations, since most of the information could be obtained from a range of existing documents.

In order to meet the desire for transparency on this project, the Commission recommended developing a multi-stakeholder communication strategy for bringing together the disparate pieces of information that have and will become available after the completion of the EISs. The information should be presented in straightforward, simple way and geared to the various needs of a wide variety of audiences.

5.5.5 Decision making on the project

The Commission's advisory review was presented to the Dutch development cooperation minister in October 2001. The minister forwarded it to the Dutch Parliament and to the Dutch representative on the Board of Directors of the World Bank in Washington. The Netherlands Embassy in Kampala distributed the advisory report within Uganda.

Dutch MPs posed new questions to the minister on the basis of the findings of the Commission's review. Two issues were of particular concern: whether the minister shared the conclusions of the Commission and what position the Netherlands would adopt in the Board of Directors of the World Bank. The minister agreed with the Commission's recommendations, but said that additional information had already been gathered which rectified most of the omissions listed by the Commission. The Dutch representative on the Board, therefore, voted for the proposal. The 'Master plan for the energy sector' was still not available, but the Ugandan authorities are expected to finalise and approve the master plan at a later stage. The World Bank approved the project in mid December 2001, adopting the Commission's recommendation to maintain continuous consultations with all the interested parties. A prominent role for NEMA in this process is foreseen and recognised.



The Commission's ambition is to help to build more effective EIA systems in developing countries. Uganda introduced its EIA legislation in 1998.

The role to be played by NEMA can be considered as a positive step for EIA in Uganda. During its site visit to Uganda the Commission held discussions with NEMA, which can be considered as the Commission's counterpart in Uganda.

The Commission always strives for a joint review of the EISs with the local EIA authority. In this case, decision making in Uganda had already taken place, which is why the Commission adopted the conditions stated by NEMA in its approvals as the starting point for formulating its review framework. The fact that the World Bank now explicitly supports the role of NEMA during implementation of the project gives NEMA and the application of EIA more political weight.

We may conclude that the EISs have played an important role in the decision making by several parties involved in the project and can help strengthen the position of EIA in Uganda.

ISBN: 90-421-1001-5

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Commission for Environmental Impact Assessment, The Netherlands,
including all photo's, except the picture on page 20:
from: Alterra, Research Instituut voor de Groene Ruimte, Wageningen, 2000.

Text editing/translation: Derek Middleton

Design/layout: Mark Wagenbuur

Cover photo:

Sluice in the IJsselmeer Dam, Marc Laeven.

Back cover photo's, from top to bottom:

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Oil products storage plant, near Terneuzen, Michiel Odijk

Some facts on the Commission for EIA in the Netherlands

The Commission for EIA is a private foundation, with a budget of its own funded by government subsidies. It acts as an independent expert committee and is involved in all environmental impact assessments in the Netherlands. The Commission advises competent authorities at two stages of the assessment process: the scoping exercise to identify the required content of the environmental studies and the review of the quality of the information compiled. When providing advice the Commission takes public comments into account. The Commission also advises the minister for Development Cooperation at the Ministry of Foreign Affairs on EIA matters concerning activities in developing countries with which the Netherlands has a formal cooperation relationship. Advisory reports are published by the Commission itself. So far the Commission has issued advice on more than 1100 projects and plans.

The work of the Commission is founded on two principles: expertise and independence. It is the combination of these two that allows the Commission to provide an unbiased review of environmental information. The Commission is a statutory body and its duties are laid down in the Dutch Environmental Management Act. It has a chairman, several deputy chairmen and a secretariat staffed by 18 technical secretaries and 19 supporting staff.

The Commission has about 400 advisors with a collective expertise covering all environmental fields, such as air, soil and water pollution, ecology, hydrology, geology, archaeology, radiation, noise nuisance and visual landscape impacts, and the technical and physical planning aspects of the activities for which an EIA is required. In addition, the Commission can call upon experts in other disciplines that may be relevant, including environmental law, social psychology, environmental economics, land reclamation and consolidation, transportation, waste disposal, energy generation and consumption, environmental health, etc. In short, the Commission is able to field any expertise required for any EIA. If specific expertise is not readily available among the members and the advisors, new advisors can be called upon. The experts are paid professional fees for their services, based on the actual time spent on consultancy.

The Commission does not convene plenary sessions, but establishes small working groups for each individual EIA or SEA. The law stipulates that the Commission has the right to establish its own working groups of experts, recognizing that this is a prerequisite for its independence. For each project the Commission provides the competent authority with a list of the members of the working group. The competent authority has the right to raise objections to the inclusion of one or more experts in the working group if it has good reason to doubt their impartiality with regard to the activity or the decision concerned. If there appear to be solid grounds for objection, the Commission usually takes action and replaces the person or persons concerned. The advisory scoping guidelines for the EIA and the review of the EIS are prepared by the same working group.

Each working group is chaired by the Commission's chairman or one of its deputy chairmen. The chairman of a working group must see to it that the experts focus their attention on the essential environmental issues of the project concerned. Each working group is assigned a technical secretary who is responsible for the day-to-day management of the working group's activities and the preparation of draft advisory reports. The chairman and the technical secretary keep track of deadlines and see to it that the advisory reports are submitted within the statutory period.