



THE *rain* DRAIN

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The Amazon and African rainforests are fragile environments that need to be protected. How can this be done effectively without putting the economic burdens of industrialized nations on the delicate chemical synthesis performed by plant life in developing countries, or on their social and economic systems? Two experts on global economics discuss the rainforests in the international marketplace.

In February of 1991, representatives of more than 100 countries meeting at Chantilly, Vancouver, agreed in principle to an international treaty to limit the emission of gases that harm the atmosphere. The world's rain forests are among the major actors in this drama. They include the South American Amazon rain forests and forests such as the Korub National Park in Cameroon and Oban Park in Nigeria, which at sixty million years are the oldest in Africa. Forests are major actors because carbon dioxide, the main gas emitted through industrial activity, is taken in by green leaves and chemically transformed into oxygen. Industrial activity can increase without harmful effects provided that there are more forests to recycle the carbon dioxide that it produces.

ILLUSTRATION BY ALEX BLOCH

Currently the emission of carbon dioxide in North America is 500 times greater than that in Latin America, Africa and Asia combined. A similar ratio holds for the cumulative emissions of these regions since 1800. So industrial countries pollute the global atmosphere, while the developing countries, which contain most of



the world's forest mass, recycle the carbon dioxide emitted by industrial activity in developed countries. With this interpretation, the developing countries appear as benefactors rather than as malefactors of the world's environment. Requesting that developing countries protect their rainforests for the good of the global environment and thereby stall their industrialization is tantamount to requesting that the Third World subsidize the industrial countries. There seems to be no moral obligation on their part to do this.

Public opinion has been given a different perspective. Some people in industrial countries see Brazil's deforestation of the Amazon as a crime against humanity and other animal life and protest vehemently. Controversial though the opposite view may be, it now

commands general assent in the scientific community. The meeting at Chantilly in February agreed that developing countries must be compensated for the economic costs that they incur in attempting to save the planet's atmosphere. The anticipated treaty is already expected to contain substantial transfers to the developing countries in the forms of debt remission and technology transfer. Other outright transfers are also on the agenda.

A recent market-oriented proposal includes the assignment to each country of marketable licenses for the emission of gases, licenses that may be traded for cash. The total emission so licensed sums up to the maximum that will not harm the planet's atmosphere. It is widely expected that through technology transfers, debt remissions, licenses and other devices the developing countries will receive substantial funds in exchange for restraint in using their rainforests as a basis for economic development. Recall that the economic development of Great Britain, the first industrial power, was based on the use of forest resources as a source of power. Agricultural development, often a necessary precursor of economic development, may also involve forest clearing. This was true of important regions of the USA and Canada. So there clearly is a large cost to the developing countries in agreeing to preserve their environmental resources, in that the most commonly followed route to economic development will be ruled out.

Will such transfers from industrial to developing countries solve the

problem? Market forces have to be considered when making this judgment. This is because transfers alter wealth and therefore also alter demand patterns. If the extra wealth of developing countries is transformed into higher demand for industrial products and into technologies that are environmentally damaging, then the net effect of the transfers could be negative. In general the growth of developing countries can be expected to place increasing demands on global environmental resources even if accomplished without deforestation. As they move towards patterns of heating, cooling, transportation and industrial activity resembling those of the industrial countries, their emission patterns will also come to resemble those of the industrial countries. Some part of the emission gap referred to before will be closed.

If the growth of poor countries is to be compatible with declining degradation of the global environment, at least one of two things must happen. One is that their growth must follow a radically different route from that of the present industrial countries. They must devise technologies and economic growth patterns that are considerably more environmentally friendly than any used in the past. The alternative is that industrial countries cut back on their environmentally demanding activities sufficiently to accommodate the demands of the developing countries and in addition to lead to a net reduction.

The second alternative seems most unlikely to be acceptable politically. Industrial countries are

already feeling very acutely the costs of respecting the environment. The other alternative, environmentally friendly development strategies, does however require that new clean technologies be implemented in developing countries. These countries can hardly be expected to shoulder the burden of inventing and implementing new technologies in addition to that of economic and social progress. As the aim of the new technologies will be to preserve global environmental goods, it is appropriate for the industrial countries to assume responsibility for the emergence of these technologies and for their transfer to developing countries.

This would be a fair "quid pro quo" for the agreement of developing countries not to follow the well-trodden path to economic development that proceeds via deforestation and intense environmental degradation. It would also represent a radical change from the present state of affairs. Currently clean technologies are developed and patented in industrial countries; developing countries are typically priced out of the market for these technologies. Developing countries are left using the old dirty technologies which the USA and Western Europe are desperately trying to leave behind.

One move in the right direction might be a "patent holiday" on all environmental-preservation technologies for countries with a per capita income below \$1,500. Another such move would be for industrial countries to require companies based in them and also operating in developing countries

to observe the same level of environmental care in developing countries as they do in their home countries. This means making the environmental regulations to which a firm's activity must conform the more restrictive of those in the country where the activity is occurring and those in its home country. An international protocol to this effect would go far to ensuring the rapid international adoption of techniques that are best-practice from an environmental viewpoint. It would also prevent such situations as prevail in the Dominican Republic, which uses great quantities of German-produced pesticides whose long-lasting toxicity has caused their sale to be banned in Germany.

Another helpful move would be for international development agencies such as the World Bank and the IMF to stop recommending development strategies based on the growth of cash crops for export markets. This has been a staple item in the repertoire of advice from both the IMF and the World Bank to poor countries. It has been responsible for the clearing of many forests, and has also proven to be bad advice from almost any other perspective. There are now good alternatives available. For example, software development is clean and labor-intensive, and is a growing industry in India and South East Asia. Its knowledge requirements are easily encompassed by developing countries with good educational systems. The same is true of some aspects of the hardware and telecommunications industries. A very innovative recent agree-

ment between Merck & Co. Inc. and Costa Rica points to a way in which developing countries can actually realize a commercial return on rainforests without destroying them. This agreement gives Merck the right to collect samples of living organisms from Costa Rica's rainforest and to use these as a basis for developing pharmaceutical products. In exchange, Costa Rica will receive a royalty on the revenues from selling any products developed in this way.

A small California company, Shaman Pharmaceuticals, has made a number of similar agreements.

At least a half dozen clinically and commercially valuable drugs, including some anti cancer agents, have already been developed from research in tropical forests.



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