Session 9.

A Sustainable Baltic Region

Foundations of Sustainable Development

Ethics, law, culture and the physical limits

Editor
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Uppsala University

A Sustainable Baltic Region

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Foundations of Sustainable Development

Ethics, law, culture and the physical limits

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Preface

In the debate on development and environment, the word 'sustainability' is used in many different contexts and by many different groups and people. It is obvious that it expresses quite different meanings and connotations. Sustainability *or* sustainable development acts as a metaphor for hopes, fears and visions that are not always spelt out. When browsing through a discussion on the subject in one electronic conference one may find, for example:

"There has been a world-wide interest in 'sustainable' development and everyone is mouthing the words. Could the problem with moving from our present insanity to a sustainable world have something to do with the 'definition'? Here is my definition of sustainable development: 'Sustainable development is improvement in the quality of life while remaining in a state of continuity with the initial physical conditions'." (jhanson@ilhawaii.net)

"Sustainability comes from the Latin root meaning to 'support from below'. To sustain means to maintain, to supply with nourishment, and to support the vitality of something. According to the Context Institute 'A community must be supported from below – by its inhabitants, present and future ... through the peculiar combination of physical, cultural, and, perhaps, spiritual characteristics, inspire people to care for their community'." (rflyer@earthlink.net)

Already in these texts we find references to physical conditions, political statements, issues of justice, well-being and spiritual growth. A similar spread of approaches is typical in discussions with friends and colleagues. Our task in this booklet is to attempt to analyze these foundations of sustainability. In particular, focus is put on its ethical dimensions (Chapters 1–3). The booklet also reflects how the values expressed by the concept of sustainability are implemented in law (Chapters 5–6), in culture and, in fact, in the civilization shift that may be expressed (Chapter 8). The development component of the expression is also penetrated (Chapter 4).

The fact that in the debate the concept of sustainability is vague is sometimes perceived as a weakness and is said to expose the word to political exploitation and even to make it meaningless. However it does not necessarily constitute a problem. Terms such as 'health' and 'peace' are also vague but nevertheless important, even indispensable, and useful and can be made precise and measurable. In Chapter 7 the different approaches to operationalize sustainability are analyzed by defining its physical limits and providing indicators to monitor it. The social and economic components of sustainability have, however, not been possible to penetrate in this booklet, or, in general, in this series of booklets. The emphasis remains on resource exonomics and ecelogy.

The booklet comprises contributions from many individuals concerned with the roots of sustainability. I want to take this opportunity to express my appreciation to all the co-authors of the book, who could contribute only by adding one more task to already full work schedules. Our aspiration is that you, the readers of the book, will discuss and penetrate the meaning of sustainable development and find your own platform for creating a good and hopeful future for yourselves, our communities, our countries, our Baltic region and our World.

Uppsala, February 1997

Lars Rydén
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Principle 3 of the Rio Declaration:

"The right to development must be fulfilled so as
to equitably meet developmental and environmental needs
of present and future generations."

1.

Environmental Ethics and Sustainable Development

by Mikael Stenmark

1.1 What is environmental ethics?

One of the most urgent problems facing humanity today is the environmental damage which threatens our planet. The crucial question is how we can achieve a 'sustainable society', or what is often called 'sustainable development'. But what are the characteristics of a sustainable society or of sustainable development, and what contribution can environmental ethics make towards the solution of this urgent problem? What, after all, is environmental ethics? These are some of the questions that we shall deal with in this section of the book.

The classic definition of sustainable development as the goal which we should strive to obtain if we want to save ourselves and the Earth from extinction, is offered by the World Commission on Environment and Development (UNCED). They write:

> *Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs. [World Commission 1987, p. 43]*

The idea of sustainable development has come to dominate late twentieth-century discussions on environmental and developmental policy. It is now perhaps the main framework for understanding the relationship between economic, social and ecological problems. For many people it provides a common vision for the future as well. 'Sustainable development' is also the key term that binds all of the books in this series together.

The questions we are to ask in this chapter are, among others: Are there any values involved in accepting sustainable development as the long-term goal for the Baltic region? If so, what are these values and why should we accept them? Questions such as these are the topic of the academic discipline, environmental ethics. The task of environmental ethics is to study systematically and critically the values and attitudes that govern (whether consciously or unconsciously) our treatment of the natural world. Other questions of environmental ethics are: Why should a society be concerned to limit the destruction of the varied natural ecosystems that provide the habitat for wild species? What sort of development or growth is not only economically and ecologically acceptable, but also morally acceptable? What does it mean to say that we ought to take into account the needs of future generations and how can this idea be justified?

Environmental issues raise fundamental questions about what we as human beings value, about the kind of beings we are, about the kinds of lives we should live, about our place in nature, and about the kind of world in which we might flourish.

Joseph R. DesJardins

Any ethics which attempts to guide us in our treatment of nature are a form of environmental ethics. Hence the basic issue of environmental ethics is not how people ought to relate morally to other people, but how they ought to relate to nature – to animals, species and ecosystems. We must therefore distinguish between environmental ethics and human ethics, that is, the systematic and critical examination of attitudes and values that influence humans' behaviour towards other humans. A central question for the ethicist is how these two kinds of ethics are related. How should competing moral claims arising from conflicts between human ethics and environmental ethics be resolved fairly? An example of such a situation would occur when an environmental duty to preserve the biosphere or large ecosystems comes in conflict with a human duty not to violate other people's freedom.

1.2 Norms and descriptions

Within ethics it is common also to distinguish between descriptive ethics and normative ethics. The task of descriptive environmental ethics is to detect the values that form the basis for the standpoints which individuals, organizations and governments adopt on environmental issues. It involves identifying, describing and classifying the values that directly or indirectly influence our behaviour towards nature. However, in ethics, one not only asks what values and attitudes *do* in fact govern people's behaviour towards nature, but also what values *should* govern people's behaviour towards nature. Hence a second aspect of ethical reasoning involves making critical judgements, suggesting advice, and offering ethical guidelines. If, for instance, individuals and governments have to re-evaluate their relationships to the environment, in exactly what ways does this need to be done? What values are ethically acceptable and mandatory if the aim is a sustainable society? Questions such as these are the agenda of normative environmental ethics.

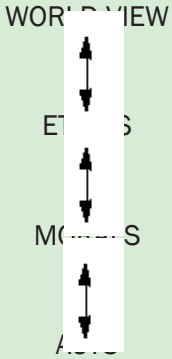
What is Ethics?

WHY ETHICS?

Today the role of ethics in the development of our societies is stressed ever so often. Ethics is important when talking about the environment: every day, in all phases of life, we influence the environment, we use up resources, we change the conditions of our fellow human beings and the surrounding nature. When I consider the consequences of my acts for others and take responsibility for them, then I behave ethically consciously.

Ronald Engel, chairman of the IUCN Ethics Working Group, mentions five reasons why ethics is a major concern in these discussions:

- There is a new awareness of the role of values in human activity.
- There is a new appreciation of the way in which moral ideas motivate persons to care for the world around them, often to the point of considerable self-sacrifice.
- There is an interest in clarifying the values at stake in policy decisions and giving moral reasons for alternative courses of action.
- Ethics is helping to resolve some of the outstanding value conflicts that thwart conservation and regional development projects.
- Ethics is helping to define a new social paradigm that will help promote sustainable development in each culture and region of the world.



Acts, what I do, are sometimes based on a value

Morals is a sets of values, like human rights, the ten commandments

Ethics refers to reasoning on how to apply such values; 'theory of morals'

The World view is how I see life, e.g. I am responsible for my acts; I am part of a context in time and space

THE BASIC CONCEPTS

We will use the words in such a way that morals refer to judgements or sets of values, like human rights, that motivate a decision to act in a certain way. Ethics refers to the reasoning required to know how to apply such values. Finally we should not forget that our world view underlies all this. For example it is only possible to accept a moral obligation, if you consider yourself to be responsible for what you are doing.

THE BASIS FOR A DECISION TO ACT

It might be that humnas are moral beings but, nevertheless, morality is not always the platform for a decision. It is quite useful to try to find out why we act the way we do. We might easily list five categories of answers.

When I drive my car on a certain kind of fuel, or buy a certain product in a shop, or eat a certain food, the reasons for these choices might differ. It might be because it is legal, because everybody does it, because I like to do it, because it is cheapest for what I want to achieve or because I refer to certain values when choosing to do so.

Quite often the answers to several or to all five questions coincide. They are not so often in conflict. But strictly it is only number 5 below that we refer to as an ethical or sometimes a moral reason.

How often this comes into the picture when I decide what to do? If we try to analyze what values are at stake when influencing the environment perhaps the importance of this category will increase a little.

Why do I act the way I do?

1. The legal answer	because the law says so
2. The social answer	because everybody else does so
3. The psychological answer	because I feel that it is right
4. The instrumental answer	because it is the most efficient
5. The ethical answer	because I respect certain values

L.R.

Normative ethics is the attempt to determine what moral values we ought to accept, how we ought to behave and what character traits, such as courage, impartiality and fairness, we should develop.

Environmental ethics presupposes that values are an essential part of the environmental crisis and its solution. But are there really any values involved in the solution of the environmental problems that the Baltic region faces? Do we have to get into discussions about values? Cannot science provide us with a value-neutral definition of sustainable development as well as the means to achieve it?

1.3 The limits of science for the solution of environmental problems

For many people, and especially for many in policy-making positions, science and technology offer the only hope for solving environmental problems. This could be because many of the ecological threats which we have to learn to handle often are invisible and require advanced technical methods to be detected. Another motive could be that we should turn to science because it offers objective and factual answers where a lot of emotions are involved and conflicts of interest often arise.

Although science and technology are indispensable for solving environmental problems, these problems do not belong exclusively or even primarily to the domain of science and technology. To comprehend the limits of science and technology, consider what science alone can tell us about the environment. It can, for instance, give information about the depletion of the ozone layer, the extinction of biological diversity, the increase in air pollution and reasons why these things are happening. Often science can also tell us what things we must undertake to change these states of affair. In other words, science can tell us what is the case, why something is the case and how to change it. Technology can, in its turn, provide us with the means to make these changes.

Environmental ethics is the systematic and critical examination of attitudes and values that influence human behaviour and determine governmental policy towards nature.

But note that from this scientific information alone we cannot develop any environment and development policies. To arrive at the position that we should try to prevent the depletion of the ozone layer or decrease air pollution, we have to add something else. We need to know how to *value* these states of affair in relation to other things such as economic growth or human freedom. More fundamentally, we need to know how humans not only can, but should, live together with other living creatures and how human culture ought to fit into the Earth's ecosystems. Hence, environmental decisions and policy-making require both (a) knowledge of reality (what science can provide) and (b) acceptance of values (what science cannot provide).

The idea that ecology or any other science could by itself tell us how to live in relation to nature is therefore misguided. This mistake of confusing facts and values, 'is' and 'ought', is sometimes called the naturalistic fallacy. One commits the *naturalistic fallacy* whenever one derives how something ought to be from how things are. But no factual statement entails a value statement. The point is that, in defending an evaluative judgement, we need to do more than simply demonstrate that it is natural or frequent. This, of course, does not mean that we cannot support ethical decisions by appealing to empirical fact. What it means is that what is good or desirable does not follow automatically from a description of what are natural processes in nature.

The following example illustrates this fallacy:

(1) There are endangered species.

(2) Therefore, we ought to preserve as many endangered species as we can.

Here an 'ought' statement is derived from an 'is' statement. But a further value premiss is needed to make the above argument valid as is illustrated in the following examples:

(1) There are endangered species.

(2) Species ought to be preserved because they are valuable to human beings (for instance, because of the unique genetic information they can provide us with).

(3) Therefore, we ought to save as many endangered species as we can.

The premiss could also be:

(2*) Species ought to be preserved because they have a value of their own, apart from their use to humans.

Hence if the survival of any species, including human beings, is desirable, it is desirable for reasons that go beyond the findings of biology or any other science. However, this kind of fallacy is not uncommon in political and scientific contexts. Because of this, it is important to identify and discuss critically what values should function as a basis for environment and development policies. Environmental problems have not only a *scientific-technological* dimension but also a *normative-evaluative* dimension.

1.4 Values and sustainable development

The Norwegian Prime Minister, Gro Harlem Brundtland, said in her opening statement at the 1988 World Conference on the Changing Atmosphere that what is needed for a solution of the ecological crisis is the development of "a new holistic ethic in which economic growth and environmental protection go hand-in-hand around the world". She also chaired the World Commission on

Environment and Development whose report, *Our Common Future*, emphasized that "We have tried to show how human survival and well-being could depend on success in elevating sustainable development to a global ethics" [World Commission 1987, 308].

However, the problem is that in this report it is only maintained that values are relevant to environmental problems and that we need a new holistic or global ethic. No attempt is made to specify exactly what the relevance of values is, what this new ethic consists of, and how it is different from the 'old' ethic. In other words, no answer is given in the report to questions such as: "What would it mean to elevate sustainable development to a global ethic?" But before we can accept 'sustainable development' as a new ethic as well as a new economical strategy, we need to know what ecological, social, political and personal values it is based upon and how it reconciles our moral ideas of human freedom, equality and well-being with our moral obligation towards animals, species and ecosystems (if, indeed, that is what the new ethic is all about).

Let us therefore try to analyze some aspects of the concept of sustainable development and examine what values are associated with it. A good starting-point is the definition given by the World Commission on Environment and Development: "Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs".

The first thing to notice is that it is human needs that are at the centre of concern (not the 'needs' of animals, species or ecosystems). This fits well with the first principle of the Rio Declaration: "Human beings are at the centre of concerns for sustainable development. They are entitled to a healthy and productive life in harmony with nature."

Secondly, it is not just the needs of humans now living we have to take into account, but the needs of future human generations. If we accept the idea of sustainable development, we also accept that we have moral duties towards future people. (For a discussion of this see Chapter 2)

Thirdly, we have to know what needs we are talking about. Would any human interest or desire qualify? Yes and no. The World Commission writes: "Poverty is not only an evil in itself, but sustainable development requires meeting the basic needs of all [people] ..." [World Commission 1987, 8]. However, no clear distinction between needs in this sense and consumer wants of the kind characteristic of the western world in particular is upheld throughout the report. Nevertheless, it is realized by the Commission, at least implicitly, that we have to distinguish between two kinds of human interest: (a) 'needs' such as attaining a minimum caloric intake, being protected from life-threatening predators and maintaining a minimum body temperature and (b) 'wants', or 'desires', such as driving a Mercedes, going to concerts and playing tennis. We could call interests of the first kind 'basic interests' and those of the second kind 'non-basic interests'.

The Ethics of the Rio Declaration

Even if each of the 27 principles of the Rio declaration – which introduces the Agenda 21 document – express a value, Principles 1, 3, 4 and 5 are central in formulating the ethics of this declaration:

PRINCIPLE 1

Human beings are at the centre of concerns for sustainable development. They are entitled to a healthy and productive life in harmony with nature.

PRINCIPLE 3

The right to development must be fulfilled so as to equitably meet developmental and environmental needs of present and future generations.

PRINCIPLE 4

In order to achieve sustainable development, environmental protection shall constitute an integral part of the development process and cannot be considered in isolation from it.

PRINCIPLE 5

All States and people shall cooperate in the essential task of eradicating poverty as an indispensable requirement for sustainable development, in order to decrease the disparities in standards of living and better meet the needs of the majority of the people of the world.

1.5 Human 'needs' and 'wants'

Though many needs are fixed either genetically or physiologically, we must still be aware that there are cases where no sharp dividing-line can be upheld. This is so because what turns out to be a 'want' in one place might be a 'need' in another. For instance, wearing a fur coat is a want in London or Paris, but a need in most Eskimo cultures. Hence, what is a basic human interest varies to some extent between different people, cultures and geographical locations. This of course complicates the issue, but the general conclusion must still be that a sustainable development should include first of all the fulfilment of basic human interests and only secondarily – and only if not incompatible with the former – human wants or non-basic interests.

In the discussion of needs we have to establish a relationship between sustainable development and economy. What is characteristic of the defenders of sustainable development is that they tend to believe that economic growth is essential for the solution of environmental problems. Brundtland

writes in her foreword to *Our Common Future* that: "What is needed now is a new era of economic growth – growth that is forceful and at the same time socially and environmentally sustainable" [World Commission 1987, xii]. Economic growth and sustainable development can and should go hand in hand. (See also Principle 12 in the Rio Declaration.) But this does not mean – as is sometimes overlooked – that economic growth is intrinsically related to the concept of sustainable development. It is not, because the aim of sustainable development entails first of all the fulfilment of basic human interests. Only to the degree that economic growth is an efficient means for achieving that aim is it compatible with sustainable development. Consequently, if economic growth turns out not to be an efficient means to that end, then it ought not to be maintained.

This leads to a fifth point. The idea of sustainable development does imply certain limits to development and also to economic growth. The World Commission writes that these limits are "not absolute limits but limitations imposed by the present state of technology and social organization on environmental resources and by the ability of the biosphere to absorb the effects of human activities" [World Commission 1987, 8]. Hence sustainable development is constrained, among other things, by: (a) technology, that is, the technical means we have now and shall in the future be able to develop; (b) social organizations and economy, that is, the present social and economical structures and the improvements to these that are possible in the future; (c) the Earth's biosphere, that is, the carrying-capacity of the Earth's ecosystems.

It is, of course, the last constraint, the carrying-capacity of supporting ecosystems, that is the new and distinctive limitation on development, that first of all characterizes the idea of sustainable development. Our individual behaviour and governmental policies must be guided by the awareness that there is a limit to the ability of the biosphere to absorb the effects of human activities. We must therefore conserve, protect and restore the natural environment so that humans can receive long-term benefits from it.

However, there is an additional limitation to development. There are also (d) moral constraints to sustainable development. To see this clearly, consider the following very radical solution of the environmental crisis. Suppose somebody proposed that we should kill all Europeans and North-Americans because in this way we can cut the waste of natural resources and so attain sustainable development. This seems to be technologically possible, ecologically sustainable and so on, but still it would not be in accordance with the idea of sustainable development. Why? Because the advocates of sustainable development respect the moral right to life which every human possesses. If this solution were adopted to solve the environmental crisis, that right would be violated. Hence environmental policies must also be *morally sustainable*. The members of the World Commission seem at least to acknowledge this implicitly when they say, for instance, that: "Poverty is not only an evil in itself, sustainable development requires meeting the basic needs of all, and extending to all the opportunity to fulfil their aspirations for a better life" [World Commission 1987, 8]. Statements like this make sense only if it is assumed that every human has a moral right to satisfy his or her basic interests. Hence by breaking that right the limits of sustainable development are exceeded. As a result, not just any sort of development or growth is morally acceptable.

The above discussion has begun to outline the following definition of the concept of sustainable development:

> *Sustainable development* consists of individual behaviour and governmental policies that attempt to satisfy the basic and non-basic interests (as long as the latter do not come into conflict with the former) of present and future human generations within the limits set by technology, morality, social and economical structures and the carrying-capacity of the Earth's ecosystems.

Hence the moral imperative is that the improvement of the quality of present and future human life must be technologically, morally, socially, economically and ecologically sustainable.

By now it should also be clear why science cannot provide a value-neutral definition of sustainable development. This is simply because the concept of sustainable development is imbued with values! Examples of values upon which the idea of sustainable development is based are:

(i) We should strive to obtain a society that satisfies our human interests as far as it is possible without jeopardizing the interests of future human generations.

(ii) We should conserve, protect and restore nature for the sake of humans.

(iii) We should strive to obtain economic growth as long as it can be done in a morally, socially and ecologically sustainable way.

Science cannot even tell us that sustainable development has more value than no development at all. The question whether or not we ought to accept sustainable development as a goal for our behaviour and governmental policies lies outside the domain of the sciences. What science can tell us – given that our goal is to obtain sustainable development – is what means we could adopt to reach that goal and what different pieces of empirical information we have to take into account in the process. This, of course, is indispensable but nevertheless an essential yet insufficient condition for the solution of the ecological crisis we face in the Baltic region and in the whole world today.

Justice and ethical conflicts

BE FAIR TO THE FUTURE

When talking about environmental justice, at least three principles need to be considered.

Firstly, my actions will influence the world next generations will live in. This is the principle of inter-generational equity or 'being fair to the future'. It has many dramatic illustrations. If we catch all the salmon in the Baltic Sea, there will be no opportunity for our children to catch salmon. This is actually the situation in quite a few of the rivers flowing into the Baltic Sea today. The salmon is extinct.

THE UP-STREAMERS AND THE DOWN-STREAMERS

The second principle is that of human equity, justice among us who are living now. We have to share scarce resources among us. Not the least between the rich part of the world population and the poor majority. This is clearly underlined in the Rio Declaration.

It is not always immediately clear what is meant when we talk about a common resource. The water in a river is a common resource for those living upstream and downstream even if they do not meet, and the up-streamers may destroy it. If the inhabitants in Krakow destroy the water in the Vistula for those living further downstream, in Warsaw, is this right? If the question is difficult in respect of a river in one country, it is even more difficult for one that flows through several countries as the Rhine does.

The same kind of reasoning of course applies to the Baltic Sea which we all want to enjoy, and which is influenced by us all. Also, the atmosphere which is harmed by some, is breathed by us all! So we all are down-streamers.

DOES NATURE HAVE A VALUE OF ITS OWN?

Thirdly, there is the position that we have moral obligations towards nature itself; the biocentric or ecocentric ethic. If we accept that, then we simply may not 'use' all of nature for the purpose of humans. We have to leave some of it alone for it's own sake

TO SOLVE AN ETHICAL CONFLICT

It is clear that ethical conflicts will appear in many ways when managing resources that are common to us here and to our descendants. Such conflicts arise when it is clear that the values at stake cannot all be fulfilled simultaneously. We all know such conflicts from our personal lives, ethical dilemmas that end in the sacrifice of one value: we may not pursue two different aims simultaneously.

Ethical conflicts also occur in environmental matters. Conflicts around the construction of large roads or hydro-power dams are typical. The dams are meant to fight poverty and give a better life for thousands in the country. But, as a consequence, a whole group of people may have to leave the land they live on. For them, intangible values are threatened. Also, large areas of nature may be wiped out.

When analyzing such conflicts it is important to list all the actors who are concerned. The list will often be quite long and include local populations, other life forms of several kinds, as well as future generations. Then the values which these actors defend must be specified and highlighted if the values are threatened. This analysis does not solve the conflict but it makes the situation more clear.

A principle one may use is so-called 'valid consent'. Those affected by a decision should be properly informed and agree. This principle is derived from a similar one in medical ethics, that of 'informed consent', used by physicians before treating their patients. In the end, decision-making must be part of the democratic practices in a country.

THE ACTOR'S PERSPECTIVE. WHICH HAT DO YOU WEAR?

Many of you might say that you are not in a position to influence these decisions. You are not an actor. Somebody else decides. But often individual choices do make a difference and in fact many of us every day take decisions that influence the life of others and ourselves. We do it as consumers, we do it when we travel, etc.

Many individuals go further than that. There is right now a small war going on in England about the construction of a highway through a beautiful forest west of London. Members of the green movement, Friends of the Earth, are trying to protect the forest. For the managers of the road-building company, the situation is different. They are in business.

It is typical that the role you appear in influences the way you think. Which hat do you wear? Do you wear the hat of the manager, the hat of the family father, or the hat of the nature lover? As a father you think about the future of your children. Do you want them to have access to this forest during their lifetime?

TO BUILD OUR FUTURE WORLD

When we decide about this kind of project we are building our future world. Do we want to live in a world with forests, we may not build roads through all of them. We have to decide among many alternatives. Do we want the forest to walk in and enjoy, to produce timber, for roads, or do we want to leave it alone?

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2.

On Fairness and Justice

by Mikael Stenmark

2.1 Conservationists and human-centred ethics

The values and attitudes that the idea of sustainable development expresses are the same as those endorsed by a group of environmentalists know sometimes as "conservationists". The conservationists point out the value of nature as a resource for human life, but stress that these resources have been used in a very short-sighted and inefficient way. What is instead required is detailed, planned management of natural resources. Gifford Pinchot, the founder of the conservation movement in the USA, writes that: "The central idea of the forester, in handling the forest, is to promote and perpetuate its greatest use to men. His purpose is to make it serve the greatest good of the greatest number for the longest time" [Pinchot 1914, 23]. Human beings' present interests ought to be satisfied without destroying the productive potential of the ecosystems. Hence, conservationists are concerned about the pollution of our environment and the exhaustion of resources and so on. But their concern is solely with the threats posed by such things to humans' present and future well-being.

The environmental ethics that conservationists and hence also defenders of sustainable development (consciously or unconsciously) assume in their reasoning about environmental issues are often called *human-centred ethics* or *anthropocentric ethics*. They are anthropocentric because they think that environmental policies should be evaluated solely on the basis of how they affect humans. What is distinctive of anthropocentric ethics is the idea that non-human species and natural objects have value only insofar as they are of use to humans. Hence only humans have intrinsic value. Nature consequently has a merely instrumental value.

To be able to comprehend this fully we have to understand what something having intrinsic or instrumental value means. We could say that something has *intrinsic value* if it is value that the object has independently of its value to any other object. Something has *instrumental value* if it has value as a way of obtaining something else that has intrinsic value. For instance, we ordinarily think that money only has an instrumental value. Money is valuable only if it helps us achieve things that are valuable in themselves, such as health and happiness. If we cannot find anything worth spending it on, it becomes worthless. But other things such as happiness, peace, love and health have a value in themselves. The so-called *principle of human equity,* which constitutes the foundation of human ethics, is based on this distinction. It says that every human being is unique and has value in himself or herself, that is, has the same human rights.

> Human-centred or anthropocentric environmental ethics is, roughly, the idea that human behaviour and governmental policies should be evaluated solely (or at least primarily) on the basis of how they affect present and future human generations.

Hence, according to the anthropocentric environmentalists, the idea is that the environment ought to be preserved because it is valuable to us human beings, not because it has a value of its own – in the same way that we do not have to preserve money, cars and radios for these objects' own sake. If they are to be preserved, it is for our own or other people's sake. So according to anthropocentric ethicists, our moral duties with respect to nature are all ultimately derived from the duties we owe to one another as human beings. It is because we respect the human rights of all (present and future) people that we should place certain constraints on our treatment of the natural world and its non-human inhabitants.

This means not only that humans are the only 'moral agents' (beings who can treat others rightly or wrongly), but also that they are the only 'moral subjects' (beings who can be treated rightly or wrongly). Humans are *moral agents* because they are able to reflect on their existence, base their choices on their reflections and can hence be held morally responsible for what they do. Humans have the ability to form judgements about right and wrong, engage in moral deliberation, carry out the decisions that are the result of their deliberation and be held responsible for those decisions. Humans are the only beings who can act either morally or immorally and are therefore different in this respect from entities such as ecosystems, trees and tigers. It makes no sense to hold a tiger morally responsible for its actions. Tigers are amoral beings.

A *moral subject* is a being that can be treated rightly or wrongly and towards whom moral agents (or human beings) can have duties and responsibilities. According to anthropocentric ethicists, the classes of moral agents and

moral subjects are identical. Humans are the only moral subjects; the only kind of beings that can be treated rightly or wrongly. Hence, a human's act towards other organisms is in and of itself an amoral one. It becomes a moral act only when humans are affected. This means that our moral duties, for instance, not to pollute or jeopardize biological diversity, are duties regarding the environment, not duties to the environment.

2.2 Human-centred ethics and future generations

As we have seen, the answer to the question of why we should accept the idea of sustainable development as the guideline for individual behaviour and governmental policies is derived essentially from a *moral principle* that requires sharing the Earth's resources fairly with other human beings. What is further distinctive about anthropocentric environmental ethics is that the group of human beings that we should share fairly with is extended to include future human generations. In this sense, the ethics of sustainable development goes beyond traditional human ethics and is a 'new' ethic. The principle of human equity is extended to include future human generations as well. We can call it, the *principle of intergenera-tional equity.*

The reason for this extension of traditional ethics is caused by the fact that human activity nowadays is affecting climatic and atmospheric changes at a rate unprecedented in the Earth's history. Two of the most clear examples of these changes are the greenhouse effect and the depletion of the ozone layer. The heaviest risks involved in these environmental problems fall not upon present people but upon future generations who cannot take part in the decision we have to make concerning how to handle these risks. Nor will they benefit from our wasting natural resources. Many anthropocentric ethicists have realized these intergenera-tional consequences of environmental problems and have thus been forced to consider in detail the ethical impact of our actions and policies on future people.

Basically two (overlapping) issues must be considered:

(1) How many people should we produce in the future? For instance, do we, or do we not, have a duty to limit the number of people on earth?

(2) What are our duties towards future people? To what extent ought we take their interest into account in our decisions and policies?

Let us start with the first issue. Population growth is a crucial factor in many environmental problems. In *Our Common Future* it is maintained that:

> "In many parts of the world, the population is growing at rates that cannot be sustained by available environmental resources, at rates that are outstripping any reasonable expectations of improvements in housing, health care, food security, or energy supplies. . . . Urgent steps are needed to limit extreme rates of population growth." [World Commission 1987, p. 11]

Do humans have a moral obligation to procreate? Or do they have a moral obligation to refrain from having, say, more than two children? More generally, is there some ethically preferable population goal?

I do not intend to give a survey of the possible answers to this question here. Instead I shall focus only on the framework that the idea of sustainable development offers to the issue of population growth. A framework is already indicated in the above quotation from the World Commission: population growth must be "sustained by available environmental resources". Sustainable development can only be obtained if population size and growth are in harmony with the productive potential of the ecosystems. Thus, an ethically preferable population goal is one that, at the very least, does not exceed the limits set by the carrying-capacity of the Earth's ecosystems.

2.3 Do we have moral duties towards future generations?

Let us turn to the second issue. Do we have any moral duties towards future human generations? If so, what is the content of these obligations? Some people have claimed that we have no such duties or at least that our duties are restricted only to our immediate successors; our children and, perhaps, grandchildren. One reason given is that we can know neither what the interests (needs and wants) of future generations will be nor what new resources may become available to them through new technology. Therefore, it is meaningless to talk about duties to, or the rights of, distant generations.

Perhaps it is true that we cannot know in detail what the interests of future people will be. However, it is highly unlikely that they, at least for a very long time, will not need clear air and water, agricultural land and energy.

If we want sustainable development, we thus must take into consideration the generations that succeed our children's and grandchildren's. Think about, for instance, the storage of radioactive waste material. If we want sustainable development we have to store radioactive wastes in a way that is safe for a period measured in thousands and thousands of years. The same goes for issues about global warming – because its severe impact is not likely to be felt for a couple of generations.
Richard and Val Routley argue that the present policies of creating and storing nuclear wastes are analogous to the following conceivable situation. Imagine a trip on a crowded long-distance train. As the train leaves one station, someone places a package on board that contains a highly toxic and explosive gas. The gas is packaged in a container that the sender knows is not very strong and may well leak before the package arrives at its destination. It will certainly leak if the train is involved in an accident or if some passenger accidentally or intentionally interferes with or

Fig. 2.1 The idea of sustainable development maintains that future generations will have as much right as we to a secure and healthy life: It is a question of caring for our children and grandchildren. This ethics is easy to explain but difficult to apply.

attempts to steal the gas. All these events have happened with packages on past trips. Any leak will probably kill those people close by and seriously harm others. Some but not all of the passengers know about the container; none have consented to its accompanying them. It is along these lines that Richard and Val Routley think the present generation is sending nuclear wastes on a train ride. They write:

> "Like the consignor in the train parable, contemporary industrial society proposes, in order to get itself out of a mess arising from its own life-style – the creation of economies dependent on an abundance of non-renewable energy, which is in limited supply – to pass on costs and risks of serious harm to others who will obtain no corresponding benefits … If we apply to the nuclear situation standards of behavior and moral principles generally acknowledged (in principle if not so often in fact) in the contemporary world, it is not easy to avoid the conclusion that nuclear development involves *injustice with respect to the future on a grand scale*." [Richard and Val Routley 1982, 118–119]

Whether or not the Routleys are right in their assessment of how nuclear wastes are handled (an issue beyond a philosopher's competence), what their example shows is, at least, that most people would seriously condemn the individuals in the parable who placed this package on board the train. Even if the senders hope and believe that no accident will occur, we would seriously criticize these individuals for jeopardizing the lives and health of many innocent people. This suggests that our moral intuitions support the idea that we have moral duties towards future people. There are grounds for thinking that we should accept a principle of intergenerational equity.

2.4 How to treat future generations in a fair way

How then can we decide what is the fair treatment of future generations? What do we have to take into account? How should we determine what actions are appropriate if we accept that we have duties not only to people living now but also to future people? One way of handling the issue is proposed by Bryan Norton.

He suggests that we should use the moral filter that John Rawls in his book *A Theory of Justice* (1971) calls the 'veil of ignorance'. Rawls' veil of ignorance is intended to guarantee impartiality in questions of justice. The basic idea is that we should imagine a situation in which we have to make a decision about what the principles of a just society are, without exactly knowing who we would turn out to be in this society and when and where we should live in it. In this way we can filter out individual self-interests based on gender, class, economic status, geographic location and so on.

Accordingly, Norton suggests that, when we have to make decisions about the fair treatment of future generations, we should think of ourselves as being placed behind a 'veil of intergenerational ignorance'. We must design a society that we would be willing to live in without knowing the generation in which we are going to live. Norton names such an imaginative individual, Ric, and writes:

> "As Ric foresees a society such as our own, which alters nature rapidly and has available frightening models projecting cataclysmic changes in the environmental context, he would expect us to question the moral acceptability of our violent activities. He would choose a society that would struggle to delineate parameters and thresholds, based on the best model of biology, ecology, climatology, and so on. These parameters and thresholds would, in turn, imply constraints on the trends in individual behavior that threaten to accelerate de-stabilizating changes in a normally slow-changing environment system. From a moral viewpoint, these constraints would represent 'fair' treatment of future generations – the treatment a rational, self-interested chooser would insist upon if he did not know which generation he will inhabit." [Bryan Norton 1995, 136]

A much fuller account of our duties towards future people is of course needed, but the idea of a veil of intergenerational ignorance could provide us, at least, with a good methodological starting-point.

Behind the idea of sustainable development is anthropocentric environmental ethics which maintains that future generations of people have as much right to live a physically secure and healthy life as those of the present generation. Thus the World Commission writes:

> "We borrow environmental capital from future generations with no intention or prospect of repaying. They may damn us for our spendthrift ways, but they can never collect on our debt to them. We act as we do because we can get away with it: future generations do not vote; they have no political or financial power; they cannot challenge our decisions. But the results of the present profligacy are rapidly closing the options for future generations." [World Commission 1987, 8]

In their opinion this is morally wrong. Each of us is under an obligation to conserve natural resources so that future generations will be able to enjoy their fair share of benefits derived from these resources. We do not have a right to jeopardize the well-being of future human generations. We must preserve biological diversity because we otherwise risk the disappearance of species that might be useful to us in, say, developing new ways of protecting us from diseases. We must also protect wilderness areas so that future people can have as much opportunity to experience and appreciate them as we do. Thus a whole set of moral duties regarding human behaviour and governmental policy towards nature can and should be founded on the interest of present *and* future people alone.

To sum up, the answer to the question: "What kind of ethics is the idea of sustainable development an expression of?" is that it is an expression of an extended traditional human ethics. What is new about the ethics of sustainable development is that it involves the ethics of *future* generations. We have moral duties towards future people and not just to present human beings.

3.

Humans and the value of Nature

by Mikael Stenmark

3.1 Preservationists and non-human-centred ethics

Is the ethics of sustainable development controversial in any sense? Put differently, is there any other type of environmental ethics available that might be more reasonable to adopt? There is a number of environmentalists who are far from satisfied with the anthropocentric environmental ethics on which the idea of sustainable development is based. David Ehrenfeld, for example, claims that: "There is no true protection for Nature within the humanistic system – the very idea is a contradiction in terms" [Ehrenfeld 1978, 202]. It is, according to Ehrenfeld, a contradiction in terms because how could these western attitudes and values – that the idea of sustainable development is an expression of – provide the basis for a solution to the problem that they themselves have caused? The idea is that we are in this mess because we have treated the natural world as merely resources for our use. It is this human-centredness that is, in the final analysis, the source of the problem. We therefore need to reject the belief so deeply rooted in our culture that humans are entitled to manipulate the world in the pursuit of human (present and future) interests without regard for other living things.

This group of environmentalists are sometimes called 'preservationists' and their environmental ethics are known as *non-human-centred ethics* or *non-anthropocentric ethics*. According to the preservationists, the basic mistake that the conservationists make is that they regard the products of nature merely as a resource for the satisfaction of human interests and desires. Instead, the intrinsic value of nature must be recognized and emphasized. The preservationists aim at the protection of nature for its own sake, not for ours. While the conservationists intend to protect nature for humans, the preservationists intend to protect it against humans. Paul Taylor writes, "we [must] sharply distinguish *conservation* (saving in the present for future consumption) from *preservation* (protecting from both present and future consumption)" [Taylor 1983, 185].

The solution to environmental problems does not consist of a more efficient and long-sighted use of natural resources, but depends on our simply having to learn how to respect nature. People must fundamentally re-evaluate their relationship to the natural environment. Preservationists do not agree on how far-reaching this re-evaluation must be and what consequences it will have for the structure of our society. It is common, however, for them to question, among other things, the idea that economic growth is necessary for a solution to environmental problems.

This respect for nature implies that there are limits to how nature can be treated apart from its use having to be efficient and long-sighted. Humans do not have the right – even given that it is done within the limits set by the carrying-capacity of the Earth's ecosystems – to extract as much as possible from nature. There are other limits as well. Humans have instead a duty to protect nature, not because such behaviour would give us benefits or be in our own self-interest, but because we would otherwise violate the rights of all living things. Endangered plants and animals, perhaps even ecosystems, have a right to exist and this right limits the ways in which we are justified to use them for our purposes.

So behind the preservationists' ideas we can find a kind of ethics other than the anthropocentric one endorsed by the conservationists. Aldo Leopold, one of the best-known spokespersons for the preservation movement in the US, articulates such ethics when he writes:

> "A thing is right when it tends to preserve the integrity, stability, and beauty of the biotic community. It is wrong when it tends otherwise." [Leopold 1949, 262]

Hence not only the actions of humans towards other humans, but also human actions against other living things, can be moral or immoral.

3.2 Instrumental value or a value of its own

In this kind of environmental ethics it is maintained that nature or other living things besides humans also possess intrinsic value or inherent worth. Not only humans, but *everything* that exists in nature must be respected as valuable in itself. So what is distinctive about non-anthropocentric ethics is that it rejects the anthropocentric idea that non-human species and natural objects have value only insofar as they are of use to humans. Hence, its name 'non-anthropocentric ethics'. Nature thus has intrinsic value; not merely instrumental value. This means that just as it is wrong for us to ask: "What is

Implementing ethics

How do our values take effect in actions? A quick answer would be that they form the basis for politics and law making. But this is how they become part of the formal web of society. Here we would like to analyse how they influence our daily life.

RESPONSIBILITY

An ethics requires that we admit that we have the option to choose and are responsible for our choices. This is the basis for a society built on law. But to act legally is not necessarily acting ethically. There are mostly many legal alternatives; sometimes none of these coincides with personal values. How should we choose between them?

Let us illustrate with a young man that is drafted for military service. He thinks it is not ethically right to make war, but on the other hand his parliament, elected democratically, has decided that all young men should serve in the army. Two values are then in conflict: respect for democracy and unwillingness to prepare for war. The individual has to solve this conflict himself. To merely refer to the decisions taken in good constitutional order, is to avoid responsibility.

Similar situation might occur when projects with overwhelming environmental consequences are implemented. Individuals even break the law when opposing e.g. large highways, polluting industries, hydropower dams etc.

Sometimes the consequences for opposition is so costly for an individual and very often for his or her family, that it seem impossible to take responsibility. It is also quite often that responsibility formally is on some other level in an organisation. These facts limit this approach sometimes called responsibility ethics. However on the other hand it has been unequivocally established in international law that individuals have a limited possibility to refer to higher authorities to avoid responsibility.

CARING

An alternative way to see how ethics and values may take effect is a very basic relation between two humans – that of caring. It does not build on formal reasoning but rather on emotion – the love and caring of an individual towards children, family and friends. This attitude may be expanded to include other life forms and the Earth as a whole.

ETHICS

Ethics, properly speaking, deals with how to act on the values we have. For example we may say that it is the consequence that should be considered when deciding how to act: If the consequences are good than the means are of no importance. This is called consequential ethics.

We may also say that some ways of acting are simply not allowed regardless of the consequences, for example to kill another human being, or to lie. This is called deontological ethics.

Empirical studies show that in practice peoples ethics consists of a mixture of these two attitudes. When consequences are very dear then one might use means that in other contexts would not be allowed. An important question is where such an attitude will lead us in extreme cases. May we use any means to uphold or defend a system that we think is right? In the fight for independence in former eastern bloc countries an impressing creativity was demonstrated when protesting against oppressive regimes. In almost no case was violence used. This was certainly crucial for the establishment of credible democratic nations.

VALUES AND MORAL

Morals refers to our sets of values. Reflection on our own ethics should lead to scrutinising the values we believe in. Here we will mention two aspects: Are values universal or linked to specific cultures; and to what extent are biocentric values accepted in the general population.

In questionnaires certain values repeatedly come high on the list, such as health and peace. These values may be universal. Other issues such as democracy, personal liberty and the rights of women, not to talk about the rights of animals, are clearly culture dependent.

The United Nations have played an important role in establishing a base of universal values. These include e.g. human rights, women's rights and children's rights, which all have been expressed in declarations adopted by a large number of member nations. The work of IUCN in formulating an ethic for living sustainably with a clear component of biocentric ethics represent an effort to make also these values universally accepted.

In a long-term project in western Europe to study the changes in ethics the attitudes towards nature and animals have been monitored since 1980. In the 1990 poll 61 % expressed the view that nature has a value of its own, while 36 % said that it only has a value by being of use for humans. Likewise 55 % mentioned that animals and humans have the same value while 40 % said that humans have a higher value.

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a human being good for?" so the question: "What are plants, animals or wilderness good for?" is also wrong according to the non-anthropocentric ethicists.

The main point in non-anthropocentric ethics is that, in deciding how we should act, we must take account of the *impact of our actions on every living thing*. Hence the preservationist is concerned about the pollution of the environment and the destruction of rain forests not primarily because they constitute a threat to human welfare, but because the welfare of nature itself is endangered. According to them, we can solve the environmental crisis we are facing only if we change our fundamental attitude towards nature and endorse a non-anthropocentric value-system.

This means that, although humans are the only *moral agents* (beings who can treat others rightly or wrongly) on Earth, they are not the only *moral subjects* (beings who can be treated rightly or wrongly). The classes of moral agents and moral subjects are not identical. Hence, a human's action towards other organisms is in and of itself – and contrary to what the anthropocentric ethicists think – moral or immoral. It does not become a moral act only when humans are affected. This means that our moral duties, for instance, not to pollute or jeopardize biological diversity are duties *to* the environment, not merely duties *regarding* the environment. In other words, in non-anthropocentric ethics all living things count as 'morally considerable'. They must be taken into account in our moral deliberation. Therefore, every impact on nature ought to be evaluated on the basis of what effect it has on *every living creature*, not only on the basis of its effects on humans. This alternative environmental ethics has profound consequences for individual and governmental enterprises.

Ordinarily when we plan, for instance, to open up a mine we have to take into account the interests of the people (if any) living on that piece of land and ask ourselves whether the benefits of the mining outweigh the losses of the people directly affected (they have to move, perhaps find new jobs, etc.). Only if the benefits outweigh the losses and we are ready to compensate these people fairly for their loses, could mining be morally acceptable. The defenders of an ethics of sustainable development would add that we also have to take into account how the mining will affect future people. However, non-anthropocentric ethicists claim that this is not enough because humans are not the only moral subjects who are affected by the mining project. It will also have an impact on other living things and their habitats. The mining probably involves cutting down trees, destroying plants, killing animals, coercing other animals to abandon their habitats and modifying or even destroying ecosystems. Hence there are other beings besides humans that can and should be treated rightly or wrongly and whose interests and welfare accordingly must be taken into account.

Non human-centred or non-anthropocentric environmental ethics is, roughly, the idea that human behaviour and governmental policies should be evaluated on the basis of how they affect all living things and Earth's ecosystems (and not merely present and future human generations).

3.3 A principle of inter-species equity

Whether this expansion of the number of beings who are morally considerable will undercut the moral validity of the mining project depends on at least two things. It depends, first of all, on whether or not we should think that all living things have equal value and, secondly, on what human interests are at stake. Non-anthropocentric ethicists count all living things as morally considerable, although not necessarily of equal moral significance. According to the defenders of *biotic egalitarianism,* perhaps the most radical form of non-anthropocentric ethics, all living things are of *equal* value. Taylor expresses such a view when he writes: "The killing of a wild flower, then, when taken in and of itself, is just as much a wrong, other-things-being-equal, as the killing of a human" [Taylor 1983, 242]. Taylor's non-anthropocentric ethics is an example of an expansion of the principle of human equity, not only in 'time' (the principle of intergenerational equity) but in 'scope', into what we could call, *a principle of inter-species equity*: All living things have not only intrinsic value, but also possess equal (intrinsic) value.

Most forms of non-anthropocentric ethics allow, however, for differential significance within the class of living things, although humans might not be counted the most significant. The preservation of the biosphere and of large ecosystems might be thought more significant than the preservation of a large number of humans.

It is also relevant when determining the moral validity of the mining project to take into account whether the human interests in the situation are 'needs' or merely 'wants' (or desires). Especially in a situation when it is necessary to cut down trees, kill animals, and modify ecosystems to secure people's basic interests, such actions can be morally permissible. However, since the human good seems in most cases of mining to include only the satisfaction of non-basic interests or material benefits, it would be very difficult to justify how it could be morally permissible to allow mining to the extent that we presently do in the Baltic region or in the world in general. But also in the cases were it appears to be morally acceptable, we must be ready to compensate non-humans for their losses, just as we compensate humans. However, the precise outcome of this moral consideration depends on the degree of moral significance that non-human living things are granted.

3.4 Biocentrism and ecocentrism

Although there are a number of possible ways of developing a non-anthropocentric ethic, it is nevertheless helpful to distinguish between 'biocentrism' and 'ecocentrism'. What all forms of non-anthropocentric ethics share, as we have seen, is that their defenders count as morally considerable living things other than humans (or attribute intrinsic value not merely to humans but also to non-human organisms). The non-anthropocentric ethicists do not, however, agree on which of these non-human things have a value in themselves. What can be understood to have intrinsic value, besides humans, are roughly: (1) individual members of non-human species, (2) species as a whole and (3) ecosystems (or the biosphere) or a combination of these.

The advocates of *biocentrism* claim that all living things have a value in themselves, but since species and ecosystems are, *per se*, not living things, they do not have intrinsic value. Therefore, only human and non-human individuals, and not species and ecosystems, are moral subjects or morally considerable. The defenders of *ecocentrism*, on the other hand, claim that the biosphere, species, land, water and air, as well as ecosystems, also have intrinsic value. These can just as well be treated rightly or wrongly. [See, for instance, Rolston 1988.] In fact, right and wrong are functions of the well-being of the 'biotic community' as a whole, not of its constituent members.

We can see the different consequences that biocentrism and ecocentrism have for governmental polices by focusing on the problem of endangered species. According to the biocentrist Paul Taylor, we should maintain a radical 'hands-off policy' with regard to all living species [Taylor 1986, 172–79]. We not only have a *prima facie* duty not to do harm to other living things, but also a *prima facie* duty not to restrict or violate their freedom. We are required to respect their wild freedom by leaving them alone, just as we, in human ethics, respect other people's freedom by not intervening in their lives.

A prima facie duty is a duty that is binding at all times unless it is overruled by other equal or stronger duties. (For instance, in human ethics we are usually considered to have a duty not to lie to other people and also a duty not to cause other people harm or suffering. These duties could, in a certain situation, be in conflict and in most cases we would say that the latter duty is stronger than the former, but not always. Both duties are examples of prima facie duties.)

Hence, if it is the case that the extinction of a species-population is due to entirely natural causes, we are morally prohibited from trying to stop the natural sequence of events from taking place in order to save the species-population. (Things are different if the extinction is caused by past human activities. Then the duty of restitutive justice might require that we restore the balance of justice between us and the species that has been wronged.) This also means that 'wildlife management' which involves the protection of one endangered species by killing off its natural predators in a restricted area is not morally justifiable.

One problem with this kind of biocentric endangered species policy is that it will not account for all the actions that many people feel morally obliged to do for endangered species. Examples of this include preserving an endangered species by protecting it from natural predators or undertaking action to bring into the world as many of it as possible. In fact, the protection of a species might involve actions that are contrary to the interests or needs of some or all of the individual members of the species. This is done, for instance, when the range of a group of animals, such as a certain kind of wolf, is severely restricted by hunting all those outside a protected area.

In this regard, ecocentrism seems to be more acceptable because it is compatible with these moral intuitions. (However, if we accept a biocentric ethics the number of endangered species would probably still drastically

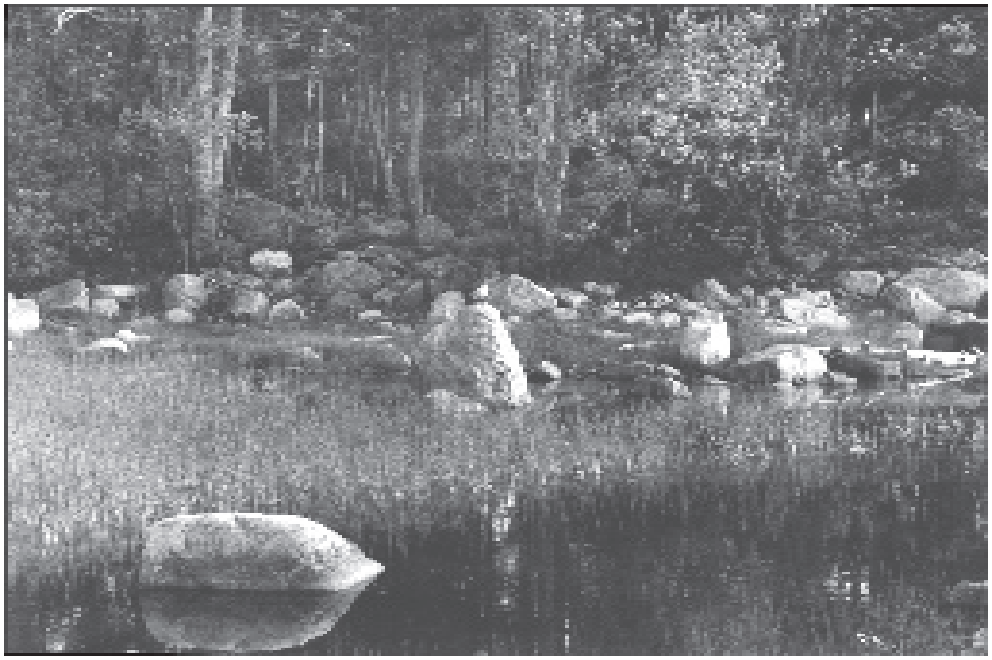

Fig 3.1 A biocentric or ecocentric ethics maintains that we should respect nature regardless if it is of value to us humans. An ethics of sustainable development integrates this in the responsibility of leaving to the future "a world as diverse as the one we inhereted".

Caring for the Earth – a world ethic for living sustainably

In 1980, the International Union for the Conservation of Nature, IUCN, published the World Conservation Strategy in which the concept of sustainable development was given currency for the first time. In 1984, the IUCN set up its Ethics Working Group, EWG, which includes some 500 participants from 50 countries. Ethics was, on this basis, included as an important element in the 1991 document Caring for the Earth – A Strategy for Sustainable Living. Caring for the Earth essentially deals with how to implement sustainable development. Its Chapter 2 covers the topic of ethics.

A global workshop on the theme, held in 1993 with 17 organizations represented, was reported in the 1994 document Advancing Ethics for Living Sustain-ably (Engel and Denny-Hughes, 1994). The EWG further contributed to the Global Biodiversity Strategy and to the recent IUCN Environmental Law document (IUCN 1995). Many of the thoughts of this group have been summarized by its chairman Ronald Engel in Ethics of Environment and Development: Global Challenges, International Response (Engel and Engel 1990).

IUCN is an organization with several hundred members, unique in that both governments and NGOs participate. It was organized by UNESCO in 1946 for the protection of biodiversity. Its headquarters are in Gland, outside Geneva.

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Elements of a world ethics for living sustainably

Every human being is part of the community of life, made up of all living creatures. This community links all human societies, present and future generations, and humanity and the rest of nature. It embraces both cultural and natural diversity.

Every human being has the same fundamental and equal rights, including: the right to life, liberty and security of the person; to the freedoms of thought, conscience and religion; to enquiry and expression; to peaceful assembly and association; to participation in government; to education; and, within the limits of the Earth, to the resources needed for a decent standard of living. No individual, community or nation has the right to deprive another of its means of subsistence.

Each person and each society is entitled to respect of these rights and is responsible for the protection of these rights for all others.

Every life form warrants respect independently of its worth to people. Human development should not threaten the integrity of nature or the survival of other species. People should treat all creatures decently and protect them from cruelty, avoidable suffering and unnecessary killing.

Everyone should take responsibility for his or her impacts on nature. People should conserve ecological processes and the diversity of nature and use any resource frugally and efficiently, ensuring that their uses of renewable resources are sustainable.

Everyone should aim to share fairly the benefits and costs of resource use, among different communities and interest groups, among regions that are poor and those that are affluent, and between present and future generations. Each generation should leave to the future a world that is at least as diverse and productive as the one it inherited. Development of one society or generation should not limit the opportunities of other societies or generations.

The protection of human rights and those of the rest of nature is a world wide responsibility that transcends all cultural, ideological and geographical boundaries. The responsibility is both individual and collective.

Caring for the Earth, IUCN 1990, Chapter 2

fall, because we would adopt an attitude of respect for nature which involves, among other things, the recognition of a duty not to do harm to or hurt non-human living things.) This is so at least for the ecocentric ethicists who maintain not only that species have a value in themselves but also that our moral obligations to species (sometimes or always) outweigh those to individuals. Hence, even if an endangered species policy is harmful to particular individuals of a species, it might still be morally acceptable as long as the policy is still good for the well-being of the species as a whole. But recall that in an ecocentric ethics humans have no privileged status in the biotic community. They are reduced from being the 'masters' or 'rulers' of the world to mere members. Hence it should not be, as Brundtland writes in her foreword to the World Commission's report, that it is people's well-being that "is the ultimate goal of all environment and development policies" [World Commission 1987, xiv], rather it must be the well-being of the biosphere as a whole that is the ultimate goal.

This decentralization of humans seems to imply, for instance, that it could be more important to protect one million existing species than to bring into existence an additional one million human beings. But further and more problematically, if we define right and wrong in terms of the integrity, stability, and beauty of the biotic community, as the ecocentrist does, then it would seem possible that, for the good of the community, not only non-human individuals (as in the example above) but also human beings might be sacrificed. Ecocentrism then sanctions the subordination of the good of human and non-human individuals to the good of the whole (species, ecosystems or the biosphere). Assuming that human activities have on the whole a negative effect on the carrying-capacity of the Earth's ecosystems, individual human lives would be negatively valued. A member of an ecologically important endangered species would then be worth many human lives.

> We need development that will not just be economically and ecologically sustainable, but morally sustainable as well.

Contrast now these biocentric and ecocentric views with a policy of endangered species based on an anthropocentric ethics, such as the ethics of sustainable development. According to the latter, we have duties to protect species, not duties to the species themselves as such, but rather to future human beings. It is because species have value to us as a resource (by giving us, for instance, aesthetic peak experiences or unique genetic information) that we ought to preserve them. The danger with this way of justifying the protection of endangered species, from a non-anthropocentric perspective, is that we may simply decide that there is not enough reason to think that some species will ever be of use. We may take a calculated risk and decide that it is not worth protecting certain species.

3.5 Which environmental ethics ought we to adopt? – A pragmatic solution

In this essay I have indicated some of the strengths and weaknesses of both anthropocentric and non-anthropocentric environmental ethics and some of the different consequences they have for environmental policies. But where does this leave us? Should we reject the ethics of sustainable development? Which environmental ethics ought we to choose? In a sense, this is a very naive set of questions. To talk about choosing ethics gives the impression that we can simply make a decision and then go on living in accordance with the ethics chosen. But as John Passmore has pointed out, "an ethic … is not the sort of thing one can simply decide to have; 'needing an ethics' is not in the least like 'needing a new coat'. A 'new ethic' will arise out of existing attitudes, or not at all" [Passmore 1980, 56]. Hence the creation of new ethics is a cultural and also, to a large extent, an unconscious, process that must be based on existing values within a culture.

If this is correct, then at least we who live in the Baltic region have no choice but to start where we are—with anthropocentric environmental ethics. However, we do not necessarily have to end there. We might over a period of time instead realize the superiority of biocentric or ecocentric ethics. So the answer to the question of which environmental ethics we ought to 'choose' could be given at least two different answers. In the short run, we ought to stick to anthropocentric ethics, but in the long run, we might be better off adopting non-anthropocentric ethics of some sort.

For the time being, whether we save nature because it is good for our own sake or for nature's sake does not really matter, *as long as we save it*! This is so, because the important dividing line today is not between anthropocentric or non-anthropocentric environmentalists, but between environmentalists and anti-environmentalists, those who think that the whole gamut of 'green' (environmental) concerns is a storm in a teacup. The challenge is thus to motivate the large segment of the population who are indifferent to these concerns, so that they actively start to support, both on an individual and a political level, sustainable development.[1]

[1] I should like to take the opportunity to express my thanks to the *Swedish Environmental Protection Agency* for their financial support of my project "Environmental Ethics and Views of Nature: the Relevance of Our Values for the Creation of a Sustainable Society". Without that support, the ideas of this essay would never have been fully investigated.

4.

The meaning of development

by Lars Rydén and Göran Lindgren

4.1 Is 'sustainable development' contradictory?

The success of the Brundtland commission's introduction of the policy of sustainable development in 1987 very much depended on the fact that both the western countries – the North – and the developing countries – the South – had their say in the final document. The North expressed its concern about environmental and long-term impact (for example about population growth) through the 'sustainable' component; the South emphasized its concern about improving living conditions in the 'development' part.

The presence of the word 'development' in the concept of 'sustainable development' has invigorated the debate on very fundamental issues regarding development. Some have even claimed that the two components in the expression, that is, sustainability and development, are contradictory terms – one cannot have both at the same time. The meaning of sustainability has been dealt with previously. To analyze this controversy further we need to discuss more precisely what is meant by development. We have to start with a short background.

4.2 The historic background

Soon after the end of the Second World War, major efforts were made by the victorious nations, dominated by the United States, to support a restructuring of the countries of the defeated side, in particular Germany. Through the Marshall Plan, named after General Marshall, a large-scale investment programme was initiated and set into motion in western Europe. Soon afterwards plans were made to address economic stability and development in the world as a whole. The overriding objective was to prevent a new financial collapse of the kind that occurred during the 1920s and 1930s. The collapse was considered a major reason for the success of the fascist ideologies which in turn had led to the war.

In 1944 at a meeting in Bretton Woods outside New York, the World Bank, WB, and, as a financing institution, the International Monetary Fund, IMF, were created. The WB was given the task of providing soft loans to poor states for investment programmes, while the IMF was there to avoid the major breakdown of currency exchange rates and international financing structures.

The international institutions, or the Bretton Woods institutions, were followed in several countries by the creation of national institutions for international aid. These also addressed issues similar to those of the World Bank. Large investments for infrastructure development such as road networks, telephone networks, power production stations, etc. were heavily subsidized by these national agencies, often with the involvement of industries in the country providing the loans.

During the 1990s the two Bretton Woods institutions have been joined by a third one for world economy, the WTO, the World Trade Organization. This organization continues to promote global free trade as GATT (General Agreement on Tariffs and Trade) did before. In the Baltic region also, similar financing bodies are active, in particular the EBRD, the European Bank for Reconstruction and Development and the NIB, the Nordic Investment Bank.

The efforts to promote economic development have been centred on the GNP (Gross National Product). GNP is an estimate of the monetary value of the total sum of all production and services in a country, agricultural production, industrial production and the worth of the service sector.

4.3 The 'down-side' of economic development

It is obvious that economic development was and is asked for in many countries in the world. It had, however, sometimes disastrous results in the way it was conducted. Little concern was shown for the culture of the countries to be 'developed'. The investments did not always result in functional social infrastructures. Roads and bridges did not work without the proper social structures; machines did not work without the training of people, know-how and access to spare parts.

But the loans stayed. The repayment of the loans or even paying the interest, is a heavy burden on the economy of these countries. In fact the economy of several of the countries receiving such loans has declined since the 1970s. The loans given by the World Bank, and bilaterally by individual nations, have accumulated into a trap in which these are now deeply entrenched.

The policy of the IMF has been quite harsh. The IMF has required that all these nations efficiently address the issues of national budget deficits accumulated over many years and created by economic policies where

FROM THE INES APPEAL TO ENGINEERS AND SCIENTISTS

A Professional Ethics of Sustainable Development

The document "Towards Sustainable Societies – An Appeal to Engineers and Scientists" from INES, the International Network of Engineers and Scientists for Global Responsibility, attempts to formulate an ethichs for professionals in the development field. Its introductory part is cited here.

Sustainability

Sustainability is a value-based aim and process with environmental, technological, political, social, economic and institutional implications. Sustainability requires that we organize our societies so that they evolve in harmony with nature; dominance over nature is a failed option.

Sustainability calls for a significant reduction in use of global natural resources and a sharing of these resources between individuals, societies and generations so that a maximum of well-being and dignity is achieved for all. It calls also for the creation of safe and peaceful living conditions and for respect for human, cultural and biological diversity.

The current situation

While encouraging initiatives and possibilities exist, the overall thrust of our economic systems, social structures and science and technology is working against sustainability; radical changes are required to preserve the options for future generations.

Human activities are producing unprecedented changes in the biosphere, degrading, for example, soil fertility, ground-water supply and biodiversity.

We are overusing natural resources, thus eroding our life-support basis; these resources are being used in an inefficient way, creating too little of value, too few jobs, and too much waste; further, there are growing inequalities, both on a national and on a global level, in the distribution of income, labour and wealth derived from the use of the resources; marginalization of individuals, societies and even whole regions has become a major threat to sustainability. In most countries, employment has become increasingly precarious and poverty is spreading. All these distortions diminish governability, give rise to insecurity and tensions that often result in excessive reliance on military force, and this reliance in turn exacerbates the problems referred to above.

A sustainable future

A positive alternative to the current situation is the development of new economic, technological and social structures and implementation of societal values, aiming at sustainable societies. Any process of development seeking sustainability should take the following criteria into account:

- **protecting the integrity of the biosphere**
  - practice sustainable agriculture and forestry;
  - preserve marine resources and biodiversity;
  - establish networks of nature protection;
- **efficient use of resources**
  - social innovation in production and product distribution and use;
  - development of new technologies and designs to increase efficiency;
- **self-reliance**
  - enhancement of endogenous production capacity in the non-industrialized countries using all opportunities available,adding value to the resources and creating jobs in the countries and communities of origin;
- **participatory democracy**
  - creation of structures that ensure access without discrimination of any sort including gender or income level to education, participation in civil and political life, health care, food and other resources, and means of production and labour opportunities; these structures should encourage people to bring their creativity into the political planning and decision process, and thus contribute new ideas and life styles to global sustainability;
- **fair trade**
  - establishment of fair trade patterns and regulatory mechanisms;
- **peace and non-violence**
  - creation of a culture of non-violence and establishment and strengthening of structures for peaceful resolution of conflicts;
  - prohibition, elimination and verified safeguards against all weapons of mass destruction;
  - severe restrictions on the development, transfer and use of all weaponry.

From the Appeal to Engineers and Scientists written at the congress Challenges of Sustainable Development organized by INES, the International Network of Engineers and Scientists for Global Responsibility on August 22–25 1996 in Amsterdam The full text is available on line at http://cac.psu.edu/~duf/social/ines.html or directly at http://www.frt.fy.chalmers.se/amst/appeal.html

such loans were an integrated part. As a result, major social programmes have been severely cut resulting in blatantly increased poverty and deteriorating social conditions, health care, etc. and increased differences between the rich and the poor.

The globalization and deregulation of the world economy has been a further cause of economic difficulties. The poor countries produce crops for export – cash crops – to improve their national incomes, but world market prices and conditions of trade are such that these countries remain poor. In the meantime the people may starve. Movement of money over borders can be made in seconds and allows investors to use natural resources and labour where it is the least expensive. The multinational companies are in many cases stronger than the nation states. In the end, globalization has undermined self-reliance: many countries are no longer able to support their own population.

A comparison with the former planned economies in the East, in particular the Soviet Union, over the same period of time, show some striking similarities. The development of large-scale industrial and infrastructural investments was a prime objective. In the East, it was not at all balanced by other powers in a pluralistic civil society. The results were therefore even more flagrant exploitation of natural resources and building large-scale structures.

Some of this development, such as the building of water reservoirs for hydro power stations, deforestation and mining, in particular copper mining, had disastrous environmental effects. It has also involved the physical removal of people from areas where these projects took place, with very harmful consequences for those concerned. In addition, when the projects were carried out by multinational companies, only a part of the money stayed in the country of origin.

A particular point is that many nations used a significant share of their national resources and foreign loans for military purposes, which in most cases have contributed nothing to development but have rather diverted scarce resources, both manpower and investment, from more pressing needs.

4.4 The critique

Since the 1960s, GNP growth has been the primary goal for many countries and agencies. In 1978 the World Bank started publishing an annual report called the World Development Report in which the GNP figures for many countries were also published. When the social effects of the measures to reduce budget deficits became more visible, many reacted. Criticism grew against a too narrow perspective on development where only economic growth counted. That criticism has been voiced by many. We might cite, as one proponent, Jakob von Uexkull, the founder of the Right Livelihood Award, who said: "You cannot simultaneously empower the people and the multi-national companies, you cannot combine local self-reliance with the primacy of global 'free' trade. The major components of the present order – scientism, industrial developmentalism, and nation-statism – tolerate no other gods".

It is obvious that in many ways the development that has taken place is not sustainable and is even contrary to the very essence of sustainability. We may point to some of the most important reasons:

1) The exploitation of natural resources, that leads to increased GNP, may in reality not increase the wealth of the nations or people. It may rather be an embezzlement of resources.

2) The loans taken lead to the countries' dependency on the outside world and decreased self-reliance.

3) Development at the local level, stressed in Agenda 21, is on the contrary decreased by the large-scale thinking.

4) Actual economic development does not address real needs, but leads to increased economic and social injustice.

However it is important not to draw the conclusion that increased GNP is bad and that economic development is evil. Increased GNP only shows that the economic potential of a country might have increased. Depending on how that increase came about, it might or might not mean that the country is economically better off. The simplistic way of equating development with higher GNP/capita is being questioned more and more.

The ensuing discussion has focused on the fact that everybody has basic needs for food, shelter, clothing, health, education, etc. It was evident that these needs are not necessarily met by fast economic growth.

Also, other goals that are more controversial have been added: democracy, freedom, justice and human rights. These goals are differently perceived and not easily operationalized. In some countries they are regarded as western concepts and not applicable for other cultures. 'Asian values' are better suited for Asia, it is claimed; mostly, but not only, by advocates of authoritarian regimes.

A different concept of development, sometimes called human development, has been worked out as a result of this debate.

4.5 How to measure human development – indices

Basic needs have been defined in many different ways but seldom with a precision that makes them operational. There is general agreement that food, water, health, education and shelter should be included (Stewart 1989, p. 348). Many different indicators for these and other aspects of basic needs have been used by researchers who have tried to operationalize them. One of the first attempts was the Physical Quality of Life Index (PQLI) developed by Morris David Morris in 1979. He took three crucial variables and made an index of them where each of them had the same weight. The variables were infant mortality, adult literacy rate and life expectancy. Some

similar recent attempts are found in Table 4.1.

Which of these indicators are best is not easily established. The largest problem is however how to weigh them together. Any index of basic needs (or human rights) must choose the relative weight of the included factors. This choice is based on the preferences (or the welfare function as economists call it) of the person who chooses.

The Human Development Index proposed by the UNDP, the United Nations Development Programme, (the last in Table 4.1) has aroused considerable attention and their estimates for 1993 are found in Table 4.2 with more data from them and also from UNICEF (the United Nations Children's Fund) and the World Bank.

The traditional way of comparing economic levels between countries, GNP/capita is found in column 10, and can be compared with the Human Development Index in column 7. As can be seen, they are almost in the same order but the differences between countries are smaller. Comparing GNP/capita with column 6, which shows GDP/capita adjusted for differences in purchasing power, reveals that the rank order is not changed very much but the differences are much smaller. One of the reasons is that GNP only measures production that is sold on the market and parts of total production, especially in developing countries, are therefore not included. The adjusted GDP/capita is therefore a better indicator for standard of living.

In columns 8 and 9, a purely physical measurement, mortality of children under 5 years of age, is found. The differences between countries are smaller in the same way as for life expectancy at birth in column 3. Too much attention on GNP/capita does not adequately reflect the standard of living and ought to be complemented by other measures.

4.6 State and community building is part of development

Developing a country not only means building better conditions for people. It also entails state and community building. Below are mentioned only a few of the difficult questions that arise in this connection.

One harsh criticism of the large developmental projects typical of the past is that they result in opportunities for a few, typically in governmental positions, to collect fortunes, while the majority remain 'underdeveloped'. The distribution of economic assets in a country is one of the many aspects of state building.

More recently, several development programmes have introduced a policy of giving small loans to many. These small sums of money may then be used to start small companies and to support community development at the local level. The importance of development at the local level is underlined in the Agenda 21 document.

Just as distribution of monetary resources is important, so is the ownership of natural resources. To what extent should the resources be owned by the State? In the countries where, until recently, everything was

Table 4.1 Various indices for human development

Indicators	*Researchers*
• infant mortality rate	Goldstein 1985
• calorie intake, protein intake, life expectancy, infant mortality rate, medical personnel supply, primary school enrolment, adult literacy rate, income share of poorest 40%	Ram 1985
• existence (food, water,air, retention of body heat, sleep, mechanisms for communal protection) intelligence (communication, informal education) sociality (freedom of expression, freedom of association)	Weigel 1986
• people per physician, caloric intake, life expectancy, infant mortality, 1988 welfare expenditure, PQLI (Physical Quality of Life Index) infant mortality, adult literacy rate, life expectancy INSP (Index of Net Social Progress) 41 indicators	London &Williams
• human suffering index (GNP/capita, energy consumption/capita, daily calories supply/capita, infant mortality rate, adult literacy rate, access to clean water, annual inflation rate, growth rate of urban population, growth rate of labour force, personal freedom)	Hess 1989
• child mortality rate, crude death rate, enrolment in secondary school 1990 year 1, life expectancy at year 1	Stokes &Anderson infant mortality rate at

state property there is now rapid privatization going on. How far should this go? To whom do the mines, forests, fields, water and air belong? Unrestricted use of air, water and land, in short the environment, does not lead to sustainable development. The environment needs to be protected. One task for the state might be to own and receive payment for the use of the environment. But again, even the environment may be 'sold' on a market. In the USA, air, or rather emissions rights, are being sold on a market.

Resources owned privately may not necessarily be used freely; they might be protected. However, in many cases the state is not strong enough to enforce its will. There are many examples of strong foreign owners that buy and use resources to the detriment of the country.

The recommendation in the Agenda 21 document is that more ownership, as well as financial and legal competence should be concentrated at the local level, the municipality. A degree of self-reliance is then developed and the negative sides of globalization counteracted.

4.7 Developmental ethics

The above discussion, as well as the ethical dimension of sustainability, will easily lend themselves to the formulation of 'developmental ethics' to be considered by those involved in development, professionally or otherwise. As an indication of what such ethics may contain, we shall cite from the Appeal to Engineers and Scientists written at the recent congress 'Challenges of Sustainable Development' organized by the INES, the International Network of Engineers and Scientists for Global Responsibility on August 22–25, 1996 in Amsterdam. (See page 22.)

Table 4.2 Human development indicators and indices
Figures are given for the Baltic region and for comparison also for some other countries.

1 HDI rank	2 Country 1993	3 Life expectancy at birth, years 1993	4 Adult literacy rate, % 1993	5 School enrolment ratio, % 1993	6 Adjusted real GDP /cap (PPP$) 1993	7 Human development index 1960	8 Under-5 mortality rate, 1994	9 Under-5 mortality rate, 1994	10 GNP per capita USD 1985–94	11 GNP/cap ann.growth rate, %
1	Canada	77.5	99.0	100	5 947	0.951	33	8	19 510	0.3
2	USA	76.1	99.0	96	5 973	0.940	30	10	25 880	1.3
3	Japan	79.6	99.0	78	5 947	0.938	40	6	34 630	3.2
5	Norway	77.0	99.0	90	5 946	0.937	23	8	26 390	1.4
6	Finland	75.8	99.0	96	5 913	0.935	28	5	18 850	–0.3
9	Sweden	78.3	99.0	80	5 937	0.933	20	5	23 530	–0.1
17	Denmark		75.3	99.0	87	5 946	0.924	25	7	27 970
1.3										
18	Germany		76.1	99.0	79	5 941	0.920	40	7	25 580
37	Czech Rep.	71.3	99.0	67	5 815	0.872		10	3 200	–2.1
41	Slovakia	70.9	99.0	71	5 620	0.864		15	2 250	–3.0
55	Latvia	69.0	99.0	72	5 010	0.820		26	2 320	–6.0
56	Poland	71.1	99.0	76	4 702	0.819	70	16	2 410	0.8
57	Russian Fed.		67.4	98.7	79	4 760	0.804		31	2 650
–4.1										
61	Belarus	69.7	97.9	79	4 244	0.787		21	2 160	–1.9
68	Estonia	69.2	99.0	78	3 610	0.749		23	2 820	–6.1
80	Ukraine	69.3	95.0	76	3 250	0.719		25	1 910	–8.0
81	Lithuania	70.3	98.4	72	3 110	0.719		20	1 350	–8.0
108	China	68.6	80.0	57	2 330	0.609	209	43	530	7.8
135	India	60.7	50.6	55	1 240	0.436	236	119	320	2.9
174	Niger	46.7	12.8	15	790	0.204	320	320	230	–2.1
World		63.0	76.3	60	5 428	0.746			4 470	0.9

Col. 1 HDI rank is the rank number of the HDI in column 7
Col. 5 Percentage of combined 1st, 2nd and 3rd level gross school enrolement
Col. 6 Adjusted real GDP/cap is GDP/cap in constant prices adjusted for differences in purchasing power between countries in $
Col. 7 The HDI is an index combining measures of life expectancy, educational attainment and adjusted real income (cols. 3–6)
Cols. 1, 3, 4, 5, 6 and 7 are based on data from *Human Development Report* 1996
Cols. 8 and 9 are based on data from *The State of the World's Children* 1996
Cols. 10 and 11 are based on data from *World Development Report* 1996

Building sustainability ethics into policy and decision making

The values of sustainability may be transformed into written documents and institutionalized in many ways. Here we will point to a few main strategies. A detailed discussion is found in T. C. Tryzyna (1995).

1. INTEREST GROUPS AND NON-GOVERNMENTAL ORGANIZATIONS

The report 'Caring for the Earth' produced within the IUCN is the foremost example of a detailed document on sustainability where a code of ethics has a central place. These ethics may be expressed in the decisions and programmes undertaken within the organization. These and corresponding documents produced in other voluntary organizations may similarly have substantial effects on the activities of their members and large groups of other citizens.

2. POLITICAL PROGRAMMES

Many agreements between governments – in this context the Rio Declaration might be the most important – have a clear ethical content. When signing, the countries agree to include ethics in national policy. When the documents have been ratified by parliaments, they should in principle be transformed into national law.

Programmes adopted by political parties are of a similar character but might of course only be effective to the extent that the parties have a political influence.

3. PROFESSIONAL GROUPS

Many professional groups, national and international, adopt codes of ethics that form part of the basis for their professional activities. This is well known for the medical profession but is also common for engineers, journalists, etc. Many of these codes of ethics contain more or less detailed texts on the environmental aspects of the profession. In some cases, there are ethical committees within the professional associations that scrutinize the activities of their members to see whether they live up to the ethics adopted. In some associations, such as those for physicians and lawyers, it is possible for registration to be withdrawn in a case of unethical behaviour, an extremely severe sanction.

4. COMPANIES AND BUSINESS

Several companies also adopt codes of ethics which include regulations on the environmental consequences of the companies' activities. These texts normally function as policy documents within the company and may more or less be part of the development of products and other activities of the employees. There are no sanctions but the ethical or environmental profile may be a very important part of the marketing and success of a business activity, especially if customers are sensitive to these issues. The quite influential international Chamber of Commerce has adopted a code of environmental ethics.

Another important sector is that of finance. Many banks and financial institutions, including the World Bank, have adopted rules of credit policy that say that financed projects should not only be economically sound but also ethical; so-called rules for ethical investments.

5. OTHER INSTITUTIONS – UNIVERSITIES

Other institutions may also adopt similar documents. A case of special interest is the Charter for Sustainable Universities adopted by the CRE, Conference of European University Rectors in Barcelona in 1994 and signed by several hundred universities throughout Europe. Its implementation and the performance of member universities was reviewed at a conference in Bradford, England in October 1995.

Similarly, many organizations, and even more municipalities have, as part of their Agenda 21 work, included ethical principles as part of the basis for their programmes.

6. LAW

When compared to the above, the inclusion of the ethics of sustainability in law is much more far-reaching. In particular, whereas above it is mostly institutions of civil society that adopt new policies, it is the State that enforces the law. While non-legal rules have the character of voluntary agreements, although they often may be very efficiently enforced, the law is binding.

The law may be seen both as the written documents, the laws themselves, and as the institutions, the procedures for enforcement of laws, different authorities and courts. The law is distinctively different from other ways of implementation in that it concentrates on acts rather than motives, it is most often concerned with examining cases after they happen rather than before (although concessional courts are different) and there are much more severe limitations when transforming ethics into law as opposed to into political programmes and codes of ethics.

LR

5.

From Ethics to Law

by Wibren van der Burg

5. 1 Is legislation an answer?

An analysis of the moral values and norms connected with sustainability and the construction of what I shall simply call a morality of sustainability are important first steps. The next step, however, is to get this morality implemented. How can we make sure that citizens adapt their behaviour? How can society at large become more sustainable? A quite natural answer to these questions is to say that the law should enforce the norms and values connected with sustain-ability. If there is a serious problem that outrages the public, we often hear people say: "There should be a law against it." So if the problem is that neither our present society nor our individual life-styles are sustainable, we should make laws that change this society and these life-styles. If pollution is morally wrong, we should prohibit it.

This appeal to the law may be a natural reaction, but this does not mean that a natural reaction is always the best one. Quite often, in fact, creating a law is not a good answer to a perceived problem. There are many steps to be taken before we can decide that we should transform a moral norm into a legal one. In modern pluralistic societies, many moral norms, especially those with regard to the environment, are controversial. Legislation in these cases often has major side-effects and may even be counter-productive.

Sometimes a law is difficult to enforce because the illegal conduct is generally accepted and common or because it takes place in a private home where it is hard for law enforcement agencies to detect it. Enforcement can be difficult or almost impossible for practical or financial reasons. Sometimes a legal intervention is undesirable on grounds of normative principle, because some dimensions of our life should not be the state's business. For instance, according to most political theories, legal regulation of the number of children a woman is allowed to have would not be acceptable. Lastly, we should not forget that the law is a distinct institution with its own role in society and with specific characteristics and limitations. A host of issues like these should be taken into account before making the move from morality to law.

5.2 Why morality needs law

The ideal way to reach a sustainable society might seem to be to establish a situation in which all individual citizens are fully committed to a morality of sustainability and voluntarily act according to the norms based on those values. They minimize their use of energy and natural resources; they actively participate in the democratic processes; they voluntarily give a substantial amount of their income to the needy and to collective institutions, like the state, that provide public goods.

Of course, this ideal is quite unrealistic. It is unlikely that people will really make such major contributions voluntarily. If, for example, we think of the high tax rates in most countries, it is implausible that we shall be able to raise the same amount of money through gifts. The legal obligation to pay taxes is necessary to ensure enough funds for public purposes. Similar arguments hold with respect to other aspects of sustainability, such as the prevention of pollution.

We should not dismiss the prospects of voluntary sustainable behaviour too easily, however. In many cases, people do indeed make substantial contributions to the solution of environmental problems, by insulating their houses, by separating glass, paper and other recyclable refuse and so on and we may expect that further improvements are possible, once people tend to take the problems of the environment more seriously.

Even so, it is clear that, although it may be a major contribution, the voluntary contribution by morally motivated citizens will not be enough to create a sustainable society. To understand why law can be of help, we need to determine the shortcomings that law is expected to remedy. Without claiming completeness, at least four (partly overlapping) clusters of factors can be mentioned. For each of these factors, law can provide a partial remedy for the shortcomings of morality, but not all that is needed.

It should be noted that this perspective on morality and law ignores a major cluster of factors responsible for blocking the transformation into a sustainable society, namely, structural factors such as the structure of the world economy or the characteristics of the international legal order. This is not because I do not consider them important, but because it is not possible to analyze them in a framework of transforming morality into law.

5.3 Four factors that restrict legi-slation

(i) Information factors

It is often very difficult for ordinary citizens to know which action is better from the point of view of sustainability. If I want to buy a new refrigerator, I need to know which type is most energy efficient. Also, on a more general level, how serious are the environmental problems really? It is clear that information campaigns and education are the primary means to address this problem. Law can play a supporting role here; for example, manufacturers could be legally obliged to give adequate information about the environmental aspects of their products.

(ii) Financial and practical factors

If a plane ticket from Amsterdam to Stockholm is cheaper than a train ticket, the choice will be obvious for most of us. If it takes much extra effort to take empty bottles to a glass container for recycling, many people will not do so. Financial and practical factors like these can be very important in influencing people's behaviour. Changing those factors is primarily a matter of public policy; for instance, through providing easy facilities for refuse collection and various types of tax on undesirable behaviour and subsidies for desirable behaviour. Legislation is often an instrument to realize such policies, if only because taxes and subsidies are usually introduced and changed by way of law.

(iii) Coordination factors

One of the essential characteristics of environmental problems, but also of problems of social justice and democracy, is that they concern (partly) public goods and that collective action is needed to solve them. A clean environment and a flourishing democracy are public goods: no one can be excluded from enjoying them once they are provided. Even if I did not contribute anything to the achievement of these goods, I can still benefit from them. (In the philosophical literature this problem is called 'the free-rider problem'.) Moreover, my individual action does not have a noticeable influence on the achievement of these goods. The individual actions of one person cannot turn a public transport system into a profitable system. We need the cooperation of a great number of persons, or collective action, to ensure this. A self-interested person has, therefore, little incentive to contribute to the provision of public goods. Especially if someone participates in the economic sphere, the reverse is rather the case: when your competitors contribute, while you avoid the costs of contribution, you have a competitive advantage. Therefore, no one will voluntarily contribute. The collective result will be far from optimal: the 'production' of these public goods is much lower than desirable.

A way out of the deadlock is to oblige individuals by law to act morally and to contribute to the realization of public goods. Arguments like these are standard in traditional fields of state activity such as defence, public security, the setting of minimum wages and social security. Similar arguments may be used with respect to the newer problems connected with the ideal of sustainability. If the state obliges us all to pay energy taxes or to obey rules protecting the environment, no one gets a competitive advantage and everyone can profit from the resulting public good.

A different way out of this deadlock is to change the economic parameters (or sometimes the way in which they are perceived) so that people understand that it is profitable, not only collectively but also individually, to act in a way that contributes to sustainability. In the field of environmental problems, this is indeed often a real possibility. Saving energy and raw materials also saves money. Developing new environmental technologies can be a profitable industrial business and a reduction in pollution is sometimes necessary to avoid liability suits from citizens.

(iv) Moral factors

This is a very broad category. Citizens' moral opinions with respect to sustainability vary; some will deny that they have a moral duty as regards nature or, more likely, they will tend to take their duty very lightly. Others will be convinced that they have this duty, but they simply do not act accordingly because they are not sufficiently motivated. There may be various ways to deal with this problem; providing a better moral education and stimulating lively public moral debate may be some of them.

Law can play two roles here. Legislation has a symbolic function: it can express certain fundamental values and present them as guidelines to citizens. More important is the direct role of law. Legal sanctions may provide citizens with an additional non-moral motivation to stick to certain norms, whether the citizens perceive them as moral obligations or not. Perhaps my moral motivation for not throwing litter out of my car window is in itself not strong enough, simply because it is such an easy way of getting rid of it. But if there is a severe penalty on this behaviour (as in the United States), this may well motivate me to abstain from it.

It should be noted here that sanctions need not always be penalties under criminal law. Administrative sanctions, like the withdrawal of official permits, or civil sanctions, like the payment of compensation for damage, may be even more effective. For a large company, the threat of a criminal penalty for polluting a river may be less serious than the risk of civil lawsuits for compensation by victims who have suffered health problems after swimming in that river.

These four clusters of factors are not comprehensive but they give a good overview of the various types of problem that law is supposed to solve. For some problems (like those concerned with lack of information) the role of law can only be marginal – solutions will have to be found elsewhere. For

other problems, especially those of a practical and financial nature, law can be seen as an instrument for public policy that indirectly influences behaviour. Finally, as an answer to coordination and moral factors, law can be used to enforce moral norms directly, especially by providing sanctions.

5.4 Law as an instrument of public policy

The morality of sustainability can be implemented through a variety of public policies. Only some of them use legal regulation as an instrument. The idea that law is an instrument for public policies is a standard one in modern welfare states. (Of course, law has other functions as well, like protecting citizens against one another and against the state.)

Law can be used in many ways; for instance, to regulate the economy with the purpose of achieving justice. Legally determined minimum wages and standards for working conditions, quotas for the participation of women, minorities and the disabled in the labour market are examples of this instrumental use of law. In a similar vein, law can be used to promote sustainability by setting limits to the amount of manure that is allowed to be spread on an acre of farmland, setting minimum standards for the insulation of houses and for the energy efficiency of household equipment, and so on. In recent years, many countries have seen a rapid growth in regulations concerning the environment, sometimes also the result of supra-national legislation from the European Union.

However, there are reasons for doubt about the effectiveness of this traditional form of instrumental regulation. Various studies have shown that sometimes the effect of instrumental regulation is minimal or even counter-productive. Some legal interventions have serious side-effects. Too strong an emphasis on law as an instrument for political purposes can also endanger the integrity of law as a relatively autonomous institution that has an important function in the protection of citizens against the state. Fundamental doubts have been voiced about the ambition of governments to rule their societies and to change and restructure them. These criticisms have not only been heard in the Communist world, but also in the social democracies of the West. As a result, most western societies have gone through a period in which attempts were made (but often unsuccessfully) to have less regulation.

Various alternatives for state regulation have also been proposed. Some authors have argued for a more reflexive type of law where societal subsystems or sectors organize and regulate their activities autonomously. A recent development in environmental law is the idea of covenants, in which the government and certain organized segments of society, like the chemical industry or the agricultural sector, agree on certain policy goals, but which leave the industry or the sector concerned a substantial amount of discretion to decide on the way in which these goals should be reached.

The effectiveness of alternatives like these is still a subject of debate and study. Anyhow, it should be clear now that the desire to make laws purely for instrumental purposes should not be met uncritically. An evaluation of the probable effects and of possible alternatives should be made before one can conclude that "there should be a law". Moreover, recent theoretical debates have shown the importance of morality. Both instrumental legislation and the suggested alternatives usually work best in situations where almost everyone agrees on certain fundamental values and goals, and is morally committed to them. In other words, legislation can remedy some of the shortcomings of morality but, conversely, it needs to be supported by morality as well.

5.5 Law as the enforcement of moral norms

Law can also influence behaviour directly by simply making certain types of action illegal. Some moral norms are legally enforced; transgressions can lead to criminal punishments, administrative sanctions or civil liability suits. The core of traditional criminal law consists of the legal enforcement of moral norms against theft, violence and so on. Private law embodies moral norms regarding the protection of property and liability for harm caused to other persons. In a similar way, the implementation of a morality of sustainability could lead to statutes prohibiting the irresponsible disposal of wastes or creating civil liability for polluting the air with toxic substances.

Even with respect to the traditional norms of law, this is a much too simple picture, however. For one thing, the interaction between law and morality is usually more of a two-way process than a one-way translation. Moreover, the step from moral ideas to legal norms is not a simple translation. There is always a transformation process in which moral ideas are merged with typically legal concepts and modes of thinking. Even if identical words are used, they often mean something different in the legal context. Law is a distinct institution with specific characteristics, limitations and dynamics that influence the role and interpretation of legal norms.

For instance, in criminal law we need general and yet precise norms, otherwise legal practice would be confronted with many problems of application. We can quite vaguely say that we have a moral obligation to refrain from driving a car at a dangerous speed. In the law, however, it is more practical to have (also) a more specific norm like it is forbidden to drive at a speed of more than 100 km/h on roads of type A.

Another example is that the principles of civil liability usually have many similarities with the

From morality to law: some issues to be considered

1. THE NEED FOR LEGAL INTERVENTION

What is the problem we perceive and is law a solution to the problem? Other policies may give better results or we must simply be content with the fact that neither legislation nor other policies can solve the problem. When it is considered desirable to separate household refuse so that paper, glass, etc. can be recycled, we must first try other alternatives like creating a better system of wastepaper collection.

Most societies are in the process of growing public awareness and willingness to cooperate voluntarily to achieve environmental goals. Sometimes premature and strict legislation will even frustrate this process, because it provokes opposition from those citizens for whom the changes go too fast. On the other hand, legislation may also foster this process by symbolizing the change in our common values and providing democratic legitimacy.

2. THE AVAILABILITY OF ALTERNATIVES

As many studies on the effects of legislation have shown, law is sometimes very ineffective or even counter-productive. Therefore, we should always carefully consider whether there are alternatives.

Providing information, creating subsidies and other facilities for desirable behaviour or imposing higher taxes on undesirable behaviour may be more effective and politically more acceptable than direct prohibition of undesirable behaviour or rationing of resources. Higher petrol or electricity prices may help more than legal measures to reduce our energy consumption. Recently, various other alternatives have been discussed. Promoting self-regulation in a cooperative process of all parties involved. Certification of products by independent boards (supported by all parties involved) in which environmental factors are taken into account may be a better way than setting inflexible legal standards.

3. THE FIELDS OF LAW

Law is a plural phenomenon. There are various (sub)fields of law, each with its own characteristics. Criminal law is different from administrative or civil law. There is a tendency among the public, when speaking of law, to focus on criminal law. In modern law, however, other fields of law are often much more important.

When considering legislative approaches, we must carefully choose which fields of law are best suited to do the job. For some problems, an administrative law approach will be adequate; for example, if technological possibilities change very rapidly and general guidelines are difficult to draw, a system of permits may be most effective and flexible.

As a second example, if the administrative and judicial agencies are understaffed and overburdened, it may be wise to try to mobilize the citizens. A method for doing so is that of making private lawsuits easier, for example, by recognizing so-called 'class actions' which enable individual citizens to sue in court on behalf of a whole group when public or collective interests are at stake.

4. THE INTEGRITY, ROLE AND CHARACTERISTICS OF LAW

Law is a distinct social institution with a specific role and concomitant limitations. Law cannot make people morally perfect; it is better suited for enforcing minimum standards. Setting the standards of achievement too high in legal regulation can therefore result in ineffective laws.

Law has special problems of enforcement and proof. Criteria of due process and the Rechtsstaat sometimes lead to practical and normative problems in trying to get people convicted. These considerations are very important, especially in environmental law, where many crimes are victimless.

5. THE EFFECTS OF THE LAW

Both the intended effects and the unwanted side-effects of legislation should be calculated. Legislation is not always effective in influencing people's behaviour. Legal prohibition of certain polluting activities here may lead to the transfer of an industrial company to a Third World country where environmental control is less or even minimal. A new prohibition might not be effective because the police force is already overburdened and will not give priority to the prosecution of offenders.

6. THE NORMATIVE LIMITS OF THE LAW

According to most normative political theories, some forms of behaviour that are considered morally wrong should nevertheless not be the subject of legal prohibition. Just when and why this is so is, however, an issue of controversy. The crucial problem here is that many environmental problems have to do with life-style issues – a category of issues that is traditionally considered to belong to the private sphere in which the

concepts used in discussions of moral responsibility. The specific characteristics of law and legal dynamics have, however, also resulted in major differences, such as the introduction of the legal concept of strict liability. Quite often, the transformation process of implementing a moral norm and the subsequent legal dynamics change the original moral ideas beyond recognition.

Issues like these are complicating factors but they do not make the transformation of moral norms into law completely impossible. We can therefore try to transform a morality of sustain-ability into legal norms, provided we are prepared to tackle those issues. In some cases the transformation is quite simple. We can create a legal rule that prohibits dumping litter. If the fine is substantial and the chance that transgressors are caught and punished is high enough, this may deter citizens from such undesirable behaviour.

In other cases, legal regulation is less simple. One of the causes of eutrophication is that too much manure is spread on farmland. The surplus which the land cannot absorb then pollutes the ground water. Morally, this problem may seem easy to solve: we could construct a moral principle that no farmer should spread more manure than the biological absorption capacity of his land allows. But how do you translate this into a legal norm? Such a general norm would be too vague to be of practical use. Many factors are relevant here, like the characteristics of the land and the crop. It is technically quite difficult (though not impossible) to elaborate this basic principle and turn it into a feasible legal norm or system of norms.

There are not only technical problems here. Most modern societies are morally pluralistic. Everyone agrees on minimum rules against murder and theft. On moral principles regarding topics like the environment and social justice, however, there is often substantial disagreement. This raises, firstly, the normative question as to whether the law should impose moral norms on a minority that does not agree with these norms. This question touches on a number of issues in political philosophy regarding democracy, the protection of minorities, state neutrality with respect to religious and moral convictions – complicated issues that cannot be elaborated here. It raises, secondly, the practical question as to whether it is feasible to enforce such laws. People who do not see the point of legal norms are more likely to disobey them as soon as they get the chance.

This practical problem is especially important when we are dealing with so-called victimless crimes – crimes in which there is no identifiable victim who can complain. Traditional examples of these are the use and sale of illegal substances like alcohol and drugs, euthanasia, abortion and various types of sexual conduct between consenting adults (such as homosexual acts or adultery). In many countries, acts like these are considered immoral by a majority and they have been made criminal offences. (I leave aside here the normative issue as to whether these acts should really be considered immoral or should be made illegal.) It is always very difficult to enforce such norms because the acts are so difficult to detect and prosecute. In ordinary criminal cases, there is a victim of the theft or the assault, who reports it to the police and who can help to establish the evidence by providing relevant material and testimony. When someone consumes drugs in private, it is much more difficult to detect this act and prove it. This is even more so when the person lives in a subculture that does not consider the use of drugs immoral – there will be little cooperation then.

Many actions that harm the environment are 'victimless' crimes. The 'victims' are the environment, animals, perhaps future generations – but only seldom are actual living persons. Neither the offenders nor the people in their direct environment often see any harm in the acts involved – there may even be sympathy for farmers or fishermen who dodge environmental regulations. This makes detection and proof difficult and the effectiveness of regulation is often doubtful.

5.6 From morality to law

The conclusion above is that legislation works best when there is a broad moral agreement on the norms embodied in the law. Law cannot supplant morality, only supplement it, while at the same time, vice versa, it has to be supported by morality.

Legal implementation of moral values and norms is in many ways problematic. Law is sometimes ineffective or it may not be the best instrument to realize moral values; it may also be undesirable from a normative point of view to enforce moral norms through the law. Without claiming completeness, I shall list a number of topics that will have to be addressed before we can make the step from a morality of sustainability to legal regulation. (See box p. 30)

The problem here is to find the right balance. Inactivity by the state may lead to further deterioration of the environment, whereas too much state intervention may erode our civil liberties and civil society. The latter are essential conditions for keeping public awareness of environmental problems alive – only free, well-informed citizens may be expected to take their moral responsibilities seriously. Here, as elsewhere in this chapter, the message is that moral awareness alone is not sufficient, but nor is the law; we need both. Law is not an alternative for morality, but its supplement, just as morality is a supplement to law.

Legal regulations and sustainability

Sustainability may be introduced into law in different ways. There are many regulations concerning environmental protection already in effect even before sustainability has been adopted as a political goal. More recently, laws have been implemented that are directly based on the concepts of sustainability. They include regulations on resource use (for example, taxation on the use of fossil fuels) and waste management (for example, regulations on recycling). Several laws are the consequences of international conventions such as protection of the atmosphere and biodiversity. There is only very little that is directly related to, for example, the rights of future generations.

Physical planning has a special role here since it forms the basis for the use of natural resources and preservation of biotopes, biodiversity and in general long-term planning that will shape the world for future generations.

Below follows a short enumeration of some of the major categories of legal regulations relevant to sustainability. For further reading see 'The Baltic Sea Environment Session 7 (I.–M. Andréasson-Gren, G. Michanek and J. Ebbesson, 1992).

LR

1. LEGAL REQUIREMENTS AND ENVIRONMENTAL QUALITY STANDARDS (LIMITS)

Legal requirements are precise restrictions or prohibitions, banning the use of hazardous substances such as DDT and PCB, as well as controlling certain practices such as discharges from vessels, certain forms of transportation of hazardous chemicals, etc. Quality standards define allowed amounts of polluting substances in water and air and thereby emissions to water and air. Such regulations enforce improved purification of discharges and stimulate the introduction on non-waste technologies.

2. LEGAL ECONOMIC INSTRUMENTS

Legal economic instruments, which include taxes, fees and subsidies, are determined by legislation. These instruments do not enforce, but promote, environmental protection and sustainability. Important examples are taxation on fossil fuels, oil and petrol and fees on emissions of carbon dioxide.

3. MATERIALS FLOWS AND RECYCLING

More recently, legal requirements relating to waste handling have been expanded by requirements on recycling. Thus, a company selling a product may be forced to take care of the used product. Products might be forced to contain only recyclable materials. Some materials might be outlawed, as mercury is in Sweden.

4. TOWN AND COUNTRY PLANNING; PERMITS (CONCESSIONS)

Land and water is continuously being developed. New factories, power plants, roads, harbours, etc. are built. Concessions for such developments are part of town and country planning. The planning authority, often a municipality, must balance all conflicting interests, such as those of production, leisure, etc., in connection with the proposal and evaluate at least the environmental impact of a new installation. Legally binding regulated planning also exists in the energy, waste management and water sectors.

The legally binding protection of nature has to be considered. Thus, protected areas, nature reserves, the protection of endangered species and the protection of biotopes must be considered in physical planning.

Factories, sewage treatment plants, etc. are examples of point sources with potentially great environmental impact. A permit (concession) is required before such an installation can be built or expanded. Permits are granted for certain emissions for a certain period of time. By reducing the periods for which the permits are issued, authorities can stimulate the development of better technologies.

5. LEGAL RESTRICTIONS ON DISCRETIONARY POWERS

Legislation also distributes the power of decision-making to authorities, whose competence is thus usually restricted by legislation. Such regulations define sustainable development as the basic goal to be promoted in all physical planning but leave open the question of how the responsible authorities should do it. Some guidelines as to how physical plans should be drawn have, however, been defined.

6.

SUSTAINABILITY IN LEGISLATION

by Nina Herala

6.1 Sustainability starts to find its way into law

From a legal point of view, the general principle of sustainable development can be transformed into legal rules, political goals and legal principles. To be accepted as a legal rule, it is necessary that sustainability is first adopted as a political goal. As a political goal, it affects both enactment and amendment of legislation as well as the use of discretionary powers. The use of discretionary powers depend also on legal principles. Legal principles can be statute-based or interpreted on the basis of legal or administrative decisions.

Sustainable development has been set as a political goal in all Nordic countries following the Brundtland Commission Report, the Rio declaration and Agenda 21. A more comprehensive environmental policy is the aim.

Sustainable development can be divided into protection of nature and human environment. When protecting nature, the aims are ecological balance and biological diversity. Human environment should be developed to promote a socially and culturally sustainable setting. Sustain- ability in the development of society requires that economic factors are taken into consideration. (Our Common Future 1987.)

The substance of sustainable development has been defined in Sweden in a government bill, in Denmark in legislation and in Norway in an environmental policy statement to the Norwegian *Storting* (Parliament). In Finland the Ministry of Environment has appointed a working group consisting of different administrative sectors to prepare a government bill for sustainable development by February 1997.

6.2 What is protected in law?

In Sweden and in Denmark attention has been paid to preserving buildings, nature, landscapes and to increasing opportunities for taking part in decision-making at local level. The development of the infrastructure in Sweden and the protection of undeveloped coastal areas in Denmark have also been described as relevant matters in sustainability.

In Norway, sustainable development has been defined in politics in a way that stresses environmental considerations in decision-making, plans and programmes. Environmental protection comprises the preservation of the most basic public interests such as better administration of resources, effective use of natural resources, diminished pollution and more effective preservation of nature and cultural heritage.

In Finland, the Finnish National Commission on Sustainable Development has defined the crucial goals and means for sustainable development. The aim has been to reduce the disadvantages of human activities for the environment. Attention has been paid to protect the diversity of nature, undeveloped coastal areas and groundwater as well as the atmosphere on the Earth.

Physical planning is considered to be a central tool to prevent environmental problems because sustainable development requires a broad view of the appropriate use of land and the ability to coordinate conflicting interests. (Towards Sustainability 1993:70.)

Physical planning is regulated as a skeleton law which mainly prescribes the competence of the authorities and the aims of land-use planning. It can therefore be called 'welfare state regulation' which mainly delegates the power of decision-making to administrative authorities. When talking about sustainability, the competence of authorities is restricted by

(i) subject-matter regulation (mainly goals and flexible provisions),

(ii) the principles restricting administrative decision-making (legal equality, objectivity, prohibition of unlawful purposes and principle of proportionality) and

(iii) the provisions concerning the aims that the authorities should promote.

6.3 A healthy environ-ment as a consti-tutional right

Both in Norway and in Finland, environment has been mentioned among the basic rights in the constitutions. In Norway, the right to a certain standard of environment is considered to be a basic human right. According to the Norwegian constitution, everybody is entitled to a healthy environment and to nature in which productivity and biodiversity has been maintained *(Kongeriget Norges Grundlov*, art. 110b).

The regulation is above all a political statement about the importance of the protection of the environment. It is a statement to the private sector of the importance the legislator is attributing to the protection of the environment. The constitution does not

Sustainability in the Constitution of Estonia

The Estonian Constitution contains the Act of Sustainable Development passed by the Estonian Parliament in February 1995.

The Act consists of two parts. In the first part, Article 1, the purpose of the Act is established. The second part, Articles 2-12, deals with the natural environment and natural resources. The act establishes several principles of sustainability. A large part of the act, however, deals with more classic environmental issues, environmental impact assessment, monitoring, environmental standards and land planning. Articles 1, 2, 3 and 5 are quoted below.

ARTICLE 1

1. This act establishes the national strategy principles of sustainable development.
2. The national strategy of sustainable development is based on the principles established in the decisions of the UN Conference on Environment and Development (Rio de Janeiro, 1992)
3. The second part of this act establishes the bases of sustainable use of natural environment and natural resources.
4. The principles of sustainable development for other fields are established by law, other legal acts or by a national programme.

ARTICLE 2

The purpose of sustainable use of natural environment and natural resources is to guarantee an environment meeting human needs as well as necessary resources for economic development without causing significant damage to the environment and maintaining natural diversity.

ARTICLE 3

1. Subject to the Constitution of Estonia everyone is obliged to spare the living and natural environment as well as to avoid causing any damage to it.
2. Liberties to command a property and to be engaged in entrepreneurship shall be restricted proceeding from the need to protect nature as common property of mankind as well as national wealth.
3. Minimization of pollution of the natural environment and the use of natural resources in the amounts maintaining natural balances, are the fundamental requirements of economic activity.
4. Planning any action of transboundary effect or likely to have a significant impact on the environment as well as general regulation of environmental protection shall be carried out in international cooperation.
5. The use of natural environment and natural resources shall be regulated by use and pay rates, in establishing which the impact of nature use on the environment is taken into account.
6. Plans, programmes, development projects and projects shall be public.

ARTICLE 5

1. The reserve of renewable natural resources is divided into critical and usable reserves.
2. The critical reserve of renewable natural resources is the lowest amount guaranteeing natural balance and reproduction, implementation and protection regimes as well as the maintenance of biological and landscape diversity.
3. The critical reserve of renewable natural resources, together with the reserve proceeding from indeterminacy, shall be established by the Government.
4. The remaining part of the established critical reserve of renewable natural resources is the usable reserve of the renewable natural resources. On planning economic activities the extent of established usable reserve shall not be exceeded.
5. The extent of usable reserve and the annual use rates are established by the Government taking into account the natural increment. The procedure of using the usable reserve of the renewable resources shall be established by law.

prescribe the criteria for a healthy environment and nature. Due to the rule of law, statutory actions should be taken before obligations and restrictions on the use of the environment can be required.

Landowners and tenants of land have, however, obligations to control the use of natural resources in the interests of the needs of future generations. The provision of the constitution binds authorities when using their discretion. The constitution has also an impact on the enactment and application of laws.

In Finland, the provision containing the right to clean and healthy environment is also based on the constitution. The provision obliges the legislature and authorities to improve environmental legislation on the basis of private rights. Everyone is to be responsible for the biodiversity of nature, the environment and cultural heritage. The responsibility of the public administration is restricted to providing everybody with the right to a healthy environment. The public administration does not have the same responsibility to preserve nature. The capability of the environment to survive is regarded as the precondition for other human rights.

When amending the constitutions in Sweden and Denmark, environmental provisions have not been included among basic human rights, although the political interest in nature and the environment indicates the importance of the matter.

As for the three Baltic states, Estonia has included in its constitution the right of the population to a clean environment. Everyone should preserve both the human and the natural environment and is obliged to compensate for the damage caused to the environment. In Latvia and Lithuania, similar principles have been set out in legislation on the environment. The same principle of the right to a favourable environment and the right to compensate for any damage has been set out in the Russian and Belarusan constitutions also. The 'polluter pays' principle has been introduced into legislation in Russia and Estonia. The constitution of the Ukraine is more specific about the responsibilities of the state. The state is responsible for ensuring ecological security and maintenance of the ecological balance.

6.4 Physical planning and the sustainable use of land

Physical planning has a special role since it forms the basis for the use of natural resources and preservation of biotopes and biodiversity, the planning for traffic infrastructure and in general long-term planning, thereby shaping the world for future generations.

Sustainable development has been added as a goal into legislation concerning physical planning in Denmark, Finland and Sweden. In Norway, the state authorities have to give more detailed provisions about the implementation of the constitution. In Finland, sustainable development is the basic goal in physical planning and land-use planning. The goal covers natural resources as well as the environment. According to Sweden's physical planning and building regulations, sustainability is the aim when planning the environment for the people. The law in Denmark provides for sustainable development both in the people's environment and in that of animals and vegetation.

Specific legal regulations aiming at sustainable use of land are very rare. There are provisions about which parts of Danish, Norwegian and Swedish coastal areas should be left undeveloped. Because of the several exceptions provided by the law, even these provisions delegate widely the power of decision-making to administrative authorities. In Finland the shores are protected by a government administrative directive which has to be applied in physical planning.

The definition of state interests is important for the distribution of competence. The protection of nature is usually considered to be a state interest. The Finnish government has protected special nature and landscape areas. There are no legal provisions restricting what can be considered to be a state interest.

In Sweden, state interests have been defined in legislation. State interests have been divided into geographic protection areas and sectoral state interests. Only interests defined in legislation can be protected by state authorities. In Norway, the definition of state interests is a political question. The government as well as the Ministry of Environment have defined the protection of nature and minimizing the need for traffic as state interests and have stressed relating environmental questions to economic life. The government can make decisions on defined state interests and also on ques-

tions that the municipalities have not been able to agree about.

In Denmark, the Ministry of Environment has stressed that sustainable development must be integrated into the community structure. This means more concentrated building in suburbs and the concentration of services to the centres.

When aiming at sustainable development in land-use planning, the goal is to save the environment from building and to minimize the need for traffic as well as effectively utilizing the existing infrastructure. When trying to build more effectively, one should not forget aesthetic appeal. Recreation areas should be part of the land-use plan as well. More effective land usage also means that we are trying to encourage utilization of built and unbuilt suburban areas before extending development to other areas. The splintering of the community structure increases the need for private vehicles and traffic. Private vehicles in their turn place a strain on the environment from the point of view of emissions, noise and the need for parking space. To reduce the disadvantages of private car usage, maximum limits for the parking space requirements of private cars have even been suggested.

When planning the community structure and land usage, we should favour solutions that promote walking, light traffic and public transportation as the main forms of travelling from place to place as well as railway traffic for moving goods from one area to another.

With the help of regional plans, sustainable development can be promoted by protecting state-wide and area-wide special nature-, landscape- and cultural areas. The preservation of special recreation areas should also be taken into account. When considering coastal areas, it means that some parts of the shore should be left undeveloped and building should be concentrated. The diversity of nature and biotopes should be protected from development and preserved for opportunities for outdoor recreation in order to save nature for future generations. Regional plans offer a good way to plan the use of an area in advance by identifying the optimal utilization of nature, its sources and potential during the planning phase.

In the case of a single special project, an environmental impact assessment (EIA) has to be undertaken. The assessment clarifies, for example, the effects which a project has on the environment and the landscape. Such groundwork is the basis for decision-making and it should not only affect the granting of building and other permits but should also determine the conditions of use of the developments concerned.

6.5 Institutions responsible for sustainable use of land

(i) Government

A government has an impact on sustainable development when it sets up political goals and defines means to promote sustainable development. In Finland, the government has also issued administrative directives for the protection of nature and cultural heritage. The Ministry of Environment confirms the regional zoning plans. If some other ministry opposes such confirmation, the decision is transferred to the government. In Sweden, the government is the body to which appeals are made in matters concerning the public interest. It also confirms the regional plan for Stockholm as far as it concerns state interests. In Norway and in Denmark, the Ministries of Environment can intervene in physical planning in matters concerning state interest.

In Finland, sustainable development has also been added as a goal in legislation guiding authorities' decision-making. It is the duty of the Ministry of Environment to promote sustainability.

(ii) Regional Authorities

There are two kinds of authority at the regional level. The municipal alliances draw up the regional plans which regulate physical planning in municipalities. The regional authorities of state, the county governments, look after state interests in land-use planning. In Sweden, a regional plan has only been drawn up for the Stockholm region. The county governments can only advise municipalities as regards municipal plans which are not legally binding. The county governments can overrule municipal decisions on legally binding detailed plans if state interests have not been followed. In Norway, the county governor points out regional and state interests in his statement on physical plans.

At the regional level in Denmark, only the municipal alliances take part in decision-making on physical planning. Municipal alliances have the right to veto municipal plans that are in conflict with regional plans, provisions of law or with state interests. In Finland, regional state authorities confirm municipal decisions on physical plans in all municipalities except the largest towns which are under the jurisdiction of the Ministry of Environment. Municipal alliances in Finland have to take into consideration whether regional planning is in harmony with sustainable development.

(iii) Local Authorities

Elected local councils have the decision-making power in municipalities. The responsibility of municipalities to promote sustainable development consists mainly in providing a socially and culturally sustainable environment. But municipalities also implement the provisions of other physical plans and land-use regulations and also use free discretion in drawing up physical plans. In Finland, municipalities have to promote sustainable development and the well-being of the inhabitants in their areas.

7.

How do we probe the physical boundaries for a sustainable society?

by Joachim H. Spangenberg and Friedrich Schmidt-Bleek

7.1 Which issues to address

The notion of sustainability, as proposed by the UN Commission on Environment and Development, refers to a socio-environmental concept. It has proved widely attractive in its attempt to harmonize two principles formerly regarded as antagonistic – environment and development. It foreshadows a means of economic development that secures a dignified life for all people, without over-burdening ecological systems.

Both the technosphere and the ecosphere are non-linear complex systems – the former is viable only as a parasite of the latter. It is therefore not trivial to ask what practical and directionally safe criteria may apply in order to guide economies within ecological guard-rails, that is, enabling the Earth to remain in balance. Nor is it trivial to attempt to harmonize any conceivable approach at the international level, since there will always at the same time be winners and losers. Ten years after the publication of 'Our Common Future', the international dialogue on these matters is only intensifying.

In this paper, we offer some thoughts which may also serve as a conceptual framework. We attempt to define the relevant parameters that need to be taken into account to steer human development towards ecological sustainability. We further propose a measure for resource productivity in the economy and demonstrate how quantitative targets can be derived and used to define performance indicators.

We suggest that the following four issues be addressed when attempting to operationalize the concept of sustainability:

- a practical framework to integrate the economic, social and environmental dimensions of sustainability;
- a clear definition of the categories to be taken into account for each of the dimensions;
- methodologies to monitor progress towards sustain-ability for each of the categories and
- targets in order to measure distance-to-target (performance indicators).

We shall first explore to some degree the environmental, that is, the physical dimension of sustainability, in order to prepare the ground for further discussions.

7.2 Environmental sustainability, carrying-capacity and critical loads

The physical dimension of sustainability refers to leaving intact – for an infinite length of time – the stability of the internal evolutionary processes of the ecosphere; a dynamic and self-organizing structure. The eco-sphere, as well as the anthropo-sphere, is part of a larger system and open to flows of either materials or energy, or both. Thus, the anthropo-sphere is an open, thermodynamic subsystem of the Earth with respect to materials and energy and the earth is – for all practical purposes – closed to flows of external matter but open to energy inputs, consisting mainly of solar radiation. It is primarily this window to energy inputs from space which provides room for a sustainable use of natural resources for humankind.

An economic system is environmentally sustainable only as long as it is physically in a (dynamic) steady state, that is, the amount of resources utilized to generate welfare is permanently restricted to a size and a quality that does not over-exploit the sources, or overburden the sinks, provided by the ecosphere. Without this:

- human economies would have to continue to draw on the *stock* of natural resources (for example, high grade ore, crude oil, fertile soil) or, from an energy viewpoint, they would continue to use up low-entropy resources which sooner (3rd millennium) or later (4th millennium) would be exhausted[1];
- the immense (and rapidly increasing) *flows* of resources through the global economies would continue to lead to an increase in entropy, resulting in a variety of unpredictable and irreversible environmental impacts. These will include slow, long-term changes such as global warming, as well as short-term irregularities such as storms, stronger hurricanes and flooding rivers, resulting from the destabilization of ecological systems. This is equivalent to threatening the life-support system of humankind.

Whereas the size of stocks and their accessibility is an economic issue, ecology worries about resource flows, since these are what

[1] Unless the resouce productivity grows at a sufficiently high rate and without limit, as the formal models in the neoclassical tradition show – if not even predict; unfortunately, this is against both common sense and the laws of thermodynamics.

contribute to environmental impacts (Spangenberg et al, 1997). Thus, the environmental condition of sustainability is a steady-state system, with the smallest-feasible flows of resources at the (functionally, not geographically defined) input and output boundaries between the techno-sphere and the ecosphere.

The maximum continually supportable rate of output has been called the critical load and the maximum continually supportable rate of flow, the carrying-capacity. The latter term originates in biology, where the carrying-capacity is defined as the number of individuals of a given species that can be sustained over time without over-burdening the host system. Such a measure must, obviously, consider the average long-term per capita resource consumption of all natural species. As for the human race, one must remember that not only is the world population still increasing sharply, but the consumption of natural resources (energy, materials, space) is also on an even steeper rise. This is – or must lead to – an unsustainable situation.

As current experience with climate change, ozone depletion, acidification, eutrophication, forest decline, falling water tables, desertification, erosion and loss of biodiversity (to name a few) indicates, we are already at or even beyond the limits of carrying-capacity. Due to the technical skills of humankind, its innovative drive and the material growth of the anthroposphere, an infinite number of – ever-changing – disruptive interactions can occur at the boundaries to the ecosphere. Moreover, these impacts are characterized by non-linear relationships between stresses and responses. An unknown quantity of these effects can neither be detected within human time horizons, nor – were they found and measured – could they be attributed to distinct causes (Hinterberger, 1994; 1995; Spangenberg, 1993). This precludes the observation or theoretical calculation – and thus quantification – of the totality of concrete consequences of human (economic) activities on ecosystems (Schmidt–Bleek, 1993). This also illustrates the limited power of cost-benefit analyses in shaping environmental policies, particularly regarding the systematic restructuring of the economy in the push toward sustainability.

Since neither the carrying-capacity nor the critical load can ever be precisely determined, the political application of these natural science-based concepts must necessarily take into account the precautionary principle. This means that decision-makers must steer the economy, not by scratching the guard-rails, but by staying clear of them, keeping the economy in the middle of the road towards sustain-ability.

7.3 Environmental space

Leaving the field of natural science and coming one step closer to its application in the socio-economic field, we now introduce the notion of environmental space.

Environmental space (as defined in Spangenberg, 1995) is a normative concept with a physical, as well as a socio-economic and developmental, dimension. The concept was developed by H. Siebert (1982), and the notion coined by Opschoor, Weterings and others, although the basic idea behind is much older, going back to classical economics. Physically, environmental space is described as the capacity of the environmental functions of the biosphere to support human economic activities, that is, the carrying-capacity[2]. The social dimension of environmental space is given by the 'global fair shares' or 'equity principle' derived from the definition of sustainable development, assigning to all living people a moral right to achieve a comparable level of resource use, and to future generations a right to an equivalent supply (inter- and intragenerational distributional justice). Given the uneven distribution of resource use today, the need for a global stabilization or reduction (for example, by one-half) in the use of environmental space translates into a need to reduce the physical resource consumption of industrialized countries by a factor of five to ten.

This calculation, based on the two explicit assumptions that we are already at or beyond the limits of carrying-capacity, and that the equity principle of intra- and intergenerational justice should be applied, can be used for policy guidance only if its two basic assumptions are shared by the decision-makers and supported by the individuals concerned.

The developmental dimension of environmental space reflects the need for a resource consumption which guarantees a dignified life and defines a lower bound for resource use below which, on the basis of given technology, no sustainable life-style can be maintained: widespread poverty, hunger and lack of participation are considered inherently unsustainable. Within these boundaries, a sustainable econo-my should succeed, providing the goods and services to meet human needs, generating enough financial surplus to pay for investments and providing enough jobs and income to avoid social tensions. Consequently, sustain-ability can be defined as 'living within our environmental space'. Environmental space, thus defined, is the window of opportunity between poverty and wasteful over-consumption.[3]

Environmental space as defined so far, however, is not operational. In order to make it a viable, science-based policy tool, the categories to be analyzed have

[2] Since it is the flow of materials that cause the environmental impact, and not the amount resting undisturbed in the soil, scarecity of resources is not an environmental problem, but the mere concern of the economists. From an environmental point of view, reduction of extraction , i.e. of flows, is the key issue.

[3] This environmental definition, focussing on flows, i.e. resource inputs into the technosphere, differs from Opschoors initial, more economic definition. He had proposed to consider those resource consumption levels as sustainable, which at current exploitation rate would not exhaust stocks within less than 50 years. However, the calculations of Opschhor indicate that a reduction of throughput as proposed here would also serve to meet his economic criteria for the scarecity-of-supply.

to be defined (for example: State of biodiversity? Output of CFCs? Input of materials?).

If carrying-capacity is the chosen target, then environmental space is the compass. Now, we have to adjust our compass and identify the directions. Later, we shall measure the distance to the target and draw up maps for the route (policy proposals).

7.4 Categories of environmental space

There are several options for describing the use of environmental space, all of which may be helpful for specific purposes (J. Hille, 1997). From our point of view, the chosen option needs to identify those characteristics that permit easy translation into policy action in a directionally safe manner.

- Using descriptions of the state of the environment (for example, forest die back or numbers of endangered species) can help illustrate the need for immediate action and guide curative measures. Due to the complex character of environmental systems, however, and in particular to the widely unknown rebound effects[4] it is hardly ever possible to identify clearly the underlying causes and thus it is impossible to design appropriate policy responses to the driving forces of environmental degradation.
- Taking the state of the stocks of environmental resources (existing biodiversity, reserves of fossil fuels and minerals, etc.) as a measure may indeed be the basics of resource eco-nomy[5], but this provides hard-ly any information about the environmental situation and trends: coal in the ground does not cause environmental harm, unless it is mined and burnt. Resource stock assessment is therefore an inappropriate measure for the use of environmental space.

Unlike stocks, however, resource flows are of key importance for environmental deterioration, providing good estimates about the use of environmental space. The throughput of resources, however, must be measured at a well-defined point to permit the reproduction of data and international harmonization. The most appropriate choice for this point of measurement is obviously the border between the ecosphere and anthroposphere (or 'humansphere', as W. Rees calls it). Since there are functionally two of these borders, on the input as well as on the output side, we now have to compare the usefulness of choosing one of these options.

Traditional environmental politics have focused on regulating the output side of the economy. Measures such as pollution abatement equipment, BAT (best available technology) for emissions reduction, critical loads assessment, are all different ways of reaching the same goal: influencing the quality and quantity of the outputs that our economy releases into the ecosphere (only relatively recently has the insight grown that products are the main emissions of industrial societies and product regulations are just beginning to be included in environmental regulation). Environmental research as well has focused on the interaction of anthropospheric outputs with the ecosphere, with great effort invested and limited – albeit important and helpful – results. Input-related regulations have long been known, in the form of fleet-efficiency regulations and licences for mining (relative-input limitations) and logging or groundwater extraction (absolute-input limitations). For operationalizing the environmental space concept, then, which approach is more suitable?

- Whereas the number of materials entering our economic systems is limited to 50 – 100 abiotic substances including energy carriers[6], output control has to handle about 100,000 substances from the chemical industry alone, each of which interacts in various ways with the ecosphere and the other substances emitted.
- Whereas the number of points of entry into the anthroposphere is limited to some 20,000[7], the exits are beyond any control: every smokestack, every exhaust pipe, every waste dump, every drainpipe is such an exit. (Figures based on estimates for the German economy).

In designing appropriate policy measures, focusing on the inputs can provide higher regulatory efficiency with much less effort in control (Spangenberg et al,, 1997). This becomes particularly important when the introduction of market-based financial instruments is considered: regulating outputs with financial instruments will either need a new control bureaucracy or generate the risk of massive free-rider effects. (Hinterberger, 1997)

The next step is to define which inputs need to be analyzed to provide a comprehensive and directionally safe, but simple, assessment[8]. Every use of environmental space needs a realm where it can take place, materials as the physical basis of the agents and their instruments and energy. These are three at least partially independent variables:

[4] Rebound effects are here understood to be all effects that overcompensate efficiency gains by additional growth, at least partly due to the reinvestment of the additional income from the efficiency gains.

[5] Although the stocks, as well referred to as natural capital, are hard to quantify. Financial valuations based on current market prices are only applicable to marketable goods, and "willingness to pay" anlyses give information about cultural values of the people interviewed but contain no information about the ecological value of the stocks concerned.

[6] With e.g. limestone, crude oil or hard coal counted as one substance each. Substances without economic value excluded.

[7] Extraction points of minerals, energy carriers and water, where they enter the antroposphere, but excluding air. An oil field e.g. is considered one entry point.

[5] Although the stocks, as well referred to as natural capital, are hard to quantify. Financial valuations based on current market prices are only applicable to marketable goods, and "willingness to pay" anlyses give information about cultural values of the people interviewed but contain no information about the ecological value of the stocks concerned.

the relationship between the amount of tonnes of materials, kilojoules of energy and hectares of land used to produce one item varies from product to product and from service to service. Thus, we propose these three – energy, materials and land – to be the core categories of environmental space. Each can also – if necessary – be split up into environmentally relevant sub-categories such as, for example, air, water, soil, biotics and minerals for materials, fossil, renewable and nuclear for energy or build-up, pasture and agricultural for land use.

We propose characterizing the physical aspect of the use of environmental space through a quantification of the flow (or throughput) of energy, materials and land of a given economy, based on computations of input.[9]

Some authors have attempted to define one unifying measure to integrate all inputs or, as with the ecological footprint concept (Rees and Wackernagel, 1995), primary inputs and outputs. The ecological footprint describes carrying-capacity appropriated in terms of "area necessary to provide the basic energy and material flows required by the economy" (p. 18): "Complete Ecological Footprint analysis would include both the direct land requirements and indirect effects of all forms of material and energy consumption. Thus, it would include not only the area of different ecosystems (natural capital) required to produce renewable resources and life-support services (different forms of natural income) but also the land area lost to biological productivity because of radiation, contamination, erosion, salination, and urban 'hardening' [..]. It would also factor in non-renewable resource use insofar as it can account for processing energy and use-related pollution effects. At present, however, our assessments are based on a limited range of consumption items and waste flows". (p. 52). Simplicity in this case is achieved by considering a simplified economy, with food, wool and wood the only inputs and CO_2 the only output (fossil fuel availability is considered a given, and the area necessary to fix the emitted CO_2 defines the output side). Input- and output-related areas are added to calculate in hectares the total fertile area appropriated. (For a more detailed economic analysis see Folke et al., 1996.)

Consequently, we propose defining the categories of environmental space, that is, the flows to be controlled in order to approach sustainability, in terms of the physical inputs of energy, materials and land used into our economic system.

Already this quite reduced model of a modern economy illustrates that our use of environmental space is far beyond the Earth's carrying-capacity. Based on Canadian data, a per capita claim on land emerges that is three times as high as the global average land availability. Beyond this 'call for action', however, the limited complexity of the model is a serious obstacle for its application as a quantitative assessment tool.

This kind of problem arises with any measure that tries to express different dimensions of the physical environment by using one dimension as a catch-all standard: energy, land use and material flows have no common unit by which to measure their use. Any integration remains either simplistic or arbitrary (for example, by defining standard conversion factors).

The same holds even more true for all attempts to assign a monetary value to all components of the environment, or, worse, to social issues as well. The result is at best illustrative, at worst it can direct planning for the future, exclusively based on value per perceptions of a selection of living individuals i.e. "colonizing the future" in value terms.

7.5 Setting the targets

For energy, due to the latest findings of the IPCC, an international consensus is emerging on the need to substantially curb CO_2 emissions. We therefore need not go into any further detail of energy consumption measurement and reduction here. We propose to take the IPCC recommendations as reduction targets.

For land use, the need for a sustainable pattern is evident from the threats to biodiversity and soil fertility loss, in Europe particularly due to erosion and the leaching of micronutrients. However, so far no broadly accepted measure for biodiversity exists, and probably none can be developed to quantitatively cover the ecosystem, species and genetic level of biodiversity, not least because of the lack of data. Consequently, the criteria proposed for strategies for more sustainable development are more qualitative than quantitative in nature. (For details, see Reetz, 1994).

Our main concern, however, is to focus on material flows: in addition to non-renewable minerals and biomass, these include all energy carriers, thus offering a broad basis to assess the environmental impact of resource use, covering specific aspects of energy consumption and (at least partially) land management systems. Therefore, developing a measure to quantify material flows is of utmost importance for any attempt to operationalize the concepts of sustainability and environmental space. Operationali-zation means that the definition is made clear and an empirical content is assigned to the concept, so that a (real) policy can be built upon it.

Each use of a natural resource, be it water for drinking or cooling, minerals for industrial production or construction, land for agriculture or air for breathing. inevitably increases the entropy of the overall system. We consider the total material flow an appropriate measure of disturbance, and we regard the reduction of material flows a necessary (although not

[9] (For land "flow" is equivalent to "area claimed for a specific purpose".)

in all cases sufficient) means of reducing the pressure of humankind on the global environment in a directionally safe manner. The goal of reducing material flows is proactive in that it does not refer to individual symptoms of environmental damage, but to the overall impact on the system, thereby trying to prevent future damage as well as reducing the current potential for disturbance. Although a direct link of material flows to environmental stresses is evident only in a minority of cases (as was the case with total energy consumption until the threat of global warming from CO_2 emissions was taken seriously), many of the well-known symptoms of environmental degradation, from declining fish stocks to reduced fertility due to, for example, heavy metal accumulation, can doubtless be traced to intense material flows as the indirect cause.

Consequently, we consider dematerialization, defined as a dramatic reduction of anthropogenic material flows, of utmost importance for an ecologically positive change in our economic structures. In other words, dematerialization can serve as an operationalization of key aspects of the normative concept of sustainable development.

A reduction of world-wide anthropogenic material flows – which are already greater than those arising from natural processes (Schmidt–Bleek, 1992, 1993) – to one-half of the present dimensions, is a reasonable indicative goal. If it turns out that, in the long-run, a 40 per cent or 60 per cent reduction in material flows is needed to reach a sustainable use of materials, this makes no significant difference in terms of policy, since the necessary reversal of the current trend of globally increasing material flows is the same, as any sensitivity analysis shows. (Spangenberg, 1995)

The present levels of consumption and investment in the rich countries (with 20 per cent of the world's population) are responsible for about 80 per cent of the world's natural resource use, whereas the picture is reversed for poor countries. Moreover, existing investigations of long-term trends in the intensities of use (IU) of materials (Basic references are Malenbaum, 1975; Considine, 1991; Jaenicke et al, 1992) and energy (See e.g. Proops, 1988) suggest that these tend to grow rather than decrease in the early stages of development – as a consequence of both structural and technological changes through time. Thus, the equity principle embodied in the environmental space concept, as well as feasibility considerations, demand that resource efficiency increase dramatically in industrialized countries.

Decreasing resource throughput in absolute terms does not mean compromising wealth (service availability and well-being) since technological and social innovations that generate increasing resource productivity can compensate or even over-compensate for the difference in material use.

7.7 Resource productivity times ten

By how much does resource efficiency have to be increased ? The factor of two on the global level, if combined with the equity considerations mentioned above (a kind of 'human right' to resource use) translates into a factor ten improvement in resource productivity for industrialized countries. This goal, to be reached in a 30 to 50 year time-span, is equivalent to an annual increase in resource productivity of 4.5 per cent, and considered a pragmatic, feasible and necessary policy target. (See the Factor 10 Club, 1994; Spangen-berg, 1995). This amount of time is needed to allow the technical, social and economic structure to adapt and adjust without major conflicts with the requirements of sustainability. This is all the more necessary if, alongside technology improvements such as those forecast in the US technology development programme and the resulting efficiency gains, a culture of sufficiency is to emerge among the populations of industrial countries, accustomed to levels and – much more important and problematic – forms and dynamics of well-being which clearly cannot be maintained for a very long time.

A delinking of economic growth and material use in relative, and in some cases even absolute, terms has been reported in the past (Jaenicke et al, 1992), so the question to be answered is whether or not this endogenous trend towards lower material use is sufficient from an ecological point of view. We doubt this assumption for several reasons:

- because it is not the 'intensity of use' but the absolute quantities used that matter for environmental problems;
- because these empirical findings are either referring to refined industrial materials and not primary ones (in this sense, the empirically based assumption of declining material flows is the result of a defective measurement methodology)[10] or – in an even more limited sense – to the unlinkage of certain emissions (SO_2, NO_x), which are not indicative for a reduction in the total throughput of the respective economy;
- because the trend is too unstable (after delinkage, relinkage occurs[11]), too weak for the necessary changes to come about before it is too late and often driven not by the economic dynamic itself, but by legislative measures, that is, dependent upon political interference with the economy, which makes it reversible;
- because the decreasing intens-ities of use in industrialized countries in many cases mere-ly reflect the prevailing

[10] Incidentally it is quite obvioius how closely this definition is linked to the "traditional" setting of (materials') economics, according to which only "scarce" resources do matter

[11] See the recent debate among Jaenicke's research team (Jaenicke et al, 1992) and S. M. de Bruin /H. Opschoor ("Is the Economy Ecologising?", Tinbergen Institute Working Paper TI94–65, Amsterdam, 1994

Indicators for monitoring sustainable development

SUSTAINABILITY INDICATORS

Sustainable development, like many new concepts, need to be made concrete, operationalized and measured. A crude comparison may be made with health. There are some general measures, like body temperature, and a long series of rather specific measures that reflects aspects of health like psychological well-being, physical fitness and functions of the various body organs.

To measure sustainability one defines and develop indicators, that reflect the functioning of our society, the ecosystems, and long series of specific functions. Much efforts have been spent to identify the best sets of indicators for sustainable development and a large literature exist on the topic.

GLOBAL INDICATORS

The World Bank reflects global progress towards environmentally sustainable development in its ESD reports. The annual conferences on ESD have developed a report card on ESD for member nations. The World Resource Institute's (WRI) World Resources Reports is another example of regular reports. The State of the World Institute in Washington DC, USA publish yearly an influential State of the World report, concentrating on environmental, social and economic situation of the countries of the world. The most prominent set of environmental indicators is the "PSR" (= pressure, state, response) system developed by the OECD and applied to all industrialized countries, and, based on it, the DSR (= driving force, state, response) system of the UN-CSD (Commission on Sustainable Development). This one tries to distinguish social, economic, institutional and environmental aspects of sustainability. It will become the basis for national reporting by the year 2000.

LOCAL INDICATORS

For work in a specific nation, region or community it is more useful to have a set of indicators adapted to the area. Encouraged by the UNCED Conference in Rio all over Europe now "Local Agenda's 21" are being developed, many of them using indicators. One of the most promising attempts to harmonize them has been the ESI project. ESI, the European Sustainability Index project, coordinated by the International Institute for Urban Environment has developed the ABC approach with three categories of indicators:

- Area specific indicators, to measure problems specific to the area
- Basic indicators, which are environmental indicators,
- Core indicators; a set of ten basic measures providing minimal information to measure local sustainability

The issues that were evaluated by the set of ABC indicators were healthy air, safe streets, good housing, greenery, environmental compliance, and sustainable resource use.

A GENERAL APPROACH – THE PROACTIVE INDICATORS

the choice of indicators depend on the purpose, such as policy making, information to the public, etc. Economic, Social and Physical dimensions of sustainable development also use different sets of indicators. The Wuppertal Institute proposes, in their so called proactive indicators approach, a set of indicators that are relevant for all of these purposes. The underlying assumption is that material flow reflects the basic mechanism of unsustainability and should be reduced to approach sustainbility. It deals with resource use in five areas:

1. Material
   - material extracted (Mt/y)
   - share of renewable (%)
2. Energy
   - primary energy consumption (PJ/y)
   - share of renewable (%)
3. Water
   - water extraction (Mm^3/y)
   - share of groundwater (Mm^3 %)
4. Area
   - development of infrastructure area (%/y)
   - development of undisturbed area above a minimum size (%/y)
5. Soil
   - erosion (t/ha/y)
   - loss of micronutrients (t/ha/y)

For each of these areas it will be possible to calculate a sustainability gap. Thus the share of non-renewable energy of all energy is the sustainability gap. A measure of progress will be obtained by comparing two consecutive periods.

MONITORING THE STATE OF THE ENVIRONMENT

To monitor the state of the physical environment a longer series of indicators are used. In the Sustainable Germany report 15 key measures are given. These are

1. Production of gases greenhouse gases, carbon dioxide, methane etc.
2. Ozone destroying gases, freons etc
3. Soil destruction, erosion etc.
4. Acidification, emission of SO_x and NO_x
5. Eutrophication, emission of nitrate and phosphate
6. Loss of biological diversity
7. Reduction of non-renewable resources (diminishing stocks)
8. Overuse of renewable resources (diminishing flows)
9. Use of water reserves
10. Pollution of ground water
11. Pollution of air, summer smog
12. Forest death
13. Waste
14. Quality of environment in cities
15. Contamination with toxic substances, such as VOC, heavy metals

For each of these indicators a series of monitoring results are needed. Thus for indicator 1, greenhouse gases, one needs data on production of anthropogenic CO_2, methane, N_2O, etc. These may be combined into the indicator value using their global warming potential as weighting factors.

Of the 15 indicators no 1–3 is of global relevance, no 4–8 of regional relevance e.g. for the Baltic Sea, and no 9–15 of more local relevance.

THE GOALS

Using indicators it is also possible to define in more concrete terms the goals of development in the region. Thus for Sustainable Europe the proposed goals for resource use as compared to 1995, are given in the table. (Spangenberg et al, 1995)

The Wuppertal Institute proposes that materials flows and the mips are used as key measures to monitor the development towards sustainability. To be even more precise, one need to calculate the environmental space and resources available for each individual on earth, and thus in the region, and make this the goal for the development of the region.

The indicator targets should be understood as subject to discussion and adjustments as experience and knowledge grows. The basis for targets are for CO_2 the IPCC recommendations, to materials 50% reduction on global level, for land use reduction of pressure of biodiversity.

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Reduction targets for Europe

Resource	Present use per cap. p.a.	Env space per cap. p.a.	Change needed (%)	Target 2010 per cap. p.a.	Target 2010 (%)
CO_2 emissions	7.3 t	1.7 t	–77	5.4 t	–26
Primary energy use	123 GJ	60 GJ	–50	97.2 GJ	–21
Fossil fuels (a)	100 GJ	25 GJ	–75	78.0 GJ	–22
Nuclear	16GJ	0 GJ	–100	0 GJ	–100
Renewables (b)	7 GJ	35 GJ	+400	12.2 GJ	+74
Non-renewable raw materials					
Cement	536 kg	80 kg	–85	423 kg	–21
Pig iron	273 kg	36 kg	–87	213 kg	–22
Aluminium	12 kg	1.2 kg	–90	9.2 kg	–23
Chlorine	23 kg	0 kg	–100	17.2 kg	–25
Land use pattern					
Built-up land	0.053 ha	0.051 ha	–3.2	0.051 ha	–3.2
Inland waters	0.009 ha	as now	0	0.009 ha	0
Protected sites	0.003 ha	0.061 ha	+1933	0.061 ha	ca +2000
Woodland	0.164 ha	0.138 ha	–16	0.138 ha	–16
Arable land (c)	0.237 ha	0.100 ha	–56	0.150 ha	–37
Wood	0.66 m^3	0.56 m^3	–15	0.10 m^3	–15
Water	Regional and national estimates needed, European targets not adequate.				

(a) coal, lignite, oil, gas; (b) wind, hydropower, fuelwood, biomass incineration, solar heating etc;

(c) incl. perennial crops, excluding permanent meadows and pasture land

pattern of international trade with material-intensive production (typical of the early stages of industrialization) in industrializing countries, as well as the material flow of raw material production.

For these reasons, it seems obvious that dematerialization should serve as a policy goal, something to be striven for but, unfortunately, not a very likely result of mere 'endogenous' economic evolution.

7.8 The need for a methodology of measuring material flows

To become operational, the quantitative target set must be based on a standardized methodology, delivering meaningful, transparent and replicable information about the total material brought about by a certain product or service. For this purpose, the resource-efficiency measure mips '(material input per unit of service) was introduced (Schmidt–Bleek, 1994). Mips is a methodology for measuring material inputs (mi) at all levels (product, company, national economy, region) including all their 'ecological rucksacks', that is, the total mass of material flows activated by an item of consumption in the course of its life cycle, and to refer this mi to the end user service s derived from that flow as a standardized reference. Briefly, mips relates the material inputs mi necessary for the production, distribution, use, redistribution and disposal to the end-user service provided by any given goods. This allows for comparisons among different yet functionally equivalent products; for example, the average 'ecological burden' associated with travelling from A to B by car can be compared with that associated with the same transport service enjoyed on a train. Consequently, the substitution of a certain amount of one material with a lesser amount of another (including 'rucksacks'), but delivering an equivalent service (in this case: getting to B) is regarded as highly desirable and a key task for innovative research.

In summary, we can say that material intensity and flow accounts[12] are analytical tools to illustrate just how much material (the material is always understood to include energy carriers) flows through the economic system at the sectoral, national, regional and international levels. These tools are aimed at: quantifying the efficiency of economic operations in physical terms, adressing equity questions, such as questions on how much material is used by whom and how it is distributed and illustrating global patterns in provenance and movement of material.

Again decreasing resource throughput in absolute terms does not mean compromising wealth (service availability and well-being) since technological and social innovations that generate increasing resource productivity can compensate or even overcompensate for the difference in material use.

7.9 The lower threshold: How to operationalize needs

Having defined the border line between "living within our environmental space" and overcon-sumption beyond the carrying-capacity of nature, we will finally give some hints how to deal with the lower limit – the "floor" – of the environmental space. This "floor" represents the minimum annual quantity of resources needed per person in order to lead a dignified life. The criteria that must be fulfilled for this, whatsoever the situation of affluence or social tensions may be, be deep-ly rooted in the European culture.

The minimum resources consists of three elements: the physiological minimum (food, clothing, shelter), the basic needs (essential public services like drinking water supplies, basic health service and education) and the social participation minimum (mobility, security, access to all kinds of societal institutions, etc.).

The physical minimum, a necessary precondition for mere survival, defined by several UN organisations, should be quite the same all over the world. The basic need minimum covers the crucial needs for an active an healthy life including basic social standards. The ecological costs of supplying basic services vary widely with the culture, infrastructure and thus on the affluence of a society.

The average affluence is decisive for what is needed to participate in a society, what one has to participate in. Here it is, where the most significant differences in the minimum resource consumption occur, and they can only be changed by changing the societal standards. This is not the same as per-capita income levels: one should keep in mind that the prices of goods are rarely representative of the resources consumed to make them available (their "ecological rucksacks"). Moreover, participation includes democratic rights etc., which cannot be expressed in financial terms – for democracy, this would be a contradiction in terms.

Consequently, we are not able to define the "lower level" in internationally applicable quantitative terms, as it would be an unjustifiable oversimplification of the rich diversity of (European) cultures and the sometimes painfully different social situations in different countries.[13]

[12] The intensity of use would be appropriated as interlinking indicator, if the underlying definition of materials was environmentally relevant; given the definition of materials to which it has been traditionally referred, and the fact that it is measured in relation to GDP, it is clearly a fully economic indicator. MIPS is analogous, in that it has the same structure of a share between uses and results (efficiency measure) but very different in that it links two well-distinguished objectives (nature on the one side and well-being on the other) and constitutes an intermediate objective expressing the extent to which they are reconciliated. The lower the MIPS, the higher the well-being obtainable from a given dissipation of the environment and/or the lower the disspation necessary to obtain a given well-being.

[13] We are grateful for support by Aldo Frania on economic issues.

8.

Sustainable development as post-modern culture

by Pentti Malaska

8.1 Modernity and progress

Sustainable development is introduced in this paper as the kernel of a post-modern civilization, its intrinsic idea of progress.[1] It has been said that no other concept has been so important to the societies in the western world as the idea of progress: a belief in the continuous improvement of incomplete humankind.

The idea of a humankind progressing through time was articulated already in antiquity, but the modern idea of progress, the modern project, was set in motion in the Enlightenment period some four hundred years ago, and since then the western world has been accomplishing this project with some great success but with failures also. When humankind is said to progress, it is regarded as changing or developing for better in its material and social well-being, as well as morally, and in its relationship with nature. The concept of progress is thus not only a factual concept like the concepts of change, growth, development or evolution but is intrinsically a value concept.

Progress by Growth

It is not surprising that growth continues,
even though the Earth is finite.

Most people, rich or poor,
see expansion and growing more
as the only imaginable solution
to their real and immediate problems
even though the Earth is finite.

In the world of riches, growing more
appears to be the way of life
necessary for employment, status,
paying back anticipated growth some day,
and for development defined solely by things
and matter
even though the Earth is finite.

In the world of poor, growing more
seems the only way out of poverty and despair, and
having children not only as a source of joy and love,
but as a thing of trade and safety of life
even though the Earth is finite.

Until other ways but growing more
are found to remedy the problems encountered,
the people will not give up their hopes and desires
invested in the idea of progress by growth
even though the Earth is finite.

But the Earth is finite!

(Pentti Malaska)

The essence of modernity and its peculiar idea of progress meant two things: firstly, an emancipation of human knowledge from the authority of the holy scriptures or magic and, secondly, an emancipation of people as autonomous moral actors from the external or divine authorities.

According to the western myth of progress, people will prosper, feel better and value their lives more, when they are free to apply their own will, sense and reason rather than having to obey external authorities, divine or secular. Emancipation became a strong cultural motivation. In this moral sense, the post-modern is regarded as a continuation of modernity; it is modernity becoming conscious of itself. But becoming conscious requires deconstruction of the unconscious failures of modernity.

In order to overcome the natural, inherited human incompleteness, learning and the acquisition of knowledge was inevitably necessary. This, in turn, needed teaching and education, which became a general sign of emancipation in the modern societies. The emancipation of human intelligence led to the maturation of rational thinking with the birth and emergence of the modern sciences in the sixteenth century, which then demonstrated their power through technology, industrialization and economic development. Moral emancipation was realizing itself through nation states, political activities, revolutions, societal changes and the emergence of democratic governments, but its contribution to progress is less convincing and more incomplete still than that of science and technology.

Furthermore, the myth of progress always remains intimately related to the views of nature held by humans. Nature is the ultimate base and source of matter, energy and space for human coexistence on Earth, as well as a source of knowledge and learning, and even a framework for humanistic values of what is good, beautiful and true in life. Technology in turn is a means, an intrinsically human way, to contribute to human life on Earth within nature. We are to a certain extent what the visionary thinkers of the Enlightenment period thought of the future; we

[1] The study does not agree with the claims that a post-modern 'theory' should reject all metaphors of progress as irrelevant in a complex world view. (Bauman 1992).

Views of nature from pre-modern to late-modern times

Nature as a divine order

The idea of a perfect, divine order of constant nature can be found in the writings of the classical Greeks and Romans. Plato believed that nature was designed to meet humanity's needs. Cicero wrote in 44 BC: "Everything in the world is marvellously ordered by divine providence and wisdom for the safety and protection of us all... Who cannot wonder at this harmony of things, at this symphony of nature which seems to will the well-being of the world?" And further: "But for whom, it has been asked…We may…well believe that the world and everything in it has been created for gods and for mankind".

Nature as organic whole

The organic metaphor stems from an idea of an organism, which passes through major stages from birth and youth to maturity and further to old age and death after a given space for reproduction. Organic nature has a history, and it is not constant nor does it maintain any state very long but is varying all the time. While the overall variation of organic events is known, the organisms enjoy individuality in details, and their course becomes unpredictable from the human point of view due to the variability of the unique situational factors and interactions. The organic metaphor of nature does not lead to a conclusion of the constancy and stability of nature as the metaphor of the divine order does. A continuous variation of nature, in a self-contained way, is 'natural' and inevitable.

The idea of the organic, varying nature was held by many earlier cultures, by the Ancient Greeks, Romans, Judeo-Christians and others. It can still be found in some 'primitive' cultures, but in western cultures it has lost any pragmatic value. The recent, so-called Gaia hypothesis of Lovelock can be seen as a late echo of the organic view. Nature as a machine and a stockpile of resources was substituted for the organic view of Nature.

Nature as machine

Changing the metaphor from a living organism with magnificent structural fitness and organic appearance created by the Great Artist led to a view of the Earth as a machine functioning mechanically according to the magnificent laws of nature created by the Great Engineer.

Throughout the modern mechanistic metaphor, nature is seen as a perfect machine, which has a capacity to keep operating and maintaining and restoring its steady-state balance of operations even during perturbations, and which is composed of replaceable parts, and driven by cosmic energy from the sun.

An influential and brilliantly articulated statement of the modern belief in the constancy and stability of machine nature can be learned from George Perkins March, the American father of environmental protection. In his book Man and Nature in 1864 he wrote: "Nature, left undisturbed, so fashions her territory as to give it almost unchanging permanence of form, outline, and program, except when shattered by geologic convolutions; and in these comparatively rare cases of degradation, she set herself at once to repair the superficial damage, and to restore, as nearly as practicable, the former aspects of the domination".

An ideal machine nature is regarded as operating according to the laws of nature and its operations are regarded as readily predictable. Machines can be rationally re-engineered, which suggests that nature can also be repaired by humans. Machine nature has no preservable history nor individuality and no situational uniqueness or unpredictability. This 'wisdom' has been empowered and much applied by the industrial utilization of nature.

Mechanically ordered, constant and stable nature has until today been the predominant idea also in the science of ecology and in environmentalists' views. It has been a hidden or spelt- out pre-assumption in programmes of conservation and protection and also in national laws and international agreements on the management of living resources. Some scientists have raised doubts that the view of a steady-state machine nature may not be adequate but even misleading at all levels of the ecosystems or entire biosphere. These doubts are a part of the modern dilemma.

Nature as evolution

According to the late-modern view, nature is always in change, and she has autocatalytic, self-organizing capacities, which are a *sine qua non* for life emerging and persisting on this planet. If not looked at through the old metaphors, we see that, wherever constancy has been sought in nature, change has been discovered instead and, wherever stability has been searched for, discontinuity, fluctuations, and evolutionary leaps have been the case. Nature even when undisturbed would not be constant in forms, structures or functions, but changing at every scale of time and space at her intrinsic 'natural' rates. Balance of nature does not exist and never existed; the variations and changes always dominated the scene of nature.

The old concerns about how to preserve nature undisturbed have transformed to the question of how to cope properly with nature, which is continuously changing. Life itself is dependent on changing; life is a far from equilibrium pattern of changing. Life is a change. Nature follows the rules and laws of a complex, evolutionary system probably common to all evolving phenomena whether material, social or mind-like phenomena in its essence (Laszlo). Bifurcations or branchings as from the modern to a post-modern view are natural, chaos-like patterns not excluded, and human life is a change agent for an evolving dynamic order. Sustainable development is a late-modern bifurcation of human evolution, wherein modernity is becoming conscious about its failures but also about the new available possibilities.

(Based on Botkin 1990, Laszlo 1996)

are their future fulfilled. But not without controversy. Just here a late modern antithesis is getting its momentum against the modernity.

8.2 The modern dilemma

The controversy about progress has arisen from two permeating concerns. One is the concern for people and other earthly creatures at whom the concept of progress is aimed and for whom what is best in life must be found.

The other concern is about the role of economic growth, science and technology in contributing to people's lives and changing it at the same time, for better or for worse. Industrial development has undeniably brought better living conditions for hundreds of millions of people especially in the western world and among its collaborators. Yet, there is also the other side of the reality: the poverty of as many or even more people has not been alleviated but is increasing faster than the world gross economic product.

Further, present-day technology in relation to nature has not resulted only in being a blessing, but is awkward and destructive as well. It is necessary to recognize facts and failures in global environment management, such as the depletion of ozone layer, climate change, ocean pollution, loss of biological diversity, unmanageable nuclear catastrophes, etc. Continuing trends offer no guarantee that future generations will be able to progress on equal terms with us, or even that all of our contemporaries will experience progress during their lifetime. This condition is a dilemma, a fundamental contradiction of the very idea of progress of the Enlightenment. It requires us to contemplate the very idea and to ask whether this dilemma is solvable or whether it means instead that we have to give up the very idea of progress, as some post-modern thinkers suggest.

The fastest economic growth without solidarity and sustainability, the most complete machinery of democracy without respect for the golden rule of ethics common to all religions, and the most extensive freedom without dignity and responsibility for others cannot advance progress. An alternative would be an ethically nihilistic, plain Darwinian view of the lack of progress, 'un-progress', according to which everything which happens or will happen is optimally good and right just because it happens. Or what it appears justifies what it ought to be. The modern dilemma is a cultural and ethical one. The factual failures observed are just symptoms of a breakdown of the fundamental assumptions and basic myths of progress, nature and technology held to be true in western culture for centuries. A contradiction occurs between them and real achievements and a change of views is inevitable in the search for correction.

8.3 The late-modern transition

Researchers and philosophers in almost every field of enquiry talk about the present time as a great transition, and even anticipate a major shift to a new era. Recognition of failures in scientific management of the environment and failures to counteract poverty in the world is regarded to be part of the tremor. While, on the one hand, mainstream economic development and modern technology are valued as the sole nucleus of progress, they have, on the other hand, contributed to environmental problems and enduring disparity and poverty. Modernity is losing its momentum of progress in the true spirit of the Enlightenment.

A transition from the beliefs of modernity, dominant since the Middle Ages, to the new post-modern values and idea of progress is an evolutionary search. The earlier shift of views on progress comparable to this transition was that from the pre-modern to the modern era in the sixteenth century, and it took two to three centuries to mature. May we now expect – because of the faster development of technology and globalization of human civilization – a much faster shift to a post-modern era?

The late-modern transition will need its time to mature too and, meanwhile, human cultures are in a destabilized transient period between the two different eras. However, not all human societies will be changing at the same time or in a coherent pace to post-modernity, but rather the world will remain as the multi-layered and fragmented ensemble that it always has been. In the future as in the past there will be continuous tensions and disparities between culturally diversified parts of the human population instead of harmony and peace.

8.4 Views of nature from pre-modern to late-modern

The prevailing belief about nature is a crucial element of the idea of progress, and the pre-modern beliefs and metaphors of nature are different from the modern ones. Emancipation of knowledge with the development of science brought about a profound change not only to the idea of progress but also to the views of nature and the role of technology.

Two metaphors and explanations about the character of nature dominated pre-modern times. According to one, nature was a perfect, constant and divinely designed order and, according to the other one, nature was seen as an organic phenomenon, variable, renewable and with everything within it fitting perfectly. In modernity, the dominant views of nature were transformed to a machine metaphor. The views are described in the box on p. 46.

8.5 Sustainable development

In order to maintain the idea of progress, societies must respond proactively to the aims of sustainable development and, at the same time, deconstruct the interrelationship between the technological way of life and nature as represented by the modern machine metaphor. A view of sustainable development was articulated in the report 'Our

Principia Ethica of Sustainable Development

A. To fight poverty and unequal economic standing of the developing countries

B. To stop depletion of nature and destruction of environment

C. To secure that future generations will have the same opportunities for well-being as we enjoy

D. Sustainable development is aimed to be socially just and equal, ecologically and economically sustainable, politically and culturally free and innovative

Common Future' by the UN environmental committee chaired by Mrs Gro Harlem Brundtland from Norway, in 1987 , and made concrete in 'Agenda 21', the declaration of the UN Environment Summit in Rio.

Sustainable development in a broad context has distinct social, economic and environmental, as well as cultural aspects, which are all important to recognize. Ecologically sustainable development with appropriate economic and technological development included is a necessary element in this larger context, of which the two other parts are just and equal social development and democratic politics, and free and creative cultural development. These three dimensions give direction to the manifestation of sustainable development.

Based on the view of nature as evolution, a working definition of ecologically sustainable development may be formulated as follows:

Human development is ecologically sustainable in relation to the environment if the interventions and effects imposed by human activities whether economic, technological, social or cultural do not alter the instrinsic rates of change of nature or the ecosystems in ways unmanageable by nature or irreversible from the point of view of future generations.

This abstract and theoretical statement is a sufficient condition for a human/nature co-evolution, and it is possible to derive from it necessary conditions for sustainable welfare and sustainable technology.

Operationalization of the above definition leads to four strong requirements:

(1) dematerialization of production,

(2) immaterialization of consumption,

(3) annihilation of rebound effect, and

(4) long-term depopulation control.

They can be made more conceivable with a decomposition of the total environmental stress caused by human activities.

8.6 Decomposition of total environmental stress

A necessary condition of sustainable development derivable from its definition is that the total environmental stress on the environment imposed by human activities should not be increasing. The stress is here proposed to be measure with the total anthropogenic flow of material from nature (in the form of resources) through the tech-nosystem (as goods) and back to nature (as wastes and pollution). A simple formula (Table 8.1) shows how the stress is composed of the three major contributing processes of human activity: population growth, material intensity of consumption and resource productivity.

A necessary condition of sustainability is now:

$$\text{total rate of stress} = \text{rate/A} + \text{rate/B} - \text{rate/C} < 0$$

The condition simply states that the total environment stress should not increase. The ways and means of fulfilling this condition must be based on the simultaneous control of the contributing processes. The operationa-lizations of (1) to (4) introduced above aim just at managing this condition of sustainability by requiring each contributing rate separately to meet the necessary condition, that is, rate/A < 0, rate/B < 0, and rate/C > 0.

8.7 Dematerialization of production

Rate/C > 0 implies increasing resource productivity. It is to be achieved by better and more efficient technologies so that more and better production is provided with less use of natural and environmental resources; more from less, in all parts of the economy and life cycles of the products from raw material extraction and goods manufacturing to transport, marketing and services and life-long maintenance.

There are many untapped potentialities as Ernst von Weitzäcker, A.B. Lovins and L.H. Lovins presented to the Club of Rome in their report, 'Factor Four'. They claim that it is possible to increase the resource productivity of the world GDP through technology development by a factor of four in a few decades and by a factor of ten in a longer period. This means that the stress contributing effect of GDP/MF may drop to a quarter and then to a tenth of the current value.

8.8 Immaterialization of consumption

Some have argued that the GDP had no relevance in environmental stress accountancy. It is not true. GDP may have less and less relevance as a measure of the real welfare of people, but its relevance as a contributing factor of environmental stress is undeniable.

The GDP per capita is a kind of a measure of commercial material consumption in the world economy. The sustainable development principle tells that the rate of this measure should be diminishing,

or negative, in other words, rate/B < 0. This is, however, in direct contradiction to the overall economic policies of countries and international trade agreements. That is one indication that sustainable development is not an easy but a contradictory concept, and it may not be possible to pursue it without considering ethical issues.

One concern is to better understand welfare productivity, and to observe alarming empirical facts. According to this it has been decreasing since 1970s in western countries (Figure 8.1).

Neither material consumption nor economic growth is the ultimate aim of well-being, but only a better or worse means to it. Thus it is the concept of well-being which needs first and foremost to be ethically revised and, after that, we could consider what kind of material consumption and economic growth can best serve the revised end. Increasing the well-being of the population is a viable target if it can be achieved through increasing the welfare productivity of GDP. To increase the welfare productivity should be a basic aim of sustainable development. The issue can be formulated at world level as follows:

Increasing the welfare productivity, WF-PROD, is the way of achieving a decrease in material consumption, immaterialization of consumption, without compromising the needs of welfare. In practice, this would mean that our need structure would shift away from material-intense satisfiers towards social and cultural or spiritual needs satisfaction. It would make the world economy move more and more towards service-like production and consumption modes and structures.

8.9 The rebound effect

In the midst of the current, late-industrial transition and information society development, we are encountering one serious obstacle to the immaterialization of consumption. It is called 'the rebound effect' by sustainable development promoters. Under market frameworks, which are not adequately in tune with social and environmental externalities, dematerialization achievements could become overcompensated by an excess growth of world GDP-related material consumption. The total material use in consumption may increase by more than the amount of savings of resources brought by demateri-alization of production and, of course, total material consumption is closely related to population growth and solidarity or insolidarity of economic policies.

Recognition of the rebound effect is a new phenomenon and not many empirical measures are yet available. The analyses of it are the intellectual challenges of sustainable development. Figure 8.2 depicts how the rebound effect of world energy consumption well exceeds the savings from efficiency improvements.

Table 8.1 Decomposing the total environmental stress into the three main factor contributions

Contributing process	*Symbol*
A. The bigger the human population growth rate (% per year), rate/A, the stronger is the stress contribution	rate/A
B. The faster the growth rate of the world GDP per capita, rate/B, the bigger the increase of material intensity of consumption is, and the stronger the stress contribution	rate/B
C. The slower the rate of increase of the resource productivity of GDP, as measured by the ratio of GDP to the total material flow (MF) through the technosystem, rate/C=rate (GDP/MF), the stronger is the stress contribution	rate/C
D. Total rate of the environmental stress	rate/A + rate/B – rate/C

Material consumption as measured by the World GDP per capita		World welfare per capita		Welfare productivity of World GDP
GDP/P	=	WF/P	:	WF-PROD

where WF-PROD = WF/ GDP is the welfare productivity of GDP

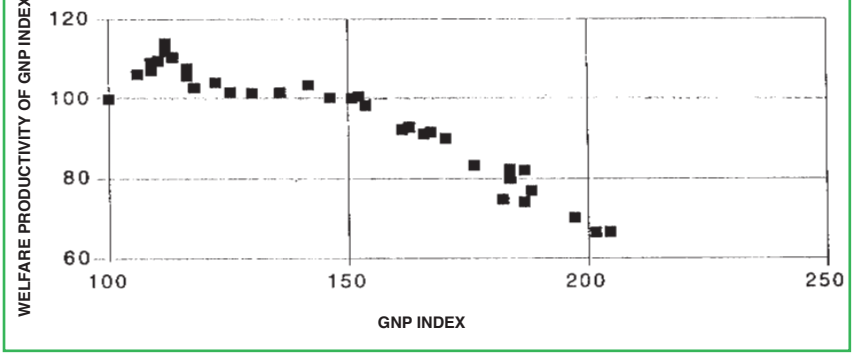

Figure 8.1 Welfare Productivity. Welfare productivity expressed as welfare per GNP and capita, related to GNP. Data from the United States in the period 1950–1986. Above a certain value increased GNP does not lead to a corresponding increase in welfare. (Source: Ekins, P. and Max-Neef, M., eds (1992) Real Life Economics. Understanding Wealth Creation. Routledge. London, New York.)

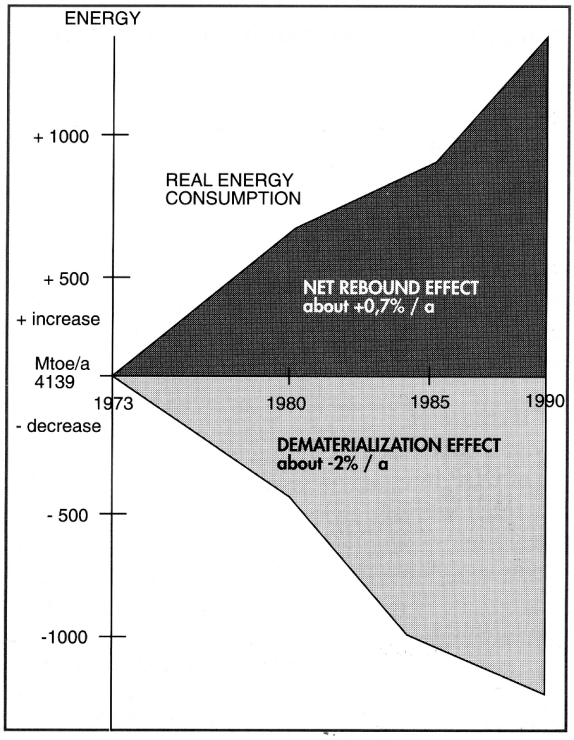

Figure 8.2 The rebound effect as illustrated in world energy consumption. Energy efficiency in 1973 (4 139 Megatonnes of oil equivalents were then used) increased up to 1990 by 2 % per year. But this did not lead to decreased consump-tion as in the same period the total consumption increased by 2.7 % yearly. The net rebound effect was thus 0.7 %. (Source: Sun, JiWu (1996) Quantitative Analysis of Energy Consumption Efficiency and Savings in the World 1973–1990.)

8.10 The depopulation process

A realistic vision of sustainable development inevitably requires putting an end to the population explosion and even a settling down of the world population at a lower level than at present in due course in the future. Contrary to this aim, however, the world population is growing, and no fast reduction of growth rates is expected in the developing countries. Depopulation control for sustainable development is a long-term aim, if only overpopulation does not become too severe a threat to sustainability too soon.

According to an analysis by a FAW working group, a significant reduction in the world population may be achieved by appropriate, economic and social incentives, and through substantial support to the less-developed countries from the richer world (Figure 8.3). Economic incentives are an effective means of the depopulation process, especially among those living in extreme poverty. For the first time ever, a real possibility of a better future for themselves and their children may be made available by incentives. It is, however, evident that the population explosion will continue for some decades yet in any case. The depopulation process for sustainable development must get underway without delay. According to the model, the process may start to show an effect only after a peak of about 9 billion people. Other peak projections of the world population without incentive policies are bigger, ranging from 10 to 16 billion.

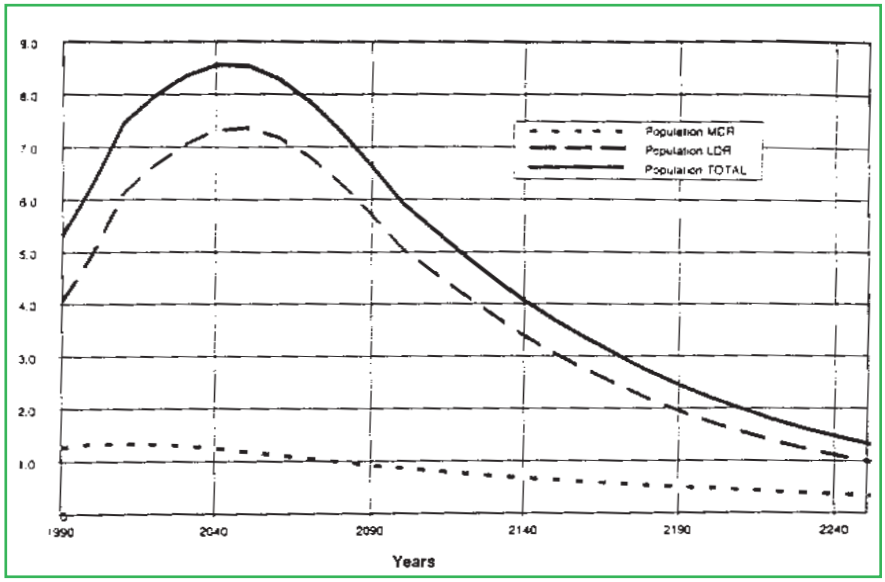

Figure 8.3 Possible development of population size in the more developed regions (MDRs) (lower curve) and in the less developed regions (LDRs) (middle curve), and total population (top curve), assuming appropriate economic and social incentives for population control. The target for 2 300 is 1 billion. (Source: Benking, H., Brauer, G.W., Fliedner, T.M., Grener, C., Malaska, P., Morath, K., Pestel, R. and Radermacher, F.J. (1996), Robust Path to Global Stability: Tough but Feasible. J. of the Finnish Institute of Occupational Health, People and Work. Research Reports (forthcoming).

Power of ethical awareness

The mission of human beings
is not to confirm their plain existence
because it does not necessarily mean anything
really essential.

The mission of human beings
is not to secure life
because life has its own means of taking care of itself.

Life wins
whatever we humans do.
Life persists with humans,
but even without them.

The mission of a human being
is to prove that life
is richer and more precious
with humans than without them.

Making life full of dignity
and consciousness worthy of experience
demands special human quality and awakening to ethical self-awareness.

The power of knowing thyself!
It raised up many,
some even above the ground.
But those who stayed on all fours
did not approve.

Pentti Malaska

9.

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A Sustainable Baltic Region

THE FOUNDATIONS OF SUSTAINABLE DEVELOPMENT

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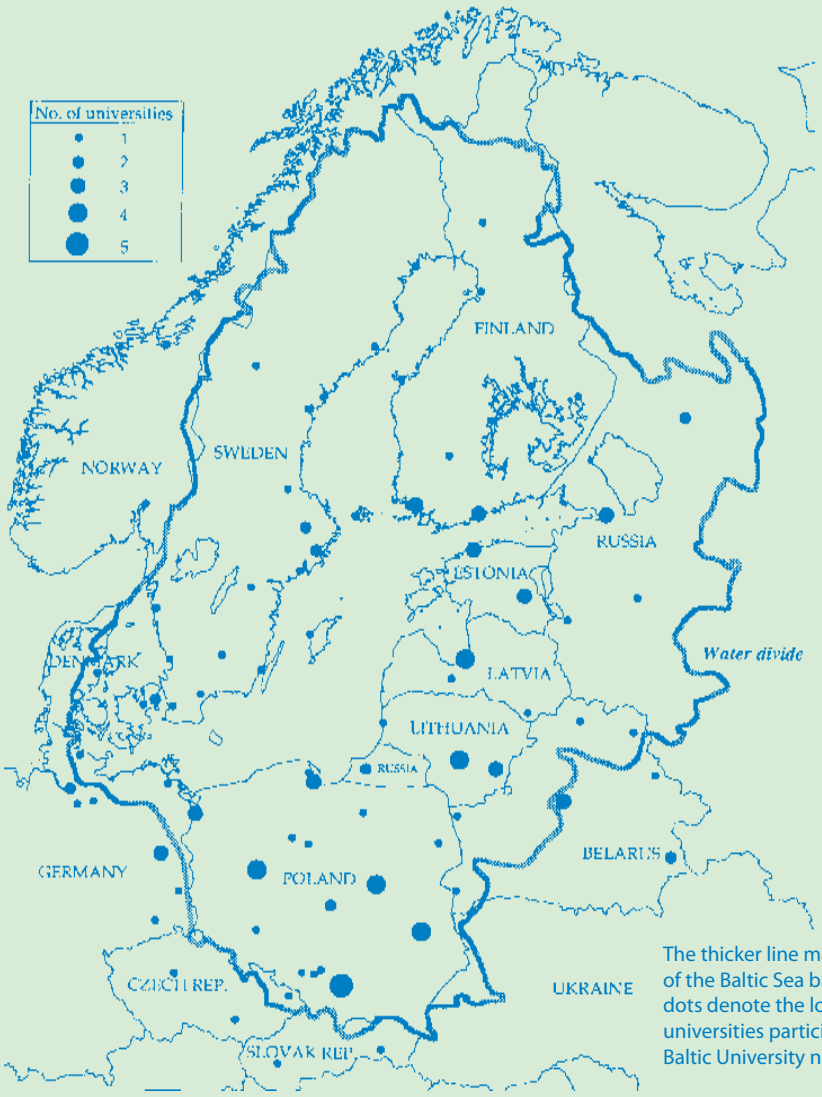

The thicker line marks the limits of the Baltic Sea basin, and dots denote the locations of universities participating in the Baltic University network.

A SUSTAINABLE BALTIC REGION is a series of well-illustrated booklets introducing the concept of sustainable development, in particular with reference to the area around the Baltic Sea, the Baltic Region. It deals with issues of sustainable use and management of natural resources, the long-term protection of our environment and the sustainable organization of human societies from the level of households to those of municipalities, cities and countries.

The booklet series constitutes the main reading in a university credit course, produced by the Baltic University Programme, and offered by the universities in the region. The other main component of the course is a TV series of ten programmes, produced in cooperation by a consortium of national TV companies in the region, broadcast over satellite TV and national TV channels. The TV series contains a wide variety of reportages from all count-ries in the region. In addition, the course contains a database on natural resources and environmental impact in the region available over the Internet. The booklet series is available in English, Polish and Russian, while the TV series is produced in English and in several national languages.

The Baltic University Programme is a network of international cooperation among some 150 universities in the 14 countries that are wholly or in part within the Baltic Sea basin. The Programme is coordinated by Uppsala University.

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