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AN INTEGRATED MODEL OF A DECISION-MAKING BASIS FOR ENVIRONMENTAL IMPACT ASSESSMENT (EIA) OF TRANSPORT INFRASTRUCTURE INVESTMENTS

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Abstract

Social and environmental impact assessment is increasingly used in transport planning to qualify the decision-making in this area. In this paper, a new integrated model for Impact Assessment (IA) is outlined which is designed to solve the compatibility problem between soft and hard scientific data and ordinary experiences. The crucial elements in this model are the use of phenomenological experiments, a new analysis terminology based on basic co-existential referents and the advice of extensive public participation.

INTRODUCTION

For an increasing number of legal systems, Environmental Impact Assessment (EIA) is an obligatory and central part of planning and decision-making of important transport infrastructure investments. (E.g. Nijkamp & Blaas 1994, Lamure 1992, Lee & Lewis 1991, OECD 1994, Therivel 1993.) The ambitions with this instrument have been enormous. It has been introduced in order to make possible the reliable assessment of the total effect of a project on both non-human nature and people. However, the EIAs so far carried out are much more restricted as to their ability to yield a sufficient and satisfactory basis for environmentally sustainable decision-making on transport infrastructure investments. Among the shortcomings, the following four issues are of particular importance.

Firstly, current EIAs lack the interdisciplinarity necessary for a comprehensive analysis and assessment of the expected impact on man and nature. In particular, the exclusive focus on technical indicators gives little room for the contributions of the social sciences and humanities and for the non-scientific, but still highly relevant experiences of ordinary people. Secondly, to the extent that soft values (e.g. psychological factors and ethical issues) are taken into consideration, they are usually disregarded in the final assessment due to their incompatibility with "hard" scientific data. Thirdly, there is a widespread disagreement on the nature and range of environmental problems. While people may share a particular terminology and rhetoric, methods and goals can still be quite different due to basic disagreements on how to perceive and experience the world. Fourthly, there are different suggestions as to the role of the public in planning and decision-making. It has been largely ignored that these issues are decisive also for the material questions at stake and their ethically acceptability.

On the basis of these problems, an integrated model for Impact Assessment (IA) is needed. Such model must be based partly on conceptual analysis, partly on empirical evidence. For empirical research, new methodological instruments should be considered, such as "phenomenological experiments", to serve the demands on integrative modelling.

In this paper, a discussion of methodological issues is central. A new model for IA is outlined which is designed to solve the compatibility problem between soft and hard scientific data and ordinary experiences. The crucial elements in this model are the use of phenomenological experiments, a new analysis terminology based on basic co-existential referents and the advice of extensive public participation.

THE TRANSFORMATION OF QUANTITATIVE INTO QUALITATIVE, NORMATIVE RESEARCH

The attempt to avoid subjective, non-controllable statements and to secure uniformity in method and comparability of data has given quantitative research a central place in science. Social science has largely assimilated objectives and techniques from natural science and made it a specific goal to transform qualitative information into hard-core data, programming the computer to process these data in an algorithmic way. Questionaires, interviews and observational results are given mathematical expression in statistics, geometric models and tables.

Transport and environmental research and planning is heavily relying on quantitative analysis too, which is particularly manifest in IA, cost-benefit analyses, economic research

and technical planning. It is the intention of this paper to question this use of quantitative data and methods, in particular in relation to IA of physical transport infrastructure (although the following discussion may hold true in other fields of research as well). It is argued that quantitative analysis suppresses important normative features and prevents meaningful integrative analysis. By "meaningful integrative analysis" I mean analysis which yields practical knowledge suitable to decision-making, implying (1) that the decision-basis is inherently normative and (2) that different technical languages are translated into a discourse language which is trans-sectoral and related to concrete contexts of existential meaning. I shall shortly explain the character and implications of these demands.

(1) The demand that knowledge in order to be practical has to be "inherently normative" means that one's investigation must reflect the challenges given with the interaction between human and other natural beings. No social and natural circumstances are "neutral" in character. To the contrary, they challenge a moral being insofar such a being has the capacity to respond more or less adequately to a given challenge. For example, the description of a traffic accident can never be "neutral with respect to responsibility" (as occasionally claimed, e.g. Schofer et al. 1995, 317). A proper description of such an incident, i.e. a description which has practical significance, must use value-laden concepts, such as "careless drivers", "unattentive cyclist" and cannot be reduced to pure physical and causal descriptions without loss of meaning. The careless driver and unattentive cycist constitute a challenge to which "response-able" people have to respond in a way which may be characterised as more or less adequate.

(2) The demand on trans-sectoral, integrative research implies that any appropriate investigation must find a proper discourse language which is able to function as a common denominator of basic existential concerns. Fortunately, ecology, economy, engineering science, geography, sociology, biology and ethics share a common concern for the well-functioning of living beings and natural systems which motivates and directs their research and forms the basis of interpretation. However, this concern for life and well-being is more often about statistical relations than about real-life or existential matters. Practical knowledge as searched for in transport and environmental research must be based on a common normative denominator which reflects true existential concerns. It is the idea of the model for IA proposed below to elaborate such a denominator as common guiding principle.

The turn to qualitative, normative analysis is motivated by the following considerations. Firstly, while avoiding dependence on particular researchers and on the situational constraints that shape inquiry, quantitative research is explicitly designed in abstraction from the social, subjective and contextual features. In this respect its approach aims at value-freeness and objectivity. However, for research aiming at practical knowledge, the abstraction from social, subjective and contextual features in the name of objectivity is unwarranted (Bastian & Schreiber 1994, 367). In qualitative, normative research, objectivity is redefined as the participatory grasping of concrete interactions. To this purpose I shall recommend the use of so-called "phenomenological experiments". (See below.)

Secondly, although in particular social scientists are very creative in transforming qualitative information into numerical data, there are numerous cases where this strategy has to be given up. For envrionmental research, Goudie observed that "primary impacts give rise to a myriad of successive repercussions throughout the ecosystems which may be impracticable to trace and monitor. Quantitative cause-and-effect relationships can [therefore] seldom be established" (Goudie 1986, 294). Moreover, though the valuation of people's life or health can be expressed in market prices on the basis of insurance amounts, these valuations will never reflect the true moral feelings and perceptions of those who are affected. If we regard life and health conditions as unvaluable, those existential questions cannot be integrated into quantitative evaluation models at all. Another example is the estimation of people's attitudes to the establishment of traffic-intensive, arterial roads. Neither willingness-to-pay approaches

nor cost-risk-benefit analyses will ever reflect the significance and actual impact of a road and road traffic on actual people. Only those feelings and other subjective features will normally be taken into account in an IA which fit pre-given, rational standards. Thus, focusing on quantifiable data will exclude at least some, and probably the most important features from investigation and any assessment on this basis is very likely to be insufficient.

Thirdly, the recent focus on threshold values raises problems not only related to the question of whether it is possible at all to identify objective natural limits for environmental load, but also problems related to their actual practical effect. In general, it can be claimed that the legitimate exploitation of threshold values is hardly compatible with a cautious environmental strategy.

THE ROLE AND NATURE OF PHENOMENOLOGICAL EXPERIMENTS IN IA

To gain *integrative* knowledge, new trans-disciplinary methods have to be considered. Various theories have been proposed to back up qualitative research. The present approach is based on a combination and qualification of in particular three of these methodologies: phenomenology, ethnomethodology and participatory research.

Phenomenology explicates how objects and experiences are meaningfully constituted and communicated in the world of everyday life. (Holstein & Gubrium 1994, p.264) Phenomenologists have been reluctant to present particular methods for use in practical research. Phenomenology is regarded to be a theory of knowledge. However, any theory of knowledge has methodological implications. Basically, phenomenology makes use of audiotaped conversations, but also written anecdotes of personal experiences are widely utilised. Other sources of phenomenological research are poetry, art (including photography and drawings) and phenomenological literature (i.e. analyses of basic social phenomena such as confidence, love and responsibility). Being heavily inspired by phenomenology, the aim of *ethnomethodology* is not to provide causal explanations of patterned behaviour, but to describe how members recognise, describe and account for the order of their everyday lives. *Participatory research* includes participation observation and action research, which is based on the living experiences of other people and the researchers' normative commitment in connection with particular case studies. Its aim is ultimately the transformation of social practices. (Reason 1994; Atkinson & Hammersley 1994)

The combination of ethnomethodological descriptions, participation observation, action research and phenomenological analysis provide the framework of *phenomenological experiments*.

Experiments are at the core of any scientific enterprise. The function of experiments is partly the corroboration and falsification of theories, partly the prognosis of single data. Not all experiments aim, however, at the determination of laws of nature and other causal phenomena. They may just be concerned with the characteristic of single, unique events and they may show the possibility of particular behavioural changes without committing to statements about outcome probabilities. In this sense they contribute to what has been called a "phenomenological description". Making people familiar with particular scenes or events by the help of phenomenological descriptions (which partly are based on phenomenological experiments) is motivating and contributes to the change of social practices. Phenomenological descriptions yield practical knowledge of particular contexts of action.

The aim of phenomenological experiments is to provide experiences which motivate behavioural changes (or confirm and strengthen those attitudes and practices which already are largely in agreement with the particular experiences). These changes are changes of the

participants or - through phenomenological descriptions - of other actors. Phenomenological experiments are designed to involve both mental and bodily functions, i.e. they try to comprehend the participant as an interactive being, whose behavioural features cannot be reduced to obsevational data or subjective representations. Performing phenomenological experiments, the investigator has to involve himself in the experiential situation of the investigated agent and use a wide range of metodological approaches to secure a comprehensive data collection. Actually, he has to share the experiences of the testee. Probably, the most appropriate way to register and present these shared experiences will not be by tables and numbers, but by making *committed* and *committing* descriptions of phenomenal experiences.

The role and nature of phenomenological experiments is to provide comprehensive knowledge of particular normative facts. Phenomenological experiments and phenomenological descriptions form part of a knowledgebase which includes, besides what might be called "knowledge of special experiences" (German: "Erfahrungswissen"), "knowledge of everyday experiences" (German: "Alltagswissen") and "scientific knowledge" (German: "ExpertInnenwissen"). With increasing public participation the knowledge of everyday and special experiences obtain increasing significance. (Rüede et al. 1997.)

INTERPRETING ENVIRONMENTAL AND SOCIAL IMPACTS IN TERMS OF CO-EXISTENTIAL REFERENTS

In planning we have to face a multiplicity of challenges or "pollutions". In a broad sense, pollution stands for any form of human-made change which challenges the living conditions of natural beings and their ability to respond properly to actual and future challenges. Following this definition, which can be traced back to interpretations from shifting historical and cultural contexts, the range of potential forms of pollution or problematic impacts must be taken to include at least the following phenomena (Tabl.1):

Table 1: Types of problematic impact: pollution

Noise
Smell / Odour
Particle Emission
Time Pollution
Space Pollution
Wind (airing, lee, refreshment, etc.)
Warmth and Coldness
Light / Darkness
Resource Deterioration / Exhaustion
Ugliness
Exchange impairment
Non-vigorous development
Impairment of power and sensibility (in particular of moral judgment)

The list distinguishes forms of pollution which are to some extent incomparable. Yet, careful reflections disclose a hierarchy and certain priorities. For example, the impairment of peoples natural powers and sensibilities, in particular the damaging effect on moral judgment, is obviously a more severe form of pollution than various health effect caused by noise or particle emission. Impairment of moral judgment affects our general power to involve in responsible practice and is, therefore, fundamental for proper choices of human activities,
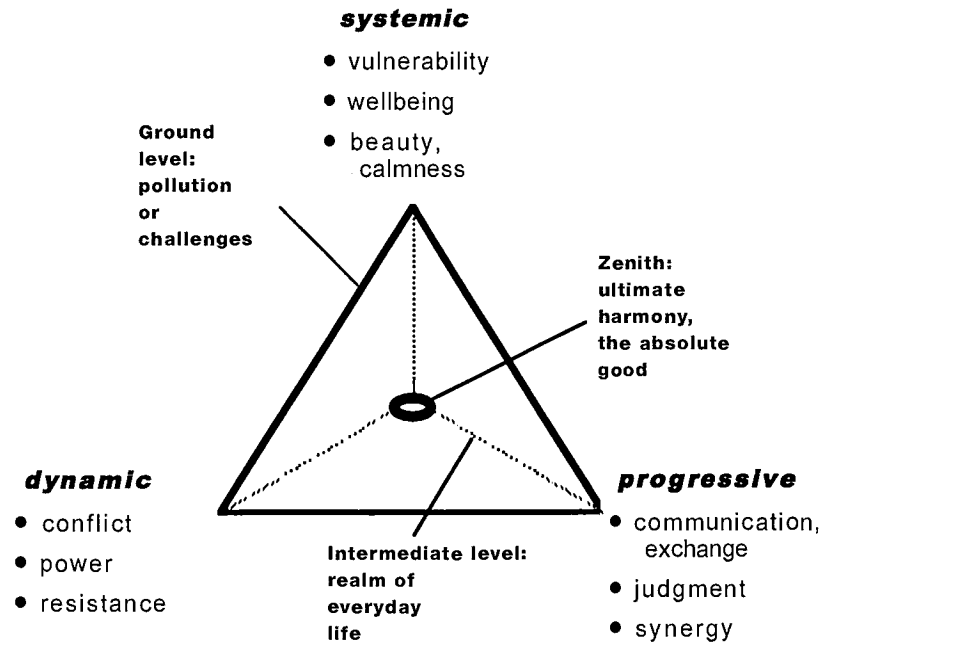
including health care. Final orderings, however, can first be disclosed at the level of particular case analysis.

To see this, however, different forms of pollution have to be disconnected from their various technical and conceptual frameworks. Forms of pollution which are mainly described and identified in natural sciences and those with an terminological framework used in social and human sciences or in ordinary language must be translated into a basic, interdisciplinary language. The need of a common language for analysis should meet two demands:

(1) It should focus on basic *existential* matters which help interprete polluting activities in terms of what is important for living beings (nature). It is presumed that a language which focuses on existential matters is more appropriate to describe the nature of environmental problems than any technical-scientific language.

(2) What should be searched for are concepts which are *proper* translations of technical terms while putting these meanings into a wider and sufficient context of understanding.

Some of these concepts we are looking for are already used sporadically in literature on pollution. This is the case with concepts such as vulnerability, well-being and the ability to exchange. These concepts can be used across disciplinary borders and express basic existential concerns. Yet, other concepts might prove to be necessary in order to make possible appropriate descriptions. Fig. 1 mentions some of these concepts.

systemic
- vulnerability
- wellbeing
- beauty, calmness

Ground level: pollution or challenges

Zenith: ultimate harmony, the absolute good

dynamic
- conflict
- power
- resistance

Intermediate level: realm of everyday life

progressive
- communication, exchange
- judgment
- synergy

Figure 1: Basic existential referents in IA

Pollution are challenges which motivate or urge the perceiving individual to changes and improvements. Human beings normally believe in the possibility of changes to the better. However, challenges never end and pollution can not be abolished. Still, we are driven to

try to improve the situation. Fighting pollution is a major purpose of human activity, either by reacting to actual problems or by improving the standard of purity.

The focus on environmental problems is part of this endeavour. Giving environmental research a narrow technical interpretation, however, has prevented people from understanding the basic existential context of environmental problems. The consequences are severe.

First and foremost, sectorial thinking precludes insights into the contextual truth of particular events. Next, by interpreting environmental problems as problems with certain external natural resources an untenable separation of man and nature is reproduced and strengthened. Moreover, pollution being given a technical interpretation prevents ordinary people from involving, while experts are trusted to find technical solutions.

An enlarged concept of pollution, as suggested, would be a major step to re-involve people in acts of "purification" and human progress, to contest the current, untenable dualistic world-view and to provide sustainable, long-term solutions based on contextual understanding.

To illustrate the way to talk about pollution in co-existential terms, I shall shortly discuss the concept of noise.

NOISE POLLUTION

Today, noise problems related to transportation are mainly dealt with in terms of dB(A). Noise measurements make up the basis of impact evaluations. (E.g Jones and Chapman 1984.) Politicians have widely agreed that beyond a certain level of measurable noise sounds are transformed into noise. Noise is unwanted and unacceptable sounds. However, although highly convenient, the demarcation of noise on the basis of general threshold values i arbitrary and highly problematic. (See e.g. Guski 1987) The phenomenon of noise is too rich and complex to be dealt with satisfactorily on the basis of physical measurements. As a consequence a few studies have emerged which emphasize the importance of the *meaning* of sound as opposed to its physical parameters. (Cf. Cohen & Spacapan 1987.)

Guski (1987) defines noise as sounds which is undesired or which has a detrimental influence on someone's physical, mental, social or economic condition. To make sense of this complex phenomenon and in order to see the compatibility of its various elements, a re-interpretation in ethical or co-existential terms might be performed. The purpose of an analysis of noise is, in this sense, to clarify these co-existential meanings and confront them with corresponding meaning analyses of other, related forms of pollution.

The essential thing to know about a particular sound as polluting (i.e. as noise) is not its measurable figures, but its function or role in relation to basic co-existential referents, such as exchange, communication, calmness, power, etc. (See fig.1.) To reveal these meanings, psychological, sociological, biological and physiological studies of the impact of sound on different forms of life are indispensible. Yet, these scientific results have to be screened critically from the point of view of ethics. Ethics is taken to be the discipline which deals with questions of meaningful practice and is primarily concerned about the abilities of moral subjects to act responsibly ("response-ability").

The ethical screening process will particularly focus on two types of attitudinal, perceptual and interpretative distortions: (1) Subjective perceptions and attitudes which have a negative impact on basic co-existential concerns, and, in particular, our ability to judge

these concerns (moral judgment). (2) Sectoral descriptions (e.g. technical or economic terminology) which cover up "what really matters" from a co-existential point of view.

The following list of noise impact (row 1) is based on Guski (1987), Jones & Chapman (1987) and Homburg & Matthies (1998). Their focus is primarily on environmental psychology. Therefore, the list cannot be complete. However, it is sufficient to illustrate the intended nature of analysis. Row 2 indicates the need for re-interpretation and lists relevant co-existential referents. These referents are basic, non-analysable concepts which have their exact meaning established contextually.

Table 2: Noise impacts and their co-existential referents

Noise...

...diverts attention from actual intented acts	attraction exchange power/ judgment
...ties up energy for resisting noise and its impacts	resistance exchange power/ judgment
...creates annoyance / psychological stress and moral complaints	well-being communi-cation calmness judgment
...impairs the capacity of hearing and other senses; creates physiological sensitization	exchange communi- cation beauty
...impairs blood circulation, increases muscle tensions	exchange well-being
...disturbs sleep and calmness	calmness well-being
...impairs productivity and work related judgment	exchange power
...necessitates various undesirable noise prevention measures	exchange communi- cation well-being
...influences socio-economic distribution, price level etc.	exchange power
...distorts judgment	power/ judgment
...hampers altruistic behaviour (e.g. helping behaviour	exchange
...may invade someone's privacy or "personal world"	resistance vulnerability well-being
...is relative to different sensibilities, physical, geographical, historical and cultural circum- stances	power

The table indicates that quite different and at first sight seemingly incomparable noise impacts can be dealt with on the basis of a few co-existential referents. It is possible, therefore, to avoid bargaining and instead reformulate the problems in a unitary language.

If we perform corresponding re-interpretations in co-existential terms of *other* forms of pollution, we may be able to speak about pollution in a clear, comparable and meaningful way. In fact, noise pollution is not a well-defined phenomenon, but shares various relations and overlapping concerns with, for example, resource deterioration, ugliness, time pollution, exchange impairment, non-vigorous development and the impairment of power and sensibility. Some of these phenomena are related to other types of pollution, such as space pollution, light/darkness, etc. In this way virtually all pollutive activities are somehow related, directly or indirectly. Only if we find a common, concerning language to describe these activities will it be possible to deal with them in a meaningful and effective way.

PUBLIC PARTICIPATION IN IA

When people are supposed to participate in a common normative discourse, the issue of public involvement has to be reconsidered. As long as IA is perceived to be mainly dependent on technical-scientific knowledge, the role of the public is fairly restricted. However, this changes radically when the focus in IA is instead put on conditions of co-existence. Then, it is reasonable to claim that assessment processes should be open to the public in *all* its phases and be *governed and controlled* by the public.

Now, it is important to realise that the public is not the individual consumer, nor the aggregation or association of consumers, but the citizen in his or her responsible involvement. This is true in particular in matters of transport infrastructure which is clearly an exclusively public issue. The relevant question is not what can society and nature provide for the individual consumer, but rather what are the adequate conditions for citizens to involve in socially and naturally responsible behaviour.

Therefore, with the focus on public governance of IA procedures, demands on participants must be strengthened. At least, two related demands must be made:

(1) Because public participation is related to plans and projects of *public* interest, as is the case with transport facilities, the most relevant arguments and statements will be those which express common concerns (citizen perspective). This will exclude most instances of nimbyism. In other words, particular interests (consumer interests) have to be subordinated to public interests (citizens interests, shared goals, "the common good").

(2) Public participation is not a non-obligating, purely verbal activity, but a social process with corresponding duties and obligations. Therefore, a demand on participation in IA procedures must be the willingness and commitment of individual agents (citizens) to share experiences, to face particular challenges with an open mind, to be motivated by the common good, to respond in a for moral agents adequate and optimal way and to take responsibility for decisions made.

When many survey studies have to face the problem of serious clashes between expressed opinions and actual behaviour, the primary reason for this is the lack of obligations. It is free to express opinions which do not commit to particular behaviour.Therefore, we need empirical studies which have built-in commitments (sanctions).

It is part of a strategy for IA that complementary steps are taken to promote a policy which develops moral capacities. The success of public participation is dependent on the successful development of moral capacities on the basis of shared experiences. To share social experiences and a communality with non-human nature is an important condition of perceiving the common good and feeling obliged to its attainment. (Compare related viewpoints in Khisty 1996, Khisty et al. 1999, Bastian & Schreiber 1994 and Zeitler 1997.)

TOWARDS A MODEL FOR IA

A usual way of making IAs is by formulation checklists, numerically listed or put into tables for use of cross-checking. Checklists for EIA usually include social matters such as the impact of a plan or policy on employment or communal and private services. The question of what to include in those checklists and how to evaluate the actual data is essential for the significance and reliability of the model.

From the point of view of the citizen, his co-existential conditions include both general and particular features which are determined by the actual settings. Therefore, general threshold values are probably of little significance for him. For example, a noise expert declaring noise levels from rural roads under 55 dB as acceptable, makes no significant statement in those cases where one's reason for moving to the rural residential area is its peacefulness. It makes no difference to the residents whether the noise level in their area would rise to 45dB or 55dB because in both cases their main motiv for living in the rural area would be removed (Juslen 1997).

The point of reference for any IA is the particular conditions of concrete inter-human and man-nature relationships. Any change in physical infrastructure will affect human and non-human beings. For a comprehensive and proper assessment of this impact the particular circumstances have to be evaluated in relation to any affected moral subject (human beings, animals, plants, ecosystems, etc.) (See fig.2). The proper criterion for such an evaluation are not quantitative measures (environmental load, threshold values, etc.), but decisions based on a fundamental respect for the moral status of the affected beings and systems and their partical co-existential conditions. The only judge in this connection are morally competent agents who perform a moral decision on the basis of informed and sensitive interactions and shared experiences. The use of qualitative measures means that an assessment comes closer to the essential problems and their complexity and ensures a relatively open decision basis with extensive public participation (Elling & Nielsen 1996, 74).

The major criterion for IA is the impact on conditions of co-existence (e.g. Sukopp & Wittig 1993, 356), including the moral competences essential for successful symbiotic behaviour. As a general rule impacts have to be evaluated in relation to the question whether the activity concerned makes it possible or prevents moral agents from making proper, i.e. responsible decisions. Any physical infrastructure, technology or any other particular measure which forces people to act in morally reprehensibly ways has to be assessed negatively. Negative impacts can also be termed "pollutive". *"Pollution"* is just another word for the negative impact on conditions of co-existence or, what is literally the same, for the impairment of capacities of moral judgment.

By focusing on *co-existence* and not just existence, I shall exclude short-sighted, individual want-satisfactions which do not pay attention to their social and natural contexts. The important thing is not to protect each individuals' separate rights and interests, but to recognise the symbiotic context of any being as the natural starting-point for analysis. It is assumed that any human or other individual can only be identified and respected, if it/she/he is not unduly disconnected from its/her/his life context or settings. When we insist on somebody's right to a good environment, the problem is not the well-being or survival of the single individual, but a disturbed or distorted relationship between so-called rights-holder and other co-existing beings. The focus on cross-checking within IA lists has exactly this function. However, these lists don't work satisfactorily as long as different terminologies block out comparative analysis. Therefore, we need existential referents as listed in table I. Below fig.2 is a graphical representation of the general structure of IA, applicable to assessments of projects, plans and strategies.

LAND USE

INSTITUT.
FRAME-
WORK

TECHNOLOGY
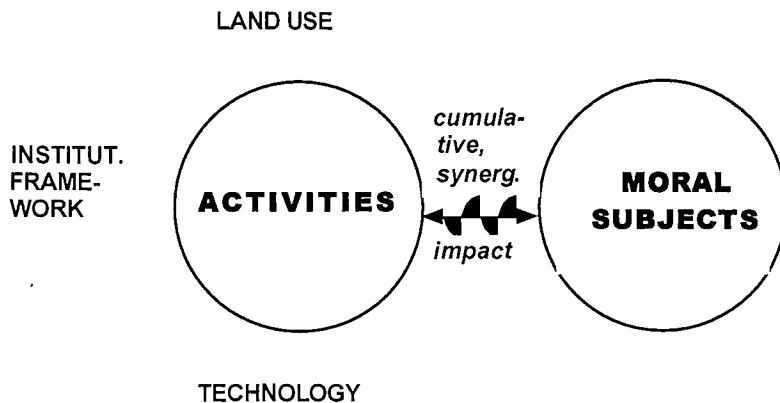
Figure 2: General model of IA

Impacts are relative in meaning, significance and extent to the particular *moral subjects* and their circumstances. For centuries it has been an uncontested assumption in modern liberal society to reserve the status of moral *subjects* to human beings and that of moral *agents* to a subclass of humanity, namely rational, experienced people.

However recently, not only beyond, but also as a result of critical reflection within Western culture, this classical anthropocentric attitude has been seriously challenged. It has become legitimate to ask whether other natural beings than humans deserve to be called moral subjects. Environmental impacts are not only impacts of significance for human well-being and survival, but have possibly some kind of moral importance of its own, without identifiable utility effect. As a consequence, the class of moral subjects should be kept as open as possible.

Clearly, the way a human being fulfills its role as moral subject is quite different from the way a particular animal, plant, a ecosystem or substance should be treated. Accordingly, the impact of a particular pollutive phenomenon (e.g. noise or darkness) is different among different moral subjects. Living beings (humans, animals, plants, etc.) respond naturally to given challenges. Their "response-ability", however, is quite different and, thus, our expectations to them - which form the basis of complaints - must be relative to their particular capacities. To treat specific natural phenomena inadequately, i.e. to impose an impact on them which affects them adversely, means to neglect their particular nature or capacities, i.e. it impairs their ability to respond properly to various challenges. Examples are the impairment of the moral judgement of human beings, the prevention of domestic animals to use and develop their natural instincts (e.g. scraping of hens, etc.), the transgression of the carrying capacity of an ecosystem, the weakening of the resistance of organisms, etc. In IA, the crucial question, therefore, is to whether any plan or project is likely to affect the capacities of natural phenomena (man included) to respond properly to present and future challenges.

Although the extention of the status of moral subjects to other natural beings is still far from being universally accepted, its line of reasoning is at least conceivable. This is not necessarily so with potential moral subjects like "landscape", "townscape", "water", "soil" or "cultural heritage". How can a *landscape* be a moral subject? A piece of nature is said to be a "landscape", if we take it as a sensory experience without any utility function. The piece of nature imposes an impression on us which is not purely subjective but originates from the

interaction between the human agent and the particular natural phenomenon called "landscape". Landscape is the total sensory impression of some piece of nature which is aroused in a sensitive human being. (Hellpach 1950, 107). This means that for other natural beings, the character of a landscape may be less important or not important at all or have a quite different meaning. Therefore, assessing the impact of any plan or project on landscape involves primarily the careful investigation of the empowering interaction between beings with aesthetic and other sensory capabilities and a particular segment of natural phenomena. To the extent the sensory and related capacities of co-existing individuals is adversely affected by man-made changes of the landscape, these impacts on the landscape should - from a moral point of view - be avoided. In this case, the landscape is not an independent moral subject, but is defined contextually as a dynamic relation between a human, sensitive agent and another delimited natural phenomenon. The beauty of a landscape (which is said should be morally preserved) is not an objective quality of a piece of nature, but its potential to create a perception of beauty in certain sensitive beings.

In relation to human beings, the impairment of moral judgment is crucial in IA. It threatens one of our most vital capacities as responsible human agents and prevents future responsible decisions. Therefore, a general guiding idea in any IA procedure is to raise the question whether the activity concerned has a negative impact on our capacity to act as morally responsible beings. Having this in mind, we may formulate the following *Assessment Rules,* for short called **SPEAK-PRO**, where SPEAK is concerned with the major steps in IA and PRO deals with the involvement of the public in this process.

Table 3: SPEAK-PRO. Assessment rules and public governance

Assessment Rules
Screening and scoping. Preliminary overview and classification of problems.
Phenomenological experiments, interviews and other field work.
Effect analysis. Single, cumulative and synergetic effects.
Evaluation of Alternatives.
Knocking down pollution. Countermeasures. Feedback.

Public Governance
Proposals. Mail boxes and audiences for the public to make proposals (e.g. as known from Quality Circles).
Participation in phenomenological experiments.
Reviewing different options and interpretations in fokus groups (not based on interest balancing but out of motivations to serve the common good). Open to all with qualifying motivations.
Ombudsman institution for decision making. Independent of political parties and interest groups.
Observation, mediation and monitoring.

The SPEAK-rules are supposed to be performed with extensive public involvement. Scientific experts are involved in effect assessment (E), the formulation of viable alternatives (A) and the design of countermeasures (K). However, their contributions will be critically screened by responsible working groups and the ombudsman and they will be asked to interpret their work in relation to baisc co-existential referents. The ombudsman has as his primary function to act as mediator and to observe that the procedure adheres to the central ethical objectives of the assessment.

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