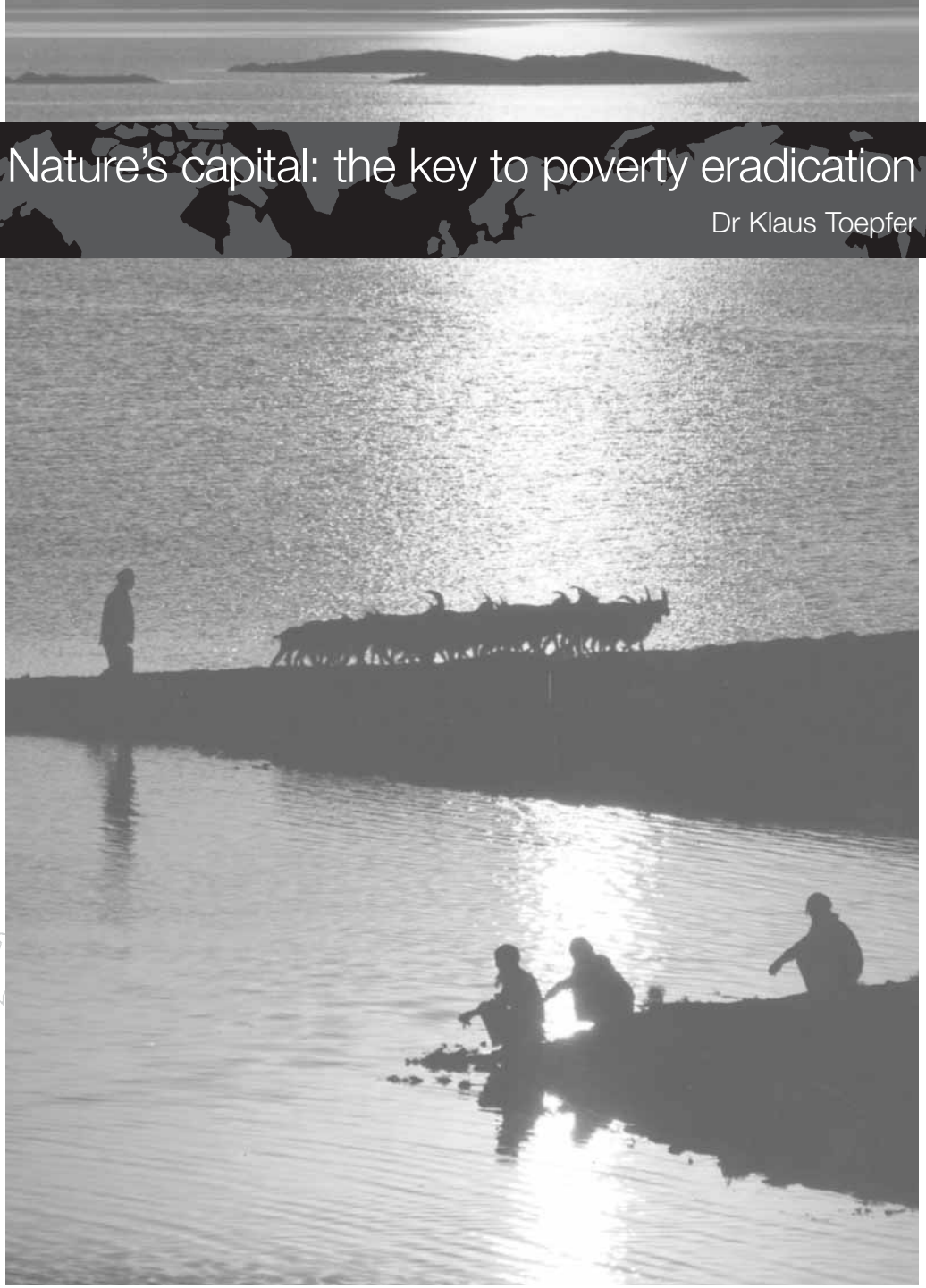
# Nature's capital: the key to poverty eradication

Dr Klaus Toepfer



**The year 2005 was quite an important one in the field of sustainable development and the environment. We witnessed focused activity concerning the interrelationships between the environment and poverty; and we saw the launch of the Millennium Ecosystem Assessment. We took what I believe is an important step forward by asking, together with more than 2,000 scientists from around the world: what is the status of nature's capital? Are we overusing it? What is the status of the different ecosystem services?**

Incidentally, it was at the beginning of this millennium that we decided – for the first time – not to publish a new Red List of Threatened Species. This does not mean that we are no longer concerned with the responsibility of mankind for the diversity of creation and for species interrelationships. But it was crucially important to have the Millennium Ecosystem Assessment alongside the Millennium Project. Inspired by Kofi Annan, the Secretary-General of the United Nations, the Millennium Project is linked with the eight Millennium Development Goals (MDGs) agreed upon at the Special Session of the General Assembly of the UN in 2000 in New York by all the heads of state and government. The MDGs are fairly well known by now, but it is worth looking at them again. By 2015 all United Nations Member States have pledged to:

1. Eradicate extreme poverty and hunger
2. Achieve universal primary education
3. Promote gender equality and empower women
4. Reduce child mortality
5. Improve maternal health
6. Combat HIV/AIDS, malaria and other diseases
7. Ensure environmental sustainability
8. Develop a global partnership for development

Number seven – "Ensure environmental sustainability" – is the goal that I am going to highlight, but it is not an isolated one: the environment runs like a red ribbon through all of these goals. When UNEP held its Governing Council in Nairobi, Kenya, in February 2005, the ministers discussed exactly this topic: what is the contribution of the environment to the realization of the Millennium Development Goals?

It would take too long to go through all the goals here, but each of them can be directly linked to environmental services. Goal 7 and the environment are not just important to those of us working in that specific area, but go much further.

The main topic of concern, and again one that interlinks with many of the others, is the first goal, "Eradicating poverty and extreme hunger". Even in this world of affluence, we still have huge differentiation between those with the most and those with the least to live on. The UN system uses, as an indicator of poverty, living on less than $1 a day. We could spend a whole semester discussing whether or not this is a good indicator but, in any event, it is the one we have.

In this world of 6.2 to 6.3 billion inhabitants there are some 1.4 to 1.5 million living on less than $1 a day. The target is to reduce that number by 50 per cent by the year 2015, but we would still have 800 million impoverished people. If we then sub-divide the world, we find that in one part the main challenge is to fight obesity – here in the industrialized countries, children are becoming fatter and fatter – while in the other part of the world many people remain in a condition of hunger. With such a vast difference between the situation in one part of the world and that in the other, we need to consider what this means for global stability.

I want to show you some of the striking changes that have occurred over the last few centuries. I was recently in Tokyo discussing climate change, and among those present was Paul Crutzen, the Nobel laureate for chemistry, awarded for his contribution in linking the destruction of the ozone layer with specific chemicals, the chlorofluorocarbons. He had a wonderful list and it is from him, rather than some neurotic environmentalist, that the following figures have come.

- Over the past three centuries human population has increased tenfold to 6 billion.
- The cattle population has increased to 1.4 billion, or one cow per family.
- Urbanization has increased tenfold in the past century, so that almost half of the people live in cities and megacities.
- Industrial output increased 40 times during the past century and energy use 16 times.
- Almost half the land surface has been transformed by human activity.
- Water use increased ninefold during the past century to almost 1,000 cubic metres per capita. The

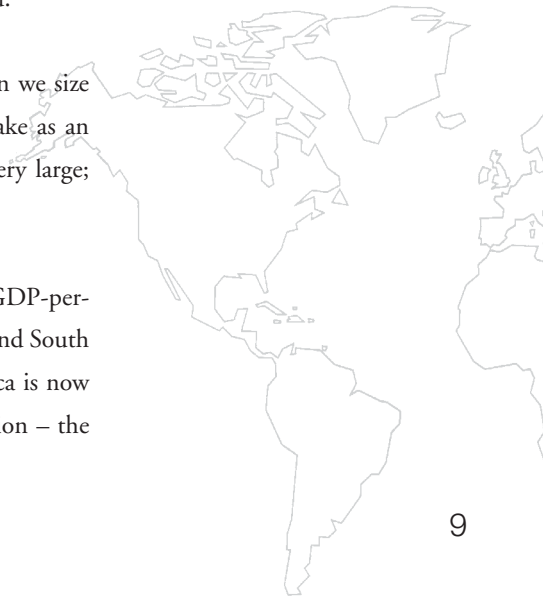
main use of water, taking up 65 per cent, is irrigation, with a strong interrelationship with food production, for example for rice production. A further 25 per cent of water is used by industry and approximately 10 per cent by households.

- The fish catch has increased 40 times.
- The release of sulphur dioxide through coal and oil burning is now at least twice the sum of all natural emissions. Over land the increase has been sevenfold, causing acid rain, adverse health effects, poor visibility and climate impacts due to sulphate aerosol particles.
- More nitrogen is now fixed as agricultural fertilizer than is produced by natural processes on land.
- The release of nitrogen oxide to the atmosphere from fossil fuel and biomass burning is larger than its natural inputs, causing high surface ozone levels over extensive regions of the globe.
- Several climatically important greenhouse gases have substantially increased in the atmosphere: for example, carbon dioxide by 30 per cent and methane by more than 100 per cent.
- The production of chlorofluorocarbon gases has caused major changes in the chemistry of the stratosphere, especially ozone loss, which has been particularly large in the spring over the Antarctic continent, the so-called ozone hole.

These figures demonstrate that extreme changes have taken place. The question is: are we overloading nature? Can we handle these changes in a way that permits stable development, and particularly in a way that avoids conflict? Conflict is a real threat. We, therefore, must seriously consider the effects of environmental change on poverty and the differentiation in this world.

We all know the shape of the physical world. Let us instead imagine how it looks when we size countries by other important factors. For example, what is the shape of the world if we take as an indicator the number of people under 15 years? Africa and Asia look very different, and very large; India is massive; and both North and South America, as well as Europe, are small and slim.

Then consider the shape of the world when we use GDP per capita as an indicator. This GDP-per-capita world is dominated by three large areas – North America, Western Europe, and Japan and South Korea – where GDP per capita exceeds $20,000 measured in purchasing power parity. Africa is now tiny, and comparing this Africa with the earlier one we get an idea of the huge differentiation – the instability in the world – particularly in the world of young people.

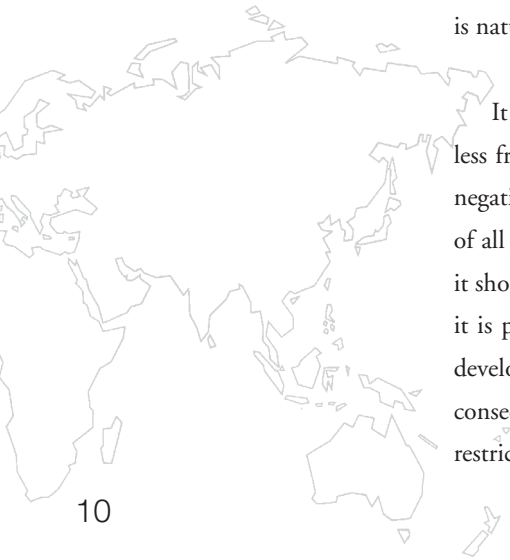


We can then ask how the world will be shaped in 2020, supposing that, for example, the economic growth rate of China remains at around 9 per cent, and that of India at 7 or 8 per cent, and that we will have an extra billion people on the planet by then. Africa will be more or less unchanged, while Latin America will be have got smaller. This illustrates how necessary it is to overcome poverty.

In order to reduce poverty and improve economic development, three types of capital are necessary. The first is financial capital. We saw earlier this year Prime Minister Blair's initiative at the G8 meeting, where Africa was the main topic discussed, and the Live 8 concerts and associated campaign to "make poverty history" – all based on bringing more financial capital to overcome this problem. Of course, in a country like China we find blocks to economic development, but, with reserves of some $700 billion, it is not financial capital that is hindering economic development in China.

The second capital needed is human capital. We need education – and if we go back to the MDGs we see that one of them is to achieve primary education for all, especially for girls.

Most discussions up until now have centred around financial and human capital as the means to overcome poverty: that we also need nature's capital has often been forgotten. Let us take China as an example again. The Vice Premier of China came (for the first time ever) to our recent Governing Council in Nairobi, with a large group of people including four ministers. China is clearly aware that the bottleneck in the implementation of its decision to quadruple the country's gross national product is nature's capital, and that they now need to invest in it. Why is this bottleneck happening?



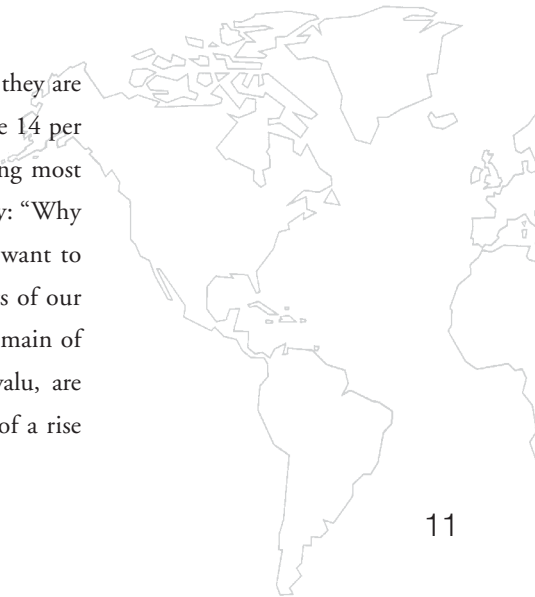
It is not difficult to explain from an economist's point of view. Many of nature's assets are more or less free goods, common goods. People have used them as much as they wanted with no immediate negative consequences. The air – the atmosphere – has been perceived as such, available for the disposal of all sorts of gaseous emissions. Few have asked whether this facility should carry a price or whether it should be limited. The same has been more or less true of water, particularly in those regions where it is plentiful. To some extent we have encountered a problem over this resource because economic development first came about mainly in those parts of the world where it is abundant, with the consequence that technological advancements have not needed to be water-sensitive. Where water is restricted, as we find for example on aeroplanes, a solution has often been found.

Nature has the capacity to absorb a certain amount of all kinds of waste: gaseous, fluid, solid, etc. But if you exceed its absorption capacity you realize that there is a limit, and a downside for human health. When we have a free good, and do not pay a price, then we need to be aware that we are using a free good and consider the true costs.

The true environmental costs of development in the three regions with the highest per-capita GDP have been largely ignored – externalized. Economic development has been subsidized by overusing nature's capital both at home and abroad. This is why, in 1972, people started to question what was happening to the environment – which knows no national borders – leading to the United Nations Conference on the Human Environment and the birth of UNEP. It was then that environmentalists decided that we needed to work together to identify the transboundary consequences of overusing nature's capital.

Economic science has long been familiar with the idea of a "beggar-my-neighbour" policy. This happens when nations develop specific currency exchange-rate policies, or wages or other policies, that lead to their neighbours being the ones to carry the costs of such growth processes. We do the same with the environment. In many countries, all you need is the precise location of a land-fill or a high-emission manufacturing plant and you can work out exactly where cities and borders lie – such facilities tend to be located on a country's or city's boundary so that the wind takes the problems to its neighbours.

It is a familiar phenomenon, beggar my neighbour. But when people become aware that they are the beggars, they are not happy about it. Africa has a share of the global population of some 14 per cent, and a share of global carbon dioxide emissions of 3.2 per cent. But Africa is suffering most from climate change. So Africans could, of course, come to the industrialized nations and say: "Why are we paying for the fact that you cannot handle your carbon dioxide emissions? If you want to continue, you must at least back us in adapting to climate change." Externalizing the costs of our own welfare has consequences for the behaviour of others, and therefore for the overall domain of security in this world. This leads me to the fact that small island states, specifically Tuvalu, are already asking who will be liable should – or when – they become submerged as a result of a rise in sea level.

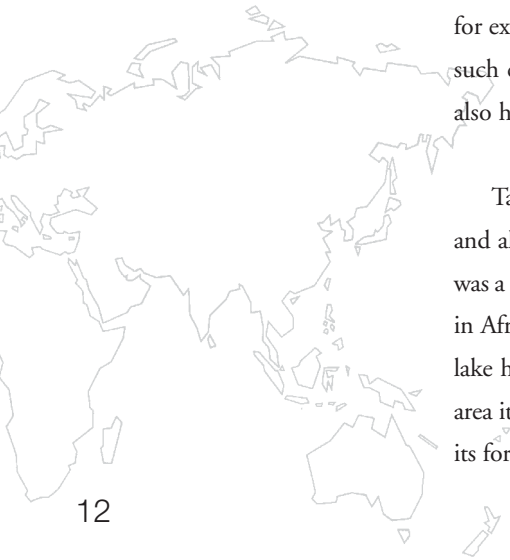


## Environment on the Edge

UNEP is headquartered in Nairobi in Kenya, in the centre of Africa, the best location we could ever have but not an easy one. There we are confronted with many of the major problems of this world – 75 per cent of the global population lives in cities like Nairobi, not in cities like Cambridge. We see poverty on a daily basis; we know what it means to have no sanitation and inadequate water. Therefore, our motto is "environment *for* development", not environment for environment, nor environment and development. Environment *for* development is sustainable development – the peace policy of today.

I will give you a few additional examples of the effects of unsustainable development. We can compare satellite pictures of the ice cap on the Arctic in 1979 and 2003, and we see that it has diminished so much that we will very soon find that the passage via the Arctic is open. You may have seen the *New York Times* of October 2005 that showed two pictures of what is happening in the Arctic – the opening of the Arctic, the melting of the permafrost, the decrease of albedo (reflectivity) – and the probability that this is directly linked to the non-linear development of climate change. There is enough material there for a whole lecture on its own. As we saw in the list from Paul Crutzen, there are changes going on, and these changes are reflected in the environment.

You could, of course, ask why we need ice in the Arctic. There was certainly once an Arctic with jungles. We also know that it is one of the world's biggest fossil fuel reservoirs. If you exclude the Arab countries, I think the Arctic has the same capacity as all the other countries with proven oil reserves together. I have heard people say how nice it would be to have the climate of the Mediterranean in, for example, Sweden, as there would then be no need to go to the Mediterranean. The problem is that such changes in fact have only losers and no winners, because the dynamic nature of these processes also has negative consequences: an increase in extreme weather conditions and so on.



Take water as another example. We know that water use is linked to population and development, and also to climate change. We can compare Lake Chad in Africa in 1963 and 2001. In 1963 the lake was a significant water body surrounded by four important countries: Nigeria, with the largest population in Africa, Cameroon, Chad and Niger. Each country had a large share of the lake. By 2001 parts of the lake had dried up while others were covered with vegetation. Water now extends over a fraction of the area it did in 1963, with none at all in Niger and Nigeria. In Chad, it occupies only a tiny proportion of its former extent, and even in Cameroon there is a far smaller body of water than previously.

Again, at the time of the Soviet Union the authorities decided to increase abstraction from the two rivers that fed the Aral Sea, for rice and especially for cotton production, which uses a great deal of water. Water was consumed in such quantities that none reached the Aral Sea, with the consequence that the sea has been gradually disappearing. In 1989-90 it separated into two – the Large Aral and the Small Aral – and between 2000 and 2001 Vozrojdeniya Island joined the mainland to the south. Again, we have a common good not being correctly valued. Nature's capital is decreasing, with consequences for poor people in particular.

And finally, let us look at the Mesopotamian Marshlands. In 1976 these occupied a significant area linked to a specific group of people with a specific cultural identity, the Marsh Arabs. This is an instance of the interrelationship between biodiversity and cultural diversity, one we should underline much more. By 2000 all that was left of the marshes was a small area more or less in the transboundary region between Iraq and Iran. A number of people say that this was the first "eco-cide" in human history; that in destroying the environment, the basis of existence for a specific group of people was also destroyed. Indeed, the Marsh Arabs could no longer live there. At UNEP we are working with financial help from Japan to revitalize these marshlands. There are many problems, not least because if we want to have marshlands again we need water, and the water we need there cannot also be available elsewhere. Nevertheless, there is much that can be done to stabilize the marshlands again. Once more, we have seen nature's capital decreasing, with consequences for the poorest people.

We must ask again whether we are valuing our ecosystem services correctly and must seek to introduce much more efficient technologies. The current problem with water is not that we do not have enough but that we do not have enough money to make sure it is recycled. We have an investment crisis, an administrative crisis and a technology crisis. How to use water better will soon become a question of survival, and therefore also a source of possible tensions.

One of our particular current interests is to stimulate discussion, new calculations and new methods to determine an appropriate way of measuring the growth rates of specific nations. Particular attention is being given to this by Professor Sir Partha Dasgupta in Cambridge. What, he is asking, is the realistic growth rate of China? If the necessary reinvestment in nature's capital were integrated into the calculation the picture would change considerably.

This is not just a technical issue. In a world that undervalues nature's capital, or does not value it at all, the losers are those who are producing nature's capital. And given that the main reserve for the production of nature's capital is in the developing world, we must conclude that we are not only decreasing the growth rate in developing countries but doubly burdening their economic and societal development.

The World Summit on Sustainable Development included mention of access and benefit sharing of genetic resources and indigenous knowledge, and we have a similar concern coming out of the Convention on Biological Diversity. The World Trade Organization and the World Intellectual Property Organization have a clear regulation known as TRIPS – trade-related intellectual property rights. This seeks to ensure that intellectual property rights are protected and that whoever wants to use someone else's intellectual property has to pay for it. This is now the accepted solution around the world.

But we do not have a TRIPS-like agreement for the rights of indigenous people with regard to their own knowledge; this knowledge is available at a zero price. Nor do we have any regulation concerning access to genetic resources, which are largely located in and maintained by developing countries. Genetic resources can be accessed free of charge, while the result – the intellectual property – is protected by a price tag. Understandably, many in developing countries believe this is unfair. People gain information from the genetic knowledge available in developing countries, use it and make products out of it, and then the developing countries have to pay a high price for the products, only possible because they once protected this biodiversity.

We are in the early stages of producing instruments on access and benefit sharing, but there is great interest in making them much more binding. There is already something like the "OPEC"[1] of biodiversity, consisting of like-minded countries of mega-biodiversity, initiated by Mexico and now I think chaired by India. These mega-biodiverse countries are saying that they should receive some form of linked payment for the use of their biodiversity by others.

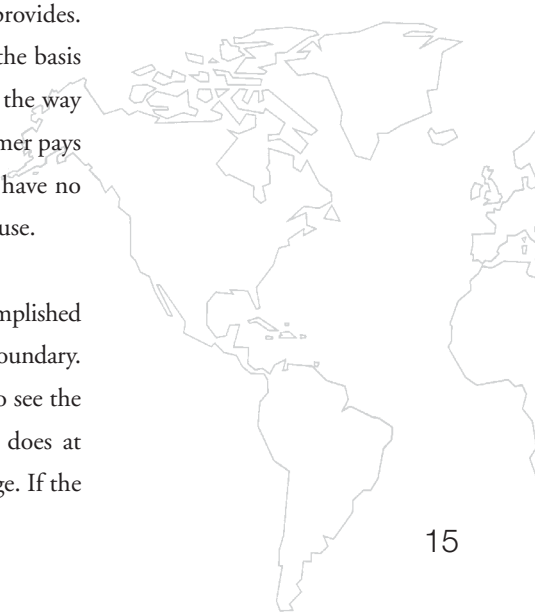
We learned from the Nobel prize laureate on economics, Joseph Stiglitz, that the calculated worth of the capacity of forests in developing countries to fix carbon is between $30 billion and $50 billion

1. Organization of the Petroleum Exporting Countries

a year. But they currently do it free of charge. The question is: how can the interest of people in protecting their forests be increased? There is no point telling them they have no right to destroy forests that contain biodiversity and operate as carbon sinks, because they will reply that that is all very well but what is in it for them? We need a policy to ensure that those who produce these common goods also benefit from them. Interestingly, if those with forests cut them down they can then be paid to reforest the area under the Kyoto Clean Development Mechanism. But if they leave the forest standing, there is no compensation mechanism. We need to find a solution to this.

It is good that we are being pressed not to use timber from tropical rainforests – a number of non-governmental organizations have run campaigns on this issue. But we also need to persuade the people living in the countries with forests of the value of those forests. Logs are currently exported to industrialized countries with almost no import duties imposed on them. But as the value-added chain lengthens, the import duty grows. As a result the potential for adding value is exported to the developed world along with the logs. There is nothing to encourage those in the country that produced the logs to appreciate the forest's value. Not only must we emphasize the importance of nature's capital and the fact that it is being overused, we must also make people understand how nature's capital contributes to world stability and find ways to change the situation.

Mexico has made a start, introducing the first pilot project to pay per hectare of protected forest, according to specific criteria for the forest canopy, in order to maintain the carbon sink it provides. Payment starts at $50-60 per hectare per year and goes up to $250 and more, calculated on the basis of the forest's value for fixing carbon and for watershed management. A country that has led the way in the watershed field is Costa Rica. Amongst other projects it has one in which the downstreamer pays the upstreamer to protect the forest in order better to manage the watershed. If upstreamers have no interest in protecting the forest, they are highly likely to change their surroundings and land use.



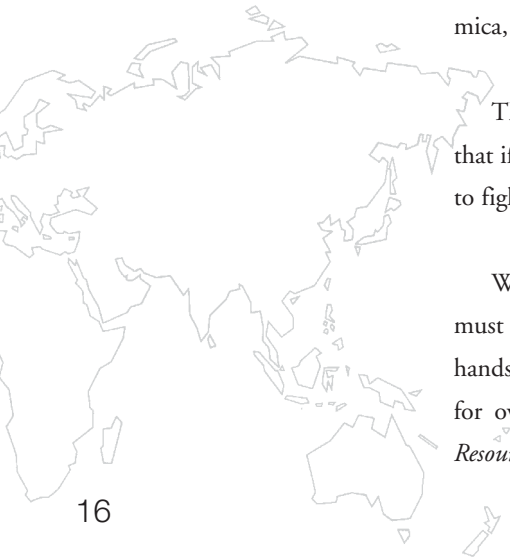
More such initiatives are on their way. Of course, this kind of undertaking is more easily accomplished within the boundaries of one country and is much more difficult if the area concerned is transboundary. But we cannot expect everything to be easy, and it is vital to take this course unless we want to see the next Millennium Ecosystem Assessment showing an even more disturbing picture than it does at present. Nature's capital has already been reduced to 60 per cent of what it once was, on average. If the

lost 40 per cent had been used well, to overcome poverty – with the idea that we were seizing our chances and would make up for it later – it would be easier to understand. But we still have high levels of poverty; we still have a very worrying distribution of births; we still have the three ultra-rich areas contrasting with the rest of the world; and we are still pursuing a development path where nature's capital is not valued. We are going in a very risky development direction if we ignore these signals.

The most successful book we have ever made at UNEP (*One Planet, Many People: Atlas of Our Changing Environment*) was based on a very simple idea: we looked at specific places in the world and compared satellite photographs from the 1970s with those from around 2000. The book achieved tremendous coverage in newspapers around the world. Here are two examples from it.

The first is a district of southern Spain, which in 1974 was a typical rural agricultural area. By 2004 it was under glass. From the shoreline to the base of the mountain behind, some 20,000 hectares had been transformed into greenhouses to produce crops such as tomatoes, with an accompanying heavy demand on water. An ecosystem service – water – was redirected to irrigation in a region that is now experiencing periodic droughts, with implications for the economic situation as well.

The second example concerns the mouth of the Yellow River. Between 1979 and 2000 a giant animal-like head formed in the delta as a result of sedimentation, the effect of deforestation and wetland destruction upstream. This is one of the world's muddiest rivers, bringing sediments such as mica, quartz and feldspar from north-central China.



There are more examples – such as the development of Las Vegas – but these are sufficient to show that if we go on like this, we will find we are destroying the natural capital that we so desperately need to fight flooding, to maintain agricultural production, to store water and so on.

What is my message? Most probably my message is not as scientific as it could be, but it is that we must be aware that nature, nature's capital, is not a luxury for those who have no problems on their hands. Nature is a basis for fighting poverty. The poorer the people, the more they need nature's capital for overcoming poverty. You may have read the recent World Resources Institute report, *World Resources 2005 The Wealth of the Poor: Managing ecosystems to fight poverty.* If you have, and

remembering *An Inquiry into the Nature and Causes of the Wealth of Nations* by the well-known economist Adam Smith, published in 1776, you realize that we really do have to recalculate the wealth of nature. It is not by chance that one of Partha Dasgupta's chief books – *An Inquiry into Wellbeing and Destitution* – has a title echoing this concern.

We have to reconsider nature's capital, not emotionally and not in a back-to-nature way, although that is necessary and helpful as well. Respect for nature is the basis for many good regulations. It is to some extent a pity that the only regulation of our use of nature's capital that we have at present goes by a dollar or euro sign. In previous generations it was also linked with spiritual values. Nobody had to ask the price of water because those spoiling it became social outcasts. If you examine the basis of all the big global religious beliefs, you find this spiritual respect. They do not need a dollar sign.

If we want to fight against the decrease in nature's capital, we have to go back to investment decision-making. It is extremely important that poverty reduction strategies for developing countries integrate nature as a specific target. We must inform people that there is a higher return on an investment in mangroves than in the construction of a new dam; we learned this in the tsunami. We have all the figures, we can do the calculations – and we must thank the economists for this, including David Pearce of the United Kingdom, who died some weeks after delivering his contribution, linking poverty and the environment, to our Poverty Environment Partnership, a cooperation with the United Nations Development Programme and others. It is essential to bring this information into the decision-making process for investment.

There is a nice example of investment decision-making from our headquarters country of Kenya. In 1980, Kenya decided to construct a new dam – the Masinga dam – responsible for 50 per cent of Kenya's electricity production and for an even greater proportion of its water supply. In 1980 the capacity of the dam was more than 1.4 million cubic metres. Twenty-five years later the capacity is down to a million cubic metres, and inadequate, so there is now a call for a new dam. The underlying cause for the reduced capacity is huge deforestation, along with the disappearance of terraced coffee production due to the drop in coffee prices. These developments all resulted in a sedimentation and erosion process that has decreased the dam's capacity. Of course, we can now construct a new dam; we can follow the old development pattern with an increase in speed. But we can also now try to convince

investors to look first at afforestation and improving wetland quality in the dam's catchment area. Only then should there be debate on whether there is a need for additional capacity. The decision should not be made in isolation.

We are blessed in Kenya: last year's Nobel peace prize winner, Wangari Maathai, well known for her work in planting trees, is working with us to try to convince people that investing in nature's capital would provide a better return than a new dam. Only if we can prove this do we have a fair chance of being integrated into the investment decision. Otherwise we will not be heard, because it is much more difficult to hold vested interests in the natural capital of forests and wetlands than in building a dam. That is not to criticize those who wish to invest in a dam: were I an industrialist, I would do the same in a comparable situation. So we try, step by step, to quantify environmental services, to draw up profiles for different countries, to evaluate where nature's capital is lacking and where there is a need for targeted investment, and make this a common approach to poverty reduction because poor people, especially, need this help.

I hope that I have given you some useful ideas to think about. I was once a professor – and my family is convinced that this was the best time in our lives. But it is too late for me now. I can only, after retiring from the United Nations, go on to my balcony to drink a glass of wine and criticize the way the world is going. But as long as we have a chance to change this, let us join hands, for it really is worth it. It is investment in the peaceful development of our world.

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