

ISLANDS AND SUSTAINABLE DEVELOPMENT



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SMALL ISLANDS, BIG ISSUES

The first Global Conference on the Sustainable Development of Small Island Developing States (SIDS) convened in Barbados in 1994. The purpose of the gathering was to examine national and international strategies, and adopt plans and programmes intended to enable these territories and their limited resources to undergo development in a sustainable manner, while enhancing in them the coping mechanisms and human skills necessary to pursue sustainable development.

The Barbados Conference was a spinoff from the United Nations Conference on Environment and Development — known as the Earth Summit — which met in Rio de Janeiro in 1992. The purpose of the Summit was to debate a challenging list of pressing environmental issues known as Agenda 21, and follow this up with the implementation of an action plan.

That the numerous small, mainly island, states could engineer this much international support for their own perspective on environmental concerns, and provoke a full-scale international conference, is due to three main factors. First is the powerful lobbying efforts that these three dozen or so member states have exercised via the Alliance of Small Island States (AOSIS), gaining a platform and a hearing. Second is the contention that, because of geography, size and ecology, environmental problems are bound to impinge on small island territories in special ways. That these two explanations carry any weight at all is, however, debatable given the third reason, that islands remain important geo-strategic platforms and sovereign custodians of large tracts of marine resources: they would



therefore merit being appeased and sponsored in their own mini world summit.

The caption of the publicity poster for Barbados 1994 could not have been more striking. The physical limitations and insularity of the world's smallest states and territories contribute to an intensification of the problems associated with environmental management and economic development: small islands, big issues.

Small and Island (often Nation, but almost always semi-autonomous) States are, faithful to their acronym, promising candidates for proving to be the SINS of the world. Still considered by some as quirks of decolonization, we continue today to come across arguments expounding their non-viability, while they continue to survive. Environmental issues are among the latest in a long series of hazards that are alleged to threaten not just the quality of life of small island citizens but their very physical existence.

Islanders have heard it all before. Their condition is one of extreme proneness to a wide repertoire of external interventions. Economically, small island territories suffer from dependence on a very narrow range of products (sugar, bananas, copra, pineapple, cod, marijuana?), light manufacturing (textiles, screwdriver industries, data processing) or services (tourism, tax havens, banking), with hardly any influence on the terms of trade. The weakness of the arrangement is that it is wide open to potentially erratic market fluctuations, which these territories cannot control or even predict. Financially, micro-insular territories receive considerable largesse from beyond their shores. These include remittances from emigrants as well as official public transfers and other forms of bilateral or multilateral aid. Such inflows constitute a regular and necessary supplement to the balance of payments that would otherwise never balance high expenditures with low, locally generated revenues. Ecologically, small islands are prone to natural disasters — cyclones, epidemics, droughts. While larger countries can often take such mishaps in their stride, these small places are likely to suffer shattering and long-lasting consequences.

Of course, vulnerability is not necessarily an intrinsically negative attribute. Proclaiming peculiar fragility and weakness may make ample diplomatic sense, if it attracts lucrative conference tourism, or begets international attention and financial or commercial assistance.



Nevertheless, small islands stand out as quasi-laboratory test cases that allow an examination of the effects of industrialization or a change to services, as well as the policy outcomes concerning the tension of economic development and environmental preservation. Such countries could thus serve as advance (and, being small and remote, affordable) warnings of undesirable scenarios. Already the archipelagic reef of Tuvalu is an un-willing prime target for the possible effects of global warming. It will disappear silently beneath the waves of the South Pacific owing to sea level rise, unless the causes behind global warming are halted and, preferably, swiftly reversed (Lewis, 1990).

The silence of such disappearance bears testimony to the benign neglect with which small islands have been treated. The approval and implementation of the Declaration and Programme of Action of the Barbados Conference — dealing with the management of environmental problems, the sound harnessing of natural resources, and human resource development needs — might go a little way towards preventing this outcome (Streeten, 1993).

But the issue of sustainable development is complex and multifaceted. While an attractive catch phrase, its actual application may prove elusive. Its implementation looms much larger than the capacity of any single nation, let alone any small island territory. One of the fundamental concerns is precisely to avoid a consideration of the issue of sustainability from an exclusively national perspective. Such would be a case of intellectual paralysis, resulting in very serious policy lacunae.

This paper deals with the various, at times conflicting, interpretations of sustainable development and of the problems of implementation. It proposes various alternative scenarios bearing a sensitivity to global, regional, or local environmental degradation. The paper concludes with a plea for a global environment protection agency, one that would correct the current lag of institutional infrastructural provision behind technological enhancement. Such an agency would also avoid those subtle social traps that would otherwise prevent the activation of cooperation at the global level towards a more efficient and equitable allocation of resources.



DEFINITION

Sustainable development, in the words of the report of Gro Harlem Brundtland, chair of the World Commission on Environment and Development (WCED), is “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (WCED, 1987).¹ This definition is sufficiently vague to cover many contingencies. J. R. Hicks similarly wrote that “the purpose of income calculation in practical affairs is to give people an indication of the amount which they can consume without impoverishing themselves” (Hicks, 1946: 172). Even this definition is elusive, because the maximum amount of consumption that individuals can expect to maintain while keeping the initial level of wealth intact depends on their expectations of future prices and interest rates. But current values, according to economic doctrine, reflect the best estimates that economic agents can make of this uncertain future.



A MULTI-DIMENSIONAL ISSUE

Sustainable development has come to mean much more than maintaining intact the physical capital that produces an income stream (or increasing it in line with population growth, technological developments, intertemporal preferences, etc.). Maintenance, replacement, and growth of capital assets, both physical and human, is certainly one aspect of sustainability. Physical wear and tear, technical obsolescence, and the depreciation of human capital have to be taken into account.

Secondly, not only physical but also human capital has to be maintained. Technical, managerial, and administrative knowledge and its dissemination through education can be substitutes for physical and

¹Another definition in the same report is “a process of change in which the exploitation of resources, direction of investments, orientation of technological development, and institutional change are all in harmony and enhance both current and future potential to meet human needs and aspirations” (p. 46).



environmental capital, or they can be complementary to it. In the ability of human inventiveness to substitute for exhaustible resources lies the hope for sustainability.

A third aspect, to which much attention has been paid recently, is maintaining the physical and environmental conditions for the constituents of well-being. Unless the environmental resources serving as inputs are valued in themselves (as some of them certainly are), it is the results, not the means, that must be sustained. This implies two distinct things: first, avoiding polluting the water, air, and land on which our lives and work depend; and, second, avoiding the exhaustion of renewable resources that are essential for production, unless adequate replacement is provided.² (It may imply increasing these environmental resources, again depending on population growth, technology, preferences, etc.) As to non-renewable resources, the implication is that investment in substitutes should take place, so that the productive base for sustaining well-being is maintained.

Related to this is a fourth aspect of sustainability: resilience. The system must be able to adjust to shocks and crises, to be sufficiently flexible and diverse with respect to resources (including biological diversity) and practices (including approaches to knowledge), to maintain itself in the face of an uncertain future.

A fifth aspect is avoiding burdening future generations with internal and external debts. Although to anybody burdened with a debt liability there corresponds an equivalent asset holder, this does not mean that the net debt burden is zero. Tax liabilities, and the ability to enjoy interest receipts, have important effects on incentives to work, save, and risk, in addition to the distributional impact.

A sixth aspect of sustainable development is fiscal, administrative, and political sustainability. A policy must be credible and acceptable to the citizens, so that there is sufficient consent to carry it out. Fear of popular protest in the form of mass demonstrations or riots can frustrate reforms. In order to be sustainable politically, the course of opposition and resistance has to be traced and measures to overcome it have to be

²Accounting for the depletion of exhaustible natural resources is easier than for environmental values such as clean air and water, for the former have market prices, a useful starting point, which the latter do not.



designed. The administrative apparatus must be capable of carrying it out on a continuing basis, and revenue must be available to meet the needs of public expenditure. International peace and domestic security are important dimensions of political sustainability.

A seventh aspect is the ability to hand over the management of projects to citizens of the developing country in which they are located, so that foreign experts can withdraw without jeopardizing their success. This implies training local counterparts and helping to create local technological, managerial, and administrative capacity.

Sustainability is therefore a multi-dimensional problem. It implies responsible behaviour towards future generations, despite the fact that they have no vote and cannot put direct pressures on policy-makers.

“Sustainability” by itself is, however, not a clearly defined term. First, there is the problem, already mentioned, whether one should be concerned with sustaining the constituents of well-being or its determinants, whether with the means or the ends. Clearly, what ought to matter are the constituents, the health, welfare, and prosperity of the people, and not so many tons of minerals, so many trees, or so many animal species. Yet, some of the writings on the subject confuse the two.³ If in the process of curing ovarian and other forms of cancer the Pacific yew trees (or even the Northern spotted owl, to whom the forests are home) had to be reduced in number, in order to produce the drug taxol, people’s health must be given priority over trees.⁴ Of course, some would want to attach end-values to many of the determinants, insofar as they are part of “nature”

³We have been, so far, remarkably successful in inventing substitutes for, or in economizing in, exhaustible resources. The exhaustion of a natural resource cannot leave us worse off than we were before its discovery. Wilfred Beckerman once pointed out that the world had survived remarkably well without Beckermonium, a mineral named after an ancestor of his who failed to discover it in the 19th century.

⁴Taxol has been produced from the bark of the Pacific yew tree, which is now endangered. University of Kansas researchers now claim that a Himalayan relative of the Pacific yew tree could serve as an alternative source of taxol. From this tree, *Taxus baccata*, unlike the yew tree, taxol can be extracted from its needles and twigs, without hurting the tree. See *Wall Street Journal*, Monday, April 20, 1992, B6.



(such as the Grand Canyon). This view might be called ethical environmentalism in contrast to prudential environmentalism.

Then there is the question as to sustainability at what level, or at what rate of growth or decline? There is nothing sacrosanct about the existing stock of resources. Population in Western Europe is stationary or may decline, but Kenya's population will be three times today's in 2025, and world population will be more than 8 billion people, compared with over 5 billion today. Sustaining income per head for humankind may imply increasing the stock of resources. On the other hand, substitution possibilities and technical innovation imply the ability to run some down. Population growth, technological innovations, and intertemporal preferences will determine whether the stock should be increased, kept constant or reduced, and at what rates, or whether its composition should be changed. But, as *The Economist* has put it, "sustainable development is still useful. Like many important ideas, it is better than nothing for as long as there is nothing better" (*The Economist*, Sept. 16, 1989: 77).



THREATS TO THE ENVIRONMENT OF DEVELOPING COUNTRIES

The principal threats to the physical environment of the developing countries can be grouped under the following headings:

- 1) Continuing rapid rates of population growth;
- 2) Accelerating rates of urbanization with consequential air and water pollution;
- 3) Atomic energy: accidents, waste disposal, sabotage;
- 4) Damage done by persistent pesticides and other dangers to the food chain;
- 5) Damage done by industrial trace materials and toxic waste disposal;
- 6) Destruction of forests and soils, plant and animal life;
- 7) Depletion of fisheries;
- 8) Silting and salination;
- 9) Air and water pollution and the depletion of fisheries; and



- 10) Global and regional transnational concerns about warming, the ozone layer, acid rain, and ocean pollution.

It will be seen that this list overlaps with, but is not identical to, a similar list that could be drawn up for advanced industrial countries. Whereas poverty is the main cause of environmental degradation in poor countries, it is opulence in the rich countries. (This is not true of all forms of environmental degradation. Urban air and water quality have shown a tendency to improve above a certain income level.) Poverty and population pressure generally drive people to the cultivation of ever more marginal land. This erodes the soil and depletes shallow water resources, causing growing poverty as crop yields fall and women spend more time collecting firewood and fetching water. It is estimated that 14 million people in the developing countries have become environmental refugees, driven from their homes by environmental degradation. The poor are both the cause and the victims of environmental degradation.

The rapid rates of population growth are the consequence of the introduction of modern death rates, resulting from modern death control, into societies with little cheap and effective birth control, and hence with traditional birth rates. At low income levels, children are wanted because firewood and water have to be collected and many household chores have to be done. Old people need sons to look after them. Even young parents need many helpers. There is a vicious circle between the desire for large families, which leads to environmental damage, and the need for more hands to overcome the damage.

The so-called demographic transition from one equilibrium, in which both death rates and birth rates are high, to another, in which both are low, is both difficult and slow. The implications of this demographic transition have been discussed at length, and all that is needed here is to note that it involves heavy environmental pressures in the poorest societies. Population growth in the developing countries is about five times as great as it is in the advanced countries in the second half of this century. The world's population has doubled since 1950 and will be well in excess of 10 billion in 2050. It may be as large as 20 billion. The share of people living in the advanced countries has fallen from 35 per cent in 1950 to about 20 per cent today, and continues to fall. The 80 per cent in the developing



countries account for less than 20 per cent of the world's consumption. If present trends continue, world population will not stabilize until a size of 10 or 11 billion is reached. About 40 per cent of the population in the developing countries is less than fifteen years old, compared with 30 per cent in the developed countries. The high dependency ratio implied by such an age distribution puts a heavy burden on the working population, on social services such as education, on the government budget, and on the ability to mobilize resources for development.

It is anticipated that, between now and the year 2000, one billion people will be added to the populations of cities, more than the total number in cities now. The fastest growing cities are in the developing countries, where the ability to cope with the strains of urbanization is weakest. Here again, the literature is large and it must suffice to mention the high costs of urban services and the threats to the environment from pollution of air and water, congestion, noise, and disease transmission.

The dangers from atomic energy, on which many developing countries are embarking, stem from the threat of the proliferation of nuclear weapon capability, reactor failures, the difficulties of disposing of radioactive waste, the possibility of diverting plutonium by terrorist groups, and the uncertainty about radiological standards. Less widely discussed but perhaps at least equally serious is the potential threat to civil liberties that arises from the need to protect societies against terrorists and saboteurs. The need for armed guards and possibly private armies to guard nuclear power stations can bode ill for human freedom. While all these problems exist also in advanced countries, the level of technical competence of dealing with them is lower in developing countries. Some of these dangers have implications that reach beyond national boundaries. They call for international coordination or transnational, global institutions, to be discussed more fully below.

The attraction of using cheap and effective chemical pesticides in agriculture is clear in countries where the pressure to grow more food is very strong, but the long-term adverse effects can be immense.

The urgent advances of industrialization will tend to spread trace materials of industrial origin: mercury, cadmium, polychlorinated biphenyls, and other substances can have poisoning effects on people. Paper that is chlorine-bleached contains dioxin and other organochlorines,



which, in sufficiently large doses, are hazardous substances. Lavatory paper, tampons, Kleenex, milk cartons, coffee filters, and disposal diapers contain it.⁵ Firms from advanced countries have used developing countries as the dumping ground for their toxic waste.

The destruction of tropical forests as a result of the need for fuel (or for foreign exchange from the export of wood), with the associated adverse effects on soils, is now well-documented, though the effects on climate and the global atmosphere, and on the alleged mass extinctions of plant and animal species, are more controversial. Dams have caused silting, and irrigation canals have led to salination, destroying the fertility of the land.

A concern for environmental protection for developing countries is often met with hostility. It is felt that the industrialized countries have achieved high levels of living and now wish to prevent or slow down the same process of industrialization in the developing countries, for the sake of preserving values and interests that are mainly the concern of the rich. Sceptics of environmental protection can also say that preserving the environment has many of the ingredients beloved of women's magazines — animals, a strong medical interest, and a readily identifiable villain. It is a cause that appears to appeal to the most advanced sociologists and to those who detest change in any form, to old people of both sexes and to the revolting young of unidentifiable sex, to the silent majority and the screaming minority, to the young swingers and to the old danglers. The majority of respondents in a recent Louis Harris poll in the USA rated a clean environment more important than a satisfactory sex life (*Atlantic Monthly*, October 1990). No wonder, then, that some spokespersons for the developing countries have said to those from the developed countries: "you have enriched yourselves by rapacious exhaustion of scarce raw materials and polluting the environment, and now you want to stop the

⁵Recently there has been a reassessment of dioxin. In 1992, an independent panel of scientists concluded that dioxin was not a large-scale cancer threat, except to people exposed to unusually high levels. It is now regarded as only a moderate threat to human beings. It appears far less risky, for example, than asbestos, radon, nickel, coke, chromates, or smoking.



world and want us to get off. We shall worry about the environment when we have become as rich as you.”

Such reactions, perhaps less common today than a few years ago, are entirely understandable. It is generally true that the benefits of additional production and incomes are greater, the lower the income per head, and the harm done by pollution is less, the lower the level of industrialization, urbanization, and production. For this reason, it would be absurd to impose uniform environmental standards everywhere, irrespective of the level of development. But it is often cheaper to design processes that are low in destructive material discharges than to try later to modify these wastes and damages, once they have been generated. There is no reason why developing countries should not learn from the mistakes of the now advanced countries and avoid courses of action that they would later regret. It has been found that the additional costs attributable to environmental and health safeguards in non-environmental projects have ranged from 0 to 3 per cent of total project costs. Costs are lower the earlier the protective measures are added to the project design. Increasingly, these protective measures are being incorporated in the basic design of projects, such as emission controls for industrial plants. Prevention is much cheaper and more effective than cure. Sound watershed management, for example, which protects reservoirs from siltation and floods, costs much less than rehabilitation of a deforested, eroded watershed.

It remains true that the rich countries' consumption of energy is profligate. They enjoy spacious houses with high heating and cooling costs, and sprawling cities with roads clogged by two or three cars per family. The advanced countries produce about half of the 6 billion metric tons of greenhouse gases emitted each year, with only one-fifth of the world's population. This is, of course, a reflection of the very unequal distribution of wealth and income. Energy consumption in the developing countries is expected to grow at a rate of 5 per cent a year, from 2,000 million tons of oil equivalent (mte) today to over 3,000 by the end of the century. All countries will have to raise their energy efficiency and develop new and renewable sources of energy.



ECONOMIC GROWTH VERSUS ENVIRONMENT?

The problem of “growth versus the environment” is wrongly posed. Growth is simply the intertemporal dimension of any strategy. Production, consumption, poverty reduction, income redistribution, employment, environmental protection, must each have a time profile, and this may give rise to inter-temporal trade-offs. Economic growth is a side-effect, not the aim, of a rational economic policy. It could be that sustainable development calls for more, not less, growth. It certainly calls for differently composed growth. For, although zero growth is not an option (it requires resources to maintain capital and therefore only delays exhaustion), unless sustainable development is consciously pursued, zero or negative growth could well be the result.

With technology a given, four options should, theoretically, be considered. First, we may abstain from producing as much as we otherwise would, in order to reduce pollution and raw material exhaustion, which are closely linked to the pattern of production. We opt for fewer goods, in order to be saddled with fewer bads. Second, we devote resources that would have produced goods to produce products that combat pollution: more anti-bads. Whether this implies stepping up the rate of growth of national product, slowing it down, or changing its composition, depends on conventions of national income accounting. Much that is now counted as part of net national income should be deducted as intermediate production, as anti-bads, required to combat the bads produced in the course of generating the gross national product. There is something to be said for the foundation of a Society for the Promotion of Anti-Bads.

Third, we may step up the production of goods, notwithstanding the fact that they aggravate pollution, to a degree that compensates for the growth of pollution: more goods to make up for the growth of bads. Finally, we may produce different products, with different characteristics. These are not as attractive as those that would have been produced without regard to pollution, but with the compensating merit that they carry with them less pollution: goods that are not quite so “good,” but that generate also fewer “bads.” Cars may travel more slowly, but are also less polluting. Compared with these four options, zero growth, sometimes advocated,



would be not only a blunt but also ineffective instrument for achieving a sustainable environment.

In practice, it is normally much cheaper and more effective to take preventive action before the creation of bads than to compensate for their generation or to produce instruments to combat them. Just as it is easier to build distributional objectives into the growth process, or protection of the poor into the adjustment process *ab initio*, so it is more effective to build environmental objectives from the beginning into the direction and composition of growth.

In addition, there is much evidence that some previously polluting agents can be used profitably and harmlessly, so that no trade-off arises. It points to the existence of unexplored and unexploited profit opportunities, which can be seized as a result of environmental regulation. Effluents, previously discharged into rivers, have turned out to have commercial uses. When unexplored and unexploited profit opportunities are discovered, bads can be transformed into goods. This may require some expenditure on technical research. In other cases, cheap substitutes can be used to replace damaging substances. Du Pont, the world's largest producer of chlorofluorocarbons (CFCs), had discovered some equally cheap substitutes, which made the provisions of the Montreal Protocol of 1987 (signed by 57 countries), for the protection of the ozone layer (which protects us from certain types of cancer), acceptable. International Business Machines Corporation, America's largest source of CFC-113 emissions, had reduced its emissions in May 1991 by 95 per cent from the 1987 level. In the Ottawa Agreement of 1988 some industrial countries bound themselves to reduce the volume of CFC emissions by the end of the century to half the 1986 level.

The leading electronics companies have moved more rapidly than expected to phase out the use of industrial cleansers that damage the ozone layer. CFCs are used, in addition to air conditioners, refrigerators, and foam insulation, to clean circuit boards and sensitive electronic components. Now cheaper, more effective and less damaging alternatives have been discovered, including warm, soapy water (*The New York Times*, May 15, 1991). Some companies have developed circuit boards that need no cleaning at all.



Solvents used in the manufacture of pressure-sensitive tape were replaced with solventless raw materials, reducing 1,100 tonnes of solvent emissions and saving US\$1.5 million on one factory alone. On another tape-making line, an inert condensation type solvent recovery system recycles about 1 million kg of solvent previously emitted in the atmosphere at an annual saving of US\$750,000 in solvent, production, and energy costs. Modification of a plant boiler to burn high-hydrocarbon exhaust from a maker saved a million dollars in add-on pollution control and is likely to recover US\$270,000 of energy annually. Ammonium sulphite produced in reactors during the formulation of iron oxide, previously discharged through a waste water treatment plant into a river, is now concentrated in a vapour compression evaporator and sold as liquid fertilizer worth about US\$271,000 a year; savings in pollution control equipment totaled US\$1 million. Examples could be multiplied (Samstag, 1984).

Environmentalists claim that these discoveries have important implications for other environmental concerns, including the reduction of the use of fossil fuels, which contributes to global warming, the elimination of CFCs from aerosol cans, and the formulation of cleaner gasolines.

Michael Porter (1990) has argued that environmental regulations are entirely consistent with maintaining international competitiveness: countries with the most rigorous requirements often lead in exports of the affected products. The reason for this paradoxical conclusion is that regulations force companies to redesign their technology, to innovate, and to find new uses for waste products. The result in the medium to long term is often lower costs and improved product quality. Processes are adopted that lower the use of scarce or toxic resources and that recycle profitably previously wasted by-products.

Three types of questions have to be investigated: first, the relationship between differently composed rates of population growth and of income per head and the discharge of harmful substances; second, the relation between these substances and the physical environment; and third, the impact of these changes in the physical environment on the health and well-being of human beings, both now and in the future. The first is technical, the second physical, the third biological and physiological (Dorfman, 1991).



Having answered these three sets of factual questions, the problem becomes one of evaluating any remaining conflicts between higher incomes and environmental degradation and sharing fairly any sacrifices, either of the environment or of income, between the partners. Such fair sharing will involve compensation of poorer countries by richer ones for accepting measures of environmental protection that are either more costly or reduce the rate of growth. This can be done, for example, by issuing permits for emissions in excess of their needs to low-income countries, which they could sell to the high-income countries, who will want to use more permits than they have been initially allocated. A system of monitoring both the state of the environment, and individual countries' performance and discharges, will be needed, as well as mechanisms for penalizing offenders. UNEP now has a Global Environmental Monitoring System (GEMS), although it is grossly underfinanced.

There is now firm evidence available to answer the first question, that concerning the relation between income and certain types of pollution. The main conclusion is that urban sulphur dioxide concentrations and urban suspended particulate matter levels are lower per cubic metre in high-income cities than in low-income cities. It is also evident that these concentrations have been falling in high-income and middle-income cities over the last decade.



HUMAN, SUSTAINABLE DEVELOPMENT: POLICY ISSUES

There is some overlap with, but there are also important differences between, the environmental problems of poor and rich countries. Poverty has been one of the most important enemies of sustainable environment, and environmental degradation has reinforced poverty. As has already been said, the poor are both the cause and the principal victims of environmental degradation. To be freed from this vicious circle not only sustains the environment, but is above all beneficial for the human beings who live in it. The fundamental concern of the development effort is not with enlarging the choices of trees, but of humans. Deforestation and soil erosion as a result of the growing need for fuel wood; the spread of schistosomiasis or bilharzia from stagnant water reservoirs; the spread of



onchocerciasis or river blindness from running mountain streams; these are the environmental problems of poor rural people, caused by them and imposing suffering on them. The eradication of poverty will also remove these environmental threats, and their removal will contribute to the reduction of poverty.

The first lesson is that late industrial starters can learn from the mistakes of earlier starters. It is possible to avoid in the beginning the creation of the environmental damage that the advanced industrial countries have inflicted upon themselves, and the wasteful uses of energy that the Western style of industrialization has involved. Heavy dependence on oil supplies and being hooked on the motor car, can be avoided by more energy conservation and greater use of indigenous sources of energy. These would also contribute to greater self-reliance.

A second set of policy questions relates to the international location of dirty processes. Just as differences in factor endowments guide the allocation of resources according to comparative advantage, so differences in pollution costs should in principle guide international specialization of industry. The costs of pollution will tend to be lower in many developing countries, or at least in some areas (cities such as Cairo and Lagos are more polluted than London or Washington), and the benefits to be derived from industrial production will tend to be higher, because incomes are lower. This argument assumes that the benefits from higher incomes accrue to the poor. For both these reasons, a shift of some polluting activities from the industrial countries to the developing countries (and perhaps some trade in toxic waste) can be envisaged. The rule might be summed up by saying, "what some find grubby, others find groovy." But this has to be qualified in two respects. First, it is important to protect the poor in the developing countries, who are liable to be the chief victims of uncontrolled pollution. Second, as pointed out by John Williamson, the technical capacity of some developing countries may be much less capable of dealing with environmental damage.

A distinction should be drawn between local, regional, and global pollution. Global pollution includes the spread of persistent pesticide residues that can be carried far beyond national frontiers; the burning of fossil fuels, and the release of carbon dioxide, methane, nitrous oxides, and CFCs into the atmosphere that may lead to the greenhouse effect and



global warming, although some say it will usher in a new ice age; deforestation, especially in the tropical rain forests, which may upset the ecological balance and deplete genetic resources; the pollution of the oceans through oil spillage or dumping from ships; the pollution of air streams by jets; the destruction of the ozone layer through chlorofluorocarbons, which causes skin cancer, cataract, and other health problems; ultraviolet radiation that may lower the harvest of soybeans, the world's leading protein crop; chemical wastes that seep downwards to poison ground water and upwards to destroy the atmosphere's delicate balance; acid rain that ruins forests; and so on.

Regional pollution arises from the geophysical linkages between several countries, such as river pollution, desertification, and regional air pollution. Deforestation in the Himalayas causes flooding in Bangladesh. DDT is banned in the USA, yet it is found in the mud of Lake Siskiwit near Lake Superior, carried by the wind. Acid rain, sulphur dioxide emitted from US coal-fired power plants, is carried to Canadian forests.

Local pollution is confined within national boundaries, such as the eutrophication of a lake from fertilizer or sewage discharge. It would be legitimate for a country to restrict activities and products that would affect it and that result from another country's activities, but such restrictions must not be used as a pretext for protectionism by the industrial countries, where the pollution is purely local and remains confined to the area of production in the developing country. Taxes imposed by industrial countries on their pollution-intensive activities can be used by them as an excuse to exclude imports from countries that can conduct these activities at lower social costs without harm to the importing country. The "sweated environment" argument for protection is as fallacious as the "sweated labour" argument. The international free trade unions are misguided (or act in the interest of rich country trade unions) insisting on the same environmental standards for all countries, so as not to give an "unfair" advantage to poor countries. Local environmental problems are also presented by traffic congestion in cities, pollution of beaches and along coast lines, and suburban sprawl.

A third set of policy questions relates to the return to the use of some natural products that had been hit by the invention of synthetics, but in the production of which the costs of pollution had not been allowed for.



Pyrethrum against DDT is one example; natural fibres against synthetic fibres, another. Some of these natural products have the advantage not only of being free from pollution, but also of being efficiently labour-intensive (often female labour-intensive) and contributing to rural development, and therefore to employment and reduced rural-urban migration.

A fourth set of questions concerns the actions developing countries should take in the face of growing scarcity of non-renewable natural resources. Many of these have not been priced according to their scarcity, taking into account a proper social discount rate and risk premium. A correct pricing policy would provide incentives for more economical use of these products, for switching to products that use less of these materials or none, for a search for new sources of these materials, and for the development of substitutes. Meanwhile, the higher revenue earned by the material-exporting developing countries should be used for diversification and development, while developing countries dependent on their imports but without corresponding high-priced exports should be insured against damage from higher prices.

Economists have a bias in favour of using prices to reduce pollution and raw material exhaustion. Non-economists object to using taxes to discourage damaging activities and to granting “licences to pollute” and licences to despoil. The differences rest upon attaching different moral evaluations to different things. People value the opportunity to express disapproval, which would not be reflected in a fine balance of benefits and costs. Licences are normally not given for activities that should be stamped as illegitimate. (But licences are given to carry guns in the USA.) Putting a price tag on a highly valued item demeans it. The opponents of price policies may also think that the motive makes a difference, whereas taxes are indifferent to motives.⁶

⁶In his review of Steven Kelman’s book *What price incentives? Economists and the Environment*, in *Journal of Economic Literature*, Vol. XX (Sept. 1982), pp. 1105–1106, W. J. Baumol replies to the possible view of economists that these ways of thinking are irrational: “But, as Kelman asks, is it irrational to distinguish between manslaughter and murder? After all, the victim is equally dead in both cases! He cites Justice Holmes’ telling aphorism ‘even a dog distinguishes between being stumbled over and being kicked’.”



But it is not enough to estimate the possibility of exhaustion and to attach a price to these materials, allowing for time and uncertainty; what is also needed is coordinated action between the developing countries in which these non-renewable materials are to be found. Incentives, both rewards and penalties, are required to secure joint action, and agreement on rules about how increases in revenue derived from joint scarcity pricing should be shared and used for development. In particular, ways should be found to mitigate or prevent harm being done to developing countries that depend on the imports of these materials.

A fifth set of questions concerns the role of transnational companies in environmental policy. In the new international division of labour, which would be guided by differential pollution costs in different countries, the location of certain “dirty” processes in developing countries could be one of the functions of the transnational corporation. This could be done either by the firm locating certain “dirty” processes within its vertically integrated system of operations in a developing country where the social costs of pollution are lower and the benefits from industrialization higher, or by transferring the whole integrated operation to such a country. The argument would be analogous to that of locating unskilled or semi-skilled labour-intensive processes and products in developing countries. One important advantage is that the transnational corporation will act as a pressure group to ensure access for the products to the markets of the developed countries, which might otherwise put up protectionist barriers under the pretext of environmental protection.



GLOBAL INSTITUTIONS FOR SUSTAINABLE DEVELOPMENT

The problems of the local environment are different from those of the global. Common property rights to a local pond or grazing area are often respected, and behaviour has evolved that prevents their destruction. Not so for the global commons. Our present interdependent, pluralistic, multi-polar world is less stable, and more in need of the promotion of peace, prosperity, conservation, and global leadership than past orders, in which a single dominant power has assumed these responsibilities. No single power is both able and willing to assume these functions today. Although



this can be a danger, it also presents us for the first time in history with the opportunity to create a world order based not on dominance and dependence, but on equality, pluralism, and cooperation. This calls for the exercise of our creative institutional imagination and for sacrifices of national sovereignty.

We are suffering from a lag of institutions behind technology. The revolutions in the technologies of transport, travel, communications, and information have unified and shrunk the globe, but the organization of the world into nation states dates back to the Peace of Westphalia in 1648, to the 19th century unifications of Germany and Italy, and the post-First World War creation of new nation states. When the nation states were founded, the city states and the feudalism that preceded them had become too small for the scale of operations required by the Industrial Revolution. The political institution therefore was adapted to the new industrial technology, to the roads, railways, and canals. The nation state was then a progressive institution. But technological determinism is not plausible. The adaptation of institutions to technology is not an inevitable process. The Middle Ages had, for example, lost the Roman technology about roads, baths, aqueducts, and amphitheatres, and these were allowed to fall into disrepair. But now the nation state, with its insistence on full sovereignty, has become an obstacle to further progress. It has landed us in several "Prisoners' Dilemmas": each nation acts in its rational self-interest, and the result is that every country is worse off. It pays each nation to pursue this mutually destructive course, whether others do likewise or not.

I shall not discuss the desirability or the feasibility of a world government. If it ever were to come about, it would probably be the result of a trend we are already beginning to observe. Common interests and conflicts are running nowadays across national boundaries. The European farmers are in conflict with the European industrialists and the public that has to pay for the Common Agricultural Policy. The advanced countries' textile manufacturers are aligned in the Multifibre Arrangement against Third World textile exporters and the consumers in industrial countries. US industrial interests are aligned with Third World debtors in wishing interest rates to be low, against its financial interests, who prefer high interest rates. Industrial countries' bankers are aligned with developing countries' exporters, against the protectionist lobbies of those who fear



imports. The nation state may become the inappropriate level at which such issues can be resolved.

Clearly, Prisoners' Dilemma outcomes move the world economy away from a more to a less efficient allocation of resources. There exist, therefore, potential gains, by moving back to more efficient allocations. According to Coase's Theorem, in the absence of transaction costs and in the presence of well specified property rights, a legal framework, and full information, if one country inflicts damages on another which are greater than the benefits to the first country, the injured country will enter into a contract with the injuring country and compensate it for not inflicting the injury, and still be better off. Or, if the benefits are greater than the damage, the injuring country can compensate the injured country for accepting the damage, and still be better off than it would have been, had it been prevented from inflicting the damage. For example, the US emits acid rain to Canada. Canada could then offer compensation to the US for relinquishing the emission of sulphur dioxide, the chief component in acid rain, and still be better off than it would be in accepting the acid rain; or the US could offer compensation to Canada for accepting the acid rain and still be better off than it would be if it had to clean up the mess and stop the emission. But as we all know to our regret, we are far away from outcomes according to Coase's Theorem, although we are not always at the other end of the spectrum, the Prisoners' Dilemma. Coase's Theorem remains useful, in spite of its unrealistic assumptions, in drawing our attention to the fact that there are unexploited mutual profit opportunities from restraint. Obviously compensation ought not always, or even often, to be paid. The losers, such as the English landlords after the repeal of the Corn Laws in 1846, may not deserve to be compensated; or, even if they do deserve it, the costs of imposing taxes to finance the compensation may be so large as to make the compensation uneconomic. But the fact that it could be paid draws our attention to potential unexploited gains.

Add to the Prisoners' Dilemma the Free Rider Effect, according to which each country relies on others to bear the costs of arrangements that benefit everybody. As a result, public goods, such as peace, an open trading system (including freedom of the seas), well-defined property rights, standards of weights and measures, international stability, a working monetary system, or conservation of the global environment, are undersupplied, while public



bad, such as wars, pollution, raw material exhaustion, and poverty, are oversupplied. The situation has been described in parables and similes such as the Tragedy of the Commons, Social Traps, the Isolation Paradox, etc. Everybody free rides, and thereby ensures that there is no horse. These parables contradict the parable of the Invisible Hand, according to which the pursuit of self-interest by each individual promotes the good of all.

The ranking of preferences by each country is the following:

- 1) My country does not contribute while others do. (Free rider, defection of one.)
- 2) My country contributes together with others. (Cooperation.)
- 3) No country contributes. (Prisoners' Dilemma outcome.)
- 4) My country contributes while no other country does. (Sucker.)

Behaviour by each according to 1, or the fear of 4, leads to outcome 3. Although 2 is preferred to 3, we end up with 3, unless either rewards and penalties, or autonomous cooperative motivations, lead to 2. Incentives and expectations must be such as to rule out outcomes 4 and 1, so that if I (or you) contribute, I will not end up a sucker. In the absence of such motivations, the result is that peace, monetary stability, an open world economy, environmental protection, debt relief, raw material conservation, poverty reduction, and world development will be undersupplied.

It has been shown that iterative games of the Prisoners' Dilemma type lead to non-destructive outcomes. The partners learn and adopt mutually beneficial strategies. It has already been shown that we find ourselves between the two extremes of Prisoners' Dilemmas and Coase's outcomes. For several reasons it is harder to reach cooperative agreements in international transactions than in others. There are now many states, and large numbers make agreements more difficult. We do not have a world government that could enforce agreements. Change is rapid, which undermines the basis of stability on which agreements are based. The absence of a hegemonic power also removes the sanctions against breaking the agreement. And all these factors prevent the trust from being built up, which is an essential prerequisite for international agreements.

Examples of Prisoners' Dilemmas on the global scale are ubiquitous. Above all there is the arms race, which, though we have so far avoided a



major nuclear war, has contributed to hundreds of minor wars, mostly in the Third World, but also in the heartland of Europe. Then there is competitive protectionism, through which each country casts its employment problem onto others. Competitive exchange rate movements; research and development wars; investment wars; environmental pollution; the killing of whales; and the debt crisis are only some of the areas in which these battles are fought.

To avoid these traps, coordination and enforcement of policies are needed. But coordination means that each country has to do things it does not want to do. The US has to balance its budget in order to lower world interest rates; Germany has to grow faster, but she does not want to suck in guest workers from Turkey and Yugoslavia; many say Japan should import more, but she does not want to hurt her domestic industries. And so on.

Even Mrs. Thatcher, a powerful advocate of free markets and state minimalism, in a speech to the United Nations in New York on November 8, 1989, had come to recognize that in order to avoid global warming and coastal flooding, countries that emit carbon dioxide and other gases that trap heat in the atmosphere would have to act together, that restrictions would have to be obligatory, and their application would have to be carefully monitored. Any one country acting by itself would be at a competitive disadvantage by having to incur the higher costs of protecting the environment (*New York Times*, Nov. 9, 1989).



A GLOBAL ENVIRONMENTAL PROTECTION AGENCY

Just as in an uncoordinated world each country has an incentive to pour its problem of unemployment, metaphorically, into the yards of others, so does it, literally, cast its muck into the neighbouring fields or into the oceans, the lakes, the atmosphere, the land, or the food chains which are the global commons. Acid rain that kills forests, the emission of chlorofluorocarbons that destroy the ozone layer, the global warming resulting from the burning of fossil fuels, overfishing in common waters, are examples of global abuse that can be stopped only by global agreements that limit national sovereignty.



The domestic environmental problems of rich countries are often in conflict with poverty reduction in developing countries, while the domestic environmental problems of poor countries both arise from, and contribute to, poverty. But the global environmental problems are shared by the whole of humanity and call for global solutions.

The solution to mutually destructive actions pursued by each country separately is the establishment of a global environmental protection agency, with powers of enforcement. Each country, by sacrificing some of its national sovereignty, gains more in the pursuit of its national interests than it would have done, had it continued to act independently.

Such an agency would require substantial finance and powers. A tiny step in this direction was taken in November 1990. Twenty-five industrial and developing countries agreed to establish a Global Environmental Facility (GEF), which is run jointly by the World Bank, the United Nations Development Programme (UNDP), and the United Nations Environment Programme (UNEP). It started off on a trial basis in 1991 with a fund of about US\$1.3 billion. A little progress was made at the Rio United Nations Conference on the Environment and Development in June 1992, which gave strong verbal support to the Facility. In March 1994, developed countries announced a pledge of US\$2 billion financial aid until 1997 to replenish a new and restructured version of GEF. Compare this sum to the US\$ 70 billion that the UN said was needed for environmental purposes, and with the US\$ 125 billion each year between 1993 and 2000 recommended in Agenda 21.

Initially, modest resources will be devoted to providing help in financing programmes and projects that affect the global environment. Four areas have been selected for the operations of the Facility.

- 1) *Protecting the ozone layer.* The GEF's work will be coordinated with the implementation of the Montreal Protocol to phase out the use of CFCs, halons, and other harmful gases.
- 2) *Limiting greenhouse gas emissions.* The emission of carbon dioxide, CFCs, and methane will be limited, the adoption of cleaner technologies and fuels will be encouraged, as well as reforestation and forestry conservation.



- 3) *Protecting biodiversity.* The diversity of species contributes to materials for medicines and industrial products, genetic resources for food production, and the regulation of climatic and rainfall patterns.
- 4) *Protecting global water resources.* The Facility will support programmes that encourage planning against oil spills; to abate water pollution, to prevent and clean up toxic waste pollution along major rivers and to conserve water bodies.

Developing countries with GNP per head of less than US\$4,000 will be eligible for GEF funding for investment projects and supporting services.

In 1992, the Ministers of 93 countries reviewed in Copenhagen the progress made under the 1986 Montreal Protocol on the ozone layer. They took three big decisions: to set up a fund to help poor countries; to tighten the timetable to phase out CFCs (by the end of 1995); and to add two new substances to the list of restricted chemicals.

Since then, negotiations have continued. Two treaties were signed in Rio by most countries present: one to reduce the emission of greenhouse gases, the other to protect biological diversity. Both have been ratified by enough countries to come into effect. Vague talk about a climate treaty continue. The treaty on biological diversity suffers from disagreement among its signatories as to what problems it can help to solve. Meanwhile, deserts, wildlife, climate, industry, and governments go on much as before.

The initial steps towards a Global Environmental Protection Agency should be on very specific issues, such as the Montreal Protocol or the International Whaling Commission. A sharp and narrow focus in the early stages will prevent endless discussion, frustration, and acrimony. But the problems of primary concern to the poor people in the developing countries — clean air in the towns, access to safe water and sanitation, the prevention of soil erosion and deforestation, and population control — are not touched by the Facility. From the point of view of these concerns, the Rio conference was a failure.

Can one conclude as much about Barbados 1994? For small island territories, tangible outcomes of this conference include the setting up of an information network (SIDS/NET) and of a technical assistance



programme (SIDS/TAP). But such projects are a long way from meeting the fundamental, environmental, and development needs of these locations, even if they were adequately financed, which they are not.

Would Barbados '94 turn out to be another sad, one-off exercise in conference tourism? Never before has so large and important an international forum as the Barbados conference been devoted to small island affairs. This may be, in itself, an impressive achievement. But the substantive measure of success lies elsewhere. The integrated management of fresh water and coastal zone ecosystems of small island developing countries, the control of those land- or marine-based sources of pollution that degrade those waters, and the generation of an indigenous human resource capacity to manage both of these ... these have been pronounced as the hopeful, tangible spinoffs of Barbados '94. These three key policies are also the officially espoused priorities of the GEF's current operational strategy. Yet, unless such a strategy is fast deployed by concerted international action, environmental degradation for small islands may result in irreversible, serious, and extensive damage. The small and beautiful will be the first to cross the threshold of environmental non-return. So much for the taste of paradise. For some islands, it may already be too late.



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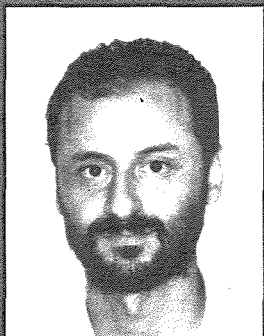
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COMPETING STRATEGIES OF SOCIO-ECONOMIC DEVELOPMENT FOR SMALL ISLANDS

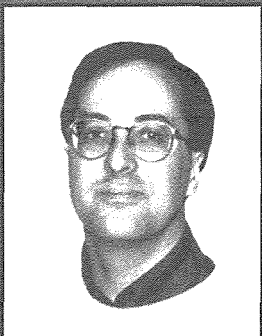
Competing Strategies of Socio-Economic Development for Small Islands outlines development strategies for small islands within increasingly integrated regional and global economies. Islands provide intriguing lessons in the culture, economics, and management of a sustainable pattern of development based on locally proven, home-grown "good sense," far removed from continental "best practices."

This volume considers two broad frameworks for critiquing small island economic development: *internal economic organization and resource management* and *external integration and dependent development*. Case studies focus on the disparate experiences of the Azores, Cape Breton, the Isle of Man, Jersey, Malta, Newfoundland, Prince Edward Island, and the Shetland and Orkney Islands in crafting innovative development approaches. These seek to maximize, on one hand, the competitive advantage afforded by exploitable resources, and, on the other, the delicate mechanics of relating to larger, national, or supranational entities. Four other papers by scholars of international repute and a seminal editorial introduction provide a broad overview of key topical debates.

This collection of essays is a result of the international conference, "An Island Living: Patterns of Autonomy and Dependence in the Small Islands of the North Atlantic," convened at Brackley Beach, Prince Edward Island, in September 1992. Fifty-two participants exchanged views on the social, political, and economic challenges facing twenty-four small island territories. This book, Volume 2 in the Island Living Series, consists of sixteen papers, thirteen of which were originally presented at the Conference and have subsequently been edited and updated.



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