

Corporate Strategies toward Sustainability

Nazli Choucri

1. INTRODUCTION: CORPORATE ACTORS IN A GLOBAL SYSTEM

The rapid growth in the global economy since World War II has created unprecedented alterations in ways of doing business. New environmental factors generate new challenges for corporate activities, shaping new constraints as well as new opportunities. Today, firms operating across sovereign borders are confronted with a new challenge: how to evaluate and respond to emerging environmentalism. What about the issue of sustainability? What can corporations do, if anything, to protect their market positions? What can they do, if anything, to meet the growing demand for “sustainable development”?

The purpose of this paper is to highlight challenges and opportunities for corporate strategy and to outline alternative corporate responses and contributions to growing concerns about the environment and sustainability.

Environmentalism and Sustainability

There are at least three definitions of environmentalism: (a) a political belief shaping political action; (b) a new “theory” influencing economic policy; and (c) a significant factor in investment decisions and business practices.¹ To confound matters further, there are emergent linkages in theory and in practice between, on the one hand, environmentalism (in all three definitions), and on the other, the international community’s endorsement of sustainable development as a global goal for all states, both developed and developing.

Ambiguities of definition aside, almost everyone agrees that some form of “sustainability” must be devised for the peoples of this world in all political entities everywhere. Debates about “sustainability”, however, have not yet entered the domain of corporate strategy. Indeed, the notion of “sustainable corporate activity” remains beyond the pale in most executive boardrooms.

From a global perspective, however, corporations are increasingly (and perhaps inadvertently) positioned in a proverbial “catch 22” situation. On the one hand, private firms of all scale and scope are acknowledged to be the major procurers, consumers and polluters in the world’s economic structure. On the other hand, they

¹Nazli Choucri, “Environmentalism”, in J. Krieger (ed.), *Oxford Companion to Politics of the World* (Oxford University Press, New York, 1993).

are almost universally regarded as the source of technological innovation, adaptation and hence "solutions" to the world's environmental problems. This dual role may well be placing new pressures on the design of viable corporate strategy in a changing world order.

Undoubtedly one of the most significant organizational innovations in cross-border business is the practice of intra-firm accounting and intra-firm transfers. Such institutional practices enhance efficiency, to be sure, but they also impede transparency. The growing environmentalism is in itself a new source of pressure not only for increased transparency, but also for increased corporate liability for environmental harm.

The Strategic Dilemma

From the perspective of emergent international law on the environment – and linkages to the imperatives of sustainable development – the strategic dilemma is this: how to manage in fair and equitable ways the interactions between private stakeholders and sovereign states. The dilemma is all the more pressing in light of the growing corporate liability for cross-border environmental dislocation.

If a firm is to compete effectively in an increasingly competitive global market, it cannot misread the signals of growing environmentalism and proceed to conduct business as usual. But, while governments, public interest groups and international organizations are searching for institutional innovation and adaptation in that area, global corporations – with few exceptions – have generally failed to develop a strategy for dealing with the changing business environment due to the emergent environmentalism.

From a corporate perspective, the fundamental issue in both the short and the long runs is to find the best means of ensuring the sustainability of profit and performance in a changing world order. While the proverbial "bottom line" is most surely profitability, sustainability is an essential requisite for survival. And survival is necessary before profit can be pursued.

2. ENVIRONMENT AND SUSTAINABILITY: DUAL CHALLENGES FOR CORPORATE STRATEGY

Evidence on the Environment

Industrial activity anywhere and of every sort has the inevitable consequence of generating effluents of various types. While precise inferences cannot be made, the evidence so far suggests some broad patterns with respect to empirical impacts of corporate activities worldwide.²

First, there are notable differences between sources of process pollution and those of producer pollution – each with distinct patterns, agents and effects. Problems related to process pollution are generated by the chemical, iron and steel,

²See Nazli Choucri, "Multinational Corporations and the Global Environment", in N. Choucri (ed.), *Global Accord: Environmental Challenges and International Responses* (MIT Press, Cambridge, MA, 1993), pp. 205–54.

petroleum, and pulp and paper industries, among others. Product polluters are most highly concentrated in the agricultural sector, and the automotive and tobacco industries, among others.

Second, while there is clearly a shift of location away from industrialized countries and toward developing countries, these shifts cannot be attributed solely or even largely to differences in environmental regulation. Relocation of corporate activities cannot be explained on environmental grounds alone.

Third, by extension, it seems apparent that shifts in the location of corporate activities worldwide – from more to less developed countries – can notably be attributed to policies of site exclusion rather than to the differences in environmental regulation. Economic activities have tended to shift away from densely populated regions in industrialized countries to other areas of the world.

Fourth, based on these trends, it appears that the greater the exclusion based on site characteristics, the greater is the likelihood that industries will relocate “elsewhere”. In essence, some form of global “zoning” may be taking shape, driven more by the policies of industrialized countries and those of developing countries (but not necessarily on environmental issues).

Finally, there are no consistent patterns indicating where that “elsewhere” is likely to be, other than away from densely populated centres in industrialized countries.

Environmental Investments

Traditionally, multinational corporations have shown little operational environmental responsiveness, defined in terms of pollution abatement expenditures. Evidence suggests that throughout the 1970s and 1980s, expenditures on pollution abatement averaged about 0.01 per cent of capital spending, taking into account pollution expenditures in both domestic and foreign operations.³ By the end of the 1980s and into the early 1990s, the trend showed an increase in pollution abatement expenditures. Most industries showed an upward trend in investments in pollution control; but in some there was evidence of a decline. The reasons for this decline are not readily discernible. It might be that capital equipment, upgraded in earlier years, did not require continued upgrading; or it might reflect expansion in other parts of the operation relative to investments in pollution control.

In the United States, for all manufacturing, pollution control expenditures were 7.5 per cent of capital spending, and for all businesses 2.1 per cent (1989–90). Differentiating pollution control expenditures by medium (air, water and solid waste) there was a consistent (but small) upward trend between 1988 and 1990, generally less than 1 per cent. In a few industries this increase was approximately 5 per cent, and in only one case was there an increase greater than 7 per cent (for blast furnaces in steel works 1989, to reduce levels of airborne pollution).⁴

In short, investment in pollution control remains a marginal item. Even if that were the only indicator of corporate responsiveness to environmentalism – which it is not – then we could infer that there has been marginal responsiveness to date.

³*Ibid.*, adapted from pp. 212–15.

⁴*Ibid.*, see pp. 216–17.

Environmental Legislation and Treaty-making

Contentions between private stakeholders and public interests often come to a head in the framing of national legislation. Environmental legislation has taken an upward turn in almost all parts of the world, although at different levels (local, regional, national) and at different rates.

The United States has one of the longest and most comprehensive records of environmental legislation, beginning with regulation of large-scale public works in the 1890s. The earliest instances of legislation focused on regulating interventions in nature; later legislation appeared to be broader in scope. Over the decades, a major policy thrust has been that of "pollution prevention". With varying success, the intent of the 1969 National Environmental Policy Act, which framed that policy, was to encourage initiatives to prevent damage before it happened. Over time, however, the scale and scope of environmental degradation called for extensive commitments of funds for "clean up". With the Superfund legislation and amendments, the funding for "clean up" assumed extensive proportions.⁵

Trends in environmentalism at the national level are converging to generate a global pattern reflected in multilateral treaty-making. It reflects the formal sovereign commitment to environmental management. Issues of enforcement, compliance and implementation emerge subsequently; here only sovereign intent is indicated.⁶

There are at least two other factors to be considered, namely, the "environmental voter" and the "environmental consumer". From a corporate perspective these two factors contribute to increased pressures for transparency and for the "full disclosure" of business activities.

The "Environmental Voter"

In countries with participatory politics, voters are expressing their environmental sensitivity through the ballot box. In the United States, for example, one indicator of this trend is the increase in the number of issues on the environment that are placed on the ballot at the state level. Voters are beginning to define "ballots", "referenda" and "propositions" as political instruments for voting on their environmental beliefs.

Such trends are emerging at different rates in different countries. Environmental degradation in Eastern Europe, for example, is believed by some to have accelerated the demise of communism. The scale and scope of the subsequent clean-up effort required was as unexpected as it was astounding. As another example, "green" votes in Germany have pressed the government to address environmental issues, influencing the "eco-labelling" legislation. *Eco-emballage* in France may also be viewed as a means of voter mobilization. The Norwegian government's directives for placing limits on carbon emissions, despite opposition from industry,

⁵At each stage the "take" of the legal profession expanded commensurately, creating the basis for a public backlash to limit legal fees associated with Superfund activities.

⁶See also Peter M. Haas with Jan Sundgren, "Evolving International Environmental Law", in Choucri, *op.cit.*, note 2, pp. 401-30.

also reflect this general trend. The relevant point is that business can no longer count on the anonymity of the market place. Environmental scrutiny appears to have acquired a momentum of its own.

The “Environmental Consumer”

Trends in environmental voting are led by environmental sensitivity in consumer behaviour. We can anticipate a convergence on environmentalism between consumer behaviour and voting behaviour. The environmentally sensitive consumer will have staying power and will show increased sophistication in evaluating the cost factors in being environmentally responsible. The sensitivity of the consumer will translate into more political action as consumers improve their use of the political process for expressing their “environmentalism”.⁷

Since environmental costs are being passed on to the consumers, rather than being borne strictly by business, consumers are responding by demanding changes in “business as usual” and are pressing for greater environmentalism in products and processes “at source”.⁸

There is every reason to believe that the international community is likely to negotiate and adopt more agreements on environmental management. Already the post-UNCED round of initiatives is taking shape, and the agenda of the UN Commission on Sustainable Development further reflects the growing sovereign commitment to global environmental management.

The Global Dilemma for Business and Industry

From a corporate perspective, the problems posed by environmental voters and consumers can be summed up in two simple equations:⁹

The environmental legislation equation is as follows:

Environmental degradation + Growing environmental ethos + Precedents of payments to the victims of pollution = More regulation and legislation on the environment

The corporate environment equation is analogous:

Consumer protection legislation + Growing environmental ethos + Precedents of liability for environmental damage = Increased liability costs and increased uncertainty

The fact that these equations have shared elements in themselves reinforces their robustness and makes it all the more difficult for business to bypass them. That environmentalism at the national level seems to be supported by sovereign

⁷Nazli Choucri, “Environmentalism and the Grocery Industry: What Next?”, prepared for the 1993 Food Marketing Institute/Grocery Manufacturers of America Environmental Affairs Conference, Washington, DC, 22 March 1993, revised as “Environmentalism and the Food Distribution Industry: What Next?”, Massachusetts Institute of Technology, Center for International Studies, Working Paper Series on the Political Economy of the Global Environment and Energy.

⁸Nazli Choucri and Jan Sundgren, “Toward Sustainable Consumption”, prepared for the Environment Directorate, Organization for Economic Cooperation and Development, Paris, January 1994.

⁹Nazli Choucri, “Introduction”, *Proceedings of the Symposium on Global Environmental Accords: Implications for Technology, Industry, and International Relations*, Massachusetts Institute of Technology, Cambridge, MA, 24–25 September 1992.

commitments at the global level may well create something of a "level playing field" for global business. We are likely to see more, rather than less, regulation of private activities at all levels. Multinational firms as well as national, state and local enterprises will be faced with increased pressure to comply with environmental regulation and legislation.

From a corporate perspective, too, these factors are generating a profound dilemma: How can global firms retain a competitive edge in an increasingly level playing field? All of this translates into new pressures on corporate strategy.

3. EMERGENT PRESSURES ON CORPORATE PERFORMANCE: CONSTRAINTS AND OPPORTUNITIES

The "Demand" for Sustainable Development

With the formation of the UN Commission on Sustainable Development and the commensurate institutional innovations at the national level in many parts of the world, the term "sustainable development" has been moved from the realm of ideas to that of action. Despite ambiguities about the precise meaning (and measurement) of that concept, the imperative of sustainability appears to have taken hold at both corporate and sovereign levels. For all practical purposes, the international community has articulated a "demand" for sustainable development, leaving policy-makers, analysts and practitioners everywhere with the daunting task of filling in the details of strategy and policy.¹⁰

From a corporate perspective this "demand" poses challenges and imposes considerable pressures for greater transparency in business actions and transactions. Paradoxically, it also provides a remarkable opportunity for the corporate community to do what it does best, namely, innovation, creativity, adaptation to new conditions and shaping new markets and new production possibilities.

On a worldwide basis it appears that environment-related industry is expected to become the largest segment of the economy. The international market for environment-related products and processes is valued at roughly US\$280 billion per year and is expected to double within the decade. The fact that there is good business in environmentalism means that this trend must be taken especially seriously in the global marketplace.¹¹

New Opportunities for Corporate Creativity

Changing conditions can also provide new opportunities for industry. This includes new ways of "doing things" as well as new ways of drawing the consumer into the process by using industry's "goodwill" to facilitate the practice of environmental responsiveness. Some industries have taken the initiative by setting their own environmental goals and factoring them into their strategic plans. Some notable initiatives have already been taken:¹²

¹⁰UN Conference on Environment and Development, Agenda 21, Rio Declaration, Forest Principles.

¹¹*Op. cit.*, note 7.

¹²Adapted from Stephan Schmidheiny (ed.), *Changing Course: A Global Business Perspective on Development and the Environment* (MIT Press, Cambridge, MA, 1992).

- (a) In 1990 Monsanto set a goal of cutting air emissions of a class of hazardous chemicals by 90 per cent by 1992. This was viewed as an impossible task, but by 1991 they had gone well toward meeting that goal.
- (b) Dow Chemical's Waste Reduction Always Pays (WRAP) programme rewards employees for work on waste reduction projects.
- (c) Wakefern Food Corporation's establishment of their own natural gas fuelling stations to power their natural gas vehicles is a bold initiative designed to cut automobile emissions.
- (d) The 33/50 programme of the US Environmental Protection Agency is to support self-regulation in US business. The target is 600 companies; the goal is a 50 per cent reduction of levels of seventeen toxic waste pollutants by 1995.
- (e) Japanese industry has supported the government's "New Earth 21" programme to address global warming by focusing on new technologies that reduce the country's dependence on fossil fuels.
- (f) The 3M Company's pollution prevention policy (3P), established in 1975, reduced air pollutants, wastewater generation and solid wastes, saving the company about US\$500 million in the process.
- (g) Henkel, a German consumer products firm and speciality chemical company, has introduced phosphate-free detergents.
- (h) Novo-Nordisk in Denmark illustrates the development of new waste-exchange systems across industries for the reuse of waste, i.e. the use of nitrogen wastes for fertilizer production.
- (i) Proctor and Gamble demonstrates leadership in the use of life-cycle analysis for comparing the environmental performance of different products.
- (j) ENI, an Italian concern, has developed a chemical replacement for lead in gasoline through synthesis of a new chemical product (MTBE).

The basic thrust of these initiatives is toward "life-cycle" analysis and policy, taking an overall view of environmental factors related to products, processes, distribution and disposal.

The "Hidden Hand": Changing Liability Conditions

The creative responses noted above have been motivated largely by the need for corporate responses to changing market conditions. Concurrently, however, there has been increased evidence of corporate liability for environmental harm. Dramatic incidents such as that of the *Exxon Valdez* in the United States, preceded by the earlier Bhopal accident, are among the largest and most visible of these incidents. Less dramatic are the numerous regular liability incidents that cumulatively are serving as a "hidden hand", placing corporate activities under increasing public scrutiny. The net effect to date has been to place global business in a defensive position. The corporate environment equation referred to above aptly sums up the issue at hand.

In a broader global context it is now apparent that the international community has begun to frame a set of principles for the conduct of business worldwide. Together they can be viewed as the other side of the "hidden hand". These are principles reflecting new norms that global business will be increasingly called upon to uphold.

New Principles for Business

The emergence of these principles – somewhere in the moral and policy spaces relating to norms, rules, regulations and law – can be traced in large part to the preparations for UNCED 1992 and to some of the earlier notions consolidated at the regional level. Indeed, international norms and laws are part of the process of adjustments to changing global conditions. These new business principles include:

- (a) best practice: use best available technologies and processes;
- (b) pollution prevention: prevent the generation of pollution before it happens;
- (c) the polluter-pays principle (PPP): polluters should pay the full cost of environmental damage caused by the production of goods and services;
- (d) the precautionary principle: assume the worst and act with caution (consistent with the above principles);
- (e) full-cost pricing: take into account production costs plus the full cost of related damage to the environment;
- (f) eco-efficiency: economic efficiency alone is not sufficient and practices of efficiency on environmental grounds must be developed;
- (g) eco-labelling: a practical application of and a guideline to the above, among others; norms and procedures for eco-labelling are developing worldwide, despite confusion and sometimes conflicting signals;
- (h) compliance and reporting: businesses should measure their performance with respect to the environment; and
- (i) common but differentiated responsibility: recognize a “global partnership” among countries and assign some accountability to the industrialized countries since they both “created” the problems and have access to mechanisms for “solutions”.

While most of these principles do not have the force of law, they are powerful norms that are shaping new regulations. The international community as a whole is intent on responding more rapidly to environmental problems. Together, the combined effects of corporate creativity, the “hidden hand”, and the new principles for business may be altering in profound ways the conventional parameters for the conduct of the corporate community worldwide. If these factors contribute to the “level playing-field”, then corporate advantage must be found along new dimensions.

4. CORPORATE STRATEGY FOR THE TWENTY-FIRST CENTURY: IMPERATIVES AND OPTIONS

The Crucial Imperatives

Whatever the specific priorities might be for a particular corporation in a particular business or industry, there are four basic imperatives that all firms, everywhere and at all times, must consider as they define corporate strategy for the twenty-first century:

- (a) **Profitability:** to ensure to shareholders (private and public) that the operations are financially sound and that undue risks are not to be taken that might jeopardize the financial or legal integrity of the firm.

- (b) **Responsibility:** to reflect both to shareholders and to employees that the firm's mission and its operations are consistent with basic ethical values and with the global community's evolving sense of moral, political and strategic responsibility.
- (c) **Adaptation:** to develop and maintain the capability for adapting to a changing corporate culture as it might evolve in the business at hand, and to demonstrate receptivity to new information about changing market conditions.
- (d) **Innovation:** to retain, and expand wherever possible, the capability for innovation in significant aspects of the operation and to develop the capability for "leapfrogging" with respect to new ideas, products and processes that might affect future profitability.

These strategic imperatives are generic, in the sense that they must be pursued above all else. This also means that the corporate community must first tend to these crucial imperatives, and then – only then – can it be effective in responding to the demand for sustainable development.

Responding to the "Demand" for Sustainability

The corporate community tends to respond to this "demand" in at least three ways. The first is to "do nothing and hope for the best", i.e. "business as usual". This is a strategy of accumulating risks but postponing the costs. Given the growing environmentalism worldwide, these costs will eventually have to be met. Since risks are accumulated, they grow, and the costs of any "solutions" then would be greater than they are at present. It is also a strategy that makes the industry hostage to the growth of environmentalism and vulnerable to the "hidden hand" of liability.

The second is to respond to new signals, consumer demands and legislative and regulative trends as they emerge, i.e. a reactive strategy. This is a strategy of reaction, which makes it more difficult to plan. It also means taking the risks as they come. Since the policy context everywhere is becoming more environmentally sensitive, a reactive strategy will always be behind the times. It also means that whatever planning takes place will be limited in its effectiveness. A reactive strategy on sustainability means reduced control over business practices.

The third is to use the evidence so far as a means of anticipating future evolution of constraints and challenges, i.e. a proactive strategy. This means putting in place some "planning" capability to allow for responding to risks and costs as they emerge. On a corporation-wide basis and in all phases of operations, a proactive strategy toward sustainability means, on balance:

- (a) to promote national and international harmonization of regulations that affect the industry worldwide;
- (b) to influence the policy process on decisions related to the industry;
- (c) to assist the policy process by providing industry expertise; and
- (d) to help to inform consumers about the industry's environmental actions in terms of content, costs and trade-offs.

Even if the corporate community – in part or as a whole – does not make a commitment to pro-action, it must protect its profitability. A minimum step in that direction is to bring corporate culture up to date on conditions for and dimensions of sustainability.

Sustainability in Corporate Management

The Rio process and the responses of business and industry involve integrating a concern for sustainability in all parts of economic and business operations. No industry can avoid developing organizational responses to these challenges. Drawing on the insights of the Business Council for Sustainable Development, a generic approach to sustainability in corporate management entails the following factors as part of strategic planning:¹³

- (a) recognize the need for both long-term economic growth and environmental sustainability;
- (b) confirm that products and processes are becoming more environmentally sustainable;
- (c) protect and maintain credibility with customers, consumers and society as a whole;
- (d) create open dialogues with all stakeholders;
- (e) press for clarification and standardization of environmental information;
- (f) involve employees in developing a dialogue and deliberations on dimensions of sustainability and on measurement of sustainability;
- (g) work toward the adoption of voluntary initiatives, rather than mandatory measures; and
- (h) establish adaptable "environmental audits" to gauge progress.

All of these factors will impact on the internal operations and organization of industry. New corporate roles will need to be created to respond effectively to environmentalism. New forms of information generation and processing will be required. Among the notable examples of corporate initiatives are those of Ciba-Geigy's programme called Vision 2000, which brings environmental concerns into the core of corporate strategy; and Du Pont's assignment of the CEO as Chief Environmental Officer and the establishment of an environmental leadership council composed of senior vice-presidents.

While effective initiatives must be made at the level of individual businesses, there is an important role for industry associations. They need to remain informed of technological advances, new scientific information, legislative and other directives – and any environmental factors that may impact on the operations of the industry.

5. CORPORATE CONTRIBUTIONS TO SUSTAINABLE DEVELOPMENT

It is a basic fact of international reality that the world's corporations must, on the one hand, protect their own market position in a changing global order and, on the other, find ways of assisting the international community in making the transition to sustainability. Specific contributions can be made by the world's corporate community in order to facilitate this transition. Coupled with a robust strategy for global partnership, these contributions could have long-lasting impacts worldwide. This concluding section presents both the contributions to and a global strategy for implementation.

¹³Adapted from Schmidheiny, *op.cit.*, note 12.

The Corporate Contribution Equation

Corporate contributions to sustainability entail efforts to engage in “best practice” initiatives, to expand “leapfrogging” potentials, and to undertake “built-in training”. Far from being philanthropic in nature, each of these contributions involves specific actions that would have specific benefits not only for the developing world, but also for industrial nations and for the future of corporate strategy worldwide. These activities must be viewed as a complete “package”, rather than a list of discrete items. Together, they constitute the corporate contribution equation:

$$\text{Best practice initiatives} + \text{Leapfrogging activities} + \text{Built-in training} = \text{Corporate contribution to sustainability}$$

The first component of this overall package pertains to “best practice”. While it is generally agreed that “best practice” is to be encouraged whenever possible, the specific content of what constitutes the “best” of any “practice” is subject to great ambiguity, if not disagreement.

One important contribution, therefore, is for the corporate community to establish its own directives about what constitutes best practice – by industry and by sector. This would mean agreement on (a) criteria for best practice, (b) processes by which such practices are to be identified, (c) mechanisms for monitoring the conduct of, and deviations from, “best practice”, and (d) methods for disseminating information about (a) to (c).

In a very real sense, this component of the overall package could be construed as a worldwide “corporate project for sustainable development”. A vast amount of information does in fact exist about “best practice”, but it is uncatalogued, not evaluated, basically “raw” in nature, and difficult to access.

The corporate community is best positioned to facilitate instances of technological “leapfrogging”.¹⁴ By “leapfrogging” is meant (a) the possibility of avoiding replicating the historical trajectory of any particular technology, and (b) the positioning of new users at the frontier of technology rather than disseminating potential obsolescence.¹⁵

Clearly, leapfrogging is not a universal possibility for all countries, all economic sectors, or all industries, but the potentials are far greater than are commonly envisaged. A recent report for the UN Commission on Sustainable Development provides both an argument and evidence for leapfrogging in three sectors of activity: technology for waste management and minimization, energy technology, and information technology.

To the extent that such leapfrogging can be facilitated, corporations would be making immediate contributions to sustainable development – in very real terms. Tying leapfrogging to assessments of “best practice” would ensure a certain degree of realism and of quality control.

As the major repositories of the world’s technological knowledge and skills, the corporate community is uniquely positioned to accelerate the dissemination of skills

¹⁴See Nazli Choucri, “Technology and Finance for Sustainable Development” prepared for the Environment and Natural Resources Group of the United Nations Development Programme, 17 February 1994, for technology-specific opportunities for “leapfrogging”.

¹⁵*Ibid.*

by doing on a worldwide scale. However, corporations have seldom been called upon to play such a role; nor are they likely to consider skill dissemination as part of their global mission.

From a purely commercial perspective, everyone gains if the workforce is characterized by greater rather than lesser levels of skill, or if labour in all categories is of higher rather than lower quality. Skill enhancement efforts have all the properties of a "win-win" outcome. Therefore, the corporate community could either (a) be formally called upon by the international community to include a "skill enhancement" clause in its overseas operations; or (b) choose voluntarily to introduce such a clause. To avoid any impression of misplaced philanthropy, national governments might wish to attach incentive measures (in the nature of a tax break, for example) to encourage as well as to facilitate "built-in training" as a strategy for sustainable development.

The Technology Triangle: A Strategy for Global Partnership

The proposed strategy for facilitating corporate contributions to sustainability is based on a significant role for the private sector. Indeed, countries where the private sector is most attuned to changing market conditions and has the ability to respond effectively are those in which a robust "technology triangle" is in place. The technology triangle refers to strategic interactions and effective cooperation among three sets of institutions: (a) science and technology, (b) government and governance; and (c) business and industry.¹⁶

The "triangle" refers to the collaboration among those sets of institutions that create new ideas and knowledge, those that make the rules and regulations of society, and those that commercialize ideas, as well as knowledge and skills, in the context of the rules and regulations of society. The effectiveness of the triangle lies in the reduction of transaction costs, the efficiency of information on "supply" and "demand", and the proximity of innovation and innovators to commercial possibilities and commercial entities.

On a global scale, the notion of a technology triangle for sustainable development has powerful possibilities of a practical nature. As we have seen, new initiatives are already being devoted to the mobilization of such linkages on a global scale. To the extent that these efforts are effective, the corporate community's contribution to the global welfare may be markedly enhanced.¹⁷

Fundamental to the success of such a partnership is the willingness of the parties to envisage the long-term implications of short-term decisions and conditions. By definition, institutions of science and technology adopt time frames that are considerably longer than those of either governments or corporations. So, too, business and government are biased toward the short run.

Some adjustment in time frames must thus be made by all parties. Institutions of science and technology must be willing to consider the shorter-term implications of

¹⁶See "Epilogue" in *Proceedings of the Symposium on Global Environmental Accords: Implications for Technology, Industry and International Relations*, Massachusetts Institute of Technology, Cambridge, MA, 24-25 September 1992.

¹⁷United Nations Development Programme, Environment and Natural Resources Group, "Technology and Finance: New Opportunities and Innovative Strategies for Sustainable Development", prepared for the Commission on Sustainable Development Intersessional Working Group on Technology Transfer, 22-25 February 1994.

programmes and activities designed for the longer run; and business and industry as well as government must seek to consider the longer-term implications of programmes and decisions framed by the imperatives and pressures of short-term conditions and concerns. The prospects for sustainable development on a global basis would be greatly enhanced by this dual adjustment to conventional approaches to the time factor and to time horizons.