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Author(s): Lester Brown

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LESTER BROWN

Rich Countries and Poor in a Finite, Interdependent World

OVER THE PAST two decades the global scale of economic activity has nearly tripled. In 1950, the goods and services produced throughout the world were valued at just over a trillion dollars. By the early seventies, they were worth nearly three trillion. While it has been more fashionable to focus on the population explosion of the postwar period and the resultant growth in claims on resources, clearly there has also been an enormous growth in individual consumption of goods and services in much of the world. The combined effect of these two trends has been an overall growth in consumption that causes the global economy to double every sixteen to eighteen years.

The continuing expansion of economic activity depends on a number of the earth's critical resources. It depends on the earth's capacity to provide fresh water; to produce food, forest products, and marine protein; to supply minerals and energy fuels; and to absorb waste. In many parts of the world, the scale of economic activity is beginning to put pressure on at least some of these resources. When the earth's capacities are exceeded either locally or globally, certain undesirable and sometimes irreversible changes occur.

The costs of exceeding the earth's various capacities take many forms. Among these are the eutrophication of fresh water lakes and streams, a rising incidence of environmentally induced illnesses, the progressive deforestation of the earth, soil erosion and abandonment, the extinction or threatened extinction of various species of plant and animal life, inadvertent or deliberate climatic alterations, either locally or globally, and growing scarcity of some raw materials. Among those resource constraints which are most immediately limiting the continuing expansion of economic activity are the supplies of fresh water and marine protein, and the available waste absorptive capacity.

Fresh Water

In many countries, the expansion of agricultural and industrial activity is impeded by a scarcity of fresh water. The principal constraint on the spread of high-yielding wheats—the Green Revolution—in a number of

countries ranging from Mexico to Afghanistan has been the limited supply of fresh water. The lack of water is also a serious constraint on Soviet efforts to expand crop and livestock production.

Competition for waters of various rivers and river systems which cross national boundaries has become intense in recent decades. India and Pakistan required several years to negotiate mutual rights in the allocation of the Indus River waters. Competition between Israel and the Arab countries for the water of the Jordan River is intense. Protracted negotiations were required to allocate the Nile waters between the Sudan and the United Arab Republic. Use of the Colorado River waters continues to be a thorn in the side of relations between the United States and Mexico.

Soviet efforts to expand domestic food supplies have been seriously handicapped by a scarcity of fresh water. When the virgin lands project of the late fifties failed to live up to expectations, the Soviets attempted to expand their food supply by intensifying production on existing cultivated areas. The consequent need for more water led them to devise plans for diverting southward the flow of four major rivers which now flow north into the Arctic Ocean. Once these plans became public, however, the international meteorological community was quick to respond. Meteorologists urged the Soviets to abandon these plans, arguing that to interrupt this flow of warm water into the Arctic would alter the climate in the Arctic, and in turn trigger compensatory adjustments throughout the global climatic system. One study estimated that rainfall in central North America would be measurably reduced if the Soviets were to proceed with these plans. For the time being, at least, these plans are being held in abeyance and the Soviets are importing grain.

Within the United States, the state of Florida recently contracted with a rain-making firm to increase rainfall in Florida in order to break an extended drought that was damaging agricultural crops and threatening wildlife in the Everglades. The interesting question is: What if Texas were to sign such a rain-making contract? How would this affect relations between the United States and Mexico? What if Ceylon, in an effort to become self-sufficient in its production of rice, were to hire a rain-making firm to increase its share of the monsoon rainfall at the expense of India?

The Food and Agriculture Organization projects that global demand for fresh water will increase 240 percent by the end of the century. Needless to say, this could generate great pressures on countries to use whatever technologies are available or can be developed to expand their fresh water supplies. National efforts to expand fresh water supplies by using advanced technologies often have transnational if not global consequences. In our ecologically interdependent world, we must now seriously consider regulating national interventions in the climatic system to expand fresh water supplies, particularly when this may be done at the expense of another country.

Marine Protein

Another resource for which competition among countries is becoming increasingly intense is the world's marine protein supply. As population increases and incomes rise, the demand for animal protein is increasing at close to 3 percent per year. The world fish catch expanded from 1950 to 1968 at an average rate of nearly 5 percent per year—more than double the rate of growth in the population. Since 1968, growth in the world fish catch has slowed significantly, which suggests that growth in marine protein supplies might fall behind the growth in population, not to mention the growth in global demand generated by rising incomes.

Many marine biologists now feel that the world catch of table grade fish is very close to the maximum sustainable limit. A UN sponsored conference convened in 1948 to survey the condition of world fisheries concluded that only a few table grade species, and these rather exotic ones, were being overfished. A contemporary examination suggests that a large number, perhaps a majority, of the thirty-odd leading species of table grade fish may now be overfished. Reports of the recent annual conventions of the fifteen-member International Commission for the Northwest Atlantic Fisheries (ICNAF) provide some insights into the deteriorating condition of fisheries in the northwest Atlantic, traditionally one of the world's richest fishing grounds. Overfishing is the principal cause of this deterioration.

Even more disturbing is the growing number of situations in which countries cannot agree on a limitation of the catch and on the allocation of this catch among the countries involved. Competition among countries for the ocean's fish supplies is evident in daily newspaper headlines. Within the ICNAF membership, Britain and Iceland are in continuous conflict over the fishing rights off the coast of Iceland. Conflicts between U.S. and Soviet ships off the Atlantic coast of North America are frequent. Expanding Soviet and Japanese fishing fleets compete for limited supplies in the North Pacific. American fishermen deeply resent the intrusion of Soviet, Korean, and Japanese trawlers off the West Coast of the United States. Scores of U.S. fishing trawlers have been confiscated off the west coast of Latin America by the governments of Ecuador and Peru. Brazil has insisted on a treaty regulating the terms on which U.S. fishermen are permitted within its 200 mile offshore territorial limits.

Complex social and political issues are raised by the prospect that the world catch of table grade fish may be at or close to the sustainable level. One sticky international political issue is how countries share the catch of those species where the catch must now be limited. The principal division among countries is likely to be along economic lines. The rich countries are likely to insist on allocating the catch according to a historical base. Such is the case within the ICNAF in instances where agreement has been reached. Most quotas set by the Commission are distributed among member nations

according to a formula which allocates 40 percent of the total catch in proportion to average catches over the previous ten years, 40 percent in proportion to average catches over the previous three years, 10 percent to coastal states and 10 percent according to special needs. This formula has not always been acceptable to all countries involved. Failure to agree on the allocation among countries has generally resulted in a continuing decline in the stocks and catch of the species in question within the ICNAF region.

The poor countries, many of which are just entering the world fisheries on a large commercial scale, can be counted on to resist formulas based largely on historical shares. They are likely to counter with proposals to allocate the catch on some other basis, perhaps according to coastal proximity or population. Historically based allocations would mean that the rich countries would maintain the lion's share of the world fish catch; population based allocations would mean that the poor countries would get the major share since they have an overwhelming majority of the world's people. Political leaders in some poor countries are certain to request first claim on this common global resource because their people are suffering from protein malnutrition.

One of the great difficulties in assessing the future of world fisheries is the lack of reliable data on which to base projections. If the rate of growth in the world fish catch falls significantly below the level of the past two decades, as it now seems certain to do, how will this affect prices of marine protein? How will it affect efforts to eliminate protein malnutrition in poor countries, and relationships between rich countries and poor as rich countries use their superior purchasing power to bid protein resources away from the poor ones?

Waste Absorption

Another of the resources on which the expansion of economic activity depends is the earth's waste absorptive capacity. Utilization of this resource may have a greater impact on the relationships between rich and poor countries than almost any other, with the possible exception of liquid fossil fuels. Those countries which are highly industrialized have now reached a situation in which local waste absorptive capacities are often being exceeded. The result is eutrophication of fresh water lakes and streams; a rising incidence of environmentally induced illnesses, particularly respiratory illnesses in urban areas; and the threatened extinction of a number of plant and animal species.

The unwillingness of local populations to bear the environmental consequences of excessive waste discharge has resulted in the passage of a vast amount of legislation in recent years limiting the waste discharge of industrial and other activities. Within the United States, this includes

national legislation such as the Clean Air Act, the Clean Water Act, legislation in almost every state, and ordinances at the local level. The net effect of compliance with these new laws is to raise the cost of production, particularly in some of the more pollution-intensive industries.

One of the industries affected most in the United States is petroleum refining. Between 1972 and 1975, seven new oil refineries will be needed to meet the projected demand for refined petroleum products in the north-eastern United States. It is highly unlikely that any of these refineries will be built there. In some communities in the region the construction of oil refineries is prohibited regardless of the pollution abatement technologies used. In others, the cost of complying with regulations would raise the cost of production so much that oil company executives are locating their new refineries elsewhere—in the Caribbean, the Middle East, or, in the case of one firm at least, in Indonesia.

Other industries are carefully assessing the impact of environmental legislation on their production costs. Increasingly, we can expect that multinational corporations will respond to pollution differentials in much the same way they have responded to income differentials over the past fifteen years. They will locate the pollution-intensive phases of their operations in poor countries in much the same way they have located the labor-intensive aspects of their operations in the same countries to take advantage of lower wages.

Japanese industrialists, operating in a country faced with perhaps the world's most serious national pollution problem, are beginning to think of systematically locating pollution-intensive activities elsewhere. Plans devised a few years ago to construct feedlots in Japan have been altered, and investment by Japanese firms is now scheduled for countries where coping with feedlot waste will be easier.

Some developing countries are beginning to perceive of their underutilized waste absorptive capacities as a resource to be exploited in international economic competition, in their efforts to expand exports and to attract new investment by multinational corporations. Brazil, for example, has publicly invited multinational corporations to locate their plants in Brazil where there is as yet relatively little pollution and where there are few pollution regulations. Rich countries, feeling the impact of this relocation on their own rates of economic growth, levels of employment and balance of international payments, will undoubtedly try to insist that all countries, rich and poor, adopt the same environmental regulations in order to nullify this potential economic advantage of poor countries. Many poor countries will argue that their unutilized waste absorptive capacity is a resource to be exploited in international economic competition, like mineral reserves, fertile soil, or tourist attractions.

We have examined briefly three of the resources on which global

economic activity depends: fresh water, oceanic protein, and waste absorptive capacity. As long as the hydrological cycle produced more fresh water than man could ever hope to use, there was no competition among countries for fresh water supplies. As long as there were more fish in the ocean than man could ever hope to catch, the entry of another country into a given fishery or the addition of a few more fishing ships to the world fleet was of little concern. But today, with overfishing becoming widespread, such additions may represent a serious threat to world fisheries.

Similarly, as long as the ecosystem could absorb far more waste than existing scales of economic activity could produce, there were no problems. We have now reached the point, however, where the expansion of economic activity is beginning to press against the limits of the earth's resources, locally and globally. As it does, the interaction and interdependence among countries rise. The question of how those resources which are in limited supply, or which can be expanded only at considerable cost, are divided among countries becomes a critical international political issue.

Raw Materials

Those countries which industrialized earliest are beginning to deplete and, in some cases, exhaust their indigenous supplies of raw materials. Among these are several European countries and the United States. Japan, of course, has been heavily dependent on other countries for raw materials ever since it began to industrialize. Europe today is heavily dependent on imports for its supplies of petroleum and for most of the principal minerals. Even with the North Sea oil fields in full production by 1980, Great Britain will still depend on imports for half of its petroleum supplies, and for continental Europe the percentage is much higher.

Within the United States, dependence on imported energy fuels and raw materials has been rather limited until recently. In 1970, for example, the United States was only marginally dependent on petroleum imports. In some years during the past generation it was actually a net petroleum exporter. Projections show, however, that by 1985 the United States will be dependent on imports for more than half of its supplies of petroleum and natural gas. This is closely paralleled by the situation in minerals supply. It is projected that by 1985 the United States will be dependent on imports for more than half its supplies of nine of the thirteen basic industrial raw materials. Among these are iron ore, aluminum or bauxite, and tin. In 1970, imports of energy fuels and minerals cost the United States \$8 billion. By 1985, this sum is projected to increase to \$31 billion, assuming constant prices, an assumption which, needless to say, is no longer considered realistic.

Some exportable reserves of energy fuels and raw materials are located in industrial countries such as Canada, Australia, and the Soviet Union, but

the great bulk of them are located in nonindustrial countries. Exportable petroleum reserves are controlled almost entirely by the eleven members of the Organization of Petroleum Exporting Countries (OPEC), all non-industrial countries. Four poor countries—Chile, Peru, Zambia, and Zaire (Congo)—supply most of the world's exportable surplus of copper. Three others—Malaysia, Bolivia, and Thailand—account for 70 percent of all tin entering international trade channels. Cuba and New Caledonia have well over half of the world's known reserves of nickel. The main known reserves of cobalt are in Zaire, Cuba, New Caledonia, and parts of Asia. And Mexico and Peru, along with Australia, account for 60 percent of the exportable supply of lead.

The prospect of collective bargaining by raw-material-exporting countries is a very real one in those instances where a few countries control most of the world's exportable supplies. The success of the eleven-member Organization of Petroleum Exporting Countries (OPEC) in bargaining for improved terms for supplying petroleum to the international community is a model which other raw material exporters can be expected to attempt to emulate. Copper exporting countries are attempting to organize. There is talk within the aluminum industry to the effect that the politics of oil may become the politics of aluminum. Coffee producers are beginning to consider negotiating collectively, independently of the importing countries, to set world coffee prices. How many of these efforts will be successful remains to be seen, but the existence of a highly successful model is encouraging other groups to try.

As industrial societies deplete, or in some cases exhaust, their indigenous reserves of important raw materials, they are becoming heavily dependent on nonindustrial countries for raw materials. This in turn is transforming the relationship between rich and poor countries from one in which the poor have been heavily dependent on the rich for capital and technology, to a more genuinely interdependent one, in which the rich are becoming dependent on the poor for raw materials and for cooperation in environmental and other matters.

Social Justice at the International Level

The rapid expansion of global economic activity against the backdrop of increasing environmental pressure is thus compelling mankind to address the issue of social justice on a world scale and in a new context. Hitherto, the rich could urge the poor at home and abroad to wait, arguing that the benefits of growth would eventually trickle down, that the supply of a given resource could always be expanded. And it is quite conceivable that yet-to-be-discovered technologies will make this possible. Indeed, the difficult adjustments which must be made in economic systems—both domestic and international—are immensely easier in a growing economy than in a static

one. But when opportunities for further expansion of a given resource are limited, the issue becomes not how to expand the resource, but how to divide it. Given what we presently know and can foresee about the availability of resources and the state of the environment, it may be possible to narrow the global poverty gap only by slowing the growth in consumption of material goods among the rich while accelerating it among the poor countries.

Traditionally, rates of economic growth in nonindustrial countries were closely tied to those in the industrial countries. A slowdown in industrial countries was usually followed by a slowdown in nonindustrial ones. In part this was because rates of economic growth in nonindustrial countries often correlate closely with growth in their export earnings. The close correlation in growth rates between the two groups of countries may be diminishing. At least some of the nonindustrial countries are benefiting from the rapid growth in exports of energy fuels and minerals to the industrial countries, from their improving export terms for some key raw materials (such as petroleum), from a gradually expanding share of processing in exported items; and from their growing trade with each other.

Control over the major share of the world's exportable supplies of many important raw materials ranging from petroleum to tin is giving the nonindustrial countries leverage in the international economic system which they have not heretofore enjoyed. The terms on which they make resources available are influenced strongly by their desire to attain a more equitable share of the global economic pie. Numerous efforts are under way to increase their share of processing raw materials. Poor countries seem most anxious to abandon as rapidly as possible their traditional "hewers of wood, drawers of water" role in the world economy. For example, Turkey and Japan have made an agreement whereby Japan is building a 50,000 ton per year ferrochrome alloy plant in exchange for a million tons of chrome ore to be delivered over a ten-year period.

Increasingly the poor countries are invoking the need for greater social justice at the international level in their economic relationships with the rich countries. Algeria took over control of the French oil and gas interests in the Algerian Sahara with the express desire of providing an acceptable level of living for every family in Algeria. They knew that if these resources remained in French hands, this objective would not be fulfilled.

In Chile, President Allende linked his terms of compensation to the copper firms, whose holdings his government had expropriated, to the needs of the Chilean people. He claimed that there are 700,000 children in his country who will never develop their full physical and mental potential because they were deprived of sufficient protein in the early years of life. The copper companies, he argued, have invested a paltry sum in Chile, but they have taken out \$400 million in profits. This sum, President Allende pointed out, would be sufficient to fill the protein deficit in Chile for as far as one could see into the future.

In Peru, Foreign Minister Edgardo Marrin justified the extension of his country's offshore limits to 200 miles in terms of Peru's needs. The fish from the rich fishing grounds off the coast of Peru provide much of the protein consumed by the Peruvian people and earn most of the country's foreign exchange. He argued that industrial countries such as the Soviet Union, Japan and the United States are able to invest in sophisticated technologies such as sonar, floating fish-processing factories, and auxiliary fishing fleets to roam the world's oceans taking fish wherever they can find them. Peru, on the other hand, lacks the capital and technology to compete in these ways. It can protect its share of the world's oceanic protein supplies, he maintains, only by extending its offshore limits. Political leaders in other maritime developing countries are taking similar positions.

The relationship between rich countries and poor is not at present a particularly happy one. Although nearly all poor countries have achieved political independence, many do not feel that they have yet attained full economic independence. Many feel that political imperialism has simply been replaced by economic imperialism. They cite the trade negotiations of the postwar period as an example. The Kennedy Round of trade negotiations was very much of, by, and for the rich countries. Broad reductions in tariffs on industrial products were made, but little liberalization was achieved on the agricultural commodities which the poor countries export. At present, the duties levied on imports into the industrial countries from the poor countries are roughly double those levied by the rich countries on imports from each other. Economic assistance from the United States and the Soviet Union, two leading industrial societies, has fallen sharply in recent years. The share of the GNP which these two industrial giants make available in economic assistance to poor countries is less than one half of one percent.

In the monetary area, when it came time to allocate the new international reserve currency, the Special Drawing Rights, among member countries of the International Monetary Fund, the lion's share went to the rich countries, thus reinforcing the existing global maldistribution of wealth. As the United Nations Conference on Trade and Development in Santiago in May 1972 and the U.N. Conference on the Human Environment in Stockholm in June 1972 indicated, the poor countries are increasingly dissatisfied with their position in the world. They can be counted on to try to improve their position by exercising every bit of leverage they can get in the form of control over raw materials or refusal to cooperate in various international efforts.

Population Growth Versus Rising Affluence

The issue of what share of the pressures on global resources is attributable to population growth and what share is attributable to rising affluence

is becoming an issue between rich and poor countries. Political leaders in the rich countries with low rates of population growth focus attention on the rapid population growth in the poor countries as a source of stress on resources. Their counterparts in the poor countries point to the pursuit of superaffluence in the rich countries as the principal source of growth in claims on global resources.

In fact both are important. At the global level, the growth in annual consumption of goods and services—about 4 percent per year—is allocated rather equally between population growth and rising individual affluence. If the 4 percent rate of economic growth of the past two decades were to continue to the end of the century, the gross world product, now just over \$3 trillion, would expand to \$9 trillion. Even the increase of global economic activity from \$2 trillion to \$3 trillion greatly increased both pressure on resources and competition among countries for those increasingly scarce resources on which the expansion of economic activity depends.

As we look to the future, we must ask ourselves how we can accommodate ourselves to the earth's ecosystem, the natural life support systems on which our existence depends, and the finiteness of many resources. Clearly one way is to slow the growth in individual consumption among the more affluent, something which might be done without in any way impairing their well-being. Another way, of course, is to move toward a stabilization of world population as rapidly and systematically as possible.

A part of the conventional wisdom within the international development community has long been that the two billion people living in the poor countries could not aspire to the lifestyle enjoyed by the average North American because there is not enough iron ore, petroleum and protein in the world to provide it. Even while accepting this, however, those of us in the United States have continued the pursuit of superaffluence, increasing our consumption of resources as though there were no limit to the amount that could be consumed.

Political leaders in the poor countries are beginning to ask with disturbing frequency what right Americans, who constitute only 6 percent of the world's people, have to consume a third of the earth's resources. This question is being raised in the various international forums where access to and allocation of resources among countries is discussed.

Within the United States we must examine carefully the presumed link between our levels of well-being and of material goods consumption. There is growing evidence that this relationship is at best a tenuous one. At low levels of income and consumption, increases in material goods, such as food or household appliances, do very much affect one's level of well-being, but after a point improvements in well-being are scarcely perceptible. For a man with only a crust of bread, the acquisition of a second crust greatly improves his well-being. For a man with a loaf of bread, an additional crust has little impact on his actual well-being.

The technologies underlying our economic system evolved in a situation of relative resource abundance. We have reached the point now where we need to reexamine these technologies in the light of growing resource scarcity. Could we retain our current level of individual mobility with a much smaller volume of resource use merely by limiting the size of automobiles? Could we greatly reduce energy consumption with a properly designed public transport system? Should we be building skyscrapers, with their enormous energy requirements, or should we abandon the competition to see who can build the tallest building in each major city? We must reexamine the use of our public budgetary resources and the maintenance of a global military establishment. The issue may no longer be whether the U.S. taxpayer can foot the bill, but rather, whether mankind can afford such a frivolous use of resources.

In a global economy which is increasingly integrated and interdependent, countries compete for common global resources of energy, minerals, marine protein, forest products, and agricultural commodities. Under these circumstances, the more of us there are the less each of us has. As recognition of this spreads, efforts to slow population growth and achieve population stability may acquire a new urgency. We must ask ourselves how we can stabilize world population sooner rather than later.

Given recent trends, it is relatively easy to envisage a strategy which would lead to population stabilization in some of the wealthier societies. In Europe, population has recently stabilized in East Germany, West Germany, and Luxembourg. Other countries, such as the Netherlands, the United Kingdom, the United States, and the Soviet Union, may well stabilize their populations within a decade or two if the recent decline in birth rates continues. Japan's population growth is slow enough so that it too could stabilize within the foreseeable future—given the appropriate policy decisions. In summary, we can envisage a situation in which, a decade or so hence, population growth in the wealthier countries might come to a halt.

What is far more difficult, however, is to envisage a rapid slowing of population growth in the poor countries in the foreseeable future. Birth rates do not usually voluntarily decline in the absence of a certain minimum level of living—an assured food supply, literacy (if not an elementary school education), at least rudimentary health services, and reduced infant mortality. What we may witness is the emergence of a situation in which it will be in the interest of the rich countries to launch a concerted attack on global poverty in order to reduce the threat to our future well-being posed by continuous population growth.

The costs of doing so are not as formidable as one might think. The evolution of the global economy has reached the point where this may have become a realistic undertaking. For example, according to UNESCO estimates, it costs approximately \$8 to enable a person to become literate in a

developing country. For a billion illiterates, this would require an expenditure of \$8 billion. If this were spread over a five-year period to minimize annual outlays, it would come to \$1.6 billion per year. Shared by several wealthy countries, it would amount to a few hundred million dollars each per year at most. This might be a very cheap price to pay to achieve one of the preconditions for a major slowdown in global population growth.

The Chinese experience in providing health services, including family planning, to the countryside has been instructive in this connection. By using limited available resources to train paramedical personnel, they have apparently succeeded in providing at least rudimentary health services to the great majority of their vast population, although income per person averages only \$140 annually.

Following World War II, the United States took a major global initiative and decided that it would use its food-producing resources to intervene anywhere in the world where famine threatened. It has followed this policy over the past twenty-five years, even when, as in India in 1966 and 1967, a fifth of the U.S. wheat crop was required to forestall famine. Perhaps the next step should be not merely to avoid famine, but to work systematically toward providing a minimum nutritional intake for everyone in the world. Again the Chinese experience is instructive for it seems to have permitted the achievement of adequate nutrition at an exceedingly low level of income.

In summary, we may now have reached the point in the evolution of global society, in the expansion of economic activity, and in the deteriorating relationship between man and the environment where we must give serious thought to the need to at least attempt to satisfy the basic social needs of all mankind. At first glance this seems terribly ambitious. It may, however, be much less costly than we would at first think if we utilize some of the new technologies and new approaches now available. It may be one of the cheapest ways of insuring our own future well-being.