

Bartelmus, Peter

Working Paper

Sustainable development: Paradigm or paranoia?

Wuppertal Papers, No. 93

Provided in Cooperation with:

Wuppertal Institute for Climate, Environment and Energy

Suggested Citation: Bartelmus, Peter (1999) : Sustainable development: Paradigm or paranoia?, Wuppertal Papers, No. 93, Wuppertal Institut für Klima, Umwelt, Energie, Wuppertal, <https://nbn-resolving.de/urn:nbn:de:bsz:wup4-opus-8928>

This Version is available at:

<https://hdl.handle.net/10419/49099>

Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

Terms of use:

Documents in EconStor may be saved and copied for your personal and scholarly purposes.

You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.

If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.



Peter Bartelmuß*

Sustainable Development – Paradigm or Paranoia ?

*Permission by Cambridge University Press to reproduce information in Figure 1 (from: 'Whither economics? From optimality to sustainability?', Environment and Development Economics 2, 1997, p. 332) is gratefully acknowledged.

Nr. 93 • Mai 1999

ISSN 0949-5266

Wuppertal Papers

Abstract

Sustainable development is the globally embraced paradigm for integrating environment and development policies. Agreement ends with attempts at operationalizing the elusive notion of sustainability. A contentious debate among 'environmentalists' and 'environmental economists' has brought about a confusing proliferation of indicators and policy advice on sustainable development. Greening the monetary national accounts could moderate the debate by generating concepts and indicators which translate environmental concerns into the language of widely used economic variables. The implementation of sustainable growth and development requires more. 'Eco-nomic' instruments of environmental cost internalization need to be combined with environmental legislation and regulation. Such reconciliation of environmental and economic policies should be supported by a 'social compact' between government and civil society. The sustained implementation of sustainable development depends on it.

TABLE OF CONTENTS

INTRODUCTION	1
A NEW DICHOTOMY: ECONOMIC VS. ECOLOGICAL SUSTAINABILITY	1
WHERE ARE WE? IS GROWTH SUSTAINABLE?	4
WHERE TO? FROM PARANOIA TO PARTNERSHIP	9

INTRODUCTION

On the surface there is agreement: environment and economy interact; interaction calls for integration of environmental and socioeconomic policies; and the solution is found in the widely propagated paradigm of sustainable development. Scratch the surface and you open a Pandora's box of differing notions of sustainability and means of achieving it.

The more contentious debate is on the assessment side of the coin. Proclamations on the state of the world run the gamut of the Worldwatch Institute's dire warnings about the economic system heading for self-destruction,¹ to assigning just a few percentage points to environmental costs in green GDP measures.² Is sustainable growth just a bad oxymoron, as claimed by Hermann Daly, a leading green economist, or is it a *sine qua non* for development, according to the United Nations' Agenda for Development?³ A confusing array of indicators purporting to measure genuine progress, human development, sustainable development, genuine saving, or natural wealth have been advanced to define and support the different viewpoints.

Experimenting with different definitions and measures of sustainable development is not a bad idea. However, the zeal with which some of these indices are sold and an emerging polarization of corresponding analyses are more troublesome. Both policy makers and scientists have been drawn into an acrimonious debate about the 'right' approach to a paradigm which was globally embraced at the Rio Earth Summit in 1992.

A NEW DICHOTOMY: ECONOMIC VS. ECOLOGICAL SUSTAINABILITY

An emerging dichotomy in analysis and measurement can be sweepingly characterized as the environmentalist vs the economic worldview of the environment-economy interaction. To integrate environmental concerns and economic objectives environmentalists and economists

applied their respective tool-kits to the other field. They thus imposed their own tenets and values, resulting in distinctly different notions of the sustainability of growth and development.

Environmental economists seek to incorporate scarce environmental services of natural resource supply and waste absorption into their monetary value system. Their premise is that these services can be treated like a commodity for which individuals express their preferences via markets or, in the absence of markets, via surveys of their ‘willingness to pay’. A variety of valuation techniques have been applied to environmental assets, and their services and service losses.⁴

The policy implications of costing environmental impacts are twofold. On the one hand, environmental ‘externalities’, the usually neglected social costs of environmental damage, are to be ‘internalized’ into the budgets of households and enterprises. Market-oriented instruments of establishing property rights over natural assets, pollution charges, fees for natural resource uses or tradable pollution permits are to convert the social costs into private ones. The purpose is to discourage further damage to the environment and to encourage the search for environmentally sound production and consumption patterns. On the other hand, macroeconomic analysis and policy should use environmentally adjusted aggregates, such as a green GDP or truly net (of natural capital consumption) investment, to steer the economy onto a sustainable growth path.

Environmentalists repudiate the notion of treating the environment as a commodity. They see the environment as an indivisible national or global heritage about which people hold personal beliefs and convictions, rather than preferences in terms of economic cost or benefit. Adjusting GDP in green accounts can be considered as “colonization of the environment by the economy”.⁵ Since, according to this view, the value of the environment cannot be expressed in money, ‘physical’ indicators of sustainable development, carrying capacity of particular territories, or flows of materials through the economy are advanced. *Ecological economists* have focused on the latter, i.e. ‘material throughput’. They hold the physical use of natural resources, rather than economic scarcity, responsible for most environmental problems; this view places them close to the environmentalist camp, albeit with a readiness to incorporate market solutions.⁶ For instance,

a joint report by research institutes from the USA, Germany, Netherlands and Japan estimated that industrialized countries use or move annually 45 to 85 tons of materials per capita. The report stops short, however, of characterizing these “staggering” figures as unsustainable.⁷

Environmentalists seem to have a harder time in specifying comprehensive policy recommendations. Physical indicators are obviously more difficult to compare and add up, owing to their use of different units of measurement; they are therefore less instructive about harmonizing economic and environmental strategies. For example, the above-mentioned report on natural resource flows adopts the Wuppertal Institute’s call for ‘dematerializing’ the economies in industrialized countries by a factor of 10. Even over a lengthy period, such action would require drastically modifying production (technology) as well as curtailing consumption.⁸ Indeed, there have been calls for making the transition from ‘quantitative’ economic growth to a “steady-state economy“, reflecting “qualitative development“⁹ - colonizing the economy?

Two basic concepts of sustainability can thus be distinguished. The long-term preservation of produced and natural capital, income or consumption is the focus of *economic sustainability*. In this context, different strengths of sustainability have been advanced to ‘keep capital intact’. Neoclassical economists favour a weak sustainability notion, assuming that overall capital maintenance can be achieved largely by replacing depleted or degraded natural capital with human or produced production factors. On the other end of the sustainability scale, *ecological sustainability* is typically strong, demanding the full preservation of vital environmental assets and their services. Economists thus see the role of the environment as a scarce requisite for economic growth, whereas environmentalists stress nature’s provision of life support and other essential amenities.

The question of who is right or wrong in the sustainability discussion cannot be solved by sweeping statements. The following section examines, therefore, what empirical studies can tell us about the long-term sustainability of economic activity.

WHERE ARE WE? IS GROWTH SUSTAINABLE?

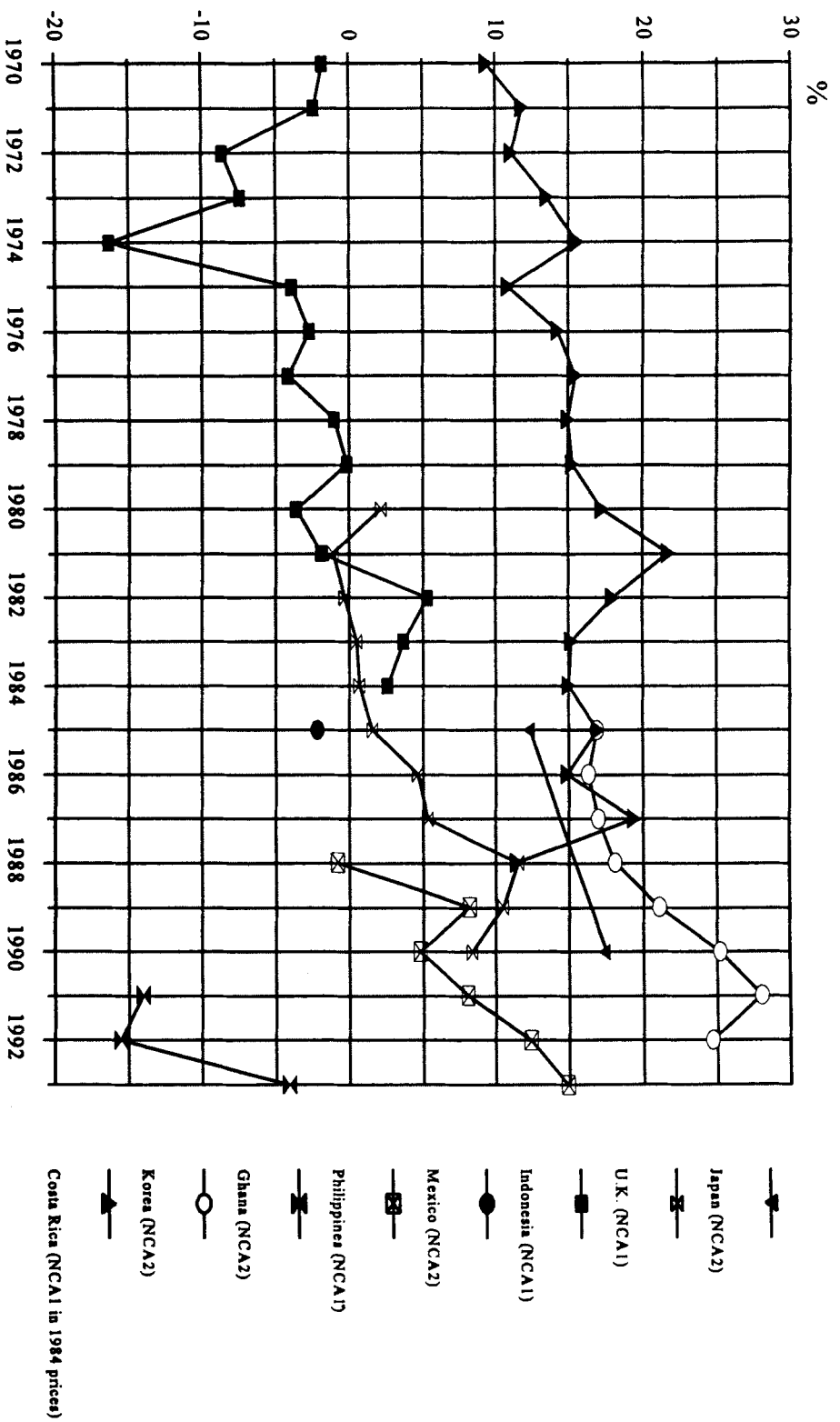
As expected different indicators provide widely differing and hardly comparable results. For example, the World Bank valued nature's capital *stock* at \$ 35 trillion, which is about the same as the value of nature's annual *services* of \$ 33 trillion, estimated by a team of American scientists. The popular Genuine Progress Indicator (GPI) adds 'desirables' such as housework and community services to consumption (a GDP component) and deducts 'regrettables' such as the cost of pollution or the loss of leisure; the indicator supposedly explains why America is "down" by 45%, since 1970, while GDP is "up" by 50% at the same time. Examples of more cautious country rankings are the Human Development Index (HDI) and calculations of a Pollution-adjusted GNP. The former drives Switzerland from its 4th place in terms of per-capita GDP down to 16th, while the latter lowers the country to number 31.¹⁰

Typically, these studies suffer from a high-handed focus on 'key' concerns and indicators, controversial pricing of priceless values of health, leisure or cherished species, and arbitrary, usually equal, weighting of unequal issues such as life expectancy, literacy and GDP per capita as by the HDI. The purpose may indeed be more to "spread funk with numbers" - a judgement about the GPI by *The Economist* (of 30 September 1995) - than to lend statistical support to decision making.

My own provisional assessments of the results of more systematic environmental accounting and trends in a physical index of material flows do not convey a clear picture of the sustainability or non-sustainability of economic growth.

Compilations of an Environmentally-adjusted net Domestic Product (EDP)¹¹ do not indicate a reversal in trends of economic growth, conventionally measured by time series of GDP. Perhaps a more intuitive way of looking into the sustainability of economic performance is to measure a nation's ability to generate new capital after taking produced *and* natural capital consumption into account. Figure 1 shows *net* capital accumulation, accounting for the long-term loss of

Figure 1. Net Capital Accumulation¹ in per cent of NDP



Source: P. Bartelms, "Whither economics? From optimality to sustainability?", *Environment and Development Economics* 2 (1997).

Note: ¹ Net capital accumulation (NCA) is defined as net capital formation minus environmental cost; NCA1 refers to net capital accumulation covering natural resource depletion costs only; NCA2 covers depletion and degradation costs.

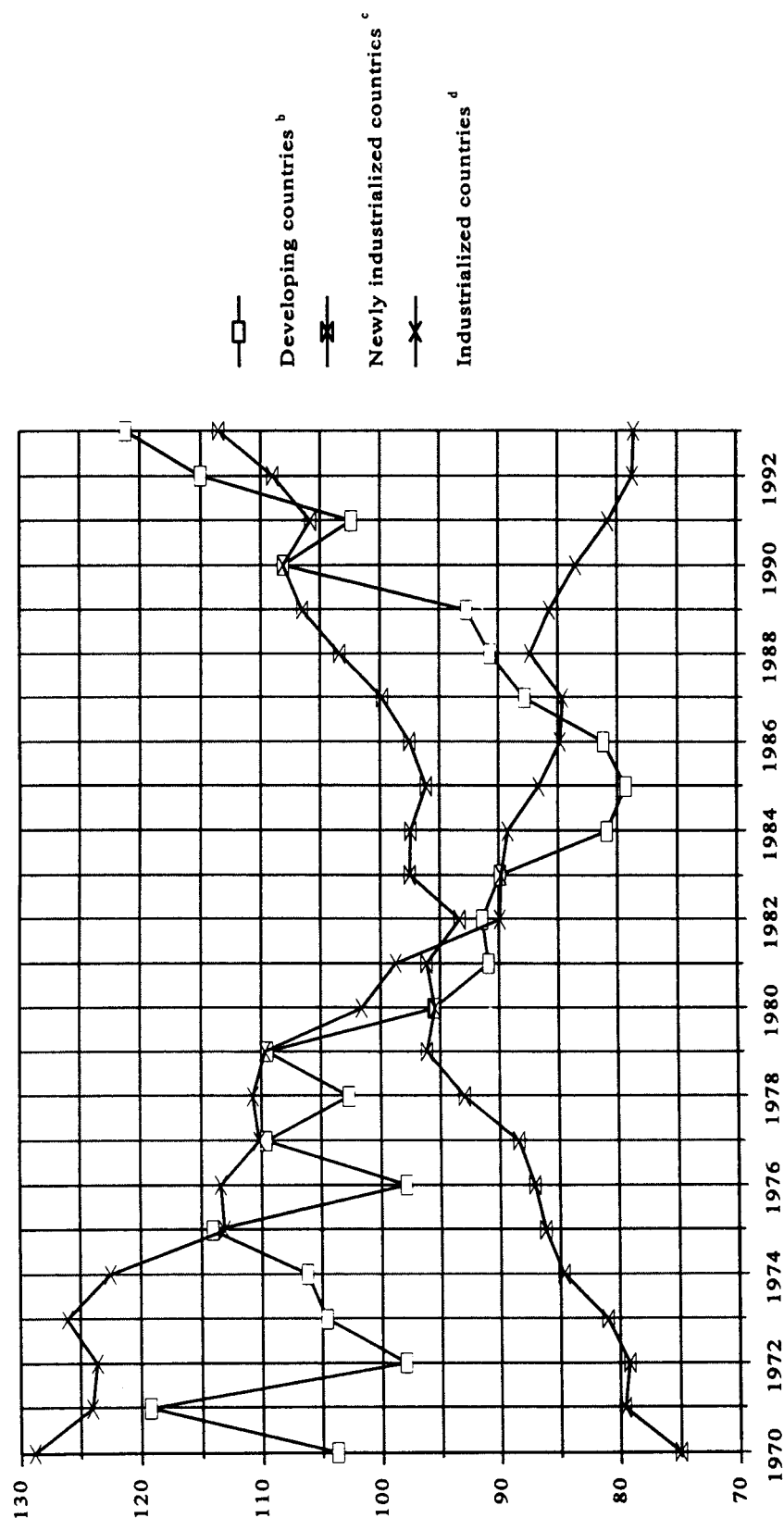
natural resources and environmental degradation, in per cent of net domestic product (NDP).

Indonesia, Ghana and Mexico (as far as a one-year result can tell) exhibit non-sustainable patterns of disinvestment. The performance of all other countries seems to be sustainable, at least for the periods covered, and in terms of overall, produced and natural (non-produced) capital maintenance. As already mentioned, such overall capital maintenance represents weak sustainability which may hide complementarities in the use of environmental assets.

In contrast, a physical index of material intensity (IMEI) can be seen as a proxy for pressure on the environment, resulting from flows of materials (throughput) through the economy. If we could establish a clear connection between throughput, changes in carrying capacity and effects of its violation on the provision of environmental services and the quality of life we would indeed have a good measure of ecological sustainability. However, we lack a clear specification of natural carrying capacities¹², and IMEI is based on a relatively narrow selection of a few materials only. At best, the index is a rough measure of linkage or delinkage of economic growth and environmental pressures. Nonetheless, Figure 2 does convey a possible pattern of delinkage of growth from environmental deterioration for industrialized countries (represented by USA, U.K. and Japan) and linked growth and environmental pressure for newly industrialized countries (Korea, Thailand, Indonesia, Mexico). Note, however, that even declining trends in IMEI may hide increasing - absolute - material throughput in connection with increasing GDP, that is continuing pressure on environmental capacities. More erratic movements are observed for the developing countries (Costa Rica, Ghana, Papua New Guinea and the Philippines).

On their own, the above statistics do not confirm the sustainability or non-sustainability of economic growth and development. The reasons are limitations in scope and coverage and controversial valuations of green accounts, and relatively arbitrary selection and (equal) weighting of materials in the material intensity index. However, there are indications of non-sustainable economic performance in some natural-resource based developing countries. For now, a sound dose of skepticism about 'genuine' or 'true' indices seems to be in order; their purpose may indeed be more to provoke by shocking sum totals than to provide statistical

Figure 2. Index of Materials/Energy Intensity (IMEI)^a 1970-1993



Source:

United Nations Statistics Division (UNSD) data bases (country indices first presented in P. Bartelmus, "Whither economics? From optimality to sustainability?", *Environment and Development Economics* 2, 1997).

Note:

^a Average (for all selected materials) percentage deviation from the average consumption of each material per GDP (1970 - 1993, in constant prices). Materials included are cement, steel, freight (rail and road) and energy.

^b Costa Rica, Ghana, Papua New Guinea, Philippines.

^c Indonesia, Mexico, Republic of Korea, Thailand.

^d Japan, U.K., U.S.A.

support to decision making.

Concluding that overall sustainability of economic performance can neither be confirmed nor rejected is certainly not as exciting as evoking or demolishing doomsday scenarios. It is, however, an honest first step towards overcoming the paranoia of mutual environmental-economic colonization, with a view to discrediting quick-fix data manipulations. The next step would be to join hands in developing consistent and statistically valid data systems for a comparable assessment of (non)sustainability. International work on environmental statistics, indicators and accounting by the United Nations, OECD and European Union are promising efforts of standardizing concepts and methods in these areas.

WHERE TO? FROM PARANOIA TO PARTNERSHIP

Environmental economists urge us to apply market instruments such as green taxes or subsidies to efficiently prod enterprises and households into environmentally sound behaviour. Such instruments use individual preferences and knowledge, expressed in actual or simulated markets, as the gauge of economic and environmental costs and benefits. Top-down intervention by remote bureaucracies is thus avoided. Environmentalists, on the other hand, believe that individual, self-concerned preferences are bad judges of environmental impacts of economic activity, especially if they refer to difficult-to-assess health effects and aesthetic, cultural, educational or ethical values; individual preferences have to be superseded by collective judgement and decision making.

How can we reconcile these seemingly contradictory strategies? The answer is to combine them. Two major obstacles lie in the path of reconciliation. One is the long-standing battle of economics to overcome its stigma of a 'soft' social discipline and to achieve the status of a positive (as opposed to normative) 'science'. As Samuelson's standard textbook proclaims,

economists should “try very hard to keep positive science [of economics] cleanly separated from normative judgements“ and “as free as is humanly possible from the taint of wishful thinking and ethical concern”.¹³ Clearly, the exclusion of normative reasoning from the main body of economics is not conducive to taking non-economic values into account. The other obstacle is the deep-rooted hostility of some environmentalists toward the “dismal science” and its “evil indicators”.¹⁴ A growing literature of discontent with an apparent resurgence of laissez-faire economics bears further evidence of a schism between economists, and social and environmental scientists.¹⁵

An important step toward reconciliation is to make vision visible by explicitly relating the set of social and environmental goals and norms to economic (market) activity. This could be achieved by specifying a *normative framework* within which economic market activity could be played out.¹⁶ For the time being, standards and regulations are typically scattered, with an emission or critical-load standard here, and an environmental rule or law there. Other social targets like the equitable distribution of income and wealth are hardly ever specified for political reasons. In an open and democratic nation, civil society and government are called upon to negotiate and reveal minimum or desirable standards of living, carrying capacities of natural systems, equity in the distribution of income, produced and natural wealth and environmental impacts, and other cultural and social targets. Focusing on dematerialization to reduce environmental pressures, ‘guardrails’ for ecoefficient production and consumption have been recommended by scientists of the Wuppertal Institute: as already discussed, they call for an increase in ‘resource efficiency by a factor of 4 overall and of 10 for industrialized countries.

Economists should overcome their aversion to merging positive (factual) information with normative criteria in analysing environment-economy interaction. Taking account of an explicitly set normative framework could alleviate fears of ‘eco-dictatorship’ or, as the case may be, reveal necessary limitations of economic activity. In both cases, economists can only gain in relevance by making the transition from formalistic rigour to real-life assessments and corresponding policy analysis. Environmentalists, on the other hand, should acknowledge the

role and power of economics in society. This would provide them with a realistic appreciation of the usefulness of market instruments in environmental policy; it might also alleviate or possibly confirm generic fears about “environmental ethics being crowded out by these instruments”.¹⁷

If normative constraints or standards would indeed impair significantly market exchange, a radical shift from focusing on individual preferences to those of society would be necessary. The invisible hand of the market would have to be replaced, at least in part, by the visible hand of the norm or standard setters. Establishing such a normative or ‘institutional’ framework should of course be done as transparently and democratically as possible. A *social compact* between ‘shareholders’, benefiting from economic activity, and ‘stakeholders’, suffering from its environmental impacts, would be needed. The result should be consensus and partnership, encouraged by an enlightened government, in implementing environmentally sound production techniques and lifestyles.

The 1998 session of the United Nations Commission on Sustainable Development called for an interactive dialogue and voluntary agreements between government and civil society to foster sustainable development. ‘Ecoefficiency’ and ‘responsible entrepreneurship’ are the philosophy behind voluntary initiatives of industry to ensure environmental cost internalization and ‘cradle-to-grave’ product policies.¹⁸ For instance, the U.S. car industry has been offering to reduce emissions by up to 70% over the next few years.¹⁹ However, voluntary efforts will not be able to fully replace more coercive ‘command-and-control’ measures²⁰; they will, however, change the climate of cooperation among share- and stakeholders – a prerequisite for the sustained implementation of sustainable development.

Notes

¹L. Brown, "A new era unfolds", in: L. Brown et al., eds., *State of the World 1993* (London and New York: Norton, 1993), p. 4.

²See K. Uno and P. Bartelmus, eds., *Environmental Accounting in Theory and Practice* (Dordrecht, Boston and London: Kluwer Academic Publishers, 1998).

³See for the respective views of sustainable development: H.E. Daly, "Sustainable growth: a bad oxymoron", *Grassroots Development* 15/3 (1991) and B. Boutros-Ghali, *Agenda for Development* (New York: United Nations, 1995).

⁴G.C. Daily, *Nature's Services - Societal Dependence on Natural Ecosystems* (Washington, D.C. and Covelo, Cal.: Island Press, 1997) describes the use of cost-benefit analyses to value a large array of nature services. Valuation methods applied in environmental (national) accounting can be found in K. Uno and P. Bartelmus, eds., *Environmental Accounting in Theory and Practice* (Dordrecht, Boston and London: Kluwer Academic Publishers, 1998).

⁵W. van Dieren, ed., *Taking Nature Into Account* (New York: Springer, 1995), p. 7.

⁶ See e.g. F. Hinterberger, F. Luks and M. Stewen, *Ökologische Wirtschaftspolitik, Zwischen Ökodiktatur und Umweltkatastrophe* (Berlin, Basel, Boston: Birkhäuser, 1996).

⁷World Resources Institute et al., *Resource Flows: the Material Basis of Industrial Economies* (Washington, D.C.: World Resources Institute, 1997), pp. 15 and 16.

⁸ 'Ecoefficiency' in production and 'sufficiency' in consumption are the catchwords for a combined approach that is expected to halve material flows world-wide in about 50 years, see F. Schmidt-Bleek, *Wieviel Umwelt braucht der Mensch?* (Berlin, Basel and Boston: Birkhäuser, 1994), pp. 167 et seq.

⁹ H. Daly, *Beyond Growth* (Boston: Beacon Press, 1996) seems to favour the immediate transition from growth to (qualitative) development while, probably more realistically, the ecological economists of the Wuppertal Institute advocate a 30-50 years transition period; see F. Hinterberger and P. Schepelmann, *Ecoefficiency and Resource Productivity*, Wuppertal Paper (in prep).

¹⁰The World Bank estimate of natural wealth is derived from data presented in World Bank, *Expanding the Measure of Wealth* (Washington, D.C.: The World Bank, 1997); nature's services are estimated by R. Costanza et al., "The value of the world's ecosystem services and natural capital", *Nature*, 387 (May 1997): 253-260. As to the GPI, see C. Cobb, T. Halstead and J. Rowe, "If the GDP is up, why is America down?", *The Atlantic Monthly* (October 1995). UNDP publishes its recurrent country rankings in its *Human Development Report* (New York and Oxford: Oxford University Press, annual), and the Pollution-adjusted GNP is a joint effort by UNDP, UNEP and World Bank staff: E. Rodenburg, D. Tunstall and F. van Bolhuis, "Environmental indicators for global cooperation", Working Paper No. 1 (Washington, D.C.: The Global Environment Facility, 1995).

¹¹See e.g. K. Uno and P. Bartelmus, eds., *Environmental Accounting in Theory and Practice* (Dordrecht, Boston and London: Kluwer Academic Publishers, 1998).

¹²Assumptions about minimal or desirable standards of living for people to be sustained in a particular territory and possibilities of importing and exporting sustainability through trade across territorial boundaries make the carrying capacity concept an ambiguous measure of long-term sustainable development.

¹³P.A. Samuelson and W.D. Nordhaus, *Economics*, 14th edn. (New York: McGraw-Hill, 1992), p. 295.

¹⁴As coined in reference to GDP by the Dutch environmentalist R. Hueting at the Special Conference of the International Association for Research in Income and Wealth (IARIW) on Environmental Accounting (Baden, Austria, May 1991).

¹⁵Examples of recent criticism of the narrow focus of economics on formalistic models of market behaviour, at the expense of real-world vision, are R. Kuttner, *Everything for Sale* (New York: Knopf, 1997); J. Foster, ed., *Valuing Nature? Ethics, Economics and the Environment* (London and New York: Routledge, 1997); and R. Heilbroner and W. Milberg, *The Crisis of Vision in Modern Economic Thought* (Cambridge University Press, 1995).

¹⁶Such a framework of normative constraints of economic activity might turn the question of sustainability of economic growth into one of the “feasibility” of development: see P. Bartelmus, “Whither Economics? From optimality to sustainability?”, *Environment and Development Economics* 2 (1997), p. 339.

¹⁷B.S. Frey, “Pricing and regulation affect environmental ethics“, *Environmental and Resource Economics*, 2, pp. 399-414, 1992.

¹⁸The concept of ecoefficiency has been made popular by the Wuppertal Institute, notably in E.U. von Weizsäcker, A.B. Lovins and L.H. Lovins, *Factor Four: Doubling Wealth, Halving Resource Use* (London: Earthscan Publications, 1997). The World Business Council for Sustainable Development, a coalition of international companies, publishes a wide range of research reports and guidelines on the topic (website: www.wbcsd.ch).

¹⁹New York Times of 19 April 1998, “Study questions feasibility of clean air goals“.

²⁰Notably where our partners do not yet exist as in the case of future generations, or where our ‘life companions’ (other living beings) are unable to voice their opinions in negotiations for a social compact.