NATURAL RESOURCES AND ECOLOGICAL TAX REFORM

Ernst Ulrich von Weizsäcker
President, Wuppertal Institute for Climate, Environment, and Energy, Germany, and Member of Parliament (Bundestag),Germany

Keywords: Sustainable Development, Efficiency Revolution, Green Taxes, Biodiversity.

Contents

1. Three Ecological Challenges

The "Earth Summit" of Rio de Janeiro, 1992, has addressed three major ecological challenges of our time, namely: sustainable development; saving biodiversity; and protecting the global climate. Significantly, pollution control played only a subordinate role. And rightly so. Pollution control has been the main environmental agenda in industrialized countries for 20–30 years. It has been successful and is in the process of being copied or waiting to be copied in the newly industrialized countries. But it has not solved the three major problems, (un-) sustainable development, biodiversity losses and climatic change. Rather to the contrary, in an indirect manner, pollution control may even have made things worse: Only the prosperous countries had the means to pay for costly pollution control. The result, often presented in an optimistic language, is that all countries have an excellent environmental pretext for intensely pursuing their economic growth. In the end, it is exactly that growth that is associated with unsustainable life styles, with habitat destruction and with increasing emissions of greenhouse gases that alter the earth's climate. To be sure, pollution control will always remain a highly important task of environmental and public health policies. But we must be careful not to blur the distinction between a pollution-free environment, and sustainable life styles.

Sustainable development attracted public attention through the Brundtland Report of 1987 that actually triggered the UN General Assembly's decision to convene the Earth Summit of Rio de Janeiro. During the Earth Summit, sustainable development was addressed both in the Rio Declaration and in *Agenda 21*. To reduce "sustainable development" to its essentials: Not more should be consumed at any time than can be replaced or renewed in a reasonable time frame.

Biodiversity has been an old concern of mankind. National Parks were created since the late nineteenth century. Notwithstanding, biodiversity came under very strong pressure only since the second half of the twentieth-century and has not moved up to the top of the global environmental agenda before the Earth Summit.
Climate protection became a major global concern in the mid-1980s after chemical analysis of Antarctic ice cores produced a conspicuous correlation between CO_2-concentrations and temperatures on earth over the last 160 000 years (see Figure 1).

We shall discuss the three challenges consecutively.

1.1. Sustainable Development

Discussing sustainable development we have to look for measurements or at least estimates of what is consumed and what is naturally replenished. One way of measuring the ecological impact of our daily life can be found in the *Sustainable Netherlands* study by the Milieudefensie, the Dutch branch of Friends of the Earth. The authors (Buitenkamp et al., 1992) defined an "ecological space" that is available for mankind and that may be attributed to the six billion people presently living on the planet. They find that our present lifestyles are unsustainable but that with a few exceptions (including frequent long distance air travel and excessive meat consumption) our lifestyles could theoretically be maintained if drastic improvements of resource efficiency would be developed and would be widely adopted.

A similar concept was developed in Canada, by William Rees and Matthis Wackernagel (1994), the "ecological footprints" idea. Count the space needed for your food, shelter, clothes, mobility, energy, education, holidays etc. The astounding result is that your ecological footprints are as large as four hectares for West European citizens and still larger for typical US Americans or Canadians. Multiplying this footprint area by the population of an industrialized country typically leads to an overall area far in excess of the country's size. The footprints of people in the richest countries such as the USA, Germany or Japan are on average some five to ten times larger than those of people in China or India. In this footprint language, the USA, Germany, and Japan are hopelessly over-populated, while China and India are not.

There are two major differences between the footprints and the ecological space assessments:

- The "footprints" include a fairly generous contribution accounting for energy consumption. For energy use the area is calculated that would be required if all was coming from renewable energy sources (fossil and nuclear energy "footprints" are defined to be equivalent in size with renewable energy footprints; that definition reflects the plausible assumption that fossil and nuclear energies are not ecolocically preferable to renewables—because they are depletable and hazardous).
- The "footprint" calculations are purely descriptive which means that there is no allowance for future efficiency gains.

These two differences explain the astonishing fact that the "footprints" estimates lead to highly pessimistic results while the "space" concept comes up with a fairly optimistic

outlook. Of the two differences, I fear that the pessimistic footprints approach is ultimately unavoidable with regard to energy consumption. Non-renewable sources of energy are limited by definition, after all. And they contribute to greenhouse gas emissions or to highly unwanted nuclear waste. On the other hand, the optimistic "space" concept is absolutely right with regard to technological progress. In fact, the entire thrust of my own contribution rests on dramatic increases of resource efficiency that are attainable given time and given adequate frame conditions.

Both the "space" and the "footprints" concepts raise a disquieting question with regard to development. What will happen to the Earth if six billion people will assume lifestyles associated with Western size footprints (or space)? Currently the meaning of development is closely linked with an increase of space, energy and material resource consumption. Thus, by 2020, China and India, too, will be hopelessly overpopulated in terms of their footprints. We would need three to four planets of Earth's size and resources to accommodate six to eight billion US size ecological footprints. That is a rather drastic way of demonstrating that our present Western lifestyles are ecologically unsustainable and that they collide with the limits to growth. This clearly hints at a fundamental moral and equity problem involved in Western consumption patterns. (We shall come to the question of how to reduce the size of our footprints without jeopardizing the quality of our lives at a later juncture.)

In other words, we shall absolutely depend on technological breakthroughs in resource efficiency unless we are prepared to assume much more modest lifestyles. Political history does not suggest that voluntary modesty is readily achievable in democracies. Fortunately for our democratic system, technology is opening a wide door for prosperity under the limitations of space and natural resources. The pressing question remains, however, whether market forces and state action will make use of the opportunities. This question will be taken up later, after briefly illustrating the technological options.

1.2. Biodiversity

Biodiversity, as we can assess today, is directly linked to the footprints. Biodiversity became a prominent political issue during the 1980s. The first cry of alarm receiving worldwide attention came from a mere four pages contained in the Global 2000 Report to President Carter (Barney, 1981). On pages 328–331, Thomas Lovejoy described a couple of scenarios of forest destruction and the related losses in biodiversity. In one scenario, not un-plausible at the time, losses of 500 000 to 600 000 species were feared to occur during the twenty years left until the year 2000. This meant a daily toll of more than fifty plant and animal species—a devastating figure for anybody caring for the environment.

Clearly the use of land for agriculture, logging, mining, road-construction, and, not the least, settlements for a growing human population, were identified as the prime reason for the loss of species. Here we are: it is the oversized footprints that cause the disaster of rapid biodiversity losses. Admittedly, many of the extinct species are rather inconspicuous, hardly visible for the lay public. Nevertheless, such rare and inconspicuous species may play important roles in the interlinking webs of ecosystems.

In the North, there is a habit of blaming the South for the habitat destruction that mostly hits the developing countries. The footprints story, however, clarifies that we in the North manage to export much of our footprint demand (e.g. for tropical fruit, winter vegetables, beef, cotton, timber, and metals etc.). Hence, much of our footprints are in effect located in the developing countries where they cause considerable additional land use and biodiversity losses. Without this mechanism, the industrialized countries would not be able to maintain ecological footprints in their sum far exceeding their own territories.

One reason for the massive land conversion and habitat destruction, perhaps the most important reason, is the gigantic flows of materials that are induced by our modern consumer society. Each one of us in the North induces material flows of some forty to eighty tons per year (Schmidt–Bleek, 1994). It seems plausible that we shall have to reduce drastically these avalanches of matter in order to save the better part of the biodiversity both abroad and at home.

The Biodiversity Convention of Rio de Janeiro does not address this important part of the causal chains leading to biodiversity losses. At least, the Convention asks for a mechanism of equitable benefit sharing between North and South as regards the use of the treasures of biodiversity. Equitable benefit sharing is a notion that should exclude "biopiracy," i.e. the grabbing chiefly by Northern biotech firms (or botanical gardens) of genes and seeds taken from the South and thence considered Northern property open even for patenting. The sixth Conference of the Parties (COP) of the Biodiversity Convention, held in 2000 in Nairobi, seems to have made some progress towards a fair arrangement between North and South with regard to equitable benefit sharing.

At the same COP, the Cartagena Protocol on Biosafety was signed by an encouraging number of countries. This protocol explicitly put the precautionary principle ahead of the free trade principle, which fact was seen as a blow to the otherwise dominant free trade ideology. Historically, the agreement on the Cartagena was reached in Montreal a mere few weeks after the Seattle Ministerial Conference of the World Trade Organization (WTO) which, after unprecedented non-governmental protests ended in disarray. It is fair to say that without Seattle, the precautionary principle of environmental policy would not have gained so much support at Montreal.

-
-
-

Bibliography

Ballard C. L. and Medema S. G. (1992). *The Marginal Efficiency Effects of Taxes and Subsidies in the Presence of Externalities: A Computational General Equilibrium Approach*. East Lansing, MI: Dept. of Economics, Michigan State University.

Barbir F. T., Veziroglu N. and Please H. J. (1990). Environmental damage due to fossil fuel use. *International Journal of Hydrogen Energy* **15**, 739–749.

Barney, G., ed. (1980). *Global 2000*. Harmondsworth: Penguin.

Brundland, G. H. (1987) (World Commission on Environment and Development) *Our Common Future*. Oxford: Oxford University Press.

Buitenkamp, M., Venner H. and Wams T., eds (1992). *Action Plan Sustainable Netherlands*. Amsterdam: Milieudefensie.

Hawken, P., Lovins A and Lovins H. (1999). *Natural Capitalism*. Boston: Little Brown.

Lorius C. et al. (1995). A 150 000 year climatic record from Antarctic ice. *Nature* **316**, 591–596.

Prognos (1992). *Externkosten der Energieerzeugung.* Bonn: Gutachten für den Bundesminister für Wirtschaft.

Rees W. and Wackernagel M. (1994). Ecological footprints and appropriated carrying capacity: measuring the natural capital requirements of the human economy. In A. M. Jannson et al., eds. *Investing in Natural Capital*. Washington D.C.: Island Press.

Repetto R., Dower R. C., Jenkins R., and Geoghean J. (1992). *Green Fees: How a Tax Shift Can Work for the Environment and the Economy.* Washigton, D.C.: World Resources Institute.

Schmidheiny S. and the Business Council for Sustainable Development (1992). *Changing Course: A Global Business Perspective on Development and the Environment.* Cambridge, MA: MIT Press.

Schmidt-Bleek F. (1994). *Wieviel Umwelt braucht der Mensch?* Basel: Birkhäuser.

Tooley M. J. (1989). Global sea levels: floodwaters mark sudden rise. *Nature* **342** (6245): 20–21.

Von Weizsäcker E. U. and Jesinghaus J. (1992). *Ecological Tax Reform: Policy Proposal for Sustainable Development.* London: Zed Books.

Von Weizsäcker E. U., Lovins A., and Lovins H. (1997). *Factor Four: Doubling Wealth, Halving Resource Use*. London: Earthscan.