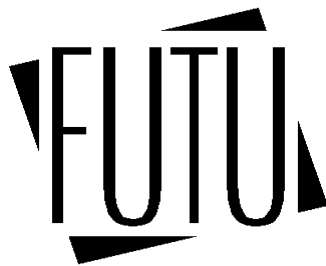


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FINLAND FUTURES RESEARCH CENTRE



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**Pentti Malaska**

**SUSTAINABLE DEVELOPMENT  
AS POST-MODERN CULTURE**

The purpose of the research programme Citizenship and ecomodernization in the information society – the futures approach – is to study the social and ecological dimensions of emerging information society. Particularly we aim at assessing social impacts of new informational structures that are impinged on citizens. We also focus on analyzing the ways application of information technology influences on targets and realization of sustainable development. The study programme comprises of ten individual research project organized around above sketched themes.

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# 1. THE DILEMMA OF PROGRESS

## 1.1. Modernity and progress

Sustainable development is introduced in this paper as a kernel of a post-modern civilization, its intrinsic idea of progress. The study does not agree with the claims of a post-modern "theory" that all metaphors of progress should be rejected as irrelevant. 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 Antics, 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.

The essence of the modernity with 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. It is a Western myth that this is possible and will lead to changing or developing humankind for better in its material and social well-being, as well as morally, and in its relation with Nature. The concept of progress is thus not only a factual concept like the concepts of change, growth, development, or evolution but intrinsically a value concept.

According to the Western myth of progress people will prosper, feel better and value more their lives, when they are free to apply their own will, sense and reason rather than to obey external authorities, divine or secular. Emancipation became strong cultural motivation. The post-modern may also be regarded as continuation of the modernity, it is the modernity becoming conscious of itself. But becoming conscious requires deconstruction of the unconscious failures of the modernity. In order to overcome the natural, inherited human incompleteness learning and knowledge acquiring was inevitably necessary. This needed in turn teaching and education, which became a general way of emancipation in the modern societies. The emancipation of human intelligence led to maturation of rational thinking with birth and emergence of modern sciences since the 16th century, which then demonstrated their power through technology, industrialization, and economic development. The moral emancipation was realizing itself through nation states, political activities, revolutions, societal changes, and emergence of democratic governments, but its contribution to the progress is less convincing and more incomplete still than that of the sciences 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, and also a source of knowledge and learning, and even a frame of humanistic values, of what is good, beautiful and true in life. Technology in turn is a means, an intrinsically human way to contribute for 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 are their future fulfilled. But not without controversies. Just here a late modern antithesis is getting its momentum against the modernity.

## 1.2. The modern dilemma

The controversies of progress have arisen from two permeating concerns. One of them is a concern of people and other earthly creatures: for whom the whole idea of progress is aimed at, and what is it what is best for life? 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: poverty of equally many or even more people has not been alleviated, but is increasing faster than the world gross economic product. And the present-day technology in relation to Nature has not turned out to be only blessing, but 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. Continuation of trends offers no guarantee that future generations will be empowered to progress in equal terms with us, or even that all of our own contemporaries will experience progress during their life time. This condition is a dilemma, a fundamental contradiction to the very idea of progress of Enlightenment. It calls us to contemplate over the very idea, and to ask if this dilemma is solvable, or does it mean instead that we have to give up the very idea of progress, as some post-modern thinkers suggest.

The fastest of economic growth without solidarity and sustainability, the most complete machinery of democracy without respect for the golden rule of ethics common to all religions (FICOR), and the most free of freedom without dignity and responsibility for others cannot advance progress. An alternative would be an ethically nihilistic, plain Darwinian view, 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 true in the Western culture

for centuries. A contradiction occurs between them and real achievements, and a change of views is inevitable in search for correction.

## 2. POWER OF ETHICAL AWARENESS

### *Power of Ethical Awareness*

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

The mission of the 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

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

Making life full of dignity  
and consciousness worth 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)

### 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. (Bauman, Laszlo, Nisbet, Toeffler, von Wright). Recognition of failures in scientific management of environment and failures to counteract poverty in the world is regarded to be part of the tremor. While, on one hand, the main-stream 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. The modernity is losing its momentum of progress in the true spirit of Enlightenment.

A transition from the beliefs of the modernity dominant since the middle ages to new post-modern values and idea of progress is an evolutionary search. The earlier shift of views of progress comparable to this transition was that from the pre-modern to the modern era in the 16th 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 - much faster a shift to a post-modern era? The late-modern transition will need its time to mature, too, and meanwhile the human cultures are in a destabilized transient period between the different two eras. However, not all of the human societies will be changing at the same time or in a coherent pace to a post-modernity, but the world will rather remain as a multi-layered and fragmented ensemble as it always has been. In the future as in the past there will be continuous tensions and disparities between the culturally diversified parts of the human population instead of a harmony and peace.



## 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 sciences brought about a profound change not only to the idea of progress but also to the views of Nature and role of technology.

Two metaphors and explanations about the character of Nature were dominating in the 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 phenomena variable, renewable with a perfect fit of everything within it. In the modernity the dominant views of Nature were transformed to a machine metaphor.

### 4.1. Nature as 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" (Botkin, 1990, p. 84).

### 4.2. 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 given space for reproduction. The 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 conclude constancy and stability of Nature as the metaphor of the divine order does. A continuous variation of Nature, self-containedly, is "natural" and inevitable.

The idea of the organic, varying Nature has been held by many earlier cultures, by the Antic Greek, Roman or Judeo-Christian, or others. It can still be found alive in some "primitive" cultures, but in the Western cultures it has lost any pragmatic value. A recent, so called Gaia hypothesis of Lovelock can be seen as a late echo of the organic view. Nature as a machine and a stock pile of resources substituted the organic view of Nature.

#### 4.3. Nature as machine

Change of 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 (Botkin, 1990, p.103).

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.

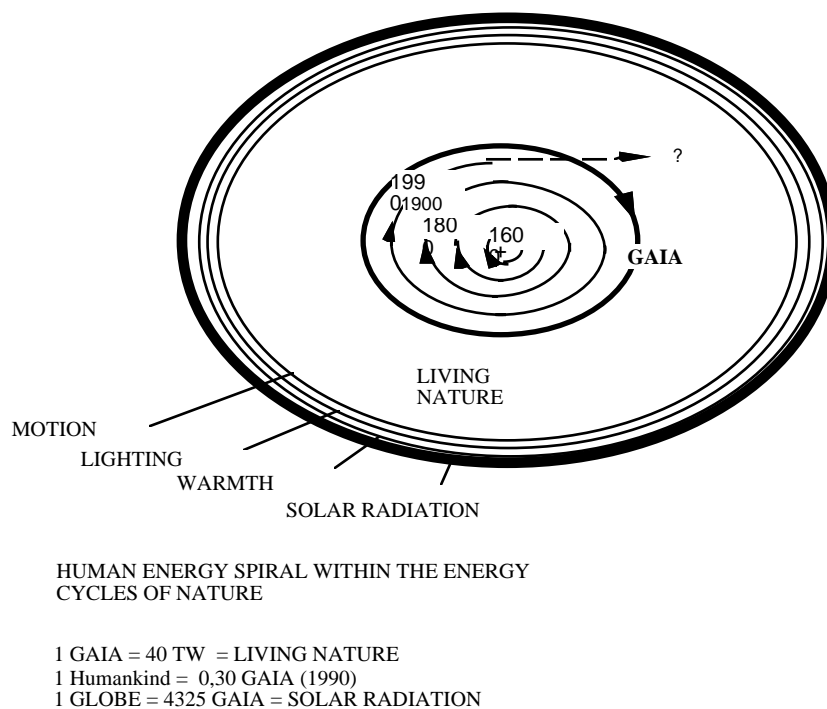


Figure 1. Global Energy Spheres

A quotation from a seventeenth century writer, Sir Matthew Hale, is illustrating. In his *Primitive Origination of Mankind* he wrote: "Qualities of natural things are so ordered, to keep always the great Wheel in circulation" by the mutual and restless agitation of those two great Engines of Nature, Heat and Cold" (Botkin, 1990, p.106).

An influential and brilliantly articulated statement of the modern belief in constancy and stability of Machine-Nature can be learned from Georg 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 degradament, she set herself at once to repair the superficial damage, and to restore, as nearly as practicable, the former spect of the domination" (Botkin, 1990, p. 54).

An ideal Machine-Nature is regarded to operate 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 perceivable history nor individuality, and no situational uniqueness, no unpredictability. This "wisdom" has been empowered and much applied by industrial utilization of Nature. The mechanically ordered, constant and stable Nature has been till today the predominant idea also in the science of ecology and environmentalists' views. It has been a hidden or spelled out pre-assumption in programs of conservation and protection and also in national laws and international agreements on the management of living resources (Botkin, 1990, p. 9).

Some scientists has raised doubts that the view of steady state Machine-Nature may not be adequate but even misleading at all levels of the ecosystems or entire biosphere (Botkin, 1990, p. 9). These doubts are a part of the modern dilemma.

#### 4.4. Nature as evolution

According to the late-modern view, Nature is always in change, and she has autocatalytic, self-organizing capacities, which are sine qua non for that life emerged and persisted on this planet. If not looked 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 (Botkin, 1990, p. 146).

The old concerns about how to preserve Nature undisturbed has transformed to a question 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 mindlike phenomena in its essence. Bifurcations or branchings as one 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 the modernity is becoming conscious about its failures but also about the new possibilities open.

## 5. SUSTAINABLE DEVELOPMENT

In order to maintain the idea of progress the societies must respond proactively to the aims of sustainable development under distinct social, economic and environmental pressures, and at the same time deconstruct the interrelationship between the technological way of life and Nature represented by the modern machine metaphor. A view of sustainable development was articulated in the report of 'Our Common Future' by the UN environmental committee chaired by Mrs Gro Harlem Brundtland from Norway in 1987, and concretized in 'Agenda 21', the declaration of the UN Environment Summit in Rio in 1992. The table summarizes the "Principia Ethica of Sustainable Development" in a synoptic form.

Table 1. Principia Ethica of Sustainable Development

<p><b>PRINCIPIA ETHICA OF SUSTAINABLE DEVELOPMENT</b></p> <p><b>A.</b> To fight poverty and unequal economic standing of the developing countries</p> <p><b>B.</b> To stop depletion of nature and destruction of environment</p> <p><b>C.</b> To secure, that the future generations will have the same possibilities of well-being as we enjoy</p> <p><b>D.</b> Sustainable development is aimed to be socially just and equal, ecologically and economically sustainable, politically and culturally free and innovative</p> <p style="text-align: right;">P. Malaska</p>
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Sustainable development in a broad context has distinct social, economic and environmental, as well as cultural aspects, which are all important to recognize. The 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 the directions to manifestation of sustainable development.

### 5.1. Ecologically 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 affects imposed by human activities whether economic, technological, social or cultural do not alter *the intrinsic rates of change of Nature or the ecosystems* in ways unmanageable by Nature or irreversible from the point of view of the future generations (King, 1994).

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 definition above 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 the human activities ( Malaska, 1971; Noorgaard, 1994; Etkins, 1996; Van Dieren, 1995).

### 5.2. 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 measure with the total antropogenic flow of material from Nature (in form of resources) through the technosystem (as goods) and back to Nature (as wastes and pollution). A simple formula (table 1.3.) shows how the stress is composed of the three major contributing processes of human activity: population growth, material intensity of consumption and resource productivity.

Table 2. Decomposing the total environmental stress into the three main factor contributions

<b>Contributing process</b>	<b>Symbol</b>
A. The Bigger the human population growth rate (% per year), $rate/A$ , is the stronger the stress contribution	$rate/A$
B. The faster the growth rate of the world GDP per capita, $rate/B$ , is 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 with the ratio of GDP to the total material flow (MF) through the technosystem, $rate/C=rate(GDP/MF)$ , the stronger the stress contribution	$rate/C$
-----	
D. Total rate of the environmental stress = $rate/A + rate/B - rate/C$	

A necessary condition of sustainability is now:

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

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 operationalizations 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, i.e.  $rate/A < 0$ ,  $rate/B < 0$ , and  $rate/C > 0$ .

### 5.3. 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 in their report, 'Factor Four', to the Club of Rome (von Weitzäcker, et al., 1995). 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 fourth and then to a tenth part of the current value.

Figure 2. Resource Productivity

Source: Jänicke, Mönch, Ranneberg, Simonis (1991)



#### 5.4. Immaterialization of consumption

Some has 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. Sustainable development principle tells that the rate of this measure should be diminishing, or negative, in other words,  $\text{rate}/B < 0$ . This is, however, in direct contradiction with 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 of better understanding the welfare productivity, and observing alarming empirical facts according to which it has been decreasing since 1970s in the Western countries.

Figure 3. Relationship of Welfare Productivity on GNP in the USA from 1950 to 1986

Source: Data from Ekins, Paul & Max-Neef, Manfred (eds.) (1992) *Real Life Economics. Understanding Wealth Creation*. Routledge. London, New York. pp. 232-233.

Neither the material consumption not the 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 well-being of the population is a viable target, if it can be achieved through increase of the welfare productivity of GDP. To increase the welfare productivity should be a basic aim of sustainable development. The issue can be formulated at the world level as follows:

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 for the welfare productivity of GDP.

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 satisfyers 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 (Giarini, 1989).

### 5.5. The rebound effect

In the midst of the current, late-industrial transition and information society development, we are encountering one serious obstacle of immaterialization of consumption. It is called a 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 (Greiner, et al., 1996). The total material use in consumption may increase by more than the amount of savings of resources brought by dematerialization of production. And of course total material consumption is closely related to population growth and solidarity or unsolidarity 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. The figure depicts a rebound effect of the world energy consumption exceeding well the savings from efficiency improvements.

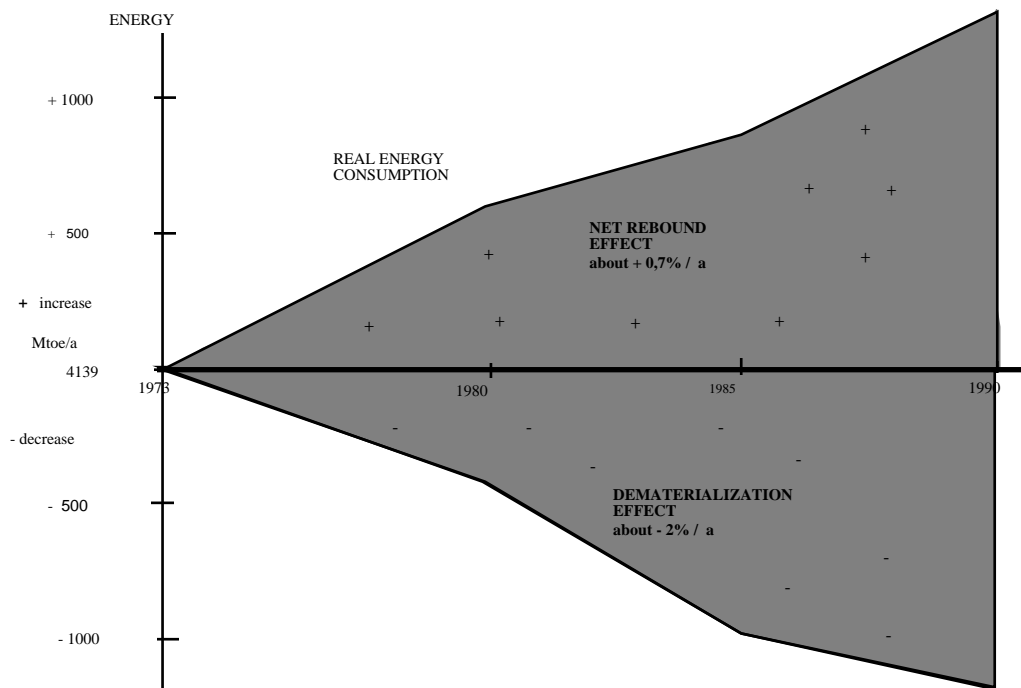


Figure 4. World Energy Consumption in 1973-1990 with the Dematerialization and Rebound Effects Diagnosed

Source: Sun JiWu (1996). Quantitative Analysis of Energy Consumption Efficiency and Savings in the World 1973-1990.

## 5.6. Depopulation process

A realistic vision of sustainable development inevitably requires putting an end to the population explosion, and even 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 the overpopulation may not become too a severe threat to sustainability too soon.

According to an analysis by a FAW working group (Benking, et al., 1996), 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. Economic incentives are an effective means of depopulation process, especially among those living in extreme poverty. The first time ever, a real possibility of a better future for themselves and their children may be opened with incentives. It is, however, evident that the population explosion will continue for some decades yet in any case. Depopulation process for sustainable development must get underway without delay. According to the model the process

may start to show effect only after a peak of about 9 billion people. Other peak projections of the world population without incentive polices are bigger ranging from 10 to 16 billion (Lutz, 1995).

Figure 5. Population size in the more developed regions (MDRs) and in the less developed regions (LDRs)

Source: Benking, et al., 1996

## 6. PROGRESS AND GROWTH

It's not surprising that growth continues,  
even though the earth is finite

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

In the world of riches attaining 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 attaining 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 safe of life  
even though the earth is finite.

Until other ways but growing more is 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!

## 7. FINAL REMARKS

It is about thirty years since the publication of Rachel Carlson's awakening book *Silent Spring* (1962), twenty five years since the first UN Environmental conference in Stockholm in 1972 and since *The Limits to Growth* and other reports to the Club of Rome, less than twenty years from the World Conference of the Churches in Boston, when the threefold idea of just, equal and sustainable development was first discussed, and scarcely ten years from the Brundtland report of the UN Commission, *Our Common Future*. These are all pre-Rio landmarks of environmental awareness and global responsibility.

The second UN conference on the environment and sustainable development in Rio in 1992, and its declaration *Agenda 21*, gave a new impetus and scope to the idea. The ongoing discussion thereafter is documented in the report *Our Global Neighbourhood* of the UN Commission on Global Governance.

Sustainable development is the post-modern idea of progress, it means that the modern idea of progress is deconstructed and transcended. It assumes sustainable technology but even more than that deconstruction moral emancipation of Enlightenment, which has remained too incomplete.

All citizens have a crucial role to play in this major shift of the idea of progress towards sustainable development.

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## ABSTRACT

Sustainable development is the post-modern idea of progress with a principia ethica emerging from the failures and achievements of the modern project of Enlightenment. The paper describes the course of human development with these terms and concepts of the modern dilemma.

## PREVIOUS PUBLICATIONS:

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