

# **Are Screening Processes effective Instruments and What are the Environmental Benefits?**

Associate Professor, Ph.D. Eskild Holm Nielsen<sup>1</sup>, Professor, Ph.D. Per Christensen and Associate Professor, Ph.D. Lone Kørnøv, Department of Development and Planning, Aalborg University

## **Abstract**

Environmental Impact Assessment (EIA) is the process by which the effects that proposed projects are likely to have with respect to a number of environmental criteria is evaluated. Screening is an activity carried out in advance of an EIA to determine whether, in fact, it is necessary to undertake a full assessment.

Screening processes in accordance with EU legislation were implemented in 1999 in Denmark. Previously, screening procedures were non-existent in Danish practice. During the last couple of years, the counties (county councils) in Denmark have conducted around 2000 screening decisions for project categories listed in Annex II of the EIA directive. Approximately 3% of these decisions lead to an EIA-process in accordance with Article 5 and 10 in the EIA-directive. The Ministry of the Environment has asked Aalborg University to conduct an evaluation of the Danish experience with EIA.

Among other aspects, the evaluation focuses on the screening process. It includes a documented study of 98 screening decisions combined with interviews with the developer and consultant for each project. Through these investigations, we are able to analyse the following topics for screening decisions: the environmental focus, the extent to which the process is in compliance with EU legislation, whether changes are implemented in order to avoid an EIA-process, and the environmental impacts related to the modification of the projects.

In this paper we will analyse the extent of changes due to the screening process, and also how radical they were. Thus, we have identified how many projects were changed due to the existence of the EIA regulation. It was also possible to determine, whether the changes were implemented before or after the application being submitted to the authorities. Other questions that will be considered are: What kind of environmental considerations do the changes reflect? And are they in line with EIA's holistic environmental approach?

On the basis of our evaluation, we will discuss the efficiency of screening processes as a regulatory instrument. Are screening processes a cost-effective instrument? To what extent are the environmental benefits for this large number of projects covered by the screening regulation? Does the screening regulation ensure that all projects with a significant impact are identified?

## 2. Evaluation of EIA in Denmark

Since its introduction in the Danish planning system in 1989, the EIA system has been discussed by the public, national government, universities and, importantly, county authorities, who are the responsible for implementation of the rules.

Circumstances are different today than they were in 1989, and they will of course be different ten years hence. Naturally, therefore, EIA regulation has developed and it continues to do so. Nevertheless, the EIA rules are here to stay and, because it is an approach with strong holistic elements within its methods, on which the statements rest, it is important to identify the strengths and weaknesses of the rules and practice of EIA.

Based on this, Aalborg University has investigated the existing EIA practice in Denmark with the overall objective of being able to evaluate experiences. The investigation, which was conducted during the period 2001 – 2003, was funded by the Ministry of the Environment. Box 1 shows the different elements and investigations within the evaluation. This paper is based upon results from investigations 3, 4, 5 and 6. We will attempt to analyse how the Danish authorities have been dealing with EIA legislation. We will also analyse how projects have been changed, both before submission to the authorities and during the screening process. Finally, the environmental benefits based on these changes will be discussed.

### **Experience and competence:**

1. Investigation into experience and competence amongst officials, politicians and consultants.

### **Quality objective and quality assurance:**

2. Investigation of politicians and officials criteria for: a) good quality of EIA statement and EIA process and for b) quality assurance.

### **Indirect and direct environmental effects:**

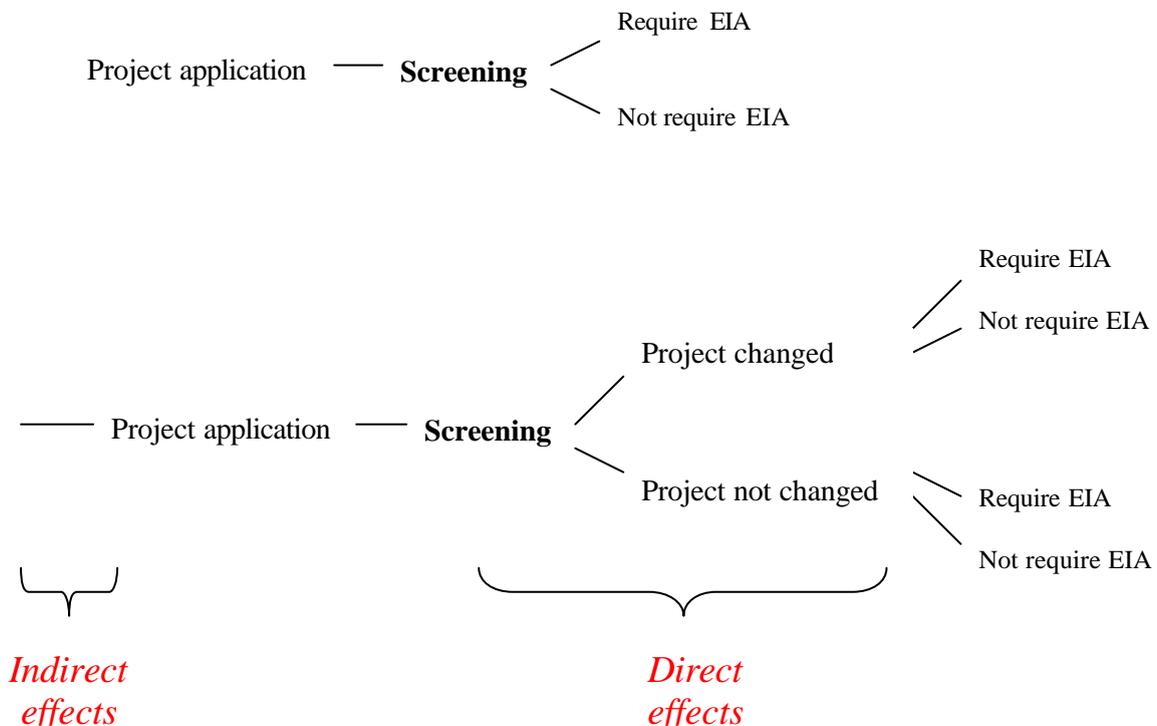
3. Investigation of the environmental impacts because of EIA - based upon:
  - The magnitude of changes in the project design;
  - The time for the changes;
  - The characteristic of the changes.
4. Investigation of whether the intentions in the EIA Directive on a holistic approach are fulfilled – based upon:
  - The environmental concept in the EIA process, in the environmental statement and in the approval/permission;
  - Assessment of cumulative impacts;
  - Assessment of indirect socio-economic impacts.
5. Investigation of the different actor's participation in the EIA process, their influence on changes in project design and in fulfilling the holistic approach.
6. Investigation of the administration of the EIA rules.
7. Investigation of the potential for developing the future EIA work and EIA regulation.

### **Box 1. Overview of the content of the evaluation in Denmark**

The empirical basis for this paper is a review of screening decisions plus interviews with officials, consultants and developers. From the 12 Counties in Denmark, we have received and reviewed 98 screening decisions, including annexes and other relevant material.

In Denmark, the threshold criteria have so far not been used in order to reduce the number of yearly screening decisions. At the moment the government is discussing the introduction of a threshold for livestock projects. The adoption of threshold criteria will lead to fewer screening decisions. Meanwhile, they must be formed in such a way as to fulfil the criteria listed in Annex 3 of the EIA Directive. In this paper we will illustrate the changes to projects due to the screening process. It is interesting, therefore, to identify the environmental impact of changing the projects.

In figure 1, we have tried to outline the principle assumption of the screening process.



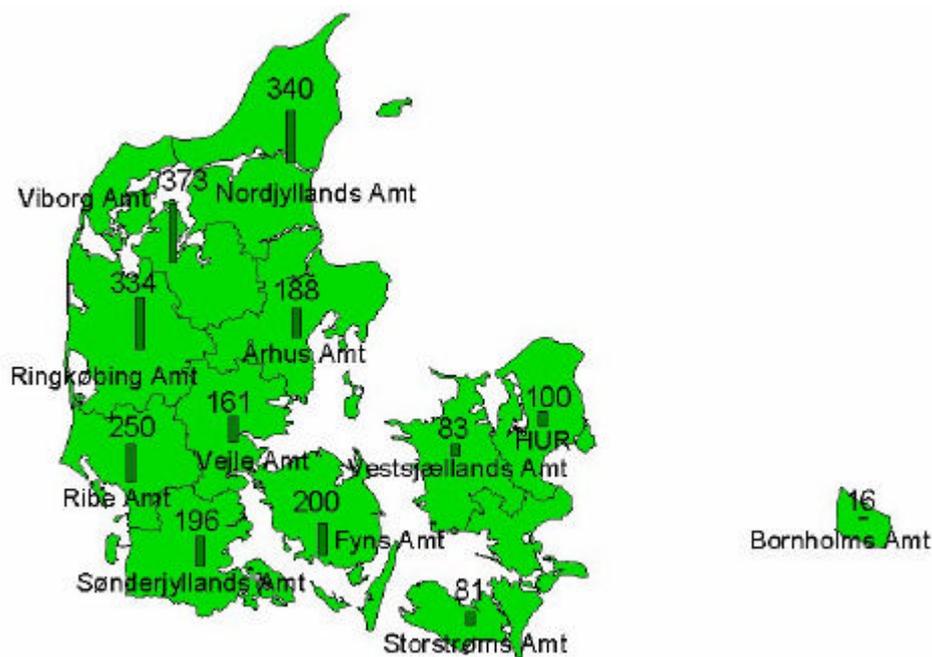
**Figure 1. Different assumptions in the screening process.**

Investigations of the screening process have been designed in such a way that we have been able to identify changes both before and after the project application was submitted. Changes to the project that are made before submission are in order to avoid the project having to undergo an EIA process. In other words, it is of benefit to the developer to optimise the project environmentally at that stage. If the screening process identifies significant environmental problems, then changing the project can sometimes eliminate them.

This paper will try to deal with both the screening process and also the decision, as it is an independent regulation instrument. The purpose is to identify the outcome of screening activities.

### 3 The Screening Process in Denmark

In Denmark, statistics on screenings are limited, but in our evaluation we have identified the number of projects subjected to screening processes. In 2001, 2.322 projects had entered into a screening process. Intensive livestock projects are the dominant (88%) because of the absence of lower threshold values. Every livestock extension of farms will therefore be subject to a screening process. The Danish Government is currently working on a proposal for criteria on intensive livestock projects.



**Figure 2. Number of screening processes initiated in Danish counties in 2001.**

According to our interview with officials in the 12 counties, the type of projects that were screened varied significantly according to the characteristics of an area. In the western part of Denmark, for example, almost 100% of projects are intensive livestock, while the corresponding proportion for the region of greater Copenhagen is only 10-20%.

Denmark has implemented the screening aspect of EIA strictly in accordance with the directive. Thus, Danish legislation operates with exactly the same categories of projects as the directive. Within the national legislation, the Minister of Environment has delegated the responsibilities for the screening process to the counties. They are expected to conduct the screening decisions of the projects listed in Annex 2 of the EIA directive. The counties are the regional planning authorities and are therefore the appropriate bodies. Regarding other environmental regulations, the municipalities are the responsible authorities for many of the projects that are subject to the screening process. In principle, the developer is obliged to send the application to the county, but the municipalities are responsible for informing the developer about the requested screening decision.

It is our assessment that only animal stocks projects have all been subject to screening processes. This assessment is based upon the high number of intensive livestock projects and on the fact that pollution from farming has been an ongoing public debate in Denmark for twenty years.

In our investigations we have analysed the knowledge of rules for EIA screening exhibited by applicants and the consultants. Thence, 77% of the consultants and 65% of the applicants were aware of the rules. In order to cover all Annex II projects, it is important that the municipalities are aware of the rules and make sure that the projects they know of are referred to the county. The fact that projects other than livestock projects only cover 12% of the total number of screenings, however, indicate there is potential for an increase in referrals. It is our perception that many more industrial and infrastructure projects should be integrated into a screening process.

The Ministry of the Environment has tried to evolve national regulations and guidelines in such a way that the authorities use as few resources as possible. In principle, the developer is obliged to pass on all the required information. The overall idea is that the authorities must conduct the assessment based on existing information and that provided with the application. If all necessary information has been provided, then one working day is judged sufficient time to handle the decision.

In summary, the counties do the following in order to fulfil the screening aspects of the EIA regulation:

- Assess whether a projects is covered by Annex 2 of the EIA-directive.
- Assess whether a project has an environmental impact that justifies conducting an EIA.
- The decision (assessment) is based on an assessment of the environmental impacts according to the following criteria:
  - Characteristics of the project;
  - Location of the project;
  - Characteristics of the potential impacts.
- Publish the decision is and make all documents available to the public<sup>1</sup>.

By including landscapes with a historical, cultural or archaeological significance, screenings in the EIA context have challenged the authorities with a broader approach to the environment. Cumulative and potential environmental impacts have also presented a similar challenge.

Through interviewing the officials responsible for screening decisions in each county, we have been able to identify the aim of the screenings according to them. These are:

1. Change projects in order to reduce the environmental impact;
2. Assess whether projects will mean significant environmental impacts;
3. Comply with EIA regulation.

---

<sup>1</sup> Within 4 weeks any member of the public can challenge a decision by making an appeal to the Nature Conservation Appeal Board. The Board can then choose whether to uphold the decision or revise it.

Almost all the officials have explicitly emphasised that they try to change projects in order to prevent pollution or to reduce it by implementing abatement technologies. Besides reducing the environmental impact, the purpose of making changes is also to avoid an EIA statement.

The developer has an interest in making changes to prevent or reduce pollution in order to avoid an Environmental Impact Assessment (EIA). An EIA is both time-consuming and costly for the developer. Rather than being part of this process, then, it is often more efficient to change the project to avoid or minimise environmental impact.

*"If in the screening process you can identify a particular problem and you can also identify solutions for it - such as reducing odour emissions or changing the production process - this is the aim of the administration."*

(A Danish official)

### **Do the authorities involved in the implementation process cope with EU guidelines?**

In our evaluation we have analysed 98 projects, which have been the subject of screening processes: 55 livestock projects and 43 other projects, which all cover other categories than livestock in Annex II in the EIA directive. These projects have been analysed in terms of the use of the systematic approach and how the decisions have been disseminated to the public. Furthermore, we have analysed, whether the cumulative effect of other projects, potential impacts, and the absorption capacity of the natural environment have been assessed in the decisions. Analysing these issues provides an indication of whether the authorities operate with a broad concept of environment in practice. Such issues go beyond traditional environmental regulation. They represent the most challenging aspects for the officials and thus have been chosen for our analysis.

Eight of twelve counties have developed checklists for assessing environmental impacts. Only three of these checklists reflected Annex 3 of the EIA directive, however. In these three counties, the checklists are used for a variety of projects. The other five checklists cover only aspects on location and are only used for livestock projects. It can be concluded that only three out of twelve counties have tried to develop an approach with the broad environmental concept in accordance with the EIA directive. Within the other nine counties, it seems, they deal with the different environmental aspects randomly or intuitively. In the following discussion, we analyse how the counties have dealt with the issues that go beyond traditional regulation.

Only in 17% of the analysed decisions have the authorities included the cumulative effect of the project with other projects in their assessments. The assessments are primarily qualitative. In a few cases, though, they are based on calculation. If assessment of cumulative effects is included at all, it is via a rough estimate. Farming in Denmark is very intensive and it is therefore very relevant for livestock projects to assess cumulative effects. However, this was only actually calculated in 8% of the projects. To illustrate how important assessing cumulative effects is, specifically in agricultural projects: environmental loads of nitrogen are very high in most rural areas and therefore often a threat to the groundwater (Agger et al., 2002); assessing a project in isolation would not give a meaningful indication of the extent of this threat.

In total, 36% of the projects have assessed potential impacts, though these were mainly carried out on a qualitative basis. The potential impact has been calculated in only 7% of cases, all livestock projects. Calculations have either been on nitrogen emissions into the groundwater or on the

nitrogen deposits into environmental sensitive geographical areas. In four out of twelve counties, the potential impacts are included in the developed checklists. The assessment can be said to be a rough estimate, as in most projects completing the checklist is the extent of assessment. From the documents we have seen, it seems as if filling in the blanks is essentially based on common sense. Furthermore, we cannot ascertain from the documents, on what basis the blanks have been filled in. There is no indication of the kind of environmental impact that has been considered. It can be concluded that in almost two thirds of the projects potential impacts have not been included, while in 7% they have been either calculated or superficially considered.

The absorption capacity of the natural environment covers areas of nature, cultural and environmental interest, which are considered valuable by the planning authorities. In only 27% of the analysed projects is the absorption capacity of the natural environment mentioned in decisions. Again the three counties who have developed a checklist according to Annex 3 in the directive are among those who have considered this theme. Filling in blanks on the checklist has been the dominant way of assessing the absorption capacity of the natural environment. Only in a few cases have the authorities made specific assessments of the impact within the affected area.

In two thirds of the projects, officials have assessed the protected areas to be affected. In less than half of these incidents, however, have the authorities made a specific estimate of impact. In relation to the appeal board, the authorities must make an actual assessment of the affected area in order to comply with Danish EIA legislation.

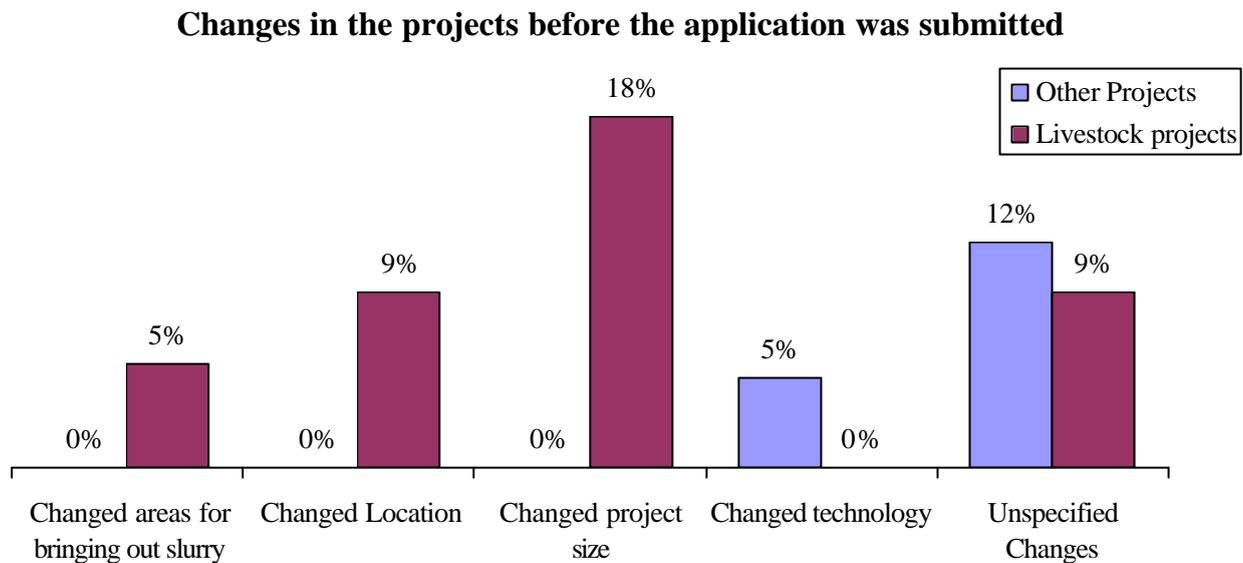
For a layperson to understand and to consider the screening decision of a project the authorities must provide sufficient information. This must include information about the characteristics, location, and environmental impacts of projects. Furthermore, the authorities must inform the public about the delimitations that have been used in the assessments. For half of the analysed projects, the authorities did not provide the reader with enough information. Decisions documentation comprised less than two pages with insufficient attention given to adequate description. Such documentation is too brief to give the reader the relevant information as per Annex 3 in the Directive.

It must be concluded that, so far, the Danish authorities have not developed practices that comply with the directive. They need to work more systematically, and must improve with regard to including cumulative and potential impact aspects. Moreover, they should conduct specific assessments of the impact in geographical sensitive areas that are affected by a project. In the following section, we will analyse, whether the practices of the counties have changed the projects as well as the environmental benefits from any changes.

#### 4. Changes in projects

Changes in 98 projects that were made prior to the submission of the application are analysed in order to give an indication of the indirect effect of EIA regulation. Thereafter, we analyse those changes that have taken place after submitting the application. The analyses are based on interviews with the developer, his consultant and the officials responsible for screening decisions within each county. Specific changes in projects are identified via interviewing the developer and his consultant.

Regarding livestock projects, 35% were changed before the developer submitted the application. For other projects, 16% were changed. In total 26 projects were changed before submission. Figure 3 presents the different changes.

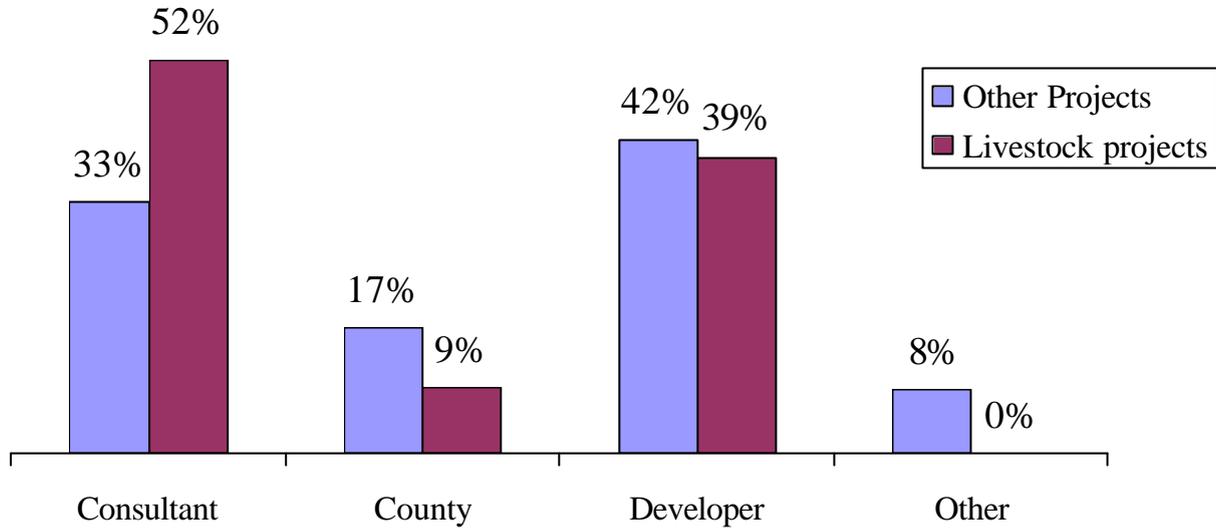


**Figure 3. Changes in 55 livestock projects and 43 other projects before submission**

Within livestock projects, 23 changes have been identified in 19 projects and 7 changes have been identified within other projects. In total 27% of the projects were changed before submission. A disproportionate number of changes among livestock projects were identified, however. Our interviews were made more than one year after the county had conducted the screening. As the design of the project took place even longer before that, we consider the number of changes identified to be on the low side. In other words, certain changes had probably been integrated into projects so long ago that the developer and the consultant either failed to recall them or no longer regarded them as changes.

The interviews gave us an opportunity to identify who had suggested the changes of the project. The most active within the processes were the developer and the consultants, who together suggested approximately 83% of the changes, equally divided between them. In the other cases, the official from the county suggested the changes. These findings were expected as developers and their consultants are the dominant players in the phase before a project is submitted.

### Who suggested changes before submission?

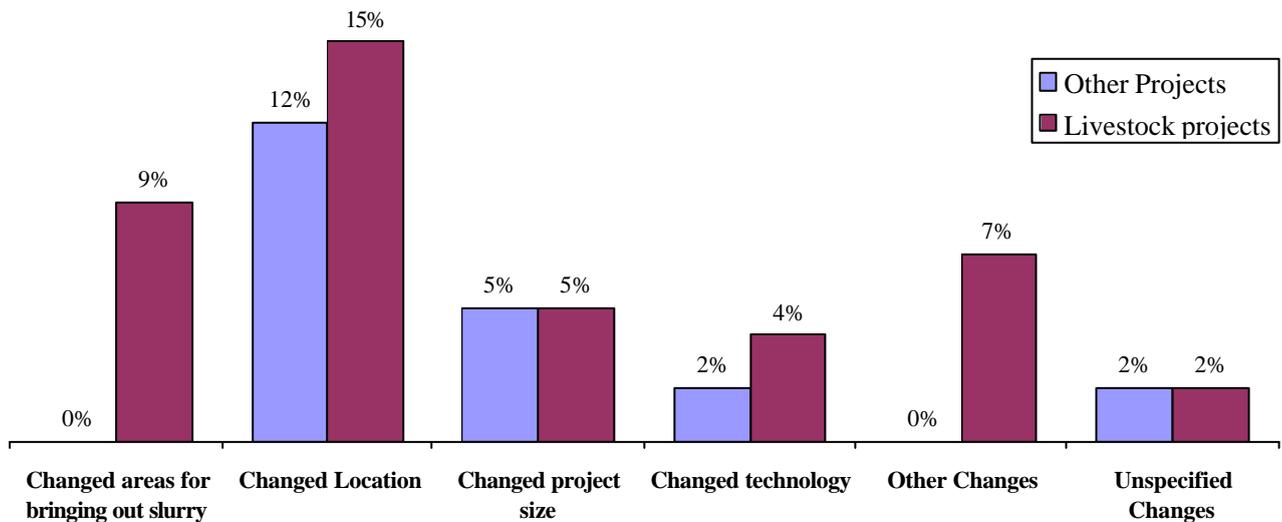


**Figure 4. Actors who suggested changes of the project before submission**

Between livestock projects and other projects, there are no significant differences in the identity of actors suggesting changes.

After projects have been submitted to the authorities, we have identified the changes made by conducting interviews with the developers and the consultants. In total, 26% of the projects were changed after submission. Once again, most of the changes (29%) were associated with livestock projects, whereas 21% were associated with the other projects.

### Changes in the projects after the application was submitted



**Figure 5. Changes in 55 livestock projects and 43 other projects after submission**

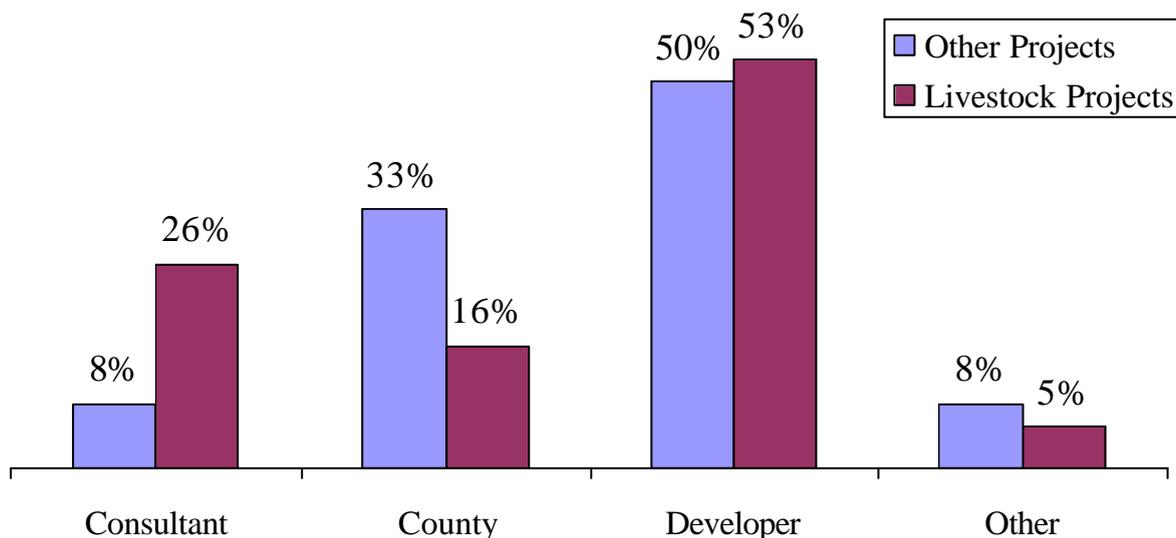
The number of changes in the project after submission of the application is slightly higher. The dominant change is within the location of the project. In two cases, the projects were determined, being more radical changes

The changes before and after submission of the application were more or less the same. They covered basically incremental changes. Changes in livestock projects are for example: the areas for bringing out slurry are changed due to environmental impacts; another location; the size of the project; and changed technology to cover the handling of slurry and ventilation. For livestock projects, the changes were most frequently in size. The existence of a threshold, which is the case with livestock, gives the developer an incentive for avoiding an EIA-statement. Therefore, developers often attempt not to exceed the threshold.

Officials were of the opinion that many farmers have optimised their planning of crops on different fields in order to minimise the emission of nitrogen into the groundwater. Neither developers nor consultants mentioned these changes to us, however. The explanation for that omission may be that farmers do not consider the planning of crops as part of the project. Rather, it is probably considered a way of managing the farm. In the assessment of the impact, the planning of crops is only included when officials estimate or calculate the emission of nitrogen into the groundwater.

After submission, the developers are still the most active party, but the officials play a greater role than the consultants. This must be related to the fact that the screening process is formalised after submission.

### Who suggested changes after submission?



**Figure 6. Actors who suggested changes to project after submission**

In 50% of case it is the developer who comes up with suggestions for changes, while in approximately 25% of cases it is the officials who do so. The role of officials may be slightly underestimated due to fact that the developer may be “too proud” to admit that someone other than

him- or herself suggested the changes. In fact, changes are often a result of a dialogue between the involved parties and it is often difficult to identify who initiated the idea.

Some of the officials claimed in the general interview that they were reluctant to give suggestions because it could be considered as a demand by the developer. This means that it can be difficult to combine the roles of supervising and advising the developer and at the same time being responsible for approving the project (Smink, 2002).

If compared to Figure 4, which presents whom suggests changes *after* submitting the application, it appears that there is a tendency towards the counties being less active in livestock projects than in others before the submission of the application. Meanwhile, the opposite is true for the consultants.

	<i>Projects with changes before submission</i>	<i>Projects with changes after submission</i>	<i>Total number of project with changes</i>
<b>Livestock projects</b>	19	16	29
<b>Other projects</b>	7	9	15
<b>All projects</b>	26	25	44

**Table 1. Number of projects with changes in 55 livestock projects and 43 other projects**

In total, 45% of the projects have been changed in relation to the process of screening, and in some of these projects more than one change have been identified. There is no significant difference between the numbers of changes before and after the projects being submitted. Overall, 53 % of the total livestock projects and 35% of other projects have been changed. In general, it seems that livestock projects are more frequently changed than those in other categories.

For all the projects analysed, the identified changes must be considered as modifications to the exiting technology. Though the majority of changes have been preventive, a few have involved abatement technologies. It is our assessment that the existence of an EIA screening instrument serves to ensure that projects are optimised and adjusted from an environmental point of view. Apart from the two livestock projects identified, radical changes have been absent from almost all projects. Based on the interviews, it is our view that changes were implemented in order to comply with EIA regulation.

According to the consultants and developers, changes in projects will lead to less pollution than the project as originally planned. Changes in livestock projects will mean a reduction in nitrogen emissions, less impact on nature-protected areas and landscapes, and minimisation of environmental impacts on neighbours. In numbers, the screening of livestock projects is approximately 2000 per year. Meanwhile, EIA livestock projects total around 30 a year. Due to the large difference in numbers, some of the counties have noted that the screening process and the decisions have a higher impact than the few EIA livestock projects. Even though the changes are incremental, taken together the projects will provide a significant environmental benefit compared to no regulation. In general, environmental benefits from other - non-livestock - projects reduce noise pollution. These projects will have less impact on sensitive landscapes.

From a governance perspective, changes to projects leads to fewer decisions where the authorities assess that a project must undergo an EIA process. This statement was identified in more than half of the interviews with the counties. Actually, this is primarily the case within livestock projects.

## **5 Conclusion and Perspectives**

The existence of the screening process has changed 45% of projects. Half of the changes were integrated before submission of the project and the rest during the screening process. Many projects were submitted to the authorities more than one year after interviewing the developers and consultants. It is therefore our assessment that we have only identified some of the changes. The overall aim of the screening process is to assess the environmental impact of projects as well as to adjust or change projects in order to minimise that impact. The fact that almost half of the projects were changed must be taken as an indication that the aim has been fulfilled.

The screening instrument is considered efficient in terms of securing an environmental optimisation of the projects. Almost half of the projects have been changed and the changes have primarily been preventive measures. Efficiency is judged by not only the capacity of screening to change the project, however, but also by the fact that the authorities use very few resources. This instrument seems to be an "eye-opener" for the developers, furthermore, one that signals many opportunities for adjustment and optimisation of project from an environmental point of view. On average, an EIA process takes 22 month in Denmark (Kørnøv et al., 2003). So, when the authorities decide that there is no need for an EIA process, the developer saves money on both the direct costs of the process and also in terms of time lost. All in all, then, screening emerges as a significant and efficient instrument for preventing pollution.

On the basis of our evaluation, it can be concluded that the Danish authorities need to work more systematically with screening decisions, particularly in order to be more accountable to the public. The presentation of many decisions does not give the public a fair chance of assessing whether they comply with regulation. So far, only three out of twelve counties have evolved practices, which reflect the demand in national legislation and the directive. The majority of counties have evolved practices that are not in compliance with national legislation or the directive. The ambition must be to implement a practice that reflects the broad environmental approach in line with the EIA directive. In the future, county authorities must improve their performance in terms of assessing cumulative effects and the potential impacts. They should also make a specific assessment of the impact within any sensitive geographical area likely to be affected by the project.

The broad or even holistic approach to the environment is important to include in the practices of counties. Otherwise, the gains of a preventive approach may remain unexplored. If the authorities are able to widen the environmental perception of developers, then the changes made to projects might be more radical.

## References

Agger P.; Christensen P.; Reenberg; A. and Aaby, B (2002): The Landscape – Nutrients from the agriculture and immission limits for the nature (Det fede landskab – Landbrugets næringsstoffer og naturens tålegrænser. Niche. 2002.

Council Directive 85/337/EEC changed by 97/11/EC on the assessment of the effects of certain public and private projects on the environment. EU

The Ministry of the Environment, *The advantages of EIA – Evaluation of EIA in Denmark, main report* (Udbyttet af EIA – Evaluering af EIA i Danmark, hovedrapport), writers: Christensen, Elsborg, Kørnøv, Nielsen, Schmidt and Stensen, 2003.

Smink, C.K. (2002). Modernisation of environmental regulations. End-of-life Vehicle regulations in the Netherlands and Denmark. Ph.D. thesis. Department of Development and Planning, Aalborg University.

---

<sup>i</sup> Aalborg University, Department of Development and Planning, Fibigerstraede 13, 9220 Aalborg, Denmark.  
Contact: ehn@plan.auc.dk