

## **THE CONCEPT OF THE JOURNAL OF TRANSDISCIPLINARY ENVIRONMENTAL STUDIES\*\***

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The Journal of Transdisciplinary Environmental Studies focuses on important environmental issues and the integration of natural and social science into the field of environmental management and planning. We hope and believe that both university researchers and people engaged in knowledge production in government departments, consulting companies, public and independent research institutions will find the journal rewarding to read and to write for. We begin this outline by arguing for the need for a scientific journal encompassing both academic scholars and practicing professionals, and then go on to present the case for a journal focusing on important environmental issues from a transdisciplinary point of view. Third and lastly, we will identify some environmental problems we find strategically important in these years.

On the whole, scientific journals have failed to take into account the changes that have occurred in the production of scientific knowledge, despite the fact that these have been tremendous during the last forty years. We will briefly discuss this change and then jump to our conclusion about the role of our journal.

The number of institutions involved in knowledge production has expanded considerably. In the past universities had something of a monopoly in this area. Today, however, knowledge relevant for environmental science is produced by many different kinds of institutions first and foremost ministries, public research institutions, independent research institutions, consulting companies and universities (Gibbons 1994). This dispersal of knowledge production has only had a limited impact on institutional arrangements in the scientific world. Most scientific journals are still written, peer reviewed, and read exclusively by university employed research workers. Many would argue that this is so because university research is of a different kind than research undertaken by other institutions; university research is often seen to be more "basic," and hence more genuine in comparison to applied research. The adjective 'applied' may imply that research outside the universities is just a question of employing knowledge that has already been developed in universities. With regard to environmental science we propose the use of different phrasing: 'scientific research' versus 'regulatory research'. This phrasing indicates that what differentiates the two kinds of research is their different aims – not their different levels or different institutional settings.

The aim of scientific research is to produce 'truths' of originality and significance relevant to universities, whereas the aim of regulatory research is to produce 'truths' of relevance to governmental and industrial policy, examples could be whether a specific substance is carcinogenic or not, and, if so, how it could be regulated, or the environmental impact of the green consumer movement and ways of strengthening the movement. Regulatory research normally includes components of knowledge production, knowledge synthesis, and prediction (Jasanoff 1990). Regulatory research seeks to provide the scientific background for regulatory decisions, and hence often has to integrate different

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\* A number of people have commented on previous drafts of this paper. Especially we would like to thank the other members of the Editorial Board for their comments.

strands of knowledge, break new ground and accept lower levels of certainty than those of scientific research. Both undertakings are often quite innovative, but regulatory research is risky, and has often been accused of being flawed. In particular instances this may be so, but it is, nevertheless, a form of "contested" science because it has consequences for regulatory regimes, and because the level of knowledge required to justify regulatory decisions is always open to discussion. We find that scientific research is less often contested in this way. On the other hand scientific research can be criticised for being inward-looking and excessively formalistic – tendencies peer review might even exaggerate. Our intention with this journal is to combine the best from the two worlds. A peer review system will ensure that regulatory research is sound science. We expect that the focus on important environmental issues can ensure that the Journal has relevance and focuses on matters of practical importance. If the journal lives up to our intentions, we believe we have developed a journal for people in government departments, consulting companies, public and independent research institutions, as well as universities engaged in production of knowledge related to the environment.

During the 1960s, Europe saw a growth in the number of environmental problems, and in connection to that there was a corresponding need for specific academic qualifications related to environmental management. Danish environmental legislation has focused on decentralisation and that has created a demand for qualified environmental practitioners in local and regional councils. The environment act of 1973 combined an emergency powers act and a planning act; local decisions were to be taken partly based on assessments of chemical, biological and ecological circumstances and partly based on an economic and social background. That is to say a need was created for transdisciplinary qualifications involving an understanding of a range of disciplines from the natural and social sciences.

Transdisciplinarity should be distinguished from interdisciplinarity.

Interdisciplinarity draws upon themes of process and evolution that embrace different disciplines such as physics and biology, and usually requires teamwork and close collaboration between researchers and the phenomena being studied (O’Riordan 1995). Interdisciplinarity might embrace both physical and social systems and in this way it might be transdisciplinary, but in our context research it is only transdisciplinary if it draws upon both natural and social sciences, as well, in some contexts, as the humanities.

Transdisciplinarity draws upon a variety of disciplines for information, analysis, and insight, and that means taking more negotiated sciences into the policy realm and engaging with the public. This is needed because societal understanding is vital to the conduct of sciences under conditions of great uncertainty, value conflict and data ambiguity which pervade contemporary society.

Based on these experiences and discussions in the editorial board a framework for the content of the journal appears. Figure 1 shows 3 circles that illustrate important areas of interest, and the research to be published in the journal should focus on the common area.

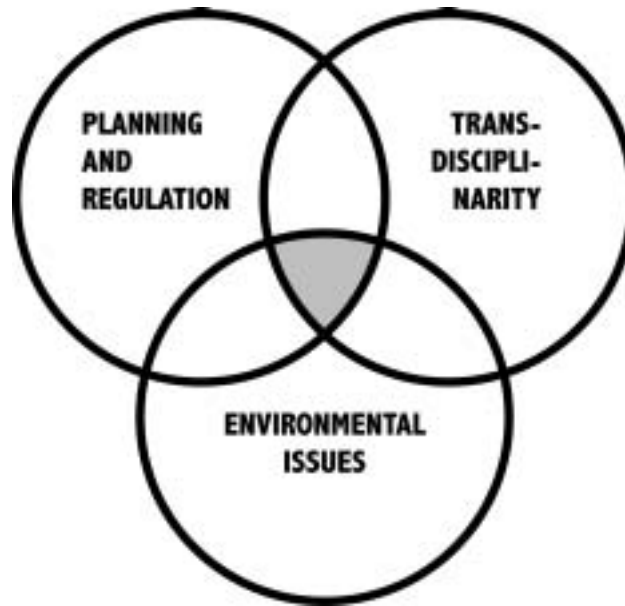


Figure 1: The circles illustrate: a) Planning and Regulation, b) Environmental Issues c) Transdisciplinarity. The common grey area is the focus of TES journal.

a) *Planning and Regulation*. We define planning and regulation in its broad sense as all forms of social control over, or influence on, activities that are valued by society. Thus it includes both deliberate state command and control regulation as well as the green consumers impact on industry. And it includes both approaches focusing on understanding as well as approaches focusing on strategies for solving environmental problems.

b) *Environmental issues* of relevance to society and the actual environmental discussion. The problems should be of a certain importance and that will of course change as the environmental discussion continues. The environmental public debate among government, NGO's, scientists, business people, citizens etc. constitutes environmental problems and the need of regulation.

b) *Transdisciplinarity*. The journal focuses on studies, which include disciplines from natural sciences and social sciences. Not all problems have this element of transdisciplinarity and as a consequence we limit ourselves to certain environmental issues because we believe there is a scientific need of developing this specific field. It might be difficult to find research where natural science and social science are equally balanced but that is what we are aiming at. On the other hand we will accept non-balanced articles as long as they try to enter into a dialogue with the other scientific field.

### **Important Environmental problems**

It is to some degree possible to foresee the rise of environmental problems. A governmental need of transdisciplinary research appeared in many industrialized countries in the eighties and research centres were established. In Denmark, regulatory science is sometimes called strategic research, which has some of the same transdisciplinary features as mentioned earlier

in this paper. The strategic studies consider environmental problems in a dynamic sequence of driving forces (see Figure 2).

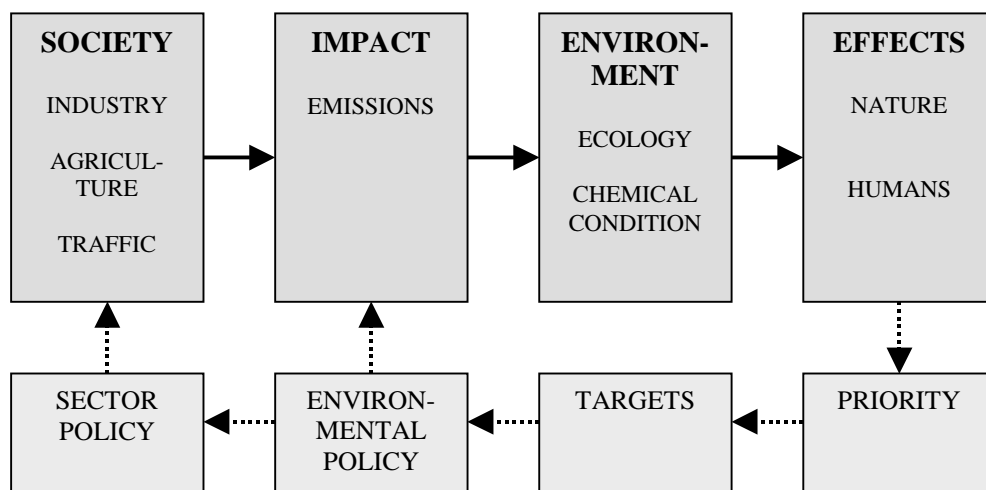


Figure 2. The Environmental Political Dynamics.  
 The industry and others have different emissions to the environment which have unwanted effects on nature and human beings (Full Arrows). The society might prioritise among these effects and execute regulation to mitigate some of them (Dotted Arrows). (Modified from Holten-Andersen 1998)

The diagram (in Figure 2) illustrates important elements of the dynamic of environmental problems. Projects and activities lead to emissions into the environment, and effects arise when the impact is undesirable for other social groups. The pollution load is always related to one or more production/social activities such as area use, resource utilization, manufacturing, transportation, agricultural production, fishery, forestry and consumption. Many elements are involved in comprehending the environmental problems. Scientific documentation of risks, monitoring, pressure from NGO's, media and general public awareness might over time initiate an environmental policy and regulation.

From experience we know that under certain societal circumstances, when a conflict has attained a certain magnitude, the governmental system will generate corresponding environmental regulations (Andersson 1992).

A number of environmental issues can be identified as examples of problems that presently will cover the scope of the journal.

*Climate change:* An international agreement was negotiated in Kyoto, and the Kyoto protocol has been launched. The US refuses to sign the protocol and argues that CO<sub>2</sub> sinks should be included and accepted in a higher degree in the protocol. As an example of a problem for further studies a phrasing can be as follows: “Should natural sinks play a role in the international attempts to control CO<sub>2</sub> discharges?”

It is an environmental problem that concerns both international planning and regulation. The natural science part is to establish the knowledge of natural sinks like different kinds of forests, moors, farmland etc. The social part of the research deals with problems of including sinks in the protocol and how to establish an efficient control system.

*Use of chemicals:* For many years chemicals used in industry and household consumption have been environmental regulated on the basis of different kinds of test methods which are mostly designed so that an organism is exposed to one or two substances following which, a response is measured. Recently the precautionary principle has been introduced and applied to the situation where a regulation should take place even there is no firm scientific proof of a certain impact. A study can deal with the extent to which: “The precautionary principle has been reflected in environmental management in different countries?”

The contribution of natural science is to aid the definition of the precautionary principle, whilst social science prescribes methods for comparing different regulatory systems.

*Biodiversity:* The Biodiversity convention came into force in 1993, and the discussion has focused on rainforests in tropical countries where particularly high numbers of species are found per area. But the protection of diversity is also relevant in temperate countries like Denmark where most of the area is farmland. A relevant study can then elucidate: “How can crop rotation increase biodiversity in farmlands?”

The natural science literature contain results of diversity of different groups of plants and animals in certain crops and social science is necessary to study the economic costs of more diversity in farming.

*Valuing ecosystems:* The Danish Economic Council has introduced a concept of “genuine saving” which is to say that the capital of machines, buildings, nature, fresh air, knowledge can be priced and compared. A society can use resources such as oil, if the income is used for education, roads or other things that make the society richer. A possible paper could deal with: “Environmental consequences of valuing ecosystems.”

From an ecological point of view it is difficult to accept a certain price of, for example, a moor, while it make sense to an economist.

*Environment and economy:* In some industrialised Western countries the growth of GNP is higher than the related national use of fossil energy. There seems to be a reduced use of resources per produced unit and consequently a reduced amount of pollution. An actual paper could go deeper into an explanation of such phenomenon: “ Is decoupling between economic growth and pollution a myth or reality?”

The natural scientific study can consider whether improved technological efficiency is really reducing the resource consumption, and social scientists can assess the role of the environmental management.

*Traffic:* Small particles from diesel driven lorries are hazardous to human lungs. Small particles are suspected of causing 22 deaths in Denmark per annum. A potential paper for TES journal is: “Can a filter which reduces the amount of small particles which are emitted from diesel engines be called a sustainable solution?”

*Environmental knowledge and public participation:* Public participation is needed in the regulation for various reasons (legitimation, mobilisation of local knowledge, disseminate information, improve obedience) but the ongoing expertification and erosion of local knowledge are barriers to free communication. This type of problem is met by the local acceptance or rejection of international and national regulation for example the wildlife in the Wadden Sea.

### **In brief**

The Journal of Transdisciplinary Environmental Studies focuses on transdisciplinary environmental sciences of relevance for planning and regulation. The target group of the Journal is people engaged in both "regulatory" and university environmental research.

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