

# **Ecological Debt**

*An enormous Debt the North owes the South*

**A Review**

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## **Introduction**

On that cold night of Dec 3, 1984, yes, nearly twenty years ago, poisonous gases escaped from the pesticide plant of the transnational company Union Carbide in the city of Bhopal, where I live. The impact was catastrophic and genocidal. Men, women and children, unaware of what was making them choke and fight for life-saving breath fled their warm beds in panic, running distraught, hopefully away from the murderous poisons that had clouded the skies. In an hour or so, over 3000 of them could not outrun the deathly poisons, and they collapsed all over the city, in a grotesque dance of death that had no dignity. And hundreds of thousands from a city of million plus vanished from the city, retching, coughing and mortally scared. They escaped death, but the poisons have made life hell for them, and they continue to suffer, and die from the effects even now. Over 20,000 have died till now.

In wartime Europe, Hitler had to construct special concentration camps with elaborately built gas chambers to exterminate heavily guarded prisoners. But the free and democratic people of the peaceful city of Bhopal required no such expenses of coercion in order to die; the whole city was turned into a deadly gas chamber, free of cost! And the gas, methyl isocyanate, was more lethal than anything even Hitler had used. All that was required was to grant permission to the US based transnational chemical giant – Union Carbide - to put up a plant in a city in order to earn profits by manufacturing and selling a pesticide, Sevin, used in cotton fields. As it transpires now, the company knew exactly the effects of the poisons in its plant, but when corpses were being piled up that morning, the officers of the plant were saying that the escaped gases could at best cause sore throats! What is most callous and a mockery of justice is that the then CEO of Union Carbide, Warren Anderson, against whom international arrest warrants are pending is enjoying his retirement in Atlanta in US, even though he is directly responsible for over 20,000 deaths; because the US refuses to hand him over. But to locate one Osama bin Laden, allegedly responsible for the heinous deaths of 3,000 people on 9/11, the US can launch a war at an international level!

The Bhopal Gas Disaster adequately highlights the environmental and human disaster that mega-business, backed by mega-bucks can cause. Nor is it isolated. The mercury poisoning of the Minamata Bay in the middle 1950's should remind us that industrial disasters are part and parcel of the prevailing paradigm that financial institutions - bilateral, multilateral or private - have been promoting the world over, through arrangements that are trapping the recipient countries in a spiral of illegitimate, and odious debts. (Vinod Raina et al: 'The Dispossessed' – Victims of Development in Asia)

The environmental destruction of the South that we witness today is only an extension of a legacy going back over five hundred years, characterised more by ecological plunder during the period of colonisation. Such plunder, from Latin America, Africa and Asia left nothing that is of value untouched – spices, plants, animals and germplasm, humans as slave labour, land, gold and other minerals, oil and other fossil fuels. The increasing wealth of the North in these five hundred years is built on the bedrock of such plunder, that took away whatever was valuable in the colonies, and rendered the people in the colonies increasingly impoverished, so much so that these once rich and wealthy lands are today characterised as underdeveloped, developing or part of the Third World.

## **The Making of the Underdeveloped Third World**

So how did the process of rendering a majority of people on the planet to be the inhabitants of the Third World, the impoverished South, come about? As Clive Ponting (*The Green History of the World*) traces in remarkable detail, it began with the expansion of Europe.

The first phase of European expansion, from 1500 to about 1700, was largely confined to the Spanish and Portuguese conquests of central and south America, the settlement of north America, principally by the British and French, and the extension of the trade along the African coast and into the Indian Ocean and south-east Asia. The second phase, lasting from about 1750 to 1850, saw the British defeat the French for control over the Indian sub-continent, growing trade between Europe and China and the settlement of Australia and New Zealand. In the last phase after 1850 attention was concentrated on carving up Africa, and after the defeat of the Ottoman empire in the First World War, France and Britain established control over most of the Near East. The last European war of conquest came in 1935 when Italy defeated the long-lived empire of Ethiopia.

The great wave of European emigration did not begin until the 1820s when the combined pressures of rapidly rising population in Europe, poor food supplies and a low standard of living (plus better transport) all encouraged emigration .between 1820 and 1930, an estimated 50 million people emigrated from Europe. Naturally, the expansion of Europe resulted in a complex clash of cultures. The people who suffered the most were the less developed societies, in particular the population of the Aztec and the Inca empires, and the native people around the globe who were still gatherers and hunters or primitive agriculturists. Many indigenous societies disintegrated under European pressure when they were not deliberately destroyed. The stark truth is that the native peoples lost their land, livelihood, independence, culture, health and in most cases their lives. Despite differences in approach the common themes running strongly through European attitudes to the process were a disregard for the native way of life and an overwhelming urge to exploit both the land and the people. The story of the natives under the impact of Europe is one of soaring death rates brought about by disease, alcohol, and exploitation together with social disruption and the decline of native cultures, especially under the influence of the missionaries.

Just how rapidly the vulnerable native societies in the Americas collapsed is borne out by the following examples:

- a) At the time of Spanish conquest, Santo Domingo, one of the first islands to be reached by Columbus, had a population of about one million. After 40 years of intense exploitation, slavery and many deaths through European diseases, there were only a few hundred natives left.
- b) The same happened on an even larger scale in Mexico after the Spanish conquest of the Aztecs in 1519. The population fell from 25 million in the early sixteenth century to some 6 million by 1550 and to 1 million about 1600.

- c) In both Mexico and Peru the indigenous culture was destroyed, much of it simply to secure loot. Nearly all the great treasures of the Aztec and Inca states were melted down and shipped to Europe. Altogether between 1500 and 1650 Spain stole about 220,000 kilos of gold and 15 million kilos of silver from the Americas.

The rise of Europe in the four hundred years after 1500, from being a backward area of the world to dominate the rest of the globe not only drastically affected a whole range of ecosystems but also reshaped the relationship between different regions. The words of Cecil Rhodes, one of the influential forces to shape the British expansion in Africa, reveal this relationship succinctly:

“We must find new lands from which we can easily obtain raw materials and at the same time exploit cheap slave labour that is available from the natives of the colonies. The colonies would also provide a dumping ground for the surplus goods produced in our factories.”

Today, his complete sentence would include dumping polluting and hazardous industries, like that of Union Carbide in Bhopal, toxic pollutants and waste in the previous colonies. The way in which one part of the world – Europe, North America and the white colonies, the neo-Europe, became ‘developed’ and the way another part became ‘underdeveloped’, under the collective title Third World, are not separate phenomenon; they are inextricably linked. In the world market that was created by Europe, one region was able to extract a large surplus of products and natural resources and cheap or forced labour from the dependent area. The subordinate economies concentrated on producing crops, raw materials and minerals that were of low capital intensity and low profits. Although some development did take place in the subordinate colonial economies, it was almost entirely geared to the needs of the home economies.

The achievement of political independence in the Third World did not bring economic independence. Economies have remained tied into the global system created by the industrialised world and their structure has proved very difficult to change. For most countries in the Third World the only available option was to increase production of few cash crops or minerals in an attempt to raise income and exports. Following the Truman doctrine described later, borrowing money from the West in order to finance development projects, often of dubious value and relevance to local conditions, has led to a spiral of accumulating financial debts. While on the one hand the countries are transferring their ecological resources, or degrading their own environments in the process, without much payment, they are getting trapped in financial debt, where there can be no defaulters.

The consequences of this unbalanced development have profound effects for the entire world. The industrialised world, the North, is able to live with the highest material standard of living ever achieved in the world. Much of the price of that achievement has been, and continues to be paid by the populations of the global South, in the form of exploitation, poverty and human suffering. One can see that in these 500 years, the forms and institutions of extraction to the West may have changed, but the purpose hasn't. Instead of the rather undignified manner of taking over political control of countries by colonising them by the use force, more ‘dignified’ trade and financial rules are continuously being brought in to effectively nullify the political independence of the former colonies.

## **Developing the South**

The presence of a transnational company like the Union Carbide from the US in a remote place like Bhopal is certainly not accidental. It is in accordance with the 'bold' doctrine of development that was scripted by the US more than fifty years ago. Flush from its 'victory' in the Second World War, hastened by the use of the ultimate weapon of mass destruction, the atomic bomb; in Hiroshima and Nagasaki, President Truman in his inaugural speech of his second term in January 1949 scripted the future for the planet thus:

*' We (the US) must embark on a bold new program for making the benefits of our scientific advances and industrial progress available for the improvement and growth of underdeveloped areas. More than half the people of the world are living in conditions approaching misery. Their food is inadequate. They are victims of disease. Their economic life is primitive and stagnant. Their poverty is a handicap and a threat both to them and to more prosperous areas.'*

(Except that in the case of Union Carbide, and in many similar instances around the World, it is the industrial representative from the prosperous area that has been the harbinger of death and misery!)

Thus, the 'underdeveloped' countries would be aided to realize the 'American Dream', was his promise. This incidentally is the first time that the term 'underdeveloped' country was used, categorising the world in a developed – underdeveloped binary. Countries and regions that have been the cradles of civilization – China, Japan, India, Egypt, Mexico and Latin America, amongst many others, were designated as economically primitive, diseased and a threat to more prosperous areas, through the use of the single term – underdeveloped; even though it is in these countries and regions that the most developed cultures, symbolized by literature, scholarship, languages, arts, music, aesthetics, crafts, mathematics, medicine, agriculture, natural biodiversity and mineral riches abounded and flourished. No wonder, therefore, that most of these countries were the targets of the most brutal forms of colonization, the plundering of which provided the basis for some other countries to be designated as developed, in President Truman's classification.

Quite obviously, this new definition of development relied exclusively on the degree of economic and technological development, ushering in the era of ranking countries on the basis of indicators like GNP, per capita income and quality of life indicators like cars, TV's per capita and so on. How was the promise of aiding the underdeveloped countries to realize the 'American Dream' put into practice? Through just that process – Financial Aid. It is interesting that though the Bretton Wood institutions, the World Bank and the IMF, were set up to reconstruct the war ravaged Europe, the total aid from these institutions to Europe has been no more than 2%; the rest has gone where it was not intended to go, to underdeveloped countries, ostensibly to help them realize the American Dream. Through a variety of such aid mechanisms, bilateral, multilateral and private, where are these countries more than fifty years later today? Mostly still aspiring to achieve the Dream! In reality, what exactly does achieving this Dream imply? An adequate answer might be - to achieve the lifestyles of the American people. Which implies, to consume energy, water, food, minerals, timber/biomass, fossil fuels and other resources of the Earth at the rate that the American people consume, with the further implication that the subsequent emissions and waste deposition would also be at the level that the US puts out into air, water and the land of the Earth? Japan with a population of just over 125 million has

certainly rivaled the 250 million population of the US in this race; what would happen if just two other countries with billion plus populations, India and China, were to achieve such lifestyles? Would anyone else be able to live on this Earth?

However, while aspiring for the American Dream (because this dream defines the sole development path for the Governments of the World) most of these designated underdeveloped countries are caught in a spiral of financial debt, totaling a staggering 2554 billion US dollars in 1999, which has accumulated in these 50+ years of aid – read debt – driven development. Instead of helping the developing countries to join the developed club, such a path to development has necessitated further classification of countries on the lines pioneered by President Truman. For example, the World Bank now designates about 41 countries as HIPC (Heavily Indebted and Poor Countries). Just as some patients carrying AIDs and cancer are termed terminally ill, so is HIPC a designation for ‘terminal’ countries in this language of Debt and Development. But for people of the World, nearly all of these countries, which include Bangladesh, Burma, Cambodia, Vietnam, Laos, have creative and productive societies. Their designation as seriously sick with the disease ‘HIPC’ is an indication of how overpowering a particular vocabulary and path of development dominates the mind-set around the globe.

We are now entering a stage of World history, however, when the financial calculation of these debts is somewhat trivial compared to the fundamental changes that are being aggressively crafted to change the very backdrop against which we have been used to viewing nature, social relations, cultural norms and life. Not only is the painting different, the canvass itself is being reinvented. Intellectualism has existed and abounded on the belief that knowledge, the very basis of intellectual exchange, is a free public asset; to be accumulated and exchanged in the open public domain without restraint. The Intellectual Property Rights regime is however forcing us to accept that knowledge itself is a commodity that can be privately owned and even monopolized, for profit. We will grapple for a long time to make sense, if ever, of such a fundamental change in the social (commercial?) transaction of knowledge. The question then arises, which knowledge is monopolisable and which is not – the farmers’ knowledge of agriculture or the agricultural scientist’s? Since the motivation for the monopoly is profit, clearly the farmer is being cheated, while the scientist is being made to benefit, if the scientist’s knowledge is held to be monopolizable, and the farmers’, public. Which then provides a norm for judging the worth of knowledge itself – if it cannot be commodified; it must be inferior or worthless. Clearly, these changes cannot leave the educational institutions unscathed.

And since life forms can also now be created (cloned) and privatized and monopolized, nature itself, that provided a canvass to make sense of family, human relations and social behavior is being tampered with. It was ‘natural’ to grow into an adult, seek a partner, and have children. But no more. Surrogate motherhood, made to order babies after test tube babies, that can be obtained at a price suggests a future scenario impossible to predict in social, cultural, or gender terms. But what is clear is that it amounts to a colossal ecological tampering where a few will profit and many may have to pay.

If the norm is to assign a price to knowledge and products derived from natural sources, the question is: what should be the time frame from which we start calculating who owes whom? Why must it be from the time when WTO was set up? If certain countries are deriving huge

benefits from the knowledge and natural resources that they took freely from the time of colonization, and continue to do so under various economic and trade regimes today, why shouldn't we start the clock ticking from say 1492, when America itself was discovered by the Europeans and colonization started? This then is the basis of putting forward the concept of Ecological Debt, as the accumulated and continuing debt that nations owe each other for the knowledge, resources and the ecological space that they are usurping in order to further advance. Sadly for the industrially advanced countries, even if we were to balance the financial debt that the underdeveloped South owes to the developed North, it is the North that would have to pay an enormous amount to those very countries that President Truman designated as diseased, hungry and impoverished. But the notion of ecological debt is not merely financial; it is an attempt to raise ethical, moral and political questions about the present World order.

## **Ecological Debt**

In his prologue to 'Ecological Imperialism' the Biological Expansion of Europe, 900 –1900; Alfred W. Crosby asks "Perhaps European humans have triumphed because of their superiority in arms, organisation and fanaticism, but what in heaven's name is the reason that the Sun never sets on the empire of the dandelion?". He also provides an answer, "Perhaps the success of European imperialism has a biological, an ecological component".

Ecological Debt of the North to the South is not just historical, but continues to be accumulated even today. A persuasive definition is that of the 'Accion Ecologica' of Ecuador, Ecological Debt is *'The Debt accumulated by the Northern industrial countries towards the Third World countries on account of resource plundering, environmental damages, and the free occupation of environmental space to deposit wastes, such as greenhouse gases. Those who abuse the biosphere, transgress ecological limits and enforce unsustainable patterns of resource extraction of a range of natural resources must begin to discharge this ecological debt. The ecological debt accumulated through such processes as the extraction of a range of natural resources, ecologically unequal terms of trade externalising ecological costs, the appropriation of traditional knowledge, for example, of seeds and plants, on which the modern agri-business and biotechnology are based, contamination of the atmosphere through the emission of various greenhouse gases, producing and testing chemical and nuclear weapons in countries of the South, and the dumping of chemicals and toxic waste in the Third World. The current system of neo-liberal globalised market economy maintains and augments the ecological debt through such mechanisms as the SAPs imposed by the international financial institutions, foreign investments, unequal terms of trade, forcing countries to produce export products in order to redress financial debts; and through the trade-related Intellectual Property Rights within the WTO which protect the patenting of genetic material for agriculture and pharmacology by TNCs without compensation for the original guardians of the biodiversity of the South'*.

### **The Accumulation of Ecological Debt**

Following upon Acción Ecológica's definition of ecological debt, we can justifiably say that the peoples of the South deserve redress for debts accumulated through:

- the extraction of natural resources (petroleum, minerals, and marine, forest and genetic resources) that damages the basis of survival of Southern peoples;
- ecologically unequal terms of trade whereby goods are exported without taking into account the social and environmental impacts of their extraction or production;
- the looting, destruction and devastation during the colonial period (including slave labour, genocide and cultural genocide);
- the appropriation of traditional knowledge relating to seeds and medicinal plants upon which biotechnology and modern agro-industries are based;
- the degradation of the best lands and marine resources used for export production putting at risk food self-reliance and cultural sovereignty of Southern communities;



- the contamination of the atmosphere by industrial countries through excessive emissions of greenhouse and ozone-destroying gases causing climate change;
- the disproportionate appropriation of the carbon dioxide absorption capacity of the world's oceans and vegetation;
- the production of chemical weapons and nuclear weapons which are often tested in the South;
- the dumping of toxic wastes and the sale of pesticides banned in the North in the Third World.

The current economic system maintains and augments the ecological debt through such mechanisms as:

- the financial debt;
- Structural Adjustment Programs;
- foreign investment;
- raw material prices that exclude the ecological cost of their production or are less than the cost of producing sustainable alternatives (e.g., petroleum priced below the cost of sustainable production of ethanol from biomass);
- unequal exchange of products with extensive environmental costs (e.g. soil degradation) for products that are less damaging to the environment;
- the bioengineering of seeds and plants to make them dependent on chemicals;
- Trade-Related Intellectual Property Rights (TRIPS) within the WTO and NAFTA which protect the patenting of genetic material for agriculture or pharmacology by Northern transnational corporations without compensation to the original guardians of biodiversity in the South.

### **The Relationship between Financial Debt and Ecological Debt**

The demand by financial creditors that Third World nations repay unsustainable debt (combined with the imposition of Structural Adjustment Programs), compels them to undertake ecologically destructive practices to meet their debt payments. The debtor countries have no choice but to produce products for export far beyond what is needed for their own populations. Such overproduction for export is aggravating the following ecological trends:

- rapid deforestation destroying biological diversity and turning vast tracks of land into virtual desert. "Since 1970 the wooded area per 1,000 inhabitants has fallen from 11.4 square kilometres to 7.3." (UNDP 1998:4)
- use of the best land for export crops forces peasants onto marginal lands. For example, farming on steep hillsides vulnerable to erosion contributed to recent deadly mudslides in Honduras, Nicaragua and Venezuela.

- increase in pesticide and chemical fertilizer use. For example, the banana industry in some countries makes use of the pesticide DBCP which causes male sterility.
- destruction of mangrove swamps for shrimp farming, making coastal areas more vulnerable to flooding. In Ecuador 70% of mangrove forests have been cut down to make way for shrimp farming, affecting the livelihood of traditional fishers and aggravating flooding by storms resulting from the El Niño phenomenon.
- wasted fuel, deterioration in nutritional quality and greater use of chemical preservatives due to long-distance transport of food.
- substitution of tree farms and monoculture for biological diversity: Forestry monoculture harvests commercially valuable wood and destroys the rest as "weeds" and "waste". "This 'waste'", comments Vandana Shiva (1993:24) "is the wealth of biomass that maintains nature's water and nutrient cycles and satisfies needs of food, fuel, fodder, fertilizer, fibre and medicine of agricultural communities."
- over-fishing: "[World] fish stocks are declining with about a quarter depleted or in danger of depletion and another 44% being fished at their biological limit." (UNDP 1998:4)
- destruction of natural habitats and human livelihoods as a result of damage from petroleum extraction. For instance the damage wrought by Shell Oil in the Niger Delta, the home of the Ogoni people.

### **Can the Ecological Debt be Quantified?**

Attempts to compare the ecological debt with its financial counterpart present a number of dilemmas. While insurance companies try to place a monetary value on human life, the intrinsic worth of a human being or of the biosphere as the sustainer of all life, human and non-human, can never be reduced to mere dollars and cents.

Professor Joan Martinez Alier uses the example of export of wood from tropical rainforests to explain why an exact quantification of the ecological debt is impossible. Cutting down tropical forests involves a past and a continuing loss of biodiversity which has not even been categorized and whose potential monetary value is unknown.

Nevertheless, Martinez Alier (1998) argues that "although it is not possible to make an exact accounting, it is necessary to establish the principal categories [of ecological debt] and certain orders of magnitude in order to stimulate discussion."

In this context, it is possible to approximate some aspects of the ecological debt in monetary terms. For example, some of the economic costs of overfishing or deforestation can be quantified. While the estimates cannot be precise, they can at least suggest the magnitude of the ecological debt.

Before we describe some of the ways that the size of the ecological debt might be quantified we need to clarify how our approach differs from that of some other groups, beginning with neo-classical economists.

### **Rejecting Neoclassical Assumptions**

Most mainstream economists take the natural world for granted, assuming that there are no limits to the carrying capacity of the earth or to its ability to absorb wastes from the human economy. One of the explanations for most economists' blindspot is the limitation imposed by their analytical models which require that everything be quantifiable in monetary terms.

Valuing everything, including human life, only in terms of market transactions leads to enormous distortions. An infamous example of this kind of thinking may be found in a memo signed by Lawrence Summers in 1991 when he was chief economist at the World Bank. The internal World Bank memo argues that "the economic logic behind dumping a load of toxic waste in the lowest wage country is impeccable." The memo goes on to say "under-populated countries in Africa are vastly under-polluted, their air quality is vastly inefficiently low compared to Los Angeles or Mexico City. Only the lamentable facts that so much pollution is generated by non-tradable industries (transport, electrical generation) and that the unit transport costs of solid waste are so high prevent world welfare enhancing trade in air pollution and waste."

This memo constitutes a disturbing example of the racist thinking that leads to environmental degradation. The memo argues that the death of an African due to toxic pollution is less costly in economic terms than the death of a Northern citizen because "the foregone earnings from increased mortality" are less per capita. The memo adds that concern for environmental quality rises with income. Transferring polluting industries to low-income countries would then be "welfare enhancing" since it would augment their money incomes.

As John McMurtry (1998:323) observes: "Life itself in this calculus is conceived as being of worth only to the extent of its price.... Disease and death are of no concern except as they cost money. Pollution and toxic waste are not to be prevented, but assigned a money value.... Health and life themselves are to be sacrificed to a higher good, an advanced place in the money order of wealth."

Summers' memo was met with justifiable outrage. José Lutzenberger, then environmental secretary of Brazil, called it "a concrete example of the unbelievable alienation, reductionist thinking, social ruthlessness and the arrogant ignorance of many conventional economists." These remarks cost Lutzenberger his job, while Summers was appointed US Secretary of the Treasury just one year later. (Tavernier 2000:4-5)

Economists at the Centre for Social and Economic Research on the Global Environment (C-SERGE) in the U.K. have also displayed similar underlying racism in their analysis. In attempting to estimate the social costs of climate change they valued the life of someone living in a developing country at US\$150,000 while saying that a life in the US or Europe was worth US\$1,500,000. The different figures were calculated according to peoples' ability to buy damage insurance. This outrageous attempt to value some human lives as being worth 10 times as much

as others sparked an international protest campaign against "the Economics of Genocide". (Global Commons Institute, undated:23)

Attempts to estimate ecological debts must begin with different premises: the inestimable value of all life and recognition of the human economy as a subsystem within the wider ecosystem which itself has an immeasurable worth.

### **Bioprospecting and Biopiracy**

Appropriation of biodiversity and traditional knowledge from Indigenous and farming communities in the South has been occurring for centuries. Many of the crops that are now grown throughout the world were first cultivated by Indigenous and farming communities in the South. No one thought of charging royalties or claiming intellectual property rights over maize from Central America, sugar cane from India, potatoes from the Andes, soybeans from China, coffee from Africa or wheat from the Middle East when they were first transplanted to other continents. Yet the beneficiaries of this transfer of life-sustaining biological knowledge owe a real debt both to the earth and to the original guardians of biodiversity.

In our day, the biotechnology industry's search for living organisms with potentially marketable traits is described as "bioprospecting". Transnational corporations send agents into farming communities to "discover" crop varieties or herbal medicines in developing countries where 84% of the earth's biodiversity is found. Nowadays bioprospecting involves the collection of plant, animal and microbiological specimens that may or may not have commercial value. It is estimated that only "about one in 10,000 chemicals derived from mass screening of plants, animals and microbes eventually results in a potentially profitable [discovery]." (RAFI 1994:2)

While the Convention on Biological Diversity promotes the "equitable sharing of benefits" from bioprospecting, the reality is that farmers and Indigenous peoples are being offered less than 3% of the profits derived from their knowledge. For example, the US government-financed International Cooperative Biodiversity Group (ICBG) project in Peru offered Indigenous people royalties of between 0.25% and 1% of eventual sales from discoveries made on their land. Meanwhile biotechnology colossus Monsanto and Washington University stand to scoop up the rest of the profits.(RAFI 1997:1)

Similarly, Conservation International's ICBG-funded project in Surinam offers Indigenous peoples royalties of just 2% to 3%, while pharmaceutical giant Bristol Myers Squibb stands to reap the lion's share of profits from any discoveries. (RAFI 1997:1)

A precedent for the paltry amounts that transnational pharmaceutical companies pay for bioprospecting rights was set in 1991, while the Convention on Biodiversity was still under negotiation. That year Merck & Co. offered the Instituto Nacional de Biodiversidad (INBio) in Costa Rica a 2-year research budget worth just over US\$1 million, plus a small royalty on net profits from future sales of patented products. RAFI (1994:3) estimates that, "If the Merck/INbio deal were widely replicated, the South's biodiversity could all be auctioned off for the paltry sum of about \$10 million per annum."

People in the South have been denied and are still being denied the financial benefits that should rightfully be theirs from the exploitation of their natural resources and the commercialization of their indigenous knowledge.

The takeover and patenting of the knowledge of the poor by global corporations is doubly offensive. It creates a situation where the poor have to pay for the use of the seeds or the medicines they themselves evolved and passed on freely from generation to generation. One notorious example is the US patent on basmati rice won by a Texas company, RiceTec Inc., in 1997. RAFI (2000) call this "a classic case of biopiracy. Not only does the patent usurp the basmati name, it also capitalizes on the genius of South Asian farmers who have for centuries selected and maintained basmati rice varieties that are known worldwide for their fragrant aroma, long and slender grain and distinctive taste."

### **Estimating the Biological Debt**

What is the economic value of the biological knowledge appropriated from the Third World? Once again it is not possible to establish a precise figure. However, a number of estimates have been made of the contribution that Southern biological resources and indigenous knowledge already make to Northern economies.

RAFI (Nov. 1994) estimates that medicinal plants and microbials from the South contribute at least US\$30 billion a year to the North's pharmaceutical industry. These calculations are for past appropriations. The value of future discoveries is literally incalculable. Demanding fair compensation (whether in the form of annual royalties or other payments) for biological material found in the South is not the same thing as saying that biodiversity has only a monetary value. Nevertheless it is entirely just to demand that a portion of the ecological debt be discharged by fairly compensating the peoples of the South for the wealth generated by exploiting their knowledge and generations of care for the earth's biodiversity.

Historically, the agricultural systems of virtually every European colony were drastically altered to provide food and farm products that Europe, and increasingly the United States required. The predominant subsistence agricultural systems of the colonies were systematically destroyed to provide for plantation agriculture; to produce sugarcane, tea, coffee, cocoa, rubber, tobacco, cotton, palm oil, bananas and rice. In the process, a staggeringly vast amount of 'southern ecological product' was transferred to Europe and the US, for a pittance. We need to remember that the water used for the cash crops, the accompanying soil degradation, the cheap human labour, and a variety of such ecological impacts and inputs were never part of the financial costs. Nor was the transfer of precious tropical germ plasm, the consequent hybrids or the southern farmers knowledge to produce newer seeds ever considered in monetary terms.

By the early twentieth century, Europe and the US had brought about a major transformation in the economies and societies of the emerging third world. As Ponting describes in great detail in his *Green History of the World*, countries which had been largely self-sufficient in food and which grew crops mainly for local markets had become part of the world economy dominated by Europe and the US. Through a powerful mixture of political control, economic pressure,

investment and market forces, ‘development’ of these economies took the form of growing crops for other countries at a great ecological cost.

Perversely though, the greater profits in agriculture have only grown in these ‘master’ countries, since they have capitalized their farm production and have greater food surpluses. They compose the majority of those few nations that consistently, decade after decade, export large quantities of food. For example (see Alfred Crosby), in 1982 the total value of all agricultural products that crossed national borders was \$210 billion. Of this Canada, the US and a few countries accounted for \$64 billion, or over 30 per cent of the total. Their share of wheat, the most important crop in international commerce, was even greater. In 1982, \$18 billion worth of wheat passed over international borders, of which these few countries exported about \$13 billion. In the same year, world exports of soyabeans, a crop which originated in China, amounted to \$7 billion. The US and Canada accounted for \$6.3 billion of this. Similar is the story with beef and mutton. The share of these few countries in vitally important foods is much greater than the Middle East’s share of petroleum exports!

In production terms, these countries do not lead the world. In terms of productivity per unit of land, a number of other countries outdo the neo-Europes, whose farmers, small in number but great in technology specialise in extensive rather than intensive cultivation. Per farmer, their productivity is awesome, but per hectare it is not so impressive. These regions lead the world in the production of food relative to the amount locally consumed or, to put it another way, in the production of surpluses for export. As an example, in 1982 the US produced only a miniscule percentage of world’s rice, but it accounted for one-fifth of all exports of that grain, more than any other nation. The margins of profits per agricultural labour for the year 2000 for a few countries are cited in the following table:

**Agricultural Productivity**

(WDR 2000; figures for 1996-98 in US dollars)

<u>Country</u>	<u>agr. value added/agricultural worker</u>
US	39,001
Australia	30,904
Japan	31,094
Germany	22,759
Argentina	9,597
Malaysia	6,061

If one were to calculate the knowledge, germplasm and other ecological costs that went from the South over the past few centuries that have enabled such a high per agricultural worker profit for the rich countries today, we could begin to calculate the portion of profit that ought to be flow back to those who made that possible, which are the farmers of the South.

## **Carbon Debt**

Scientists overwhelmingly agree that climate change is already occurring as a result of increased concentrations of carbon dioxide (CO<sub>2</sub>) and six minor greenhouse gases in the atmosphere. The average global temperature has risen by one degree Celsius over the past 135 years. Most experts agree that it could increase by another 1 to 3.5 degrees Celsius over the next century. Global warming also entails fractured Antarctic ice shelves, flooded islands and coastlines, and more intense storms.

Currently, human economic activity, primarily the burning of fossil fuels, results in the release of twice as much CO<sub>2</sub> into the atmosphere as can be absorbed by the world's "carbon sinks", that is the capacity of land-based vegetation and marine life to absorb carbon dioxide and release oxygen through photosynthesis. As a result CO<sub>2</sub> concentrations in the atmosphere are increasing.

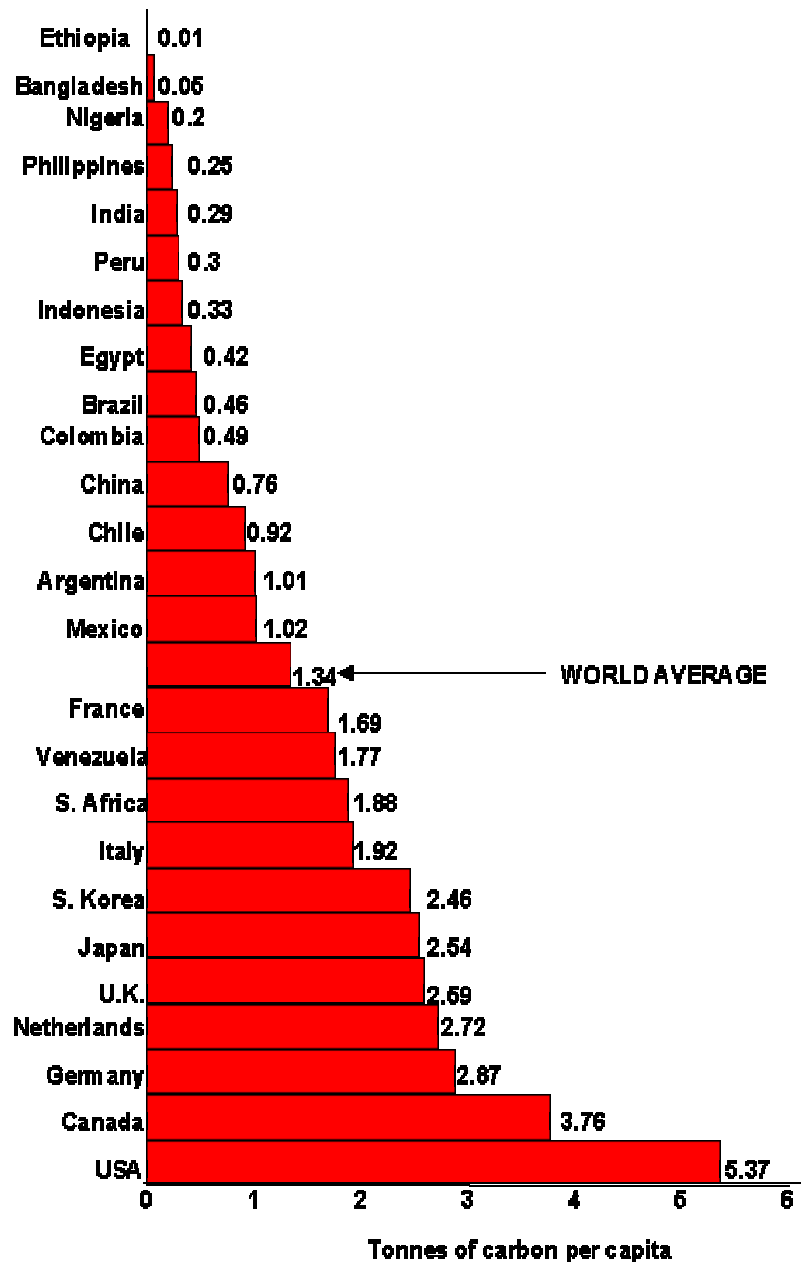
Those who use too much of the carbon dioxide absorption capacity of the world's oceans, vegetation and soil owe a debt to all living creatures whose habitat is threatened. They owe a particular debt to the carbon creditors, the poor of the South who use less than their fair share of the CO<sub>2</sub> absorption capacity. The poor and Indigenous peoples, such as the Inuit living in Canada's North, are among those who are likely to suffer the most severe effects of disappearing permafrost, floods, droughts, tropical storms and rising ocean levels brought on by climate change. These consequences of global warming are another manifestation of environmental racism.

Chart 3 illustrates how industrial countries' per capita emissions of CO<sub>2</sub> far outweigh the modest emissions from developing countries. As Joan Martinez Alier (1998:2) observes, the unequal carbon use proceeds "as if the rich had assumed property rights over all the CO<sub>2</sub> sinks: the oceans, the new vegetation and the atmosphere."

In 1996 the average Canadian was responsible for three times as much CO<sub>2</sub> emission as the world average. US residents used four times as much as the global average. Clearly it is the responsibility of the carbon debtors, those who use a disproportionate share of the world's carbon absorptive capacity, to curb their output.

At the United Nations conference on climate change in Kyoto in 1997, industrialized countries only agreed to reduce their greenhouse gas emissions after they had "grandfathered" emission rights at 1990 levels. In other words, they chose to ignore the previous history of unequal appropriation of carbon sinks by taking 1990 emission levels as the starting point. Then they only agreed to reduce their emissions by a very modest 5.2% below their 1990 levels by the period 2008-2012. Within this global target Canada and Japan agreed to cut emissions to 6% below 1990 levels, the US 7% and the European Union 8%, while Russia and the Ukraine agreed to stabilize emissions at 1990 levels. These commitments are nowhere near the 60% to 80% reduction that must be achieved, according to the Intergovernmental Panel on Climate Change (IPCC), which represents over 2,000 scientists from 100 countries. While some European countries have begun to reduce their emissions, Canada is discharging 1.5% more CO<sub>2</sub> every year into the atmosphere.

While developing countries are signatories to the UN Framework Convention on Climate Change, they did not make specific emission reduction commitments under the Kyoto Protocol. They argued that it is up to the wealthier, industrialized countries to reduce their emissions first. As of July, 2000 only 14 nations, all of them developing countries, have ratified the Kyoto Protocol. It will not become legally binding until it is ratified by 55 nations, including industrialized countries accounting for 55% of the world's greenhouse gases. (TS 6/07/00:A12)



**Chart 3 Per Capita Carbon Emissions of Selected Countries (1996)**  
*(metric tonnes of carbon)*



### **Compensation for carbon creditors**

If industrial and developing countries were to agree on a new protocol involving contraction of carbon debtors' emissions and convergence towards an equitable and sustainable per capita target for carbon emissions, the process would take several years. In the meantime the carbon creditors should be compensated as they wait for the convergence to occur. Tables 1 and 2 illustrate how that compensation might be calculated.

Table 1 begins with the assumption that contraction should aim to bring emissions down eventually to the level recommended by the Intergovernmental Panel on Climate Change scientists, that is 60% below actual 1990 emissions. It then uses actual 1996 emission levels to calculate by how many thousands of tonnes each G7 country exceeds the target. In the case of Germany no comparable data is available due to the fact that the unification of East and West Germany has made historical comparisons difficult. So the illustrative estimate for Germany is calculated on the basis of a 60% reduction from the 1996 level.

Table 2 then gives three estimates of how much compensation might be due to the ecological creditors. While the data here are for one year only, the compensatory payments would continue for as many years as it takes to achieve convergence with developing countries on common per capita emissions targets. With each passing year the carbon debtors payments would decline as the G7 countries contracted their output. Failure to curb emissions would result in higher annual carbon debt service payments.

As Table 2 shows, the annual carbon debt payments would depend on the price attached to each tonne of carbon emission rights. These estimates are, of course, only crude approximations of compensation due since the price assigned to carbon emission rights is a moving target and difficult to determine.

Nevertheless, there are some benchmarks that can be used to suggest the price of carbon emission rights. The range of estimates cited in Table 2 is derived from three possible ways of estimating the price of emission rights per tonne of carbon. Newspaper reports at the time of the Kyoto conference suggested that emission rights might trade for a price of US\$10 per metric tonne of carbon. (TS 3/12/97) Another benchmark comes from a proposal by the British government to sell an 8% "overachievement" of their Kyoto reductions commitment to the US for £100 million. At 1996 UK emissions rates and at current exchange rates this trade would be the equivalent of charging about US\$12.50 per tonne of emissions. Thirdly, Professor Joan Martinez Alier refers to a proposal by Costa Rica to sell CO<sub>2</sub> absorption bonds worth US\$20 per tonne of carbon absorbed by new vegetation it would cultivate for the purpose.

These three different prices yield the range of estimates cited in Table 2 implying initial carbon debt payments for the G7 of between US\$15.5 and US\$30.9 billion a year. If the results illustrated in Table 2 are expanded from just the Group of Seven to include all Northern industrial countries, then the annual carbon debt payments would be about twice as large - between US\$30 billion and US\$59 billion.

Acción Ecológica (2000:9) calls the US\$20 per tonne figure "a bargain basement price". If annual payments of between US\$30 and US\$59 billion could have been collected over the years

that Third World debt was growing out of control, they would have obviated the need for most of the loans contracted by Third World countries. Acción Ecológica (2000:9) points out that what is most important is not the exact calculation of payments due for the carbon debt, but "the relationship between these enormous figures and the external debts of the Third World [which] removes any moral justification the industrialised nations might feel they have for forcing Third World people to pay what is basically unpayable."

**Table 1 Group of Seven CO<sub>2</sub> emissions relative to a 60% reduction target**  
(1000's of tonnes of carbon)

	Actual CO <sub>2</sub> emissions 1996	Actual CO <sub>2</sub> emissions 1990	Emissions Target 40% of 1990 levels;(i.e. a 60% reduction)	Carbon Debt*
<b>USA</b>	1,446,777	1,316,589	526,636	920,141
<b>Japan</b>	318,686	292,212	161,885	201,801
<b>Germany</b>	235,050	n.a.	n.a	141,030
<b>UK</b>	152,015	153,734	61,494	90,521
<b>Canada</b>	111,723	111,798	44,719	67,004
<b>Italy</b>	110,052	108,857	43,543	66,509
<b>France</b>	98,750	96,393	38,557	60,193
<b>Total G7</b>	2,472,417			1,547,199

**Table 2 Estimates of Compensation due to Carbon Creditors**  
(1000's of tonnes of carbon and US\$ millions)

	Carbon Debt*	\$10 per tonne	\$12.50 per tonne	\$20per tonne
<b>USA</b>	920,141	\$9,201	\$11,502	\$18,403
<b>Japan</b>	201,801	\$2,018	\$2,523	\$4,036
<b>Germany</b>	141,030	\$1,410	\$1,763	\$2,821
<b>UK</b>	90,521	\$905	\$1,132	\$1,810
<b>Canada</b>	67,004	\$670	\$838	\$1,340
<b>Italy</b>	66,509	\$665	\$831	\$1,330
<b>France</b>	60,193	\$602	\$752	\$1,204
<b>Total G7</b>	1,547,199	\$15.5 billion	\$19.3 billion	\$30.9 billion

### **A US\$13 trillion "carbon debt in economic efficiency terms"**

A study sponsored by the U.K.-based agency, Christian Aid, cites "illustrative estimates [that] show the G7 running up carbon debts in economic efficiency terms of around US\$13 trillion each year." The Christian Aid study does not suggest that the US\$13 trillion constitutes a liability that might one day be collected by the carbon creditors of the South.

Rather the estimate emerges from efforts by the Global Commons Institute in London to refute claims by mainstream economists who analyze climate change in "economic efficiency terms". For these mainstream economists, the destruction brought on by climate change can be treated as an affordable damage cost, especially since it occurs mostly in the South. As we saw earlier these economists tend to value the life of a human person living in the South at only one tenth of that of a person living in the North.

The authors of the Christian Aid study challenge this notion of "efficiency" with another way of calculating it based on the premise that every human has an equal right to a share of the world's carbon absorption capacity. Their study measures how much of the G7's Gross Domestic Product is produced through the use of fossil fuels in excess of an equitable global per capita allotment of carbon emissions. The results yield a G7 deficit "in economic efficiency terms" of US\$13 trillion a year.

The same team calculated the carbon credits accruing each year to the citizens of 41 Highly Indebted Poor Countries (HIPCs) who use less than 0.4 tonnes of carbon per capita. These calculations yield 2 sets of results depending on whether incomes are calculated in terms of actual exchange rates or in terms of Purchasing Power Parity (PPP) to give a truer picture of incomes in countries with weak currencies. In the former case the result is an annual credit of US\$141 billion for the 41 HIPCs. When the national efficiencies were calculated in PPP terms, the 41 HIPCs have a collective annual carbon credit of US\$612 billion.

### **Ecologically Unequal Terms of Trade**

When goods are exported at prices that do not take into account the social and environmental costs of their extraction or production, the result is ecologically unequal terms of trade. Joan Martinez Alier (1998) cites as an example Mexican oil sold to the US at a price that does not take into account the "massive environmental damages caused by oil drilling in the rainforests of Tabasco and Campeche."

In Ecuador it is estimated that environmental damage resulting from oil extraction by Texaco is equivalent to approximately one dollar for each barrel of oil extracted. This estimate does not include the added global damage from greenhouse gases emitted when the fuel is burned.

Martinez Alier (1998:13) goes on to say: "The greatest threat to the environment is overconsumption in the North. An overconsumption encouraged by an ecologically unequal trade. ... The only way to impose an ecological adjustment on the North would be by means of higher priced oil and other primary materials." Martinez Alier suggests a type of carbon tax could be collected by petroleum and minerals exporting countries to encourage conservation among importers and to compensate for the ecological costs.

A similar idea is found in the Oilwatch declaration released at the time of the Kyoto conference: "Oil, gas and coal prices [should] properly reflect the true costs of their extraction and consumption, including the best estimate of their role in causing climate change in order to apply the polluter pays principle to reflect the cost of carbon in the price."

The idea of imposing taxes to cover ecological costs is not new. Paul Hawkin (1993:82) describes this as "cost/price integration". This idea was first espoused by the Cambridge economist Pigou who argued in 1920 that "competitive marketplaces would not work if producers did not bear the full costs of production, including whatever pollution, sickness, or environmental damage they caused. Pigou's solution was to impose a 'tax to correct maladjustments'. ... [The] tax would be comparable to the avoided cost or the unborne expense. Pigou cited prematurely peeling paint on a house next to a coal-fired mill as an example of an external cost that should be paid by the [mill]. He theorized that when the [mill] was forced to pay the full cost, it would have incentives to reduce the negative impact." (Hawkin 1993:82)

## **Ecological Footprints**

One way to approximate the size of the ecological debt that overconsumers of natural wealth owe to underusers is to compare the size of their respective "ecological footprints". Ecological footprints measure how much of the earth's finite arable land, pastures, forests, oceanic production and carbon dioxide absorptive capacity is consumed by the average person in a given geographic area.

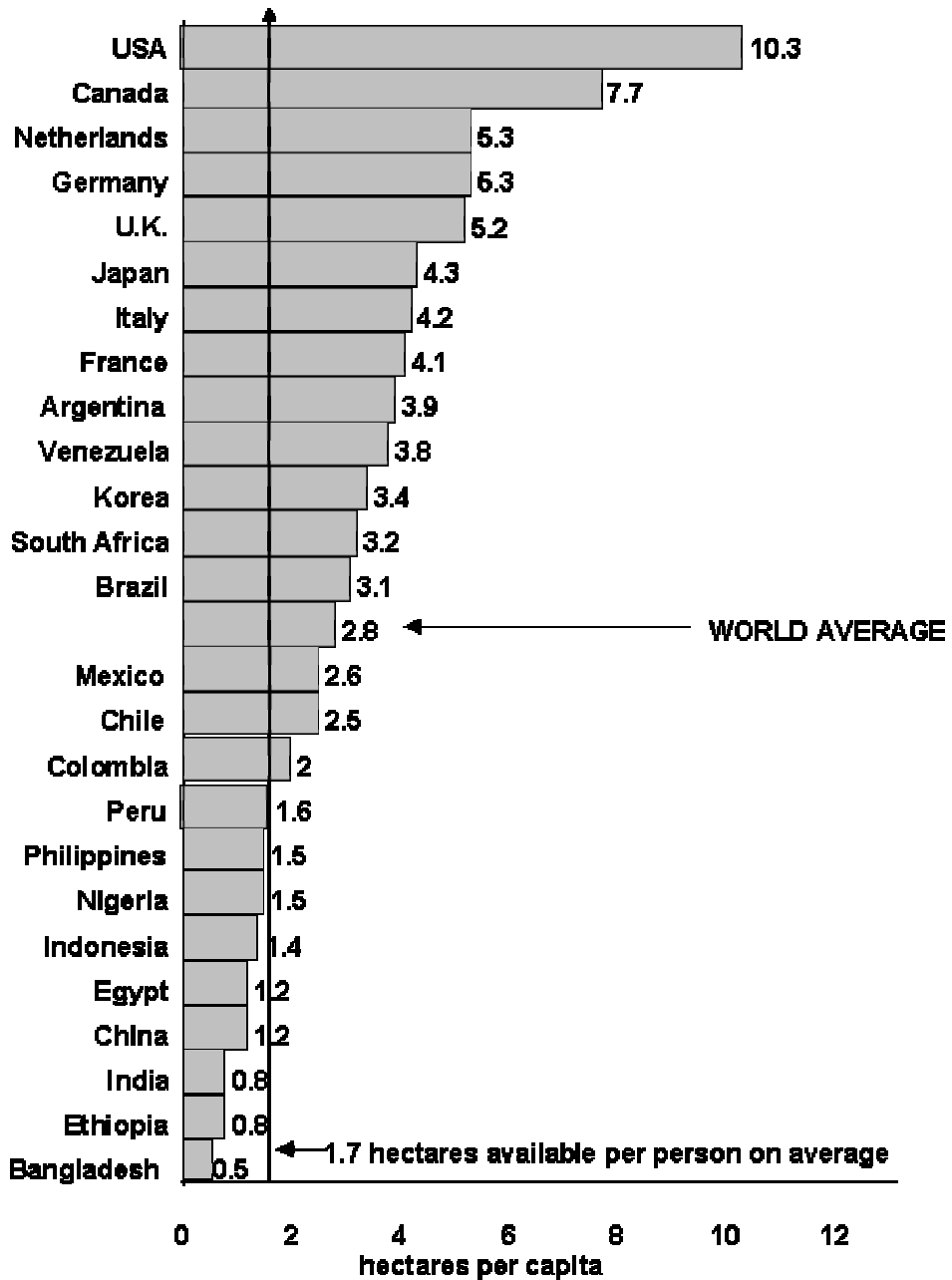
The concept of ecological footprints was developed by Rees and Wackernagel to measure how humanity's consumption patterns compare with the carrying capacity of the earth. The carrying capacity of a given species is the population of that species that can be supported indefinitely in a given habitat without permanently damaging that habitat. Ecological footprint studies show that globally humans are consuming more resources than can be naturally regenerated each year. In other words we are running down the earth's limited store of ecological capital (mostly the ancient biomass embodied in fossil fuels) rather than living off its annual production of sustainably renewable resources.

The size of any particular ecological footprint is based on the average per capita consumption of food, forest products and fuel in a given geographic area. The footprints measure, country by country, the amount of biologically productive area that would be necessary to sustain that country's resource consumption, and to dispose of its wastes, using prevailing technology.

When a country's ecological footprint is larger than its available ecological capacity, it must "import" carrying capacity from elsewhere and/or deplete its natural capital faster than it can be replenished. It achieves this by actually importing food, fuel or forestry products or by running down its supply of renewable and non-renewable resources (e.g. fossil fuels). It may also "export" wastes such as carbon dioxide emissions in excess of what its vegetation and surrounding oceans can absorb.

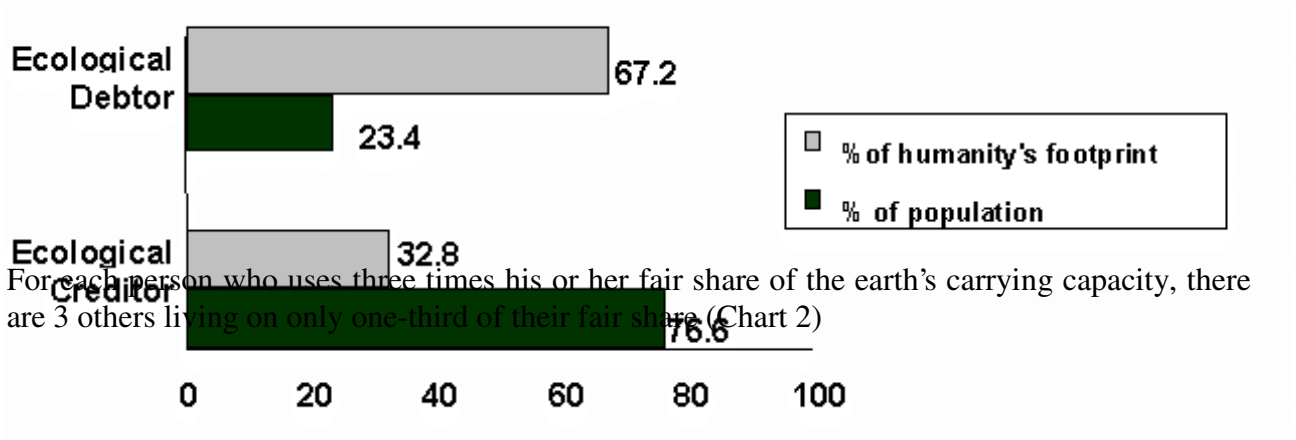
Since the concept of ecological footprints was first discussed in the June 1997 Economic Justice Report on *Economics for the Earth*, Wackernagel and colleagues at the Centre for Sustainability Studies at the Universidad Anáhuac de Xalapa in Mexico have refined their methodology. They now make more sophisticated estimates of the use of sea space and of pasture and forest yields. They also make more thorough assessments of consumption and carbon dioxide absorptive capacity.

Their earlier work showed that in 1992 humanity as a whole was consuming 25% more than nature can regenerate on a continuous basis. Their updated figures (see Chart 1) paint an even more distressing picture. By 1997 humanity's average ecological footprint had become 40% larger than the available space for producing food, fuel and forestry products on a sustainable basis. In global terms the most recent data shows that in 1997 the average person had an ecological footprint equivalent to 2.8 hectares of biologically productive land and oceanic space. But the available ecological capacity per person was only about 2 hectares. If we set aside 12% of this available space for the preservation of the 30 million non-human species that share our planet, the available ecological space per person is just 1.7 hectares.



**Chart 1 Per Capita Ecological Footprints of Selected Countries, 1997**

In global terms, 77% of the world's population has an ecological footprint that is smaller than the world average. The average footprint of these ecological creditors is just 1.02 hectares. The other 23% of the world's population, the ecological debtors, occupies 67% of humanity's footprint. In other words, just over one-fifth of the population uses two third's of the earth's carrying capacity. It is these wealthy debtors who are responsible for the fact that humanity as a whole is consuming 40% more resources than can be reproduced sustainably.



**Chart 2 Ecological Debtors and Creditors**  
*Per cent share of ecological footprint and of world population*

## **Conclusion**

Those who abuse the biosphere, transgress ecological limits, and enforce unsustainable patterns of resource extraction owe a huge ecological debt to the peoples of the South. One way to begin to offset this debt would be to cancel the financial debt owed by developing countries to Northern creditors. But simply writing off the financial debt is not enough. Other actions are needed, first to narrow, and then to eliminate the ecological deficit

Some of the ways in which the ecological debt might be addressed include:

- Applying taxes on petroleum and other natural resources that would be collected by exporters to cover the environmental and social costs of their extraction and production.
- A contraction, convergence and compensation agreement for discharging the carbon debt. Such a deal could become part of the international negotiations on climate change which have yet to address the need to pay compensation to Southern countries for their historic role in serving as carbon sinks for industrial nations that overuse fossil fuels.
- The Kyoto Oilwatch Declaration recommends that all public funds now spent by governments, international financial institutions, aid agencies, export credit agencies and so on in subsidizing fossil fuel extraction "should be used instead for investments in clean, renewable, and decentralized forms of energy, with a particular focus on meeting the energy needs of the poorest 2 billion people."
- The debt treaty drafted by civil society organizations at the 1992 Rio de Janeiro Earth Summit calls for pressure on international organizations to quantify the ecological debt. Similarly, the civil society organizations meeting in Bangkok in advance of the Tenth United Nations Conference on Trade And Development in February 2000 recommended that UNCTAD "conduct an audit of the origins of the financial debts of developing countries and a parallel study of the historical and contemporary social and ecological debt owed by the North to the South."
- Adequate payments must be made to Indigenous and farming communities for use of their knowledge, plant breeding and medicines by agribusiness and pharmaceutical companies.

It would be naive to think that canceling illegitimate financial debt is sufficient to address the urgent issues of ecological debt. Restoring right relationships with ecological creditors must go hand in hand with preserving the integrity of creation itself and maintaining right relationships with all of the earth's inhabitants. To achieve this, there must be radical changes in the current systems of production, distribution and consumption in order to restore the earth's capacity to sustain life for all.



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### **Recommended Web Sites:**

[www.rafi.org](http://www.rafi.org) - information on Biopiracy

[www.rprogress.org](http://www.rprogress.org) - information on Ecological Footprints

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