

Evaluating Nordic Environmental Impact Assessment – Part 2: Professional Culture as an Aid in Understanding Implementation

LARS EMMELIN

NORDREGIO, Nordic Centre for Spatial Development

Emmelin, L.: Evaluating Nordic Environmental Impact Assessment – Part 2: Professional Culture as an Aid in Understanding Implementation. SHPR 15:187–209, 1998.

The article discusses the functioning of environmental impact assessment, EIA, in the Nordic countries by relating EIA to professional and organisational cultures in environmental management and planning. The Nordic experience can contribute to the understanding of EIA and to the movement towards widening the scope of impact assessment to the level of “policies, programmes and plans”. To understand and to learn by the Nordic experiences the wider systems context within which EIA is operating must be taken into account. EIA can not be understood in isolation. The article shows that the understanding of professional and organisational culture as part of the implementation structures is an urgent need to complement other types of evaluation.

KEY WORDS: *evaluation; environmental impact assessment; implementation; organisational culture; professional culture; strategic environmental assessment; EIA; SEA.*

Nordregio, Box 1658, SE-111 86 Stockholm, Sweden

BACKGROUND

International studies of EIA have repeatedly shown deficiencies in evaluation and thus in development of methods and concepts (Sadler, 1988, 1996). Evaluation of EIA is in urgent need of better methods and theories. There are many theoretical problems that need attention if evaluation is to function as a tool in increasing quality and effectiveness of EIA. Emmelin (1998) has recently argued for the need to understand EIA systems in the light of organisational and professional cultures of the environmental administrations and planning systems. The argument behind this approach is that any system of assessment will be introduced, operationalised and implemented in the context of a more or less well developed environmental administration and in relation to a planning system. The present article discusses the Nordic EIA systems against the empirical material of a large study of the environmentalist paradigm of Nordic environmental administrations (Emmelin, 1993; in press; Emmelin and Kleven, 1995 and in press). To understand and to learn by the Nordic experiences one needs to take the wider systems context of environmental administration and physical planning into account. EIA can not be understood in isolation.

THE NORDIC ENVIRONMENTAL IMPACT ASSESSMENT SYSTEM

The Nordic countries¹ were late in introducing EIA if seen in an international perspective. NEPA which introduced EIA in the US came into effect in 1969 and the

EU directive (85/337/EEC) on EIA is from 1985. Denmark passed comprehensive legislation in 1989; Norway in 1990 and Finland and Iceland in 1994. Although a requirement in the Planning and Building Act for environmental assessment came into effect in 1991 it is highly debatable whether Sweden has in fact had legislation which conforms to a reasonable degree with what is internationally considered to be EIA. On the one hand there have been general requirements for environmental assessment in a large number of laws apart from the Planning and Building Act. On the other hand the legislation has specified virtually none of the requirements concerning process, form or content that distinguish EIA from any other planning process – notably there have been no formal requirements for screening or scoping (Emmelin, 1997c). Whether Sweden in fact has so far had an EIA requirement which fulfils the EU directive has not been tested. As of January 1, 1999 a comprehensive environmental legislation is to take effect. The Planning and Building Act remains as a separate piece of legislation. Whether the new legislation in any significant way will alter the situation with regards to EIA practice in Sweden remains to be seen; as a system it still has several points on which it differs from the EU directive, on EIA (Kjellerup, pers.com.). The Swedish situation will be discussed further at the end of this article.

There are several descriptive overviews of Nordic EIA (Anon, 1993) but little of comparative evaluation of the systems or their function. As part of the IAIA international effectiveness study (Sadler, 1996) a Nordic workshop was held which contains some interesting material, preponderantly taking a critical and systematic inside view (Hildén and Laitinen, 1995).

In the case of individual countries the situation varies greatly. There is a relatively rich, recent material on the Norwegian EIA system. Swensen has examined several cases and produced a thesis on the functioning of the system (Swensen, 1995 a and b; 1996 a and b). The six years of experience with the formal EIA system has been summarised by the Norwegian competence centre (Husby *et al.*, 1997). Several projects are under way in Denmark or the subject of interim reports (in Hildén and Laitinen, 1995; Elling, 1994). Compared to the situation in Norway and Denmark the situation in Sweden is less satisfactory when it comes to evaluation of the EIA system. The major systematic evaluation that exists is administrative rather than scientific. The National Auditing Board (Riksrevisionsverket, 1996) has evaluated the functions of EIA in decision making in the road sector and in decisions on hydro-power development. The study by the Board is thorough and systematic. It sets up an explicit set of independent criteria against which to evaluate a decision making system. Otherwise there are several studies of individual cases of impact analysis related both to large projects and to physical planning (Asplund and Hilding-Rydevik, 1996; Carlman, 1993 a and b). These are based on case studies and tend to be historiographic.

A comparative overview of the Nordic EIA systems

It is of interest to compare the object of EIA as defined in legislation and guide-lines with the perceptions of the object held by the environmental administrators. The handling of major elements in a typical EIA-procedure is also of interest both in relation to individual systems and their implementation and from a comparative point of view. Tables 1 and 2 give a schematic overview of the salient aspects of the Nordic EIA-systems.

Table 1. *The object of EIA in the Nordic countries*

Denmark	Finland	Norway	Sweden
A guarantee for the <i>specific assessment</i> of environmental impacts of certain projects:	A guarantee for a <i>separate assessment</i> of the environmental impacts of certain projects:	A guarantee for a <i>separate assessment</i> of the environmental impacts of certain projects:	To give the responsible authorities a <i>background material</i> for assessing the effects on environment, health, safety and those public interests defined by the Act on Natural resources:
* in the <i>framework of land use planning</i>	* emphasis on the <i>planning of the project</i> by the proposer	* emphasis on the <i>planning of the project</i> by the proposer	
* emphasis on <i>public participation</i> and an <i>open decision making</i> process	* <i>public participation</i>	* <i>public participation</i>	* applicable to a <i>wide spectrum of projects</i>

Iceland has been excluded from the table since no empirical material is included in this paper. The object is identical with those of Finland and Norway.
(Modified from Hildén, ed. 1996)

Table 2 gives a summary of some of the major elements of the EIA-systems. The elements listed can be seen as a list of criteria for fulfilling the requirements for a system to be considered an EIA system as an ideal type – in the Weberian sense of the term (Beckman, 1990). They are the main formal elements of most diagrams of the structure and function of EIA-systems (cf. Wathern, 1988; Glasson *et al.*, 1994).

Table 2. *Characteristics of Nordic EIA-systems*

Elements	Denmark	Finland	Norway	Sweden
Screening	Yes	Yes	Yes	No
Scoping	Yes	Yes	Yes	No
Assessment programme	(yes) ¹	Yes	Yes	No
Early public consultation	Yes	Yes	Yes	No
Hearings on the findings	Yes	Yes	Yes	(yes) ²
Nontechnical summary	Mandatory	Mandatory	Mandatory	Not required
Summary produced by	Responsible public agency	Project	Project	—
Independent review	No ³	(yes) ⁴	(yes) ⁴	(yes) ⁴
Formal decision on EIA	Yes	Yes	Yes	No

Iceland has been excluded from the table since no empirical material is included in this paper. The system is similar to the Norwegian except that an assessment programme or a nontechnical summary are not required.
Modified and enlarged after Hildén ed. (1996).

¹ Hildén has “yes” here based on the rather cryptic explanation that questions raised should be taken into account. This however refers to recommendations for good practice rather than formal requirements.

² Hearings are not part of an EIA-procedure but of the general planning or permit procedures.

³ Hildén here has a cryptic qualifier: “but the review is realised by the agency”.

⁴ A highly “qualified yes” in all cases since the review is restricted to those comments that the responsible agency deems fit to make.

As can be seen from Table 2 the Swedish system is characterised by its almost complete lack of formal requirements concerning method or content. There are no formalised procedures for screening, i.e. determining whether an EIA is necessary, for scoping, i.e. determining what should be assessed or for determining the assessment programme, i.e. the structure of what is to be assessed. Influence on the process by environmental agencies is therefore limited and formal criteria against which to judge an impact assessment lacking.

Nordic environmental administration

For the present discussion only a few points are of central importance. In all countries the systems are essentially three tiered with a central, a regional and a local level. In political science the systems of Sweden and Finland are often singled out since they are unique in a European context by having relatively small ministries and strong, central and independent sectoral agencies (Rothstein, 1991). Denmark and Norway on the other hand have large ministries within which there are agencies of somewhat varying degree of formal and real independence. There are historical reasons for this since the basic model for the central administrations were built up during periods when Sweden and Finland (until 1809) were one kingdom and Norway was in union with Denmark (until 1814). The regional level in Sweden and Finland is essentially an arm of central government rather than an aggregate of local government, albeit with many exceptions and modifications. The situation is the reverse in Denmark and somewhat intermediate in Norway where the government regional authority² however has a strong position in the environmental administration³.

The local level is to a large, but somewhat variable, degree independent, based on the political entities of municipalities.⁴ Especially in the planning system this independence is of major importance. Sweden has the most extreme position with a local physical planning monopoly and regional and central planning authorities with relatively weak formal instruments available, while Denmark has the most consistent, hierarchical system. In practice both planning and environmental administration is much more complex due to a number of historical, geographic and organisational factors.

APPROACHES TO EVALUATION

Emmelin (1998) has proposed a model for types of evaluation of EIA based on two dimensions and discussed some basic theoretical and methodological problems of evaluation of EIA. The first dimension is a distinction between studies of *EIA systems structures* on the one hand and of *implementation structures* on the other. EIA systems can be evaluated and compared as isolated phenomena or they can be placed in a context of planning, management and decision making.

The second dimension could loosely be called *the dichotomy between "theory" and "practice"*. On the one hand any EIA system is *designed to operate* on certain principles. On the other hand there is the practice of *how it operates*.

Confusion exists along both dimensions in that system structure tends to be equated with actual function or function explained as uniquely caused by structure. This may be because of confusion of both theory and practice and of structure and function.

The two dimensions define a simple matrix of four types of evaluation – Fig. 1.

In the first category one finds the evaluation of EIA systems against a more or less explicit ideal structure. The second category contains for example ex ante evaluations of EIA documentation against criteria for good documents or good practice. The third prevalent type of evaluation deals with the function of the system based on surveys, interviews and other statements, most often by those more or less closely involved.

The fourth category attempts to understand the function of EIA-systems and the quality of processes and documents in the context of the cultures of the implementation structures where EIA is to operate. The present article uses this approach to discuss the Nordic EIA systems.

Two major theoretical and methodological problems are also discussed and illustrated by Emmelin (1998). One is that interpretation by respondents tends to be accepted at face value, with little examination of the possible reasons for any particular standpoint – “emic confusion”. The other is the related problem of “the inside perspective”. In the case of EIA evaluation this most often takes the form of uncritical acceptance of the basic, rationalist assumption behind much of EIA that more scientific back-ground material will of necessity make decisions better; that “facts speak for themselves”.

AN EMPIRICAL STUDY: MANAGEMENT CULTURES IN THE NORDIC ENVIRONMENTAL BUREAUCRACY

The empirical material on professional and organisational culture is drawn from a survey of the Nordic environmental administrations carried out as part of the project “Management Cultures in the Nordic Environmental Bureaucracy”⁵.

The target of the survey was the total group of professionals at central and regional level in what is termed “the environmental core administration” and to officials in certain sectoral administrations. The following discussion is based on analysis of the “core” where not explicitly otherwise stated i.e. on Ministries of Environment, central agencies of pollution control and nature conservation and their regional branches or counterparts. Since the response is not total the data do in fact represent a self selected sample of the total population. The total sample of the environmental administrations, including those in the sectoral administrations, in the four countries is 3594 questionnaires. This represents an average frequency of response of slightly under 70 per cent.⁶ The survey was carried out in 1995 in Norway and in late 1996 and early 1997 in Denmark, Finland and Sweden.⁷ Due to the limited and preliminary nature of the present treatment of the material it will be mainly the major trends in the material

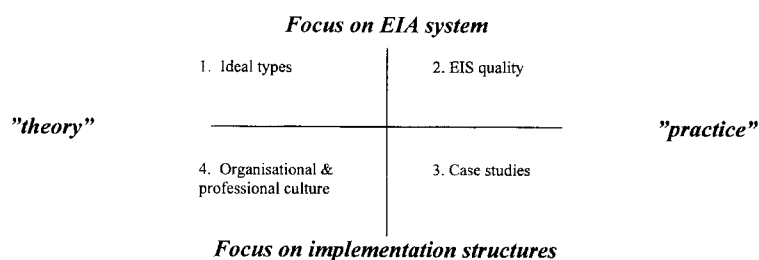


Fig. 1. Dimensions of focus of evaluation, with examples of types of evaluation. (Emmelin, 1998).

that will be used. Those that are discussed are statistically significant at the highest level, if not explicitly otherwise stated, using standard tests.⁸ A further description of the survey and some of the basic results and analysis of patterns of co-operation is forthcoming (Emmelin in press; Mulders in press; Nenseth in press).

One of the reasons for including certain sector administrations as well as professionals in physical planning was an interest in the possible emergence of "discourse coalitions" between these and the "environmental core administration". The tension between physical planning and environmental administration over EIA is noticeable in the Nordic countries (Emmelin, 1998; 1997b). This will be somewhat further explored below.

A paradigm approach

The conceptual point of departure of the project is a "paradigm of environmental management" sketched by Emmelin (1993) and used for empirical analysis in the initial Norwegian study (Emmelin and Kleven 1995; in press).

The paradigm concept used in the project is an adaptation of Törnebohm's more precise concept, rather than Kuhn's ambiguous and variable use of the term. Törnebohm's paradigm relates to individuals and their patterns of thought rather than Kuhn's slightly nebulous and indistinctly located "normal science" (Törnebohm, 1983). The following dimensions are the main components of the adapted paradigm concept and form the basis of the analysis of the professional paradigm of environmental management: *World view or territory, strategy or approach, views on knowledge, views on the role of administration, self-reflection.*

EIA-related indicators of a paradigm

The components of the paradigm which will be discussed here relate to the following dichotomies or concepts which have been central to the development of EIA. They are still the substance of much debate concerning widening the scope of EIA to "policies, programmes and plans".

- * EIA as a method for determining the "environmentally best" solution or plan versus EIA as a method for exploring and assessing the impacts of alternative ways of reaching the goals of a plan or project.
- * Attitudes towards the relative roles of expert and politician in the planning and decision making processes.
- * Attitudes towards centralism versus decentralisation.
- * Attitudes towards public participation and communication versus expert judgement.

VIEWS ON EIA IN THE ENVIRONMENTAL ADMINISTRATION

One question specifically dealing with EIA was included in both the Norwegian and the other survey. In the latter three further questions on EIA were included. These will be dealt with separately below.

In the question specifically related to EIA respondents were asked to select and rank, in order of priority, 3 out of a total of 8 alternative statements on the object of EIA as a tool in environmental management. The alternatives were⁹:

- (1) to find the environmentally best solution

- (2) to provide a broad material for decision making
- (3) to illuminate different alternatives
- (4) to find good mitigating measures
- (5) to find the most cost-effective alternative
- (6) to decide on the permissibility of a project
- (7) to inform the public
- (8) to get inputs from the public

As a basis for both the presentations of results and the discussion these alternatives need some further comments. They serve as indicators of several factors. Some relate very distinctly to certain positions on EIA which have been prominent in both the national and international debate as discussed above, others more directly to the stated aims and objectives of the legislation.

Statement 1 depicts EIA as a means of giving the environment priority in decision making. Number 1 and 3 together capture the division over a fundamental aspect of EIA: the technocratic view that experts should prescribe the best solution versus EIA as a means of providing political decision making with alternatives. This is the “calculate versus communicate” dichotomy (Sager, 1990).

Statement 2 – “to provide a broad material” – captures the rather vague objectives actually set by the Swedish and Norwegian legislation.

Statement 3 is important since the identification and analysis of alternatives is central to EIA methodology and philosophy. It has also consistently been one of the most difficult goals to achieve (Wathern, 1988). This is one of the problems well recognised within the international EIA community (Sadler, 1996). The statement is of interest in comparing the Nordic views to the international debate on EIA.

Statement 4 – “to find good mitigating measures” – is a description both of one of the main purposes as set out by legislation and of the actual results of EIA practice to date. This seems to be the view of the international EIA community expressed for example in the IAIA effectiveness study (Sadler, 1996).

In statement 5 the stress is on both an approach to decision making and a dominant method for attempting the integration of different factors into a final recommendation. It can also be seen as an expert approach to the problem of finding “the best solution” taking other factors besides the environment into account.

Statement 6 “to decide on the permissibility” is interesting since this is in practice often the overt context of an EIA. However it should also be pointed out that the role of EIA in relation to both planning permission and to the permissions under specific environmental legislation has been a bone of contention in the practice of EIA. Placing the central EIA directive under the planning legislation has not resolved this since environmental assessment is used under specific environmental legislation as a basis for the procedures for granting of permits.

Statements 7 and 8 are indicators of two levels of communicative rationality in participation in planning. While it is often stressed in the literature that inputs from the public are important to the EIA process, in practice information tends to be one-way-communication to the public. The communicative aspect of EIA is indicated by both statements and the level of ambition by the distinction between them.

Results

Fig. 2 a–f shows the fraction of the respondents that have accorded different priority to alternatives 1–4 and 7 and 8. Alternatives 5 and 6 are excluded because of the low

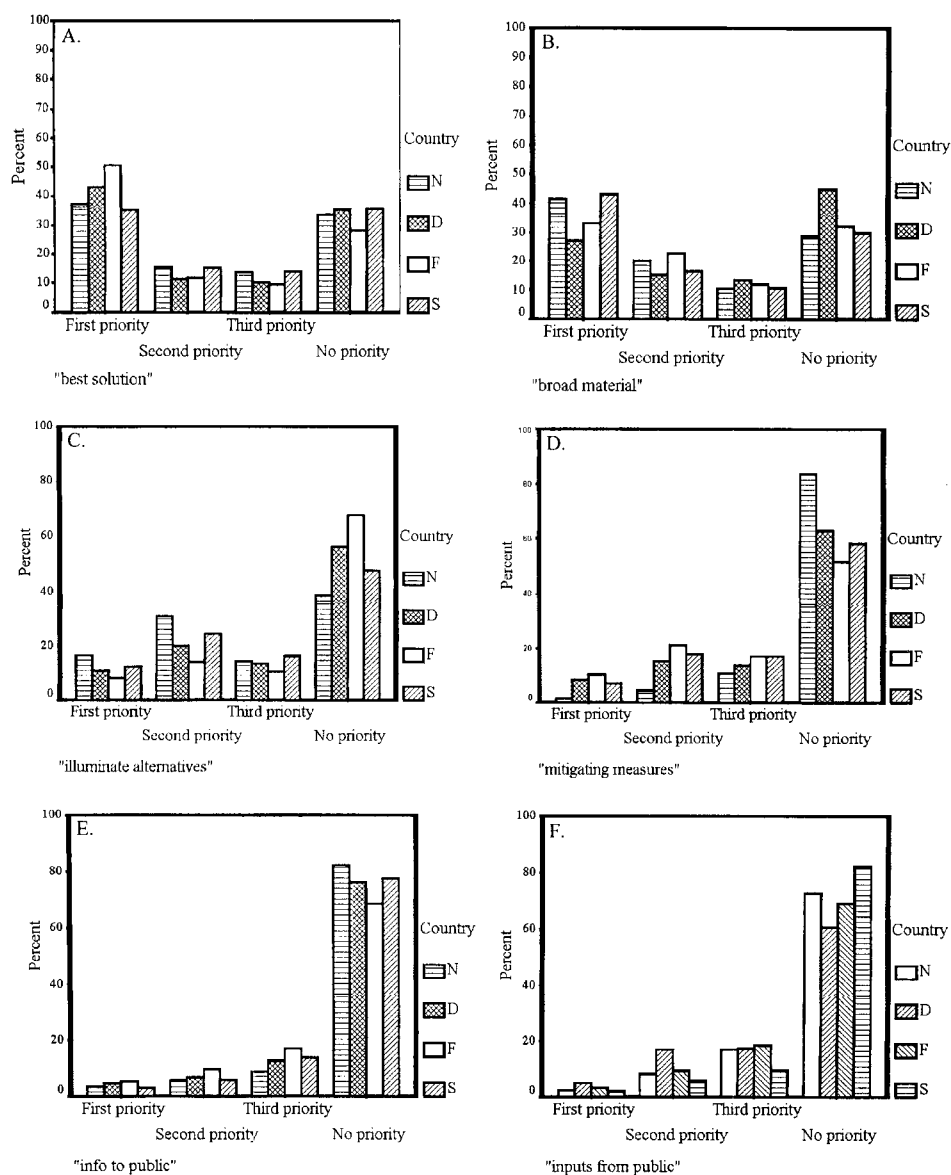


Fig. 2 a-f. Objectives of EIA.

priority given overall. Only in the Norwegian material is the fraction giving any priority at all to "cost-efficiency" above 20 per cent and most of that is third priority – this is briefly discussed by Emmelin and Kleven (in press). In all four countries the permissibility of a project (No. 6) ranks as no priority at all with well above 90 per cent of respondents. Differences between countries are too small to merit discussion but the fact in itself is notable.

The diagrams show the fractions of respondents that have accorded any priority to a given alternative. Already at this level some interesting features are noticeable. Two

statements stand out as completely dominant: No. 1 “best solution” and No. 2 “broad material”. Three alternatives come out at levels above 20 per cent of the total: No. 4 “mitigating measures”, No. 7 “information to the public” and No. 8 “inputs from the public”.

Looking at the pattern of distribution over first, second and third priority results become even more illuminating. “Environmentally best solution” (No. 1) and “provide broad material” (No. 2) both have a clear pattern of first priority. The latter is also typically a second or third priority. If given any priority at all “information to the public” (No. 7) and “inputs from the public” (No. 8) get third priority, except in Denmark where the priority to inputs from the public is higher and evenly divided between second and third.

Systems differences

Some national differences are especially noticeable. The Finnish sample is striking in putting much more priority on No. 1 “best solution” and lower on No. 3 “illuminate alternatives”. The Danish is noticeable for higher priority on No. 8 “inputs from public” and on considerably lower on No. 2 “broad material”.

In the areas where there are major systems differences it is interesting to explore the differences in perceptions between the core environmental administrations in the four countries. Two areas are immediately obvious for such examination. One is the role of public participation and the other is what I loosely will call “the spirit of EIA”.

“Environmentally best solution” and the expert view

Alternative 1, “finding the environmentally best solution” – which has a total score of 67 per cent – is the first priority of 41 per cent in the total Nordic group with a high of 50 per cent in Finland and a low of 35 per cent in Sweden. The emphasis on this alternative is striking, as has been discussed for the Norwegian material (Emmelin and Kleven in press; Emmelin, 1997a) in that this does not have any real support in legislation or guide-lines. On the contrary it must be considered precisely as a paradigmatic interpretation of the purpose of EIA. Speculatively one might explain the high level of agreement in Finland as a result of the great proportion of engineers in the administration – rationalist thinking may be high. However, further analysis is necessary for any real conclusions on this point.

When seen in conjunction with other indicators of an expert view the results on this statement are illuminating. One such indicator is the question which invites agreement with the statements that a “strong expert agency is needed to take the final decision on controversial issues”. Of the total sample 63 per cent agree with this. Fig. 3 shows the distribution of answers. The higher level of agreement for Finland is noticeable as is the lower in Norway.

Centralism

“Think global, act local” is a slogan of the Brundtland report which catches the notion that environmental solutions need popular support and that many problems arise from the cumulative effect of small decisions and life styles. Nordic planning legislation places responsibility for the physical environment largely at the local level.

A central and regional environmental administration can be expected to show interesting traits with regards to local responsibility and decision making. In line with

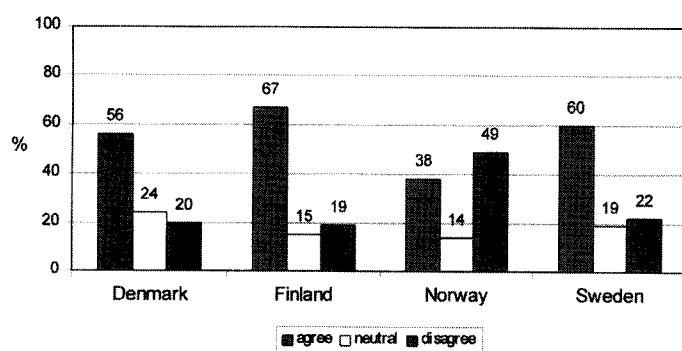


Fig. 3. Agreement with statement that "a strong expert agency is needed to take the final decision on controversial issues".

legislation and current ideology they could favour it. Or they could be negative for a variety of reasons. The classic bureaucratic ideal is centralised in the sense that uniform application of rules presupposes a hierarchy. Centralism could likewise go with the ideas of scientism, the need for specialist knowledge and overview of problems, as opposed to notions of special insights generated by closeness to the problems. Historically the two are mutually supportive in that the classic bureaucracy also embraced the ideas of "scientific management" (Rothstein, 1991). We have therefore found it interesting to include the question "Delegating great responsibility to the local level makes environment protection inconsistent" i.e. an indicator of the need for uniformity from above. Fig. 4 shows the results. There is considerable agreement with this. Comparing the situation in Norway and Sweden is interesting. Sweden is popularly often seen as the most generally centralist with Norway the least so of the Nordic countries. In the EIA-systems the situation is the reverse. Norway has arguably the most centralist EIA system while Sweden, has little central responsibilities in EIA. In the environmental sector Norway has a relatively weak local administration compared to Sweden. In spite of this Hjern (1993) has argued that the Swedish system is highly centralised. As shown in Fig. 4 Sweden is the only

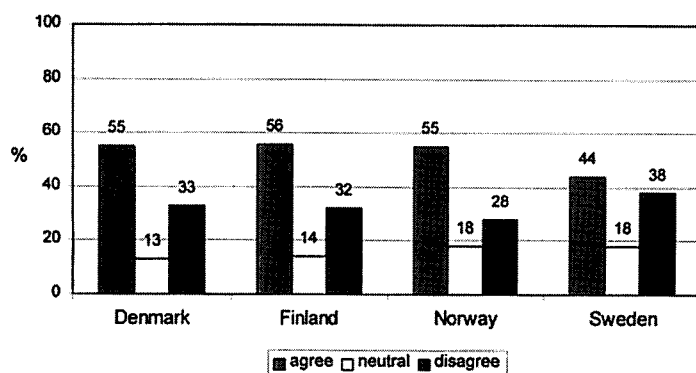


Fig. 4. An indicator of "centralism": agreement with the statement that delegation to the local level entails risks of inconsistencies in environment protection.

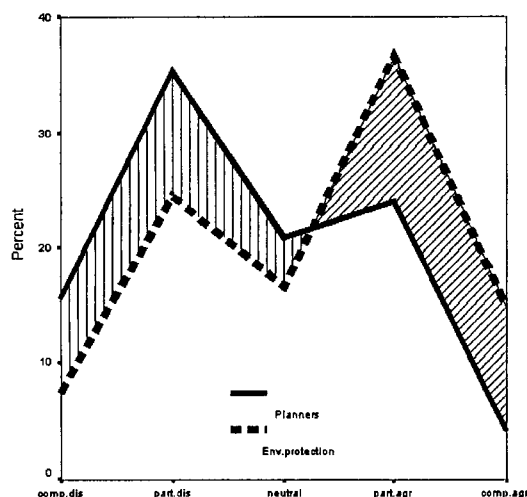


Fig. 5. Views on the risks of delegation: planners versus environmental administrators.

system where less than half of the core agree that decentralisation may be problematic. These results indicate that the “world views” in a professional bureaucracy are not simple functions of general or specific traits of the system. The understanding of functions of the system must take both the professional views and structures into account. One case of this, which is analysed below, is the differences found between “planners” and “environmental administrators”. The differences between the Norwegian and the Swedish results merit further analysis.

Looking closer at Sweden we find an interesting difference between the “planners” and those in the environmental core – see Fig. 5. The symmetry is almost perfect with planners tending to disagree while environmental administrators – preponderantly natural scientists and engineers – agree. The difference mirrors differences in the planning system and environment protection in Sweden. While the latter, as pointed out above, is centralised the planning system is essentially decentralised in that it is based on planning at the local level. The difference in position in Norway between planners and “core” is not as marked (Emmelin, 1997a).

Alternatives

To “illuminate alternatives” (No. 3), although not nearly as high as “environmentally best” and “broad material”, has a relatively high total score – 50 per cent of the total sample have given it some priority. Typically it is ranked as a second priority. However the national differences are striking with less than a third of the respondents giving it any priority in Finland as compared to two thirds in Norway. This may be seen as reinforcing the impression of a stronger expert view in Finland. Sweden has an intermediate position in this.

Most interesting however is the fact that the examination of alternatives is often given as an overriding consideration in the international EIA literature: “Alternatives are at the heart of EIA” (CEQ, 1978). There are no very substantial differences in the stress laid on alternatives in the instructions issued by the central authorities in Norway and Sweden; the Swedish do enlarge somewhat more on alternatives,

especially the use of the “zero-” or “no action alternative”. The more structured Norwegian system is likely to give more weight to alternatives in the initial stages in actual practice. Again the conclusion is that implementation can not be understood or compared from the point of systems structure alone. The policy transformations that can occur in systems with such widely differing views on a central aspect of “good practice” may be considerable.

Public participation

Two of the eight alternatives relate to public participation: informing the public and receiving inputs from the public. The general impression from the Norwegian study (Emmelin and Kleven, in press; Emmelin, 1997a) holds for the other countries: the alternatives “information to” or “inputs from” the public have a low priority.

Constructing a compound index from the two questions gives an aggregate view of attitudes on public participation. The diagram in Fig. 6 is an index of priority accorded to participation. The group “any priority” means that one of the alternatives has at least scored some priority. The index must be considered to mirror a minimal level of public participation since a score of third priority on one of the alternatives is sufficient; “no priority” means that neither alternative has been accorded any priority.

The Swedish administration stands out as considerably less concerned with participation in EIA which is consistent with the structure of the Swedish system. As can be seen from the overview of EIA-systems in Table 2 Sweden does not have public participation as an explicit component of the EIA but rather as a general requirement in planning processes. More specifically there is no requirement for early consultation in the EIA process.

The difference in “no priority” is very marked between Sweden and Denmark. The weak position of public participation in the Swedish system corresponds well with the views of the Swedish environmental administration. According to some experts the role of participation is stressed most strongly in the Danish EIA system¹⁰. Be that as it may: the views of the core environmental bureaucracy in Denmark are less negative than the rest of the Nordic administrations.

To receive inputs from the public can be regarded as an indicator on a somewhat higher degree of ambition in participation than giving information out. With 61 per cent in Denmark, 83 per cent in Sweden according to no priority the attitudes of the bureaucrats do however seem rather far from the ideals of the law maker.

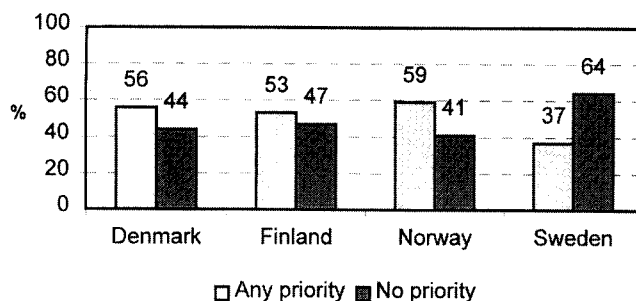


Fig. 6. An index of public participation as a priority of EIA.

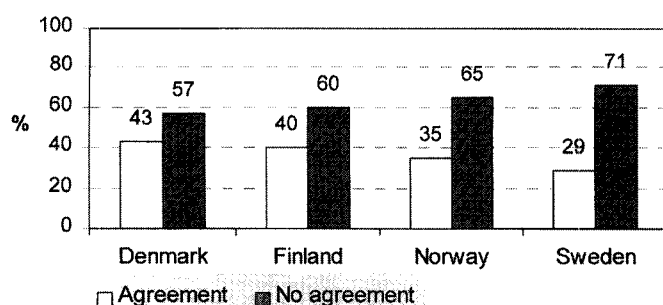


Fig. 7. Level of correspondence with "the spirit of EIA".

"The spirit of EIA"

No simplistic, quantitative evaluation of the answers against a "correct" combination of the three alternatives, including their exact priority, would be meaningful in the aggregate sample. Not even in any single country would it be possible to point to the legislation with such a degree of precision. However as in the analysis of the Norwegian material it is reasonable to construct an index of a minimum of agreement with the letter and intent of the legislation (Emmelin, 1997a). Using the index on public participation in combination with some priority accorded to either of alternatives 2 and 3 would give a description of EIA as a process of providing a broad background material or throwing light on alternatives, with a minimal amount of public participation, at least to the degree of informing the public. The answer reflecting the spirit of EIA in a minimal way would thus be a combination of some priority to alternative 2 ("broad material") or some priority given to alternative 3 ("illuminate alternatives") combined with some priority on one of the two public participation questions ("information to public" or "inputs from public"). Fig. 7 shows the degree of agreement with this index of "the spirit of EIA". Again Sweden comes out considerably lower on agreement. This is not only a function of the low degree of agreement in the public participation component.

Mitigation and granting of permits.

It is interesting to note that "mitigating measures" is given any priority by 34 per cent of the respondents, in most cases second and third priority. Mitigation could be considered as a purpose of EIA in that this is a concrete way of integrating environmental concern into projects and planning. Mitigation in fact catches the purport of the legislation better than finding the "best solution".

The low frequency of according any priority to "permissibility" is interesting in two ways. First because it is in fact one of the purposes of EIA according to some sectoral legislation. Secondly, the low frequency illuminates an interesting aspect of the self understanding of the administration. The classic "Weberian" bureaucracy is one which interprets and implements legislation in a precise and accountable manner. The granting of permits in a situation where this is in fact a purpose of a legislation and an important policy instrument would come out rather higher in an administration which adhered to this ideal. In the professional expert role as well as possibly in the advocacy role, finding the best solution should come out high, which indeed it does. Thus the

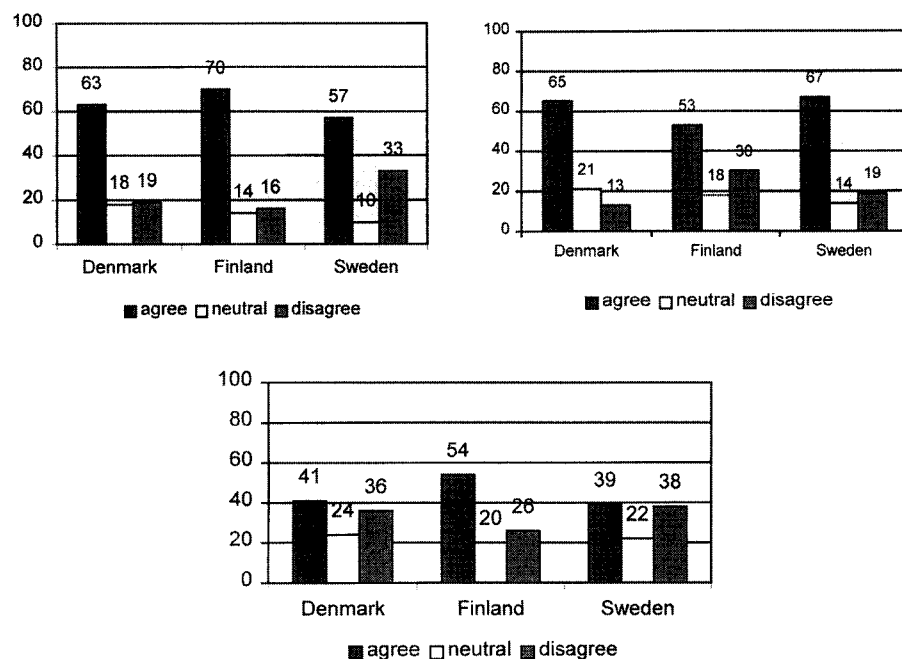


Fig. 8. Agreement with three statements concerning the relationship between EIA and decision making.

A: Authorities and political bodies should be bound by the results of an EIA.

B: EIA is one of several background documents of equal importance to authorities and political bodies.

C: By making environmental assessments on policy and plans the need for EIA on individual projects is reduced.

answers are consistent with other indicators of a strongly expert oriented or professionalised administration rather than a classic Weberian bureaucracy.

Relationship of EIA to other material in decision making

In the enlarged questionnaires used in Denmark, Finland and Sweden three further questions on EIA were used. Agreement was invited on the same five-point scale as in the question above, with the following statements:

- A) Authorities and political bodies should be bound by the results of an EIA.
- B) EIA is one of several background documents of equal importance to authorities and political bodies.
- C) By making environmental assessments on policy and plans the need for EIA on individual projects is reduced.

A is an indication of the expert and centralist decision-making ideal in environmental assessment. B can be said to be the reverse. It catches an important aspect of the Nordic EIA-systems and is in opposition to the notion of finding "the environmentally best" solution. C finally is an indicator of the notion that project EIA

is part of a planning and decision-making hierarchy – the “hierarchy fallacy” of SEA (Emmelin, 1997c). Fig. 8 shows the results.

Agreement with EIA as binding is particularly high in Finland, which fits well in with the other results indicating a strong expert orientation. In Sweden the level of agreement is considerably lower while disagreement is more frequent. The strength of agreement is also lower in Sweden – “completely agree” accounts for less than ten per cent in Sweden and over 20 in Finland. Statement B reinforces this impression with lower agreement that EIA is one of a number of equally important inputs to decision making.

The notion that SEA makes project EIA less important is quite strong. The Danish and Swedish groups are rather evenly divided, with a large neutral centre. In Finland over half the group agrees. Although the general impression of a slightly more technocratic environmental administration in Finland is reinforced by these three questions a note of caution is necessary. The Finnish administration has the shortest experience of EIA. The responses to statements can arguably be influenced by other factors than the views on administration, such as experience of the system, education and training on EIA, levels of hope and ambition concerning the use of EIA etc.

One reason to look especially at the differences between the planners and the environmental core in the material is that the EIA system is part of the physical planning system. In Norway EIA is essentially part of the planning and building legislation. Unfortunately the further questions on EIA were not asked in the Norwegian survey. The diagrams in Fig. 9 show the differences in level of agreement between the planners and the environmental core administration in Sweden on these three questions. The notion that an EIA should be binding to authorities and political bodies has a majority following in the entire group. The difference between planners and the core is quite clear: the core tends much more strongly towards this view of the role of EIA. Planners tend more strongly towards seeing EIA as one component in a variety of back-ground material for decision making, rather than according it a special status. Although the answers on the relationship between SEA and EIA tend only rather marginally towards agreement the difference between planners and core are interesting here also. The planners very clearly tend towards agreement that SEA decreases the need for EIA. In a system which has relatively weak regional and central levels the notion of an hierarchy is still quite clear among planners but not in the core. The answers of the planners mirror the structure and intention of the Swedish EIA system better than those of the environmental core on questions on all three issues.

The patterns in Denmark and Finland are very similar to the Swedish with some interesting exceptions. On the relationship between SEA and EIA it is interesting that in both Denmark and Finland it is the core that tends towards stronger agreement. The difference on the binding nature of EIA between planners and the core is very small in Finland. The impression of a stronger leaning towards technocracy is thus not something that differentiates between these groups. The impression is reinforced by the lower degree of agreement that EIA is only one of several background documents of equal importance in Finland.

On the interpretation of differences between core and planners caution is necessary. The difference in agreement on the binding nature of EIA can be seen as an indicator of technocracy. However this must be tempered by noting that the unstructured nature of the Swedish system might make it less suitable as a technocratic tool.

SWEDISH EIA: A DEFICIENT SYSTEM?

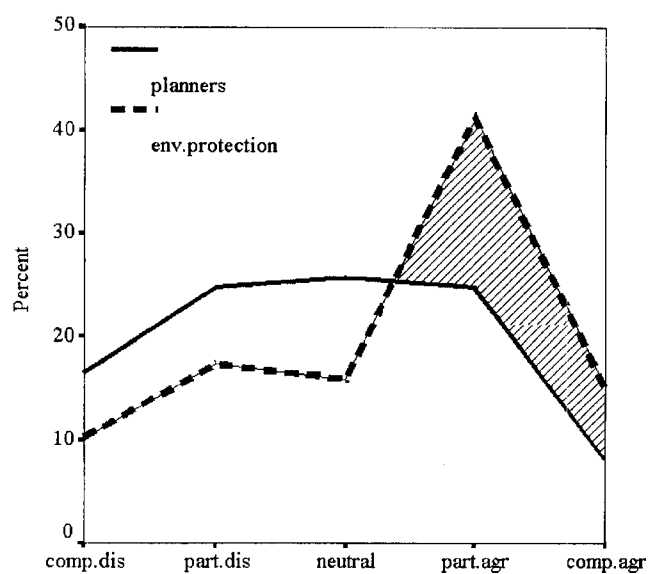
A recurring theme in much of the discussion above is the aberrant nature of Swedish EIA if compared to the of good practice implicit in the structure of Tables 1 and 2. This can be understood or analysed in terms of a paradigm of environmental management but also as the result of unresolved conflicts between the environmentalist paradigm and that of physical planning. Can it also be shown to be of importance to the functioning of the system?

In the case of Sweden there is independent evidence that suggests that the Swedish EIA-system does not function particularly well. The National Auditing Board has published an evaluation of Swedish EIA practice which concludes with a rather severe and fundamental critique of the system. Although limited to cases within the road sector and the permit procedure in the Water Rights Courts the principal conclusions have a wider applicability. To a large degree they are similar to a range of findings of many international studies over the years – see e.g. Wathern (1998); Beanlands (1988); Bissett (1988); Andrews (1988); Sadler (1988 and 1996). Most of the results are in accordance with earlier Swedish findings (Hilding-Rydevik, 1990) although this is the first time a simple formal model of EIA has been used against which to evaluate Swedish EIA. In short they can be summarised as follows:

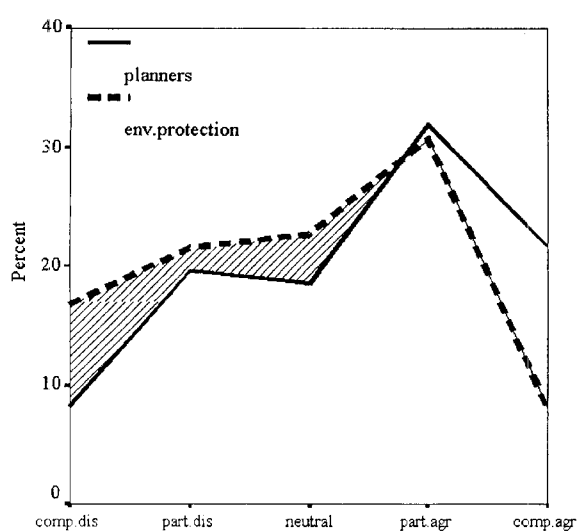
- * Public involvement comes too late.
- * The environmental authorities have no regulated and formal standing in the EIA-process
- * Review of EIA documents is deficient and the necessary competence lacking. The report notes that in some cases review by a Water Rights Court is deficient to the point of not even remarking on the complete absence of any impact assessment!
- * Description of important environmental effects may be deficient or lacking.
- * Alternatives are normally lacking. In hydro power development the preferred economic alternative is usually the only one described; in the road sector higher level decisions on road standards are considered to exclude examination of alternatives.
- * The EIA-process lacks clear rules for the process and standards for the material contents of the process.
- * There is an unclear mixture of roles in the process which essentially precludes functioning of EIA *sensu stricto*.

The National Auditing Board concludes that the most important deficiencies are related to the peculiarly Swedish lack of structure and guidelines. In line with much international experience the report also notes the lack of follow up, evaluation and competence building in the EIA field (Bissett and Tomlinson, 1988; Sadler, 1988 and 1996). Different authorities assume that others do it and no single one is responsible.

The RRV (National Auditing Board) uses a simple set of criteria for evaluation. One of them – “EIA before or after decision” – may seem simplistic or trivial. The reasoning behind it is however important. One of the well known aspects of public decision making is that decisions may in reality be taken at some other time than the formal point. In environmental assessment the problems of producing an assessment before the “actual point of decision” is focused in the debate on the need to complement project-EIA with assessment of “policies, programmes and plans”, i.e. with strategic environmental assessment (Therivel *et al.*, 1992). Here the issue is whether options have not been dramatically foreclosed or many of the contextualizing



EIA binding



SEA decreases need for project EIA

Fig. 9. The difference between Swedish planners and environmental core administration in views on the role of EIA. Level of agreement with the idea that authorities and political bodies should be bound by EIA (left) the notion that SEA decreases the need for project EIA (right).

decisions taken are of such a binding nature as to make the formal point of decision relatively unimportant for major alternatives to be considered. The fact that EIA may have more effects on mitigation than in illuminating alternatives can partly be explained by this. In project EIA there is also the effect of internal choices of methods,

professional and other norms etc which tends to foreclose even the scope for mitigation. The existence of a fixed set of standards for different road types has recently been pointed to as one such instance (Emmelin *et al.*, 1996). The RRV study demonstrates this as an explanation for the lack of alternative routes.

That the distinction made by Auditing Board study is not trivial is shown by the fact that two cases of major road projects were found where an EIA was not produced before the decision; both fell in the category of not fulfilling the other criteria for good practice.

If the Swedish system is viewed from the point of view of good international practice the situation is clear cut in this respect. Since no formal EIS exists in the system the "Swedish model" in fact means that there is in fact never an acceptable EIA at the time of decision. Environmental information may not only be spread over several documents with little chance for overview for either the public or decision makers. The RRV study also notes that the material on environmental effects or the necessary background material may be spread out over a period of several years.

One of the interesting issues of planning theory and practice that EIA brings up is the role of the planner. It is often stressed that EIA is interdisciplinary, with the planner as generalist/co-ordinator (Boverket, 1996). In practice however much of the work seems to be done by planners without bringing others in. This confusion of roles and competence can be due to both those responsible for EIA and those carrying it out. The evaluation showed that the National Road authority EIA co-ordinators often tended to overrate the competence of planners in relation to the environmental substance of the assessments, regarding them as experts rather than as generalists/co-ordinators. This is a line of enquiry that is likely to be particularly fruitful in the Nordic systems with the ongoing drive for integration with physical planning (Finnestrand Bergsjø, 1995). Professional struggle for recognition and territory are among the factors that should be analysed further.

The new environmental legislation which comes into effect in 1999 would not seem to alter the situation very dramatically. Requirements for screening and scooping are introduced, but only the former seem so far to have been formalised (Regeringskansliet, 1998). The legislation is said to lay stress on public participation but the mechanisms for forcing this are not yet clear. In a professional and organisational culture that puts so little importance on participation such mechanisms are likely to be crucial.

A CONCLUDING REMARK: LESSONS OF A PARADIGM APPROACH TO DEVELOPMENT OF SEA.

One of the major arguments against EIA in Scandinavia was a general fear, enhanced by initial US experiences, of a complex process overloaded with information. Critics of the EIA-concept in Scandinavia focused on the existence of a well developed planning system and environmental legislation. The lines of conflict can be seen as the differences between a rationalist and formal approach to decision-making and the ad hoc approaches of the planning system. It can also clearly be understood in terms of outside critique of the planning system advocating better controls, transparency and formal checks, such as those listed in Table 2 as characteristics of EIA. Not only resistance to and the modification of EIA within the planning systems can be understood in terms of professional and organisational paradigms. The ambitions to develop methods and to widen the scope from project-EIA to "strategic environmental

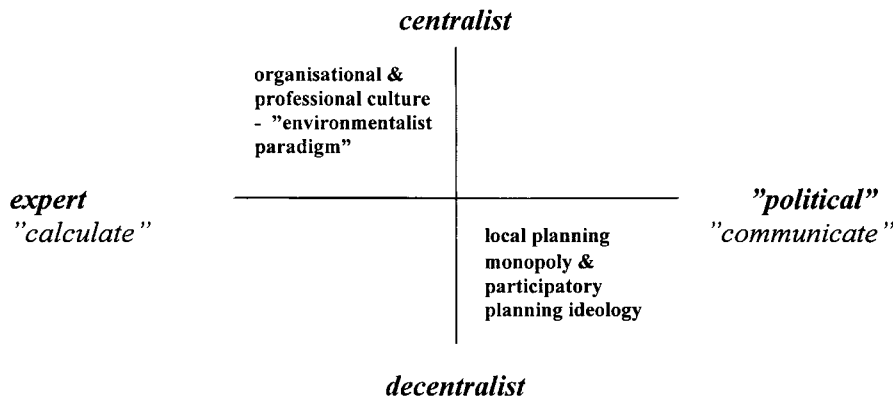


Fig. 10. The tension between professional and organisational culture in the environmental administration and the political intentions between planning and legislation in the field.

assessment" (SEA), i.e. the assessment of impacts of "policies, programmes and plans" is understandable in terms of such paradigms. SEA can in this perspective be seen as an attempt to resurrect a rationalist planning model (Emmelin, 1996).

The conflict can be illustrated by a simple matrix formed by two major planning theoretical dimensions. One is the expert versus lay or political decision making dimensions; the "calculate versus communicate" dichotomy of Sager (1990). The other is the "centralised-decentralised" dimension. As Fig. 10 illustrates the tension between the professional and organisational culture of environmentalism and the political intentions in planning and environmental legislation are considerable.

The peculiarities of the Swedish system may seem to make evaluation of limited international interest. This may be true if seen as an isolated phenomenon – an aberration in the EIA system which needs no discussion beyond the analysis of type 1 in fig. 1. Seen however in the light of the general current discussion of the relationship between EIA and SEA on the one hand and the planning system on the other it appears as highly relevant. Several recent authors in the international EIA literature have called for an integration of environmental concern in a design process with ambitions to be "pro-active" rather than reactive (see e.g. Lawrence, 1997; Brown and Hill, 1995). Proponents of the Swedish system claim that the unstructured nature of the system reflects such an integration, where environmental considerations are successively brought into the planning process and that this is strengthened in the proposed new legislation (Regeringskansliet, 1998). The possible exception would perhaps be the lack of early public consultation in the system which at least to some planning ideologies is central to pro-active planning. The new legislation is purported to remedy this. The Swedish system can, however, to a large degree be seen as an illustration of the "integration confusion" (Emmelin, 1997c) i.e. the confusion between the designing mode of planning and the analytic mode of examination at a given point in time and in an adversarial manner with demands for transparency. The recent report of the commission investigating the environmental mismanagement of the Hallandsås tunnel seems to illustrate the effects of the "integration fallacy". The commission points not only to the lack of formal controls, the lack of ways of checking whether environmental concern has in fact entered into the planning and the advocacy role that a Swedish environmental impact statement often degenerates into as major

reasons for the scandal but also to the effects of earlier binding decisions taken without environmental assessment.¹¹

I have elsewhere developed the arguments for a conscious choice of a set of assumptions and thought styles that go with methods and approaches as a necessary condition for development of methods (Emmelin, 1996). The development of SEA is urgently in need of a paradigm which differs substantially both from the models of international good practice in EIA and from the present Swedish approaches to EIA on physical plans. The drive towards "integration" and design oriented, "proactive" SEA is an avenue which risks leading SEA development up another blind alley.

NOTES

1. The term Nordic, which is the established concept in co-operation (cf. Nordic Council of Ministers) will be loosely used to cover Denmark, Finland, Norway and Sweden. Formally, Iceland should be included as well as the self governing territories Åland, Greenland and the Faeroes. The material does not cover Iceland, Greenland and the Faeroes; the regional government of Åland can not be distinguished in the data sets used for the analysis although included in the Finnish material. Scandinavia as an alternative term is unsuitable since it traditionally on cultural and linguistic grounds does not include Finland. In geography the term "Norden" is sometimes used; here it is used in diagrams.
2. Fylkesmannen; County Governors office.
3. It is sometimes claimed that Norway presents a hybrid between the Danish and the Swedish-Finnish model. For the present purpose there is no need for further analysis of this somewhat historically sensitive issue.
4. "Municipality" is the officially accepted term for the local political and geographic entity in Nordic English usage. According to at least one authority, professor Michael Jones, Dept of Geography in Trondheim the term "commune" would be more appropriate. It does however carry some unfortunate historical associations, which may be why the term "municipality" is preferred.
5. The Norwegian survey was financed by the Norwegian Research Council, the surveys of the other three Nordic countries by the Nordic Environmental Research Programme of the Nordic Council of Ministers.
6. The size of the sample is 657 in Denmark, 843 in Finland, 1 163 in Norway and 931 in Sweden.
7. The reason for this is that the project was begun as a Norwegian study – see Nenseth, 1996 and Emmelin and Kleven in press.
8. SPSS 7.5 package.
9. The translations are approximate and intended to give an indication of the substance of each statement. The original national texts are more precisely worded, the terminology being related to correct administrative usage in each language.
10. Bo Elling, Competence Centre for EIA, Roskilde University lecture at Nordic EIA further education course 1994/95 and 1995/96 and personal communication.
11. At the time of writing the report was not available. The remarks are therefore based on media reports from a press conference and a short radio interview of the chairman of the commission.

REFERENCES

- Aasetre, J. (1997) *Holdninger til miljøvern i forvaltningen* (Attitudes to environment protection in the administration). SMU-Report 3/97. Trondheim: Centre of Environment and Development, University of Trondheim.
- Andrews, R. N. L. (1988) "Environmental impact assessment and risk assessment: learning from each other", pp. 85–97 in Wathern, P. (ed.), *Environmental Impact Assessment. Theory and Practice*. London: Unwin Hyman.

- Anon (1993) *Nordiske temaer i miljøkonsekvensvurderinger* (Nordic EIA themes). Nord 1993:18. København: Nordic Council of Ministers.
- Asplund, E. and T. Hilding-Rydevik (1996) *Kunskap, Miljö och Framtid. Plan-MKB – fallstudier i två kommuner* (Knowledge, environment and future. SEA – case studies in two municipalities). TRITA-IP FR 96–14. Stockholm: Royal Institute of Technology.
- Beanlands, G. (1988) "Scoping methods and baseline studies in EIA", pp. 33–47 in Wathern, P. (ed.), *Environmental Impact Assessment. Theory and Practice*. London: Unwin Hyman.
- Bisset, R. (1988) "Development in EIA methods", pp. 47–60 in Wathern, P. (ed.), *Environmental Impact Assessment. Theory and Practice*. London: Unwin Hyman.
- Bisset, R. and P. Tomlinson (1988) "Monitoring and auditing of impacts", pp. 115–128 in Wathern, P. (ed.), *Environmental Impact Assessment. Theory and Practice*. London: Unwin Hyman.
- Boverket (1996) *Boken om MKB* (The book about EIA). Karlskrona: Boverket (National Board of Housing, Building and Planning).
- Brown, A. L. and R. C. Hill (1995) "Decision-scoping: making environmental assessment learn how the design process works", *Project Appraisal* 10: 223–232.
- Carlman, I. (1993 a) *Tänk om: Studier av konflikter i svenska miljöärenden* (Think again: Studies of conflicts in Swedish environmental cases). IMIR 1993:2. Åmyra: Åmyra Förlag.
- (1993b) "Miljökonsekvensbeskrivning för Öresundsbron – proceduren" (EIA for the Öresund bridge – the procedure), *Miljörättslig Tidskrift* 1993:1 (Journal of Environmental Law).
- CEQ (1978) *National Environmental Policy Act. Implementation of Procedural Provision: Final Regulations*. Council on Environmental Quality. Federal Register 43 (230) 55977–56007.
- Elling, B. (1994) "Policy environmental assessment in Denmark". Paper to International Workshop on Policy Environmental Assessment, the Hague December 12–14, 1994.
- Emmelin, L. (1998) "Evaluating environmental impact assessment systems – Part 1: Theoretical and methodological considerations", *Scandinavian Housing & Planning Research* 15: 129–148.
- (in press) *Förvaltningskulturer i den Nordiska miljöadministrationen* (Organisational cultures in the Nordic environmental administration). København: The Nordic Environmental Research programme, Nordic Council of Ministers.
- (1997a) "Environmental impact assessment in Norway – A paradigm approach to understanding problems of implementation". Paper to the Conference Society, Environment and Sustainability – The Nordic Perspective, Oslo 25–27 August 1997.
- (1997b) "Planering och konsekvensbedömning – professionernas kamp" (Planning and EIA – the struggle of professions), *Miljösekvensen* 2: 9–10.
- (1997c) *Landscape Impact Analysis – A Method for Strategic Impact Assessment*. Lund and Stockholm: Department of Environmental and Energy Systems Studies, Lund University/NORDREGIO.
- (1996) "Landscape impact analysis: a systematic approach to landscape impacts of policy", *Landscape Research* 21: 13–35.
- (1993) "The concept of nature in the conservation bureaucracy", pp. 25–45 in Lundgren L. J. (ed.), *Views of Nature. Report From Two Seminars*. Report 93:3. Stockholm: Forskningsrådsnämnden.
- Emmelin, L., P. Brokking, and O. Wikberg (1996) "Bevarandemål och fysisk planering" (Preservation goals and physical planning), pp. 105–145 in *Att miljöanpassa Sveriges transportsystem – Underlagsrapporter* (Environmental adaptation of the Swedish transport system – Background reports). Stockholm: SNV Rapport 4643.
- Emmelin, L. and T. Kleven (in press) *A Paradigm of Environmental Bureaucracy? Attitudes, Thought Styles and World Views in the Norwegian Environmental Administration*. Forthcoming as NIBR Report. Oslo: NIBR.
- (1995) "The role of the environmental paradigm in the perception of environmental problems". Nordiskt seminarium om samhällsvetenskaplig miljöforskning (Nordic seminar on environmental social science research). Göteborg, June 1995.

- Finnestrand Bergsjø, T. (1995) *KU og kommunal planlegging. Kan konsekvensutredninger og kommunal planlegging samordnes?* (EIA and municipal planning. Can EIA and municipal planning meet?) Report 1995: 2. Oslo: NIBR.
- Glasson, J., R. Therivel and A. Chadwick (1994) *Introduction to Environmental Impact Assessment. The Natural and Built Environment Series 1*. London: UCL Press.
- Hildén, M. and R. Laitinen (eds) (1995) *The Nordic EIA-effectiveness Workshop*. Tema Nord 1995:532. København: Nordic Council of Ministers.
- Hilding-Rydevik, T. (ed.) (1997) *Samspelet Mark-Vatten-Miljö. Fysisk planering för att nå samhällseliga mål* (The interaction ground-water-environment. Physical planning to reach societal goals). Rapport 97:1. Stockholm: Forskningsrådsnämnden.
- (1990) *Miljökonsekvensbeskrivning i kommunal planering: förutsättningar samt förslag till arbetsmetodik* (EIA in municipal planning: conditions and a proposal for methodology). Dissertation. Stockholm: Royal Institute of Technology.
- Hjern, B. (1993) "Är lokal demokratisk miljöpolitik egentligen önskvärd?" (Is local democratic environmental policy actually desirable?), pp. 177–186 in Kullinger, B. and U.-B. Strömberg (eds), *Planera för en bärkraftig utveckling* (Plan for a sustainable development). Stockholm: Bygghöförsökningsrådet (Building Research Council).
- Husby, S. R. (1997) *Seks år med konsekvensutredninger. Erfaringer med praktisering av plan- og bygningslovens bestemmelser om konsekvensutredninger 1990–1996* (Six years of EIA. Experience of the application of the EIA regulations under the planning and building act 1990–1996). Oslo: NIBR Prosjektrapport 1997:20.
- Lawrence, D. P. (1997) "EIA – Do we know where we are going?", *Impact Assessment* 15: 3–13.
- Mulders, A. (in press) (1999) *Formal Structure, Policy Management Approaches and Views of Nature in Finnish and Swedish Environmental Administrations*. Licentiat thesis. Helsinki: University of Helsinki.
- Nenseth, V. (1996) *Kunnskap og miljøvern. En undersökelse av kunnskapssyn og arbeidsformer i miljøvernforvaltningen* (Knowledge and environment protection. A study of views of knowledge and forms of work in the environmental administration). NIBR Report 1996:10. Oslo: NIBR.
- Nenseth, V. (in press) (1999) *Knowledge Pluralism in Environmental Policy-making*. Doctoral thesis. Florence: European University.
- Regeringskansliet (Office of the Prime Minister) (1998) *Miljöbalken – En sammanfattning av regeringens proposition om miljöbalk* (The act on the environment – A summary of the government proposal for an act on the environment). Stockholm: Regeringskansliet (Office of the Prime Minister).
- Riksrevisionsverket (National Auditing Board) (1996) *Miljökonsekvensbeskrivningar i praktiken* (EIA in practice). Stockholm: RRV 1996:29 (National Auditing Board).
- Rothstein, B. (ed.) (1991) *Politik som organisation: förvaltningspolitikens grundproblem* (Politics as organisation: the basic problems of administrative policy). Stockholm: SNS Förlag.
- (1991) "Demokrati, förvaltning och legitimitet" (Democracy, administration and legitimacy), pp. 42–84 in Rothstein, B. (ed.), *Politik som organisation: förvaltningspolitikens grundproblem* (Politics as organisation: the basic problems of administrative policy). Stockholm: SNS Förlag.
- Sadler, B. (1996) *Environmental Assessment in a Changing World: Evaluating Practice to Improve Performance. Final Report of the International Study of the Effectiveness of Environmental Assessment*. Ottawa: Canadian Environmental Assessment Agency and the International Association for Impact Assessment.
- (1988) "The evaluation of assessment: post-EIS research and process development", pp. 129–142 in Wathern, P. (ed.), *Environmental Impact Assessment. Theory and Practice*. London: Unwin Hyman.
- Sager, T. (1990) *Communicate or Calculate: Planning Theory and Social Science Concepts in a Contingency Perspective*. Stockholm: Nordplan Dissertation.
- Swensen, I. S. H. (1996a) "Five years of assessment: does it have an impact?", in IAIA (International Association for Impact Assessment) *Improving Environmental Assessment*

- Effectiveness: Research Practice and Training*. Abstract of unpublished paper p. 187 of Proceedings of the IAIA 16th Annual Meeting, June 17–23, Estoril, Portugal. Vol. I.
- (1996b) *Mellom fag og forhandling: KU-bestemmelsene i plan- og bygningsloven*. (Between science and negotiation: the EIA regulations in the planning and building act). MILKOM 14/96. Oslo: Norges Forskningsråd (Norwegian Research Council).
 - (1995a) *Hvordan praktiseres konsekvensutredningsbestemmelsen i plan- og bygningsloven? Leca Rælingen, en eksempelstudie* (How is the EIA regulation in the planning and building act applied? The example of the Leca Rælingen plant). MILKOM 3/95. Oslo: Norges Forskningsråd (Norwegian Research Council).
 - (1995b) *Konsekvensutredninger i praksis: etablering av Ringnes i Nittedal kommune* (EIA in practice: the establishing of the Ringnes plant in the municipality of Nittedal). Oslo: NIBR Notat 1995:139.
- Therivel, R., E. Wilson, S. Thompson, D. Heaney and D. Pritchard (1992) *Strategic Environmental Assessment*. London: RSPB/Earthscan.
- Törnebohm, H. (1983) *Studier av kunskapsutveckling* (Studies of the development of knowledge). Lund: Doxa.
- Wathern, P. (ed.) (1988) *Environmental Impact Assessment. Theory and Practice*. London: Unwin Hyman.

