

ESEE News Letter

ESEE Newsletter

Information from The European Society for the Ecological Economics - Issue N°3 – November 1997

A Word from the President

Ecological Economics and Development will be the subject of our second international conference on March 5th and 6th, 1998, at the university of Geneva. I would like to use this occasion to thank in advance our colleagues in Geneva for their efforts in organizing of this event.

A broad participation is expected of all those researchers and decision makers inspired by the new approaches and methods of the European Society for Ecological Economics. This big interest is anticipated for at least two reasons:

On the one hand, many await the conclusions which will be drawn at Geneva, concerning the dynamic activities of this new Society after a two year experience, as well as the new spirit which might emerge from the upcoming elections.

On the other hand, the subject of the conference is currently at the heart of an important number of questionings concerning sustainable development policies. The key to the solution of quite a number of environmental problems actually lies with the development of third world countries and recently developed countries.

In the context of economic globalization, increased attention has recently been paid to the instance of international externalities, or to cases of alleged cost-shifting by economic players separated by very large distances. Many of these actors involve multinational firms. These are giving rise, especially in Ecological Economics, to a growing debate on «unequal ecological exchange» between countries of the North and of the South. For example, conflicts over the control of the commercial exploitation and profits generated by agriculture and «wild» biodiversity have recently led to accusations of «biopiracy» against multinational firms. In addition, a discussion about the delocalization of occidental dirty industries to the South or to economies in transition is currently taking place. Analyses are increasingly being conducted by the «ecological footprints» left by production and consumption in rich countries, in terms of land, water and photosynthesis requirements, compared with the availability of these resources in the producing and consuming countries. The opportunity costs of forests and fisheries depletion are being discussed in terms of inter-societal and inter-temporal injustice.

These debates show that it is time for the European Society for Ecological Economics to prove its capacities in analysis as well as in policy advice. In order to accomplish this, various elements are necessary: an assessment of the state of the art of our objectives, bibliographic advice, original methods and finally policy instruments that are capable of dealing with inter- and intra-generational equity questions emerging from problems of development and environment. This is the challenge awaiting us all in Geneva!

Sylvie Faucheux

The cost of building dams is always underestimated --
There's erosion of the delta that the river has created
There's fertile soil below the dam that's likely to be looted
And the tangled mat of forest that has got to be uprooted
There's the breaking up of cultures with old haunts and habits loss
There's the education program that just doesn't come across
And the wasted fruits of progress that are seldom much enjoyed
By expelled subsistence farmers who are urban unemployed
There's disappointing yield of fish, beyond the first explosion
There's silting up, and drawing down, and watershed erosion
Above the dam the water's lost by sheer evaporation
Below, the river scours, and suffers dangerous alteration
For engineers, however good, are likely to be guilty
Of quietly forgetting that rivers can be silty
While the irrigation people too are frequently forgetting
That water poured upon the land is likely to be wetting
Then the water in the lake, and what the lake releases
Is crawling with infected snails and water-born diseases
There's a hideous locust breeding ground when water level's low
And a million ecological facts we really do not know
There are benefits, of course, which may be countable, but which
Have a tendency to fall into the pockets of the rich
While the costs are apt to fall upon the shoulders of the poor
So cost-benefit analysis is nearly always sure
To justify the building of a solid concrete fact
While the Ecological Truth is left behind in the Abstract....

By Kenneth E. Boulding

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THOUGHTS

The Value of Natural Capital or Environmental Accounting for Sustainable Development - by Walter Radermacher - Federal Statistical Office, Germany, October 1997
(E-mail : stba-uger@t-online.de)

An exercise with some students (n = 50) consisting of a brief introduction into the general functions of ecosystems and a short statistical survey yielded the following results: Per hectare of land, an estimated equivalent for the economic value of the natural services should range between 2 to 5 DM per day. By translation to annual \$ values and multiplication with the global surface, the total value of nature could be determined in an interval between 21,088 and 52,722 \$ yr⁻¹ 10⁹. The surprise about the large numbers (factor 1 to 3 of the global GDP) could be clarified with a plausibility check and a reference to Robert Costanza's study in 'Nature' which provides almost the same figures. This was the proof that the global surface is large and in particular larger than global GDP.

In a harsh contrast to that world of big numbers (attracting considerable public attention) we can find a group of activities under the title 'National Environmental Economic Accounting'. The actors in that group consisting of statistical offices and a great diversity of research institutes feel responsible to realise Agenda 21's commitment for the development of 'green accounting'. Achievement of sustainability objectives requires resource management to assure the maintenance of essential environmental functions as well as economic capital stocks. The typical mix of unsustainability consists of external effects, public goods, a global context, slow processes, complex systems and uncertainty. The consequence is that the requirements from sustainable development cannot be simply fulfilled with an accounting concept which has been tailored for market goods, national economies, short term processes and which is based on a linear descriptive model. An integration of sustainability problems would cause not only marginal but structural changes of the core (market) system. It would, therefore, be not realistic to assume that an easy adjustment by subtraction of some correction values

could solve or reflect problems of that size in an appropriate manner. Sustainable Development can only be defined and achieved by a complicated restructuring process of the society including the fact that the final results of that process cannot be anticipated by (scientific) assumptions and (statistical) surveys or estimates. Nevertheless, environmental accounting systems can and should deliver an essential input for that manoeuvre of the society towards sustainability. From that perspective there is no restriction to results in money terms. Instead, the numbers have to quantify the different aspects of the decision problem and they have to be meaningful in a macro-economic context, reliable and measurable by available capacities. Evidently, these objectives need compromises and can only be achieved step by step. Looking at the actual situation in many European countries, it can however be stated that environmental accounting already delivers valuable information of high political relevance. For further information, see for example the final report of the European research project "Environmentally adjusted GNP figures" that can be ordered at the ESEE secretariat.

Complexity in Ecological Economics: just another "buzz-word" or a new scientific paradigm ?

by Mario Giampietro - Istituto Nazionale della Nutrizione, Italy
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The exponential growth of the use of the word "complexity" in printed and virtual texts dealing with the sustainability of economic development is certainly a reason for concern. Very often, when different disciplines recognize the existence of an empty niche in their current system of knowledge we witness an inter-disciplinary convergence on the use of terms sufficiently ambiguous to convey the vernacular meaning of elusive concepts across individual disciplines (e.g. sustainable development). However, when the various definitions of the chosen term given by individual disciplines are neither consistent or compatible we are dealing with a buzz-

word. The question is whether "Complex Systems Theory" in Ecological Economics is merely "fashionable ambiguity", or a genuine integrating concept. I believe that it is real and fruitful. To make my point clear I will discuss two issues which are fundamental for the future of this field:

1. the nature of both the **indeterminacy** in the description of real systems and **uncertainty** in the forecasting their evolution. The study of complex systems shows that in spite of the unavoidable existence of indeterminacy and uncertainty they can obtain adequate results in **mapping their environment** and in **developing anticipatory systems** (biological systems have been doing these two functions for millions of years ...);
2. the impasse experienced by reductionist scientific knowledge when attempting to tackle the issue of the sustainability of human technical progress.

The world that we know is organized through a continuous cascade of events occurring in parallel on different scales. For example, sub-atomic particles operate on very small space-time scales; as result of this lower level activity we perceive atoms as entities operating at a larger scale. When aggregated on a larger space-time scale atoms' activity results into the existence of molecules, the indispensable basis of chemical processes. We can climb this ladder of hierarchical levels to arrive at cells making up organs needed by individual human beings. Individual humans operate on their own characteristic space-time scale which is much larger than that of cells but much smaller than the space-time scale at which socio-economic systems are operating. Obviously, it is impossible to describe real world systems by keeping record of all the details on all levels. If we were making an attempt to describe such a fractal reality without compression (e.g. describing economic demand and supply including in the model all the trajectories of electrons of all the atoms making up the rational agents and the structures responsible for production and consumption of goods and services)

we would have to process an unbounded quantity of information. Self-organising adaptive systems (the main subject of study of complex systems theory) are able to avoid this obstacle by mapping their environment after a major compression of the required information. Actually, it is the hierarchical organization (or fractal geometry) of the world which makes possible both compression and mapping. The molecules of CO₂ on their level can be assumed as belonging to a “type” which is not affected by the “individuality” of the atoms composing them. Even if we change the individual atoms of Carbon and Oxygen composing a CO₂ molecule this will not change its perceived characteristics on the higher level. In the same way, to study the productivity of a variety of corn we can use a description of the relative “plant-type” even though “individual plants” can exhibit variations (due to stochastic events occurring in their development) around the characteristics of the type. Attractors (an ensemble of positive and negative feed-backs organized into a system of controls) in general take care of perturbations generated by differences between “individuals” and “types” guaranteeing the identity (maintenance of steady-state) of complex systems. However, the higher we move in the ladder of space-time scales the more difficult becomes the challenge of mapping and compression. For example, the debate about the validity of the assumption of a rational behavior of economic agent should be described - in this framework - as a debate about the validity of the use of a “type description” within systems made-up of human beings. The strong individuality of humans (dramatic influence of personal history, large non-linearity between causes and effects of their actions due to reflectiveness) does not prevent their behaving in some crucial respects like types; thus the constancy of suicide rates, which can be taken as indicators of social pathology in any given society or sub-society. However, complex systems at a higher level, as socio-economic systems, nations or cultures, are so strongly influenced by their special circumstances, including particularly the reflexive elements (history, ideology, self-

consciousness) that they can only very approximately be described as “types” (e.g. “market economy”, “socialism”, “democracy”). Discrepancies between individuals and types for components of social systems (workers, consumers, firms, communities, national economies) cannot be predicted in terms of amplitude, patterns of occurrence and, above all, in terms of their relevance on the validity of the description. A high degree of heterogeneity in space and time (due to rapid localized and unpredictable changes) makes almost impossible for someone living within the society to define in details: physical constraints, technology, preferences, institutional settings. This is due to the fact that such accurate assessments have to be obtained by observers operating within the system on the same space-time scale at which the mechanisms generating changes are also occurring. In this situation, indeterminacy (defined by Martin O’ Connor as - the existence of legitimate contradictory statements of the initial conditions) is unavoidable. Chaos theory shows quite clearly that the future behavior of dynamic systems is highly sensitive to minimal changes in initiating conditions (the so called “butterfly effect”). Socio-economic systems are classic examples of dynamic systems which - to make things worse - are co-evolving with other dynamic systems (other socioeconomic systems and ecological systems). At this point, the indeterminacy of any of the possible mappings entails that uncertainty is also unavoidable in any forecast of the evolution of socioeconomic systems in their interaction with ecological systems.

The impasse experienced by reductionist science can therefore be explained by the complex nature of the real world: indeterminacy and uncertainty cannot be overcome, either by bigger models ran on more powerful computers or by accumulating more data after investing more resources in the analysis. A system operating at a particular level (the focus level at which we are interested to describe its behavior) is affected by systems operating above it on higher levels (the ones defining its context) and by

systems operating below them on lower level (the ones defining its initiating conditions). Any analysis of such a system must therefore include both: (i) the interface focus/higher level (scaling up to address the relation with the context - the “why question” in Herbert Simon definition); (ii) the interface focus/lower level (scaling down to address the mechanism determining the emergence of organized patterns on focus level as generated by initiating conditions determined by lower level processes - the “how question”). Finally, in order to study the behavior of complex adaptive systems we have to address the “why” and the “how” at the same time, that is we should be able to describe the behavior of interest on several space-time scales at the same time. Again the relative set of compressions required to avoid the need of processing an infinite amount of information will introduce an element of arbitrariness in the model we decide to use. As shown by Robert Rosen a particular choice of the mapping code is not related either to the system mapped or to the algorithm used for the mapping. The same system can be mapped satisfactorily by our information processing system through different methods of coding and/or different algorithms. Actually this is what explains, different formalisations of the definition of sustainable development in neo-classical economics, agronomy, agro-ecology, sociology, anthropology, etc. The existence of different legitimate mapping choices translate then into the need of using different and complementary descriptions/analyses. Within such a framework complex systems theory seems to support the statement of Funtowicz and Ravetz that cost/benefit analysis based on reductionist descriptions (obtained by collapsing the complexity of the system into a description based on one unique space-time window and coding and decoding method) are likely to hinder the negotiation among different social groups. On the contrary scientific analysis should be used to enhance a social learning process about how to co-evolve with the environment.

THOUGHTS

Another plea for pluralism in ecological economics,

by Friedrich Hinterberger - Wuppertal Institute, Germany

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A decade ago, at the cradle of Ecological Economics as an international society, Richard Norgaard pleaded for pluralism in ecological economics. I am certainly very much in favour of such an approach, which - as everything - has also some negative aspects. In this very short note, I would like to point to both, favourable and negative aspects, and suggest some conclusions for which I would wish some further discussions to follow within ESEE. Looking at the conferences and publications of ISEE and ESEE, it is obvious that a plurality of views and methods is applied, a variety which is much greater than in more standard ("main-stream") associations of economists. On the one hand this is certainly a good thing and many economists and (especially) non-economists join the ecological economics movement (which has not become a school yet) just because of this openness. Most obviously, ecological economists consider the knowledge of other research areas. Since the claim is to provide a better representation of ecological issues, natural science knowledge should be taken more seriously than in conventional environmental and resource economics. In addition to that, it proved also possible to use certain methods from other sciences especially from biology and thermodynamics, in analogy for economic processes. This allows a better representation of the economy-ecology-relationship. Both are complex, dynamic, evolutionary, and self-organising systems with many similarities. This is often forgotten by economists, when nature is regarded nothing more than a comparative-static boundary condition of economic activities, but also by those natural scientists who fail to appreciate the complex dynamics of human societies, which cannot be "steered" in a simple way to keep them within the (virtual) ecological guard-rails.

In addition to such analogies we certainly need "pure" social science arguments. Especially within ESEE the necessity of a socio-ecological economics with a stress on societal development has a strong root. In such a view, development is more than

pure economic development both as an appropriate tool for scientific investigation and as a normative goal: societal progress is more than just economic growth! Pluralism, obviously, means in this context that a variety of approaches and methods, developed by different sciences, is needed in order to develop a comprehensive view of the world--which does not necessarily lead (and cannot lead, as Richard Norgaard claims) to one grand unified theory: there will always be holes and overlaps. Let me stress here that such a pluralism also means that neoclassical (environmental and resource) economics has its role, but is restricted by the relevance of other theories and approaches. As Norgaard puts it: "Neither the neoclassical nor the co-evolutionary model is right or wrong. Each entails different simplifications of reality which facilitate different ways of understanding complex systems". To study the working of market economies with (in principle) flexible prices in a relatively simple and stable setting, neoclassical economic theory with its numerous modifications and developments can throw considerable light on the intricacies of such a system. The effects of an ecological tax shift, for example, can thus be studied in an appropriate way. The point here is that this theory with its strict axioms adapted to its specific research subjects is hardly capable to deal with the diverse and complicated questions which turn up when we want to give more weight to the neglected political and sociological elements. Nevertheless, the variety of methods employed by ecological economists, has also some clear disadvantages. Ecological economists have not managed to develop a joint research programme that would help to investigate the problems at stake in a coherently joint effort. Although the marginal contribution of many ecological economists is higher (because more comprehensive) than that of many neoclassical economists, the total

contribution is often quite limited, because almost everybody starts at the very bottom, trying to introduce a fundamentally new framework to the important questions we are dealing with--without very much attention to the other work done in the field so far. The upshot is that most approaches are quite far from applicability, which contradicts the ecological economists' claim to develop possible solutions to the ecological problems we face.

What can we therefore learn from standard neoclassical economics (I am aware that - in reality - such a thing does probably not exist in pure terms)? Every researcher can build upon a well-defined and worked out basis of premises, theories and results to which a single peace of work contributes. Even if in a more pluralistic view this is not so easy, the principle is right. We should try to construct a joint methodological house in which we can develop ideas further, collaborate on specific questions and fight theoretical as well as empirical battles. All this is very difficult in today's wide-spread camp of ecological economics because of the incommensurability of most approaches.

Ecological economics is much younger than its methodological forerunners. But I think it is time to consider these things. In doing so, it might help a lot if we could return to some of the basic questions brought forward by the founders of the ISEE and work on concrete problems of today and the future: how can we help/influence individual and political decision makers to make some practical steps toward sustainability? To answer that question it does not help much to criticise each other or our common enemy. It is necessary to develop new approaches by combining all the valuable items we have in our methodological backpacks (and maybe throw away some heavy weight that has become useless) and apply them to the practical problems formulated by policy makers, business leaders and citizens in our countries and beyond ■

Sustainable Consumption

Prior to the Earth Summit in New York, the Royal Society and the US National Academy of Sciences jointly issued a statement on June 3rd calling for the problems of human consumption to be addressed immediately. Global patterns of consumption must change if future generations are to be provided for, and the standard of living of the poor is to increase.

The statement, Towards Sustainable Consumption, identifies a world-wide research and action agenda for the scientific community, governments and private firms.

The statement can be viewed on the Royal Society Website* or can be obtained free of charge by sending a stamped addressed envelope to Angela Halpin at the Royal Society, 6 Carlton House Terrace, London SW1Y 5AG.

* <http://www.royalsoc.ac.uk/>

«Conaccount» Report from a Conference and further Activities,

by *Stephan Moll, Wuppertal Institute,*

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From 11 to 12 September an international conference on Material Flow Accounting (MFA) took place in Wuppertal. The conference was supported by and embedded into a concerted action called «ConAccount» (Coordination of Regional and National Material Flow Accounting for Environmental Sustainability) which is supported by the Environment and Climate Programme of the Commission of the European Union (DG XII). The ConAccount process is coordinated by

the Wuppertal Institute in close cooperation with the Centre for Environmental Science, Leiden University, the Institute for Interdisciplinary Research and Continuing Education, Vienna (IFF) and Statistics Sweden.

The main objectives of the conference titled «Analysis for Action: Support for Policy towards Sustainability by Material Flow Accounting» were:

- to inform decision makers about the potentialities of national, regional and local Material Flow Accounting (MFA),
- to exemplify the political relevance of MFA,
- to support information exchange between institutions performing MFA research and decision makers (in administration, politics and economy) using the results of MFA,
- to define a future research agenda for MFA.

In the morning of the first day plenary presentations of invited lectures highlighted essential aspects of Material Flow Accounting instruments to support sustainability oriented policy. Success and failure stories of the use of MFA were presented in parallel sessions in the afternoon. The second day was used to focus and discuss the future research agenda for MFA. Beside the official programme the about 120 participants from 16 countries used opportunity to have fruitful discussions. The proceedings of the ConAccount Conference in

Wuppertal as well as the future research agenda for MFA will be available soon. Although financial support for the concerted action is running out by the end of this year the organizer will strive for a continuation of «ConAccount» as a network for MFA researchers and users. Mandated by the conference, the ConAccount Steering Committee will continue its activities and will take responsibility for guiding future activities in the field of MFA, explore future events of interaction and an appropriate form of organization of the MFA community. In near future, a «MFA market place" will be established on the internet for finding research partners and the announcement of events. An inventory of current MFA activities in Europe is already available on (www.wupperinst.org/wi/service).

Furthermore, an internet data base (incl. definitions) for international data exchange is planned. On 19 November 1998 the Conference «Beyond Sustainability - Material Flows in Society and Environment» will be held in Leiden (Netherlands). It will serve as a panel for the next yearly interaction in the field of MFA, thus continuing the process of ConAccount.

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(continues on page 6)

ON THE WEB**European Environment Agency**

<http://www.eea.eu.int>

The EEA is a specialised EU agency set up in 1990 and based in Copenhagen since 1993. Its main objective is to provide Community and Member States with objective, reliable and comparable information to enable them to take the requisite measures to protect the environment, to assess the results of such measures and to ensure that the public is properly informed about the state of the environment. It further provides the necessary technical and scientific support. The web site is designed to introduce the EEA and make its information more accessible to the intended constituency of planners, policy makers, reformers, researchers, investigators, legislators, managers in commerce and industry, the communications media and the general public.

News

Flooding in Poland:

<http://www.Flooding.pl/>

<http://www.Flooding.pl/ecorap.html>

George Washington University:

<http://www.gwu.edu/~greenu/>

(for the results of a public-private partnership between the US Environment Protection Agency and GWU)

The Warwick University has a good 'experts register' on the WWW:

www.warwick.ac.uk/info/experts/index.html

UK Global Environmental Research Office:

www.nerc.ac.uk/ukgeroff/welcome.htm

News from the European Consultative Forum on Environment and Sustainable Development Meeting of

October 1st – 3rd 1997 in Denmark

by Sylvie Faucheux, C3ED, France

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The first meeting of the Forum (for details about its members see COM 97/307/CE) took place in the form of a plenary at the *European Agency for the Environment* in Copenhagen on October 1st 1997. The idea was to assess the measures taken and the actions supported by the European Commission in the field of the environment and of sustainable development since the last general meeting in June, where an intensification of the sustainable development approach had been decided. Priority will be given to the objectives of a sustainable structural change of society and of an integration of environmental concerns in all political fields, starting with agricultural politics. Every General Directorate will deliver an assessment of its environmental actions and policies. In order to realize these objectives, the Commission applies the concept of "eco-efficiency" and supports local initiatives which improve the participation of all societal members. Finally, a discussion between the different members of the Forum took place. The most important questions discussed were:

- the actions of the Commission on an international level, especially in South-East Asia, carried out by

- the position of the Commission for the forthcoming conference on climate change in Kyoto; the text for this position was distributed and discussed in the meeting; as of how, the preparation of the period after Kyoto is a favored issue by the Commission,
- interviews are organized and working groups are formed with the different actors concerned.

In the following, the stage reports of the three working groups were presented:

- integration of environmental concerns on different policy areas, starting with agricultural policies and going on to transport and town planning policies,
- environment and employment,
- expansion of the European Union and sustainable development.

In January 1998, there will be a first series of publications based on the work of these three groups, at about the same time as the next meeting of the Forum. A more elaborated version of the recommendations will be finished in April 1998, in order to inspire the new policy goals in June 1998.

Moreover, Domingo Jimenez-Beltran, chief executive of the European Environment Agency, explained the role of his Agency for supporting and supplementing the work of the Forum (for more information on the activities of the Agency, see the website: <http://www.eea.eu.int>).

form of a seminar, organized and chaired by Mrs. Bjerregaard. This seminar was the first of a series of four which will take place during the next four years. The objective of this kind of seminar is to help define environmental policy goals of the Commission for the period 2000 - 2010. In order to prepare this meeting, a large number of documents had been sent to the members of the Forum several weeks earlier. After a close look at the broad tendencies in Europe, the principal challenges for the European Union concerning its goals of environmental protection and sustainable development were discussed. A series of questions were tabled between the members of the Forum and different actors of the European society. Among these actors were representatives of consumers' associations, NGOs, industrials, labor unionists, agricultural representatives, architects, town planners, local representatives, scientists and so on. Among the most important issues of these exchanges were the following: accounting of competitiveness and of policies for sustainable development; the problems of articulation between sustainable development and economic globalization; the choice of policies and instruments that are best capable of integrating the action of a large number of actors; the forms of governance adapted to sustainable development; the harmonization of town planning and

development; the role of labor unions for the necessary transformation of consumers into citizens; the principle of subsidiarity and the objective of sustainable development; environmental tax systems and the modification of national accounting, etc... On a certain number of these points, Mrs. Bjerregaard and the members of her cabinet asked the participants for more precise information. Before ending the seminar with policy recommendations, every member of the Forum was asked to make three clear and precise statements on possible policies. A positive point for us, Ecological Economists, was the following point, mentioned several times in the course of the three days: the importance of research and teaching as well as of pluridisciplinarity for the work on environmental politics and sustainable development in Europe.

NSF/Lucent Technologies Industrial Ecology Research Fellowships (USA)

The US National Science Foundation (NSF) and Lucent Technologies Foundation have awarded 18 grants to researchers across the United States to advance the emerging field of industrial ecology and to encourage businesses to integrate pollution prevention practices

into their day-to-day operations. The NSF/Lucent Technologies Industrial Ecology Research Fellowships, each worth up to \$50,000 per year for two years, will support an individual or group of researchers focusing on research or teaching to help industry design processes that prevent pollution and create environmentally friendly products.

For more information about specific grants, please contact the public affairs office at these institutions.

University of Alabama: John Kaplan Gershenson - Green Modularity: Ecology and Product Retirement

Colorado State University: Carol McConica - Nonflowing Chemical Processing for Thin Film Manufacturing

Yale University: Thomas E. Graedel - Modeling the Industrial Ecosystem

Florida Institute of Technology: John Engblom - Life Cycle Assessment / Design Methodology for Reinforced Commingled Recycled Plastic Lumber (CRPL)

Georgia Institute of Technology: Dennis W. Hess - Removal of Organic Films and Contaminants from Surfaces Using Elevated Pressure, Elevated Temperature Water

University of Michigan: Gregory A. Keoleian - Life Cycle Design of Building Integrated Photovoltaic Systems

University of Missouri-Rolla: Venkat Allada - Formalization of Disassembly Process to Support Serviceability and End-of-Product Life Options

North Carolina State University: George W. Roberts - In-Situ Generation of Hazardous Reactants for Chemical Synthesis

Ohio State University: Julie Ann Stuart Models and Instruction for Life Cycle Material Content Decisions

Pennsylvania State University: Timothy Considine - Environmental and New Technology Adoption in the U.S. Steel Industry

University of Rhode Island: Winston Knight - Models and Tools for Life Product Management

Prairie View A&M University: Ziaul Huque - Pollution Control in Fuel Cell Applications Using Ceramic Candle Filter for Cleaner Power Generation

IVAM Environmental Research (Netherlands): René van Berkel - Environmental Process Diagnosis and Improvement Tool❖

Diverse Publications

[Guide to the approximation of EU environmental legislation](#)

The EU Commissioner Bjerregaard presented this first guide to EU environmental legislation at an informal meeting of environment ministers in Brussels on September 8th. The aim of the guide is to serve as a practical tool for authorities in the associated countries involved in the process of adapting national legislation and administrative practices to the so-called "environmental acquis" of the European Union.

To get a copy of the guide, refer to the web site <http://europa.eu.int/en/comm/dg11home.html> Then select: "Guide".

[OECD Report on Sustainable Consumption and Individual Travel Behaviour](#)

The OECD has recently published a report of a meeting held in Paris in January 1997 on Sustainable Consumption and Individual Travel Behaviour.

The report draws on insights from two expert workshops on Individual Travel Behaviour, one of which was organised jointly by the OECD and the Global Environmental Change Programme in July 1996.

The report can be found on the OECD Environment Directorate Website at <http://www.oecd.org/env/lists4.htm>

Andrew K. Dragun and Kristin M. Jakobsson (Editors) – Edward Elgar, Cheltenham, U.K.

The forum for the initial presentation of the papers included in this volume was a special colloquium entitled *New Dimensions in Environmental Policy*, held in the Department of Economics at the Swedish University of Agricultural Science, at Uppsala in June 1996. For more information contact :

Andrew Dragun, E-mail Andrew.Dragun@ekon.slu.se

[Report on consumer behaviour:](#)

Jager, W., M.B.A. Van Asselt, J. Rotmans, C.A.J. Vlek, and P. Costerman Boodt (1997), Consumer Behaviour: A Modelling Perspective in the Context of Integrated Assessment of Global Change, [Globo Report Series No. 17, RIVM, Bilthoven, the Netherlands](#)

This report, accomplished by a group of dutch psychologists may be of interest for researchers who are in one way or another dealing with consumer behaviour. It describes a behaviour-theoretical perspective on environmental degradation and describes a conceptual model that will form the theoretical basis of our simulation program. The conceptual model integrates various behavioural theories in a system dynamical framework. For information or a copy contact:

tel: +31 50 3636482
Email: w.jager@ppsw.rug.nl

Targets for stabilisation of Atmospheric CO₂

In their report in the 20th June issue of Science (vol. 276), Christian Azar (and Henning Rodhe (Stockholm University) argue that the required level of the stabilisation of greenhouse gas concentration is still unclear at least for two reasons : “the impacts of any given level of CO₂ concentrations are still uncertain” and “the concept of dangerous interference is ultimately a question of value judgements that can only be settled in the political arena”.

However, the scientists argue that the Intergovernmental Panel on Climate Change (IPCC) presentation of a range of stabilisation scenarios “may be perceived as a range of acceptable levels ... however this perception of the range as a definition of what is acceptable is not what the IPCC intended”. They suggest that while establishing an acceptable stabilisation level is “inherently difficult”, avoiding the discussion “leaves decision makers and social scientists, like economists, in a even more difficult position. The situation calls for greater participation from the scientific community in the debate over long-term stabilisation levels”.

Given the present scientific uncertainties, Azar and Rodhe conclude that no firm conclusions can be drawn. But, in order to jump start the

discussion, they perform some simple calculations to arrive at potential temperature changes resulting from the range of IPCC stabilisation scenarios. They compare these challenges with an estimate of the natural fluctuation of global temperature over the past millennium (about 1°C or less) and the estimated temperature change during the last glacial cycle (about 5°C). “If the climate system is sensitive to CO₂ increases in the IPCC’s upper range, then a CO₂ concentration of only 550 ppmv (parts per million by volume) will be sufficient to yield a change in average global temperature of a magnitude approaching that which occurs during the transition to an ice age”, the scientists write.

They consider a 2°C temperature change as a high risk level, and conclude from their analysis that policies should be adopted that make stabilisation in the range 350-400 ppm possible. Stabilisation at such a level would require that CO₂ emissions over the next century be about 50 % lower on average than at present. For information or a copy contact:

Christian Azar
University of Technology-Göteborg University
41296 Göteborg, Sweden
Fax : 46317723150E-mail : frtca@fy.chalmers.se ■

Research Programmes and Grants

ESF Programme "Plant Adaptation" in the field of Life, Environmental and Earth Sciences

The European Science Foundation (ESF) has launched a scientific programme on Plant Adaptation. The programme will run for five years (1997-2001) and has a budget of 840 kFRF per year.

The goal of the programme is to integrate different approaches to problems related to plant adaptation, e.g. molecular and population biology. Another goal is to strongly promote European collaboration in basic science. The programme will fund workshops and research visits to laboratories in other countries. If you want to find out about these activities, please join our mailing list by subscribing to the ESF specialised mailing list.

To subscribe, send a message to list@esf.org and as message enter JOIN PLANT ADAPTATION.

You may also look at the ESF website <http://www.esf.org/lp/planta.htm> for further information on the programme. Or contact:

Joanne Dalton, Administrative Assistant
Tel: +33 (0)3 88 76 71 22
Fax: +33 (0)3 88 37 05 32
Email: jdalton@esf.org

European Research Programme on Environment and Global Change

The European Commission has launched a call for proposals for RTD activities within ENRICH (European Network for Research in Global Change), under the

specific RTD programmes in the fields of Environment and Climate and Marine Science and Technology (MAST).

Eligible organisations are invited to submit proposals for preparatory, accompanying and support measures within the following areas of the two specific programmes:

Environment and climate:

Area 1: Research into the natural environment, environmental quality and global change (global change aspects)

Area 2: Environmental technologies (global change aspects)

Area 3: Space techniques applied to environmental monitoring and research (global change aspects)

Marine science and technology:

Area A: Marine science (global change aspects)

Area B: Strategic marine research (global change aspects)

Area C: Marine technology (global change aspects)

Area D: Supporting initiatives (global change aspects)

This call relates to measures such as strengthening co-operative links and network, exchange of data and scientific information, building research capacity to address specified issues, identifying regional gaps and priorities to improve the integrated knowledge of global change processes and impacts, and contributions to the

development of science agendas or science plans. The financial participation of the Community may be up to 100 percent.

Further information, details on the procedures for submitting proposals, and the proposal application forms are available from the Commission and on the Internet (Calls & Document Library): <http://www.cordis.lu>.

Proposals and any correspondence should be sent to:

European Commission
DG XII/D "Environment and Climate - Enrich"

Rue de la Loi 200

B-1049 Brussels

Fax: 0032 2 296 30 24

E-mail: environ-infodesk@dg12.cec.be

Closing date for submission of proposals: 16 December 1997

EC Research Partner Search Made Easy

UKRHEEO in collaboration with 4 other liaison offices in Brussels have produced a partnersearch form on the Web. To access the form go to the following website:

<http://www.euratin.net/partnersearch.html>

Then click on the Partnersearch button and fill in your details. Once you have submitted the form, it will be packaged into an e-mail message and distributed through a network of liaison offices to a multitude of European researchers■

Announcement

Resignation of Jan van der Straaten

After careful consideration and consultation with members of the Administrative Council, Jan van der Straaten has decided to resign his post as one of the two Vice-Presidents of ESEE. He has cited work pressure as a major concern leading to this decision. He will continue to be involved in the production of publications for the International Society.

Announcement of Elections to the European Society for Ecological Economics

Dear ESEE Member,

The elections will take place in two phases. First, this announcement is a call for nominations for the offices of President, Vice President, and members of the Administrative Council which is detailed below. The closing date for nominations is the 20th January, 1998. Second, a vote of **fully paid** members registered with the ESEE will, in accordance with our Constitution, be held at the Ordinary General Meeting in Geneva, 6th March, 1998 to decide amongst the nominated individuals. Note: each member of ESEE has one vote and may in addition exercise a maximum of three proxy votes authorised in writing on behalf of other ESEE Members. The offices to be filled are:

President Vice-President Seven Members of the Administrative Council

I hope you will find the procedures to be followed as stated below self explanatory. If you have any specific questions please contact me.

Yours,

Clive L. Spash
Vice-President

Nominations Procedure

Nominations for the President

Those standing for the office of President will require nomination by 5 fully paid members of the ESEE. The person nominated must be a fully paid member of ESEE, and have been consulted prior to nomination. They must provide a one page (12pt, single spaced, in English) statement of intent for the development of the Society. This statement must include provision for funding the Secretariat, and provisional suggestions for the posts of Treasurer and Secretary. (Secretary and Treasurer are elected by the Administrative Council. There is no constraint on re-election to these offices and these two functions may be held simultaneously by a single person. Neither the President nor the Vice-President may hold these offices). Finally the presidential candidate must supply a short one page curriculum vitae. In summary the documents required are:

- letters of support from 5 fully paid ESEE members
- one page candidate statement including proposed funding and administrative arrangements
- short CV of presidential candidate

Nominations for the Vice President

Those standing for the office of Vice President will require nomination by 5 fully paid members of the ESEE. The person nominated must be a fully paid member of ESEE, and have been consulted prior to nomination. They must provide a one page (12pt, single spaced, in English) curriculum vitae which shows their ability to represent Ecological Economics as a distinctive field in Europe. In summary documents required for each candidate are:

- letters of support from 5 fully paid ESEE members
- a short CV of the vice presidential candidate

Nominations for the Administrative Council

Those standing for the Administrative Council will require nomination by 5 fully paid members of the ESEE. The person nominated must be a fully paid member of ESEE and have been consulted prior to nomination. They must provide a half page (12pt, single spaced, in English) statement of their intended contribution to the Council and Society. In summary documents required for each candidate are:

- letters of support from 5 fully paid ESEE members
- a short statement of intent

Where to Send Nominations

Nominations, including the complete set of documents requested above, should be received by the ESEE Secretariat on or before 20th January 1998. The address is:

ESEE Secretariat (Elections),
Centre d'Economie et d'Ethique pour l'Environnement et le Développement (C3ED),
Université de Versailles -- Saint Quentin en Yvelines,
47 Boulevard de l'Université -- 78289 Guyancourt Cedex -- France

Forthcoming Events

The European Roundtable on Cleaner Production, Oslo, Norway, November 1st - 3rd 1997

There will be 3 main themes to the roundtable :

1. Contributions from industrial ecology towards cleaner production - focusing on how life-cycle performance can be incorporated successfully into an industry's competitive strategies.
2. Cleaner production from Sofia to Aarhus - achievements, bottlenecks, need for further action.
3. From supply-driven to demand-driven cleaner production.

For further information about ERCP 97 contact Nina Norton, National Institute of Technology, PO Box 2608, St Hanshaugen 0131, Oslo (Tel: +47 22 86 51 89/Fax: +47 22 11 12 03/Email: norn@teknologisk.no).

International Workshop on Economic Globalisation and Sustainable Development, St. Quentin, France, November 7th - 8th 1997

In the context of the European Network on Sustainable Development, a workshop is organised by the C3ED, with the support of ADEME, the French Ministry of the Environment, University of Versailles-St.-Quentin-en-Yvelines and ESEE, Friday 7 and Saturday 8 November 1997, Université de Versailles Saint-Quentin en Yvelines

Contact:

Olivier Petit, C3ED, Université de Versailles Saint-Quentin en Yvelines, 47 boulevard Vauban 78047 Guyancourt Cedex.

Tel: 01-39-25-53-75

Fax: 01-39-25-53-00

E-mail: reseau.gesd@c3ed.uvsq.fr

Conference on the Greening of Industry, Santa Barbara, USA, November 16th - 19th 1997

Sixth Annual International Conference The Greening of Industry Network, organized by the University of California Santa Barbara, the Clark University and the University of Twente, in association with the CERES (Coalition for Environmentally Responsible Economies) and the Journal Business Strategy and the Environment.

Information available on web site:

<http://www.cerc.wvu.edu/ceres/greening.htm>

CHE Autumn lecture series on Consumerism and Sustainability, Edinburgh, Scotland, Autumn 1997

the following lectures will be held in Edinburgh, Scotland, every Tuesday, 6.30pm, Friends Meeting House, Victoria Terrace:

October 21st: *Consumerism as the new idolatry*, by Rev. Prof. DONALD MACLEOD of the Free Church College.

October 28th: *The spell of the sensuous: Why reality doesn't come in packets*, by DAVID ABRAM

November 4th: *What's need, what's greed?*, by PAUL FITZGERALD.

November 11th: *Shop till you drop: The shopaholics tale*, By RICHARD ELLIOT, University of Oxford.

November 18th: *I am not a free man, I am a consumer*, By STEVE MILES, University of Plymouth.

November 25th: *Come to cancer country*, by Prof. ALEX GARDNER.

December 2nd: *Shopping mall-aise*, By POLLY GHAZI and JUDY JONES.

Fourth Annual International Sustainable Development Research Conference, Leeds, UK, April 3rd - 4th 1998

For further information contact ERP Environment PO Box 75

Conference on Innovative Options in the field of Nuclear Fission Energy, Centre de Physique des Houches, France, April 27th - May 1st 1998

Contact:

Prof J.P. Schapira, Institut de Physique Nucléaire, IPN, 91406 Orsay cedex, France

Tel : (33)-1 69 15 51 97

Fax : (33) 1 69 15 64 70

E-mail : schapira@ipno.in2p3.fr

International Workshop "Advances in Energy Studies : Energy Flows in Ecology and Economy", Porto Venere La Spezia, Italy, May 27th - 31 1998

Contact:

Sergio Ulgiati, Department of Chemistry, University of Siena, Siena, Italy

Tel : (39)-577 280 405

Forum : environmental degradation. Is there a role for (Ecological) Economics ?, Uppsala, Sweden, June 13th - 14th 1998

Contact:

Professor Andrew K. Dragun

Division of Resource and Environmental Economics
Swedish University of Agricultural Sciences

Box 7013 - 750 07 Uppsala, Sweden

Tel : 46 18 671751

Fax : 46 18 673502

E-mail : Andrew.Dragun@ekon.slu.se

World Congress of Environment and Resource Economists, Venice, Italy, June 25th - 27th 1998

Contact:

Congress Organisation Inc, 1998 World Congress, Cannaregio 4133, 30100 Venezia, Italy

Fax : ++39.41.5212705

E-mail : susan.venice@popmail.iol.it

Conference on Environmental Engineering and Management, Barcelona, Spain, September 30th - October 2nd, 1998

Contact:

Liz Kerr, ENVMAN 98, Wessex Institute of Technology Ashurst Lodge, Ashurst, Southampton SO40 7AA, UK.

Tel: 44 (0) 1703 293223 Fax: 44 (0) 1703 292853

E-mail: liz@wessex.ac.uk

International Meeting on Georgescu-Roegen, Strasbourg, France, November 6th - 7th 1998

Call for papers: Proposals should cover in particular the following topics:

1. Epistemology/Methodology
2. Environment/Energy/ Development
3. Utility and Uncertainty
4. Production and Growth Models

Paper proposals (2-3 pages in French or in English) to be sent to the following address before March 1st, 1998:

Georgescu-Roegen Meeting,

Bureau d'Economie Théorique et Appliquée 38, boulevard d'Anvers,

67000 Strasbourg - France

Co-ordinator : Eric FRIES GUGGENHEIM,

Phone : 33 (0)3.88.41.52.27 / FAX : 33 (0)3.88.61.37.66

e-mail : GR.meeting@cournot.u-strasbg.fr

Job offer *Energy and Society Faculty Position*

Energy and Resources Program - University of California at Berkeley

The Energy and Resources Group of the University of California, Berkeley seeks a scholar starting 1998-99 in the general area of "Energy and Society" for a faculty appointment at the tenure level (associate/full). Candidates must have graduate-level training in the physical sciences, a record of creative research spanning energy technology and policy, experience in seeking extramural funding, a strong interest in teaching in a highly, interdisciplinary academic environment, and a demonstrated ability to introduce scientific information into policy debates. Deadline for application is December 1st, 1997. Applicants should submit a curriculum vitae, a brief statement of research plans and teaching interests, and the names of three references to: Search Committee Chairperson, Energy and Resources Group, 310 Barrows Hall, University of California, Berkeley, CA 94705-3050. ■

Ecological Economic Teaching and Courses

*The European Environmental Policy
Special Programme for EuroManagers*

Date: November 19th –21st 1997
Venue: Rome, Italy

For further information contact:
European Institute for Public Administration
O.L. Vrouweplein 22
P.O. Box 1229
NL- 6201 BE Maastricht
Tel: 31 43 32 96 222
Fax: 31 43 32 96 296

*KEELE University, Department of Environmental Social
Sciences, Environmental Management Principal
Ecological Economics*

Date: Autumn Semester, 1997-1998
Venue: KEELE University, United Kingdom

Aims of the course : give students an insight into the subject
of Ecological Economics.

For further information contact:
Prof. J. Proops
Keele University – Economics Department – Environmental
Policy Unit
ST5 5BG Staffordshire, UK
E-mail : eca10@keele.ac.uk

Next ESEE Conference

ESEE Conference on Ecological Economics and Development, Geneva, Switzerland,
March 5th – 6th 1998

Ecological Economics and Development, Second International Conference of the
European Society for Ecological Economics. Deadline for abstracts and preliminary
registration November 15th 1997.

Contact:

Dr Roderick Lawrence, C.U.E.H, UNIMAIL, 102, Boulevard Carl Vogt, 1211 Geneva 4,
Switzerland.

Fax: +4122 705 81 73

E-mail: lawrence@uni2a.unige.ch ◆

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All contribution and comments are welcome
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