

# The outcome of EIA

## *Foreword*

An evaluation of Danish EIA rules was conducted in the 2001-2003 period. The EIA Directive came into being in 1985 and was amended in 1997. EIA has assumed an increasingly prominent role in the Danish planning system and in the rules and regulations concerning the environment. The effect of the EIA rules has been documented by means of the evaluation in which a number of EIA cases and screening exercises were examined. A total of 36 EIA cases have been analysed with a view to examining the direct and indirect effects of environmental impact assessment. In addition, a detailed analysis has been made of how environmental assessments are carried out and how often significant environmental problems are encountered which are subsequently addressed in the decision on the EIA regulation. Following the amendment of the Directive in 1997, screening exercises assumed a more prominent role. They became a focus of public attention in Denmark in particular because the expansion of a great many pig farms in the intervening period has been a very controversial issue. This evaluation takes a closer look at both the indirect and the direct effects of screening exercises.

This report is designed, at the request of the European Commission, to present the key conclusions drawn from the evaluation of Danish EIA rules to a broader European audience. We hope that it might encourage debate about the effects of regulatory activity in this field.

This report was drawn up by the Environmental Assessment Group at the Department of Development and Planning [*Institut for Samfundsudvikling and Planlægning*], Aalborg University.

## **1. Introduction**

EIA (*assessment of the effects of certain public and private projects on the environment*) is an important instrument of EU environment policy. Its purpose is to make an active contribution to preventing and minimising adverse effects on the environment by providing information to decision-makers and ensuring openness as regards the possible consequences of implementing a project. The assessment of environmental effects and the use of the knowledge thus acquired takes place throughout the decision-making process for a given project. Consequently, EIA also has the potential to become a basis for dialogue and negotiation between applicants, the general public and the authorities. This would possibly produce a result which achieves a balance between the need for development and environment considerations.

Since the EIA Directive was adopted in 1985 (Directive 85/337/EEC) - and amended in 1997 (by Directive 97/11/EC), EIA legislation and EIA practice has evolved in all Member States. The purpose of this evaluation is to be able to contribute to the discussion which needs to take place about our EIA legislation and practice, and to enhance our knowledge of how EIA functions and its potential for development.

In the following subsection we will provide an account of the objectives of the evaluation and the four parts of the analysis carried out, before illustrating how the EIA Directive has been implemented in Denmark.

### **1.1 Purpose and substance of the evaluation**

EIA was introduced into the Danish planning system in 1989 and has since been the subject of debate amongst the public, decision-makers and administrators, as well as amongst the ranks of researchers and practitioners, including of course county administrations, which are in charge of most of the work involving the application of EIA rules. Many different subjects have been discussed. First and foremost, EIA was regarded as something imposed from outside to regulate situations that were already taken into account in Danish planning and environmental rules and regulations. It was not just a new way of doing things, but the methods were also new and more holistically oriented.

To begin with, EIA was not taken seriously. Gradually, however, as it went from success to success across the Member States and proved its worth, it began to be taken more seriously. Many people's opinions of it changed, in particular in the light of the success of EIA as an instrument in relation to several of the big Danish infrastructure projects. In particular the amendments to the Directive in 1997, when the regulatory mechanism to deal with the pig-farming issue was coming more into focus, meant that EIA became one of the most debated policy instrument in Denmark. Over the years, EIA has gradually changed and counties and municipalities, as well as developers and consultants, have become better at handling these cases. EIA rules are here to stay, and there is no doubt that they will in future be one of the key instruments of Danish planning and environment policy. Especially as a number of the benefits of EIA are now clearer, in particular the fact that it is the most holistically oriented method that exists and that it has a number of advantages as regards public involvement in the decisions taken on projects of this type.

The Environmental Assessment Research Group at the Department of Development and Planning, Aalborg University, was asked to evaluate Danish experience of EIA under the heading *The outcome of EIA*. The evaluation was carried out for the Spatial Planning Department of the Ministry of the Environment in 2001-2003. In addition to looking at EIA as an instrument (cf. Christensen et al., 2003a), the evaluation also analyses the quality of EIA procedures and quality management (cf. Christensen et al., 2003b) and an extensive questionnaire-based survey on experience of EIA and EIA competencies amongst public authorities, consultants and politicians (cf. Kørnøv et al., 2003).

This resumé of the evaluation focuses on the direct and indirect effects of EIA in relation to both screening and EIA projects.

The survey focuses both on the direct effects of EIA regulation and on the indirect effects, where the effect is primarily due to changes made by the developer to a project prior to the application was sent. The results are based on a study of 36 EIA cases and 101 screening decisions. In addition to studying documentation and the environmental assessments themselves, interviews were held with officials, consultants and applicants.

The evaluation focuses less on what EIA is expected to achieve than on what it actually does achieve. This means that no evaluation criteria for a 'good' EIA were defined before the evaluation was made. This is because we do not consider it possible, or desirable, to use a single

yardstick to assess EIA. This is because the focus of the evaluation is directed both at the product, in the form of EIA reports, screening exercises and permits, and at the EIA process itself. A good EIA is not necessarily appreciated as such even by the various stakeholders involved.

The evaluation is chiefly descriptive and analytical, but also partly evaluative. It is up to the reader to interpret its findings and to decide whether changes could be made. The evaluation does not adopt a position on how the Directive has been implemented in Danish legislation.

It is hoped that the evaluation will help to increase understanding of EIA and its significance as regards taking proper account of environmental considerations. A distinction is drawn in the report between EIA screening exercises and EIA projects. This is because the EIA system is fundamentally based on two completely different forms of regulation with widely varying dynamics and regulatory mechanisms.

## **1.2 EIA rules in Denmark**

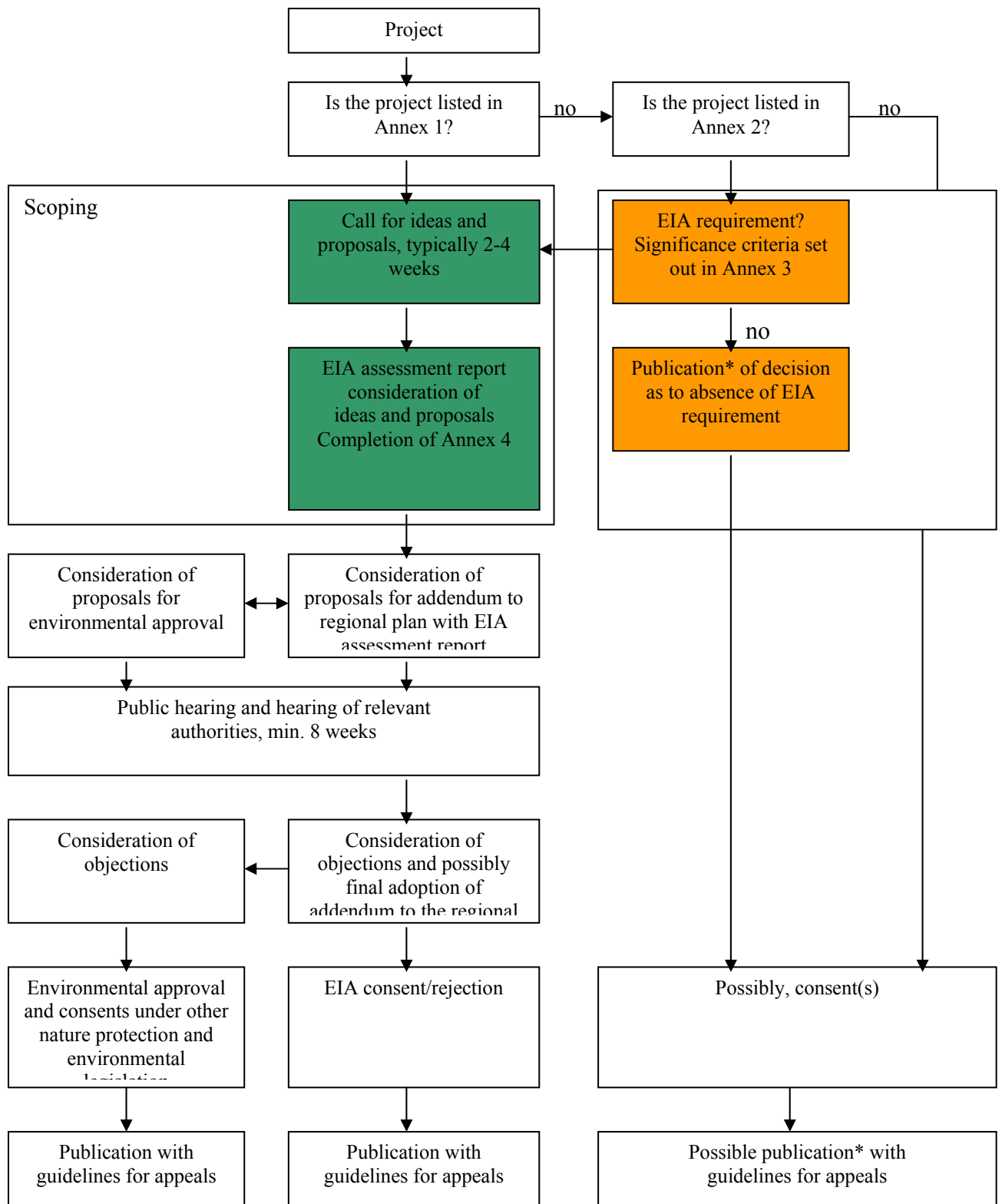
EIA has been part of regional planning procedures since 1989 - and has been adapted to fit in with the established planning and environmental regulation. The amendments to the Directive in 1997 were implemented in Denmark in 1999, bringing with them several important changes to the Danish EIA system. The national provisions on EIA are contained in the Planning Act and in Composite Order No 428 of 2 June 1999 on additional rules adopted pursuant to the Planning Act. Fig. 1.1 shows the Danish EIA procedure in relation to planning at county level.

At the first stage in the procedure, the developer submits his plans to the authority (county), which decides whether an EIA is required (screening). Prior to this, however, there will be frequent contact between the applicant and his consultant, and at this stage various changes may be made to a project. Annexes 1, 2 and 3 to Order No 428 of 2 June 1999 (composite order), as subsequently amended, are used for the purpose of screening. Annexes 2 and 3 are largely identical to Annexes II and III to the Directive. Annex 1 lists all projects which are subject to the EIA procedure, whereas Annex 2 lists projects where an EIA is required if it is thought likely to have a significant impact on the environment. The types of project listed in Annex 1 are also included in Annex 2, albeit without limit values and criteria being specified.

In order to decide whether an EIA is required for a project listed in Annex 2, screening is carried out on the basis of a number of criteria in Annex 3 to Order No 428. The criteria in Annex 3 are split into three main categories concerning the project's characteristics, its location and its potential impact on the environment.

In practice, screening makes a substantial case-flow through the system. The aim is to ensure that public resources are used precisely for projects where it is considered that a significant environmental impact is possible. Dialogue between applicants and authorities makes it possible to make changes to a project to make it as environmentally sound as possible so that it does not require an EIA. This scope for dialogue is deliberately provided for within the screening system.

Under the new screening rules, municipalities are to identify cases which should be submitted to the county administration for screening – albeit without adopting a position as to the requirement for an EIA. These are cases where 'changes are required to existing plans, there is inconsistency with current land use, or ... it cannot be ruled out in advance that the project or change will have a significant impact on the environment'. (Ministry of the Environment and Energy, 2001).



\* Publication of these may be simultaneous

**Fig. 1.1. The Danish EIA procedure.**

The result of the screening is published and communicated to the developer together with guidelines for appeal. If the project is considered to require an EIA, a call is made at the same time for ideas and proposals. This first round of public consultation includes scoping with the aim of determining the substance of the analysis, i.e. limiting the scope of the EIA to the significant environmental topics. If there is no requirement for an EIA, the public must be informed of the decision at least by the time the permits needed for the project are published.

The requirements concerning the content of the assessment are essentially the same as before the Directive was amended in 1997. Requirements for the consideration of alternatives were amended, however, and certain minor adjustments were made. Besides the alternatives which the developer himself asked to be studied, alternatives proposed by members of the public must now also be considered.

After the EIA report and the addendum to the regional plan have been drawn up, the county council delivers an opinion on whether or not to support the project. If it decides to do so, the assessment report and proposal are to be made public for at least eight weeks. If the project is covered by Chapter 5 of the Environment Protection Act [*Miljøbeskyttelseslov*] – and requires a permit under that Act – the EIA report must be accompanied by a proposal for environmental permit. Any objections are considered, and the proposal is then definitively adopted or abandoned by the county council. The relevant decision is published together with the reasons for the decision and guidelines for appeals. The time limit for lodging an appeal is four weeks.

When the EIA procedure is completed, and the counties have definitively adopted the necessary regional planning guidelines in respect of the project, an EIA permit or one of the permits or licenses referred to in Chapter 8(3) of the Order must be issued. In the context of an EIA permit, conditions may be imposed in respect of projects subject to EIA. The conditions imposed depend on a specific assessment of individual cases. The counties then monitor compliance with the EIA permit. The EIA consent must be published, and an appeal may be lodged in respect of it with the Nature Protection Appeal Board.

When the 1997 Directive was transposed into Danish legislation in 1999, EIA permit was a completely new feature in the Planning Act, as can be seen in Section 8, pursuant to which a permit must be obtained for all projects subject to EIA. A particularity of Denmark's transposition of the Directive is that, if a project is already covered by other permits/licenses/exemptions, these take the place of an EIA permit (cf. Section 8(3)). This situation is likely to impede consideration of all environmental parameters as required by the Directive, as the county administrations are prevented from regulating in relation to the broad concept of the environment owing to sectoral legislation. It should be pointed out that, in the cases analysed, no examples of EIA permits were seen. The drafting of EIA permits is a relatively new thing, and it must be assumed that the county administrations have only just started working with them.

The discussions on deregulation is a topical subject and was most recently raised in April 2003, when the Environment Minister proposed a notification scheme for simplifying the EIA screening procedure in relation to the expansion of, or alterations to livestock. No decision on the scheme had been taken by the time this evaluation was completed. A decision has now been taken, and on 18 August 2003 a notification scheme entered into force with the aim of

streamlining the consideration of cases concerning the establishment or expansion of, or alterations to livestock with up to 100 animal units.

### **1.3 Realistic expectations of EIA**

EIA is a tool which consists in gathering, analysing and presenting information on the likely environmental impact of a project. EIA is therefore about political choices, as the significance of the consequences will always vary according to the different interests involved. EIA is therefore also about making the bases for decision-making and political decisions themselves explicit. Ultimately, EIA is about communication. Fundamentally, EIA is there to provide information as a basis for the decisions and the action to be taken.

Fundamentally, EIA is an instrument which is designed to help improve the basis on which decisions are taken and to ensure that projects that are subject to EIA can only be implemented if specific permits has been obtained with the aid of which environmental conditions can be regulated. By gathering, assessing and clarifying information on a project's likely environmental impact it is possible to take better decisions which achieve a better balance between environmental considerations and other considerations. However, it is not always possible to achieve the ideal result. Firstly, EIA is based on an incomplete knowledge of environmental impact. It is impossible for case officers to have full knowledge and complete understanding of all eventualities and their consequences. Because time and resources are limited, EIA must be concentrated on the significant impacts. Secondly, the knowledge which is generated as part of an EIA is not always adequate. There will often be gaps and uncertainties. We do not know for sure if implementation of a project will avert unwanted effects or whether there will be side-effects. Also, basic data is unsatisfactory and models are oversimplified, etc. Professional discretion is therefore a natural and inevitable part of being able to predict and assess the likely impacts of a project. Thirdly, planning is political and involves many interests. EIA is part of a broader decision-making process in which considerations other than purely environmental considerations play a part. Since all projects will have both positive and negative impacts in a number of areas, it is absolutely right that the EIA assessment report should be part of the public political debate. It is important to bear in mind that EIA is not synonymous with decision. EIA is there to help provide a sound basis for use by the various parties to the decision-making process. But politicians are still free to take a decision which takes environmental aspects into account in a way other than that indicated in an EIA report.

Set out below are the analyses we have made of EIA: first we review experience of screening exercises and then we turn our attention to actual EIA cases.

## ***2. Screening exercises***

Since Danish EIA rules were amended in 1999, a large number of screening exercises have been conducted, of both livestock and other cases. These screening exercises have been highly controversial, and this evaluation for the first time provides an overview of the actual impact of the screening procedure.

The empirical basis for the analysis is provided by a review of 101 screening cases selected from all the counties of Denmark. The survey is based on an analysis of the 101 screening decisions and the associated screening note, if any. The cases comprise 58 cases relating to livestock and 43 other cases. Besides studying documentary evidence, interviews were conducted with selected

case officers in the counties about screening generally as well as about specific cases. Telephone interviews were also conducted with applicants and consultants in 98 of the 101 screening cases.

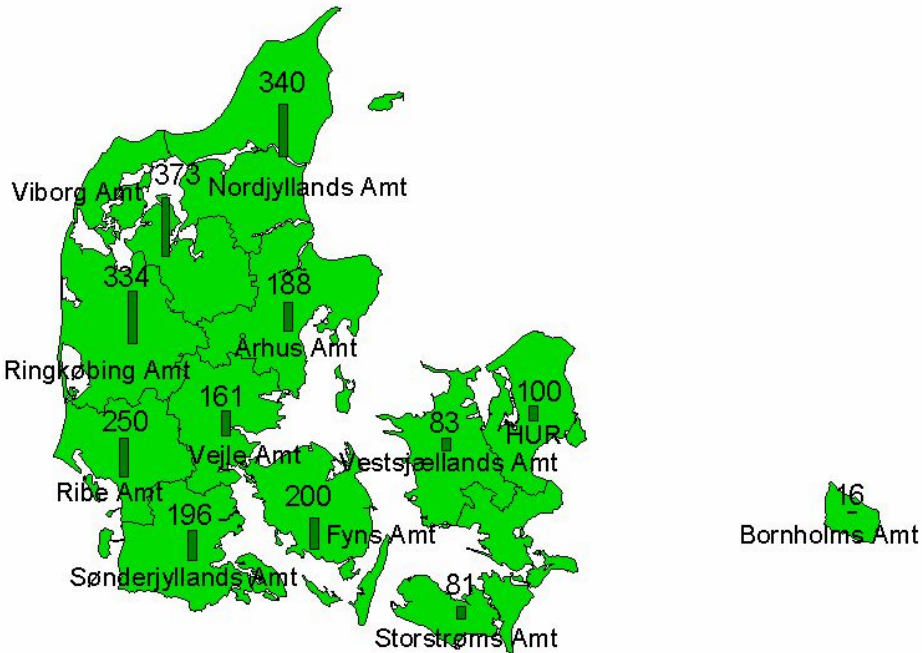
Screening decisions were studied with the aim of assessing whether the formal requirements of EIA were complied with in practice. The evaluation also included an analysis of changes and adjustments made to projects prior to the submission of the relevant applications and in the context of the screening process and decision. The indirect environmental improvements are the changes made before the application for a project is submitted to the county authorities, and direct environmental improvements are those changes which are made as a result of the screening process.

The purpose of screening is not only to decide whether a project is subject to EIA or not, but also to prompt the applicant to possibly modify his project, so that it does not require an EIA.

**2.1 Number of screening exercises in Denmark**

Since 1999, screening rules have been formulated in such a way as to ensure that screening became a genuine regulatory instrument. The number of screening exercises rose sharply to 2001 and has since remained stable at about 2000-2500 a year, with about 90% relating to livestock and 10% to other issues. In 2001, the counties received 2322 project applications that were screened. Of these, 88% were livestock-related and 12% related to other issues.

Fig. 2.1 below shows the total number of screening exercises in the different counties.



**Fig. 2.1 Number of screening exercises begun in 2001, by county.**

In 2001, the proportion of screening cases for which an EIA was deemed necessary was about 5%. However, not all the cases which were deemed to require an EIA actually resulted in an EIA

report. Some projects are abandoned if an EIA is deemed to be necessary, and others are modified so that an EIA is not required.

The breakdown of screening cases between livestock-related cases and other cases varies enormously from county to county. In the eastern counties, livestock-related cases account for only 10-20% of the total but account for the overwhelming majority of cases in the western and northern counties.

## **2.2 Administration of screening exercises in Denmark**

The rules on screening are laid down in the Order, and also described in greater detail in the Environment Ministry's EIA Guidelines (Ministry of the Environment and Energy, 2001a). In the EIA Guidelines, emphasis is placed on modifying projects so as to eliminate the need for an EIA. In cases where the county considers that significant impacts on the environment which would necessitate an EIA can be overcome by modifying the project, contact should be established with the developer with a view to getting the project modified. The developer can then choose to withdraw the application and have the modified project assessed as part of a fresh screening exercise (Ministry of the Environment and Energy, 2001a).

The Ministry has sought to develop the system so that county authorities need to use as few resources as possible. It falls to applicants to provide the basic data which the county considers necessary for assessing whether a project has a significant impact on the environment. The general idea is that county authorities base their assessment on the application and on existing information. The aim is that, when the necessary material concerning the project is available, the case officer should be able to draw up his assessment and decision in one day.

With effect from 15 August 2003, the Environment Minister introduced a notification scheme for livestock farms with up to 100 animal units. The aim is to enable county authorities to rapidly weed out straightforward cases concerning livestock farming. Under the scheme, the applicant completes a form containing ten questions, and if the answer to these ten questions is 'yes', the authority concerned must, within ten working days following receipt of the completed form, assess whether the information provided tallies with information which it has on the areas in question. If the authority considers that the information provided agrees with what it already knows about the areas in question and the information provided in the application and also considers that it is not necessary to take account of other factors, the applicant can commence the project. If this is not the case, the authority must inform the notifying party accordingly no later than ten working days after having received the notification.

When county authorities have to decide whether a project will have significant environmental impacts, they must do so in accordance with the criteria set out in Annex 3 to Composite Order No 428. Firstly, the project must be assessed in terms of its scale and its cumulative effects in combination with other projects. Secondly, the project's location must be assessed in terms of the environmental sensitivity of the geographical area concerned by the project. Sensitivity is assessed in relation to the current use made of the area, the relative abundance of natural resources, the quality and regenerative capacity of the area and the sustainability of the natural environment. In the annex, emphasis is placed on assessing a project's impact on a number of types of natural and man-made environment and landscapes requiring protection, including the aquatic environment and densely populated areas. Thirdly, county administrations must assess the potential environmental impact of a project in terms of whether its impact is cross-border in nature, the scale of its impact and the complexity, and the probability of the impact, its

durability, frequency and reversibility. As in the case of an EIA proper, EIA screening exercises are also based on broader environmental concepts than are to be found in existing sectoral legislation, e.g. the Environment Protection Act.

To some extent, most counties make use of modelling tools and calculations when screening projects, though chiefly in the context of livestock-related cases. Common examples are the calculation of nitrogen leaching and nitrogen deposition and calculation of the phosphorus balance. No fewer than eight of the twelve EIA authorities also use internal check-lists of factors to be assessed as part of the screening process. Most counties use criteria to determine where there is no requirement for an EIA. Although most counties to a certain extent apply operationalised criteria, some of the criteria are also qualitative, and the final decision therefore depends on case-by-case assessment.

The county administrations' check-lists and the EIA-requirement criteria have both been analysed in relation to the content of Annex 3 to the Directive. Three of the eight counties using check-lists follow this system, whilst the rest almost exclusively focus on matters relating to a project's location. The same three counties' check-lists are used both for livestock-related cases and for other cases, whereas the others use them only for livestock-related cases.

For the purpose of screening, most counties apply a number of operationalised criteria regarding the requirement for an EIA. This they do primarily in relation to sensitive areas of natural environment, groundwater, international conservation areas and rivers, streams, lakes and coastal waters. Compared with Annex 3, it may be seen once again that the criteria used are almost exclusively geared to the location of the project and only in few cases to its potential impact on the environment. Nor are there any criteria which relate to cumulative effects.

**2.3 Changes to projects**

The evaluation shows that the screening procedure has to a relatively large extent enabled the counties to bring about changes to projects, especially where livestock-related cases are concerned. Such changes may be made either before or after the application is submitted to the county. Changes made before the application is submitted are called *indirect effects on the environment*, and changes made afterwards are called *direct effects*.

According to case officers in the counties, most changes are made after submission, i.e. direct effects result from the dialogue between the applicants and the authorities. However, one-third of case officers state that there is an increasing tendency for changes to livestock-related cases to be made prior to submission. This is due to the fact that consultants in particular are beginning to become familiar with the counties' practices, i.e. they know the counties' procedures for dealing with applications and what information they will require and what assessments will form the basis for a procedure.

To illustrate the effect of screening exercises, applicants and consultants were asked during telephone interviews whether and when changes were made to projects. The picture presented by applicants and their consultants differs from that painted by the case officers, specifically with regard to a number of changes made prior to submission, cf. Table 2.1.

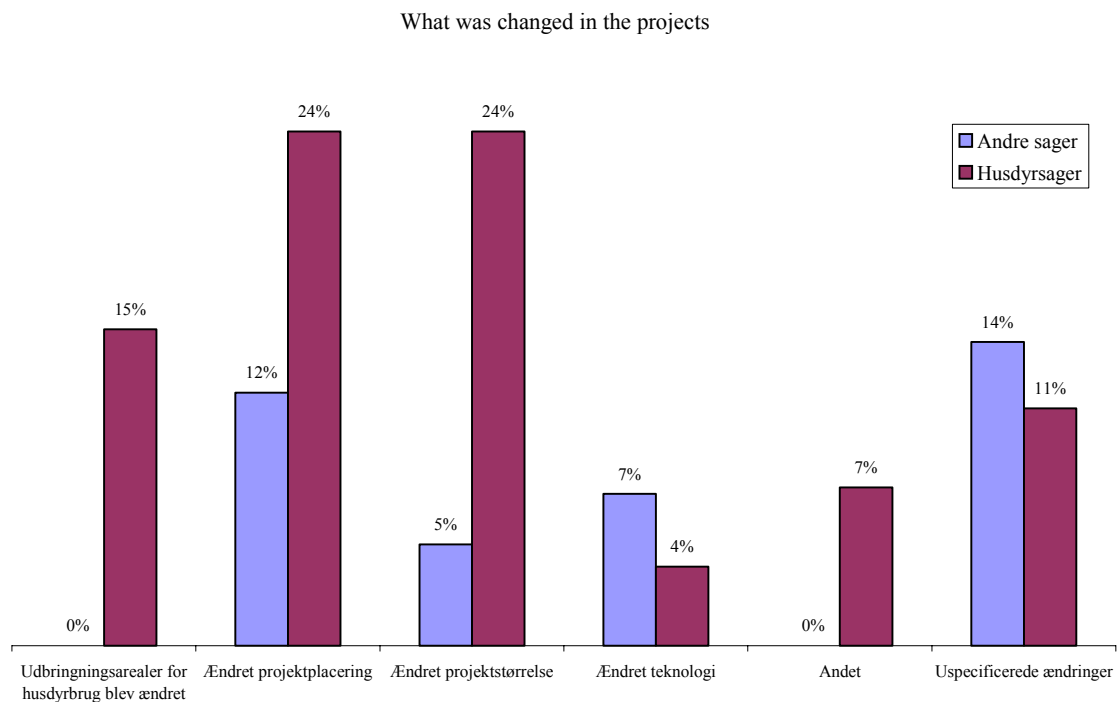
	<i>Cases where changes made prior to application</i>	<i>Cases where changes made after application</i>	<i>Total no of cases where changes made</i>
<b>Livestock</b>	19	16	29

cases			
Other cases	7	9	15
All cases	26	25	44

**Table 2.1 Number of cases resulting in changes. The survey included screenings of 55 cases involving livestock and 43 other cases. In some cases, changes were made both before and after the application.**

Table 2.1 shows that changes were made in 45% of all cases, the figure being 53% for cases involving livestock and 35% for other cases. Generally speaking, therefore, more changes are made in livestock-related cases than in other cases. It also shows that, overall, about the same number of changes are made before as after submission.

The question is whether the changes made as a result of screening would in any case have been made as a result of a subsequent EIA. In 13 of the 98 screening exercises analysed, it was decided that an EIA was required. In nine of those 13 cases, changes to the project were made either before or after submission. The fact that more changes were made here may be seen as result of the fact that the applicants tried, in vain, to amend their projects so that an EIA would not be required. Changes were made in 41% of the cases where it was decided that an EIA was not required. The number of changes generated by the screening procedure thus does not depend on how big the cases are or on the potential requirement for an EIA.



[blue = other cases  
red = livestock-related cases]

[Area where manure may be applied  
Location of project  
Scale of project  
Technology  
Other  
Not specified]

**Fig. 2.2 Types of changes made to the different types of cases screened.**

For livestock-related cases, the most common changes in screened cases both before and after submission relate to project size (number of animal units), the location of buildings and the area on which manure is to be spread. In the other cases, the most common changes related to location and technology. The changes were in particular of a preventive nature, and the changes involved were not especially radical, but were rather adjustments made so as to obviate the need for an EIA. In two cases, the resulting changes meant that the projects were abandoned.

The changes yield benefits both for the developer and for the environment. The developer avoids the need for an EIA and ensures that the project can be processed more quickly. For the environment, there are a great many improvements, such as a reduction of noise, the conservation of man-made and natural environments and reduced discharges of nutrient salts.

## **2.4 Substance and quality of EIA screenings**

On the basis of this evaluation, it is possible to assess the substance and quality of the screening decisions.

Administrative practice varies greatly from county to county as regards adhering to the system laid down in Annex 3 of the Directive, under which screening must comprise an assessment of the project's characteristics, including its nature and size and cumulation with other projects, its location and its potential impact on the environment.

As was clear from the way in which counties make use of check-lists to assess screening cases, it may be concluded that they are in fundamental control of screening with regard to assessing the characteristics of a project, including its size, and describing traditional environmental conditions. It is less clear-cut when counties are to assess cumulative effects, and the absorption capacity of the natural environment and the potential impact on environment. Only three counties use the system set out in Annex 3 to the Directive. Whilst they do indicate if such impact exists, an actual assessment of the impact on the local environment is never carried out.

Cumulative effects are assessed only in 17% of the cases, and in all of them it was concluded that there were no such effects. This means that cumulative effects are not specifically assessed. Nor were there any cases where the expansion of livestock farming was examined in relation to the overall pollution caused in an area by livestock farming, despite the fact that this ought to be a relatively straightforward exercise.

The potential impact on the environment was assessed in 36% of the cases, but only in 7% of cases was there any specific assessment. By and large, the absorption capacity of the natural environment is assessed only in the three counties which conduct screening systematically, and assessment is more sporadic in the other countries.

It may be concluded on the basis of this review of screening cases that practice in the counties as regards the assessment of environmental impact is not consistent with the broad environmental concepts used in the EIA rules, and that the projects were assessed only to a limited extent in terms of their cumulative effects, the absorption capacity of the natural environment and potential environmental impact.

### ***3. EIA projects***

As part of the evaluation of EIA projects we looked in detail at the impact of EIA in terms both of direct and indirect effects, i.e. the actual EIA process and report and the deliberations between applicant and consultant prior to that stage.

The 36 cases were selected from amongst EIA cases completed in August 2001. They relate to a wide variety of subjects. For the purpose of analysis, they were split into the following three categories: livestock-related cases, infrastructure and industrial etc. The 36 cases are fairly evenly split between the three categories, with 13 livestock-related cases, 11 infrastructure cases and 12 industrial etc cases.

The industrial cases vary greatly and include two industrial production plants, two cases of extractive activity, a waste water treatment plant, a sludge treatment installation, a dump, an incinerator for dangerous waste, two energy production plants and two shopping centres. These cases are typically already subject to other legislation.

The infrastructure cases include five road-building projects, three port installations, two natural gas installations and an airport. The Roads Directorate was the competent EIA authority for one of the road projects. The Coast Directorate was the competent EIA authority for one of the port projects. In the other cases, the counties were the competent EIA authority. All the cases are large and complex and have many types of environmental impact which effect large numbers of people. Many of the cases have a long history and were the subject of debate for several years.

Most of the livestock-related cases concern the expansion of pig farms. In one case, two pig farms were being combined without an increase in production, and in another case it was a dairy cow herd that was being increased. In the 11 cases where pig production was being expanded, production was increases to above 250 animal units (AU). The average increase was from 199 AU to 396 AU.

The cases were selected by the EIA authority itself using criteria which ensured that there would be a wide spread of cases within the three categories, including both the 'best' EIA case and two more average cases. Overall. the selection was therefore not a representative or average sample.

When conducting the survey an attempt was made to examine as many aspects of the EIA cases as possible, in the context both of the process and of the results available in the form of written EIA reports. It was therefore decided to use a variety of methods. We based the analysis of the 36 cases on the EIA report, the addendum to the regional plan and various other permits. In order to describe the actual EIA process, we visited the individual counties so as to take a look at archive material on the individual cases concerned. Each case was analysed according to a detailed system in order to pick out the changes that were made during the process. When analysing the cases, emphasis was placed on pinpointing where in the process changes were made and what sort of changes were made. Attention was also focused on the comments and objections received and their significance for the project.

Because not all the changes made to a project were evident from the files, we interviewed one or more case officers involved in the case concerned. In addition, general interviews were conducted in individual counties in order to identify their practices, strategies and policies in relation to the handling of EIA cases. In order to examine the indirect effects of the EIA process,

telephone interviews were conducted with applicants and their consultants concerning the changes made to the projects both before and after submission of the application. 29 applicants and 22 consultants were interviewed.

### 3.1 The EIA process

The EIA process is to a certain extent defined by the rules set out in the Planning Act and Composite Order No 428. In this chapter, the aim is to describe a number of general features of the EIA process and how the process is applied in the counties.

All the projects follow the prescribed procedure, with two public consultation stages and the addendum to the regional plan. They are subject to political scrutiny on a varying number of occasions along the way. The process for cases handled by the Roads Directorate and the Coast Directorate is a little different. The normal process is described in Table 3.1 and consists of 15 stages.

Stage	Stage consists of:
1	Case officer's/ working party's first examination of the case
2	Gathering of information and drafting of discussion paper where necessary
3	Political consideration (of discussion paper) before first round of public consultation
4	First public consultation
5	Administrative processing of first public consultation
6	Political consideration of first public consultation
7	Drafting of EIA assessment report
8	Drafting of proposal for addendum to regional plan
9	Political consideration (of EIA assessment report and addendum to regional plan) prior to second public consultation
10	Second round of public consultation
11	Administrative collation in second round of public consultation
12	Political consideration after second round of public consultation
13	Drafting of addendum to regional plan for definitive adoption
14	Political consideration and definitive adoption
15	Appeals to the Nature Protection Appeals Board and consideration thereof

**Table 3.1 The 15 stages into which the EIA process was divided in the survey.**

Where the Roads Directorate is concerned, a project begins with the adoption by the Danish Parliament of an act launching a project, and when the EIA process is complete, the Parliament adopts an act concerning construction. The Roads Directorate always conducts two rounds of public consultations, one preliminary round where a call is made for ideas and scoping, and another round in which the EIA report is presented. The process is thus similar to the process for cases where a county is the competent EIA authority. In the case of the Coasts Directorate, there is no preliminary round of public consultations but a hearing is held involving the relevant authorities before the EIA is drawn up and submitted for a public hearing. After the public consultation stage, the Coasts Directorate delivers an opinion as to whether the project should go ahead. There is thus just one round of public consultations and there is no political scrutiny of cases at any time.

Most counties consider it important to assume responsibility for the assessments and the conclusions. This generally means that they do the relevant work themselves. Only in a few cases does the developer submit proposals concerning an addendum to the regional plan and guidelines. In some cases, however, the whole EIA report and the addendum were drafted by the developer. There is a general tendency for counties to delegate more and more of the work to the

applicants and their consultants, in particular calculations, the description of alternatives, etc. This is partly to do with the use of administrative resources and partly because it is thought reasonable that applicants themselves should provide detailed descriptions of their projects.

One aspect much debated in relation to EIA cases is the lengthy case-processing time. The length of time taken can fairly easily be ascertained from available material. The processing time in the 36 cases varies from 7 to 43½ months, cf. Table 3.2. Seven months is probably the shortest period achievable if time has to be set aside for public consultations, political scrutiny and, in particular, the technical and routine assessment of the cases.

<i>Type of case</i>	<i>No of cases</i>	<i>Shortest case-processing time</i>	<i>Longest case-processing time</i>	<i>Average case-processing time</i>
<b>Stock farming</b>	13	11	43	25
<b>Infrastructure</b>	11	9	43½	29 ½
<b>Industrial etc.</b>	12	7	35	13
<b>All cases</b>	36	7	43½	22½

**Table 3.2. Case-processing times in months. Case-processing time is calculated as the time from receipt of the application by the county authority to adoption of the addendum to the regional plan by the county council.**

### **3.2 Changes to projects prior to submission of applications**

One of the purposes of EIA is to prevent adverse effects on the environment, i.e. to regulate construction or an activity. This is achieved by means of dialogue between the applicant and the county when the case is under consideration. However, even before the application is submitted, the EIA process may produce a number of 'indirect' effects, with the applicants (developer and consultant) more or less trying to meet the requirements they expect to be set as a result of the procedure.

An analysis of the changes made prior to submission is possible only on the basis of interviews with the applicant or consultant. The evaluation shows that a number of changes to projects are in fact made prior to submission of the application. Changes prior to submission were made in altogether 17 of the 33 cases for which we have interview material. The EIA procedure thus does have some indirect effects on projects even before the project emerges as a publicly accessible proposal.

Indirect effects are more common among infrastructure cases. This is presumably because they include large-scale road and port projects, for which the EIA is carried out by special authorities, who are also executing the projects. As explained above, some of the dialogue in such cases takes place early in the process.

Changes are least frequent in industrial etc. cases, to which, if an EIA had not been required, other legislation would generally have applied, albeit using more narrowly focused assessment criteria.

### **3.3 Changes made after submission of application**

One of the main purposes of launching the EIA procedure is to clarify the impacts which the construction or activity concerned will have and, on that basis, to amend the project so that it better fits in with its surroundings. In the EIA process, changes may come about as a result of dialogue between the developer, advisers and the authorities, and are of course also influenced by the dialogue with members of the public during the two rounds of public consultations.

Dialogue is affected by many factors. There is significant input from the developer and his adviser, but the county, too, has significant input, e.g. by virtue of the political priorities in the regional planning documents. On top of this there is also input from the public. And, last but not least, new knowledge is acquired as a result of the descriptions and assessments which the county draws up, possibly with its own or the developer's consultants, in connection with the EIA. All this input provides fuel for the dialogue between the applicant and the county and is ultimately what many a time brings about changes to a project in the period between submission of the application and presentation of the completed EIA report.

To a large extent, the purpose of EIA is to ensure that a broad-based environmental assessment can help bring about changes to relevant aspects of a project. We have therefore also assessed the nature of the changes made to individual cases. In only three cases were no changes whatsoever made either before submission of the application or during the EIA procedure. Minor changes were made in 27 cases, and in four cases - all of them infrastructure cases- substantial changes were made. These were three road projects and one port project. Lastly, radical changes were made to projects in two infrastructure cases.

**3.4 Discussion points during the EIA process**

On the basis of our analysis of the 36 EIA cases, we identified a number of points which formed the basis for discussion and analysis of the projects, and we investigated whether they resulted in actual changes to the projects. In total 725 such discussion points or comments were recorded in the 36 cases. The frequency of such discussion points in the various types of cases varies somewhat, cf. Table 3.3. Infrastructure cases give rise to the most discussion.

	Industrial etc	Infrastructure	Livestock	Total
Comments	115	515	95	<b>725</b>
Comments per case	10	47	7	<b>20</b>

**Table 3.3. Overview of comments recorded or changes proposed in the 36 EIA cases.**

During the course of an EIA case, comments, objections and other discussion points may be raised in virtually any of the 15 stages shown in Table 3.1. For each discussion point raised, we not only looked where in the process it was raised and whether it actually led to a change to the project, but also what environmental effects or parameters were discussed, who proposed the change, and why.

The 725 discussion points recorded were spread throughout the cases, but it goes without saying that most of them were objections presented during the two rounds of public consultations. We found that 290 objections had been raised in the first round and 329 objections in the second round of public consultations, leaving a total of 106 discussion points recorded at other stages of the EIA process.

Seen in relation to the types of case, it is clear that infrastructure cases give rise to most discussion. Here we found an average of 47 discussion points per case, as compared with only 10 for industrial etc. cases, and 7 for livestock-related cases. Activity is greatest in infrastructure cases, both at the public consultation stages and in the intervening periods. Industrial cases are discussed almost as often at the public consultation stages but virtually not at all in the intervening period, whereas discussion activity at the public consultation stages is lowest in livestock-related cases but higher than for industrial cases in the intervening period.

Most of the 725 discussion points raised concerned more than one subject. Overall, the 725 discussion points related to 1296 environmental topics.

By far the greatest proportion of discussion points are raised at the public consultation stages. There is no doubt whatsoever, therefore, that public consultation stages are a vital part of the EIA process. It is there that huge numbers of discussion points are raised, and our analysis shows that a relatively large proportion of these points also result in changes to projects. Many of the subjects addressed have perhaps already been taken into account by the counties through their dialogue with other parties to the case, but some also reflect fresh knowledge and new positions which the counties need to take into account in subsequent stages of the case.

The following section looks in more detail at what goes on in the individual stages of the EIA process.

### **The EIA process - from application to the first round of public consultations**

After receiving an application, the county initiates the EIA process, normally by appointing a group to deal with the case. For large-scale projects, like many of the infrastructure projects and industrial projects, in which many parties and authorities are involved, a working group is often appointed comprising representatives of those concerned. The EIA process is defined, alternatives are outlined and the most obvious problems are addressed.

23 of the 725 discussion points were raised at this stage, relating to a total of 55 environmental topics. Most of these topics related to water/sediments, flora/fauna, landscape and "other". Typically, the discussion points were raised by county case officers.

It is often at this stage that the applicant is informed that alternatives will be needed for the EIA report. An applicant seldom submits more than one project variant. It is often case officers who draw attention to the requirement to submit alternatives.

Few changes are made to projects at this stage, but more options are added for use in the debate during the first round of public consultations. Changes to projects during this period were made only in a few livestock-related cases. Negotiations with the county authorities led to minor changes to two projects.

At the first stage of an EIA case, it is typically the case officers, the applicants and the consultants who play an active part. It is at this stage where the framework is provided for sound dialogue between these parties, and it is often at this stage that it becomes clear what the parties expect from each other with regard to timescales, the production of documents, etc. It is also at this stage that initial talks are held on alternatives, very often on the initiative of county case officers who tend to prompt applicants to formulate alternatives. The obvious problems in a project are thus dealt with fairly early on in the proceedings, often before the first round of public consultations.

### **EIA process – first round of public consultation**

The conduct of the first round of public consultations varies enormously. It may merely take the form of an announcement in the press or it may take the form of leaflets or even several public meetings. It very much depends on the nature of the project concerned. The legislation and guidelines do not lay down any requirements as to the form of public consultations. In livestock-related cases, only leaflets are issued or adverts placed in the press, whereas for large-scale

infrastructure cases there is often more extensive material for use as a basis for public consultations. These often contain a more detailed and precise description of the project to be discussed. There are also differences in how much is "done" to cases - how many decisions and choices have already been made - before a case reaches the first round of public consultations. With regard to infrastructure cases, we may therefore see just as many objections raised in the first round as in the second round, whereas for industrial etc. cases and livestock-related cases fewer comments are generally received in the first round. The more specific details are provided of cases the greater public participation appears to be.

290 discussion points were raised at this stage and were split as follows between the three types of cases, cf. Table 3.4.

Category of case	No of objections	Average per case
Industrial etc.	46	3,8
Infrastructure	222	20,2
Livestock	22	1,7

**Table 3.4. Comments received in the first round of public consultation, by category of case.**

Generally speaking, far more comments are received at the public consultation stages in infrastructure cases. This naturally has to do with the scale of such projects, which take up a much space and hence affect many people, large areas of countryside and many different types of natural habitats. Moreover, such projects are often, as already mentioned, more detailed by this stage.

The discussion points addressed are typically raised by members of the public and neighbours and, to a certain extent, by interest groups. The authorities often view the first round of public consultations as an opportunity to gain access to the knowledge which is available locally and which is significant for producing the best possible EIA report. The comments made generally express concern about projects and point out problems associated with the projects. However, not very many alternatives are put forward. The comments also often raise questions as to the general social benefits of the projects. This is a subject which is seldom addressed in EIA reports and which is rejected as being outside the scope of such reports.

The subjects touched upon during the first round of public consultations cover a wide range of the "broad environmental concept" on which EIA cases are based. It is probably worth noting that subjects such as flora, fauna and landscape, and in comments received from the public, cf. Fig. 3.1. There is nothing to suggest that public participation is fuelled by personal inconvenience or conflicts between neighbours in such cases. Comments made during the first round of public consultations often result in the relevant subjects being addressed in the EIA report.

Subjects addressed in the first round of public consultation

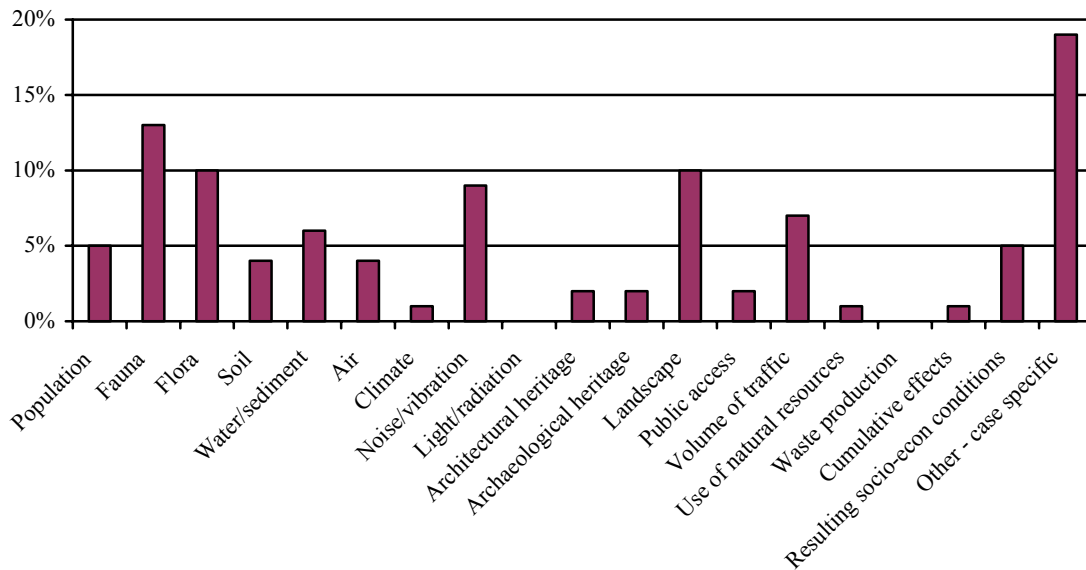


Fig. 3.1. Subjects addressed in the first round of public consultation.

### EIA process - drafting of report and proposed addendum to the regional plan

After the first round of public consultations, the counties set about processing the applicant's project and any comments received. This stage is very important, as it is here that the project's environmental impact is analysed and the project is formulated in greater detail. Significant dialogue takes place with applicants. Some counties argue that dialogue between applicant and county is the key to the process. At this stage, the EIA report is formulated, along with an accompanying proposal for an addendum to the regional plan. The report and the proposal for an addendum are subjected to political scrutiny both by the Technology and Environment Committee and the Economic Affairs Committee (and often also by the county council itself) before they are ready to proceed with the second round public consultations.

Politicians do not have a very prominent role to play either at this stage of the project or just at the beginning. From the material we have analysed, there is nothing to indicate that politicians contribute specific proposals for changes. The rationale for the EIA process in this context lies to a very large extent in giving politicians a good-quality basis for decision-making. This stage is often the longest part of the EIA process.

It is also in this stage the alternatives are examined in greater detail. Interviews with county's officers indicates that it is in particular case officers themselves, and neighbours and interest groups that submits proposals for alternatives. Neighbours are often interested in zero alternatives and also very keen to have a project moved to another location.

With regard to road projects, in quite a few cases many alternative routes were presented in the material provided for use during the first round of public consultations. The number of alternatives presented in the material provided for use in the second round of public consultations is reduced on the basis of the first round of public consultations. Many people describe this stage as an iterative process, when new knowledge is brought in to optimise the

project. In the case of infrastructure projects, a huge number of changes are made, and sometimes completely new alternatives are proposed, or routes are adjusted and crossings and fauna passages introduced.

Only 45 of the 725 discussion points were raised at this stage. The subjects addressed were typically flora/fauna and landscape. The discussion points addressed are typically raised by the county's own administration.

Analysis and synthesis are the hallmarks of this stage. The information obtained during the EIA process, the objections received during the first round of public consultations and the assessment of alternatives are all distilled, through the discussions held with the applicant and consultants, into one (or more) definitive proposal which can be put forward in the second round of public consultations. Although the figures do not indicate there to be much activity, this is the most important stage, at which the project and alternatives are drafted and actual environmental assessments are conducted. The work made by the county administration is in most cases decisive as regards the quality of the EIA report issued during the second public consultation stage.

**EIA process – second round of public consultation**

During the second round of public consultations, the proposal for an EIA report and an addendum to the regional plan is submitted. Here too, there are great differences as regards the measures taken to involve the public. In most large-scale cases, actual public meetings are held but, typically, in minor cases the EIA report and addendum are merely discussed at a general hearing.

329 of the 726 discussion points were raised at this stage. The objections were split as follows between the three types of case:

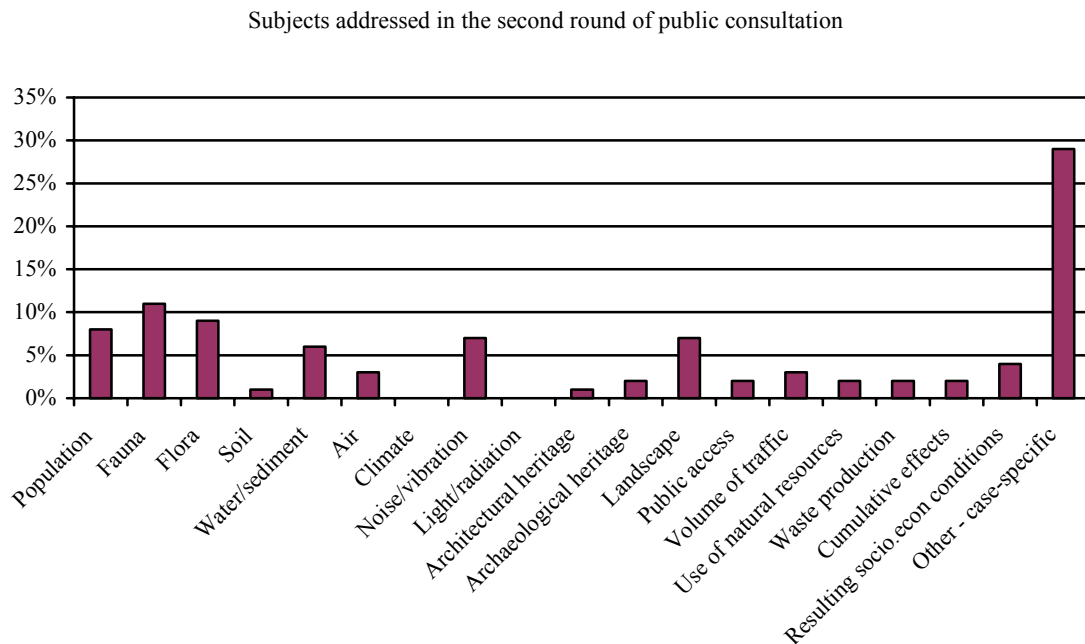
Category of case	No of objections	Average per case
Industrial etc.	59	4,9
Infrastructure	220	20
Livestock	50	3,8

**Table 3.5 Comments received in the second round of public consultation, by category of case.**

County officials often state that the public consultation stages are important for ensuring support for projects or for fostering understanding of the need for them. Dialogue with neighbouring residents also yields benefits for applicants. It may enable a firm to improve its relations with its neighbours. In some cases, public consultations may even be seen as publicity for a firm, as a way of showing off its project, or may perhaps serve as a public show of greenness. Public meetings are also important so that people can come face to face with the authorities and the firm's consultant so that the dialogue can proceed in the best possible way.

It was often stated in the interviews held with county case officers that the public consultation stages revealed fresh aspects of the projects and that the comments received from members of the public can inspire changes to projects. The 329 discussion points raised in the second round of public consultations also reflect the "broad environmental concept", although fauna, flora and landscape are almost as prominent as they are during the first round of public consultations, cf. Fig. 3.2.

The discussion points addressed are typically raised by interest groups, individual members of the public and neighbours.



**Fig. 3.2. Subjects addressed in the second round of public consultation.**

The second round of public consultations is the most active in an EIA case, with almost 45% of all identified discussion points.

### **EIA process – final political scrutiny**

After the second round of public consultations, an administrative and political assessment is made of the objections received and a decision is taken as to whether a choice should be made between the alternatives proposed, but in most cases simply as to whether changes should be proposed to the main proposal under consideration. On this basis, it is possible to finalise the EIA report and the addendum to the regional plan and to forward them for final political scrutiny. Only 21 of the 726 discussion points were raised at this stage. Nine of them also related to complaints lodged with the Nature Protection Appeal Board after the county council had taken a political decision on the case. The subjects concerned are typically flora/fauna and air pollution and noise, presumably reflecting both the broad environmental concept in infrastructure cases and the traditional problems of noise and slurry, especially in relation to complaints concerning industrial and livestock-related cases brought before the Nature Protection Appeal Board.

The discussion points addressed are raised first and foremost by state bodies in connection with the objections and complaints, but members of the public and neighbours also play a prominent role here.

### **Summary**

As part of the EIA process, a number of factors relating to nature protection and the environment, as well as to socio-economic effects, are described and assessed. Overall, we get a

clear picture of the broad environmental concept used in EIA cases, as compared to the concept used in cases where assessment takes place solely pursuant to special legislation (the Environment Act, raw materials extraction consents, etc). All counties also said that they consider EIA to be well-suited to providing a holistic description of the cases concerned.

Looking more closely at individual types of case, however, marked differences are apparent. The broadest concept of the environment is used in infrastructure cases. This, of course, has to do with the nature of such cases, which involve factors such as smoke, noise and waste and effects on the landscape, habitats and the local population. By contrast, there is a clear tendency for a narrower concept of nature and environment to be used in industrial and livestock-related cases which does not differ greatly from the concept used for instance in relation to specific sectoral legislation. In this respect, it is fair to call for a broader basis to be used for assessments in such EIA cases; otherwise it might be fair to claim that the EIA assessment does not contribute anything new.

Changes were made in 17 of the cases prior to submission of the application, and changes were made in 33 of the 36 cases during the actual EIA process. A total of 67 changes to projects were recorded.

Most changes are made in infrastructure cases, whereas the situation for industrial and livestock-related cases is more uniform. Most changes are made as a result of public consultations. However livestock-related cases differ in this respect, as not so many changes stem from the first round of public consultations, given that the activity level at this stage was in fact rather low. However, more changes were made to livestock-related cases at the subsequent stage, where the EIA report was being written and preparations were being made for the second round of public consultations.

As regards the scale of the changes made in the various types of case, a number of major and minor changes were made to individual projects. Only in less than one-tenth of cases were no changes whatsoever made. A number of (minor) changes were made in three-quarters of the cases whilst major, or even radical, changes were made in one-sixth of the cases.

Road-building and infrastructure projects are amongst the projects to which major changes are made. In four out of five road-related cases such changes are made to routes during the EIA process. Not as many changes are made in industrial cases. Some changes are made in livestock-related cases, but they are seldom radical and the most frequent change relates to the area on which slurry is spread.

### **3.5 Content of reports**

In the previous section, we saw how EIA cases are processed by the county administrations and what sort of changes this results in both prior to submission of the application and during the dialogue that takes place as the case is processed.

In this section, we take a closer look at the contents of the reports that are drawn up. What environmental subjects are described in the EIA report, and how is this done? Do the counties assess socio-economic factors, and to what extent is account taken of cumulative effects? Lastly, we also take a closer look at the mitigating measures to which this ultimately leads.

### **Description of consequences in EIA reports**

EIA reports describe the environmental and other consequences which the planned project is likely to have. Such descriptions are meant to be "holistic", as they seek to provide a very wide-ranging picture of the effects of a project. They will therefore typically include both traditional environmental topics, such as natural habitats, landscape and biodiversity, as well as socio-economic factors.

The analysis was based on the list of subjects contained in Annex 4 to the EIA Directive. Below, we look at the environmental subjects that are addressed in EIA cases and then take a closer look at the extent to which these are considered to be significantly affected.

The frequency with which the different subjects are described is indicated in Figs. 3.3 - 3.5 in the following section, which also analyses the statements as to which subjects were considered to be significant.

In the 12 industrial cases, all the potential environmental subjects which may be affected are described, albeit at varying frequencies. Water, soil and air are most frequently described, but flora/fauna, transport, landscape and culture also feature frequently. Lastly, the effects on the population are described in a little under half of the cases.

In the 11 infrastructure cases, the most striking difference in relation to general cases is that flora/fauna occupy a key position, whilst culture, landscape and socio-economic factors are also described relatively frequently. This, of course, has to do with the nature of such cases, as often a number of landscapes and habitats are being sliced through or built upon, and the consequences for neighbouring residents and the local community are considerable merely by virtue of the scale of the project concerned.

In the 13 agricultural cases, the picture is slightly different from that in infrastructure and more general cases. In the material we gathered, soil did not appear as an environmental factor which could be affected by agricultural production. Soil was thus perceived solely as a medium for cultivation and not as a "recipient" which could be affected for instance by pesticides, accumulations of phosphorus, etc. Groundwater however features in all cases. Flora and fauna also feature frequently, and it is interesting that in many cases there is also a description of the effects which changes in farming practices might have on transport.

Assessment of socio-economic effects has, for all three types of case, been loosely described as one of several types of effect. However, it is worth singling such effects for further analysis because, together with "population", it is the only one which falls outside the scope of nature and environment. The first question is: how are such factors to be assessed? According to the text of the Annex, this should be a "*description of the socio-economic conditions which could result from the effects on the environment*". It is immediately obvious that socio-economic factors are defined here as secondary effects which are a product of primary effects on the environment and hence are not socio-economic factors which derive from the project as such. It ought to be stressed that descriptions and assessments of the type referred to above were not found in the material we analysed! In all cases, socio-economic factors were defined as being immediate socio-economic effects - if they were described at all.

Socio-economic factors were described most frequently in the context of infrastructure projects, where they included employment, jobs/business, increased trade, nuisance/accidents, traffic and

noise. Socio-economic effects are described in about half of all EIA cases, where they include employment, the project's benefits for business, its potential for creating more or less traffic, for reducing personal injuries and for reducing noise in urban, but more often rural, areas. Socio-economic effects were addressed only in two of the 13 agricultural cases, where there is merely a reference to future changes in the structure of farming.

### **Assessment of the significance of the effects**

After analysing the environmental aspects that were considered to be affected according to the EIA reports, an assessment is made of the project's short-and long-term effects on those aspects. This is based on the analyses we have presented above, although in this case the number effects considered being significant is indicated.

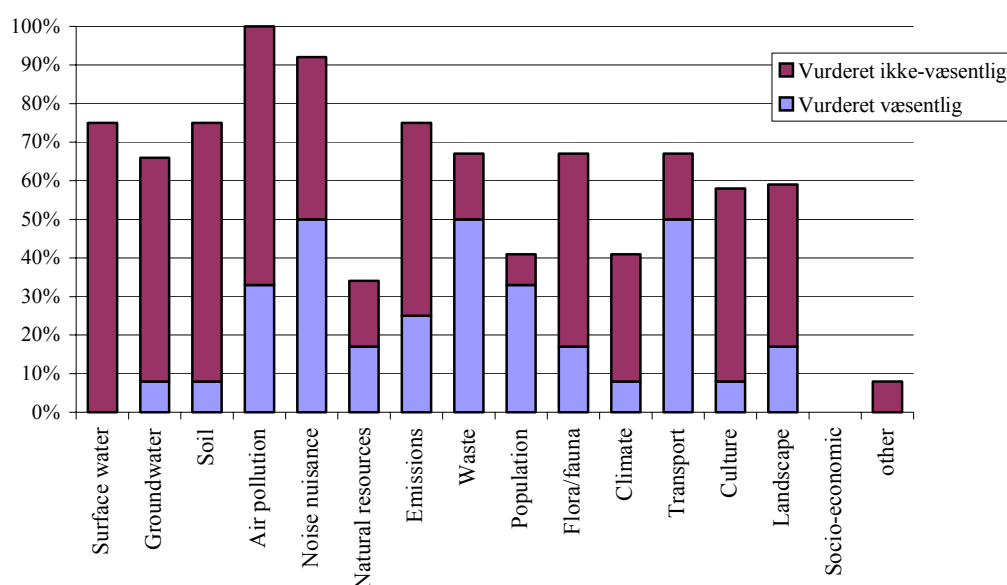
Set out below is an analysis of the significance of the various effects, again including socio-economic effects. However, it is very difficult to decide whether such effects are assessed as being significant or not, for they are often only described. In some infrastructure cases, it is stated for instance that roundabouts result in increased traffic but fewer injuries. But in almost no cases does the description make it possible to assess whether that is a significant factor or not. Often in the context of socio-economic effects, both positive and negative effects are described, but no attempt is made to assess their relative significance.

In the 12 industrial cases, we saw that noise and air pollution were frequently described effects together with surface water and groundwater, and emissions and waste. However, it is mainly noise and air pollution and waste that typically are considered to be significant effects, cf. Fig. 3.3. Neither in the case of groundwater or in the case of surface water is there considered to be a significant amount of significant effects, presumably because for these "industries" groundwater was mainly seen in the context of "accidents", and surface water is in most cases dealt with using existing waste water systems and waste treatment plants.

If we look at the broader concept of the environment, we typically find that cultural aspects and landscape, flora and fauna and transport aspects are frequently described. In most cases, however, effects described in relation to this broader concept of the environment are considered to be less significant. Only for transport aspects are significant effects more frequent, typically as a consequence of increased traffic.

For most of these projects, the effects are seen as "a drop in the ocean" and are not considered to be significant. In none of the cases was an assessment made of the cumulative effects.

### Assessment of significance in industrial etc cases

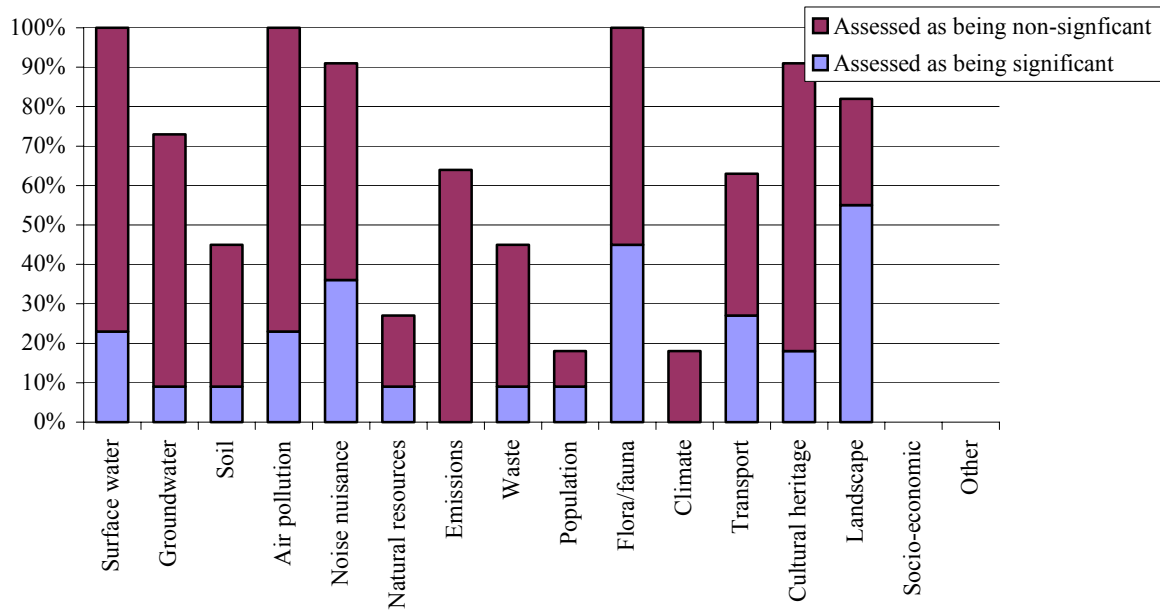


**Fig. 3.3 Environmental factors assessed as being significant in industrial etc cases.**

The picture differs slightly with regard to infrastructure cases, cf. Fig. 3.4. Once again, far fewer effects are deemed to be significant than are actually described. But the pattern is slightly different. Once again it is air and noise pollution, as components of the narrow concept of environment that are most frequently assessed as being significant, but surface water also features as being significant. This is obviously due to the fact that the waste water problem is different in this context. As there are no waste water treatment facilities which can be used, the drainage of water from road surfaces is a problem which needs to be resolved at the same time as the infrastructure is built.

However, in infrastructure cases, the broader concept of the environment is much more in evidence than in other types of case. Whereas, roughly speaking, it was components of the narrow concept of the environment that were most frequently regarded as being significant in other cases, the opposite is true of infrastructure cases, where it is in particular landscape, flora/fauna and transport that are considered to be significantly affected. This of course has to do with the nature of the cases, for in particular roads which cut across a landscape have far-reaching effects on the latter and on the many natural habitats which they encroach upon. Flora/fauna and landscape are thus the environmental components that are most affected.

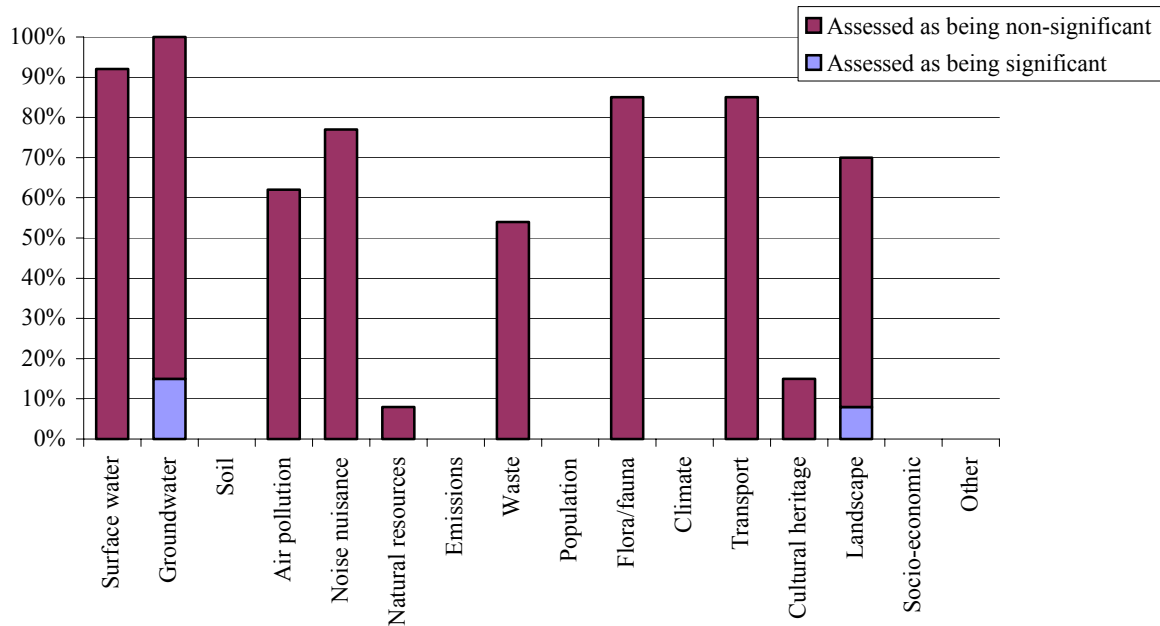
### Assessment of significance in infrastructure cases



**Fig. 3.4 Environmental factors assessed as being significant in infrastructure cases.**

In the case of agriculture, the situation as regards the assessment of significance is very different from that found in relation to the other two types of case. In agricultural cases, it is extremely unlikely that the effects described will also be assessed as significant, cf. Fig. 3.5.

### Assessment of significance in livestock-related cases



**Fig. 3.5 Environmental factors assessed as being significant in livestock-related cases.**

In infrastructure and industrial cases it may be seen that about one-third of the effects described are subsequently assessed as being significant. In agricultural cases, however, less than 4% of the described effects are subsequently assessed as being significant. There may be many reasons for this. It may be because agricultural cases are small-scale, or are perceived as such, or that the added pollution is regarded as insubstantial in relation to the large amount of nitrate and ammonia pollution that already exists in groundwater, surface water and sensitive habitats.

### Mitigating measures

After the various types of emissions have been described and the effects on the environment have been assessed, the next step in the EIA report is to adopt a position on whether mitigating measures need to be taken in respect of the project concerned. Mitigating measures may take various forms, ranging from conventional treatment plants and noise barriers to the use of cleaner technologies and instructions concerning the operation of installations and the keeping of records etc. which may help to prevent adverse effects.

One question frequently raised with regard to mitigating measures is whether they merely include reactive end-of-line or end-of-pipe measures which "mitigate" existing emissions and effects or whether they also include "cleaner technologies" which by their nature are preventive and so ensure that pollution does not occur in the first place. The vast majority of mitigating measures identified in this survey were actually reactive measures. In very few cases were cleaner technologies proposed, and on a few occasions, in relation to industrial cases, it was proposed that an "action plan" be drawn up concerning the introduction of cleaner technologies in future. The cleaner technology concept has not found its way to any great extent into EIA cases, despite the fact that it is a key concept of other rules to which industry is subject.

The number of mitigating measures vary somewhat between the three types of case. As Table 3.6 shows, the number of mitigating measures ranges from 2.2 per agricultural holding to 5.7 per infrastructure project, and from 0 in a number of cases up to 11 in others. A total of 134 mitigating measures were identified.

Case category	Number	Average per case	Interval
Industrial etc.	42	3,5	0-9
Infrastructure	63	5,7	0-11
Agriculture	29	2,2	0-5

**Table 3.6 Number of mitigating measures identified in the 36 EIA reports.**

In industrial cases, mitigating measures range from the erection of noise barriers, the laying of membrane layers to prevent groundwater pollution, the fitting of filters to prevent air pollution and the planting of vegetation to changes in the siting of an installation. On average, 3.5 mitigating measures per case are recorded. Looking at the reasons given for requiring mitigating measures, it is surprising that a large proportion of them are not justified by the fact that it has been pointed out that significant environmental problems would arise. In actual fact, significant effects on the environment are given as the reason only in half of the cases where mitigating measures were ordered to be taken.

In the case of air pollution and noise, which are precisely those effects which were most frequently assessed as being significant, there is, as expected, a high degree of correlation between an environmental problem being classified as significant and the requirement to take

mitigating measures. Surface water and groundwater, however, are often described but are not assessed as being significant, so as to warrant one or other form of mitigating measure. The reasons for this are probably twofold. The usual line of argument is likely to be that something has been assessed as significant and therefore a mitigating measure is required. But there are examples where counties have, in their assessment as to whether an effect is significant, concluded that "this is not significant as we impose this or that mitigating measure". On the other hand, it may also be argued that even where counties have assessed an effect as not being significant, they do in some cases require mitigating measures to be taken, because "this is what is done in this type of case". In connection with waste water licenses (waste water treatment plants), environmental permits (filters, noise-barriers) or road-building (fauna crossings), it is common to demand this even if the environmental problem in question is not assessed significant.

In industrial cases, there is also a clear tendency for mitigating measures to be required in relation to the types of effects which relate to the narrower concept of the environment, i.e. smoke, noise and manure more than in relation to the broader concept of the environment. 71% of the mitigating measures (30 out of 42) relate to the narrow concept of the environment.

In infrastructure cases, mitigating measures range from the erection of noise barriers to the laying of membrane layers to prevent groundwater pollution, the fitting of filters to prevent air pollution, the planting of vegetation and changes to the siting of the installation.

It is for infrastructure cases that mitigating measures are most frequently required, in particular in relation to surface water (measures to control road run-off), noise (noise barriers), flora/fauna (fauna crossings) and landscape (planting of vegetation). There is a balance between mitigating measures warranted in relation to the narrower concept of the environment and those warranted in relation to the broader concept of the environment (half each). In infrastructure cases, the fact that the environmental effects concerned have been assessed as significant is cited as a reason in respect of only 43% of the mitigating measures.

In agricultural cases, mitigating measures range from manure management systems to bans on the spreading of manure in certain sensitive zones or in areas on the fringes of vulnerable habitats. Moreover, with regard to the landscape, it is often required that vegetation be planted, especially around slurry containers, mainly for aesthetic reasons, although in one case the reason was that a hedgerow would have the effect of filtering ammonia out of the air. Mitigating measures are required less often in agricultural cases than they are in infrastructure or other cases. They are required most often in connection with air pollution (manure management systems), groundwater (manure management and bans on the application of manure), and landscape (planting of vegetation around slurry containers). Where mitigating measures are required, there is seldom any link to the fact that the environmental effects concerned have been assessed as significant in the report.

The reasons cited for 69% of the mitigating measures which were ordered to be taken concern environmental effects which relate to the narrower concept of environment, i.e. those which we saw in industrial cases. On the one hand, this shows that, in terms of regulatory approach, agricultural holdings are dealt with like businesses, as the focus is on substances and materials which are familiar from general industrial cases. On the other hand, it is surprising that the broader concept of environment, especially in relation to landscape and flora/fauna, is not more dominant, given that these projects are located in the middle of the countryside. Landscape was a

factor which was taken into account in five of the 13 cases. Flora/fauna was stated to be significantly affected in 85% of the cases, but only in one case were mitigating measures required. It is therefore clear that EIA cases relating to agriculture display an inherent weakness when it comes to using the broader concept of the environment and the relevant mitigating measures which could be required.

## **Summary**

The environmental subjects described in the EIA reports encompass the whole range of subjects set out in Annex 4 to the Directive. Use is thus being made of the broad concept of the environment, although the situation does differ from one type of case to another. As far as definite shortcomings are concerned, it may be pointed out that only scant attention is paid to socio-economic factors and cumulative assessments almost never take place.

Obviously, not all the aspects of the environment described will subsequently be assessed as being significantly affected. But once it comes to assessing the significance of such effects, the concept of the environment becomes narrower. In industrial cases, effects on aspects of the environment which are assessed as being significant are virtually all "ordinary and traditional" smoke, noise and waste. This could be because of the nature of the problems. But it could also be due to the fact that the right tools are not available for describing, and possibly quantifying, such effects. For instance, the effects on flora/fauna would be difficult to deal with, and it is a well-known fact that landscape analysis is a new and still undervalued field. It must be concluded at all events that the broad analytical approach taken at the start of industrial cases always gives way in the end to focusing on traditional problems which are considered to be the significant ones.

The same is true of livestock-related cases. These, too, start out using a broad approach, with a description of the whole range of aspects of the environment that could be affected, but as soon as it is time for assessing what is significant, problems are confined to traditional problems such as nitrogen in groundwater, surface water, odours and air pollution.

In infrastructure cases, significant effects exist to a greater extent in a broad range of aspects of nature and the environment. There is no doubt that this has to do with the nature of such cases. Infrastructure cases, such as road-building projects, involve both traditional problems relating to drainage, noise and air pollution and, because of their scale, significant problems concerning landscape or natural habitats. It is impossible not to use the broad concept in such infrastructure cases.

The narrow approach adopted in livestock-related cases and industrial cases affects the value of the EIA as an instrument and highlights the fact that it is important to adhere to the broad-based approach which the analyses are intended to have from the start.

After an assessment is made of the significance of the effects, the next step is generally to decide whether the project may go ahead and, if it can, mitigating measures are often imposed as a condition. As infrastructure projects are so big and their effects on the environment are assessed so frequently as being significant, it is in infrastructure cases that the greatest number of mitigating measures are ordered to be taken. The mitigating measures required for infrastructure projects are often justified on the basis of the broad concept of the environment, whereas in

industrial and livestock-related cases mitigating measures are justified on the basis of the narrow, traditional aspects of environment.

Of the mitigating measures taken, only a minority may be regarded as actual preventive measures, such as cleaner technology and good housekeeping. The vast majority of them are traditional, add-on/end-of-pipe measures. The preventive approach which is gradually becoming routine with regard to industrial production appears to have difficulties in gaining a foothold in the broader regulatory context which EIA cases constitute.

## ***4. Conclusion***

In these conclusions, we bring together the subjects addressed as part of the evaluation of EIA practice in Denmark. The evaluation has covered both screening exercises and EIA proper.

The first aim of the evaluation is to analyse and assess whether EIA practice is based on a holistic approach in conformity with the EIA Directive. The holistic approach derives from the fact that the EIA Directive is amongst other things based on the precautionary principle and prevention principle. Moreover, assessment of environmental effects by the authorities must be based on a broad concept of the environment. For the authorities, this means that a project's environmental impact must be assessed in terms of its potential effects on the environment, the absorption capacity of the natural environment, cumulative effects and socio-economic aspects. Our assessment of whether EIA practice has adhered to the holistic approach is based on an analysis of whether these factors have been taken into account in EIA practice. The role played by the different stakeholders in relation to ensuring a holistic approach is also discussed.

The second aim of the evaluation is to assess EIA's effects on the environment. This was done on the basis of looking to see whether changes were made to the projects concerned with a view to reducing their environmental impact. We also intend to make a quantitative assessment of the timing and nature of such changes. Public participation is addressed primarily in relation to actual EIA projects, whereas screening exercises are assessed in relation to public information.

The third aim is to assess the management and implementation of EIA. In this connection, we intend to illustrate some of the opportunities which EIA offers and some of its limitations.

### **4.1 Is EIA holistically oriented?**

The extent to which EIA may be described as holistically oriented was assessed on the basis of the concept of the environment which county administrations use in their EIA practice, including the account they take of cumulative effects, potential effects on environment and the absorption capacity of the natural environment. In addition, we wish to discuss EIA in relation to prevention so as to assess the proactive element of EIA.

On the basis of the cases we have analysed, it is clear that a broad concept of the environment is used when dealing with EIA cases. The county officials interviewed also acknowledge that EIA is well-suited to providing a holistically oriented description of the cases. Generally speaking, it may be concluded that EIA encompasses the description and analysis of aspects of the environment and the effects which are relevant to the cases in question. Public participation in a project helps to ensure that a broad environmental concept is used, precisely because the public's wish to discuss alternatives and environmental factors is conducive to such a broad-based

perspective. From our analysis of public participation in the EIA process, it may be concluded that members of the public ensure the county administrations adhere to the broad environmental approach, so that they must be regarded as an important source of ways of looking at, and of assessing, the case in question.

It may also be concluded in relation to county administrative guidelines for screening exercises that more than half of them use an approach which reflects the environmental concept laid down in the composite Order No. 428 and in line with the EU directive.

However, a narrower approach is taken when it comes to assessing the significance of the effects of projects on the environment. This is true both in the case of screening exercises and of EIA reports. Analysis of 96 screening exercises showed that county administrations take account of cumulative effects only in 17% of cases and that, in all cases, it was concluded that there were no cumulative effects. Moreover, specific assessment of potential effects on the environment was conducted only in 7% of screening exercises. With regard to the absorption capacity of the natural environment, specific assessment of projects' effect on protected areas was carried out only sporadically.

The narrower approach to the environment is least pronounced in infrastructure cases and most pronounced in industrial and livestock-related cases. In industrial cases, only the environmental factors covered by sectoral legislation, such as traditional aspects like smoke, noise and waste, are assessed. The same is also true of livestock-related cases. When it comes to assessing the significance of environmental problems in livestock-related cases, the approach taken is typically limited to looking at nitrogen-related problems. To a certain extent, however, the project's consequences for protected areas are also assessed. Analysis of EIA projects shows that county administrations do not systematically assess cumulative effects, potential environmental impact and cultural, environmental and nature aspects which require protection. Below we offer a number of suggestions as to why this is so.

In Denmark, the EIA was implemented by being grafted into the planning system and the traditional regulatory system. This means EIA is based on information and priorities that the planning system provides. The same time, the EIA decision is something different from decisions normally made on the individual case, because the aim is wider in EIA assessments and furthermore it can also be regulated more specifically in the form of an EIA permit.

The strength of EIA when it comes to analysing, assessing and regulating lies in its broad approach to the environment and its holistically oriented approach. However, these are also found in the planning system. It may be asked whether EIA actually contributes anything new in this respect. The planning system was designed to be holistically oriented and given the many sectors and subject areas it encompasses it should offer a broader concept of environment! The problem with the planning system in this context is, however, the knowledge which the different zones and designated areas based on is often based on information which is less refined than what would be possible by means of an EIA assessment. The EIA is based on a more local, site-specific analysis. An EIA can therefore be more accurate and in principle, though not always in practice, offers the possibility of conducting a cumulative analysis. It is precisely for this reason that an EIA can virtually never be based solely on the priorities and categories found in the regional plan. More often than not, more specific data will need to be gathered and analysed. In other words, the planning system is not finely enough meshed to pick out the natural and environmental aspects, and hence different interests, that exist in a specific area. The EIA, with

its requirement for a specific assessment based on the broad concept of the environment often reveals situations which result in more specific rules than a review based on regional planning guidelines would have done.

The broad concept of the environment is important for maintaining a holistically oriented approach in EIA cases. It ensures both that changes to projects are more broadly based and that a more holistically oriented approach is taken to individual projects. However, there are difficulties involved in using the broad environmental concept in practice. The knowledge-base for this approach is small. Many of the county officials interviewed considered that there is insufficient knowledge of cumulative effects and potential environmental impacts in different areas. If there is insufficient knowledge, it goes without saying that there will be fewer methods available for analysis and assessment. Many of those interviewed in EIA authorities would like to see improved methods and tools in relation to: (a) nitrate leaching and ammonia evaporation in livestock-related cases - especially for the assessment of cumulative effects; (2) impact on landscape and (3) visualisation. It was also pointed out that there is a lack of knowledge on the tolerance thresholds of recipients and background pollution.

From the county officials' point of view there is considerable uncertainty, in the form of insufficient data, knowledge and experience, new ways of thinking, acceptance within the organisation, etc, associated with the broad concept of the environment. They therefore have many reasons to fall back on more familiar and more easily quantifiable methods were they feel they are on safe ground.

County officials also feel considerable uncertainty as regards the aspects which it is possible to regulate by means of an EIA permit and how an EIA permit can complement an addendum to the regional plan and traditional licences and permits. This therefore gives them even more encouragement to regulate only traditional aspects of environment.

The lack of knowledge and methods for integrating the broad concept of the environment is also reflected in the planning system. Overall, the regional planning system does not accord cumulative aspects, potential environmental impact and the absorption capacity of the natural environment their due significance. Only natural and cultural aspects deemed worthy of protection are currently taken into account to a certain extent in the regional planning system. By contrast, it takes no account of cumulative aspects and potential environmental impact. When individual projects are to be assessed, it is essential to have an overall planning basis in place, but this is not the case with regard to the broad concept of the environment. It may be said that the value of EIA can only be fully exploited with regard to the broad concept of the environment when cumulative and cultural aspects, potential environmental impact and the absorption capacity of the natural environment are integrated into regional planning. In other words, integration is needed in order to ensure interplay between planning and projects.

It may be concluded that EIA assessments do not reflect the broad concept of the environment, and this means that traditional environmental concepts predominate when projects subject to EIA are regulated by means of addendums to regional plan and the system of permits and licences.

## **4.2 The environmental impact of EIA rules**

Changes were made to more than 45% of the screened projects analysed in the evaluation. About half of the changes were made before the application was submitted to the county administration. The remainder were made after the county administration received the application - i.e. after the screening process had been formally launched. The main aim of screening is to assess a project's impact on the environment, but it is also designed to ensure that the project is adapted and changed so that an EIA proper is rendered unnecessary. The fact that changes are made to almost half the projects may be seen as evidence that EIA screening achieves its aim.

The picture is more striking in the case of projects submitted for an EIA, as minor or major changes were made to over 90% of them. Only in less than one-tenth of the cases were no changes made. In three-quarters of the cases, (minor) changes are made with a view to reducing the impact on the environment. Major, or even radical, changes to cases were made to 6 of the 36 EIA cases analysed. Amongst these were route changes made to four road projects during the EIA process, and one project was implemented in such a way that it was no longer necessary to establish a gas-storage facility. The building of the gas-storage facility was very unpopular locally, and it was accepted during the EIA process that a change could be made which would render it unnecessary to build one. Radical changes were also made to the latest of these projects, which relates to Billund Airport, as a result of the EIA process. The change made to the project meant that it was possible to avoid building a new runway. It also saved DKr 350 million in addition to minimising the project's impact on the environment.

The changes made in livestock-related cases are seldom far-reaching, and the most common changes in such cases concern project size (number of animal units), the siting of buildings and the area of land on which is permitted to apply livestock manure. At the screening stage, changes are primarily made in order to minimise the impact on the environment and thereby to eliminate the need for an EIA, whilst projects submitted for an EIA are amended in order to reduce a project's environmental impact.

It does not fall within the remit of this evaluation to carry out a quantitative assessment of EIA's consequences for the environment. On the basis of the surveys carried out, it is possible to conclude that applicants' knowledge of EIA rules results in improvements to projects in environmental terms. On that basis, and given the scale of the changes made in various cases, it is clear that EIA results in a lessening of projects' environmental impact and that this is mainly achieved by means of traditional mitigating measures. The environment benefits from a large number of improvements such as reduced noise, the protection of natural and man-made environments and reduced discharges of nutrients. Improvements for the environment are achieved both before projects are submitted to the authorities and during the EIA procedure itself.

During the course of an EIA case, many changes are made to individual projects and to the preconditions which form the basis for them. Changes come about through dialogue with the authorities, as input from various stakeholders during the public consultation stages contributes ideas for possible changes to projects. Changes are also initiated on the basis of the analyses made by the counties themselves, as these provide applicants with a number of aspects on which to focus regarding their projects. In this context, the interval between the two public consultation stages is an important period. The EIA process ensures that essential dialogue takes place with applicants, and some county administrations also point out that dialogue between applicants and county administrations is the key part of the process.

### **4.3 EIA rules from an administrative perspective**

In this section, we set out to assess how EIA functions as a regulatory instrument. A distinction is drawn between screening exercises and actual EIA cases.

#### **Screening**

It is obvious that EIA screening exercises will result in changes to projects with a view to minimising their environmental impact. The screening cases analysed as part of this evaluation showed that changes are made to almost half of all projects. It is hard to provide a clear-cut picture of the reasons for the changes made, but changes are made to many projects in order to avoid the need for an EIA. There are many reasons why an applicant may wish to avoid an EIA. Firstly, the EIA process is time-consuming and will normally result in delays for a developer unless the latter employs a great deal of foresight in his planning. Secondly, an EIA case requires more detailed information from the developer, which may be very costly.

Judging from the administrative basis used in the counties and from the screening cases analysed, it must be concluded that screening is both a flexible and unbureaucratic instrument. All cases were typically decided on the basis of estimates, and screening exercises did not produce vast amounts of paperwork. In some of the screening cases analysed, it could be concluded that the material submitted with the application was rather concise. On the other hand, this means that the information supplied was not more than was strictly needed. Fundamentally, the progress of screening exercises depends on developers, and if the necessary information is available, county administrations can reach a decision quickly. To a large extent, therefore, the time it takes to reach a decision depends on the developer. If the developer wants to be sure of a quick decision, it is up to him to produce the documentation needed to show that the project does not have a significant environmental impact. It was clear from those interviewed that very few developers choose this approach.

At the administrative level, there are two challenges which need to be addressed in the future. Firstly, the assessments made by county administrations must reflect the broad concept of the environment enshrined in Annex 3 to the Directive, and hence also assess cumulative effects, potential effects on the environment, etc. This requires both further development of specialist skills and the provision of support for the authorities in terms of knowledge and methodology. The development of the planning system so that the broad concept of the environment is reflected will help to improve the framework for the assessment of individual EIA projects. Secondly, the authorities could draft decisions so that they are more comprehensible to applicants and laymen alike. If decisions are made more comprehensible, it is certain that the number of complaints will also fall. At present complaints are filed in respect of 8% of all screening exercises, which may be seen as an indication of the fact that understanding of screening is not adequate.

#### **Assessment reports**

On average, the EIA process takes 22 months to complete, but in one case it was possible to complete the work in seven months. Industrial cases take on average just over one year to complete, livestock-related cases just over two years and infrastructure cases up to 2½ years. These might at first seem to be rather long case-processing times, but they are due to the fact that the EIA process comprises two public consultation stages as well as a requirement for political scrutiny. It also takes time to produce detailed analyses which by nature are very broad-based and holistically oriented. Also, one of the bases for the process is dialogue with developers and

other interested parties, as a result of which a number of changes are often made to projects. Frequently in the case of the EIA projects analysed, processing came to a standstill because of a lack of information from the developer.

EIA for actual projects subject to EIA may be regarded as a constructive instrument, as it establishes fruitful dialogue with developers, their advisers and other interested parties. Dialogue with interested parties and developers and consultants provides input for making changes to projects so that projects do not have adverse effects on the environment. County officials are the key players in this dialogue, whereas politicians only play a small role in the various stages of an EIA case. On the basis of the material we have analysed, it may be concluded that EIA helps to provide politicians with a high-quality basis for decision-making.

The EIA process itself is marked out by a high-level of activity amongst interested parties. Such activity is most highly concentrated during the two public consultation stages, where projects are the subject of an often wide-ranging public debate. In total, we identified 725 "discussion points" in the 36 cases, and the level of activity in relation thereto is highest in infrastructure cases. In this type of case, we identified 47 discussion points on average per case, as compared with only 10 in industrial cases and 7 in livestock-related cases. More than 80% of the discussion points identified were in the two public consultation stages. For that reason alone, it is necessary to underline the importance of the public consultation stages.

Often, many of the subjects raised by members of the public are the same as those selected by county administrations, but some of them also provide a new insight and new ways of looking at situations which county administrations can use to advantage at subsequent stages of the EIA process. The county administrations must in any case adopt a position on the comments received at the public consultation stages.

The approach to the first round of public consultations (scoping) varies greatly depending on the type of case. In livestock-related cases, the project is presented only in the form of a leaflet and an announcement, whereas for large-scale infrastructure cases larger amounts of wider-ranging material is often produced for discussion. A more detailed and specific project description is quite normal in infrastructure cases. The greater the detail in which cases are submitted and described, the greater the public participation this appears to result in. Comments from the public are a crucial form of input at the scoping stage, as this is the stage at which the objectives and delimitations of the project are addressed. It is therefore important that greater consideration is given to the form of public consultations than is the case today. A mere public announcement is possibly not a sufficiently effective means of getting the public involved early on. The consequence of a lack of public debate during the first round of public consultations is often that far more comments are received during the second round of public consultations.

Our evaluation shows that the concept of the environment used gets narrower as the EIA process advances. The broad concept of the environment is adhered to with regard to the description of the environmental impact, but there is a tendency for case officers to revert to using a more traditional approach for the purpose of assessing the environmental impact. Consequently, the regulatory treatment of the project is also confined to the traditional approach. It may also be noted that the cleaner technology concept has found it hard to gain a foothold in EIA cases, in spite of the fact that it is gradually becoming a everyday aspect of the regulatory approach to industrial production.

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