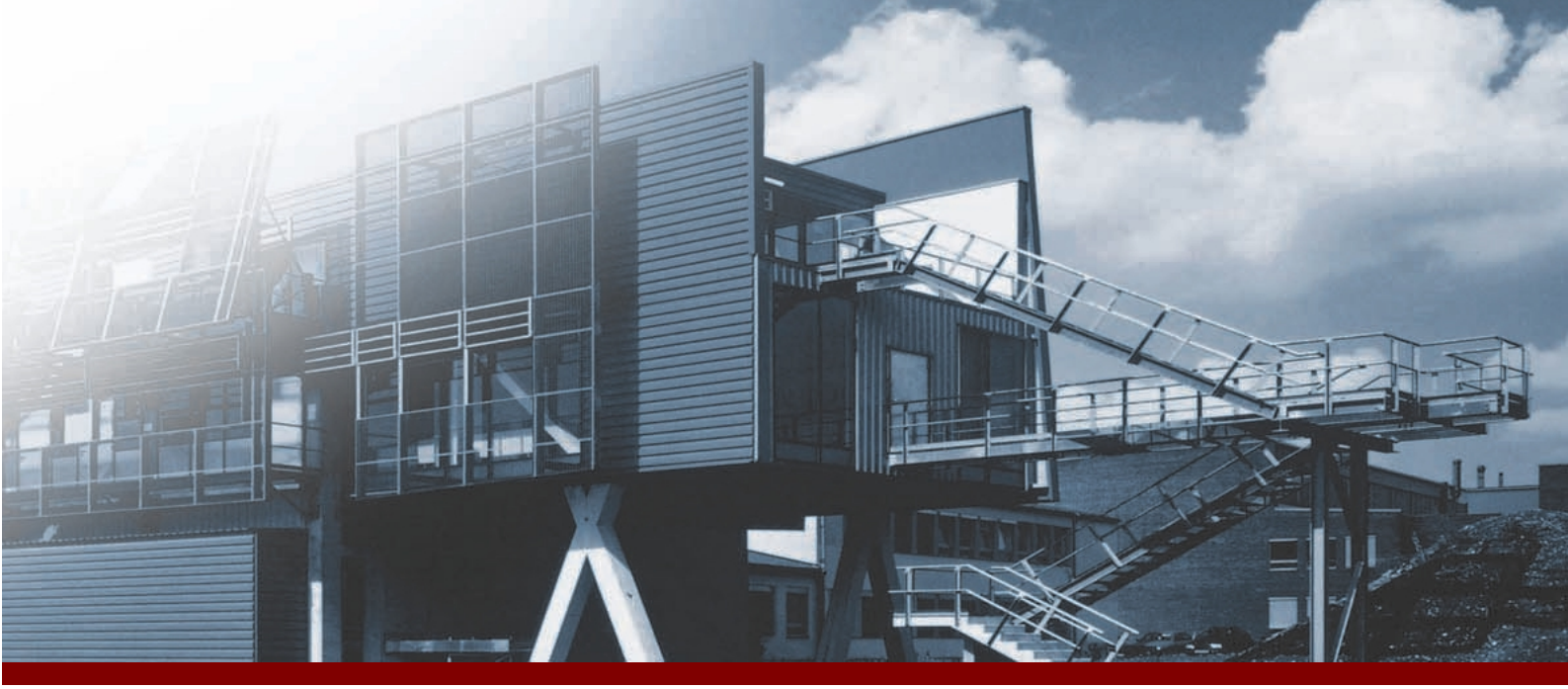

Exchange processes: Societal, institutional, and political determinants guiding environmental behaviour and processing environmental knowledge within society

EUROCONFERENCE

Quality of Life - Sustainability - Environmental Changes

PROCEEDINGS

EVENT 2

OEFZS--S-0089/2

TMR Training and Mobility of Researchers

AUSTRIAN RESEARCH CENTERS

bmvit Bundesministerium für Verkehr, Innovation und Technologie

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Preface

Preface

Sustainable development is presently one of the most challenging topics on political as well as economic and scientific levels. Nevertheless, sustainability is still – to some extent – a fuzzy concept. To deal with the very different aspects of sustainability and especially to get insights into possibilities and barriers of economic, policy, individual etc. actions, interdisciplinary as well as transdisciplinary research is necessary. According to that, the main objective of the Euroconference series "Quality of Life – Sustainability – Environmental Changes" was the international, interdisciplinary and transdisciplinary exchange of views of scientists, stakeholders, policy-makers, and NGOs about the alternatives of sustainable development in Europe. Special attention was given to the comparison and evaluation of different available systems of indicators, societal exchange processes, and strategies of intervention. Building on the disciplinary state-of-the-art, the interdisciplinary approach combined with the transdisciplinary approach represented the innovative nature of the Euroconference and allowed the discussion of alternatives to realise sustainable development considering ecological, societal and economic conditions of sustainability.

The Euroconference series was organised within the "Training and Mobility of Researchers (TMR) Programme" (4th Framework Programme) and sponsored by the European Commission, by the Austrian Ministry of Science and by the Austrian Research Centers Seibersdorf.

Concerning the organisers – the Austrian Research Centers Seibersdorf -as main contractor in cooperation with the University of Vienna and Eco Counselling Europe (NGO) - the Euroconference originated from the national research initiative "Austrian Landscape Research" (Ministry of Science). As one part of it, Eva Buchinger was managing the four years, 20 researchers, seven scientific-disciplines and citizen-participation comprising project "Quality of life and environmentally friendly behaviour: Harmony and controversy in day-to-day life in an landscape", which was finalised December 1999. Rainer Maderthaner was responsible for all psychology-related questions within this project. (See the keynotes R. Maderthaner in volume 1 and E. Buchinger in volume 3.) As another part of the "Landscape"-programme, Christian Schrefel was promoting the implementation of Agenda 21 within the project "Research on cultural landscapes and Agenda 21". (See for the scientific background of this project the keynote of D. Francescata volume 2 and the contribution of C. Schrefel and P. Wagner volume 3.)

The three events of the Euroconference series were characterised by a discussion- and exchange oriented atmosphere. Participants from the academic, industrial, political, and non-governmental spheres contributed and exchanged scientific knowledge, practical experience, personal views, etc. As part of the TMR Programme, qualification of young researchers from less favoured regions was one of the key issue.

The present publication consists of three volumes, including the keynotes and selected participant contributions[1].

Event 1: Environmental behaviour and quality of life: Ecological, sociological and communicational indicators of sustainability. Stadtschlaining, Province of Burgenland/Austria, May 6-9, 1999 (Vol. 1).

Event 2: Exchange processes: Societal, institutional, and political determinants guiding environmental behaviour and processing environmental knowledge within society. Rust, Province of Burgenland/Austria, October 16-19, 1999 (Vol. 2).

Event 3: Present and future measures to achieve sustainability on international and local levels. Stadtschlaining, Province of Burgenland/Austria, April 27-30, 2000 (Vol. 3).

The scientific team wish to thank all persons and organisations who have given their support to make the Euroconference as well as the proceedings possible. Special thanks are due to Ingrid Divis for outstanding secretarial and administrative assistance, Silvia Steinbrunner for Internet services and to Thomas Roediger-Schluga for editing the papers and processing the manuscript.

Seibersdorf, September 2000

Eva Buchinger (Austrian Research Centers Seibersdorf)

Rainer Maderthaner (University of Vienna)

Christian Schrefel (Eco Counselling Europe)

Petra Wagner (Austrian Research Centers Seibersdorf)

[1] With respect to formal criteria, the contributions are only partly standardised. Several keynote speakers have not submitted a finalised paper; their contributions have been collected in the section "Keynote Lectures – Didactic Materials".

Quality of Life
Sustainability
Environmental Changes

Event 2 - Rust/ Austria
October 16 - 19, 1999

Programme

Saturday 16 October 1999	
19:00 - 21:00	Registration and Welcome Dinner
Sunday 17 October 1999	
8:30 - 9:00	**Welcome Address** Opening by **R. Maderthaner (University of Vienna)**
9:00 – 12:00	**Plenary Session 1 : Keynote Presentations** Chaired by E. Buchinger (Austrian Research Centers Seibersdorf)
	Keynotes by Ruth Kaufmann-Hayoz (University of Bern) Social Marketing and Voluntary Agreements: Backbone of Sustainability-Oriented Policy Making? Pieter Leroy (University of Nijmegen) Political Modernisation and Innovation of Environmental Policy Agreements Donata Francescato (University 'La Sapienza', Rome) Multidimensional Community Diagnoses Concepts and Methodologies
	Lunch
14:00 - 18:00	**Parallel Sessions and Paper/Poster Presentations** Workshop A chaired by Ruth Kaufmann-Hayoz Workshop B chaired by Pieter Leroy Workshop C chaired by Donata Francescato Workshop D chaired by Catherine Rubbens
18:00- 19:00	Dinner
20:00 – 22.00	Visit to a "Heurigen" - a typical local wine tavern
Monday 18 October 1999	
9:00 - 12:00	**Plenary 2: Keynote Lectures** Chaired by R. Maderthaner (University of Vienna)
	Keynotes by Valentine Herman (ICL Belgium) Environmental Policy Making in the European Union: Companies, Consumers and the Commission Friedrich Hinterberger (Wuppertal Institute) Modeling a Sustainable Europe – a System-Dynamics Approach Catherine Rubbens (Consultant) Practical Benefits of Indicators for Different Stakeholders
12:00 - 14:00	Lunch
14:00 - 18:00	**Plenary 3: Moderated Workshop – case-oriented** Willy Kriz (Ludwig Maximilians University Munich), Paola Rizzi (Instituto Universitario di Architettura di Venezia), Christian Schrefel (Eco Counselling Europe) Environmental Education and Training Systems – Competence with Gaming/Simulation
18:00- 19:00	Dinner
Tuesday 19 October 1999	
8:30 - 12:00	**Plenary 4: Panel and Plenary Discussion** Chaired by E. Buchinger (Austrian Research Centers Seibersdorf)
12:00 – 13:00	Farewell Lunch

TMR
Training and Mobility of Researchers

bm:wv

AUSTRIAN RESEARCH CENTERS

Keynote Lectures

Keynote Papers

The Neglected Psychosocial and Behavioural Aspects in Environmental Policy-Making

Ruth Kaufmann-Hayoz

Introduction

This presentation deals mainly with two of the issues which "emerged strongly" in Event 1 of this Euroconference series:[1]

- What is the key to changing the behaviour of different societal actors towards sustainable development?
- How to integrate the psychological dimension, the question of norms and values into the sustainability discussion?

The term "societal actors" in the first question is very open: it may refer to individual persons as well as to organisations such as government authorities, trade unions, NGOs, or enterprises. As a psychologist I am used to look at individual persons as agents and at the interplay of internal and external factors which shape their behaviour. I will take this perspective today.

Considering the changes which industrialised societies have to undergo in order to develop more sustainably than they did in the recent past, individual behaviour comes into play in several ways:

1. Individuals as "consumers" who express certain lifestyles by the way they live (e.g., by the size and type of their dwelling), by the goods they purchase, by their travel behaviour, etc.
2. Individuals as citizens who act politically by voting in elections and referenda or by participating in political groups, parties, etc.
3. Individuals as members of organisations and institutions where they act in specific roles: as employees, directors, government officials, politicians, etc.

From research during the past 10 years into the psychological, cultural, and societal aspects of environmentally relevant behaviour of individuals we can draw the following tentative conclusion: Individual behaviour is not only determined by attitudes, values, and individual life-goals. People's choices and actions are shaped to a large extent by their social relations as well as by their cultural, socio-economic, institutional, and physical (including technological) framework of action, which enables and constrains individual action in specific ways (see figure 1). Today many of these framework characteristics constrain behaviour in non-sustainable directions (Gessner and Kaufmann-Hayoz 1995; Gessner 1996; Gessner and Bruppacher 1999). These opportunities and constraints can usually not directly be influenced by the individuals, because they are the result of decisions in the politi-

[1] cited from paper "Objectives" for Event 2

cal/administrative, technological, and economic domains. However, the collective action of individuals stabilises and reproduces these framework conditions, or, alternatively, it contributes to their change. Over time, there is a "co-evolution" of individual behaviour and its framework. Therefore, in order to understand and stimulate transformation processes towards sustainability, we need to analyse the complex web of agents in a society and the mutual influences they exert on each other. No single-factor or one-dimensional intervention can be successful in stimulating changes of individual behaviour and lifestyles. Examples from history show that major changes happen, when many factors together create a constellation strong enough to transgress the inertia of the existing systems. Such constellations can neither be entirely planned nor exactly predicted, because the social reality is too complex and simultaneously influenced by a multitude of self-reflecting, creative agents. However, a better understanding of the dynamics of such constellations is crucial for adequate policy-making for sustainable development.

Figure 1: Origins of barriers/resources for responsible environmental action (individual actor's perspective)

A second finding which emerges from recent research is the following: Adverse environmental effects are in most cases *unintended consequences* of human actions. They are of a secondary order with respect to the actors' intentions. Unless the actors can experience them immediately as noxious or at least as unpleasant, they will not build up any strong motivations for avoiding them. People will not easily change behaviours which they feel are important for their survival and well-being, or for their personal identity, social integration, and subjective security. In modern societies, these essential human concerns became very much associated to material consumption. Therefore, it is crucial to relate environmental demands to people's goals, hopes, and sufferings and to look for improvements on the environmental dimension of sustainability as "side-effects" of improvements on the so-

cial (and economic) dimensions of sustainable development. Such strategies are sometimes called "win-win-strategies" or "no-regret-strategies".

The question of how different societal actors can be induced or supported to act in environmentally responsible ways is usually being discussed under the heading of "environmental policy instruments". Let us look now at the set of environmental policy instruments which have been used in the past decades, keeping the above general perspectives in mind. There is an enormous body of literature from political and economic sciences on the subject. This literature is usually focussed on public policy making, i.e. on the action strategies available to public authorities. The steering capacity of the state/government to influence the citizen's behaviour according to sustainability goals is the major point of discussion. Often a distinction is being made between "classical" and "new" policy instruments.

Classical policy instruments

Traditional "command and control" or *regulatory instruments* and the more modern *economic instruments* are usually treated as "classical policy instruments". Both types are based on the assumption that the state can promote or force environmentally responsible behaviour of various target groups (individual citizens and organisations) by changing some aspects of their economic and legal framework of action (see figure 1). The two types of instruments can be shortly characterised as follows.

Regulatory instruments are legal prescriptions that have a direct impact on the room for manoeuvre of specified social actors, because they stipulate certain ways of acting or exclude some conducts. Specific actions and/or specific outcomes of actions are (not) permitted by way of mandatory orders. Thus, the rationale of a regulatory instrument is exclusively based on *command, control* and *sanction*. It is assumed that actors act according to the prescribed norm in order to prevent penalties that take effect in case of violation of the norm. Therefore, enforcement mechanisms are fundamental to the viability and effectiveness of regulatory instruments. Enforcement policies rely on a variety of secondary instruments, ranging from license withdrawal to criminal prosecution. Enforcement measures often involve an economic component in addition to the pure regulatory aspect (International Energy Agency 1989). In western democracies, only the legislative authorities are legitimised to use regulatory instruments. Although the implementation of regulatory instruments may (partly) be delegated to private bodies, the final decision on their application (and eventual enforcement measures) sticks to the public authorities. Regulatory instruments can be used to influence the behaviour of any target group – individuals as well as corporate actors or private companies.

The main classes of regulatory instruments are:

- *Standards:* Environmental quality (immission) standards and emission or technology standards.
- *Product standards* and regulations for the *use of pollutant substances*.
- Licensing and Zoning.

Economic instruments are based on the assumption that environmental degradation and resource depletion occurs, because a substantial part of the costs of economic activities is not being paid by the responsible actor but by the general public (in forms of, e.g., environmental degradation, security and health risks and long-term climatic risks). In order to correct this situation, three principle ways of intervention are conceivable: (1) rise of costs of pollutant behaviour, (2) reduction of costs of environmentally sound behaviour, (3) establishment of markets for polluting rights. Economic instruments do not constrain the actors' room of options directly, but they take advantage of the market forces: The actors' behaviour is supposed to be steered towards environmentally sound actions, because these are more cost efficient. Economic instruments are usually implemented by public authorities; they need to have a legal basis, which has often to be created before they can be implemented. Direct target groups are firms and investors as well as private persons and households, but indirectly, all actors are affected, because economic instruments affect the price mechanism.

The main classes of economic instruments are:

- *subsidies*: grants, tax allowances, soft loans, or guarantees
- *taxes* on energy/resources, emissions, products, or processes
- *charges* for the use of infrastructure or services, value-added tax, (prepaid) disposal fees, or deposit-refund systems
- *market creation* by liability insurance and transfers, tradable permits, joint implementation, or compensation for renouncement of resource use.

The search for new instruments

The rationale, the advantages and disadvantages, and the limitations of these classical instruments have widely been discussed. There has also been an intensive search and discussion of new instruments, both in praxis and in theory (e.g. Dente 1995), and several attempts to evaluate environmental policy have been made (e.g., Jänicke and Weidner 1995; Jänicke and Weidner 1997; Weidner 1996). There are three main reasons for this search for new instruments:

1. The globalisation of both the environmental impacts of human activity and the economic activities limit the influence and effectiveness of traditional national policies.
2. A great number of actors other than public authorities (private sector, NGOs - in fact the entire civil society) are under pressure and motivated to contribute to sustainable development.
3. Classical instruments of public policy often meet considerable problems of implementation (political acceptance) and enforcement, and thus lack efficiency and efficacy.

Therefore, a third class of "soft" policy instruments is being discussed in the literature under a variety of names, e.g.: "mediation and information" or "instruments of dialogue and co-operation" (Jänicke

and Weidner 1995), "persuasive instruments" (Dente 1995), and "supporting measures" (Bartel and Hackl 1994). The instruments subsumed under these and similar terms are typically available not only to public authorities, but to a variety of actors such as environmental and consumer organisations, producing industries, media, distributors, etc.). However it is a rather undifferentiated and heterogeneous class of instruments, and their rationale has often not clearly been elaborated. In the following section I propose to distinguish two major types of instruments within these "new" instruments: *collaborative agreements* and *social marketing instruments.* I will then concentrate on the explanation and illustration of the latter type.[2]

Collaborative agreements are legally binding or non-binding agreements of the private sector or parts of it (industrial sectors or individual companies), to enhance energy or resource efficiency in domains which are traditionally not regulated by public policy. Often the environmental goals are defined through prolonged negotiations between the private sector and the government.

Two classes of collaborative agreements may be distinguished:

- *Public-private agreements*: legally binding promises of individual companies, industrial sectors or their associations to the government, to reach - within a specified time - the goals which have been defined by negotiations. In turn, the government may renounce to implement regulative or economic instruments.
- *Certifications and labels* may guarantee the compliance with legal standards, or they may aim at higher standards than legally prescribed. In the first case compliance is controlled by the government, and sometimes such products or processes are promoted and/or subsidised by the state. In the second case, the control is with privately accredited organisations. Compliance with legal standards is a necessary, but not a sufficient condition.

The rationale of legally binding collaborative agreements may come close to regulatory instruments, and sometimes the price mechanism is used in a very similar way as in economic instruments. But in comparison with authoritative state interventions, these instruments contain - because of the importance of the negotiations in reaching the agreements - an element of self-regulation of the actors involved. According to Dente (1995, S. 17), it is exactly this potential of self-regulation which needs to be explored further when looking for new environmental policy instruments.

The potential of voluntary actions of the civil society seems by no means exhausted by the instruments of collaborative agreements. If the target groups of policy making are not organisations but relatively inaccessible groups such as "the citizens" or "the consumers", there is a need to design instruments which take not only economic, but also psychosocial and behavioural factors into account. These aspects have widely been neglected so far in the discussion of policy instruments, which means that a potential for promoting behavioural change toward sustainability remains unexplored.

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[2] The differentiation and elaboration of these instruments is mainly based on the interdisciplinary co-operation within the Integrated Research Project "Strategies and Instruments for Sustainable Development: Foundations and Applications, with special consideration of the community level" of the SPP Environment of the Swiss National Science Foundation. A synthesis publication is forthcoming: Kaufmann-Hayoz, R. & Gutscher, H. (eds.): Promoting sustainable development on local level: A new look on classic and innovative policy instruments (preliminary title). Basel: Birkhäuser (in prep.). For reports on parts of the project and for further information see http://ikaoewww.unibe.ch/ip_index.html.

On the one hand, neglect of such aspects accounts for a number of difficulties encountered with the policy instruments described above:

- Regulatory instruments are often perceived as constraining the personal freedom and autonomy, they may therefore cause the behavioural phenomenon of reactance. In addition, legal prescriptions directed toward barely accessible target groups are often very difficult to enforce, because control is almost impossible. Therefore the motive to avoid sanctions disappears. (Examples: illegal waste disposal by burning or dumping; bringing out manure on frozen soil)
- Economic instruments - beside the difficulty of acceptance especially among those who defend a liberalised market economy - may also cause illegal acts by individuals in order to avoid paying (illegal waste disposal may have this motive as well), and they may destroy intrinsic motivations to act environmentally responsibly ("I pay for taking away my garbage, therefore I am legitimated to produce as much as I want").
- Collaborative agreements such as an ISO 14001 certification require the implementation within the enterprise down to the daily routines and decisions of the individual employees.

On the other hand, designing interventions according to principles of behavioural and social psychology may serve as effective, flexible and inexpensive policy instruments available to all societal actors and thus enhance self-regulation, especially on the local level. Interventions of this type have been proposed already in the 1980s (e.g., Geller, Winett et al. 1982; Geller 1987; Geller 1989; see also Dwyer, Leeming et al. 1993). However, they have rarely been discussed systematically in relation to the "classical" policy instruments, although Gardner and Stern (1996) clearly recommend to "use multiple intervention types to address the factors limiting behaviour change" (p. 159).

I would therefore like to propose a forth class of policy instruments and call them *"social marketing instruments".* I will first describe the rationale of the main classes of these instruments and then give a few concrete examples of their application alone or in combination with other instruments. This will illustrate both the necessity and the potential of such instruments.

Social marketing instruments: Social marketing means planning, organising, realising, and controlling of activities of non-commercial organisations, which aim - directly or indirectly - at solving a social task and/or at disseminating social ideas or behaviours within a community (Kotler 1978; Kotler and Roberto 1991; Geller 1989; Prose, Kupfer et al. 1994). In the context of environmental policy social marketing instruments are specific intervention forms based on principles of behavioural and social psychology and of marketing, which aim at the dissemination of knowledge about environmentally relevant behaviour and at the facilitation, support and encouragement of such behaviour. The instruments are available to public authorities as well as to all other actor groups, especially NGOs, informal social movements, private companies, and even individuals.

The following major classes of social marketing instruments may be distinguished:

- *Creating incentives* for responsible environmental behaviour by rewards, lotteries, contests, or coupling the behaviour with attractive experiences;
- *Activating and establishing norms* by means of prompts, appeals, setting of social norms, model persons, self-commitment, or confrontation with discrepancies between one's own attitudes and behaviour;

- *Knowledge and capacity building* by persuasion, information about facts and interrelations, educational courses, pilot and demonstration projects, research, data bases, or consulting services;
- *Co-ordination and networking* by establishing participatory planning or problem solving processes, or by the creation and maintenance of networks;
- *Creating opportunities for action and removing constraints* by building or modifying specific infrastructures such as roads and buildings, by altering the design of appliances, or by offering specific goods and services.

If we look once more at figure 1, we may say that such instruments can produce changes in the central circle - psychological and social processes - but they may also alter the socio-cultural framework (e.g., by implementing new forms of education) or the physical environment (e.g., by changing the design of infrastructures and appliances).

Two illustrative examples

I would now like to describe two concrete local problem situations, which show the practical importance of social marketing instruments, applied instead of or in combination with the traditional regulatory command-and-control approach.

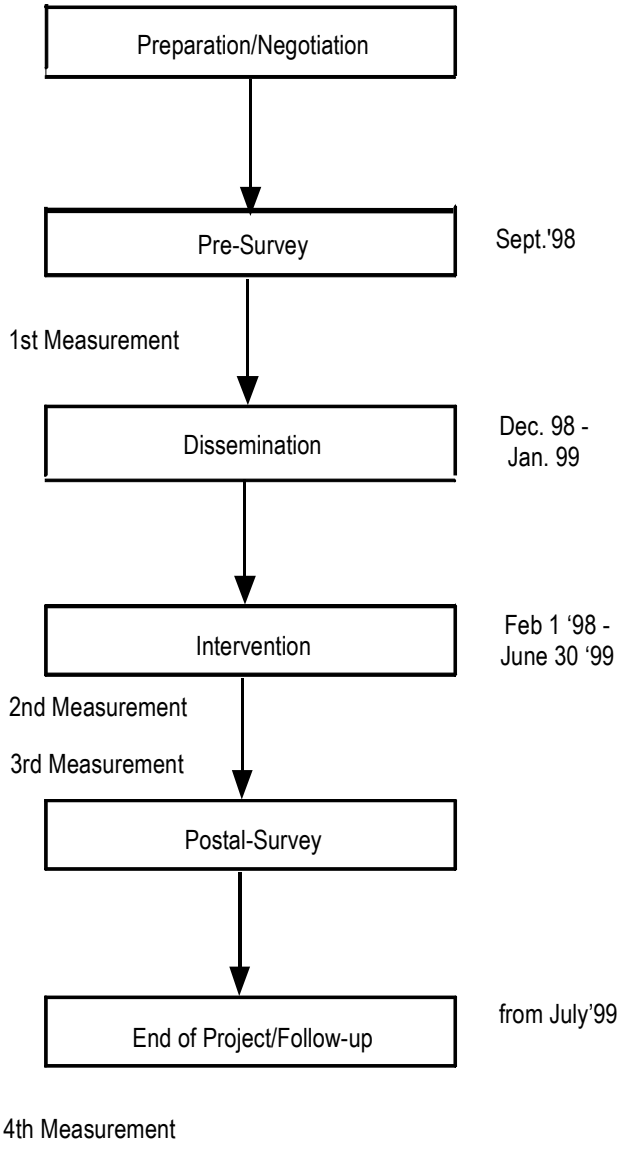
Example 1: Slowing down the traffic in residential areas

Due to the continuous increase of motorised traffic, certain aspects of life quality in residential areas of many European cities and towns have been decreasing in recent decades: the noise and danger resulting from cars travelling at high speeds through residential areas are perceived by many people as unacceptable. Therefore, reducing and/or slowing down the traffic in such areas is an issue in many communes. The traditional approach of local authorities to solve the problem is the use of classical regulatory instruments: decrees of speed limits which are enforced by road signs, controls and fines. In recent years, certain relatively crude infrastructural measures which prevent driving at high speeds (e.g. bumps and barriers) have also been applied. In general, these measures are not well accepted, when they are authoritatively decreed, and many people tend not to comply. Nevertheless, speed controls in the city of Graz (Austria), where a speed limit of 30 km/h has been set for some areas, have shown that the effect of the measure was a mean speed reduction of cars of 3 km/h.

In Münsingen, a town of about 10,000 inhabitants in Switzerland, a different approach has been tested within a social psychological research project.[3] The goal of this project was to introduce - on a voluntary basis - driving at 30 km/h on all residential roads of the commune. From the very beginning of the project, a close collaboration between local authorities, social scientists, and a communication specialist was realised.

[3] The Project "Contributions to sustainability in communities: Simulation-aided testing and diffusion of psychological forms of intervention" lead by Prof. Heinz Gutscher of the University of Zurich is one of the subprojects of the Integrated Project mentioned in Footnote 2.

Figure 2: Time schedule of the Münsingen project



Source: adapted from Artho 1999, p. 6.

Figure 2 shows the time schedule of the project. After a *preparation and negotiation* period of about 15 months, a *pre- survey* among the inhabitants was carried out. It showed, that...

- speed limit 30 km/h is an issue in the commune,
- the citizens are in principle willing to drive more slowly and to participate in a project in order to achieve this goal,
- financial benefits, noise reduction, and improved security of driving at 30 km/h as well as the time costs for the project participants have to be communicated very clearly,
- there should be no risk for project participants to be ridiculed,
- local business leaders and leading persons in associations and clubs are potential model persons,

- there is a potential of a "snowball-effect", if about 500 persons are participating in the beginning of the project.

An intervention based on the following 4 principles was then designed:

1. Self-commitment of individuals as the central element
2. Visibility of the common effort: the citizens should see that their individual contribution is part of a common achievement
3. Information about the effects (benefits and costs) of driving at 30 km/h
4. Fun: the project should be experienced as exciting rather than as an extra chore

The goal of the *dissemination phase* was to find among the 4200 drivers living in the town as many participants as possible, i.e. people who would agree to drive at 30km/h during a defined 5-month-period. A name and logotype ("Eile mit Weile" - the name of a popular family game; could be translated as "run and rest") were created, a promotion club of local business and political leaders was founded who would act as "ambassadors" for the project in their respective networks, an 8-m-tower in the centre of the town indicating the actual number of participants was built, and the project was presented to the public at the Christmas market, which is an important social event in the town, and at the same time in the local media. Within 3 months, about 1000 participants were recruited (25% of all drivers).

During the 5-month *intervention phase*, all participants received a reminder, 120 flags and posters with the logo of the project were placed all over the town, and the local media reported regularly.

Finally, *speed measurements* and a *post-survey* were performed.

The project applied the following types of social marketing instruments:

- public self-commitment of a large number of individuals
- persuasion (mainly through the members of the promotion club)
- appeals to the general public (by the media and on special occasions such as the Christmas market)
- setting a social norm ("25 % of all drivers will drive at 30km/h!", visible on the tower)
- prompts (flags and posters during the intervention phase, to remind people)
- model persons (business and political leaders)
- feedback (communication of the achieved speed reduction)

Not all results of the project are available yet. The measurements show clear reductions of driving speeds: Before the intervention 25% of the vehicles drove at less than 30km/h, after the intervention 40%; the median speed of all vehicles was 3km/h less than before the intervention (mean reduction -2.8 km). It was also calculated that the observed reduction was to be expected if 20 % of the drivers would reduce their speed, which indicates that the participants presumably observed the speed limit as they had promised. Stronger effects could only be achieved, if more people would participate.

The conclusion of the project at the time being is: The measurable speed reduction effects are about the same as were found in Graz with traditional instruments. The post-survey results will show what

effects the project had on the general attitudes and on the willingness of the citizens to contribute actively to the solution of community problems, and on their sense of effectiveness, etc. We hypothesise that the pride of having achieved something together and voluntarily could be an important positive effect of the project. In view of long term change and transfer effects to other domains, these psychological outcomes of the project may be even more important than the immediate and measurable behavioural effects.

Example 2: Recreational activities and wildlife protection

Switzerland is a densely populated area, and there are many conflicts between recreational use of landscapes and the objectives of wildlife protection. The two examples I want to contrast here are the following:

1. ***Paragliders and wildlife:*** Paragliding has become very popular since the late 1980s (within 5 years 10'000 pilots have been trained!). Ethological research has shown that in some areas, wild animals, especially ibex, do not adapt to the paragliders: they flee every time a paraglider is flying over them; they end up spending their days in wooded areas at lower elevations, where they don't find their appropriate food but instead start eating young trees. Also some rare eagle species have been shown to be disturbed by paragliders during their breeding period.[4] Alarmed by these observations, the national wildlife protection agency set up a national task force for in-depth investigation of the problem. At the local level, the authorities started a participative problem solving procedure involving all relevant local actor groups. This group made a careful analysis of the local problem situation, bringing in not only the point of view of the wildlife specialists, but also the perspectives of the paragliders, farmers, tourist managers, etc. This lead to solutions which were adapted to the specific local context and acceptable both to wildlife protectionists and paragliders. Agreements were made on certain rules to be observed voluntarily by the paragliders (e.g., to avoid flying over specific areas during certain times). Controls are performed by the local authorities, and as long as the rules are observed, they will renounce to decree legal regulations (for details on the procedure and its effects see Ingold 1999).
2. ***Recreational activities in a protected river basin:*** In a very attractive wild river landscape (Sense-Schwarzwasser in the Kanton of Bern) there is also a conflict between recreational activities and wildlife protection. During spring time, successful breeding of some rare bird species is threatened by the great number of people who like to spend their leisure time on the riverbanks. Here the approach of the cantonal authorities was the traditional one: The wildlife protection officials analysed the situation and worked out a solution, i.e., a revision of the existing regulation concerning the protected area. This revision contained an extension of the protected area and stricter rules, including a zone (20 % of the entire area) where entering would be forbidden between April and July. Actually, the restriction would not be very noticeable by recreationists, and most of their activities would still be possible. However, when the authorities began to "sell" their solution to the public, an extremely strong opposition against their plans arose. Despite the communication and information efforts that were started now, people rejected the regulation.

The comparison of these two examples of the handling of similar problem situations shows the potential and necessity of social marketing instruments. They illustrate that it makes a difference whether regulations are imposed "from above" in the traditional way, or whether they are worked out by the actors affected by them.

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Political Modernisation and the Renewal of Environmental Policy Arrangements

Pieter Leroy

Abstract

Recent changes in environmental policy encompass its scope and content, the actors involved, its organisation and instrumentation etc. These changes have often been interpreted as primarily strategic or instrumental changes, aiming at a more effective environmental policy. We do interpret these changes as part of a more substantial and more comprehensive change in the political sphere of society in general, and we understand the latter in terms of political modernisation. Not only strategic or instrumental considerations, but also changing (power) relations between state, market and civil society agencies explain the variety of newly developed policy arrangements. The latter concepts provide a theoretical framework and an analytical tool to understand the nature and functioning of these arrangements.

Recent changes in environmental policy

Over the last decade or so the predominant style of governance in environmental politics has changed substantially. In the 1970s and early 1980s environmental policy was largely dominated by state regulatory strategies (Weale, 1992), based upon the presumption that a legal rule, a series of standards, a range of permits and administrative control were appropriate policy instruments. Since then much has changed. Firstly, the implementation deficit made clear that this bureaucratic style of governance largely overestimated the management and steering capacities of the state, and neglected its actual dependence upon the expertise, the commitment etc. of those involved. Secondly, evidence of a still deteriorating state of the environment has proved this strategy to be less effective as environmental problems turned out to be global or at least international, having different and diffuse sources and causing various and often unpredictable impacts.

These weaknesses in environmental management led to more innovative strategies emphasising integrated process technology on the one hand and co-operation on the other. The ‘new politics of pollution’ thus emerged involving business in environmental policy, presuming co-operation and a self-evident concern for the environment. In short, from the mid 1970s to the mid 1990s the predominant strategy within environmental policy shifted from a hierarchical, top-down, government dominated regulatory approach towards one based on more 'horizontal' relations between the actors involved, aiming at a negotiated policy endorsed by consensus between them. The latter implies a redefinition of the role of the state, giving more space and responsibility to free market agents and forces. These changes are reflected in key policy documents such as *This Common Inheritance* (HMSO, 1990) for the UK and *Milieu en Economie* (The Environment and The Economy) (Ministry of

Economic Affairs, 1997) for the Netherlands. These policy programme documents clearly echo the 'ecological modernisation' thesis as that has been brought forward by social scientists, industry representatives and members of the moderate environmental movement alike. I will not go into the discussion on ecological modernisation here (see Mol, 1995 and Spaargaren, 1996 for the ecological modernisation approach; see Blowers, 1997, Cohen, 1997 and Leroy and Blowers, 1999 for a critical appraisal of it). I restrict myself here to indicate it as a societal and socio-scientific reflection of the changes I referred to.

This major shift in relations between the state and the market was accompanied by a parallel shift in relations between the state and civil society. In its early stages environmental policy making was in the hands of a relatively small group of specialists drawn from governmental bodies, from industries and from some interest groups (mainly concerned with conservation, amenity and health issues). As interest in the environment grew during the 1970s and 1980s the arena of participation widened to include a range of consumer and environmental groups who became routinely consulted over policy. Their incorporation - deliberately or not - helped to legitimate environmental policy. Of course some groups remained outside, notably more radical environmentalists engaged in confrontation over nuclear policy, hazardous wastes or major infrastructural programmes such as roads and airports. By the 1990s environmental policy making had become further populated by a variety of environmental experts and consultants. While these changes on one hand herald a wider political participation, they also imply control by a highly professionalised environmental policy domain from which lay people find themselves increasingly excluded. Paradoxically, then, greater participation may have resulted in greater political inequality. Hence the efforts and experiments, all over Europe, with new formulas and scenarios for organising political participation on environmental and related issues.

I will not elaborate too much on these changes here, and confine to some examples. Environmental policy vis à vis the industry, for instance, changed substantially over the last years. In countries such as the Netherlands, Belgium, Germany, France, Denmark and others this policy is elaborated into differentiated policies for specific target groups within the industrial sector, leading to series of covenants with a whole range of branches on a wide variety of products and processes. Both Glasbergen (1998) and Carraro and Lévêque (1999) come up with some comparative evidence on covenants, public-private partnerships and other voluntary agreements between state agencies and industry (branch) representatives from different European countries. A similar differentiation took place in environmental policies affecting the agricultural sector and the same is true for environmental policy related to energy, to housing and transport. The environmental policy at the EU level is following the same track, as can be seen from the Fifth Environmental Action Plan (CEC, 1992).

Environmental policies thus firstly differentiated into more specific policies for different economic target groups. This is not merely a question of policy elaboration, but represents a change in governance style as this new policy formally or actually acknowledges the participation and the involvement of the sector's representatives in the policy making process. Since, as far as I know, the environmental movement very rarely is acknowledged as a negotiation partner in these processes (apart from a few Dutch cases), this change primarily comes down to a restructuring of the state-market interrelations, strengthening the state-market nexus. Governmental bodies and the sector's representatives are responsible for both the designing of the new policy and its actual implementation. In short, state regulatory strategies have been replaced by strategies of negotiated decision making.

A more or less similar pattern applies to other environmental policy fields, especially in issues related to land use, to nature conservation, to regional development and alike. At least in France, Belgium and the Netherlands, these issues are no longer dealt with in a strategic plan that is elaborated and launched by governmental bodies. Nowadays the designing and development of such a regional policy plan is meant to be the outcome of a well-considered and deliberate process of consultation, participation and negotiation in which a consensual approach dominates. The underlying pattern of policy making is similar: these projects are set up and elaborated by professional project managers, guided by a steering committee, a sounding board in which all 'stakeholders' - the catchword of the new politics - are represented. The main steps of the policy making process are: (a) finding a common definition of the problem(s); (b) designing a plan that sets out common goals, for the acceptance of which one looks for win-win situations between the actors involved; (c) resulting in an implementation trajectory in which every partner has to take his share (see Glasbergen, 1995 for some Dutch examples, see Albrechts, Leroy et alii, 1999 for examples from Belgium). From what I know about it from the work of the Austrian Research Centers the same applies to the Austrian Cultural Landscape Programme.

Again this change in policy making processes, using new or renewed policy strategies, new policy instruments and new patterns of organisation of decision making processes, does imply a change in the predominant style of governance. Here again scenarios of consultation, negotiation and alike have replaced top-down steering. And within these negotiation processes societal groups, either market agencies or civil society representatives, have to play their role along with governmental bodies.

A deliberate strategic change?

So far nothing new, it seems, since these changes have time and again been described recently by different authors. Weale (1992), Garner (1996), Mol (1995) and many others report a gradual shift in environmental policy strategy. In short, the instrumentation of environmental policies shifts from primarily state initiated regulatory strategies via market or economic instruments towards more communicative and interactive policy strategies. An organisational change parallels this instrumentation change: since market instruments, by mere definition, are presumed to work at their best without too much state regulatory interference, their introduction implies a certain withdrawal of the state, and at least its restraining from further regulatory efforts. Communicative instruments on the other hand presume the organisation of more or less formalised arena's for interaction and negotiation and therefore for policy networks.

The latter was and to a certain extent still is, at least in the Netherlands, the catchword to characterise this new style of governance. At first the concept 'policy network' was an analytical concept, referring to the more or less stable pattern of interaction between the actors that take shape around certain policy problems, policy programmes or policy domains. Networks do differ obviously in terms of the number of actors involved and vary also substantially in terms of scope and impact. Networks on specific problems, for instance, might be ephemeral, whereas domain related policy networks tend to be institutionalised: over time the actors involved regard themselves and the others as the partners to engage with in negotiation processes, thereby to a certain extent monopolising a policy

domain. As the institutionalisation process furthers and the state acknowledges and formalises their role, such domain specific networks may even evolve into forms of neo-corporatism.

But from an analytical word, the concept of policy networks very rapidly turned into a managerial tool. From this perspective policy networks were seen as *the* organisational instrument to improve public policy making, by inviting as much stakeholders as possible, organising dialogues and negotiations between them and aiming at consensual decision making. Policy networks therefore were regarded as the organisational vehicle for the new style of governance that became popular: the so-called horizontal interaction between all parties involved. As a consequence, policy networks were advised and used as a panacea for all kinds of political problems. Confining to the environmental domain policy network approaches were set up concerning the Dutch waste management policy, the designing of regional environmental and physical planning policy, but also for the solution of long lasting environmental controversies such as the expansion of Amsterdam Schiphol Airport. In the latter case the policy network approach failed to bring about any consensus and, to the contrary, reproduced the already existing political divides and reinforced the existing power relations.

Of course the advocates of a policy network approach are well aware of its practical, especially its managerial limits. For us though, not so much its functioning as a managerial tool is a criterion for assessment, but its analytical value. We think a network approach, or in general, an approach be it analytical or managerial, that emphasises the opportunities of a consensual decision making process in which both public and private partners, both governmental and non-governmental organisations participate tend to overestimate certain things and to neglect others. For instance, we regard the network approaches in general as, in sociological terms, too 'voluntarist' and as, in political terms, too naive-pluralist. The former means that they emphasise too much on the role of actors, their degrees of freedom in strategies and interactions, and therefore, the problem solution opportunities added by such an approach, its capacity for change etc. The latter means that they pretend a more or less equal political position for the actors involved. The former emphasis implies that these approaches tend to underestimate or even to neglect the role of more structural societal factors such as tradition, represented mostly by well established and stubborn institutional patterns, leaving hardly any opportunity for a change. The latter implies that these approaches tend to neglect structural political differences and inequalities, for instance in terms of the resources available for each of the actors.

This relative one-sidedness might cause the neglect of some empirical questions we consider as very interesting and important: do the actors involved really have equal opportunities to enter the political arena? Are policy networks and the negotiations within them so open as pretended? Are all definitions of the problem and all possible options still to be negotiated? The Schiphol case - and many others of course - provides evidence of the opposite. And further: which are the resources available for each actor and how do they mobilise new ones? How does the political outcome of a policy network or a voluntary agreement in general relates to the outcome of other, previous political processes? In other words: does the former affect the latter, or even more, does it change the rules of the political game?

A unifying framework: political modernisation

As said earlier, recent environmental policy has differentiated into a wide range of more or less specific domains, with a series of goals, strategies and instruments, with a variety of actors involved, giving rise to a staggering plurality of policy arrangements. While it is true that consensual approaches aiming at voluntary agreements have been the renewing trend over the last decade or so, we still live lots of arrangements from the early periods of environmental policy. Even after the so-called withdrawal of the state, state initiated regulatory strategies are still in use - and in certain domains we are quite happy to have them, even when their functioning is questionable! -. This results in a huge number and a wide variety of environmental policy arrangements which at first sight gives contemporary environmental policy a semblance of a post-modern cacophony with no clear sense of direction.

To understand these arrangements and to be able to characterise them and to distinguish between them, we need a unifying concept and an analytical tool. The concept 'political modernisation' is meant to provide the former, the concept 'policy arrangement' to provide the latter. I'll come back to the 'policy arrangement' concept and its analytically distinguishable dimensions in the next section and restrict to 'political modernisation' first now.

When looking for many years now at environmental politics and policies, at the gradual evolution of the predominant governance style and at the dizzy variety of policy arrangements, we consider political modernisation as the common trend. It goes without saying that political modernisation is not used here as a normative or moral concept neither does it, by any means, imply notions such as progress or alike. We use it as a unifying analytical concept. Moreover political modernisation is not restricted to the environmental field. To the contrary, it represents an overall change in the political sphere. On the other hand the environmental crisis is, among others, a trigger and a particular theatre of political transformations. When using this concept, we heavily - and happily - build upon insights from both sociology and political sciences (Alexander, 1995; Beck, 1992 and 1996; Giddens, 1991; Hajer, 1995; Held, 1995; Jänicke, 1993; Lafferty and Meadowcroft, 1996 and others). Many of these authors, though quite differently, deal with processes of modernisation, its political implications and its impacts upon the environmental issue.

The term political modernisation refers to some recent political developments in western societies as a particular stage in a long-term process of modernisation. More specifically, these contemporary changes have been conceived as a distinguishable transformation of the political domain in response to major changes in both the economic and the socio-cultural domain, notably by processes such as internationalisation and individualisation, or by globalisation and glocalisation (Alexander, 1995; Held, 1995). These processes are said to provoke a new stage in political modernisation, characterised by significant changes in governance and reflected within specific discourses and practices. Key elements of those discourses and practices are (a) a change of the state's role, from providing to enabling or facilitative; (b) a greater reliance on the problem solving capacities of non-governmental agencies, especially the private market sector; and (c) a greater reliance on the self-steering capacities of 'civil society'. The first leads to the withdrawal of the state from many domains, concentrating on what are said to be its key tasks; the second leads to different forms of privatisation of former state tasks, to their devolution to quangos (quasi-autonomous non-governmental organisations) and

to various forms of public-private partnership; the third leads to the development of new regimes of governance, characterised as negotiated decision making, communicative governance, co-operative management, interactive governance etc. in which the civil society is said to play a key role (Glasbergen, 1995, 1998; Lafferty and Meadowcroft, 1996). In other words, the changes in style of governance which we have described, albeit very briefly, in the previous section, are not restricted to the environmental policy field, but represents more comprehensive political changes.

A similar transformation took place in almost all European countries, and the European integration, notably the achievement of a single currency and a single market, has led to the 'continentalisation' of these programmes of political modernisation. Perceived as (neo-)liberal at first, these programmes are now endorsed, albeit in a softened version, by social democrats as well, as may be clear from the discussion on the Third Way. Even if some left wing parties, for instance in France, reject that notion - mainly for domestic political reasons -, they apply similar political programmes.

These latest developments in political modernisation thus involve the devolution of former state functions to market agencies and, to a lesser extent, to organisations within civil society, thereby implying a major reallocation of political power responsibilities, competencies and power (Leroy and Van Tatenhove, 1999). The idea of a welfare state has been replaced by the idea of an enabling state. The former was supposed to provide public services and, in a Keynesian tradition, to secure socio-economic stability. The enabling state primarily facilitates free market competition, which is expected to further economic growth, to provide (a partly privatised) social security and to deliver services such as public transport, communications, energy supply, waste management and other services. Hitherto organised as public services, these have either been privatised, devolved to quangos or organised as public-private partnerships, in each case implying a decreasing influence of formal representative politics.

The latter leads to some critical questions about political modernisation. To name but a few: even though its programmes pay lip service to the self-organising capacities of civil society, its questionable whether political modernisation actually furthers political participation, and when so, who gains and who loses in terms of political power and control. The 'stepping back' of the state from its hierarchical steering ambitions, opens up political space to the market and, to a lesser extent, civil society, thereby politicising the so-called midfield. This implies the acknowledgement of new actors, the redefinition of the role of classical political actors and a shift in their interrelations. As indicated above, partnership, self-responsibility, consensus and agreement are the keywords of the new political discourse. Despite this discursive emphasis on partnership and consensus, questions arise as to whether these new arrangements really change power relations, whether they alter existing patterns or rather reproduce and reinforce them. In terms of empirical questions: it may be true that the political midfield is opened up now by the withdrawal of the state, but the question is who occupies this political space, who is actually included in the new political arrangements, and who is excluded (Blowers, 1998). Whereas Beck (1996) seems quite optimistic about the increasing role of 'sub-politics', there is empirical evidence that the actual influence of public participation decreases (Lafferty and Meadowcroft, 1996). And research onto the functioning of public-private partnerships, negotiated decision making and alike suggests that these arrangements imply a considerable empowerment of well equipped and well organised private consultancy and lobbying organisations.

There is some evidence that the latter applies to the environmental movement as well, as it seems to gain influence when dressed up as a professionalised organisation (Arts, 1998).

In short, we want to look critically and empirically at the new style of governance and, more particularly at the actual functioning and impacts of the new policy arrangements that result from it. Political modernisation is an inspiring concept as it links changes in day to day (environmental) politics that at first look voluntarist and instrumental, with long term processes of political change.

Talking about the long term, we distinguish three more or less consecutive stages in recent political modernisation, say since World War 2. These stages are labelled as the period of early, of anti- and of late modernisation. Each of these stages can be characterised by specific discourses and practices on progress and development, on types of governance, on the role of the state and, especially important in relation to environmental matters, on the role of technology.

Without elaborating these ideas into full detail here, the three stages can be characterised as follows. *Early modernisation* discourses reflect great optimism on progress by rationality, on a steering and responsible state, capable to construct 'the good society'. Technological rationality and progress were expected to solve major societal problems, including environmental issues. We all know which kind of environmental policy arrangements fit with this stage: state initiated regulatory strategies, aiming at adding (end-of-pipe) technology, strategies that were so typical for the early stages of environmental policy. It must be clear that, although the zenith of early modernisation lies in the 1960s and 1970s, even some recent environmental policy initiatives echo similar discourse. That is, for instance, the case with some environmental planning initiatives that still highly rely upon the steering capacities of governmental bodies.

The anti-modernist discourse is easy to recognise for those involved in environmental issues. Launched by authors such as Marcuse, Habermas, Gorz, Ullrich, Bahro and many others from quite different scientific and ideological backgrounds, it was to a large extent multiplied by the environmental movement and other 'new social movements' in the 1970s. The *anti-modernisation* discourse focused at and opposed against the one-sided modernisation and rationalisation as these caused 'externalities', such as the environmental issue, the oppression of women and the exploitation of developing countries. The coalition of the state and the capitalist economy had to be replaced by a radically different social order, on the characteristics of which one launched a variety of ideas, key words of which were democracy, participation and emancipation. It is hard to find a specific environmental policy arrangement that is typical to this stage of anti-modernisation, although the environmental impact assessment, with its strong emphasis on mobilising counter-expertise and organising public participation comes close. But more generally, the formalised public participation and alike that has been introduced or enlarged in the late 1970s and early 1980s in environmental politics as in other fields reflect, albeit in a moderate version, the political ideals of the new social movements.

It will be clear from the above that we consider the latest developments in the political domain as characterising *late modernisation*. Whereas early modernisation focused on the state's role for both political and economic developments and anti-modernisation was opposing civil society against the state-market coalition, late modernisation assumes a consensual co-operation of state, market and civil society agencies. This discourse, as we have seen, results in political programmes and practices that look for consensual steering, public-private partnership et cetera. These ideas apply to dif-

ferent political domains, one of the most interesting of which is the environment. The central purpose of the theoretical and empirical research programme of our department is to examine and evaluate the actual functioning of these recently developed political arrangements.

An alternative analytical tool: policy arrangements

We understand a policy arrangement as the substantive and organisational stabilisation - or institutionalisation - of a policy domain (or sub-domain) in terms of agents, discourses, rules and resources in a specific period. This complex definition needs some explanation. First it might be clear from the above, particularly from our comments on the policy networks approach, that we want to emphasise on change *and* stability, dynamics *and* tradition, agent *and* structure. The word 'arrangement', used both in historical sociology (De Swaan, 1993) and in (international) politics (Waltz, 1979), reflects that stance. Secondly, the domain or sub-domain varies according to the empirical field to be examined: it might be waste management or nature conservation, Local Agenda 21 initiatives as well as international environmental negotiations. In any case and thirdly, the arrangement concept is meant to encompass discourses as well as practices, substantial as well as organisational aspects of the domain concerned. Fourthly, in order to enhance the analytical capacity of the concept, we distinguish four dimensions, namely agents (and their coalitions), discourses, rules and resources. We turn to them in more detail now, elaborating a bit upon their scientific background on one hand, and coming up with the empirical questions they lead to on the other.

Agents (or actors) are the key units as policies are made by agents-in-action. As political actors do not act individually but in concert, the word *coalition* has recently been used very often in political sciences to indicate their interaction. Each policy arrangement can be characterised in terms of the actors involved, in terms of the interactions they have and in terms of the coalition(s) they forge or deconstruct. As said, political modernisation, whatever its stage, is paralleled by the involvement and exclusion of actors, by the construction and reconstruction of coalitions, their broadening and restructuring etc. This raises interesting questions for empirical research, such as which change in coalition building are we facing in environmental policies? What kind of coalitions are different political structural and cultural contexts likely to bring forward? What does this mean for cross-boundary and international policies? Does the presumed increasing number of actors involved in environmental policies further political participation? To which extent are certain coalitions successful? In short, empirical research on this dimension focuses on the number and character of the actors involved, on the coalitions they build, on the enabling and constraining influence of their political context etc.

The *allocation of power* is a second important dimension of policy arrangements as these are, among other things, systems of power. The (asymmetrical) distribution of *resources* and the relations of autonomy and interdependence between the actors involved constitute the nature of their power structure. Political modernisation, as we have seen, implies major changes in the power relations between different actors and in the resources these actors have available. Resources do not only include competencies and responsibilities, but also expertise, money, negotiation skills etc. This again raises interesting questions, such as to which extent the entrance of new actors in the environmental policy field and the consequent broadening of policy coalitions has altered the allocation of power and resources? Who actually fills in the political space the withdrawing state has left behind?

How can a consumer gain influence on his or her privatised energy supplying company? What are the actual power relations within the newly set up consensual steering committees and alike? Is the distribution of power so equal as some authors implicitly presume? And if not, what are the consequences of an uneven balance of power upon the political outcome of such processes, not only in substantial terms but also in terms of legitimacy etc.?

The dimension *rules of the (political) game* refers to how politics is to be played, which norms are legitimate, how decisions have to be taken, which allocation of tasks and competencies between the actors is formalised, along which procedures this allocation can be changed etc. As we have indicated above, political modernisation to a certain extent includes changes in the rules of the game. State competencies are restricted, market agencies can enter domains, especially the public utilities sectors such as water and energy supply, waste management, communication and others that were formerly monopolised by state agencies etc. Changing the rules of the game means redefining the opportunities and constraints for policy agents to act, to build coalitions and to build up power. It might be clear, therefore, how these dimensions are closely interrelated, and how a change upon one dimension has an immediate impact upon the others. Empirical research here should focus on questions such as whether the entrance of new political actors has induced changes of rules? If so, how these changes take place and what is their impact in terms of the allocation of power, for instance between state and market agencies?

Fourthly and finally we distinguished *discourses*. Political modernisation is paralleled by a continuing change of ideas and definitions, for instance on the role of the state, on the nature of environmental problems, on the distribution of responsibilities in solving them etc. It might be clear that these discourses, although by no means true copies of actual political practices, do have influence on those practices and are influenced by them in turn. Social constructivism has made clear (again) the importance of problem definitions and revitalised the well-known Thomas theorem "if men define situations as real, they are real in their consequences". Discourses give meaning to a policy problem, legitimise a policy domain (or not), delineate it from another (or urge for co-operation with it) etc. Whereas anti-modernist environmental claims used to be based upon 'small is beautiful' or 'political ecology', contemporary late modernist environmental policy is driven by discourses such as 'ecological modernisation', 'win-win situations' and by far the most successful story line of them all: 'sustainable development'. It might be clear which empirical questions we draw from here: how are political discourses formulated, by whom, and what is the respective role of politicians, scientists, representatives of industry and the environmental movement in these processes of naming and framing? Why are some of these discourses successful while others aren't? Assuming that every discourse - including of course a so-called scientific definition of the problem - defines environmental problems in a biased way, what are the typical biases of the contemporary predominant discourses and how does these affect ones position, including the power relations (Irwin, 1995)? Why and how do discourses vary from country to country, and what are the implications of these differences for cross-boundary and international co-operation?

Concluding remarks

In the above I have tried to explain how our department looks at environmental policies and how we, in a context of political modernisation, endeavour research on environmental policy arrangements.

This approach, it seems to us, is theoretically well elaborated and empirically fruitful. . As to the latter, we hitherto have applied this approach onto different empirical fields: toDutch infrastructure policies, to European climate change initiatives, to global biodiversity policies, to developments in Dutch agricultural environmental policies, and to Dutch-German cross-boundary nature policies. Apart from the departments' publications quoted above, we recently published on both theory and empirical evidence in different articles and books (see Arts and Van Tatenhove, 2000 and Van Tatenhove, Arts and Leroy, 2000 to name but what is written in English)..

At present we set up a comparative (PhD-)project on the way the Natura 2000 Programme initiated by the EU, is implemented in different cases of nature conservation within three countries, the Netherlands, the UK and Spain. One of the crucial issues in this project will be a comparative assessment of the impact of political modernisation upon this particular policy domain in countries with very different political tradition and structures both in general and with regard to nature conservation. We are about to start similar PhD-projects, one on the actual implementation of other European Directives and the interrelations between new environmental policy arrangements on different levels, and another on the changing way 'knowledge' is dealt with as an input in environmental decision-making processes dating from different decades and subdomains.

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Community Psychology Intervention Strategies as Tools to Enhance Participation in Projects Promoting Sustainable Development and Quality of Life

Donata Francescato

INTRODUCTION

The sociological, economic, political and anthropological literatures are devoting increasing attention to globalisation, as a "process leading to greater interdependence and mutual awareness (reflexivity) among economic, political and social units in the world" (Guillen 2001, 3-4). Some argue that the rapid increase in cross-border technological, economic, social and cultural exchange is going to bring about a new civilisation that will enhance prosperity and quality of life for all.(Levitt 1983, Ohmae (1990)

Others (Kennedy 1993, Rodrick 1997, Mittelman 2000) contest the civilising effects of globalisation and view with extreme concern the consequences of the increasing free international economic and financial flows : the diminution of authority of the nation-state, the widening gap between rich and poor both among nations and within each country.

Some (Hirst and Thompson 1996, Wade 1996, Keck and Sikkink 1998) see globalisation not as uniform and inexorable trend but more as a feeble, fragmented contradictory process which has not yet challenged the nation state, they underline that while financial globalisation has grown very rapidly, trade in goods and services has not grown much over the last two decades. Wade (1996) points out that the volume of trade is small relative to the size of most economies, that domestic investment is greater than foreign investment, multinational corporations locate most of their assets in their home countries and vast areas of the world have not been affected by globalisation. Internet exchanges, international advocacy groups concerned with human rights, the environment, world peace, women's rights, tourism and international phone calls have grown fast, but international migration through on the rise, has not yet reached important levels relative to world population. Bucking the globalisation trend is also the growing number of nation states (from 1980 to 1998, United Nations Members grew from 157 to 184), and of ethnic groups that are reasserting their identities and want to create their own state (Kurds, Basques, Catalans, Tibetans and Quebecois)

If researchers have different opinions on the consequences of globalisation, also ordinary citizens hold conflicting views. In four recent studies (Francescato/Burattini 1997, Francescato 1998, Pasini Francescato 1999,) explore the reactions of about 4500 women and men to political, cultural, economic and technological changes, two main trends emerged. On one side innovators, who support globalisation processes, happy to communicate through Internet with people all over the world and to watch the same movies, listen to the same music, wear the same tattoos and follow the same big

sports events. For these people the word change produced only positive associations such as novelty, improvement, renovation. They were optimist about the future, pointing out that globalisation increases the freedom for each individual to make a personal project out of his life instead having a 'destiny' already prescribed at birth. They underline that today a person can change nationality, residence, religion, work, partner, sexual orientation, physical appearance, gender and even unwanted personality traits through drugs and psychotherapies. They support transferring more powers to international bodies to overcome the narrow borders of the nation states. These same changes and the increased options available that fascinate innovators, create unease, and fear among traditionalists. These view globalisation as a dangerous process toward homogenisation, loss of roots, and as a reaction tend to give much value to everything that is 'local', from dialects to food, from old crafts to historical traditions. Politically they tend to trust only local leaders and want more local autonomy. Apart from these main trends a vast group of people seem to be uncertain, supporting change in some areas but non in others, and being afraid above all to have no power or opportunities to influence the direction of change.

To overcome these fears environmental activists have justly mediated between supporters of globalism and localism with the slogan: "Think global, Act local " Support for this stance come also from a community psychologist like Piero Amerio (1998, 2000) who maintains that the modern world needs to recapture the sense of the distinction between society and community first proposed by Tonnies (1887). Amerio argues that political decentralisation processes have enhanced the importance of local communities and that the concept of community underlines the positive values of collaboration, solidarity and interpersonal relations in promoting individual and social wellbeing. Above all, using a community approach, one recognises the limits of traditional individualism which considers human rights as residing automatically in each person, and considers the importance of social processes in building personal identities. In this view, social processes are not a given but the product of human action, human problems are not only personal but social problems.

Sharing some common goals community psychologists and environmental experts may benefit from a more profound knowledge of the concepts and tools developed in both fields. To support this fruitful exchange in this paper I will try to outline some of the main principles that guide interventions in a community psychology framework, and briefly describe some community psychology intervention strategies that have already been used to promote grassroots participation in projects promoting sustainable development and quality of life.

PRINCIPLES UNDERLYING COMMUNITY PSYCHOLOGY INTERVENTION STRATEGIES[1]

Community psychology aims to correct the individualistic bias of most psychology by considering people within the contexts of the social settings and systems in which they are part. Individuals live in a state of continuing transaction with the various settings in which they spend time. This state of transaction is characterised by reciprocal influence. Not only are the experiences and forms of behaviour of individuals affected by the characteristics of the settings in which they find themselves, but so too are settings created and shaped by their occupants.

In the words of Amerio (1999 p 21): "if we maintain that the social contributes to construct the individual (his psyche, its aims and hopes, and also his problems, and pathologies) we have to hold clear that the social is not a given, ontologically placed before the subject, but it is a product of human action, something (such as culture, norms, rules, inequalities in power) that mankind has built in his philogenetic history, and that, in some aspect the individuals reconstructs in his ontogenetic history".

Translating this theoretical framework in to action implies first to redefine any personal problem in social terms and vice versa, that is to generate new knowledge about a phenomenon by encouraging a PLURALISTIC INTERPRETATION.

Community psychology interventions seek to encourage the generation of multiple narratives on any given topic, to increase awareness of the variety of viewpoints from which a problem can be considered. When there is an "individual problem," it not only the individual that may have to change but also the social settings, when there is a 'social problem' changing laws and economic conditions may be important but non sufficient, individuals may need to change as well. RESPONSABILITY FOR CHANGE IS PLURAL, IT RESTS BOTH ON INDIVIDUALS AND SOCIAL SYSTEMS. Community psychologists however -to counter the main psychological bias toward individual change - favour socially grounded interventions (shifting the level of analysis from individuals to small groups, networks, organisations, neighbourhoods and communities).

Individuals and social settings vary in their capacities to be responsible, that is to act and to change, given that power and resources are distributed unevenly in our society. Community psychologists aim at empowering individuals, groups and communities by activating their positive resources (both material and psychological) so that they better deal with their problems.

Taking into account UNEQUAL DISTRIBUTION OF POWER AMONG INDIVIDUALS AND SOCIAL SETTINGS IN OUR SOCIETY means operationally that any intervention in community psychology has to PROMOTE INTERPRETATIONS of the phenomenon it works with, that TAKE IN CONSIDERATION POWER RELATIONSHIPS IN THE CONTEST BEING EXAMINED. This often may mean

[1] For reason of space I will here only briefly outline some of what I consider the main theoretical guidelines to action that support the best community psychology intervention strategies, for more in depth discussions one can refer to the works of Amerio 2000, Orford 1992, Francescato Ghirelli 1988, Francescato Traversi Leone 1993, Heller 1989, Palmonari e Zani 1998).

TO CRITICALLY REEXAMINE THE DOMINANT EXPLANATION. It follows from this guideline that any community psychology intervention TENDS TOWARD A CHANGE OF THE STATUS QUO.

Operationally it means also that goals of intervention have to be defined non only top down, but a voice must be given to those who have less power and that community psychologists facilitate less empowered individuals and social settings to identify possible allies in their communities and promote networking with militant political groups, with pressure groups and various civic groups to influence institutional change in favour of the less empowered IT IMPLIES THAT COMMUNITY PSYCHOLOGISTS RECOGNIZE THE STRENGTHS AND:LIMITS OF PSYCHOLOGICAL TOOLS AND PROMOTE INTERDISCIPLINARY COLLABORATION.

Another important assumption that guide intervention processes in community psychology is that confrontation among different ideas is positive and that conflict can promote change and evolution both at personal, group, organisational or community levels. Depending on the specific power situation in a given community one can choose tools based on what Dahrendorf (1959) has called the theory of consensus or the theory of conflict. In some community or organisation when one assume most members share common values and goals one can adopt intervention strategies of locality development, or traditional planning; in very hierarchical or highly conflictual communities or organisation one can use the social action model or advocacy planning, or a mix of strategies as described by Rothman 1974, Stockdale (1976) or Hyman 1998.

Empowering people is a goal and a process. Methodologically the process implies a VALORISATION OF PRACTICES; WORK AND LIFE EXPERIENCES AS PRODUCERS OF DIFFERENT AND USEFUL KINDS OF KNOWLEDGE and the adoption of a PLURALITY OF METHODOLOGIES taken from different disciplines which explore both “soft subjective” and ‘hard objective” components of social and personal worlds. A preference for LOCALLY GROUNDED INTERVENTIONS THAT TAKE INTO ACCOUNT HISTORICAL, GEOGRAPHICAL AND ANTHROPOLOGICAL ISSUES. Theoretically the kind of empowerment community psychologists can aim at promoting directly, is the empowerment that comes from knowing and understanding more about oneself and the world around. Working with long term unemployed, women in prison, high school dropouts as well as with junior high and high school students and college graduates (projects that have involved more than 6000 people) we have documented both through subjective and objective measures[2] that a person becomes empowered when for example she learns diagnostic tools, at the individual, small group, organisational and community level that allow her to see the weak and strong points in herself, her small groups, the organisations of which she is part, and the community is which she lives and the mutual interactions between her life and the opportunities and limits of the settings she is involved with.

As a goal empowerment is a more elusive and complex, because empowered people can use their increased power in socially beneficial or oppressive way. As Amerio (1998) points out human beings can direct their action not only to build but to destroy, not only to help but to oppress other human

[2] See D. Francescato An empowerment training model to favour transition from school to work for senior high school students The seventh Annual Conference on the Promotion of Mental Health, Maastricht, October 8’10, 1997, pag 62, and D-Francescato Group, organisational and community empowerment strategies in a changing socio-political contest. In Antonio Maria Gonzalez Psicologia comunitaria: fundamentas Y applicaciones Ariel Madrid 1999.

beings. So can empowered social settings and social systems. Empowering individuals, groups organisations and communities does not guarantee ipso facto that they are going to use their new power for socially positive aims. One must remember that a community funded on participation and solidarity is one possible outcome among many, and one that must be constructed. As Amerio (1998p 23) writes: "It has to be seen not as something that will arrive (as gift from history), but as a difficult and tiring construction. As it is difficult to look for a 'common good' that will inspire collective life without suppressing pluralism of ideas and of individual aspirations" In my book Love and Power (Francescato 1998) I also try to show that the dice are still in motion: we can move toward a more benevolent society in which pluralism and appreciation of diversity reign both within the individual psyche and among social systems, in which we integrate the best of feminine and masculine culture, or a society where Mafia rules and goals are prevalent: and knowledge, power and money are used to dominate and oppress at both the individual and institutional level, or toward a society which is much more benevolent in some realms and more oppressive in others. The complexity of the concept of empowerment as a goal methodologically requires an abandonment of traditional dual thinking,(black and white) and a valorisation of the zone of tension between opposites. With these assumptions in mind, we can now turn our attention to a brief description of one specific tool.

COMMUNITY DIAGNOSES AND NETWORK BUILDING

The technique of community diagnoses was originally proposed in Italy by Martini e Sequi (1988) and then adapted and modified by my collaborators and me (Francescato, Leone Traversi 1993, Francescato Ghirelli Tomai in press).Martini e Sequi propose to "read" the community as a complex system to find weak and strong points of seven different interdependent community profiles.

1. The territorial profile includes data about borders and geographical characteristics, natural resources, communication routes, historical, artistic or green areas, parks, and protected areas, polluted and degraded areas
2. The demographic profile includes the number of inhabitants divided by sex, educational level, socio-economic status, family size etc, and the immigration and emigration patterns including seasonal or daily immigrants
3. The economic profile includes employment figures in primary, secondary and tertiary sectors, old and new economy sectors, rates of unemployment by sex age ethnic groups, unprotected under cover work, illegal work, work safety tracks, number of work accidents or professional diseases
4. The services profiles includes news about what kind of public and private service are available in health and social sectors, in education cultural recreational areas, and what kinds of volunteer and civic associations are present in the community
5. The institutional profile includes local government (town council, mayor) bodies, police, courts, and religious institutions etc
6. The anthropological profile includes the history of the communities, its special events (periodic celebrations, fairs and festivities)the values, norms and the main problems perceived by most or by minority groups

7. The psychological profile deals with the sense of belonging, satisfaction with quality of life in the community, extent or perceived social support, problem coping mechanism, and empowerment levels of the various population groups.

There are three ways in which community diagnoses can be carried out

1. by people belonging to the community itself
2. by experts external to the community
3. by a combination of a and b which allows to confront two diagnoses, one formulated by outsiders and one by insiders

Techniques of data gathering to determine strong and weak points of each profile naturally vary from profile to profile, but generally involve gathering hard data from sources already published and integrating them with interviews with key community figures. For the most soft subjective profiles a variety of techniques are used ranging from walks around the community main squares and streets, to drawings, movie scripts, questionnaires and interviews. When both outside experts and community insiders make up the team of promoters, it is interesting to see what key people and special target groups they choose to interview and then to confront the commonalties and divergences that emerge in both the diagnoses It is very fascinating also to see the different group narratives and movie scripts different sections of the populations produce about their community. The projective techniques used to gather data in the anthropological and psychological profiles, which have been adapted from the techniques we use to assess the psycho-dynamic and psycho-environmental dimension of an organisation[3] have proven to be very powerful in liberating strong negative and positive emotions, especially when used in conjunction with more traditional action research techniques which focus on material conditions, allowing for different kinds of knowledge to emerge that can be utilised to find novel solutions, or new ways to look at old problems.

Once the readings and profiles have been traced, the results are then presented and discussed not only with the representatives of the initial sponsoring agency but with all the individuals and groups who have taken part in the diagnosis. A special meeting is held during which participants are facilitated to determine priorities of changes for their community and formulate projects on how to reach the desired change The use of creative group techniques to handle and focus problem solving in large groups (sometimes final meetings see 40 to 50 people discussing their different analyses together) have been particularly useful to allow for the integration of many different visions, and to permit those with less visibility and power to have their voice heard.

Making a community diagnoses can serve many diverse purposes for different stakeholders who can initially sponsor it. For instance it has been used in Italy by mayors and town councils to prepare “territorial development plans”, or to involve young people in volunteer work to help solve some urgent

[3] At the University of Rome we have developed a series of intervention techniques who are based on the principles of intervention outlined at the onset of this paper. Besides community diagnoses and networking, we have developed a multidimensional organisational analysis that is suited to diagnose strong and weak points of organisation focusing on four dimensions: strategic, functional, psycho-dynamic and psycho-environmental. For each dimension using different methods we have members of an organisation diagnose the strong and weak points. Then we proceed to have participants look for connections among the various levels of objective-subjective functioning, rational and irrational data and establish priorities for change. At the small group level we have developed a methodology that distinguishes among structural, task, group process and individual variables. For each variable we have developed indicators to be used by members in evaluating group functioning. For more details on these methodologies see in English Francescato 1989a, b, Francescato 1992, Francescato 1995.

community problems by co-ordinators of health services to help decide which programs should be implemented first, and to promote participation in planning a Health Cities agenda as part of an European Community Health promotion effort; by schools to find out what kind of resources existed in the community with whom to link to have better schools or to deal with high rates of school drop-out. (Cudini 1993)It has been used in South Africa to promote understanding and constructive conflict among different ethnic groups such Afrikaner, English, Indian and Blacks, who had lived in an apartheid societies and had many misgivings, doubts and fears about one another (Francescato 1998). In Austria it has been used by Cornelia Ehmayer, Sebastian Reinfeldt and Sabine Gstotter (2000), who, after been trained by me in 1997-98, ,used a creative version of the profiles diagnoses to promote LOCAL AGENDA 21 projects toward sustainable development in five small municipalities and in a neighbourhood of Vienna, adding to the original method an ecological dimension and an emphasis on planning for a better future. Moreover it can be used as a training technique to widen the knowledge students, unemployed or special groups of citizens have of their community and to promote their empowerment. We found that teaching community psychology techniques such as community diagnoses, multidimensional organisational diagnoses, small group diagnoses increases not only the ability to understand what are the opportunities and limits these settings offer to the people that live within them, but increases all three dimensions of empowerment, self-efficacy, the capacity to influence others and above all socio-political empowerment.(Francescato, Tomai, Burattini, Rosa 1998).

No matter what the specific purpose with which community diagnoses is planned, it becomes a good tool to promote networking among existing services, institutions, volunteer and other civic associations and among all key institutional figures who are interviewed for data gathering in the different profiles. In fact networking is necessary in any case to produce the diagnoses, often one key person will ask that another people be interviewed, or one special interest group will mention another special group that one should contact. Especially during the final meeting, when priorities for changes are elaborated, different representatives of the various communities settings understand emotionally what cognitively they may have known for a long time, that together they stand a better chance to see desired changes take place. When conflict is very strong among different community groups the presence of outside experts is often crucial. They can act as cultural mediators helping locals focus on issues that unite them to make something they want happen in the future rather than griping about past events. Moreover network building requires people to overcome the often deep-rooted diffidence between organisations with different mandates and often contrasting ideologies and to create a climate of trust in which new opportunities for mutual growth might emerge.

Another key to building networks is to show how a problem group (such as teenage drop-outs) can become a resources to another group (older people) in the implementation of a town project. Indeed it is also through the experience of planning and implementing such projects in one's own community that people acquire the technical and emancipatory competencies which allow them to become empowered. These competencies render them capable of knowing where to find the resources, how to develop them, and how to influence the world in which they live.

The outside expert or the community psychologist who co-ordinates initially the process of community diagnoses and network building has to work hard to make the local community group autono-

mous and powerful, gradually diminishing his or her involvement by delegating competence and responsibility to members of the network.

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Practical Benefits of Indicators of Sustainable Development for Different Stakeholders

Catherine Rubbens

Abstract

At present, a wide variety of stakeholders are in the process of developing and using indicators of sustainable development. This paper aims at reviewing key stakeholders involved in such initiatives. Through concrete examples, it identifies differences and similarities among indicator initiatives and frameworks, with an emphasis on stakeholder specific characteristics and practical benefits.

Introduction

The number of programmes with the objective of defining, developing, and using indicators of sustainable development is on the increase. As an illustration, the internet compendium on Sustainable Development Indicators[1] initiated by the Canadian International Institute for Sustainable Development (IISD) in 1997, currently counts 202 such initiatives. Though this database does not provide a comprehensive overview of indicator initiatives world-wide, the strong increase in the number of indicator programmes listed since 1997 certainly reflects a rising trend.

This paper examines some of these initiatives in more detail. The first section lists several common characteristics among indicator frameworks and initiatives.

The second section reviews six groups of stakeholders involved in indicator selection and development: international organisations; national governments; municipalities and local communities; the business community; non-governmental organisations, and the academic community. The purpose of the section is for each stakeholder to look into some key indicator initiatives, and to provide information about recent trends in indicator selection and development. It examines how indicators can be useful in assisting stakeholders in their attempts to reach sustainable development goals and objectives and to enhance communication with other parties.

Section 3 reflects on the practical relevance of indicator initiatives on the basis of the projects and programmes reviewed in previous chapters.

Even though there is no precise definition of sustainable development, it is generally accepted that the interdependence of human activities and their effects on the environment, society, and the economy pose a challenge for decision makers. Participatory and comprehensive management strategies are required for addressing those complexities in an integrated way. Indicators are an important tool

[1] International Institute for Sustainable Development, Compendium on Sustainable Development indicators, http://iisd1.ca/measure/compinfo.htm.

for monitoring and assessing sustainable development and for clarifying the intricate relationships underlying the concept. However, the current trend towards an increased number of new indicator initiatives and frameworks is often perceived as confusing.

Comparing different initiatives is complicated, since most organisations launching indicator programmes have their own goals, objectives, partners, and scale of operation. Some initiatives, for example, consist in a single set of indicators for a particular country, city, or company; whereas others propose general indicator frameworks for several countries, cities, or companies. In spite of the divergence among indicator initiatives and frameworks, they also have quite a few characteristics in common. Some of these are listed below.

Most indicator initiatives are based on a certain interpretation of the ***sustainable development*** concept. They generally propose an integrated approach addressing social, environmental, and economic issues[2]. The Global Reporting Initiative (GRI)[3], established in late 1997 with the objective of designing globally applicable guidelines for achieving enterprise-level sustainability is an example. Indicators selected at the enterprise level cover environmental aspects of sustainable development including impacts through processes, products, or services on air, water, land, natural resources and human health. Social indicators reflect the treatment of minorities or women, labour union issues, child labour, and involvement in shaping local, national, and international public policy. Economic indicators monitor aspects that extend beyond financial performance, and include community contributions and local procurement policies.

Indicators are ***a management decision-making tool for improving and evaluating performance***. Once sustainability is defined, they can help decision-makers to define sustainable development objectives and targets and to assess progress in meeting them. The process of clearly relating indicators to key objectives or targets assists stakeholders in focusing their attention on high priority areas. For example, achievement of the quantitative target of a "three-quarter reduction in maternal mortality by 2015" set at the Conference on Population and Development in Cairo in 1994, can be monitored by using the indicator "maternal mortality rate", expressed per 100,000 live births.

Indicators are ***tools for communicating with other stakeholders***. These "other" stakeholders differ from one initiative to another. Companies, for example, might want to select indicators for communicating "internally" in order to inform management, employees and the Board of Directors about the company's sustainable development performance. They might also find it useful to use indicators for communication with "external" stakeholders such as investors, accountants, bankers, insurers, consumers, and international Standard Bodies.

Most indicator initiatives are based on a ***basic set of principles*** defining how they will be selected and used. They are also often presented in a specific ***indicator framework***. For example, the Organisation for Economic Co-operation and Development (OECD) selects indicators in the context of its programme on environmental indicators on the basis of three basic selection criteria: policy rele-

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[2] Some indicator sets and frameworks emphasise specific components of the definition of sustainable development. For example, the work on Eco-efficiency Indicators and Reporting of the World Business Council for Sustainable Development (WBCSD) mainly addresses progress towards economic and environmental sustainability (see 2.4).

[3] Global Reporting Initiative, "Sustainability Reporting Guidelines – Exposure Draft for Public Comments and Pilot Testing", March 1999.

vance, analytical soundness, and measurability. The indicator framework used by the OECD is based on a Pressure-State-Response (PSR) model, where Pressure indicators reflect human activities exerting pressure on the environment, State indicators the quality and quantity of natural resources, and Response indicators the societal response to changes in the state of the environment through a variety of policy measures[4].

Indicator frameworks can be relatively simple or complicated, depending on the purpose of the initiative and on the stakeholder undertaking it. In the case of more complex indicator frameworks with the objective of harmonising use of indicators among users (e.g. several countries or companies), important issues for discussion are the appropriate number of generally applicable indicators, and ways to improve comparability of indicators among users. These frameworks often result in a combination of sets of core indicators for use by all participating parties, and voluntary or supplemental indicators which are only relevant and meaningful for specific users.

Data quality and availability is important for making indicators useful for decision making and communication. Indicators should therefore be based on robust methodologies and measurement systems that stand the test of time. The definition, means, and boundaries of measurement should be available to decision makers, and the process of data-collection should be subject to verification. One of the selection criteria for indicator selection in the context of the Work Programme on Indicators of Sustainable Development of the Commission on Sustainable Development[5] is therefore that *"the indicators should be dependent on data that are readily available at a reasonable cost-benefit ratio, adequately documented, of known quality and updated at regular intervals."*

Stakeholders involved in indicator initiatives

All stakeholders have a shared responsibility with other parties in their contribution to sustainable development. Whereas business, for example, can improve their products' ability to address human needs and quality of life, and can become more "eco-efficient" in their delivery of goods and services, governments can help formulate their economic and industrial policies in ways that encourage eco-efficiency-based steps to reduce energy and resource use.

The distinction between indicator initiatives based on the kind of stakeholder groups undertaking them is somewhat artificial. In most cases, several stakeholders co-operate in one single initiative[6].

The following sections address the main reasons why different stakeholders are interested in selecting and using indicators, and examine some key indicator initiatives more closely.

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[4] OECD, Towards Sustainable Development – Environmental Indicators, 1998; and website http://www.oecd.org/env/soe.

[5] United Nations, Department for Policy Co-ordination and Sustainable Development, "Indicators of Sustainable Development Framework and Methodologies", August 1996; and website http://www.un.org/esa/sustdev/isd.htm.

[6] An example is the "corporate CO2 Indicator", developed in 1997 by the British Imperial College, the United Nations Environment Programme (UNEP) and the Insurance Company National Provident Institution to help investors assess companies' contribution to climate change and their resulted exposure to financial risk. The Department of Environment, Transportation and the Regions (DETR) of the United Kingdom currently uses this indicator as a basis for its policy initiative in the field of company reporting on greenhouse gas emissions. See website http://www.environment.detr.gov.uk.

International Organisations

The aim of most indicator initiatives at the international level is to provide decision-makers at the national level with a workable set of indicators of sustainable development. Together with national governments, they can identify the relevance of particular data and gaps in data-collection, and establish conceptual frameworks and institutional arrangements for compiling and analysing data.

International organisations are often interested in using indicators for making comparisons across time and across space. The OECD Programme on Environmental Indicators[7] and the Work Programme on Indicators of Sustainable Development of the Commission on Sustainable Development[8] are examples of influential indicator initiatives undertaken by international organisations (Box 1).

Box 1 The OECD Programme on Environmental Indicators and the Work Programme on Indicators of Sustainable Development of the Commission on Sustainable Development (WPISD)

The OECD programme on environmental indicators launched in 1991 was developed to select and organise data and indicators in a way useful for decision-makers and the public, and to help policy makers set policies at the appropriate level. The so-called Pressure-State-Response model (see Introduction) highlights the relationships between the environment and economic dimensions of sustainable development. The OECD programme includes three types of environmental indicators, each corresponding to a specific purpose and framework. These are the OECD Core Set of Environmental indicators, several sets of sectoral indicators (e.g. transport-environment, energy-environment, and agri-environmental indicators), and indicators derived from environmental accounting.

The OECD indicators are measured and published, and are used in the OECD's analytical work and Environmental Performance Reviews. The indicators is becoming increasingly useful for monitoring and assessing environmental conditions and trends in order to increase countries' accountability and their capacity to evaluate how well they are meeting their domestic objectives and international commitments. OECD is now focusing more attention to elaborating the environmental-social interface further. The organisation also intends to improve the quality and comparability of existing indicators, and to link the indicators more closely to established goals and commitments.

The WPISD was adopted by the Commission on Sustainable Development in 1995 with the objective of providing decision makers at the national level with indicators of sustainable development, and to agree on a workable set of indicators by the year 2001, through a process of feed-back and revision of the indicators.

The Driving Force-State-Response (DSR) model adopted by the WPISD differs slightly from OECD's PSR model in that it attempts to highlight the broad scope of the sustainable development concept. In the WPISD framework, Driving force indicators represent human activities affecting sustainable development, State indicators show the condition and status of sustainable development, and Response indicators reflect policies and other societal responses to unsustainable development. The WPISD indicators are represented in a matrix structure, where the vertical structure is organised according to DSR categories, whereas the horizontal structure includes four additional indicator categories: social, economic, environmental, and institutional.

The WPISD working list of indicators includes 134 indicators and covers all of the forty chapters of Agenda 21. For each indicator, methodology sheets were developed by "lead agencies", selected from the United Nations system and other intergovernmental and non-governmental organisations. The purpose of the methodology sheets is to provide agencies at the national level with information about the concept, significance, measurement and data sources for each indicator in order to facilitate data collection and analysis. Use of the indicators in the WPISD working list is not mandatory at the national level. Since 1996, the sustainable development indicators and methodology sheets are being tested on a volun-

[7] OECD, "Using the Pressure-State-Response Model to develop indicators of Sustainability – OECD Framework for Environmental Indicators", Contribution to the Euroconference Event 1, May 1999; and website http://www.oecd.org/env/soe.

[8] See footnote 5.

tary basis by 22 countries in all regions of the world. Countries involved in this testing process have been requested to provide periodic reports on the testing phase to the CSD Secretariat.

Many other international organisations have developed their own indicator sets and frameworks[9]. The World Bank, for example, works on wealth estimates and indicators for genuine saving, which are "synthetic" indicators that measure environment and economic factors in one indicator[10]. The Statistical Office of the European Communities (Eurostat), the United Nations Development Programme, and the Food and Agriculture Organisation (FAO) are other organisations that strongly contribute to the development and the classification of sustainable development indicators.

Another international approach involves the correction of national accounts data to incorporate sustainable development concepts. The UN Statistics Division and several national statistical offices are leading this effort[11]. In addition, indicators developed in the context of International Conferences, Conventions, and Declarations receive increasing attention. The UN Statistics Division is currently in the process of conducting a review of those initiatives at the international level[12].

National Governments

At the national level, indicators can be used in state of the environment reporting, to measure environmental performance and to report on progress towards sustainable development. Indicators are useful for obtaining information on trends, pressure points, and impacts of policy interventions, and for providing guidance in modifying policy choices in response to changing realities. Indicators provide feedback on the adjustments that need to be made for accelerating the desired effects of policy interventions, on milestones achieved, and on bottlenecks hampering progress.

Several national governments have launched their own sustainable development measurement programmes, independently from the WPISD. These countries have generally developed national strategies for sustainable development, and use indicators to track progress over time. Examples of these indicator programmes are Canada's National Set of Indicators, the Policy Performance Indicators developed in the Netherlands, and the President's Council on Sustainable Development Indicator Set in the United States.

[9] The same holds for international organisations involved in data collection. For example, an inventory of Statistical Data Collection conducted by the United Nations Statistics Division in 1995, revealed a total of 312 data collection activities reported by international organisations. Many of those include data collection activities for sustainability indicators.

[10] For more information about Environmental Indicators Initiatives of the World Bank, see "Environmental Indicators – An Overview of Selected Initiatives at the World Bank", March 1999.

[11] Industry Canada, "Measuring Sustainable Development : Review of current practice", Occasional Paper Number 17, November 1997.

[12] United Nations Statistics, "A Critical Review of the Development of Indicators in the Context of Conference Follow-up", Report of the Secretary-General to the ECOSOC Informal Meeting on Development Indicators, May 1999.

Box 2 includes more detailed information on the sustainable development indicator programme in the United Kingdom[13].

Box 2 The "Headline indicators in the United Kingdom"

In November 1998, the UK government published "Sustainability counts", a consultation paper on a set of 13 "headline" indicators of sustainable development.

This small set of key indicators should act as a "Barometer of the quality of life in Britain", and is hoped to give an overview of developments in a way intelligible to the general public. Seven of the indicators are environmental, three measure economic development, and a further three social progress.

Of the seven environmental indicators selected, six are intended to measure aspects of environmental protection and one natural resource use, for which the proposed indicator is "waste and waste disposal". Examples of environmental protection indicators are "greenhouse gas emissions" as a measure of contribution to climate change, "days of air pollution" as a measure of air quality, and "road traffic" for reflecting trends in transportation. The set of social indicators such as "life expectancy for women and men" as a measure of health, and "the proportion of the population attaining a set level of qualifications by age 19" as a measure of education. Economic indicators include "gross domestic product" as a measure of economic growth, "investment in public assets" (such as transport, and hospitals and schools) as a measure of social investment.

Particularly in large countries such as the United States and Canada, projects developed at the Sub-National level also provide a rich source of experience in measuring progress toward sustainable development. An example is "Measures of Growth", the sustainable development indicator initiative launched in Maine, United States[14].

Municipalities and Local Communities

Communities, particularly municipalities were among the very first to initiate healthy city programmes and, after the Rio Summit, local applications of Agenda 21. Many local authorities have found it helpful to consider using targets and indicators to measure progress and gauge the size of the task still ahead.

Municipal governments discuss with local stakeholders what information needs to be collected and why, and then decides on the best ways to collect the information. This very process of choosing measures or indicators helps clarify and define what the local community means by sustainable development, and involves the community in the decision making process. Well-known examples include "Healthy City Toronto" in the state of Ontario in Canada, "Sustainable Seattle" in Washington State in the United States, and the UK Sustainability Indicators Project involving 10 Pilot authorities at the local level. Box 3 illustrates a more recent example launched in Tucson in the United States[15].

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[13] Department of the Environment, Transport, and Regions of the United Kingdom, "Sustainability counts - consultation paper on a set of "headline" indicators of sustainable development", November 1998; and websites http://www.detr.gov.uk and http://www.environment.detr.gov.uk/sustainable/consult.inde.

[14] Maine Development Foundation, "Measures of Growth – Performance Measures and Benchmarks to Achieve Maine's Long-Term Economic Goals", Fifth Report of the Maine Economic Growth Council, 1999.

[15] Tucson, 1998-99 Mayor and Council Policy Initiatives; and website http://www.ci.tucson.az.us.

Box 3 The Livable Tucson Vision Program

The Livable Tucson Vision Program seeks to make Tucson, a city in the State of Arizona in the United States, a better place to live by engaging the community in an inclusive planning process to identify common values, priorities, strategies, and measurable indicators of progress that will be used to shape Tucson's future.

In 1997, over 700 community members participated in a structured dialogue to discuss their goals and priorities for the City of Tucson. The priorities that were most commonly articulated by participants during this process were summarised in the 17 "Livable Tucson Goals".

During the spring of 1998, six indicator workshops were held in which community members worked together in small groups to develop indicators to measure progress toward each of the "Liveable Tucson Goals". These "Key Indicators of Progress" are used to create a "Community Report Card", that can be reviewed annually to monitor progress toward the goal of a "Liveable Tucson".

Examples of the wide variety of goals are: "safe neighbourhoods", "excellent public education", "protected natural desert environment", "abundant urban green space and recreation areas", "better alternatives to automobile transportation", and "people-oriented neighbourhoods".

Examples of indicators for measuring progress toward the goal "better alternatives to automobile transportation", are "use of alternative modes of travel", "ratio of miles of quality pedestrian and bike paths and bus routes to total lane miles of roads", and "number of days you can see Rincon Peak from Tumanoc Hill".

Business Community

The business community communicates with a variety of stakeholders, including customers, suppliers, employees, shareholders, the government, insurers, and the investment community. The primary value for business of using indicators is to collect performance information for internal business management purposes. Monitoring and reporting both inside and outside a company is an integral part of any management system. As this holds for financial, manufacturing, sales, and personnel aspects of running a business, it is also valid for environmental and sustainability management. Beyond its use as a management tool, monitoring and reporting sustainability management publicly is also a way to communicate a key element of the corporation's performance to external audiences.

Indicator initiatives at the company level are often linked to Environmental Reporting activities. Unlike financial performance, where reporting conventions are well-established, environmental

reporting in general is a recent development that is still evolving. Sustainable development communication is often complicated by the fact that environmentally relevant aspects and the needs of different audiences can vary strongly from one company to another.

Examples of companies that use sustainability indicators in their environmental reports are Xerox, Novo Nordisk, Bell Canada, and Electrolux. Tomorrow Magazine's website includes an overview of a wide variety of company environmental reports[16].

Several business initiatives at the international level share the common goal of harmonising indicators to the extent that such harmonisation is scientifically and practically appropriate. Examples are

[16] Website http://www.tomorrow-web.com.

the above mentioned Global Reporting Initiative, the work on eco-efficiency metrics and reporting of the WBCSD (Box 4)[17], and the ISO 14031 standard developed by the International Standards Organisation (ISO).

Box 4 WBCSD's work on eco-efficiency metrics and reporting

In 1993, the WBCSD created the following concept of eco-efficiency and actions that companies could take to improve their eco-efficiency : *"Eco-efficiency is reached by the delivery of competitively priced goods and services that satisfy human needs and bring quality of life, while progressively reducing ecological impact and resource intensity throughout the life cycle, to a level that is in line with the earth's estimated carrying capacity".*

Since 1993, WBCSD and its member organisations have developed strategies for improving eco-efficiency through numerous publications and workshops. A new framework for the measurement of eco-efficiency of indicators has been developed by the WBCSD to help measure progress toward economic and environmental sustainability using indicators that are relevant and meaningful for business.

Consistent with the terminology used in ISO 14031, and the GRI, the WBCSD framework contains three levels of organisation for eco-efficiency information: categories, aspects, and indicators. Categories are broad areas of influence on the environment, human health, and quality of life, that are quantifiable and applicable to all business. Aspects are the general types of information that are related to a specific category, and indicators are the specific measurements of an individual aspect, that can be used to track and demonstrate performance.

The WBCSD makes a distinction between core and supplemental indicators. The core indicators are those where there is general agreement internationally. They should be related to a global environmental concern or value, meaningful and relevant to virtually all businesses, and methods for indicator measurement should be available. Supplemental indicators are all other indicators; which are more likely to be defined from one business to another.

Examples of core indicators selected for the category "Product/Service Value" include "energy consumed", "materials consumed", "green house gas emissions", and "ozone depleting substance emissions".

The WBCSD also proposes recommendations for how companies can clearly and transparently communicate eco-efficiency measurements to management and external stakeholders for their decision making. The format for presentation includes an organisation profile, a value profile, an environmental profile, a section on method information, and an eco-efficiency profile. The WBCSD also demonstrates how companies can use graphs to report on trends and improvements over time, compared to targets and reference points, and intends to provide guidance to companies on how to select applicable supplemental indicators.

Non-governmental organisations

Many non-governmental organisations (NGOs) have been actively involved in helping other stakeholders such as local communities enhance public participation through selection and use of sustainability indicators. The New Economics Foundation in the United Kingdom[18] is a well-known example.

[17] World Business Council for Sustainable Development, "Eco-efficiency Indicators and reporting – Report on the Status of the Project's Work in Progress and Guideline for Pilot Application", April 1999.

[18] Website http://www.neweconomics.org.

Several NGOs have also strongly contributed to further development of innovative sustainability indicators. Friends of the Earth, for example, developed the "environmental space" concept, which embodies both the environmental and the social dimension of sustainable development.

"Environmental space" is defined *as "the total amount of energy, non-renewable resources, agricultural land and forests that can be used without causing irreversible environmental damage or depriving future generations of the resources they will need"*. Together with several research institutes, Friends of the Earth calculated the environmental space available in various European countries[19].

NGOs also make increasing use of indicators for monitoring progress achieved by other parties (e.g. governments or corporations) in fulfilling their sustainable development goals (Box 5).

Box 5 SPAC Watch

In February 1999, NGOs that are actively involved in the NGO Caucus on Sustainable Production and Consumption agreed to move forward with the proposed SPAC Watch initiative. NGOs discussed various aspects of the initiative at an International NGO Conference on Sustainable Production and Consumption, in Soesterberg, Netherlands.

This effort represents a collaboration among NGOs in various countries around the world, with the objective to use indicators for monitoring and reporting on progress by national governments in developing and implementing sustainable production and consumption policy.

Already, NGOs from India, Russia, Ireland, the United States, Chile, the Netherlands and other countries have committed themselves to act as civil society watch dogs to monitor efforts - or note the lack of effort – by their governments to follow through on their Agenda 21 commitments made at the 1992 Earth Summit.

In particular, NGOs are focusing attention on the commitment made by heads of state during the Earth Summit to develop national policy frameworks for promoting sustainable production and consumption practices. With special attention focused on implementation of the newly revised United Nations Guidelines on Consumer Protection, NGOs throughout the world will be noting and reporting on what steps their governments take beyond the statements made at the annual Commission on Sustainable Development sessions[20].

Academic community

Research Institutes and Universities are generally interested in the use of indicators to measure how particular variables affect sustainable development, to identify new correlations between variables, and to experiment with new and alternative types of indicators. Researchers also often conduct studies in support of policy making for sustainable development[21].

[19] Http://www.xs4all.nl/~foeint. Several useful reference materials are Sharing the World (Carley, M. and Spapens, P., 1998), Towards Sustainable Europe (Wuppertal Institute, 1995), and the Action Plan Sustainable Netherlands (FoE, 1992).

[20] Website http://www.un.org/esa/sustdev/cppnt5.htm.

[21] The project "Priorities and indicators for environmentally sound consumption" of the German Wuppertal Institute is an example. The project is part of a demonstration project of the German Federal Environment Agency, aiming at evaluating sustainable consumption patterns and lifestyles in Germany. It includes the development of indicators to prioritise measures and behavioural changes needed at the household level for reducing environmental degradation. See website http://www.un.org/esa/sustdev/cppnt5.htm.

The "Ecological Footprint" (EF) developed by Rees and Wackernagel[22] is an interesting example of an innovative indicator developed by academia. The indicator can be defined as *"the area of land required by a given group of people (household, city, or country) to provide the goods and services it consumes, and to assimilate its waste products, wherever that land may be located".*

Ever since the development of the EF, many researchers have applied the concept to national and local contexts.

Other important sustainability indicators developed by the academic community have focused on material flows. Various research institutes, including the German Wuppertal Institute of Climate, Environment and Energy and the World Resources Institute (WRI) in the United States, consider the total material flow as a measure of environmental disturbance. The reduction of material flows is therefore seen as a means for reducing the pressure of human activities on the global environment.

Several measures for assessing the economic intensity of material flows have been developed. One such measure is the material input per unit service (MIPS), the material inputs necessary for the production, distribution, use, redistribution and disposal of a given good, considered with respect to the service provided to the end-user. Another is the cost per unit service (COPS). Both were developed by the Wuppertal Institute. The WRI developed, in co-operation with the Wuppertal Institute and several other organisations, a refinement of the MIPS, entitled the "Total Material Requirement" of an industrial economy. The TMR measures the total use of natural resources that national economic activity requires[23].

How to assess practical benefits?

The last section reviewed several indicator initiatives launched by a variety of stakeholder groups with the objective of achieving sustainable development. Even though numerous descriptions of sustainable development indicator initiatives and applications are available in the literature, no comprehensive attempt has so far been made to assess practical benefits of these initiatives.

Such an assessment is likely to be complicated, since many stakeholders have their own specific objectives and derive different benefits from the same indicator initiative. Moreover, many benefits are possibly hard to quantify. However, some of those practical benefits could be:

Increased interest in all components of the sustainable development

As was mentioned above, achieving sustainable development requires an integrated approach. Focusing simultaneously on indicators reflecting the economic, environmental, and social dimensions of the concept might encourage some organisations to monitor and evaluate some aspects of their activities they have not traditionally been dedicating much attention to. The broad focus on sustainability also helps clarifying linkages among the three different components.

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[22] Rees W. and Wackernagel M., "Ecological Footprints and Appropriated Carrying Capacity: Measuring the Natural Capital Requirements of the Human Economy", in "Investing in Natural Capital: the Ecological Economics Approach to Sustainability", A.M. Jansson, M. Hammer, C. Folke, and R. Constanza, eds. Washington Island Press, 1994.

[23] World Resources Institute et. al. "Resource Flows – the material basis of industrial economies", 1997.

Improved evaluation of decision making and performance

Monitoring developments of trends over time and evaluating links with targets and objectives, helps decision-makers in clarifying and changing policy objectives and priorities if necessary.

It also enables them to detect areas for cost saving and removal of inefficiencies, and to measure impacts of interventions. A requirement is that indicators selected for monitoring progress in reaching targets are relevant and meaningful with respect to the selected sustainable development objective, should inform decision makers on how to improve performance towards achieving the objective, and need to support benchmarking and monitoring over time.

Clearer communication among stakeholders

Indicators can be useful for encouraging more transparent communication among parties, since they help enhance discussions on sustainable development priorities, and provide measurable, transparent, and verifiable information to other stakeholders and institutions. Indicators should therefore be clearly defined and meaningful to identified stakeholders. Moreover, they should not be so complex that they are difficult to use effectively by other parties.

Enhanced public participation

Particularly at the municipal, communal, and individual company level, selection and use of indicators can enhance participation and create a sense of ownership and responsibility among those involved. As was illustrated with the SPAC Watch example (Box 5), indicators can also be used by some groups for monitoring progress achieved by other parties in fulfilling their sustainable development goals, thereby enhancing transparency and participation in political and other societal processes.

Improved data-collection and methodologies

Since it is extremely costly to collect and manipulate data, it is important that interaction between institutions and units involved in data collection, and decision-makers is smooth and well developed. Discussions about sustainable development indicators can lead to a clearer understanding of the data required and can encourage more rational data collection. Efforts at the international level in particular can be helpful in identifying relevance of particular data and gaps in data-collection, in establishing arrangements for compiling and analysing data, and in providing technical assistance to parties with less experience in this area.

General interest in sustainable development indicators also encourages efforts to improve existing methodologies, and to develop new ones. For example, numerous organisations are involved in methodologies for linking and aggregating data. The literature on these issues is extensive, and goes beyond the scope of this paper[24].

Improvements in indicator harmonisation and comparability

[24] More information on linkages and aggregation can be found in the contribution of Isabelle Guinomet to the first Euroconference event: "Eurostat's tools for the development of indicators of sustainable development".

International initiatives such as the OECD Programme on Environmental Indicators, the WPISD, and the WBCSD's work on eco-efficiency metrics and reporting are particularly helpful in increasing harmonisation of indicators at the international level, thereby facilitating use of indicators across time and space. In spite of numerous technical and political complications, comparisons in "sustainability performance" among users can have the advantage of allowing for identification of success factors conducive to improved performance.

Modelling a Sustainable Europe

A System-Dynamics Approach

Friedrich Hinterberger, Joachim H. Spangenberg, Andreas Mündl, and Andrea Scharnagl[ð]

Abstract

With the coming into being of the European Union the linkage of economic growth and environmental protection at an European level has been given even greater importance. The Maastricht Treaty calls for „environmentally sustainable economic growth", the European Commission's 5th Action Programme sets out the principle of „joint responsibility for the environment" and announces the necessity of „interpolicy co-operation", which asks for the achievement of environmental goals by integrating them into the definition and realisation of other policy areas. Within the conception of such an integrated policy strategy and with respect to the whole transformation of the European economy towards a „sustainable development" mobility behaviour and the future design of the transportation system will have to play an essential role. One possibility to explore different transportation policies with respect to complex economy-ecology-relations and its interdependencies with socio-economic objectives is to experiment with system-dynamics models. An approach introduced here is „SuE", a multi-sectoral, physical-oriented simulation model for the European Union 15. It combines the character of an energy/economy interaction model with the concept of Material Input Analysis aiming to explore the effects of user-defined policy assumptions in various economic sectors on environmental indicators and the evolution of the economy as a whole.

The model is based on the principle that physical capital stock though appearing to be human-made is essentially derived from natural capital. The basic structure of the SUE model is based on an elaborated model for the United Kingdom, called the UK ECCO model. However, SUE is necessarily broader, simpler and more aggregated, since there are significant difficulties in obtaining consistent data series for the whole of the EU.

ð This presentation is based on an earlier paper by Andreas Mündl presented at the 10th International Conference on Socio-Economics in Vienna, 1998. See also: Institute for Sustainable Development (1999). Sustainable Development by Dematerialisation in Production and Consumption. Warsaw.

Basic aspects for the SuE model approach

Limits to Growth, the famous 1972 report to the Club of Rome as a think-tank for an environmental, social and economic *sustainability* argued that

...one could delink economic growth from improvements in the quality of life, or that in fact further economic growth would not improve the quality of life.[1] This zero growth demand met a harsh political rejection and was thoroughly ridiculed.

The recent sustainability debate depicts a more differentiated picture of the environment - growth relation and stresses that economic growth (growth in Gross Domestic Product GDP) not per se puts stress upon the natural environment, but the growth in physical amounts of energy and materials that society processes. Economic growth typically leads to growth in physical terms, but this is not necessarily the case, and even under current structural conditions the two need not grow proportionally.[2] The degree to which the economic growth mechanism also drives physical growth depends on the structure of production and on technology. The more an economy provides for services instead of goods, the less direct the growth impulse will be. To allow this the resource efficiency of technologies and services - in the sense of providing commodities or services with the least amount of material and energetic waste - has to be improved more quickly than the economy grows. This is the hope behind a proposed 'efficiency revolution'.[3]

Within such a concept of efficiency increase environment-oriented technological progress (as part of a technical efficiency improvement)[4] and the increase in service efficiency play a key role. However, the effects of raising these efficiencies (as well as of other policy measures which aim to avoid negative environmental impacts) on the complex environment-economy system is hard to predict even for experienced policy and decision makers. System-dynamics analysis can provide useful insights into this complexity. It can demonstrate relations which are hard to reveal by doing only single (partial) policy analysis; it hereby supports decision makers with a more comprehensive background knowledge.

Implementing the ideas of technical and service efficiency into a system-dynamics model can offer important insights into positive or negative feedbacks indicating possible trade-offs between ecological and economic objectives or even kick off new questions for old problems.

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[1] See Meadows, D.H., Meadows, D.L., Randers, J., Behrens, W.W. (1972). The Limits to Growth. New York: Universe Books.

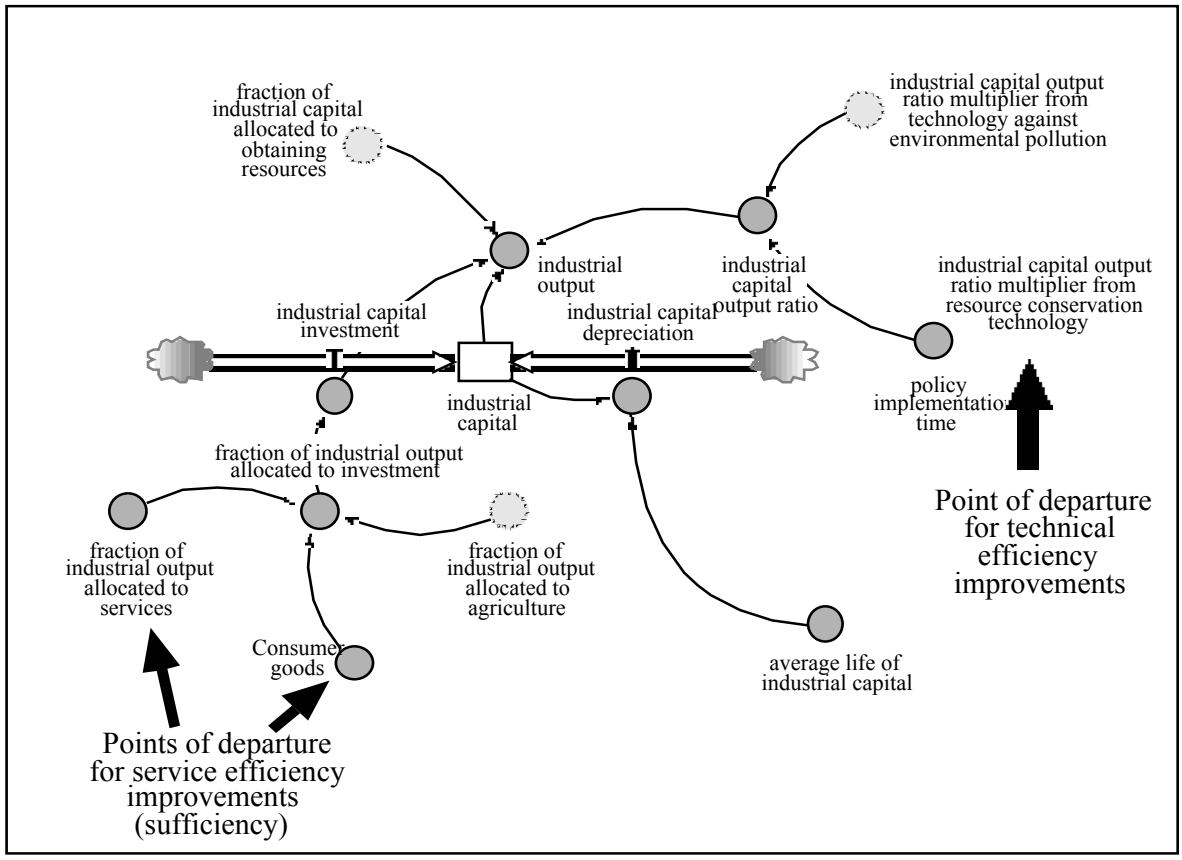
[2] See Femia, A., Hinterberger, F., Luks, F. (1999). Ecological Economic Policy for Sustainable Development. Potentials and Domains of Intervention for Delinking Approaches. SERI Working Paper No 1 (http://www.seri.at/seripaper1.htm); Fischer-Kowalsi, M., Haberl, H. (1997). Tons, Joules, and Money: Modes of Production and Their Sustainability Problems. Society & Natural Resources, 10, 61-85, J. Spangenberg, I. Omann, F. Hinterberger (1999): Sustainability, growth and employment in an alternative European economic policy Theory, policy and scenarios for employment and the environment. Working Paper (see www.hinterberger.com/Fritz/schriften.htm)

[3] See Meadows, D.H. et al. (1992), Beyond the limits, Chelsea; Schmidt-Bleek, F., Wieviel Umwelt braucht der Mensch? (1994). Basel: Birkhäuser; von Weizsäcker, E.U. et al. (1997). Factour Four. Doubling Wealth - Halving Resource Use. London.

[4] For concrete examples see von Weizsäcker, E.U. et al., op. cit. An overview of the *Factor 4* approach see von Hauff, M. (1998). 'Faktor 4'-über den weiteren Fortschritt der Umwelttechnik ['Factor 4'-on the future progress of environmental technology]. In: Altner, G. et al. (Eds.) (1998). Jahrbuch Ökologie 1998 [Yearbook Ecology 1998]. München: Becks, 254-264.

Figure 1 depicts a simple methodological frame showing possible points for departure for an improvement of technical efficiency and services efficiency within a multi-sectoral system-dynamics model. As usual in this type of model the industrial sector has a dominant role for the creation and distribution of wealth in terms of investment capital. Technical improvements which influence the resource efficiency can alter the productivity of the production process and raise resource efficiency.

Figure 1: Possible points of departure for resource and service efficiency improvements depicted in a simple system-dynamics structure for a multisectoral economy (Meadow's World 3/91 model)[5]



Even more important for the absolute reduction of resource consumption in terms of material and energy is to push a structural change which shifts the relative importance from the production and consumption of goods onto the services sector by reducing material-oriented over-consumption in particular in the three main fields of environmentally relevant household consumption and strengthening the development of eco-efficient services in these fields (housing, mobility, nutrition, Lorek/Spangenberg 2000). Such a shift impacts the capital (investment), resource and energy requirements and allocation in favour of less-resource-intensive economic activity. With respect to the SuE model many of these ideas have been integrated, however more in a way that allows the user to explore some of his own ideas with a simple but understandable structure at hand.

[5] Source: Meadows, D.H. et al. (1992). op. cit. p. 289 and Weizsäcker, E.U. et al., op cit. p. 295.

The SuE model brings together a physically based model (the energy flow based ECCO model[6]) and the material flow analysis (concept developed and data gathered by the Wuppertal Institute). Going from the assumption that sustainable development is a development that does not exceed the carrying capacity of nature, the model approach uses both energy and material flow analysis to assess the carrying capacity of nature.

The concept as used here differs to some degree from the approaches familiar to policy makers: it tries to derive targets from the assessment of the carrying capacity, quantify them in input terms and try to identify the policy strategies suitable to reach them. Together these elements have proven a satisfactory basis to assess the physical as well as the economic sustainability potentials of the EU 15 economy. SuE does not suggest optimal inputs, but invites the user to try out his/her policy suggestions. The model then calculated the environmental, social and economic the impacts.

In order to get back to the broader picture of sustainability, the biological aspect has to be included to get a comprehensive view of the environmental dimension. This has been achieved by including a „biological module" in the model, representing agriculture, forestry and fisheries and by including e.g. concerns about biodiversity in the scenarios.

The purpose of this model, however, is not only in the environmental dimension, but in the better understanding of the interlinkages between the physical and the economic, social and institutional dimension.

Basic model structure and methodology

This section gives a short overview on the underlying methodological assumptions of the SuE model which are mainly derived from the *ECCO methodology*.[7]

The *ECCO* model approach is primarily concerned with the process by which the economic system replicates and maintains its physical infrastructure. Infrastructure creation is a physical process, requiring material and energy inputs, labour and capital. The role of the latter is to direct the process feedstocks and control the transformation process. ECCO specifically focuses on energy as one key resource.

Extraction of material and energy resources also requires energy and capital. Thus, a tight interdependence between the sectors supplying resources and infrastructure exists. The rate of output of human-made capital is limited by the existing stocks of manufacturing capital, the availability of resources and the technology used. The availability of resources is, in turn, limited by the stock of infrastructure in the resource extraction sectors which are again subject to the current state of technology. Technological improvements cannot be explained endogenously by such a type of model, but

[6] The ECCO methodology will be described in the next section (III.1).

[7] For an overview see Crane, D.C. (1996). Balancing pollutant emissions and economic growth in a physically conservative world. Ecological Economics, 16, 257-268. For details see Slesser, M. (1992). ECCO - User's Manual. Edinburgh: Resource Use Institute. Slesser, M., King, J., Revie, C., Crane, D.C. (1994). UKecco - Evaluation of Capital Creation Options. Technical User's Manual Vol. 1 & 2. Edinburgh: Center for Human Ecology.

assumptions about the rate of improvement may be incorporated into the model exogenously, based on empirical data or on working hypothesises.[8]

The manufacturing sector creates an output stream of human-made capital and delivers it to the resource extraction, consumption and all other sectors (thick flow). The resource extraction sector itself delivers processed resources to manufacturing and all other sectors. The exact input-output relationships will depend upon the level of technology, and are generally empirically determined.

The integration of material flows

One important extension of the ECCO-methodology with its focus on energy resources and consumption is the integration of material flows.

Their implementation in SuE is based on the concept of the *Physical Input-Output Table*[9] (Figure 2), This approach does not only account for the flows covered by traditional input output tables, however *in physical terms (tons),* but also for material flows between the natural environment and the economy (raw materials, residuals).

In other words the physical input-output table describes flows of materials which are extracted, transformed and discharged back into the environment by economic activities, i.e. the flows into, through and out of the economic system.

In a major effort physical accounts for the European Union (EU 15) have been developed. In order to make use of the comprehensive data base of the System of National Accounts the 59 sectors the economy is disaggregated into there have been re-aggregated to fit into the sectorisation of the SuE model. For simplification purposes, furthermore different types of raw materials have been aggregated to three (of five) MI-categories[10], namely abiotics, water and air.

The implementation especially focuses on the input side of material flows where two main aspects have been taken into account. On the one hand, as a measure for the environmental impact caused by the EU economy, the total material input (TMI) into the European economy is determined. It consists of *domestic* raw material inputs - including materials not used - and *imported* raw materials[11]. On the other hand, material flows induced by final demand are interpreted at the highly aggregated level of sectors as MIPS-values (Material Input per Service Unit)[12]. n Figure 2: Underlying concept of Physical Input-Output Tables

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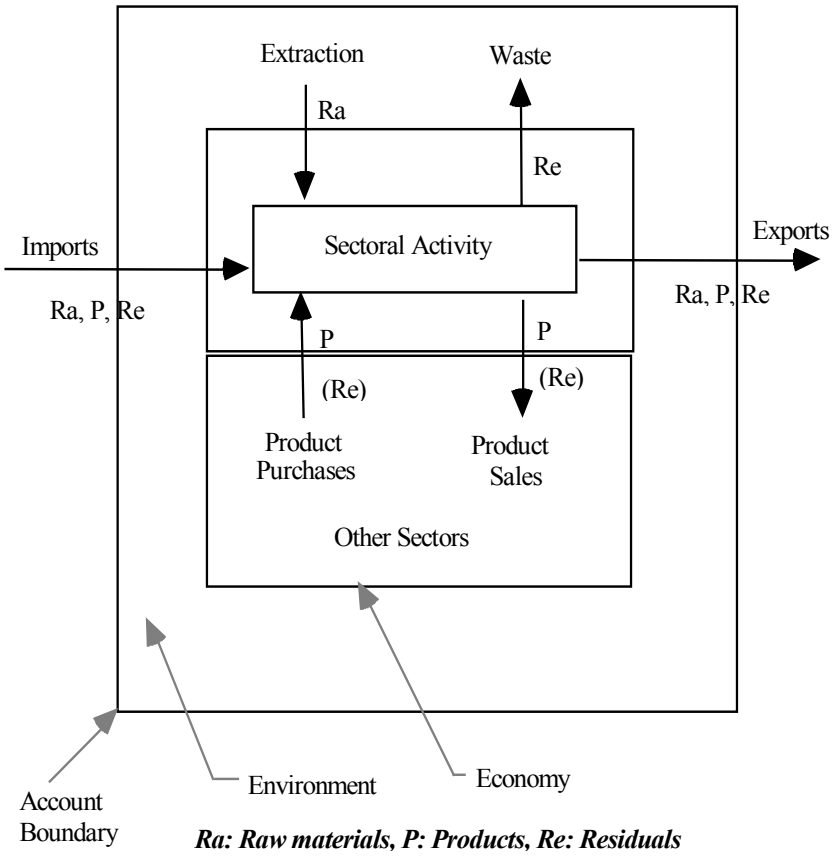
[8] See Wuppertal Institute a.o. (1998). Modelling Sustainable Europe. Final Project Report (Part II: Technical Report), Wuppertal: Wuppertal Institute, p. 9-12. Spangenberg, J.H., A. Scharnagl (1998): The SuE Model - A Decision-Support Tool Modelling a Socially and Environmentally Sustainable European Union. Key results of a joint project by the Wuppertal Institute for Climate, Environment. Energy, Edinburgh University, Madrid Autonomous University and Tampere University. Wuppertal Paper, No. 86 (October 1998; see www.wupperinst.org/Publikationen/wp.html)

[9] Stahmer, C., Kuhn, M., Braun, N. (1996). Physical Input-Output Tables - German Experiences, London Group Meeting on Environmental Accounting, Proceedings Volume, Stockholm: London Group.

[10] Schmidt-Bleek, F., et al. (1998). MAIA, Einführung in die Materialintensitätsanalyse (Introduction to Material Intensity Analysis), Wuppertal: Wuppertal Institute (in pr.).

[11] In contrast to the Total Material Requirement (TMR), which has recently been accepted by the UNCSD as official ecological indicator to be determined for all national economies - the indicator TMI as calculated by the SuE model does not comprise "rucksacks" (i.e. materials not used) of imported raw materials. Due to limited time resources a complete analysis of rucksacks of EU imports could not be done in the frame of this project.

[12] Schmidt-Bleek, F. (1993). Wieviel Umwelt braucht der Mensch? Berlin a.o.: Birkhäuser.



Ra: Raw materials, P: Products, Re: Residuals

The highly aggregated indicator TMI is determined rather straight forward by summing up sectoral raw material inputs (mostly driven by sectoral capital stocks) and imported raw materials (driven by the corresponding total demand).

It is important to keep in mind that the input output analysis is performed using an intermediate transaction matrix in physical terms (tons) which, of course, has a different content than a traditional, monetary table and thus leads to different results.

Summarising, the implementation can be interpreted as the dynamisation of the European Physical Input Output Table at the level of disaggregation of SuE sectors.

The relationship between driving forces and material use is assumed to be linear in the first place. However, there are numerous possibilities to include a de-linking relation which may result from technological change.

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Keynote Lectures

Didactic Materials

Environmental Policy-Making in the EU

Companies, consumers & the commission

Valentine Herman

ENVIRONMENTAL POLICY-MAKING IN THE EU:

COMPANIES, CONSUMERS & THE COMMISSION

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ICL PLC
BRUSSELS

QUALITY OF LIFE - SUSTAINABILITY AND ENVIRONMENTAL CHANGE
RUST/ BERGERLAND
AUSTRIA
16-19/10/99

1

OUTLINE

- DETERMINANTS OF ENVIRONMENTAL POLICY - MAKING IN THE EU, ESPECIALLY SUBSIDIARIRY AND SUSTAINABLE DEVELOPMENT
- PRODUCER AND SHARED RESPONSIBILITY MODELS, AND THE ROLES OF COMPANIES, CONSUMERS AND THE EUROPEAN COMMISSION
- THE THEORY AND PRACTICE OF 3 EXAMPLES OF EU ENVIRONMENTAL POLICY
- WHY PRODUCER RESPONSIBILITY DOES PROMOTE SUSTAINABILITY

2

ARGUMENTS

- SUSTAINABILITY CAN BEST BE ACHIEVED BY THE SHARED RESPONSIBILITY MODEL, NOT THE PRODUCER RESPONSIBILITY MODEL
- EVEN WITHIN THE SHARED RESPONSIBILITY MODEL, THERE ARE CONTRADICTIONS, INCONSISTENCIES AND TENSIONS BETWEEN COMPANIES, CONSUMERS AND THE EUROPEAN COMMISSION
- EXAMPLES ARE GIVEN FROM THREE CURRENT ENVIRONMENT AND CONSUMER AFFAIRS MEASURES
- HOW WE CAN MOVE TOWARDS A BETTER SHARED RESPONSIBILITY MODEL

3

ENVIRONMENTAL POLICY-MAKING IN THE EU:

KEY THEMES:

- SUBSIDIARITY
- SUSTAINABILITY

4

SUBSIDIARITY

- ENVIRONMENTAL OBJECTIVES AND ACTIONS WILL BE IMPLEMENTED AT THE MOST APPROPRIATE LEVEL - EU, NATIONAL, REGIONAL OR LOCAL
- THE EU WILL TAKE ACTION ONLY IF THE PROPOSED OBJECTIVES CANNOT BE CARRIED OUT BY THE MEMBER STATES
- RIGID DIVISION OF COMPETENCES BETWEEN THE EU, MEMBERS STATES AND REGIONAL AND LOCAL AUTHORITIES SHOULD BE AVOIDED
- SUSTAINABLE DEVELOPMENT COMBINES THE PRINCIPLES OF:
  - SUBSIDIARITY
  - SHARED RESPONSIBILITY AT ALL LEVELS

5

SUSTAINABLE DEVELOPMENT

1992 RIO EARTH SUMMIT -- UN CONFERENCE ON ENVIRONMENT AND DEVELOPMENT (UNCED) -- DEFINITION

<< DEVELOPMENT WHICH MEETS THE NEEDS OF THE PRESENT WITHOUT COMPROMISING THE ABILITY OF FUTURE GENERATIONS TO MEET THEIR OWN NEEDS >>

EU DEFINITION

<< A POLICY AND STRATEGY FOR CONTINUED ECONOMIC AND SOCIAL DEVELOPMENT WITHOUT DETRIMENT TO THE ENVIRONMENT AND THE NATURAL RESOURCES ON THE QUANTITY OF WHICH CONTINUED HUMAN ACTIVITY AND FURTHER DEVELOPMENT DEPEND>>

6

SUSTAINABLE DEVELOPMENT REQUIREMENTS

- LONG-RANGE VIEW OF AVAILABILITY OF NATURAL RESOURCES
- MANAGEMENT OF FINITE RAW MATERIALS
- RATIONALISATION OF ENERGY PRODUCTION AND CONSUMPTION
- CHANGING MANUFACTURING, CONSUMPTION AND BEHAVIOUR PATTERNS
- SHARING RESPONSIBILITY AT ALL LEVELS

7

SUBSIDIARITY AND SUSTAINABLE DEVELOPMENT

- A COMMON THEME: SHARED RESPONSIBILITY
- YET EUROPEAN COMMISSION PURSUING PRODUCER RESPONSIBILITY, THE

<<POLLUTER PAYS PRINCIPLE >>

8

EXENDED PRODUCER RESPONSIBILITY

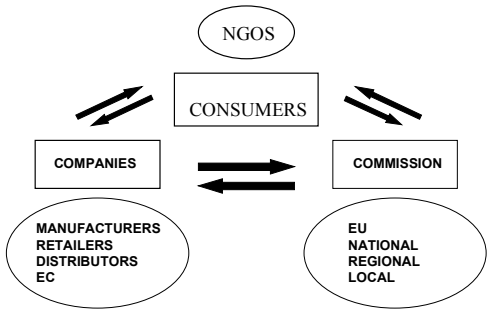
<< EXENDED PRODUCER RESPONSIBILITY EMBODIES THE PRINCIPLE THAT MANUFACTURERS OF PRODUCTS SHOULD BEAR A SIGNIFICANT DEGREE OF RESPONSIBILITY FOR THE ENVIRONMENTAL IMPACSTS OF THEIR PRODUCTS THROUGHOUT THE PRODUCTS LIFE CYCLES, INCLUDING UPSTREAM IMPACTS INHERENT IN THE SELECTION OF MATERIALS FOR THE PRODUCTS, IMPACTS FROM THE MANUFACTURERS' PRODUCTION PROCESS ITSELF, AND DOWNSTREAM IMPACTS FROM THE USE AND DISPOSAL OF THE PRODUCTS >>.

<< PRODUCERS ACCEPT THEIR PRODUCTS TO MINIMISE THE LIFE CYCLE ENVIRONMENTAL IMPACTS AND WHEN THEY ACCEPT LEGAL, PHYSICAL OR ECONOMIC RESPONSIBILITY FOR THE ENVIRONMENTAL IMPACTS THAT CANNOT BE ELIMINATED BY DESIGN >>.

SOURCE: OECD

9

SHARED RESPONSIBILITY MODEL



10

CONSUMERS

- THE ORGY OF CONSUMPTION
- LIFE-STYLE CHANGES
  - MORE, RATHER THAN LESS (NOW VIA E-COMMERCE)
  - NEW, RATHER THAN RE-USED, RECYCLED OR RE-FURBISHED
- GENERALLY SYMPATHETIC TO GREEN PRODUCTS, BUT
- MAKE PURCHASING DECISIONS ON THE BASIS OF
  - PRICE
  - PERFORMANCE
  - APPEARANCE
  - RANGE OF FEATURES
  - NOT ENVIRONMENTAL CHARACTERISTICS
- ECO-LABELS DON'T HELP FOR CERTAIN TYPES OF PRODUCTS
- AND CONSUMER ORGANISATIONS DON'T REALLY REPRESENT CONSUMERS' INTERESTS

11

COMPANIES

- PROFIT - STAKEHOLDERS' ECONOMIC INTERESTS, BIGGER, THE BETTER
- MARKET SHARE - THE BIGGER, THE BETTER
- PRODUCT INNOVATION - NEW, DIFFERENT, BETTER
- TECHNOLOGICAL INNOVATION - PERFORMANCE, FUNCTIONS, FEATURES
- GREEN PRODUCTS DON'T GENERALLY SELL, BUT ARE DEVELOPMENT AND PRODUCED
- COMPANIES ARE COMMITTED TO
  - BETTER ENVIRONMENTAL MANAGEMENT STANDARDS
  - CLEANER PRODUCTION TECHNIQUES
  - HEALTH AND SAFETY OF EMPLOYEES
  - MINIMISING MANUFACTURING, PACKING AND END-OF-LIFE WASTE
  - REDUCING ENERGY CONSUMPTION AND EMISSIONS
  - IMPROVING QUALITY, DURABILITY AND PERFORMANCE OF PRODUCTS,
  - ETC.

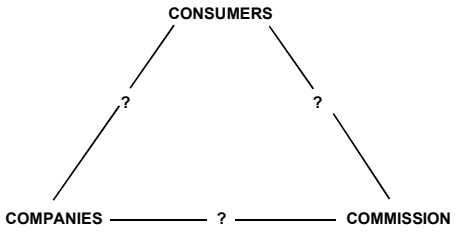
12

COMMISSION

- ENVIRONMENTAL POLICY-MAKING AND
  - INDUSTRY - COLLABORATIVE VS PRESCRIPTIVE
  - INTERNATIONAL TRADE
  - SINGLE MARKET - 1, 2, 3 ... 15 PRACTICES
  - COMPETITION/ CARTEL
  - NGOs
- NORTHERN EUROPE VS SOUTHERN EUROPE
- RICHER VS POORER COUNTRIES
- SUBSIDIARITY - EU VS MEMBER STATES

13

AN IMPERFECT SHARED RESPONSIBILITY MODEL



14

THREE EMAMPLES OF FLAWED EU ENVIRONMENTAL POLICY-MAKING

- ECO-LABELS
- CONSUMER GUARANTEES DIRECTIVE
- PROPOSED DIRECTIVE ON WASTE FROM ELECTRICAL AND ELECTRONIC EQUIPMENT

15

ECO-LABELS: THE THEORY

- A „MARKET-BASED" INSTRUMENT
- DESIGNED TO STIMULATE THE SUPPLY AND DEMAND OF PRODUCTS WITH A REDUCED ENVIRONMENTAL IMPACT
- BY PROVIDING INFORMATION TO CONSUMERS
- THAT PRODUCTS COMPLY WITH ESTABLISHED ECOLOGICAL CRITERIA DEVELOPED AND TESTED BY THIRD PARTIES

16

ECO-LABELS: THE PRACTICE

- COMPETITION BETWEEN NATIONAL ECO-LABELS AND BETWEEN NATIONAL AND EU ECO-LABEL
- CONFUSING SITUATION OF TOO MANY ECO-LABELS
- COMPLEXITY OF ECO-LABELS (BLUE ANGEL FOR PCs = 49 ITEMS) AND ALL-OR-NOTHING APPROACH
- CONSUMERS MAKE PURCHASING DECISIONS ON THE BASIS OF PRICE, PERFORMANCE, APPREARANCE, RANGE OF FEATURES, NOT ENVIRONMENTAL CHARACTERISTICS
- RETAILERS DON'T UNDERSTAND OR PROMOTE THEM
- MANUFACTURERS DON'T THINK THEY HAVE A MARKET IMPACT

17

CONSUMBER GUARANTEES DIRECTIVE: THE THEORY

- THE RIGHT TO OBTAIN A REPAIR, OR REPLACEMENT, OR REFUND, OR END OF CONTRACT FOR A NON-CONFORMING NEW OR SECOND HAND PRODUCT
- GUARANTEE FOR 2 YEARS FOR NEW PRODUCTS,AND 1 YEAR FOR SECOND-HAND PRODUCTS
- WIDE DEFINITION OR DEFECTIVE GOODS TO THE BENEFIT OF THE CONSUMER

18

CONSUMER GUARANTEES DIRECTIVE: THE PRACTICE

- PRICES WILL INCREASE AND CONSUMERS WILL PAY MORE BECAUSE MANUFACTURERS HAVE TO MEET ADDITIONAL COSTS FOR WARRANTIES, SUPPORT COSTS, SPARES AND LOGISTICS
- CONSUMERS WILL HAVE LESS CHOICE OF PRODUCTS AS MANUFACTURERS WITHDRAW BUDGET PRICE PRODUCT LINES
- AS CONSUMERS CAN DEMAND REPLACEMENT GOODS, MORE WASTE WILL BE PRODUCED, AND THE ENVIRONMENT WILL SUFFER
- EUROPEAN MANUFACTURES, ESPECIALLY SMEs, WILL HAVE HIGHER OPERATING COSTS THAN IN OTHER REGIONS, AND EUROPE WILL BE LESS COMPETITIVE IN THE WORLD MARKET

19

PROPOSED WEEE DIRECTIVE: THE THEORY

- PREVENTION OF WASTE FROM ELECTRICAL AND ELECTRONIC EQUIPMENT
- PROMOTION OF RE-USE, RECYCLING AND OTHER FORMS OF RECOVERY OF WEE
- MINIMISE RISKS AND IMPACTS TO THE ENVIRONMENT ASSOCIATED WITH THE TREATMENT AND DISPOSAL OF WEEE
- HARMONISE NATIONAL MEASURES AND STRENGHTEN THE SINGLE EUROPEAN MARKET

20

PROPOSED WEEE DIRECTIVE: THE PRACTICE:

- VERY WIDE DEFINITION OF PRODUCER RESPONSIBILITY MEANS THAT PRICES WILL INCREASE AND CONSUMERS WILL PAY MORE TO MEET MANUFACTURERS' ADDITIONAL OBLIGATIONS
- BECAUSE OF THE INCLUSION OF HISTORICAL WASTE, MANY MANUFACTURERS WILL BECOME TECHNICALLY BANKRUPT
- THE PHASING OUT OF LEAD WILL MEAN THAT IT WILL BE IMPOSSIBLE TO REPAIR EXISTING EQUIPMENT
- THE RESTRICTIONS ON FLAME RETARDANTS WILL NEGATIVELY AFFECT CONSUMERS' HEALTH AND SAFETY
- WASTE MOUNTAINS WILL BE CREATED FOR WHICH THERE ARE NO ADEQUATE RECYCLING TECHNOLOGIES OR INFRASTUCTURES
- THERE WILL BE NO SINGLE EUROPEAN MARKET BECAUSE MEMBER STATES WILL IMPLEMENT THE MEASURE VERY DIFFERENTLY

21

WEEE AND EXTENDED PRODUCER RESPONSIBILITY

- EXTENDED PRODUCER RESPONSIBILITY FOR
  - MINIMISING USE OF DANGEROUS SUBSTANCES
  - INCREASING USE OF RECYCLABLE, RECYCLED AND USED MATERIAL IN NEW PRODUCTS
  - USING COMMON COMPONENTS AND MATERIAL CODING STANDARDS
  - MEETING THE COSTS OF COLLECTION, TREATMENT, RECOVERY AND ENVIRONMENTALLY SOUND DISPOSAL OF WEEE FROM PRIVATE AND NON-PRIVATE HOUSEHOLDS
  - PROVIDING NEW-FOR-(SMILIAR) OLD FREE TAKE-BACK SERVICE FOR PRIVATE HOUSEHOLDS
  - SETTING UP TREATMENT AND RECOVERY SCHEMES
  - MEETINGS RE-USE AND RECYCLING TARGETS
  - PROVIDING INFORMATION FOR USERS, TREATMENT FACILITIES AND PUBLIC AUTHORITIES

22

CONCLUSIONS

- THE THEORY AND PRCATICAL APPLICATION OF EU ENVIRONMENTAL POLICIES ARE VERY DIFFERENT
- ENVIRONMENTAL POLICY-MAKING IN THE EU IS CURRENTLY DRIVEN BY ECOLOGICAL AND/ OR CONSUMER FORCES
- THE EXTENDED PRODUCER RESPONSIBILITY MODEL - „THE POLLUTER PAYS PRINCIPLE" - IS FLAWED. IT DOES NOT PROMOTE SUSTAINABLE DEVELOPMENT
- SUSTAINABILITY IS DEPENDENT UPON
  - ACHIEVING A BETTER BALANCE BETWEEN ECONOMIC/INDUSTRIAL ISSUES AND ECOLOGICAL/CONSUMER ISSUES
  - A MOVE FROM PRODUCER TO SHARED RESPONSIBILITY
  - DEVELOPMENT AND IMPLEMENTATION OF AN EFFECTIVE INFORMATION - COMMUNICATION - PARTICIPATION PARADIGM

23

Scientific Background Paper to the

Moderated Workshop

Environmental Education and Training of Systems-Competence with Gaming/Simulation

Willy Christian Kriz and Paola Rizzi

1. Introduction

Richard Duke – one of the 'fathers' of the scientific gaming-simulation approach - wrote more than 25 years ago: *'The problems of today are more complex, involving systems and interacting subsystems that go beyond normal human ken ... Consider our great urban centres as they exist today - multisystems within multisystems, alternative upon alternative ... Management of such an environment requires a holistic perspective that cannot be obtained through traditional sequential communication forms. Because of the lack of gestalt communication modes and therefore the lack of an integrated or holistic perspective, society's management of such complexity has consisted of four concurrent dimensions: false dichotomies, professional elitism, increasing dependency on technology and gigantism'* (1974: 4-5).

The problems of today show even more increase of complexity. But the ability of man to deal with complex dynamic systems and processes and to behave in a sustainable way do not improve to the required extent. Systems-competence denotes on one hand knowledge, in which way systemic principles - such as self-organisation, feedback, non-linear system dynamics - become effective in different environments and on the other hand competent behaviour, which includes a sustainable way of man dealing with his body, his psyche (cognition and emotion) and with his social, technical and natural environment.

The European Union calls in its White Paper 'Growth, Competitiveness and Employment' for measures for a society which is ready for the future: *'The fundamental principle of various types of measures to be taken should develop human resources throughout their lives ... The basic skills which are essential for integration into society and working life include a mastery of basic knowledge (linguistic, scientific and other knowledge) and skills of a technological environment, characterised, in particular, by the importance of information technologies: the ability to communicate, to make contacts and organise...'* (1993: 141).

Shared visions, exchanges of individual mental models in the group, skills for teamwork and team learning, personal mastery and systems-thinking are these factors, which Senge (1990) has described as central disciplines of 'learning organisations'. Learning organisations (for example a business company) can more quickly adapt self-organised to the changes of outer conditions and have a better chance to survive.

'But as anyhow problems and issues are becoming increasingly complex, how can we improve our individual and collective competence in steering and self-steering our societies, organisations and institutions? ... Gaming and Simulation have proved to be a powerful combination of methods and ideas in dealing with complex and unique issues and with value conflicts between various parties ... Gaming simulation provides a language for combining the social-human domain with the physical,

technological and economic domains and provides a shared language for communication between the natural and social sciences' Klabbers (1989: 3).

In order to translate the ideal of systems-competent individuals and learning-organisations into practice, it requires appropriate training methods. In this paper the method of gaming simulation as means of training will be reviewed. An essential advantage of the gaming simulation approach exists because this concept integrates knowledge of various scientific disciplines and attempts to make complex living contexts - that is dynamics of natural, technological, economic, and social systems and their effects - understandable (Rizzi, 1994; W.Kriz, 1998). Gaming simulation aid the understanding of complex dynamic contexts and for this reason is ideally suited for systems-competence training.

2. Systems-Thinking and Systems-Competence

The concepts of systems-theory are based on the statement that there are general principles, which can be similarly described in all scientific disciplines. Such a perspective makes it possible to regard completely different phenomena (for example physical, technical, economic, mental and social organisational structures and processes) as systems, which contain common characteristics. The systems theory is therefore – as much as gaming simulation - a multidisciplinary applied approach, with the goal of integrated co-operation between all scientific disciplines. Willke (1987: 95) defines a system as *'a holistic context of parts, whose relation to each other is quantitatively more intense and qualitatively more productive than their relationship to other elements'.* The elements and the interrelations between the elements constitute a system and a boundary to the system-environment. Systems are holistic. Systems are qualitatively different from the sum of their parts (as already stated in *"Gestalt Theory"*). The partial components of the system co-operate in a complex network. Systems are embedded in an environment and yet are also a part of a greater whole. Therefore, a system can itself be an element in another system which is hierarchically on the next higher level.

Systems change in time. Processes are regarded from the point of view of goal orientation of dynamic systems - to the emergence of a stable system structure. Such stable structures and processes, e.g. cyclical processes, are called *"attractors"* in chaos-theory and are the foundation for the control, calculation and prediction of systems behaviour. Living systems are open. Systems are connected to their environment through interactive processes (e.g. exchange of matter and energy). In the context of social and cognitive systems, information exchange processes especially play a considerable role. The common interactive co-operation of system and environment, as well as the mutual influences of elements within the system, are realised through circular interaction. Systems behaviour causes a change in the environment, which in turn has an effect on the system. Such feedback processes make possible not only the maintenance of the stability of the system, but the change and growth of systems through self-enforcing systems dynamics as well.

When systems or system-elements interact, often non-linear dynamics occur, for example exponential growth. Another possibility is that with chaotic system processes sudden changes of system structures can occur. Such system processes may develop in a way which makes prediction, calculation and control impossible. Systems demonstrate self-organisation. Self-organisation of a system exists when the systems structures are themselves established in the connected, interactive system

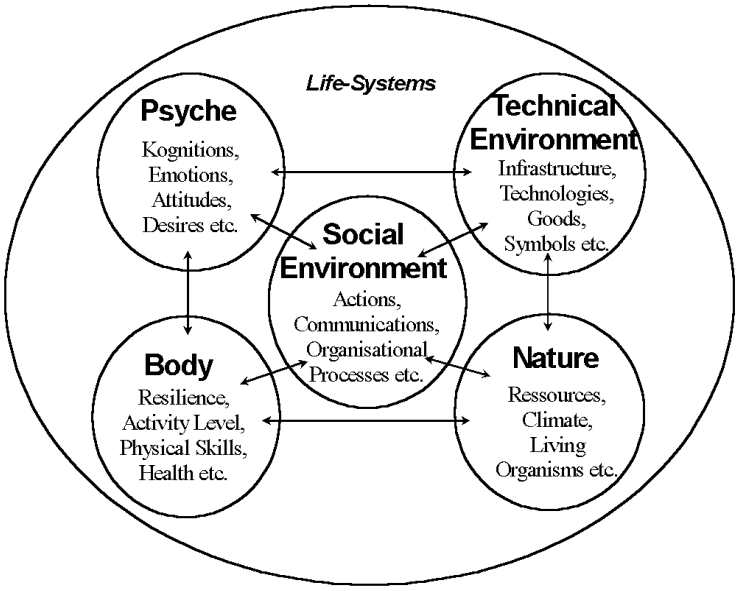
processes and are not determined externally. Of course, surrounding conditions play an essential role, because self-organisation processes appear only under certain conditions. However, only conditions for the formation of structures externally are given, not the formed structure itself. Systems actively select for their self-organised dynamic attractors from those conditions, which are at the disposal of the environment (J.Kriz, 1997).

The term *"Systems-competence"* stems originally from Schiepek, who offers the following explanation: *'Systems-Competence can be summarised and understood in deliberate ambiguity as competence of systems for systems, as competence of systems for their own processing and as competence for the processing of other systems in their environment'* (Manteufl & Schiepek, 1993: 25). Systems-Competence can therefore be defined as knowledge about the principles of systems theory. But Systems-Competence is more than just knowing in which way these principles become effective in different environments. Systems-Competence also means competent behaviour, which includes a sustainable manner of man dealing with his body, his psyche and with his social, technical and natural environment.

3. Sustainable Development of Life-Areas

In order to combine systemic and psychological approaches it makes sense to describe man and his environment and the connecting communications and procedure processes as complex dynamic systems. Human action is explained in the systemic-ecopsychological action model (W.Kriz, 1999) through the complex interaction of the five system-areas of nature, body, psyche, social environment and technical environment.

Figure 1: Systemic-Ecopsychological Action Model



3.1 Nature

The natural environment depicts the basis on which all life processes are bound. Within the system 'Nature' with its dynamic self-organised biological, chemical and physical processes, different subsystems may be defined, from a single atom to an entire ecosystem of a marshland. Man has an increasingly strong influence on the natural environment, for example through agriculture, building of infrastructure, and so on. Through an enormous expansion in various consumer goods and the creation of complex artificial systems (such as nuclear power plants, computer networks, etc.), coupled with the irreversible consumption of natural resources, the natural world is altered in such a way that the basis of human life is itself endangered. Systems-Competence in the sphere of the natural environment signifies, for instance, ecological awareness and sustainable actions, such as increased use of public transportation.

3.2 Body

With his actions, man influences his physical processes. A damaged nature has an effect upon the physical health of people. Psychosomatic effects and numerous physical subsystems are of central significance in the 'body' system. Starting with a simple cell up to the entire system of organs, the neuronal and hormonal processes form the basis for the states of consciousness as well. Systems-Competence in this category indicates for example knowledge and actions, how one eats nutritiously or how to avoid stress in difficult situations by applying relaxation techniques.

3.3 Psyche

In the psychological system, perceived information is processed. Only a minuscule part of the cognitive process reaches the consciousness. Nevertheless, the unconscious cognitive and emotional contents exert a significant influence on the active and subjective construction of reality in the psyche. Man possesses the ability, despite exposure to a constantly-evolving world and a continual flow of perceptions and experiences, to design temporally and spatially stable schemata of objects. Through the self-organised construction of mental models, an enormous reduction of complexity takes place and with it the basis for the ability to calculate, control and predict events is created. If certain affective and cognitive schemata have already been emerged as attractors of the psyche, they will have an effect on the arrangement and assimilation of new observations. In this way, partial information, which has been perceived, is adapted to the existing patterns and completed within the meaning of available schemata (Haken & Stadler, 1990).

Unfortunately, there is a danger in this ability to simplify the extraordinarily complex entirety of the world and to form stable cognitive attractors. The tendency to ignore complexity, feedback-loops, and dynamic in the systems and living worlds, in which man moves, can ultimately lead to actions with 'negative' consequences. Psychological examinations of human problem solving behaviour also come to the conclusion that the subjects were confused about the consequences of effects in complex, dynamic systems (Dörner, 1989). Systems-competence in the category of the psyche comprises for example appropriation of knowledge, continual self-reflection over the suitability of one's own values and mental models, conscious observations of one's own feelings, learning how to learn

and how to motivate oneself better, to develop abilities to be able to better structure and represent systems and processes etc.

3.4 Social Environment

Human action-patterns and manners of behaviour are formed in the social dynamics of common social construction of reality, for instance through learning processes in the family. Through language, non-verbal communication and related actions, a community of people creates a specific social culture. Actions and their effects are fed back through communication processes with other people and possess a stabilising or altering influence on action and behaviour patterns of the individual. The sociological theory of *"Symbolic Interactionism"* (Mead, 1968), views the patterns of action determined by norms, which control social roles and behaviour in the interaction of people. These norms are, from the systemic view, important attractors of communication dynamics in the social environment (Tschacher, Brunner & Schiepek, 1992). Systems-competence in this category denotes, for example, observing the rules of give-and-take of feedback in a group, learning of communication abilities and teamwork, but also the compliance of ethical norms.

3.5 Technical Environment

Manifested artificial results of human action, such as infrastructure, consumer goods, architecture, and so on, belong to the life-area 'Technical Environment'. Objects are inseparably connected to psychological valuation and common symbolic meaning. The media serve here as an interface between social culture (mediation and communication of central information, values, etc.) and manifested culture (external storage of information in books etc.). New technological innovations in the mass communication are always an essential component in the change in social patterns of human cohabitation. Systems-Competence in this category signifies not only acquiring the ability to use technical systems, but also the safe and, with regard to ergonomics, the user-friendly arrangement of technology, the implementation of technology which supports the creation of systems-competent mental models (e.g. pollution indicators) etc. The interconnections within and between the five systems as mentioned are too numerous to be discussed here (cf. W.Kriz, 2000).

4. Training of Systems-Competence with Gaming Simulation

In order to manage complexity (e.g. the formation of new organisational processes in the workplace), relevant systems, elements, attractors and systems-environments have to be defined. The analysis of systems concentrates on circular interactions, because systems consist of many interrelated processes. Systems-competence further mean a holistic description of processes. On one hand systems structures are broken down into smaller partial components and dynamics. On the other hand the systems and elements are viewed always as parts of a greater whole. Through conscious change of view, systems can be better understood in their complexity. An interdisciplinary collaboration, which integrates knowledge and experience in as many perspectives as possible, is therefore useful.

Gaming simulation is well suited to the development of models of systems because the characteristics of systems thinking are already used in the design of simulation games. *'Epistemologically, gaming simulation refers to systems, to structure, patterns and form to states and processes, to or-*

der and chaos' (Klabbers, 1989: 4). The design of simulations and games for the representation of a real system can be applied as training measures in order to produce a more holistic understanding of systems. In addition, in places where people themselves do not design simulations, but are participants in a game, comparisons between simulation and reality can be discussed during the post-game debriefing. Gaming simulation experiences can be used as starting point for building knowledge (e.g. business administration skills) or can serve as basis for education in systems thinking (Kim, 1994).

Systems analyses have to be made together with those people who act in the analysed system. The development of a shared vision is necessary for goal-oriented action processes. In order to show systems-competent social behaviour one also needs to become conscious of various relationship definitions, conflicts, values, roles, and power structures. Gaming simulation offers the advantage that a number of different scenarios can be played out. The game participants can experience themselves in different roles. Through a series of experiences in dealing with various situations, roles and consequences of ones own behaviour, action alternatives can be developed. During the debrief (reflection of experiences) these alternative and systems-competent behaviour patterns become transferable to the workplace. During the debrief the communication structures of the group and the individual cognitive schemata and systems representations can be revealed and common values, goals and rules can be formed. By this means motivation is encouraged to actively participate in systems changes and in the reframing of organisations (Bolman & Deal, 1997). The debriefing phase becomes itself a social model for dealing with each other in the group and for systems evaluation.

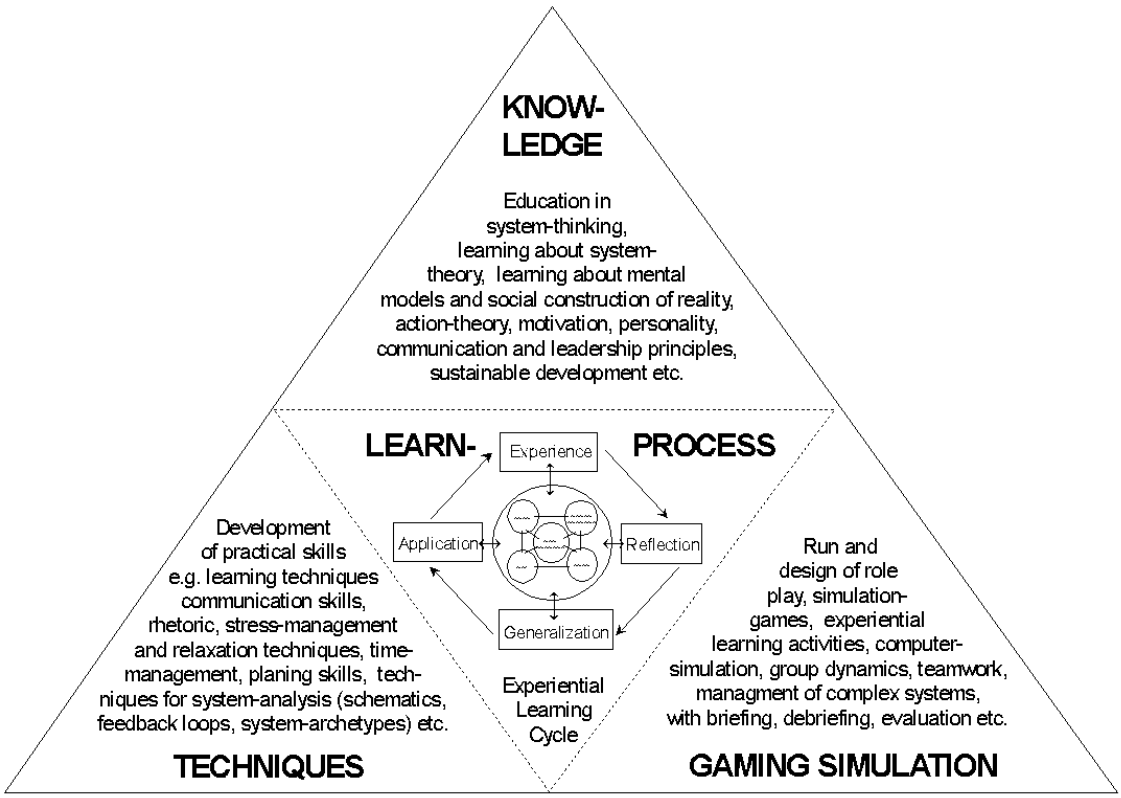
Systems processes can not be completely controlled and calculated in advance and therefore no definite solutions for the actions in organisations exist. Systems-competent strategies to achieve desired changes therefore mean the implementation of small interventions and constant feedback of the effects of the interventions. The evaluation of implemented measures makes it possible to adapt flexibly to systems dynamics. The shattering of strictly hierarchical and rigid social forms of organisations through the formation of self-responsible groups make also possible the grater flexibility, dialogue and creativity. This requires the ability to endure, permit and balance out contradictions, instead of simply prevent conflicts. The participants in gaming simulations can learn in practice which factors and dynamics are effective in the various subsystems that are relevant to them. In this way skills for better common problem solving, co-operation in a team and efficient communication, leadership and organisational structures are developed. The better dealing with stress and uncertainty can be trained and this leads to improvement on well-being. In addition gaming simulations can be used to develop better abilities to deal with the environment of the organisation, for example training of customer-orientation and negotiation skills.

A further realisation of systems thinking is that change in complex social systems emerge through the influence of relevant environmental conditions. Through the creation of most optimally environmental conditions - for example suitable learning environments - the system behaviour can be stimulated to self-organised change. The self-dynamic of systems can be used for the change in organisational structures. These requirements are fulfilled by the gaming simulation concept as well (Rizzi, 1998). Gaming simulation means a more free and humanistic and less controlled or determined form of learning. Gaming simulation really present learning conditions, under which people can demonstrate a higher degree of self-initiative and by this self-organisation of groups and sys-

tems-competent communication patterns are encouraged. Gaming simulation is a form of experiential learning.

A training model for Systems-Competence (W.Kriz & Rizzi, 1998) contains as learning goals a) the mediation of knowledge and b) the learning of concrete techniques and communication skills and c) as primary learning method gaming simulations that bring groups of people into situations in which complex problems should be solved and in which knowledge, techniques and group-skills are practised in their application (cf. Figure 2).

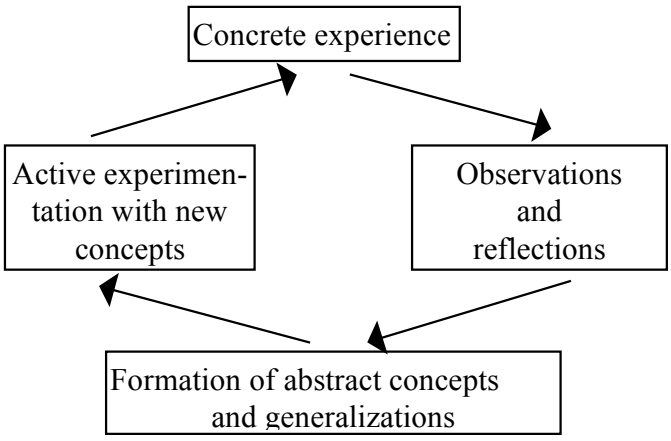
Figure 2.: Training Model for Systems-Competence



According to Kolb (1984) and to Johnson & Johnson (1996) experiential learning creates a learning-environment in which people have concrete experiences (in real life or in virtual environments; example: participants play a game). After the experience there should be a phase of reflection and observation. The experiences are discussed and many different perspectives become understandable (example: participants describe their feelings that they are frustrated and angry and discuss their observations about ineffective communication in the team). In a third step the experience is compared and connected with existing theories and abstract concepts are formed in the cognitive process (example: participants evaluate the significance of the experiences and build generalisations, they define patterns of effective and ineffective communication). New created concepts (e.g. mental

models, social representations) support the development of better strategies for sustainable behaviour in the reality. These strategies are tested and lead again to new concrete experiences (example: participants try to perform 'better' communication-patterns for effective teamwork in the next game).

Figure 3: Experiential Learning Cycle (cf. Kolb, 1984: 21)



'Games are social systems. They include actors, rules and resources, which are the basic building blocks of social systems. They are also models of existing ... social systems. While playing a game, people apply knowledge and skills to triumph over difficulties set by fellow players or by socio-economic circumstances' (Klabbers, 1999: 22). Therefore gaming simulation is a perfect learning-environment for the training of social skills and for the understanding and sustainable development of real social systems. The behaviour and communication-patterns of the actors (participants) create a complex social system and have a strong impact in the experiential-learning process. The learning-process influences in return the behaviour-patterns of the participants (cf. learn-process in figure 2).

5. A Training Program for Environmental Education and Training of Systems-Competence with Gaming Simulation

5.1 Structure and contents of the training

The Training-Program is run at the Ludwig Maximilian University Munich. It consists in four successive seminars/workshops (total number of hours: 420). Seminar I and parts of Seminar II are also run at Johannes-Kepler University of Linz and Seminar IV is run in collaboration with Venice International University.

Some of the main contents and objectives of the training program are:

- Training in the use and understanding of complex system dynamics and systems thinking
- Training of competencies for better problem solving, decision making, communication and exchange of mental models
- Increase of trust, responsibility, tolerance and motivation

- Building of democratic values and behaviour patterns
- Increase of co-operation and collaboration in teams and training of leadership skills
- Training of abilities to build shared visions and to define common goals
- Practice of reflection, analysis and evaluation skills
- Increase of understanding of different cultures, social roles and norms, training of intercultural communication
- Learn about main approaches of gaming simulation, learn how to lead and to design gaming-simulation-applications
- Support of environmental education

In Seminar I the students participate in different simulation games to train basic skills of systems-competence and to learn about the methods of gaming simulation (e.g. policy exercises, role play, pure games and experiential-learning activities, simulation-games and played simulations, computer-simulations). In the training of systems-competence games and simulations about environmental issues play an important role. With these games participants learn about the sustainable development of economic and ecological systems. (Bisters, 1997; W.Kriz & Rizzi, 1997). In addition many of these games for environmental education support the training of social competencies as well (Ulrich, 1998).

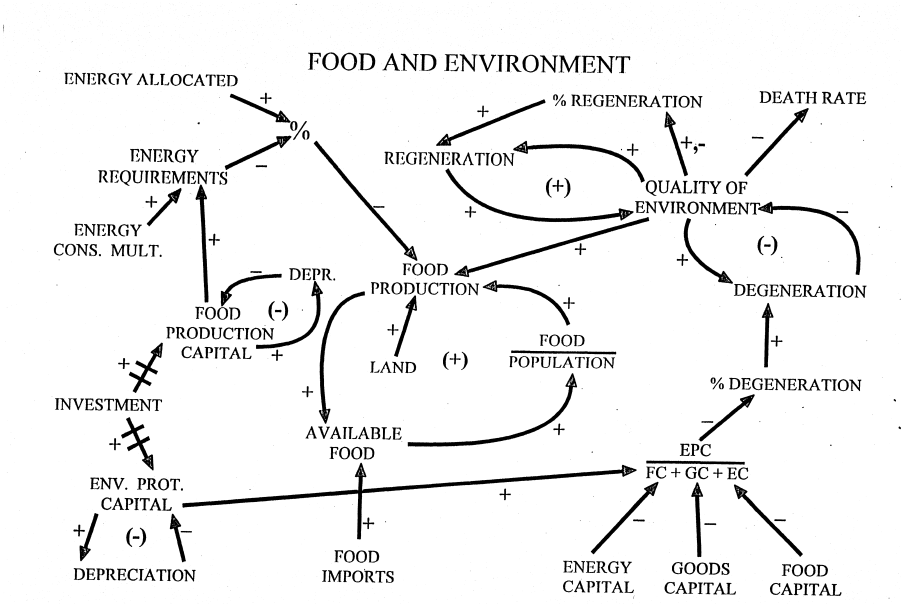
In Seminar I the trainers give lessons in theory (lecture and discussion) and present techniques (e.g. tools for building models and systems-analysis, techniques for brainstorming, communication, decision-making, facilitation of games, relaxation-techniques etc.) and conduct gaming simulations. For Seminar II the participants prepare knowledge, techniques and simulation games by themselves (with guidance by the trainers) and lead the activities of Seminar II (e.g. conduct simulation games, debrief of games, training of techniques etc.). In Seminar III the participants have the opportunity to design simulation games and to develop models of systems. Again the trainers take the role of supervisors (the teams decide if/when/how they use the trainers). Prototype-games are presented and tested. Seminar IV focus on gaming simulation for intercultural communication (with participants from different countries). Some team-activities and gaming simulations are recorded with video and parts of the video are analysed during the debrief. The students have to write seminar papers (about theory according to the contents of the program) and have to keep special 'student-portfolios' (these are 'diaries' about their own process of learning). The papers and learning-portfolios are discussed together with all participants in the program.

5.2 Example of a Simulation-Game: Stratagem

The game Stratagem was developed to simulate the interaction of different complex dynamic systems (Meadows & Toth, 1985). Stratagem simulates in a simplified form the economy of a developing country. Actors (5-10 participants; playing time 1-2 days) take the roles of ministers (e.g. minister of food production and environment). The goal is to reach a stable, sustainable, high productive society. The players receive all information about cause-effect relationships that are important for the success of their decisions (cf. figure 4). Nevertheless participants often do not reach sustainability and can even 'crash' the society. The management of the country is very a difficult task. But it gives

the opportunity to learn about systems dynamics and about group dynamics. Systems thinking and effective teamwork are trained.

Figure 4: Examples for feedback-loops in Stratagem (simulation-area: food and environment)



5.3 Empirical Evaluation of the Training Program

There are a number of empirical findings which demonstrate that gaming simulation can contribute to the improvement of competencies (Crookall & Arai, 1994). In the own research within the framework of the doctorate thesis (W.Kriz, 1999) 123 people in 11 groups between 8 and 16 participants per group were analysed with extensive test instruments. The tests included the diagnosis of cognitive abilities, personality, interaction styles etc. of the 123 subjects. In addition, the subjects participated individually in some computer-simulations as well as in a self-designed gaming simulation in a group setting. In this simulation the groups had been divided in 4 teams (with 2-4 subjects per team). The criterion of success was to become the team with the maximum of produced assets. In order to produce fortune the teams needed to solve several complex problems, to implement a strategy for sustainable resource management and to develop strategies how to negotiate in an effective way with information. Through the use of questionnaires, observation and analysis of the decisions of the subjects and post-experiment interviews, data about sustainable resource management and about the group process (complex problem solving, communication, leadership behaviour etc.) were gathered.

A few months before the experiment 24 people (of the total 123) participated in Seminar I of the training program for systems-competence with gaming simulation. These 24 people participated in different sessions of the training program. When they came together (mixed with subjects without training) in the experiment they did not know each other. Better results of the trained people in communication and teamwork would therefore not appear because of established personal relationships, but because of the development of efficient behaviour patterns in the training. The results of the

study suggest that people with training and teams with trained members achieve significant more system-competent results than people without training (different analysis of variance show results between $p \leq 0{,}01$ and $p \leq 0{,}10$; W.Kriz, 1999). Subjects with training and teams with people with training show more sustainable use of resources, better dealing with risk and uncertainty and more appropriate decision-making and leadership. People/teams with training use significant more democratic leadership styles and decision making and less authoritarian or laissez-faire behaviour (about these leadership styles cf. Furnham, 1997). These results are important, because the subjects with training did not show system-competent behaviour at the beginning of the training program. Increased leadership-qualities, communication-skills and sustainable use of resources in the experiment can be therefore interpreted as effects of the training.

A crucial question in the current research on education for sustainability is whether certain forms of knowledge have a positive effect on sustainable resource management (Gräsel, 1999). This question is important within the context of the training of systems-competence as well. An experimental study investigated the impact of systemic and social knowledge on sustainable behaviour of players in the game 'Fish Banks, Ltd". Fish Banks, Ltd. is a computer-aided simulation game, designed by Meadows, Fiddamann & Shannon (1993). It claims to help people understand the basic principles for sustainable resource management and complex systems. In this game, players act in teams representing fishing companies. As Fish Banks, Ltd. simulates a real life situation, any action of the companies has some effect. Like in real life, fishing companies may totally overload the system by overharvesting the fishing areas. The players were given either information about general characteristics of natural systems and the structure of a commons dilemma or information about social processes and communication tools or both (2 by 2 design). These treatments aimed at fostering the acquisition and the exchange of specific resource knowledge. Both kinds of knowledge were imparted in the form of presentations before running the game. The experiment was carried out with 49 students from psychological or pedagogical courses. Results show that the presentation of knowledge about social processes, communication and teamwork alone had not much effect on sustainable behaviour in the game. However, the combination of both treatments leads to a more sustainable resource management. In different analysis of variance (using several indicators for sustainability) the two way interaction came up significantly, $p<.01$ (cf. W.Kriz, Hettinger, Nerl & Gräsel, in press). The group with both treatments could benefit much more from the system knowledge as well as from social knowledge. This group was able to establish a permanent, communicative interaction among the teams and used the systems knowledge in a co-operative way for more sustainable decisions and actions. These results confirm the training model for systems-competence with gaming/simulation (Kriz, Rizzi & Nöbauer, 1999). In the training, knowledge about group dynamics and psychology of groups is combined with knowledge about systems-theory and sustainability. The training of team-skills (communication, leadership etc.) is combined with the training about the use and construction of models (schematics, feedback-loop-diagrams etc.). In the training games and simulations are played and designed that simulate dynamic systems and in which complex problems have to be solved in teams in order to reach sustainability.

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Participant Papers

Approaches to Sustainability and Environmental Changes

Teresa M. Mata, António A. A. Martins, Carlos A. V. Costa

Abstract

The importance of the sustainability concept is increasing at national and international level leading to a large debate. This has resulted in a wide variety of interpretations about this concept. A brief analysis of the most common approaches to the concept is presented in this work. Also is presented a useful way to analyse the response of society to environmental changes. The development of the society knowledge and understanding about sustainability and environmental changes is the first step to promote actions towards a sustainable development.

Introduction

Early in history the potentially usable resources were so large and the population so small that their existence had essentially no impact on available resources. In that time, sustainability was taken for granted and did not appear as an explicit goal. Actually, it has become a widely recognised goal for human society. Many aspects of modern life contribute to stress the biotic and abiotic systems of our planet, mainly from the use of natural resources, energy and waste emissions. Examples are the environmental impacts of human activities such as the depletion of stratospheric ozone, the global warming, the degradation of water and soil resources, the loss of habitat and biodiversity and the increase in volume of solid wastes.

In the past two decades, industrial organisations have largely been in the position of responding to legislation imposed as a consequence of a perceived environmental crisis. The mode of operation is essentially unplanned and always reactive rather than proactive. The discourse on the concept of sustainable development has increased significantly, resulting in a variety of definitions and interpretations. Although its important role to develop a global view with respect to our planet's future, their impact in shaping "our common future" on a more sustainable basis seems to be minimal when measured against the enormity of the global environmental changes.

2. Approaches to the Sustainability Concept

The concept of "sustainable development" was firstly defined in the report, *Our Common Future,* of UN-sponsored World Commission on Environment and Development, as "the development which meets the needs of the present without compromising the ability of future generations to meet their own needs" (WCED, 1987). Since then, thousands of initiatives were taken at local, national and global levels by governments, international agencies, business organisations and others, in an attempt to address different aspects of the environmental challenges. Several outcomes have ensued from these activities (Bossel, 1999; CEC, 1993; UNCED, 1992; UNEAP, 1995; European Communi-

ties Commission, 1994; Dominski et al, 1992; Zachary, J. 1995; Hardy, P. & Zdan T., 1997; Hardy, P. & Barg, S., 1997).

The definition of sustainable development given by the Brundtland Commission Report, *Our Common Future*, serves as the core element for almost all of the establishment's definitions and it is viewed as the key statement of sustainable development. The International Institute for Environment and Development (IIED) has developed a related definition. It is based on the identification of three systems as basic to any process of development: the biologic or ecological system, the social system and the economic system.

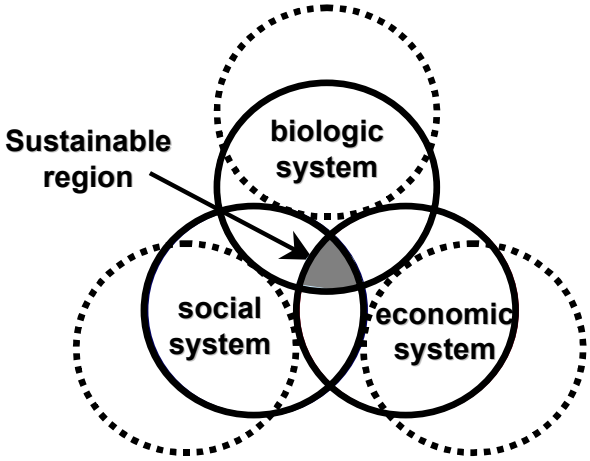
The World Business Council to Sustainable Development (WBCSD) presented another definition. It states that "Business leaders are committed to sustainable development, to meeting the needs of the present without compromising the welfare of future generations. This concept recognises that economic growth and environmental protection are inextricably linked, and that the quality of present and future life rests on meeting basic human needs without destroying the environment upon which all life depends" (Schmidheiny, 1992).

As a direct extension of the WCED definition, the version of the WBCSD asserts that economic growth in all parts of the world is essential for improving the livelihood of the poor, for sustaining growing populations and eventually for stabilising them. New technologies will be needed to permit growth, while energy and other resources may be used more efficiently to produce less pollution (Mebratu, 1998).

In recent years from the different versions proposed for sustainability, two distinct approaches have emerged in literature. One have the tendency to take the "whole" as the conceptual point of departure and take the "parts" as a complement. The other take the "parts" as the point of departure and consider the "whole" as the linear summation of the parts. Mebratu (1998) refers that "in both cases they proclaim that their approach is based on the application of holistic thinking. However, in both cases, they are missing the most important element of holistic thinking, i.e., the interaction between the parts in the whole and between the whole and its environment".

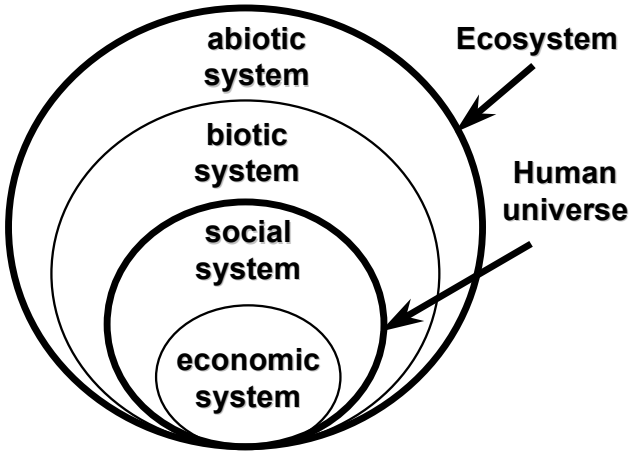
The generally accepted approach with respect to sustainability and environmental changes is represented in Figure 1. It recognises the independence between the biological, economic and social systems. However, according Mebratu (1998) this approach is in contradiction with the main objective of sustainability, that is the full integration of all systems, only achieved in the interactive region.

Figure 1: General approach considering the biological, economic and social systems.



To the contrary, Mebratu (1998) suggests the interdependency model, represented in Figure 2, based on a holistic approach. He refers that the human universe including the social and economic systems are not independent from the ecosystem but there are parts of the abiotic and of the biotic systems that do not necessarily interact with the others.

Figure 2: Representation of the interdependency model



From the several approaches that are used, a common aspect is the mix of autonomy and interdependence of their different domains, which enables them to realise their specific function. Human society applies a set of goals to each system, social, biologic and economic, each one with its own hierarchy of goals and targets. The objective of sustainable development is then to maximise goal achievement across the three systems at one and the same time through an adaptive process of trade-offs.

It is still unclear which is the best model to describe and explain a particular situation. People see life through diverse prisms. What some consider as high priority may be trivial for others and individual's ability to imagine a specific situation is constrained by his perspective. Nevertheless, visioning is

considered the most powerful tool for escaping from the confines of ideas and paradigms that lock us into many undesirable patterns of behaviour and practice.

3. Response to Environmental Changes

The stresses on many aspects of the earth system are strongly influenced by the needs of the population. Both Earth's population and their rate of change are rapidly increasing. Graedel (1996) propose a useful way to focus thinking on the most effective response of society to environmental impacts, by analysing the predominant factors involved in generating them, through the expression 1. This equation constitutes a useful indicator of the environmental impact generated by a society and their related driving forces. It relates the country's gross domestic product (GDP), a measure of industrial and economic activity with the environmental impact of a society. Although GDP and quality of life are not necessarily directly related, they are strongly coupled and we can therefore expect GDP growth to continue, particularly in developing countries.

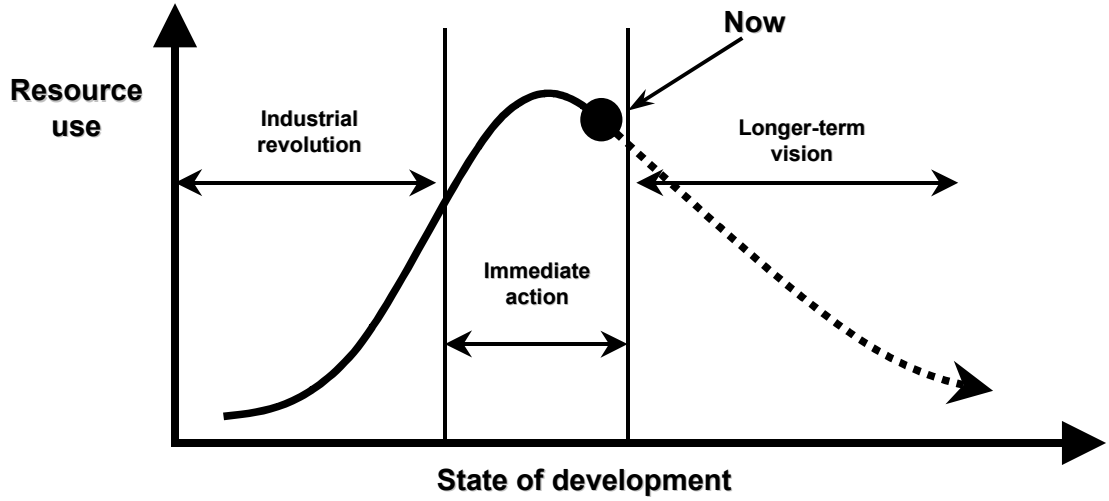
$$Environmental\ \ impact = population\ x\ GDP\ \ per\ \ capita\ x\ \frac{environmental\ \ impact}{GDP} \qquad (1)$$

The GDP per capita varies among different countries and regions, responding to forces of local conditions, the stage of historical and technological factors and so forth. It is directly related to the aspiration of humans for a better life. The third term in the equation, of the environmental impact per GDP, measures the degree to which technology is available to permit development without serious environmental consequences and the degree to which that available technology is deployed. This is primarily a technological term, though social and economic issues impose strong constraints on it. The trend for the first two terms of the master equation is to increase. If overall environmental impact is to be mitigated, then, it is the third term in the equation that offers the greatest hope for a transition to a sustainable development.

Besides the sweeping effect of environmental degradation, ecological factors have been one of the major driving forces behind every social transformation recorded in history, including the agricultural and the industrial transformations. In the historical context, it can be stated that the environmental past may often indicate useful parallels with the environmental present. Throughout most of the human history, the growth of population, the degradation and depletion of resources, the restructuring of societies and the development of new technologies have been so slow as to be imperceptible during an individual lifespan (Meadows cited by Mebratu, 1998). However, during the past two centuries and especially during the last five decades, the global economy has shown incredible growth, transforming the character of the planet and especially of human life.

A typical pattern followed by nations participating in the Industrial Revolution of the eighteenth and nineteenth centuries is represented in the Figure 3 (Graedel, 1996).

Figure 3: Schematic diagram of the relationship between the state of technological development of society and its resulting environmental impact



The first period is the unconstrained Industrial Revolution, during which the levels of resource use and waste increased very rapidly. In the second period of immediate remedial action, the most egregious examples of excess were addressed. Finally in the third period of the longer-term vision (not yet implemented), one can postulate that environmental impacts will be reduced to small or even negligible proportions while a reasonably high quality of life is maintained.

Moving Towards Sustainability through Cleaner Production

The World Commission for Environment and Development (1987) has focused on the need for a sustainable future and actions to be taken on different levels in the society to change industrial practices and consumption patterns worldwide. To reach a level of global sustainability, major changes are needed in the infrastructure for energy production, distribution and consumption, and in management of material cycle in the society.

"Energy, Environment and Sustainable Development" is one of the four thematic programmes of the Fifth (EC) RTD Framework Programme (1998-2002), focusing directly on a number of pressing environmental and energy concerns. In a sustainable development perspective, should be addressed the quality and sustainability of our use of natural resources and ecosystems, threats of global change, quality of life in our cities and the impact of the production and use of energy which is essential to our economies and our way of life, and also centrally important in environmental problems, notably climate change. Making use of knowledge and technologies developed by this programme will make it possible to meet a wide range of social and economic needs so reconciling economic development with environmental sustainability. The results of this research will support policies formulated at Community level or deriving from international commitments (Official Journal of European Communities, 1999).

Some important changes in environmental strategies have already been observed. Early, it was waste minimisation. Pollution prevention, design for the environment and industrial ecology appeared

later. They are all different terms to describe our continuing efforts towards sustainable development. Moving towards sustainability requires significant shifts in the way of life of those in developed / developing countries. One of the primary factors will be the requirement for more efficient use of resources by consumers as well as manufacturers and industries. This will necessitate the implementation of cleaner production principles and technologies. For this purpose, various tools such as scientific, engineering and economic are needed (Sikdar et al, 1999):

- Analytical tools are procedures, models or computer-based methods, that assess and quantify environmental impacts, allow comparisons among design or practice options and assist in the design of cleaner processes or products (e.g. life cycle assessment, waste auditing and minimisation, integration of pollution prevention, design for the environment, industrial ecology, zero emission, best available technologies and practices, etc.)
- Process tools are cleaner unit technologies that can be viewed as building blocks for processes (e.g. membrane technologies, separation technologies, recycle and reuse methods, green chemistry, clean catalysis, etc.)
- Economic tools are cost-benefit analysis of options, economic valuation of environmental impact or benefit.

Cleaner production is defined as developments in industrial processes and products aimed at reducing to a minimum all wastes, minimising risks to the environment and making efficient use of resources and raw materials. Implementation of cleaner production in industries has shown significant reductions in production of wastes, consumption of resources and costs. However, cleaner production and conservation of resources have not been incorporated into our way of life or our educational system. The different aspects of cleaner production described above encompass many professions, engineering, management, accounting, product and process design, planning, architecture, law, etc. All of them need to be involved in the implementation of cleaner production through sustainable development. It is only after they achieve a reasonably understanding of the components of each system, social, biologic and economic, that they are able to successfully begin understanding how the components functioned together as ecosystem.

The professions are the keys to the incorporation of sustainability into our society. The education of those professions must incorporate principles and concepts of sustainability and cleaner production into their programs to produce professionals who can manage resources sustainable and efficiently. For professionals involved in product or process design, it is required a more deep understanding of life cycle assessment and design for environment. For professionals not directly involved, it is sufficient an understanding of what these concepts mean, how the results should be used and the benefits of such undertakings. As professions become more aware of the environmental issues involved, particularly with regards to sustainability and the potential for marketing sustainable or environmentally friendly products, they will be willing to purchase from suppliers with good environmental records.

Conclusions

In recent years different versions of sustainability were proposed and several different approaches to the concept have emerged in literature. As may be seen from the conceptual analysis, most of the effort of interpreting the concept is to a large extend influenced by the fundamental tenet of specific group or organisation. It is still unclear which is the best model to describe and explain a particular situation and the existing models or approaches do not capture the whole picture.

Some important changes in environmental strategies have already been observed. One of them is the implementation of cleaner production principles and technologies responding to the need for more efficient use of resources by consumers as well as manufacturers and industries. Moving towards sustainability will also require significant changes in our professions and our educational systems. The implications of effectively incorporating sustainability concepts and principles into our educational system are enormous and changes have already started to occur.

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Pro-Environmental Norms Are Established - So What?

The Transformation of A Societal Norm Into Individual Behaviour. A Social-Psychological View.

Immo Fritsche

INTRODUCTION

Since humankind is aware of global environmental changes which are perceived to be threatening to its survival there is a need to control these changes. The fact that most of the environmental changes can be attributed to human action and therefore has been described as "maladaptive behaviour" (Maloney & Ward; 1973) makes it urgent to change human behaviour, finally. The direction of such a behaviour-change can be marked as a development towards sustainable human action.

In this paper I will outline a process how individual behaviour can be shaped by the societal necessity of pro-ecological transformation.

[Slide 1] (see attachment)

Thereby I suppose that social actors have internalised behaviour-norms which consist of the knowledge that a possible behaviour is environmentally harmful and additionally the norm that harming the environment is bad. (*I will come back to this later.*) But establishing a behaviour-norm is only the first step. The second step means to translate the social norms into behaviour of single actors. How this second step could work has to be described.

Combining the two strategies - establishing a social norm and enabling its fulfilment - delivers a strong societal tool to change individual behaviour.

STEP I: STRENGTHENING SOCIAL NORMS

During the past 25 years the public as well as social psychologists have favoured one main interventional strategy to change individual behaviour towards ecological behaviour.

The idea was to enhance people's environmental consciousness (which social psychologists interpreted mainly as **pro-environmental attitude** as well as **environmental knowledge**). Such an enhanced "consciousness" should increase the probability of behaviour consistent with this cognitive state.

Consequently, legions of environmentally activated researchers, practitioners and media-men tried to promote and to measure environmental consciousness in one or another way. The result is that the "environmental topic" is now (and still) present in public discussion or - in terms of social psychology - it has become the state of a social representation. One step further one can even state the **rise of a social norm towards pro-environmental behaviour** which should be strongly related to the term of sustainable action.

Unfortunately these efforts did not lead to a satisfying spread of pro-ecological *behaviour* which has to be carefully separated from pro-ecological *consciousness* or attitude and knowledge. Although meanwhile one can expect that nearly every child in western Europe is confident with the environmental impact of individual behaviours such as littering or driving a car there is no remarkable progress in replacing environmentally harmful behaviour-patterns in all areas of critical behaviour. In an own survey (still unpublished) N=48 participants estimated the readiness of their fellow-citizens to abstain from environmentally harmful behaviours. For example the readiness to abstain from using a car for a three kilometres long distance instead of public transportation or bike was on the average attributed to only 35 % of the citizens although the participants identified this behaviour as being clearly harmful to the environment.

This pessimistic view is supported by meta-analyses of social psychological research about the link between pro-environmental attitudes and (mostly self-reported) real behaviour. For example for 51 studies Hines, Hungerford & Tomera (1987) report an average correlation between the two variables of r=.347 (sd=.224). That means that pro-environmental behaviour is not the good predictable by attitudes as one would assume naively. The same is valid for the link between behaviour and environmental knowledge (r=.299; sd=.195).

For the discussion of interventional strategies which should increase individual sustainable behaviour this means that the first strategy of enhancing people's pro-environmental attitude as well as their knowledge about environmentally harmful behaviours is not sufficient for changing also people's real behaviours. Therefore I would like to outline a second step which has to follow step I.

STEP II: ADVANCING NORM-CONSISTENT BEHAVIOUR

Step II starts from the assumption that a pro-environmental norm (attitude and knowledge) has been already established within a group or even within a whole society (step I). Now if such normative structures are socially represented there are obviously still possibilities for individuals to act in a norm-contradicting way. How else could we interpret phenomena such as car-driving of green-party-voters or that some of them live in coal-heated, bad warmth-insulated flats[1]?

The basic idea of step II is that people have possibilities to undermine norms *situationally* without the need of giving up their compliance to the social norm. For example the coal-heating green-voter could state that her/his budget is very low and therefore s/he is forced to live in a coal-heated flat but is nevertheless still in favour of removing coal-heatings for sustainability-reasons. Psychologically spoken the poor green man or women can *account* for his/her norm-violation (Schönbach, 1990).

[1] Coal-heated flats are still widely spread within eastern Germany.

Usually we think of accounts or *justifications* and *excuses* as being relevant for individuals *after* they have committed a "sin" in order to defend their self-image as a person who acts in consistence with her/his norms. The American sociologists G. M. Sykes and D. Matza went one step further when they formulated neutralisation-theory in 1957. They state that norm-violations can be explained by delinquent's capability to neutralise their misdeeds *before* carrying them out.

[**Slide 2**]

If we transfer this idea to our topic under a psychological view it means that people who dispose of justification-scripts for specific norm-violations (using coal-heatings) are able to invalidate their norm in situations corresponding to the chosen justification. An invalidation of an internalised norm gives the individual the opportunity to execute a norm-contradicting behaviour.

The resulting interventional strategy has to deal with the justification-scripts people have in mind and is therefore a specific psychological task.

[**Slide 3**]

Schahn (1993) for example can imagine that it is possible to refute justifications of environmentally harmful behaviour via public campaigns.

IS STEP II REALLY A "PSYCHOLOGICAL" STRATEGY?

The proposed strategy in step II means refuting justifications which are socially represented and individually shared by the members of a social group or society. But what if some justifications seem to be not refutable because of "objective" background-reasons? It is - for example - a hard fact that coal-oven-flats are much cheaper than flats with modern heatings. Should it not be the goal to change "real" variables, like prizing, instead of arguing against people's justifications for non-ecological behaviour?

The answer is "yes, but ...". Of cause are there hard facts ecological sinners can appeal to but the way in which they do should be mainly dependent on (social-) psychological variables.

A good example for the psychological dependency of justifications is the selective employment of accounts under different situational demands. Data from Ritterfeld & Linneweber (1997) show different account-patterns when the politeness of reproach was varied experimentally. In an own study (Fritsche, 1999) subjects chose their accounts clearly for social desirability reasons when they had to find justifications and excuses for using a short-distance flight in public (opposed to an anonymous condition). This points to the importance of social acceptance of specific accounts which should be in turn strongly dependent on cultural aspects. In the study just cited for example the most social desirable account strategy for using the plane instead of the railway was the appeal to necessity by arguing with being in a hurry, actually. One can assume that members of less time-fixed cultures as Germany is (the study took place in Berlin) would prefer other justification-strategies.

Much more psychological research in the area of accounting-behaviour is needed. According to this need I actually prepare some studies to get more insight in the real impact the availability of justifications has on ecologically relevant behaviour and if there is a possibility of refuting justifications.

To anticipate the topic of event 3 the resulting interventional strategy to influence people's situational justifications has to achieve two interlocked processes:

1. Social psychological research can lead to an idea of how different accounting-strategies contribute to a weakened norm-behaviour-bond;
2. justifications should be refuted in two ways:

a) "objectively" existing impediments of pro-environmental behaviour of which the justifications make use (e. g. unecological prizing) should be removed (**political intervention**)

b) psychologically motivated distortions of reality during accounting, strategic argumentation or simple information-deficits have to be detected and neutralised through counter-argumentation or specific **psychological intervention** mainly on a societal level (e. g. information campaigns which putting biased argumentation right).

COMBINING STRATEGIES

Above I have outlined two strategies which should serve the increase of individual socially responsible behaviour like sustainable behaviour. Step I means to establish a pro-sustainability-norm in society. Following Step II one has to detect and work on situational accounts for norm-violations.

As I have pointed out it is important to view these two strategies as being interconnected. This statement may sound banal at first glance but reminding the shortcomings of past endeavours of social sciences or lay institutions to establish pro-environmental behaviour in society it becomes clear why the interconnection of strategies is central to successful intervention.

For present and future research in the field of socially responsible behaviour especially the strategy expressed in step II should be a fruitful guideline. At present it is still necessary to get a detailed and systematic survey of the plenty of accounts for non-ecological behaviour. Similarly experimental social research has to answer the questions under which conditions specific accounts occur, if the accounts have a detectable impact on behaviour and if they do, in which way this impact can be conceptualised and last but not least research has to deal with the "refutability" of accounts.

Thus social psychology takes the role of an instrumental science which can design and accompany measures promoting sustainable behaviour.

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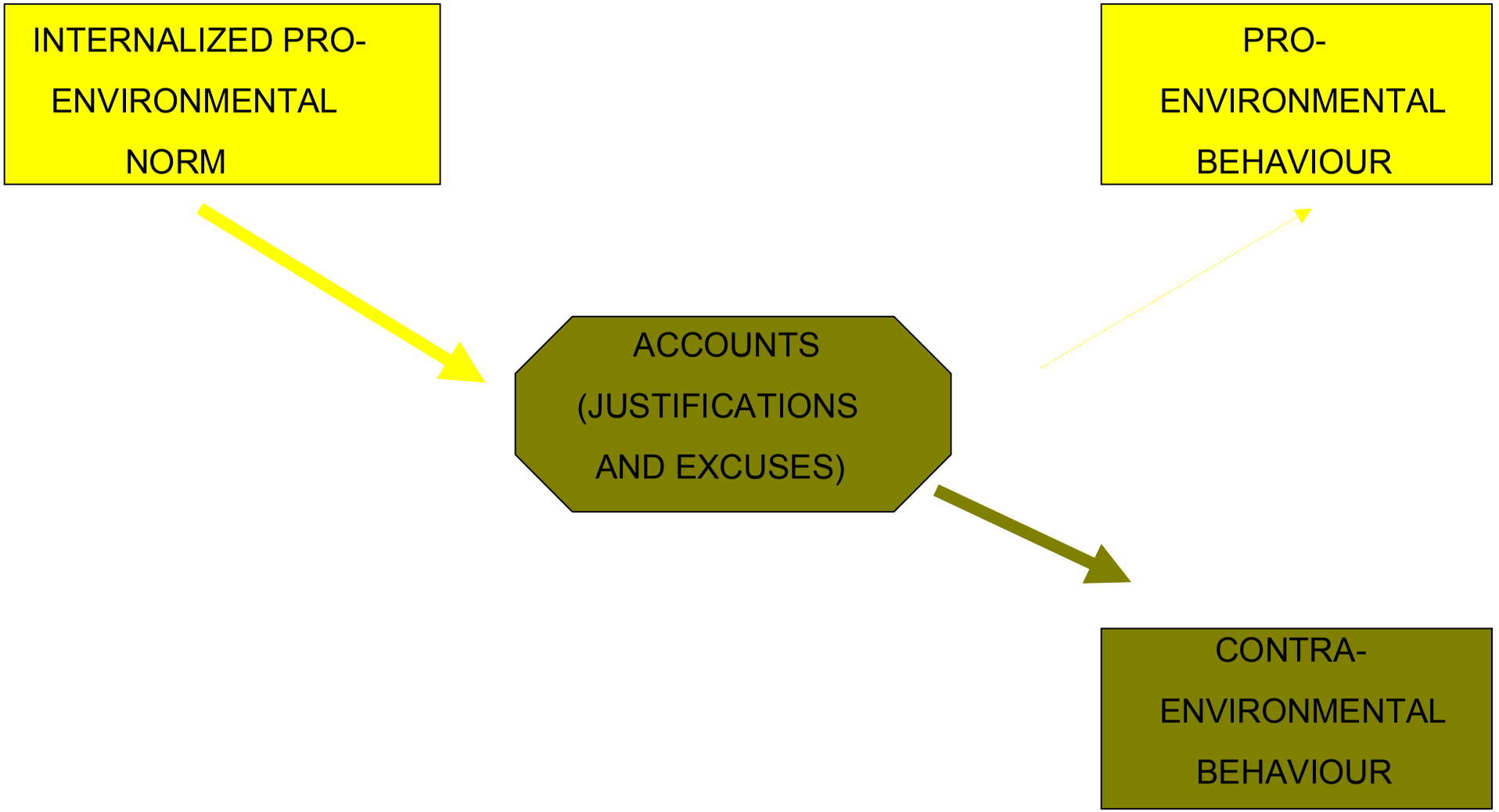
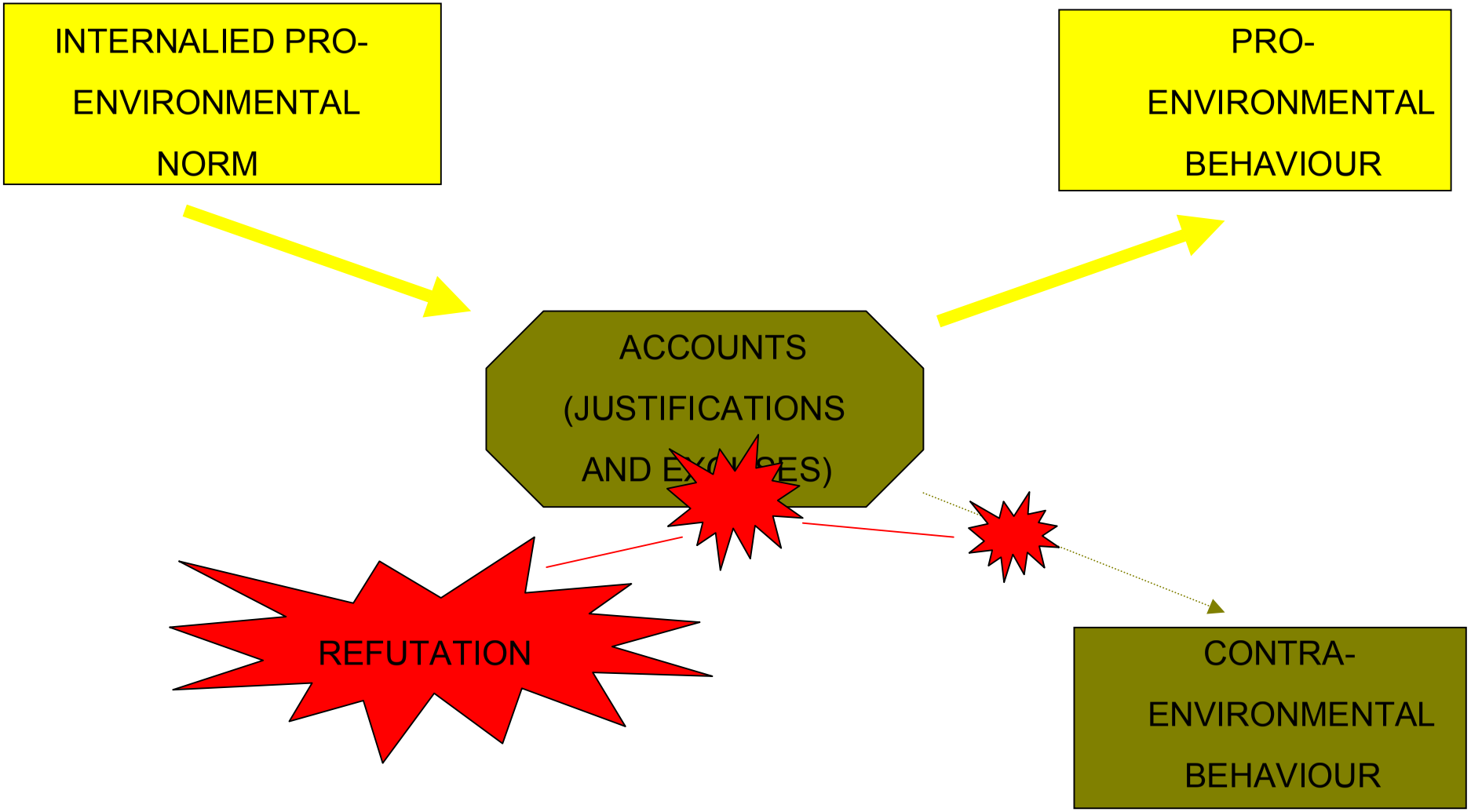
Slide 1


BEHAVIOUR X
HARMS THE ENVIRONMENT
HARMING THE ENVIRONMENT IS BAD

Slide 2


INTERNALIZED PRO-ENVIRONMENTAL NORM
PRO-ENVIRONMENTAL BEHAVIOUR
ACCOUNTS (JUSTIFICATIONS AND EXCUSES)
CONTRA-ENVIRONMENTAL BEHAVIOUR

Slide 3


INTERNALIED PRO-ENVIRONMENTAL NORM
PRO-ENVIRONMENTAL BEHAVIOUR
ACCOUNTS (JUSTIFICATIONS AND
REFUTATION
CONTRA-ENVIRONMENTAL BEHAVIOUR

Planning Sustainable Development

Pieter Glasbergen

Introduction

Traditionally, environmental planning has assumed a dichotomous hierarchical relationship between the state, as a central actor, and the market and civil society as target-groups. In that line of reasoning, the market is seen as an egoistic utility maximiser that in principle is unconcerned with the environment. Even so civil society is seen as a heterogeneous bundle of interest groups, always in conflict, and most of them primarily seeking their short term materialistic interests. Thus, there is no better means to environmental renewal than a strong state. As the representative of the common good, the state must take remedial measures.

This conceptualisation of the issue of environmental planning espouses the regulatory control model and the economic control model. Although the policy instruments may differ, they are essentially derived from the same premise - the need for coercion.

In the regulatory control model, the state formulates the environmental goals, articulates them in legally binding rules, monitors their application and imposes sanctions when the parties do not live up with the standards.

Similarly, in the economic control model, the state formulates the environmental goals. Subsequently, the authorities design a framework of financial incentives - if need be, one that can be systematically revised – that compels the market processes to make adjustments in a more environmentally friendly direction.

Scientific knowledge plays a crucial role in both models. The indisputable objectivity of that knowledge lends legitimacy to the formulation of the environmental goals. Disturbances of ecosystems are evident, and the risks they entail - especially with respect to public health - are great. This in itself is reason enough to restrict the freedom of the market and in civil society.

Planning along these lines was effective for a long period. In particular, the application of the regulatory control model has made it possible for the advanced industrial societies to rid themselves of the most serious health-threatening environmental impacts.

This paper's main argument is that this kind of planning has now outlived its functionality. The main trigger factor is found in changes in the environmental issues, which are more complex and surrounded with more uncertainty than ever. But there also is an incentive from changes in the ideology of liberal democracy; especially views on the role governments should play in orienting societal change.

Modern environmental planning should be based on a new image of the manageable society. It defines the issue of planning as the problem of setting a course of action for parties that hold different perspectives - sometimes complementary, sometimes conflicting - and have different sources of knowledge. What they need is actually more room to manoeuvre in order to deal effectively with the problems they face.

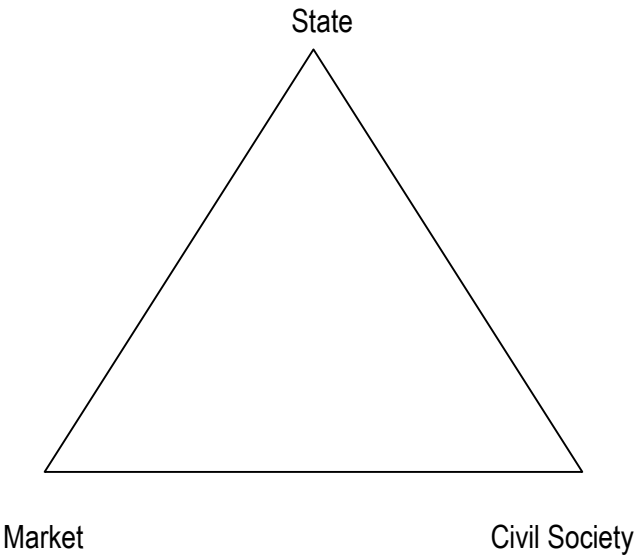
Modern environmental planning needs to promote the self-regulating capacity of private parties, stimulating them to tackle issues that are considered collective problems. Private parties are to be assigned a definite role in the public arena. On the one hand, they are expected to be active participants in public decision-making. On the other hand, they are to be given responsibility for implementing those decisions.

In the new manageable society, government authorities assure themselves of the co-operation of well-organised private parties that have a direct interest in the issues at stake.

This paper discusses some of these new forms of state, market, civil society relationships.

State, market and civil society

As a starting point for a reflection on the question of planning for sustainable development I take the view of modern society as composed of three domains: the state, the market, and the civil society. Each domain fulfils a specific function. Graphically they form the angles of a triangle.



The state stands for the public domain. It's main function is to define what is in the general interest and to promote this view. It's base is political rationality. By definition the state plays a role in sustainable development, but the content and intensity of that role has to be decided on in a continuous process of deliberation and decision making. The role of the state differs from the kind of problems and social and economic situation. The market and the civil society are both private domains.

The market is an important bearer of welfare and prosperity. To fulfil this function it has to be competitive in a materialistic sense. It's base is economic rationality. In first instance the market is not concerned for the quality of the environment. In the long run it has to be: it is bad farming on polluted soil for example. For some market parties environmental technology is an opportunity factor in competitiveness.

The civil society is that part of the private sphere that is not primarily driven by economic rationality. It is the domain of the citizen, with his values, interests and voluntary associations. It is the domain where opinions are formed and expressed through social movements and interest groups. It's base is communicative rationality. The civil society shows mixed feelings toward environmental issues. Some groups promote environmental values, others are indifferent, and others are opposed, most of time related to a specific issue.

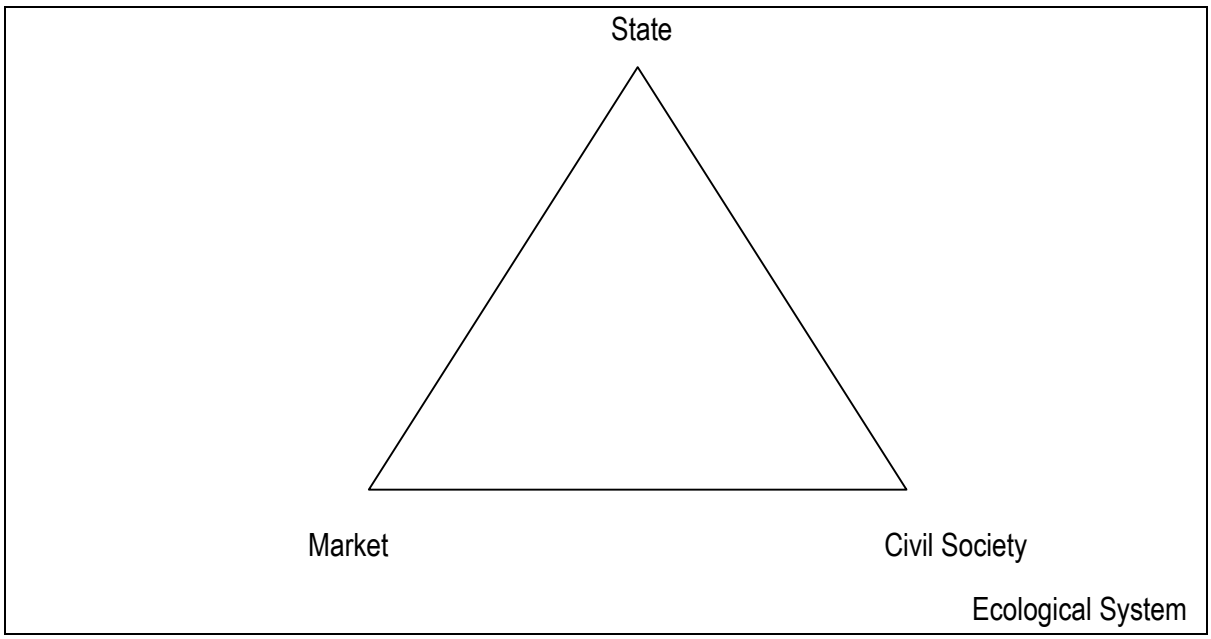
These notes on the three domains only give some indications of their characteristics. In the context of this paper the conclusions that can be made about the interrelationships of the domains are most important. As a main characteristic of the interrelationship I would like to emphasise the dual mix of autonomy and interdependence. I derive the following conclusions:

1. Each domain fulfils a specific function which can only be realised if they are relatively independent.
2. Because of their relative autonomy the domains function critical towards each other. This is a prerequisite in a democratic society.
3. The domains are interdependent too. Without an assurance of each other's existence and sustaining one another they are not able to fulfil their own function.

Planning therefore implies strong domains that are able to make connections.

The ecological system

The picture is not complete however. Sustainable development also refers to a fourth domain: the physical system, nature or the eco-system. This domain originates outside the three human domains. It is an encompassing system. Stronger still: the human domains derive their existence from this domain.



The functioning of the ecological system is based on the rationality of natural laws. This could be seen as an objective reality, but handled in the human domains it becomes an interpreted reality; a social construction. In first instance sustainable development refers to this system, but at the same time it connects this system to the world of mankind. It adds a value in this process of social construction: the value of balancing available natural resources and social and economic development. The problem here is to decide on the implications for human behaviour or societal development of this aim of balance.

In the debate about this balance, or equilibrium, two positions come to the fore. Some define the physical system as a truly objective reality. It is an external fact that can be known. Through natural science research they try to define what the boundaries of the system are. The result is fixed limits for human action. The concepts of 'carrying capacity' and 'ecological utilisation space' fit into this view. Others claim that the physical system always is a human interpreted reality. Limits are not objective facts, but social constructs. They are real because people define them as real and many others share this opinion.

My own position is between these extremes. First, I hold the view that there are limits in the physical system to absorb human activities. But I also recognise that they are only limited known. Especially on higher ecological levels. Norms based on natural science research are always arbitrary, based on assessments of environmental risks. Discussion is always possible of levels of protection.

Secondly, environmental risks are not the only risks to take into account. In the process of determination of environmental risks we always have to do with economic risks as well. Especially the consequences for welfare and how welfare is distributed. Here we also are confronted with uncertainty. For example, we don't know for sure how technology will develop, or, what changes in economic systems are possible, on behalf of the environment, without bringing these systems into a recession.

Thirdly, environmental norms put civil society under pressure. They influence life styles, consumption patterns etc. They are not enforceable without a general feeling that not accepting the norms is more risky than accepting, and consequently change of behaviour, is.

A central concept in environmental science is uncertainty. These uncertainties not only relate to the ecological system, but to social aspects as well. This is well expressed by Funtowicz and Ravetz in their article "The worth of a birdsong" (Funtowicz and Ravetz, 1994). Science cannot decide on the worth of nature. It is only in societal debate, with a broad spectrum of interests involved, that nature can be given meaning for policy. Planning for sustainable development is about finding a balance in debates on the interrelationships between social justice, economic development and ecology.

Implications of the foregoing

Gradually it might have become clear that planning for sustainable development that makes sense only is possible if in one way or another the three human domains are able to co-operate. Strict environmental targets, based on scientific evidence, is risky if we don't take into account the consequences for the market and the values in civil society. In these co-operations, the three human domains need to have an opportunity to bring in their perceptions of risks. Through deliberations, organised discourses, they can define a common ground for action and eventually share their specific problem solving capacities. That co-operation should be voluntary in nature, should take place through organised communication, and should lead to contractual agreements (Lafferty and Meadowcroft, 1996; Glasbergen, ed, 1998).

Furthermore, this co-operation can hardly be an activity for once and all. As perceptions of risks change, there is a necessity to organise co-operation as a learning process. A process in which the three human domains are able to improve both their interdependent relations and their common relation to the physical environment. Through learning environmental problem handling can be continually adjusted, thereby encouraging a progressive dynamic.

The observations so far introduce a new image of the manageable society:

a) Scientific knowledge regarding the environment is based on disputable estimates of risks. Next to environmental risks, economic risks and arguments of social justice should be taken into consideration.
b) People are concerned about their environment. They are seeking improved living standards which include environmental quality.
c) There is no better means to sustainable development than the organisation of a co-operative learning process among representatives of the state, the market and civil society.

This image has far-reaching implications for planning. Complexity and uncertainty are no longer seen as obstacles that can only be surmounted by building up a body of scientific knowledge. Rather, complexity and uncertainty are taken as a challenge to organise the necessary trade-off processes in new institutional relations.

The focus of our attention needs to shift from the building of regulatory and economic incentive structures toward the development of new institutional arrangements to foster collective action. Institutions like voluntary environmental agreements, systems of co-management, environmental co-

operatives, interactive planning, participatory approaches, integrated regional planning and collaborations between private industries and environmental organisations.

We need, in the words of Grabosky, new technologies of governance which harness energies resident outside the public sector in furtherance of the public value of sustainable development (Grabosky, 1995).

Some societies are already working with these new forms of environmental planning. In the following some of these institutional innovations in the triangle state-market-civil society are discussed. Most of the material is from the Netherlands; a country which takes consensual techniques as the bottom-line in its planning for sustainable development.

Contracts between state and market.

In the relation between state and market the Voluntary Agreement (VA) is one of the most innovative planning instruments. In the co-venanting process representatives of the government and business jointly try to come to grips with environmental issues. An essential characteristic is the utilisation of the problem solving capacity that exists within the business community itself for bringing about environmental change. The government and the private sector make agreements on the basis of mutual trust. The agreements are laid down in a more or less formal contract. In signing the contract, the parties acknowledge that they voluntarily reached agreement about a process of change. By imbuing the agreements with a degree of formality, this instrument bridges the gap that tends to arise in the chain of command so characteristic of relations of authority (Kettle, 1993, p. 22). International comparative research reveals that regarding VAs, the Netherlands takes a special position in the international field (Glasbergen,ed., 1998; Gebers et. al., 1998). Elsewhere in Europe, agreements are usually arranged for specific environmental issues such as waste management, water management and energy efficiency or a certain product. Such agreements are still being concluded in the Netherlands, but they gradually made way for more complex agreements. The latter are geared to lowering the *overall emissions profile* for a sector of industry; they span a long period of time; and they are embedded in an institutionalised co-operation. A modern environmental agreement has the following characteristics: (1) phased targets that are accepted as a commitment to make an effort; (2) a responsibility taken by the industrial sector as a whole; and (3) a system for monitoring progress and adjusting the course (Glasbergen, 1998). The sector targets leave room for individual contributions of firms.

A covenanting process has a certain pattern. This is outlined in the following steps to be taken (Glasbergen, 1999).

* *To create a common ideological basis*. The first step is to acknowledge mutual dependencies. Public and private parties have to understand that they need each other's support and co-operation to achieve their goals as well as to justify the intended change. An essential element in this phase is the recognition that multiple definitions of the problem are possible and that there are good reasons to take these other views into account. This regards specifically technical and economic considerations.

* *To recognise variation as a problem*. A second essential element in the covenanting process is the recognition that variation is a problem. There are numerous companies with their own particular opportunities and limitations regarding how to improve their emissions profile. This is done justice through formulating targets for a whole branch of industry. Individual companies are then allowed to make a contribution according to their capacity at a given time.

* *To set levels of compensation and support*. Both public and private parties seek certainties in the covenanting process. As far as the government is concerned, consultation with representatives of the branches should provide sufficient certainty about the willingness of individual companies to cooperate. This can be realised by individual signatures. However the private sector is also looking for more certainty. For them it is crucial that governments refrain from pursuing new policies that could run counter to the agreement, and if so, they would at least expect consultation.

* *To determine the key parameters*. This would appear to be the most critical point in the covenanting process, yet that is not entirely the case. Once the private sector has accepted the political goals as part of their own aspirations, as soon as the government has acknowledged the need to customise the efforts of industry and when the chance of any surprises about future shifts in policy has been minimised, then the parties can quickly come to agreement on the phasing of the targets.

* *To set up an accountability structure.* A key element of the covenanting process is the creation of conditions for a systematic approach to the issues. The planning should be embedded in structures at the individual firm and at the level of the branch of industry. A consultative body, consisting of representatives of government and industry, is a prerequisite. This council should be charged with the responsibility of guiding the entire process, monitoring the implementation, verifying the results, conducting studies on bottlenecks and looking for ways to resolve obstructions.

* *To link up with other decision-making frameworks.* It should be recognised that the covenanting process is continually in play as a multi-level game. Within the government, links need to be laid to political decision-making both at the central level and lower levels of government which often are responsible for issuing permits. Another link needs to be laid between the representatives of the branches and their constituencies.

Up to now the overall experiences with this kind of planning are rather satisfactory; the targets for the year 2000 are within reach. The most important sectors of industry themselves now take responsibility in a broad environmental field. However, this does not mean that this kind of planning is without criticism. A point to mention is that the targets set can be realised without major innovations or technical breakthrough. In the field of energy, for example, the target is related to efficiency and not to absolute reduction. Industry hardly develops a long-term vision on its environmental load. Companies stay within the margins set by government and don't do more. But in general it can be said that a learning process has been set in motion which can be continued.

New relations between state and civil society

In the relation between state and civil society I observe a strong tendency towards a more participatory style of planning. According to Agenda 21, governments, especially at the local level, should establish a consultation process with residents, companies and social organisations and secure

agreement on a process of directed change. Thus participatory approaches are generally seen as an important vehicle for sustainable development. I interpret this as an attempt to strengthen the place of civil society in political decision-making.

Most modern societies are still in search of the meaning participatory approaches should be given. Characteristic is the question what balance might be appropriate between what - in terms of Habermas (Habermas, 1993) - is called the liberal and republican organisation of democracy. In the liberal approach an emphasis is put on more open procedures for decision-making. The decision-maker develops his own ideas first and subsequently tries to communicate them as good as possible to the outside world. In the republican approach participation is seen as a tool to improve the quality of the process of forming opinions, the arguments behind a plan, and an unbiased weighing of arguments. The present participatory practices often are unclear which of the approaches they aim for. As a result expectations of initiators and participants may clash and instead of the application of intellectual capacity in society oppositional forces manifest themselves (WRR, 1998).

Recently we analysed beyond twenty public participation practices; among them The Hague Local Agena 21, Awareness Scenario Workshops, Forum Amsterdam, Verkehrsforum Salzburg and Planungszellen (Vermeulen, Van der Waals, Glasbergen, 1999). Our survey may not be representative for the whole field, but covers a broad spectre of practices. The research as such mainly intended to indicate useful elements and areas calling for improvement. All practices are fairly new and experiments are being conducted with great enthousiasm. The principal motives often are associated with mobilising creativity and knowledge and increasing public support and the enforciability of policy. Sometimes the objective is to bridge the gap between citizens and government. Often, the explicit motives behind the particular form adopted are not stated. Some methods are short-term and once-off in nature, whereas other examples involve a process. In most projects the focus is on the generation of ideas and solutions.

From our research we conclude that the application of participatory methods can result in creative solutions and a better and more widely shared analysis of the situation. But we also recognise some shortcomings one cannot easily neglect:

- In most cases, there is no explicit bilateral weighing up of environmental and other social risks;
- Little attention is paid to the knowledge needed to weigh up these risks: there is frequently no joint analysis of the effects of proposed options for solutions and uncertainties in knowledge and subjective assumptions are not called into question;
- Although various parties are invited to participate, in many cases there is no intention to seek a confrontation of differing views in order to find creative solutions;
- The underlying motives behind the approach adopted are not always made explicit and it is unclear why a participative method is being used in a particular situation;
- The linking of participative methods with regular policy needs to be improved. In many instances, the utilisation of results in formal policy decisions is unclear.

It has to be remembered that there are positive exceptions to each of the points made here. Furthermore, most methods did not arise from a desire to improve the weighing up of environmental and

social risks, but were designed rather to create public support and commitment and increase the effectiveness of policy.

In the light of the foregoing analysis, the question is what improvements are needed in the use and design of participatory approaches. An unambiguous answer, in the form of a blueprint, cannot be given. On the one hand, there are many more methods besides those researched here. On the other hand, each situation calls for an approach specifically tailored to that situation. It is difficult to say what method is most suitable for a particular type of policy problem under particular circumstances. We can, however, mention a number of 'design dimensions'.

* *Choice between internal administrative weighing up or weighing up by way of a participatory project.* For strategic issues regarding sustainable development, in theory we favour organising the process of weighing up ecological and social risks in the form of a participative project. However, it is necessary to determine in advance whether the conditions for such a project are right. If the problem is easily solved and there is no controversy there is less point to a dialogue. Furthermore, political support, sufficient commitment and capacity on the part of all stakeholders, as well as sufficient time are necessary conditions for it to be a success. If these conditions are not present, then it is better to opt for a more classical administrative/political planning process.

* *Political formalisation*. Establishing a good link from the project to regular policy and political decision-making is essential to the success of a participative project. There must be a clear political mandate and political commitment, preferably in the form of a statement of clear political objectives as the go-ahead for the project. These objectives should challenge the participants, which could contribute to setting a learning process in motion. Drawing up rules of conduct and agreements is also useful at this stage. Politicians must be involved both during and after the project, and practice shows that this involvement can take various forms.

* *Problem of structure.* During the preparations for a participatory project, the problem will have to be defined to a certain extent. Precisely because different actors will have different points of view at this stage, it is unwise to define the problem too strictly in advance. Strictly limiting the selection of participants is also unwise since this is to the detriment of a creative and innovative learning process. Furthermore, the project should be timed to correspond with a political decision, and there has to be enough time to start a learning process, including the necessary knowledge gathering.

* *Process management*. At the start of a participatory project, the participants should have similar expectations as regards the approach to be taken, their input and the rules of conduct. Parties must agree on the objectives of a project and feel a shared responsibility for its success. An outline of the process can be laid down in an agreement on how it is to be conducted.

* *Weighing up of interests through dialogue and confrontation of perceptions.* In the project, there must be an exchange of visions and knowledge which addresses differences in the perceptions of the problem, its causes, options for solutions and their implications. It is essential that the knowledge is assessed in the social forum and that the forum instigates research. This could result in complete consensus about goals and means. If not, alternative packages and combinations of goals and means can be drawn up from which politicians can make a selection.

* *Feedback.* Organising the weighing-up of ecological and social risks in a participative project sets in motion a social learning process. Learning also implies that parties can observe results from changes in both their vision and behaviour. This implies that arranging feedback is essential and that where possible participants can continue to play their roles at the implementation stage. This is easier to achieve with organised representatives of interest groups than with individual participants.

* *External communication*. Good communication, both among the participants themselves and with the outside world or the people they are representing, is essential. This seems an obvious point to make, but communication is often not properly organised. The essence of the dialogues is that differing perceptions and their underlying subjective and normative foundations are exchanged. In projects where this is done successfully, it leads to the collapse of opinions that were believed to be self-evident, of assumptions that were initially regarded as certain and the discovery of solutions which were previously not even considered. It is essential that these learning experiences are shared with supporters and the wider public.

Participation is not restricted to improving the way in which the input of opposing interests in the political process is organised. Participation goes much further, because it shifts the learning process on sustainable development to the social actors, who are themselves responsible for the development. This far-reaching ambition fundamentally affects the role of politics and the government. Administrators must be prepared also to impose that learning process on the leading players in development. One could counter with the argument that the weighing up of social interests is already at the heart of political primacy. However, since the specific aim is to clearly anchor participative projects in the administrative/ political process, both at the start and at the end, participatory approaches in our view do not affect the primacy of politics. The decision to adopt an intensive participative method should be dictated by the question of whether the necessary conditions are present. These conditions are most likely to arise in strategic development plans with a longer time span, such as economic development plans, expansion plans and traffic policy, and are much less likely to occur in operational decisions and individual infrastructure projects, where the subject matter is limited to yes/no or here/there decisions.

New relations between the market and civil society

The relation between business and the environmental movement is a topic to discuss under this heading. More than any other relation in the triangle state-market-civil society this one seems to be a conflictuous one. Nevertheless I also recognise fundamental changes on this level. The concept of sustainable development itself is the main trigger factor. This concept is an expression of the thought that both ecological and economic aspect of development fully need attention. This opens up the way for pragmatic environmental activists and more idealistic entrepreneurs to scan the opportunities of partnerships. Examples of this kind of alliances are a.o. listed by Long and Arnold (1995 and Murphy and Bendell (1997). To give some examples:

McDonald's and the Environmental Defence Fund.

In this partnership the two organisations jointly studied McDonald's solid waste problems that were largely criticised by environmental groups. Their aim was to develop solutions that were both environmentally and economically acceptable. To realise this goal the partners set up a Waste Reduction Task Force. The result a.o. was a switch from polysterene to flexible paper packaging.

Dow Europe and the European Partners for the Environment.

This project enabled local, national and European environmental groups to discuss environmental management and stakeholder engagement issues related to Dow's manufacturing sides. In particular the project assessed how stakeholders could become involved in implementing the Eco-management and Auditing Scheme.

Unilever and the World Wide Fund for Nature.

The partners formulated as a shared objective to ensure the long-term viability of global fish populations and the health of the marine ecosystems on which they depend. As a solution they sought for market related instruments which was found in a certification of products from well-managed fisheries. Unilever will only source their fishery products from this certified products in the near future. Other companies are encouraged to participate.

Pollution Probe and Loblaws.

A partnership between a supermarket chain and an environmental group. The environmental group gave it's credit to the labelling of products as 'green products' by applying a set of environmental criteria. The idea behind this project was to stimulate consumers to consider environmentally preferable products.

This selection of cases presents a varied and broad view on possible partnerships. Many of the now documented agreements between business and environmental groups are from the USA. However, also in the Netherlands this kind of partnerships are recently concluded. Some characteristics call for attention.

First, that the partnerships never touch the core-business of a company. Most are an addition to already formulated goals. Some are an attempt to test the market for an environmentally friendly alternative product.

Second, though this is not fully expressed in the cases described, a conflict often precedes the collaboration. In the Netherlands for example many partnerships resulted from (the threat of) consumer boycotts.

Looking at this characteristics it seems possible to divide the partnerships in two categories: do-good partnerships and partnerships resulting from uncomfortability with the present situation.

The motives of the parties in the collaboration may be different, although there always is some congruency.

The motives of the environmental groups are partly altruistic. By concluding a partnership they expect to stimulate sustainable development quicker than along traditional more conflictuous lines. There also are more pragmatic considerations at play. The partnership might strengthen the positive image of the environmental group. The choice of a partnership is practical too. It saves negative energy that is related to actions, boycotts and juridical procedures.

The business partner might really be concerned about the environment as well. One is seeking a way to handle environmental issues better than before. Next to this positive involvement with environmental issues one tries to prevent actions and boycotts. For business a positive, green image, also is one of the main motives. This image often goes together with a search for chances and a position on future markets.

The partnerships seem to be most risky for the environmental groups. Looking at them from their position reveals a somewhat schizophrenic situation. A partnership always relates to one aspect or activity of a company. Environmental groups cannot refrain from being critical about other environmentally relevant activities of the same firm. So we see, for example, that the partnership between McDonald's and the EDF was concluded on waste management while at the same time McDonald's was fiercely criticised by environmental groups on more fundamental aspects of its activities. Another example is a Dutch partnership between Shell and Greenpeace on promoting solar energy, concluded at the time Greenpeace was fighting Shell on the Brent Spar. Striking in this context also is that an environmental group concluding an agreement often is criticised by other groups in the movement. A good example is Pollution Probe, an organisation that was attacked by other environmental groups because it was presumed to serve commercial interest without a clear operationalised set of criteria to determine on the 'greenishness' of products. A last risk to mention for environmental groups relates to their constituencies. Environmental groups are not used to negotiate on behalf of their members. Most of time they don't have an organisational structure which allows them to work on mandate. The professionalisation that is required to function effectively in negotiations runs counter to the skills necessary to function as an activist group.

How then should we value the partnerships in a more overall perspective? As a starting point I take the view that sustainable development implies change of behaviour. Partnerships seize upon this aspect. In this sense they undoubtedly fulfil a function in bringing about change. All partnerships somehow or another bring about the necessary dynamic in the societal field. They place environmental issues on the agenda of crucial actors in sustainable development. They also encourage public awareness of these issues. Although the real impact on environmental improvement is small, the partnerships might be a first step towards collaborations on more fundamental environmental concerns. The question to face is how to organise the alliances in such a way that a change takes place from collaboration on incidents to broader, long-term collaborative learning processes

Integrated regional environmental planning

Up to know I have paid attention to bilateral relations in the triangle. However, particularly at the regional level I observe some more complex collaborations in which representatives of the state, the market and civil society work together to develop and implement an integrated regional environmental plan.

A central question throughout this paper is whether the environment and the economy should be seen as intrinsically opposing interests.

When this is presumed to be the case, it is more or less taken for granted that a form of adversarial interaction will develop among the actors involved in questions of regional development. In this type of interaction, those who represent an interest assume that the advantage to be gained in co-operation is limited; one side's gain is always another side's lost. The actors perceive each other as opponents in this kind of interaction. And they act accordingly. During their interactions, the actors emphasise their differences and not what they have in common. They provide information that only reinforces their own position and attempt to restrict any discussion to policy alternatives that serve their own interests. Indeed, adversarial interaction is competitive and takes place in an atmosphere of distrust.

Alternatively, assuming that in principle the environment can be reconciled with the economy, another form of interaction is possible. This may be called collaborative interaction. In this kind of interaction, the parties seek opportunities to achieve consensus on a policy problem. Their joint quest for options that each of the parties can endorse takes place through constructive confrontation of the diverse interests. The parties perceive each other as being mutually dependent. Specifically, they need each other if the outcome of the interaction is to be satisfactory to every one of the participants. They examine the available information jointly, looking for solutions that do justice to as many of the diverse interests as possible. In this way, they try to widen the range of policy alternatives rather than to narrow it down. Collaborative interaction is constructive and takes place in an atmosphere of mutual trust (Gray, 1989).

In my view, to bring environmental aspects into regional planning in a responsible way, it is imperative to temper adversarial interactions, turning them into more collaborative ones. This collaborative interaction can be stimulated by adopting a different organisation of the planning process, i.e. to use a strategy of network management.

The object of this planning is to address both environmental problems and socio-economic problems simultaneously, bringing public and private actors in a structured process of collaboration. This kind of planning was developed at the end of the eighties in the Netherlands in ten or so regions, which together cover more than one-third of the area of the country. In a few of these regions environmental improvements and development had been stagnating for years due to conflicts of interests. Diverse government bodies, each supported by special interests groups blocked each other's decision making. In the new planning endeavour - an initiative of the Ministry of the Environment - the aim is to seek long-term win-win solutions for environmental and economic objectives in a project organisation in which public and private parties take part. Private parties include representatives of regional industry, agriculture and environmental groups. New opportunities are sought for those interests that are threatened by the environmental goals (depending on the kind of region: farmers or/and industry). The agreements are laid down in a covenant signed by the parties involved.

Since the beginning of the nineties we analysed a lot of these attempts to organise regional environmental planning as network management (Glasbergen and Driessen, 1994; Glasbergen, ed.,1995; Driessen and Glasbergen, 1996). I don't go into details of specific projects here, but refer to the publications. Important to note is that most planning projects were able to develop in a few

years a perspective and action plan for the region. Stagnation has been broken and new developments have taken root. Recently we analysed the projects again. Most actors are still positive about their project, though some problems have become clear. Implementation of the plans, for example, is not going as fast as one thought beforehand; projects related to economic aspects do better than projects for environmental improvement. Most important however is the lack of a clear insight into actual environmental quality and improvements related to costs and investments for each actor. Therefore it is very difficult to judge the relation between goals, actions and effects. Most projects want to go on and are now developing a better monitoring system and a more stringent co-ordination of activities (Driessen and Groenenberg, 1998).

Network management differs from traditional top-down environmental planning in many ways. The most obvious characteristic is that environmental objectives are not pursued in isolation; rather these targets are always related to other societal goals. Furthermore, there is less concern for the intended final situation. In contrast, more attention is devoted to the process that has to be set in motion in order to achieve this situation. Third, less use is made of coercion as an instrument. Instead, recourse is taken to consultation and negotiation among public actors (national, regional and local) and between public and private actors. Fourth, the traditional division between formulation and implementation of policy is broken down. While policy is being formulated, parts of it are already being executed.

Network management conducted in this way seems to stimulate greater creativity in finding solutions for regional planning problems than traditional forms of planning. Nonetheless, it also has some drawbacks. One of the most important is that consensus may be reached whereby each party, including government, is satisfied but the environmental problem is not solved.

On a more theoretical level our research indicated crucial elements of network management:

- - it should be demonstrated that continuation of the existing situation is not advantageous to any of the parties involved;
- - it should be made clear that the parties concerned are not capable of independently breaking an existing impasse or of bringing a solution to the environmental problem any closer:
- - a structured process of interaction and communication should be set in motion involving the public and private actors who have the most interest in the issue. The environmental objectives should be placed in a wider developmental perspective (for a policy field or region);
- the interaction and communication process should lead to a developmental perspective that the actors involved take as a package deal. In the end, each of the participants should derive more benefits on balance than they stand to lose with this package.

Reflections

The changes in planning for sustainable development discussed here have certainly not come about without conflict. Moderate conflict still is part of many of the collective arrangements between state, market and civil society. If we abstract from the policy games and divergent interests that manifest themselves in concrete cases, we see a clear development. In environmental planning 'learning' has become a more conscious part of strategies for change. Planning more and more takes the form of organising various learning processes in collaborations of stakeholders in environmental issues. This kind of planning may prove valuable where regulation seems to have reached an obvious dead-end. This situation is reached in the Netherlands and many other western developed democracies. In those countries environmental law is well developed and environmental targets have been formulated for the long run. At the same time those countries face a 'frozen' implementation process. This is the right time, not to replace regulation, but to enrich the options for governance. A new option is to bring business and environmental groups more effectively into environmental problem solving. This option changes the role of government from an agent who directly controls to an agent who takes care of policy processes in an open and discursive manner. Planning along these lines presupposes, next to long-term political objectives, a well-organised bureaucracy, the presence of well-organised interest groups and experience with participation in the making of policy. If, under these conditions, parties also experience mutual dependency, this planning is 'a reasonable alternative' (Glasbergen, 1996).

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Barriers to Sustainable Consumer Behaviour

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Abstract

While large scale, regionally concentrated food producers, processors and distributors are becoming more and more important, a number of consumers have become dissatisfied with this food system for various reasons. Some consumers search actively for alternatives. One of the more recent social innovations in the food sector is 'Community Supported Agriculture' groups (CSAs). The aim of these groups is to provide consumers with healthy, locally grown food while at the same time revitalise local food economies. Many argue that the local character and the commitment to organic agriculture are reasons why CSAs stabilise local food security, protect the environment, and preserve small-scale, family farm type food production.

In this paper, we investigate the barriers to participation in local organic food markets of the CSA kind. Using a household survey in upstate New York the analysis examines the question, what are demand barriers of these alternative food production systems?

The survey was conducted in two distinct areas of the same region in which several CSAs are located. One group of non-member households was chosen within a close regional match of the sample of member households of one adjacent CSA. A second sample of non-member households was selected from census tracts with the lowest incomes in Schenectady, NY.

With reference to this non-member survey the question is addressed whether CSAs are likely to provide a broadly accepted alternative or only a limited one and whether and how much consumers are willing to adjust their behaviour to make CSAs a potentially more widely acceptable model for more sustainable food production. To do so, the factors that influence the probability of someone to join a CSA farm are investigated. This information helps to understand for whom CSA is an interesting concept and how can it contribute to higher sustainability.

The survey shows that there is a potential for expanding the alternative food markets that CSAs represent. This claim is based on two findings: (1) General interest in CSAs is similar in both neighbourhoods; 20 percent of the people interviewed indicated an interest in becoming members. (2) The most important factors preventing food demand through CSAs are identified by use of a logit model. These are the factors which CSA groups would have to address in one or another way, if they want to expand.

Introduction

Large scale, regionally concentrated agricultural producers, national and multinational food processors and distributors have an impact on the local landscapes of production and consumption. Low prices for agricultural products and the high rate of conversion of prime farmland into real estate development have been the major agriculture-related problems in the Northeast United States over the last few decades. A study by the American Farmland Trust found that 74,000 acres of prime or unique farmland were converted into urban land in New York State between 1982 and 1992. This means that 33 percent of the land developed had been prime or unique farmland before (Sorensen et al. 1997).

At the same time consumers have become dissatisfied with the large-scale, industrialised, and impersonal nature of the food system. Concerns about their health, large distance food travels and the durability this system requires, as well as the homogenisation of food across the country and throughout seasons, has led a number of consumers to search actively for alternatives.

In this paper, we investigate the barriers to participation in local organic food markets of the CSA kind. These are local markets with special arrangements between consumers and producers. The consumers buy at the beginning of the growing season a share of the farms harvest and receive in return every week one or two bags of fresh and organically produced fruits, herbs and vegetables of the specific local farm. These markets are characterised by face-to-face communication between consumers and producers.

In addition to a survey of CSA members in the capital of New York State (Stagl and O'Hara, forthcoming) a non-member survey was conducted. The motivation for the latter was to investigate the demand factors that motivate a more general consumer group. Non-members were surveyed in two distinct areas of the same region in which the majority of CSA member households is located. One group of non-member households was chosen within a close regional match of the sample of member households. This sampling technique of a parallel sample[1] was chosen to match socio-economic characteristics that are often closely aligned with neighbourhoods. Usually neighbourhoods which are represented within one census tract are considered as relatively homogenous in terms of economic and social factors. A second sample of non-member households was selected from census tracts with the lowest incomes in Schenectady in New York State.

The question addressed here is, whether CSAs are likely to provide a broadly accepted alternative or only a limited one and whether and how much consumers are willing to adjust their behaviour to make CSAs a potentially more widely acceptable model for more sustainable food production. Therefore, the factors that influence the probability of a non-member to join a CSA farm are investigated. This information will help to understand for whom CSA is an interesting concept and how can it contribute to higher sustainability.

[1] See for example, Babbie 1998; Sapsford and Jupp 1996; Weisberg et al. 1996

Demand for organic food on the rise

The demand for organically produced food has steadily increased during the last two decades. As a result, in 1996, sales in the organic industry were $3.5 billion, which is still a tiny fragment of conventional food store sales of $421.8 billion (Hartman 1997). Recently, the Organic Trade Association (OTA)[2] published the first 'Manufacturer's Market Survey' which surveyed 56 producers of organic products. According to this study, sales of organic food climbed by 1997 up to an estimated $4.2 billion; an average growth rate of the organic industry of 24 percent was projected. The grain snacks and candy category had the highest estimated predicted growth rate at 89 percent, followed by frozen foods at 69 percent (Business Editors 1998).

In many areas, examples of successful natural food stores and, on average, 25 percent paid premiums (Morgan et al. 1990) has spurred increased readiness of conventional grocery chains to stock organic products. Park and Lohr (1996) found no confirmation of the common supposition in the organic industry that price premiums are caused by an undersupply to markets. They write, "(w)hile markets for various organic products do experience temporary episodes of excess demand, in the long run, demand factors are more important than supply factors in determining prices paid to organic farmers. Some of these factors are within the wholesale market, and others influence it through the marketing chain from consumers to retailers to wholesalers. This suggests that price premiums will not evaporate as more growers enter the organic market, assuming nonorganic price patterns remain the same" (Park and Lohr 1996:653). Thus, the demand side plays a crucial role not only for sustainability considerations but from a perspective of purely economic considerations in organic food markets as well.

A 1995 Food Marketing Institute (FMI) study showed that 25 percent of all consumers buy natural or organic foods at least once a week. Additionally, 42 percent of all supermarkets now carry organic food in their produce department, but only very few 'natural food shoppers' buy exclusively in natural food stores (90 percent also buy sometimes in conventional stores).

After the pioneering growth of food co-operatives and green groceries in the U.S. during the 1960s, natural food supermarkets[3] (like Fresh Fields/Whole Food Market, Inc.) have taken an increasing share of the market. After California and the Northeast, large chains started to expand in metropolitan areas of the Midwest (Dunn 1995).

An important difference between small natural food markets and 'green supermarkets' is usually that the latter do not rely on local producers but rather order centrally. Thus, the agricultural production technique differs, but not the distance that food is transported. Since the network of organic processors is loser, in some cases distances which processed food is transported are even longer. There are examples where potatoes are flown in from Colorado to be processed in Virginia into 'organic' potato chips (Goldreich 1998).

[2] OTA is a business association representing the organic industry in the U.S. and Canada. Its more than 800 members include growers, processors, shippers, retailers, certification organisations and others involved in producing and selling certified organic products.

[3] As defined by NFM as natural food stores larger than 5,000 square feet and offering fresh meat and seafood.

Thus, the organic food markets seem to consist of different segments addressing different consumer wants. The following empirical research refers exclusively to the segment of CSA which seem to address all of the above mentioned dimensions (organic, local, seasonal), but reaches so far fewer people than green supermarkets, green groceries, farmers' markets or food coops.

Survey Design

Survey region

The study area of the survey consists of those in which CSA members live, which for the present study includes the areas in and around Schenectady. This study area is served by several CSAs, e.g. Roxbury Farm CSA and CSA of Hudson-Mohawk. Schenectady, a city of 65,000 inhabitants, which is located on the Mohawk River and is part of the Capital District of New York State. Until the 1970s the headquarters of General Electric were located in Schenectady and this shaped significantly the city's economic, social, architectural and environmental situation. The population of Schenectady County decreased by 8.7 percent between 1970 and 1997[4]. Industrial production has been the determining factor, however it has decreased with General Electric's drawback from the region. In the whole Capital District 15,300 manufacturing jobs (- 28.3 percent) were lost over the last 13 years, a trend which was to be observed in most industrialised countries, however the extent was higher in the Schenectady area (CDRPC 1997).

Methodology

To analyse the demand barrier for CSA participation, a household survey was conducted. The survey was taken in the fall of 1997. The questionnaires were designed as self-administered. The questionnaire consisted of 24 mostly closed end questions. Several of the questions contained a rating scale.

The survey sought to investigate the willingness to adapt buying habits and the barriers to the participation in CSAs. Since this is a predictive question about certain outcomes, again a survey tool was considered most appropriate. Again the questionnaire is a self-administered written one, again including mostly closed-ended questions.

A short paragraph describing the CSA forms the starting point of the non-member questionnaire in order to avoid non-compliance because of a lack of understanding what the questionnaire is asking about. In a step-by-step approach households are asked which features of CSAs, if any, they find appealing and how willing they are to participate in such a project. The questions on socio-economic characteristics and attitudes of respondents were kept the same as in the member survey to allow for comparability.

The questionnaire was pre-tested with a random group of 20 consumers in supermarkets of the Capital District of New York. This process suggested several modifications in the wording and re-

[4] Sources: U.S. Census Bureau and 1998 Rand McNally Commercial Atlas

sponse options given in the questionnaires; these changes were incorporated in the final design of the questionnaire.

The samples of non-members were designed such that three different dimensions can be analysed, namely first, the comparison of members' characteristics and attitudes with other people living in similar and distinct neighbourhoods, and secondly, the possibilities for expansion in different socio-economic groups. Two groups of non-members (a) with presumably very similar socio-economic characteristics as members (their neighbours), and for reasons of comparison (b) with very distinct characteristics (low income) were chosen. Thus, the samples are non-probabilistic, i.e. they do not represent the population of consumers in its composition. Non-members in member neighbourhoods were chosen equivalently to the distribution of members, i.e. a 'parallel sample' – but not a matched sample – was selected to serve as a comparison group. As a test for the choice of the census tracts included in the test group of 'similar' non-members, educational attainments of members and non-members according to the U.S. Census were compared to assure the desired overlap in sample characteristics. The low-income neighbourhoods were identified by use of census tract information5. Low-income areas are in the case of Schenectady concentrated in Hamilton Hill, but also around Wagner Avenue/Myrtle Avenue/Alvey Street.

Non-member questionnaires were randomly distributed at people's homes in the identified neighbourhoods in Schenectady. To increase the return rate and the completion rate (Babbie 1998), interviewers arranged for a date to pick up the distributed questionnaires, usually a few days later. An option was also given to mail the questionnaires back to the interviewers. In such cases stamped and addressed envelopes were provided. In members' neighbourhoods 89 non-member questionnaires and in low-income neighbourhoods 61 non-member questionnaires, respectively. In the latter case, one factor (income) was already controlled for in the sampling process; thus only a smaller sample is necessary for the statistical analysis.

Empirical results and discussion

In analysing the non-member questionnaires of the survey two main questions were pursued: (1) What are consumers looking for when searching for an alternative way of getting their produce? (2) Are CSAs a niche concept for the upper middle class or are they of interest for a diversity of consumers?

Characteristics of sampled non-members

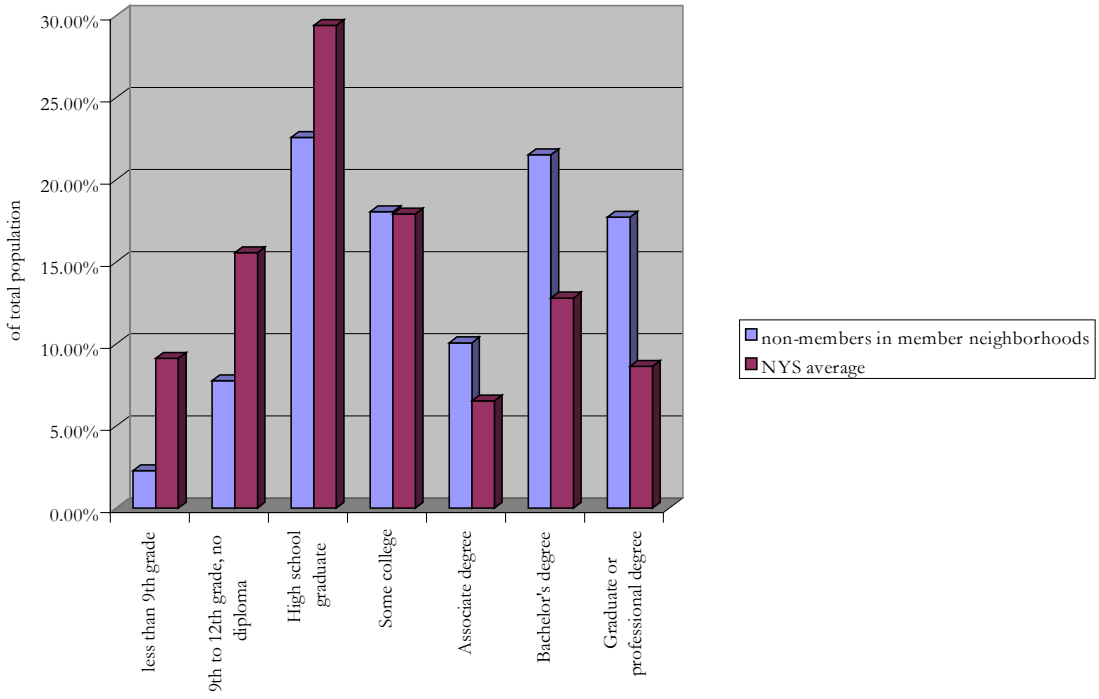
Non-members living in similar neighbourhoods as members

Non-members surveyed in the same or similar neighbourhoods where members reside have lived on average 32 years in the Capital District of New York State which is significantly longer (+78.4 percent) than members. People in these neighbourhoods live in households with an average size of 2.7 persons (which is just below the size of member households and statistically not significant, Stagl

[5] Information was retrieved from the U.S. Census Bureau "Street Locator" which is available on a subscription basis at http://www.census.gov/apsd/www/censtats.html. Information therein goes back to the 1990 census.

1999). In 34.1 percent of non-member households in members' neighbourhoods live children 14 years or younger. In terms of education non-members living in similar neighbourhoods also tend to be better educated than the state average.

Graph 1. Educational attainment of non-members in member neighbourhoods compared to the New York State average (people older than 18 years)



Sources: (U.S. Census Bureau 1990a; U.S. Census Bureau 1990b)

One of the hypotheses about differences between CSA members and non-members was that working more hours would hinder people from joining a CSA. If so, CSA members would work fewer hours than other people. However, adults in this non-member group work on average 41.09 ('adult 1') which is just 3 percent more than members' working hours; 'adults 2' in this non-member sample work on average 30.3 hours per week at their workplace which is significantly less (-18.8 percent) than secondary adults living in member households. Thus, the hypothesis that working hours are a distinguishing factor between members and non-members with similar socio-economic characteristics is not confirmed. Longer working hours which may make it difficult to fit in the extra time needed (e.g., for picking up the vegetables) do not appear to be a determining factor which keeps people from joining a CSA.

A significant difference between members and non-members living in similar neighbourhoods is, however, that fewer non-members in these neighbourhoods (39.3 percent compared to 73 percent of members) volunteer for worthy causes, and they do so for fewer hours (1.3 hours a week compared to the 3.3 hours that members do). Therefore, showing interest in and contributing to the social fabric of the community (in the larger sense) is more important for CSA members than for non-members.

For food preparation, non-members living in similar neighbourhoods as members spend about 10.7 hours a week (-3.6 percent than members). Non-members of this group eat dinner outside their home about 3.5 times a month which is somewhat less than members do (the difference is not statistically significant). 42.5 percent of the interviewees of this group have their own garden (+8.7 percent). 37.2 percent make compost (-30.2 percent compared to members), and only 16.3 percent bring their own bags when shopping for groceries (68.7 percent less than what members do). If the latter is seen as an attempt to avoid waste, it may be a sign of higher environmental consciousness of members compared to other people living in similar neighbourhoods.

Non-members living in similar neighbourhoods as members also get most of their groceries in supermarkets, but also buy from these other sources. In comparison with the members this non-member group buys less in health food stores and farmers' markets, but more in food coops.

Table 1. Frequency of shopping for groceries at the supermarket (in percent of total (=89) households)

Purchasing groceries in...	always	often	sometimes	never
supermarket	49.4	47.2	2.3	1.1
health food store	1.1	2.2	18	78.7
convenience store	0	4.5	24.7	70.8
food coop	3.4	20.2	15.7	60.7
Farmers' market/farmstand	1.1	4.5	58.4	36.0

A hypothesis about shopping habits of members was that members shop for their other groceries or supplement during the off-season not only in supermarkets but in health food stores and/or farmers' markets. The data from the survey suggest such a difference: members buy more often in health food stores and at farmers' markets/farmstands than other people living in the same neighbourhoods. 19 percent of the member group compared to 5.6 percent of the non-members in similar neighbourhoods said that they are buying always or often at farmers' markets/farmstands. 21.6 percent of members buys always or often in health food stores, whereas only 3.3 percent of the non-members investigated here.

With the exception of the highest income group, non-members living in similar neighbourhoods as members buy significantly more in supermarkets than members do. In all income groups, non-members buy more often in food coops and less frequently in health food stores and farmers' markets than members. As income probability to buy at the food coop increases, there is a weak tendency that purchases at the farmers' market or farmstand increase with income. Education enhances buying in food coops and health food stores, not purchases in farmers' markets.

In this group of non-members, what are peoples' attitudes? As can be seen from table 2, 81.2 percent of this non-member group 'strongly agree' or 'agree' that pesticide residues in food are a health risk. For 77.9 percent of them buying local is important ('agree' or 'strongly agree'). While these are lower percentages than for members, there is (surprisingly) a high agreement with these goals which are certainly important for sustainability. For only 27.4 percent of non-members living in similar

neighbourhoods as members, human interaction while buying is important and not even every third considers himself or herself politically active. 73 percent of interviewees in this group said that food processing has low priority in their households.

Table 2. Some attitudes of non-members living in similar neighbourhoods as members (in percent of total (= 83-86) households)

	strongly agree	agree	no opinion	disagree	strongly disagree
Pesticide residues in food represent a health risk.	43.5	37.6	9.4	9.4	0
Buying local is important for me.	30.2	47.7	18.6	3.5	0
It is important for me to have human interaction when I buy things.	11.9	15.5	44.0	25.0	3.6
I think of myself as a politically active person.	7.2	24.1	31.3	33.7	3.6
Food processing (e.g., canning, pickling, food drying, freezing) in my household is a low priority.	31.8	41.2	4.7	20.0	2.4

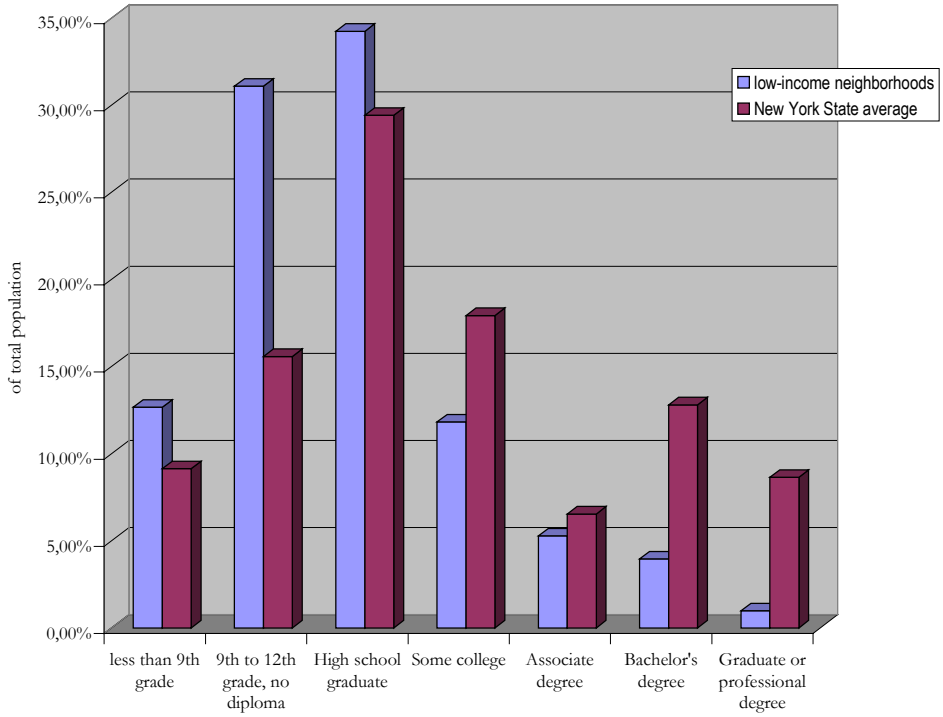
In this regard members and non-members living in similar neighbourhoods seem to be quite different. For members, pesticides in food are more of a concern, buying local is more important for them, interest in human interaction when buying is higher, and members consider themselves more politically active. 93.2 percent of the members compared to 81.2 percent of non-members in similar neighbourhoods considered pesticides in food as a health problem. For 91.9 percent of the members buying local was important or very important, whereas only for 77.9 percent of non-members investigated here. For 54.4 percent of the members human interaction when shopping was important, as compared to only 27.4 percent of non-members living in similar neighbourhoods. 55.4 percent of the members consider themselves as politically active, whereas only 31.3 percent of the non-members in these neighbourhoods do. From the information at hand, it can however not be said whether people with different attitudes than average people joined the CSA, or if it is the influence of the CSA that we are observing, or both. Yet, more information is available about the motivations for membership.

Some relationships between attitudes and shopping habits can be observed. Considering pesticides residues in food as a health risk increases the probability to buy at the health food store and in the food coop, but the relationship is much weaker than in the member group. While all interviewees of this non-member group who buy at least sometimes in health food stores or food coops (strongly) agreed with the pesticide question, only 21.2 percent and 30.6 percent, respectively, of those who (strongly) agreed then bought their groceries at least sometimes from either of these two sources. 45.9 percent of those who (strongly) agreed with the pesticide question bought at least sometimes at the farmers' market. 64.2 percent of non-members living in member neighbourhoods who (strongly) agree that buying local is important for them, buy at least sometimes at the farmers' market.

Non-members living in low-income neighbourhoods

Non-members living in low-income neighbourhoods have lived on average 32.0 years in the Capital District of New York State which is about the same as the other non-members surveyed. People in these neighbourhoods live in households with an average size of 3.2 persons (which is 11.5 percent larger than member households; the difference is however statistically not significant). People in low-income neighbourhoods are significantly less educated than the state average (see graph 2). In 52.5 percent of low-income households surveyed lived children 14 years or younger.

Graph 2. Educational Attainment of non-members living in low-income neighbourhoods compared to the New York State average (people older than 18 years)



Sources: U.S. Census Bureau (1990a); U.S. Census Bureau (1990b)

People living in low-income neighbourhoods work on average 34.5 hours per week ('adult 1') and 33.3 hours per week ('adult 2') at their workplace. This means by 13.1 percent (or 16.0 percent) shorter working hours for the primary adult compared to members (or other non-members), and for the secondary adult 10.8 percent longer (or 9.86 percent shorter) working hours than other non-members (or members).

39 percent of people living in low-income neighbourhoods volunteer for worthy causes which is the same share as other non-members, but they do so for longer hours (on average 2.9 hours per week) than other non-members - though not as much as CSA members (3.3 hours). Time used for food preparation and frequency of eating out dinner are the same in this group as for other non-members. However, fewer people in low-income neighbourhoods do compost (23.1 percent) or bring their own bags when shopping for groceries (13 percent).

Non-members living in low-income neighbourhoods get most of their groceries in supermarkets, but also buy from these other sources.

Table 3. Frequency of shopping for groceries at the supermarket (in percent of total (=61) households)

Purchasing groceries in...	always	often	sometimes	never
supermarket	63.9	26.2	9.8	0
health food store	0	6.6	14.8	78.7
convenience store	0	3.3	34.4	62.3
food coop	0	4.9	14.8	80.3
farmers' market/farmstand	3.3	11.5	42.6	42.6

People in low-income neighbourhoods get their groceries to a larger share than the other groups of this survey from supermarkets. As expected, people living in low-income neighbourhoods shop less frequently in health food stores and food coops which is probably due to higher prices there as well as due to the fact that these shops are not located in low-income neighbourhoods and thus require transportation to get there. Farmers' markets which take place in downtown Schenectady seem, however, to be similarly prominent as with other non-members. In all income ranges farmers' markets or farmstands are named as common alternative food source.

In this group of non-members, what are peoples' attitudes?

Table 4. Some attitudes of non-members living in similar neighbourhoods as members (in percent of total (= 54-57) households)

	strongly agree	agree	no opinion	disagree	strongly disagree
Pesticide residues in food represent a health risk.	50.9	33.3	12.3	1.8	1.8
Buying local is important for me.	36.8	38.6	24.6	0	0
It is important for me to have human interaction when I buy things.	23.6	36.4	38.2	1.8	0
I think of myself as a politically active person.	11.1	16.7	46.3	18.5	7.4
Food processing (e.g., canning, pickling, food drying, freezing) in my household is a low priority.	21.4	37.5	17.9	12.5	10.7

As for the other group it can be observed that a very high percentage of people (84.2 percent) consider pesticide residues in food as a health risk. More than three quarters of the group of people surveyed, who live in low-income neighbourhoods of Schenectady, give (high) priority to buying local. From these results it can be seen that concern about polluted food and desire to buy locally is not limited to certain income or education groups. What is different, however, is the degree of concern. Taking the intensity of concern into consideration and comparing the means indicates statistically significant differences exist between CSA members and low-income non-members.

Food processing is given more importance in low-income neighbourhoods than in the other survey groups. This may be at least in part due to the fact that many households probably cannot afford the more expensive processed foods. Being more used to process food at home may make people in these households more interested in CSA shares.

To conclude, very high percentages of people of all three survey groups stated that they consider pesticide residues in food as health risks and that buying local is important for them. As described in chapter one, current trends in the food industry do not contribute to solutions for these concerns. Difference in the attitudes to other groups can be observed though differences are not as big as expected. And within the neighbourhood differences in income and education do not lead to significantly different shopping habits.

With regards to non-members two questions arise: (1) What are the factors enhancing expansion possibilities of CSA groups? (2) What are demand barriers to expansion?

Non-members' reasons for interest in CSA

When asking non-members whether they wanted to become members of a CSA 37 (24.7 percent in similar neighbourhoods as members live and 24.6 percent in low-income neighbourhoods) said 'yes', they were interested, 110 were not, and three did not answer this question. While there may still be a large difference between people saying they are interested and then actually taking the action of becoming members, the fact that every forth household said they wanted to become members indicates widespread interest in local alternative food markets.

'Getting fresh vegetables' was the prime motivator for people to be interested in CSAs, concern for the environment was named second, 'doing something for my health', 'supporting local farms' and 'eating vegetables in season' followed. The motivations of people interested in joining a CSA were quite similar to the factors named by the members as reasons for joining Roxbury Farm CSA. Only 'getting organic vegetables' was the second most important reason for members, whereas it was on average only ranked eleventh by non-members. The price of vegetables played a higher role for interested people than it had for members when joining.

Table 5. Factors of motivation ranked by degree of agreement (non-members living in similar neighbourhoods as members who were willing to join a CSA)

(from question 7 in questionnaire, possible answers were: 1 = very important, 2 = important, 3 = indifferent, 4 = unimportant, 5 = very unimportant; coding reverse from questionnaire!)

Motivation for joining	Means[6]
1. Fresh vegetable	1.36
2. Support local farms	1.5
3. Concern for environment	1.5

[6] The means are calculated from answers from the following choices: 'very important' = 1, 'important' = 2, 'indifferent' = 3, 'unimportant' = 4, 'very unimportant' =5

4. Doing something for health	1.55
5. Eat vegetables in season	1.81
6. Reducing packaging	1.82
7. Know where food comes from	1.86
8. Price of vegetables	1.9
9. Know how vegetables grown	2.05
10. Organic vegetables	2.45
11. Know about biodynamic farming	2.61
12. Know how to grow vegetables	2.75
13. Take children to farm	3.37
14. Work at farm	4.16

Despite their success in the U.S. during the last decade, CSAs are often seen as a niche concept. In order to find out if this is a realistic view of CSAs or not, the factors influencing people's decision to join a CSA group ought to be analysed. To do this I will, in the following, use a binomial logit regression model to estimate the probability of becoming a CSA member.

Formalising the analysis: an assessment of member motivations

Model[7]

Based on the literature review and demand theory the following conceptual model describes the hypothesised relationships of various characteristics to a household's decision to join a CSA.

- *Environmental concern and interest in supporting the local economy increase the probability of joining a CSA farm.*

  The history of CSAs (Groh and McFadden 1997) indicates and several past studies found that values like concern for the environment (e.g., Kolodinsky and Pelch 1997) and the existence of local food production (e.g., Ostrom 1997) were prime motivations for joining or staying with CSA groups.

- *Higher income increases the probability of becoming member of a CSA group.*

  Different studies had found seemingly contradictory results with regards to the influence of income on the likelihood to become a CSA member. On the one hand, CSA shares were assumed like food in general to be a normal good, i.e. higher income increases demand, and analyses of members' characteristics found that CSA groups were characterised by above average income (Ostrom 1997). On the other hand, Gilman (1997) showed in his study that low-income as well a

[7] For a similar model see for example Kolodinsky and Pelch (1997)

wealthy people were CSA members alike, and Kolodinsky and Pelch (1997) did not find income to be a significant factor influencing membership.

- *People with a stronger link to their community are more likely to join a CSA farm.*

  People who show pro-social behaviour by doing volunteer work, are supposed to be more interested in the CSA concept. Existing social networks may also be channels for membership recruitment.

- *Higher price of the CSA decreases the probability of becoming member a CSA group.*

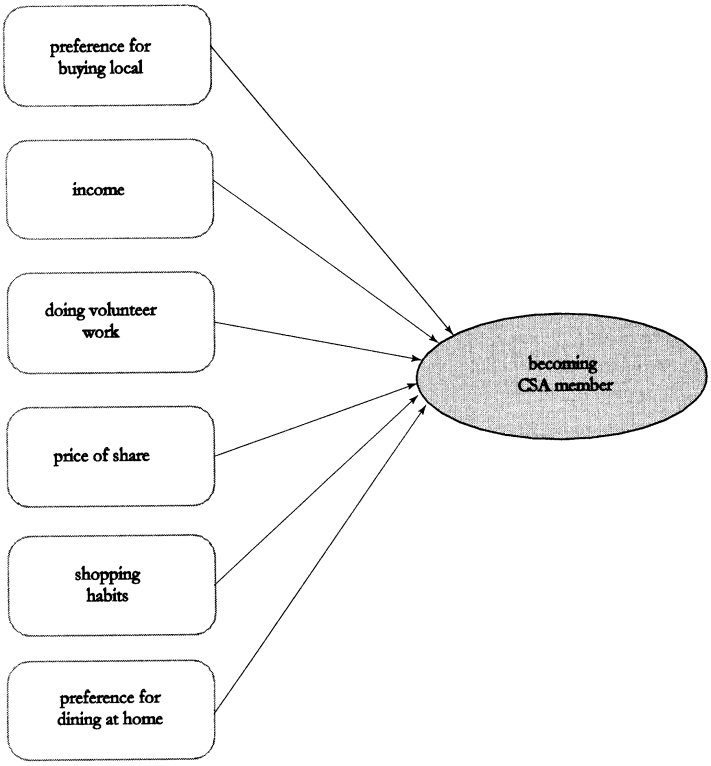
  Demand theory shows that in most cases the higher the price of a good the lower will the quantity be demanded.

- *Shopping habits will influence the readiness to join a CSA, i.e., a different shopping routine.*

  It is expected that for people who purchase all their groceries from a supermarket, there would be a higher barrier for joining a CSA.

- *Eating out decreases the need for produce shopping.*

Graph 3. Conceptualisation of the factors influencing people's decision to join a CSA



To operationalise this conceptual model a logit model is used. A logit allows for the estimation of factors influencing the probability that a (dependent) factor will be 0 or 1. The logit is linear in X, but the probabilities themselves are not. The logit allows for calculating the odds ratio for becoming a member of a CSA. The logarithm of the odds ratio can be calculated as follows:

$$L_i = \ln(\frac{P_i}{1-P_i}) = \beta_1 + \beta_2 X_i \qquad (1)$$

where X_i represents the attributes of individuals who may join a CSA group.

In our case the dependent variable is "want to become member of a CSA" (becmem7[8] = 1) or "do not want to become member of a CSA" (becmem7 = 0)[9].

To estimate the probability the following equation was used[10]:

becmem7 = ß$_0$ + ß$_1$ pchse2a + ß$_2$ pchse2b + ß$_3$ pchse2c + ß$_4$ pchse2d + ß$_5$ pchse2e + ß$_6$ amount3a + ß$_7$ gender11 + ß$_8$ cdliv12 + ß$_9$ volun13a + ß$_{10}$ volhr13d + ß$_{11}$ etotd14a + ß$_{12}$ etotd14b + ß$_{13}$ etotd14c + ß$_{14}$ oprsk15a + ß$_{15}$ oplcl15b + ß$_{16}$ ophum15c + ß$_{17}$ oppol15d + ß$_{18}$ agenk17i + ß$_{19}$ child#17 + ß$_{20}$ pershh17 + ß$_{21}$ highedav18 + ß$_{22}$ garden19 + ß$_{23}$ compst20 + ß$_{24}$ pci100021 + ß$_{25}$ avhrswka22 *(2)*

Results

If all 150 non-members interviewed are included the following factors prove significant:

Variable	ß	mean	standard deviation
pchse2a	1.4553***	1.51	0.63
amount3a	-0.6407*	2.47	0.72
volun13a (dummy)	1.2864**		
oplcl15b	-1.1047***	1.92	0.79
oppol15d[11]	0.5719**	2.99	1.03
agenk17i	-0.0324*	46.4336	14.3116
pci100021	0.0482**	20.4420	14.4123
Constant	-3.1470		

*n = 118 (valid); * indicates p < 0.1, ** indicates p < 0.05, *** indicates p < 0.01*

Using the means of the data, the calculated probability of a surveyed non-member becoming a CSA member is 10.58%. The strongest impacts on this probability were found to be (a) shopping habits,

[8] The numbers at the end of the variable names indicate the question in the survey they belong to.

[9] The precise question was, "Knowing all the above about CSAs would you be interested in joining a CSA?"

[10] see appendix for the list of variables

[11] This somewhat surprising result that people who agreed with the statement 'I think of myself as a politically active person' instead of having no opinion on this statement had a 43 percent lower probability of becoming members is in our opinion due to significant differences in political interest between the two non-member groups which were interviewed. This factor did not show up as significant when the two groups were tested separately.

(b) volunteer work and (c) preference for buying locally. For people who shop in supermarkets instead of 'often to always' or only 'often', the probability to join a CSA more than doubles (+107.08%). This means that people who buy already at least sometimes in health food stores, food coops or farmers' markets are much more likely to become members than people who shop almost exclusively in supermarkets. For people who do volunteer work the probability to become a CSA member increases by a factor of 2.62, thus the probability becomes 38.29%. For people who 'strongly agreed' instead of 'agreed' that buying local was important for them, the probability to become members was 29.23%. Compared to these factors the effect of income is moderate: if the annual income of a household is $1000 above the mean, the probability of becoming a member increases by 4.94%. Younger people seem to be more likely to become members. Every year in which people's age was above the mean had the effect of decreasing the probability of becoming a member by 3.19%. Fears that a CSA share offered too much produce for the household of the interviewee also decreased the probability of becoming members (-37.76%). Another factor which only proved significant when the two groups of non-members (low-income neighbourhood and members' neighbourhoods) were tested independently was "eating out for dinner".

As was expected, being willing to pay the given price is a pre-condition for becoming a CSA member[12]. 5 interviewees indicated that they needed a payment plan to afford the share. All the others who said that they were ready to join a CSA accepted the given share price of $300 which was the expected share price at Roxbury Farm CSA for the upcoming season.

The survey distinguishes between two specific groups of non-members (wealthy and low-income neighbourhoods). Investigating the two distinct groups revealed some differences in the factors influencing their decisions[13]. In the low-income neighbourhood, in addition to the variables mentioned above, the number of children living in the household proved significant; an increasing number of children had a negative effect on becoming CSA member. Time and organisational capacity gets scarcer when there are more children to be taken care of. This result is also reflected in the low priority (mean: 2.43 = between 'unimportant' and 'indifferent') given to the possibility of 'taking my children to the farm' (question 7o) by those families with children between 0 and 14 years old and wanting to become members of a CSA. Another interesting aspect when comparing the two interviewed non-member groups was that in the low-income group household income was more significant than per capita income.

The above results allow us to address the seeming contradiction mentioned in hypothesis one namely, that people living in low-income neighbourhoods were equally interested in the concept, while income proved to be a significant factor for membership.

On the one hand, people living in low-income neighbourhoods showed (practically) the same interest in becoming members as people living in wealthy neighbourhoods. In our survey 25 percent of inhabitants of a wealthy neighbourhood and 25.4 percent of inhabitants of a low-income neighbour-

[12] Non-members were not asked for willingness to pay other prices.

[13] An analysis of the quantitative impact of the different factors on the probability of becoming member is technically possible, does however not seem reasonable with regards to the sometimes small sample sizes these numbers would be based upon. Thus the different factors are only listed as indications of different trends in the two groups.

hood[14], respectively, said that they wanted to become members of a CSA. Thus, no significant difference in the willingness to join a CSA was to be observed between the two groups.

On the other hand, income was one of the statistically significant factors influencing the decision to join a CSA. The latter result means that CSA shares are a normal good, i.e., income increases demand for CSA shares goes up as would be expected for all food. Thus, our results indicate that while I control for other factors income is a (somewhat) significant factor. Otherwise factors, like doing volunteer work or preference for buying local, play a much more important role. From this I conclude that CSA is not only an appealing concept for wealthy people, but for non-wealthy alike. CSA groups may still be a niche concept, however, not one solely for people with high incomes, but also one for various groups with special characteristics and preferences.

Interest in buying locally was found to be a strong factor motivating people to join a CSA. Supporting a local farm in an environment where farms are endangered by land being converted by development and knowing where the food comes from are important determinants for this factor.

A factor which had not been considered in other studies was the role of volunteer work. Participating actively in the community by doing volunteer work was found to be an important factor describing people disposed for CSA membership. The active involvement in community work does demonstrate that these people do have preferences which are wider than just maximising individual utility. They show an interest in the collective and society as a whole.

Demand barriers

To find out how viable CSAs are in terms of larger receptivity, we need to understand the demand barriers. The most obvious demand barrier would be a lack of information. Only seven interviewees who said that they were interested in joining knew before the interviews what was a CSA . For the other 30 people who showed interest, not being aware of the concept may have played a role for not having yet joined. Of the total sample of 147 non-members, 22 knew about CSA and were not interested. For these the information argument surely does not apply.

A more detailed analysis of the questionnaires reveals more demand barriers. The following table 6 lists the most common reasons which non-members in member neighbourhoods gave for not being interested in becoming member of a CSA.

[14] n = 89 and 61, respectively

Table 6. Demand barriers - non-members living in similar neighbourhoods as members

Reasons	Frequency
1. Cannot make an extra trip	16
2. Too much vegetables	13
3. Inconvenient; too troublesome	12
4. Need to know in advance	11
5. Pick-up is too far away from home or work place	9
6. Share price too high	8
7. Scheduling problems	8

Factors influencing these reasons given not wanting to join a CSA can be found by running logistic regressions for each of the named reasons. Being accustomed to buying (exclusively) in supermarkets and having children decrease the readiness to make an additional trip to pick up the CSA vegetables. The problem that a CSA appears to offer too much vegetables for some people cannot be explained easily. As was expected, smaller households and households with their own gardens are more probable for considering the quantity supplied every week in comparison to large ones. Other probable factors like frequency of eating out did not, however, prove significant. Probability for considering CSA as 'inconvenient' or 'too troublesome' increases with the following factors: people who never or rarely shop in food coops seem to find extra stops for grocery shopping more troublesome than do others. More women, better educated people, and people with higher household income find CSAs particularly inconvenient. Again, it can be seen that income and education alone do not prove to be the main determinants for increased probability for membership. Having a higher preference for buying local and being more politically active reduce the barrier of 'inconvenience'. More children increase the desire among interviewees to know in advance which vegetables and fruits to expect each week. People who had already heard about the concept of CSA reduced the problems people have with the insecurity about the content of the CSA share. The more often people have already bought in the past from farmers' markets or farmstands the less this insecurity seems to be a problem. Supermarket shoppers, men and younger people are more likely to say that a pick-up is too far away from their home or work place. Working hours of second adult, lower education, not often buying at farmers' market/farmstand and household income (very small impact) increase naming scheduling problems as reasons for not being interested in CSA. People buying already at the farmer's market may be used to limited opening hours. Households with higher incomes may have more social obligations and therefore less time on hand for extra activities like picking up vegetables from the distribution site.

Most common reasons which non-members living in low-income neighbourhoods gave for not being interested in becoming member of a CSA were the following.

Table 7. Demand barriers - non-members living in low-income neighbourhoods

Reasons	Frequency
1. Cannot make an extra trip	16
2. Share price too high	13
3. Need to know in advance	12
4. Pick-up is too far away from home or work place	11
5. Scheduling problems	6
6. One pick-up day is not enough	6
7. Transportation problems	5

For people living in low-income neighbourhoods, lower education, less interest in human interaction when shopping, more often buying in supermarkets, and (again) having children hinder people from making an extra trip. Infrequently buying in health food stores, lower per hour earnings, not so often eating out for lunch and higher average working hours make people feel that the share price is too high. Like for the other non-member groups, having children increases the desire to know in advance which vegetables to expect. Some acquaintance with the (un)predictability of nature's fruits, like through having their own garden reduces the need for a priori information about the produce deliveries. Older people with higher earnings per hour, but interestingly also those working on average fewer hours, said that the pick-up point seemed too far away from their home or work place. Scheduling problems arise as different activities compete. Longer average working hours and more volunteer activities increase the probability of scheduling problems hindering people to join a CSA.

Conclusions

Just as farmers have fewer and fewer substantive choices about how to farm, U.S. consumers have in many regions fewer and fewer diversity to choose where to buy their groceries as large supermarkets replace small stores. Through their financial power transnational food conglomerates increasingly condition the geographic location, product specialisation, financial structures and ownership patterns of farmers around the world.

Local initiatives like CSAs are an attempt to reassert social control over the terms of the economic relationships surrounding the production and consumption of everyday material necessities. While this was a motivating factor for many CSA groups in their formation, expectations of potential new members are lower. Non-members interested in CSA were found in our study to consider themselves as less politically active than did other interviewees. What they hope to get from a CSA, however, is high quality, healthy, environmentally soundly produced food that they know from where it comes. It seems that – independent of how politically active people are otherwise – they find that the commodification of food which resulted in a product designed for durability and transportability much like any other form of merchandise, rather than nutritional quality or use value, has gone to far. Members and non-members interested in CSA search for a possibility where they have a voice in how food is grown, processed and marketed.

From our own findings as well as other sources several limitations of the CSA concept have come to the forefront: Lack of information seems to be the primary barrier for households for membership. Other barriers to participation in CSAs as local food system were found to be: (a) the limitations of food supply to the local growing season - CSAs can be considered only complementary to grocery shopping in stores due to the restriction on produce and limited availability during the winter months; (b) the results of the survey, indicated demand barriers to the concept (particularly due to the necessity of making extra trips, reduced predictability in pre-planning meals, scheduling problems and the perception of the concept as being too troublesome); (c) CSAs function best in the greenbelts of large city areas and not so well in rural areas; (d) as other studies indicate (e.g., (Ostrom 1997), CSA farmers often work long hours and may not earn a living wage and all too frequently the 'community' never materialises; (e) the payment of CSA shares comes from income potentially earned in unsustainable production; (f) CSAs have no controls built into the movement that could prevent the appropriation of the concept in the interests of economic profiteering (Ostrom 1997).

Thus, CSAs remain a small and limited alternative and cannot be expected to make a sizeable contribution to achieving greater sustainability in food production. The analysis conducted here, however, did reveal valuable insights about consumer motives and about the dynamic nature of consumer preferences. This analysis, in turn, creates a better understanding of how people might be receptive to more sustainable solutions. Beyond the immediate impact on CSAs these insights may also prove relevant to the much larger groups of fair trade and equal exchange consumers. Like these larger alternatives, CSAs indicate a dissatisfaction of people with the environmental and social consequences of the current food production and trading system. While CSAs cannot be expected to constitute a significant segment of the food markets, they seem to address consumer needs and wants not satisfied in conventional food markets. What is remarkable is the broad concerns that consumers have for food quality. The definition of quality is not restricted to product characteristics (as assumed for example in GATT), but is certainly related to the process of production as well. Furthermore, both CSA members and non-members indicate a concern for environmental quality albeit as it relates to their own health. Also social concerns like supporting local farms rank high. This leads to the conclusion that time constraints and inconvenience aside there is a general concern of consumers for sustainability issues. Alternative food systems, which are able to address the lifestyle constraints that households face, can be expected to constitute successful alternatives to conventional food markets.

Many CSAs were started as an initiative of rather well educated and environmentally conscious people. Taken to the extreme, a group of wealthy Microsoft and Boeing employees recently bought a piece of land in the Sammamish Valley near Seattle. They are now encouraging farmers to start CSA type operations there (Deseret News 1999). CSAs and other local food initiatives do not make as far reaching claims as some of the strong and growing environmental justice movement in the North and South described by (Guha and Martínez-Alier 1997). However, CSAs do often have a social justice component. For example, over time they tend to branch out to other income groups and often have a certain number of free shares or work shares for low-income households. As the analysis of receptiveness of non-members to become members showed, the concept was equally well received by non-member households in low-income neighbourhoods as in more wealthy neighbourhoods. Thus, if CSAs can accommodate the needs of low-income households through payment plans, free or re-

duced-price work shares, and/or a larger number of pick-up points to avoid the transportation problem, this group of consumers would probably be a possibility for expansion.

The demand barrier reported most often was that consumers are not able to make another trip in addition to their usual grocery shopping. Some CSAs chose, therefore, to offer the possibility of home-delivery. Another venue taken is networking with other farmers and with food processors. If farmers themselves were able to offer more processed food, like bread, yoghurt, or canned vegetables, they could also retain more value added. Recently Roxbury Farm CSA has made an attempt to complement their assortment offered to Columbia county customers. A group of members had encouraged other local organic farmers, producers of organic dairy products, and locally processed organic food products to make available pre-order lists for their goods. CSA members can then pick up their orders in a separate corner of the barn when they come to get their shares. Ostrom (1997) described a more advanced network of CSA farms that had started to share the goods produced, and by doing so, offered a larger variety of goods to the consumers. Such networks are also a way to allow farmers to share expenses for equipment necessary for processing their products. Through the higher value added, farmers can earn a higher income. Similarly, the 'Erzeuger-Verbraucher-Initiativen' (producer-consumer-initiatives) in Austria started as a close relationship between a group of consumers and a few farmers. Over the years, the number of farmers supplying the store, which was then set up, grew to 45 farmers. At the same time an increasing share of processed food and household merchandise was brought into the store. It is these two categories of goods that now constitute the largest share of the store's revenues. Store-like settings allow to address some of the most pressing demand barriers, namely 'cannot make an extra trip', 'too much vegetables', 'scheduling problems', and 'one pick-up day is not enough'. Such initiatives may help to overcome some of the demand barriers reported above. The drawback is that the direct relationship between farmers and consumers is largely lost. Further, depending on where processors of organic foods are located, the local dimensions of the alternative food market might also get lost.

Expansions of alternative food systems thus are particularly promising as they address the current time constraints, inconvenience, and other demand barriers.

Appendix - List of variables:

variable name	meaning
now4b	motivation: getting organic vegetables
now4c	motivation: supporting local farms
now4d	motivation: eating vegetables in season
now4e	motivation: knowing where food comes from
now4f	motivation: concern for the environment
now4g	motivation: developing a (stronger) sense of community
now4h	motivation: knowing how vegetables were grown
now4i	motivation: price of vegetables
now4j	motivation: sharing the risk with farmers

now4k	motivation: doing something for my health
now4l	motivation: reducing packaging
pchse10b	buying groceries in health food store
pchse10c	buying groceries in convenience store
edav	highest education level attained – average of adults living in a household
edhigh	highest education level attained – highest of adults living in a household
oprsk21a	opinion about pesticides representing a health risk on food
oplcl21b	opinion about buying locally
ophum21c	opinion about the importance of human interaction while shopping
oppol21d	own perception about degree of political activity
opcan21e	importance given to food processing at home
agenk24i	average age of people older than 14 years living in a household
tothse24	total number of people living in a household
wkad129a	weekly working hours of adult 1
wkavhrs	average weekly working hours of adults living in household
hhincal	household income – calculated from income ranges given
earnphr	earnings per hour (household income/average weekly working hours)
prephr30	time spent per week on food preparation in hours

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