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Sustainable Development: A Critical Review

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Summary. — Over the past few years, "Sustainable Development" (SD) has emerged as the latest development catchphrase. A wide range of nongovernmental as well as governmental organizations have embraced it as the new paradigm of development. A review of the literature that has sprung up around the concept of SD indicates, however, a lack of consistency in its interpretation. More important, while the all-encompassing nature of the concept gives it political strength, its current formulation by the mainstream of SD thinking contains significant weaknesses. These include an incomplete perception of the problems of poverty and environmental degradation, and confusion about the role of economic growth and about the concepts of sustainability and participation. How these weaknesses can lead to inadequacies and contradictions in policy making is demonstrated in the context of international trade, agriculture, and forestry. It is suggested that if SD is to have a fundamental impact, politically expedient fuzziness will have to be given up in favor of intellectual clarity and rigor.

1. INTRODUCTION

The last few years have seen a dramatic transformation in the environment-development debate. The question being asked is no longer "Do development and environmental concerns contradict each other?" but "How can sustainable development be achieved?" All of a sudden the phrase Sustainable Development (SD) has become pervasive. SD has become the watchword for international aid agencies, the jargon of development planners, the theme of conferences and learned papers, and the slogan of developmental and environmental activists. It appears to have gained the broad-based support that earlier development concepts such as "ecodevelopment" lacked, and is poised to become the developmental paradigm of the 1990s.

But murmurs of disenchantment are also being heard. "What *is* SD?" is being asked increasingly frequently without, however, clear answers forthcoming. SD is in real danger of becoming a cliché like appropriate technology — a fashionable phrase that everyone pays homage to but nobody cares to define. Four years ago, Tolba lamented that SD had become "an article of faith, a shibboleth; often used, but little explained" (Tolba, 1984a); the situation has not improved since.

There are those who believe that one should not try to define SD too rigorously. To some extent, the value of the phrase does lie in its broad vagueness. It allows people with hitherto irreconcilable positions in the environment-development debate to search for common ground without appearing to compromise their positions.[1] If, however, this political meeting of minds and the concept of SD are both products of new insights into the relationship between social and environmental phenomena, then it should be advantageous to examine these insights and characterize the concept before it is misinterpreted, distorted, and even coopted.

Buttel and Gillespie (1988) contend that such cooptation has already taken place. Agencies such as the World Bank (Conable, 1986), the Asian Development Bank (Runnals, 1986) and the Organization for Economic Cooperation and Development (Environment Committee, 1985) have been quick to adopt the new rhetoric. The absence of a clear theoretical and analytical framework, however, makes it difficult to determine whether the new policies will indeed foster an environmentally sound and socially meaningful form of development. Further, the absence of semantic and conceptual clarity is hampering

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a fruitful debate over what this form should actually be.

This paper is a critical review[2] of the literature on sustainable development with the foregoing in mind. The purpose is not to prove SD to be an intellectual oxymoron, nor to provide the "ultimate" definition of SD. The idea here is to clarify the semantics and to identify some critical weaknesses in concepts and reasoning — weaknesses that will have to be addressed if SD is to become a meaningful paradigm of development.[3]

I begin by examining the various interpretations of "sustainable development," contrasting the trivial or contradictory with the more meaningful ones. I then trace the evolution of the concept of SD, i.e., of its objectives and premises. I point out that the persuasive power of SD (and hence the political strength of the SD movement) stems from the underlying claim that new insights into physical and social phenomena force one to concur with the operational conclusions of the SD platform almost regardless of one's fundamental ethical persuasions and priorities. I argue that while these new insights are important, the argument is not inexorable, and that the issues are more complex than is made out to be. Hence (as is illustrated in Section 5), many of the policy prescriptions being suggested in the name of SD stem from subjective (rather than consensual) ideas about goals and means, and worse, are often inadequate and even counterproductive. I conclude with some thoughts about future research in SD.

2. INTERPRETING SUSTAINABLE DEVELOPMENT

The manner in which the phrase "sustainable development" is used and interpreted varies so much that while O'Riordan (1985) called SD a "contradiction in terms," Redclift suggests that it may be just "another development truism" (Redclift, 1987, p. 1). These interpretational problems, though ultimately conceptual, have some semantic roots. Most people use the phrase "sustainable development" interchangeably with "ecologically sustainable or environmentally sound development" (Tolba, 1984a). This interpretation is characterized by: (a) "sustainability" being understood as "ecological sustainability"; and (b) a conceptualization of SD as a process of change that has (ecological) sustainability added to its list of objectives.

In contrast, sustainable development is sometimes interpreted as "sustained growth," "sustained change," or simply "successful" development. Let us examine how these latter interpretations originate and why they are less useful than the former one, and try to define the terms for the rest of this discussion. Figure 1 is a "semantic map" that might help in this exercise.

(a) *Contradictions and trivialities*

Taken literally, sustainable development would simply mean "development that can be

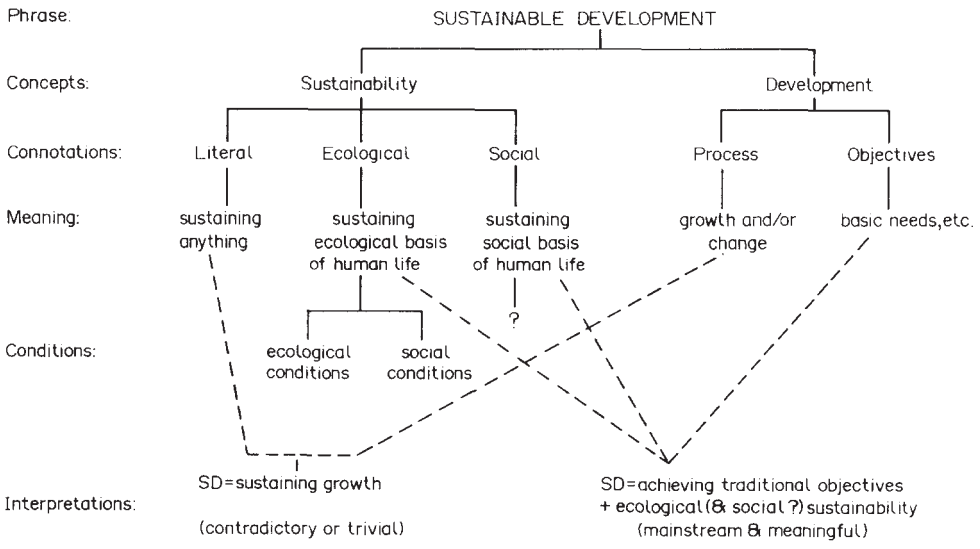


Figure 1. *The semantics of sustainable development.*

continued — either indefinitely or for the implicit time period of concern." But what is development? Theorists and practitioners have both been grappling with the word and the concept for at least the past four decades. (See Arndt, 1981, and Bartelmus, 1986, for semantic and conceptual histories of economic development.) Some equate development with GNP growth, others include any number of socially desirable phenomena in their conceptualization. The point to be noted is that development is *a process of directed change*. Definitions of development thus embody both (a) the objectives of this process, and (b) the means of achieving these objectives.

Unfortunately, a distinction between objectives and means is often not made in the development rhetoric. This has led to "sustainable development" frequently being interpreted as simply a process of change that can be continued forever (see Figure 1). Depending upon what characterization of the process is implicit, this interpretation is either impossible or trivial. When development is taken to be synonymous with growth in material consumption — which it often is even today — SD would be "sustaining the growth in material consumption" (presumably indefinitely). But such an idea contradicts the now general recognition that "*ultimate* limits [to usable resources] exist"[5] (WCED, p. 45, emphasis added). At best, it could be argued that growth in the per capita consumption of certain basic goods is necessary in certain regions of the world in the short term. To use "sustainable development" synonymously with "sustain[ing] growth performance" (Idachaba, 1987) or to cite the high rates of growth in agricultural production in South Asia as an example of SD (Hopper, 1987) is therefore a misleading usage, or at best a short-term and localized notion that goes against the long-term global perspective of SD.

One could finesse this contradiction by conceptualizing development as simply a process of socio-economic change. But one cannot carry on a meaningful discussion unless one states what the objectives of such change are and why one should worry about continuing the process of change indefinitely. Neoclassical economists define the objective of development as "increase in social welfare." They then proceed to measure social welfare in terms of economic output, and point out that "a growth in economic output does not necessarily mean growth in physical throughput of materials and energy" (Pezzey, 1989, p. 14), thus "proving" that there is no contradiction between sustainability and development. But this argument is at best circular (because to achieve continuous increases in social welfare one actually needs to know what constitutes social welfare, in which case one might as well explicitly state these constituents to be the objectives of development) and at worst fallacious (because there are serious theoretical problems with aggregating individual utility functions within and especially across generations, and serious practical problems with devising indicators for any social welfare function that are not as distorted as GNP). Again, it is not clear why the process of increasing welfare should continue indefinitely, or whether it can do so.

Sometimes, the adjective "sustainable" is simply used instead of "successful." For instance: "For economic development to be truly 'sustainable' requires 'tailoring the design and implementation of projects to the needs and capabilities of people who are supposed to benefit from them'" (Barbier, 1987). Since "beneficiary-oriented design" (or "grassroots participation") is a procedural imperative for any development program to be successful, such a statement tells us nothing about the overall goals of that developmental process. This usage is therefore not very useful; moreover, it is confusing, because sustainability has already acquired other specific connotations.

(b) *Sustainability*

What then are these specific connotations of "sustainability"? While a more conceptual discussion is reserved for later on, some basic terms and usages need to be clarified here. The concept of sustainability originated in the context of renewable resources such as forests or fisheries, and has subsequently been adopted as a broad slogan by the environmental movement (Lélé, 1988). Most proponents of sustainability therefore take it to mean "the existence of the ecological conditions necessary to support human life at a specified level of well-being through future generations," what I call *ecological sustainability* (see Figure 1).

Since ecological sustainability emphasizes the constraints and opportunities that nature presents to human activities, ecologists and physical scientists frequently dominate its discussion. But what they actually focus on are the ecological conditions for ecological sustainability — the biophysical "laws" or patterns that determine environmental responses to human activities and humans' ability to use the environment. The major contribution of the environment-development debate is, I believe, the realization that in addition to or in conjunction with these ecological conditions, there are social conditions that influence the ecological sustainability or

unsustainability of the people-nature interaction. To give a stylized example, one could say that soil erosion undermining the agricultural basis for human society is a case of ecological (un)sustainability. It could be caused by farming on marginal lands without adequate soil conservation measures — the ecological cause. But the phenomenon of marginalization of peasants may have social roots, which would then be the social causes of ecological unsustainability.

Sometimes, however, sustainability is used with fundamentally social connotations. For instance, Barbier (1987) defines social sustainability as "the ability to maintain desired social values, traditions, institutions, cultures, or other social characteristics." This usage is not very common, and its needs to be carefully distinguished from the more common context in which social scientists talk about sustainability, viz., the social aspects of ecological sustainability. A war destroying human society would probably be an example of social (un)sustainability, and it in turn may have social or ecological causes. (Note that these categories are only conceptual devices for clarifying our thinking; real problems seldom fall neatly into one category or another.)

(c) *Sustainable development = development + sustainability?*

In the mainstream interpretation of SD, ecological sustainability is a desired attribute of any pattern of human activities that is the goal of the developmental process. In other words, SD is understood as "a form of societal change that, in addition to traditional developmental objectives, has the objective or constraint of ecological sustainability." Given an ever-changing world, the specific forms of and priorities among objectives, and the requirements for achieving sustainability, would evolve continuously. But sustainability — as it is understood at each stage — would remain a fundamental concern. Ecological sustainability is, of course, not independent of the other (traditional) objectives of development. Tradeoffs may sometimes have to be made between the extent to and rate at which ecological sustainability is achieved *vis-à-vis* other objectives. In other cases, however, ecological sustainability and traditional developmental objectives (such as satisfaction of basic needs) could be mutually reinforcing. This interpretation of SD dominates the SD debate; I shall therefore focus on it in the rest of this paper.

3. THE CONCEPT OF SUSTAINABLE DEVELOPMENT

What are the traditional objectives of development, and how have they been expanded or modified to include sustainability? If the pursuit of traditional development objectives has undermined ecological sustainability in the past, what new insights suggest that such undermining or contradiction can be avoided now and in the future? How does this help build a working consensus between different fundamental concerns? In this section, I examine how the SD debate has addressed these questions.

(a) *Evolution of objectives*

The term sustainable development came into prominence in 1980, when the International Union for the Conservation of Nature and Natural Resources (IUCN) presented the World Conservation Strategy (WCS) with "the overall aim of achieving sustainable development through the conservation of living resources" (IUCN, 1980). Critics acknowledged that "by identifying Sustainable Development as the basic goal of society, the WCS was able to make a profound contribution toward reconciling the interests of the development community with those of the environmental movement" (Khosla, 1987). They pointed out, however, that the strategy

> restricted itself to living resources, focussed primarily on the necessity of maintaining genetic diversity, habits and ecological processes. . . . It was also unable to deal adequately with sensitive or controversial issues — those relating to the international economic and political order, war and armament, population and urbanization (Khosla, 1987).

Moreover, the WCS was "essentially supply-sided, [in that] it assumed the level and structure of demand to be an independent and autonomous variable," and ignored the fact that "if a sustainable style of development is to be pursued, then both the level and particularly the structure of demand must be fundamentally changed" (Sunkel, 1987). In short, the WCS had really addressed only the issue of ecological sustainability, rather than sustainable development.

Many have responded to such criticisms during the eight years since the WCS. The United Nations Environment Program (UNEP) was at the forefront of the effort to articulate and popularize the concept. UNEP's concept of SD was said to encompass

(i) help for the very poor, because they are left with no options but to destroy their environment;
(ii) the idea of self-reliant development, within natural resource constraints;
(iii) the idea of cost-effective development using nontraditional economic criteria;
(iv) the great issues of health control [*sic*], appropriate technology, food self-reliance, clean water and shelter for all; and
(v) the notion that people-centered initiatives are needed (Tolba, 1984a).

This statement epitomizes the mixing of goals and means, or more precisely, of fundamental objectives and operational ones, that has burdened much of the SD literature. While providing food, water, good health and shelter have traditionally been the fundamental objectives of most development models (including UNEP's), it is not clear whether self-reliance, cost-effectiveness, appropriateness of technology and people-centeredness are additional objectives or the operational requirements for achieving the traditional ones.

A similar proliferation of objectives was apparent at the IUCN-UNEP-World Wildlife Fund sponsored conference on Conservation and Development held in Ottawa in 1986. Summarizing the debate, the rapporteurs Jacobs, Gardner and Munro (1987) said that "Sustainable Development seeks . . . to respond to five broad requirements: (1) integration of conservation and development, (2) satisfaction of basic human needs, (3) achievement of equity and social justice, (4) provision of social self-determination and cultural diversity, and (5) maintenance of ecological integrity." The all-encompassing nature of the first requirement, and the repetitions and redundancies between some of the others were acknowledged by Jacobs, Gardner and Munro, but they did not suggest a better framework.

In contrast to the aforementioned, the currently popular definition of SD — the one adopted by the World Commission on Environment and Development (WCED) — is quite brief:

> Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs (WCED, 1987; p. 43).

The constraint of "not compromising the ability of future generations to meet their needs" is (presumably) considered by the Commission to be equivalent to the requirement of some level of ecological and social sustainability.[5]

While the WCED's statement of the fundamental objectives of SD is brief, the Commission is much more elaborate about (what are essentially) the operational objectives of SD. It states that "the critical objectives which follow from the concept of SD" are:

(1) reviving growth;
(2) changing the quality of growth;
(3) meeting essential needs for jobs, food, energy, water, and sanitation;
(4) ensuring a sustainable level of population;
(5) conserving and enhancing the resource base;
(6) reorienting technology and managing risk;
(7) merging environment and economics in decision making; and
(8) reorienting international economic relations (WCED, 1987, p. 49).

Most organizations and agencies actively promoting the concept of SD subscribe to some or all of these objectives with, however, the notable addition of a ninth operational goal, viz.,

(9) making development more participatory.[6]

This formulation can therefore be said to represent the mainstream of SD thinking. This "mainstream" includes international environmental agencies such as UNEP (e.g., Tolba, 1987), IUCN and the World Wildlife Fund (WWF), developmental agencies including the World Bank (e.g., Warford, 1986), the US Agency for International Development, the Canadian and Swedish international development agencies, research and dissemination organizations such as the World Resources Institute (Repetto, 1985, 1986a), the International Institute for Environment and Development, the Worldwatch Institute (1984–88), and activist organizations and groups such as the Global Tomorrow Coalition (GTC, 1988).

The logical connection between the brief definition of fundamental SD objectives and the list of operational ones is not completely obvious — mainly because many of the operational goals are not independent of the others. Nevertheless, it is possible to infer that "meeting the needs of the present generation" is operationally equivalent to WCED's first and third operational goals (reviving growth and meeting basic needs), while the need to maintain the ecological basis for the satisfaction of these objectives in perpetuity can be operationalized through the remaining goals (especially 2, 4, 5, 6 and 7).

(b) *The strength of the concept*

The strength of the concept of SD stems from

the choice of an apparently simple definition of fundamental objectives — meeting current needs and sustainability requirements — from which can be derived a range of operational objectives that cut across most previous intellectual and political boundaries. Repetto has tried to express this idea of SD as a powerful tool for consensus:

> [SD has] three bases . . . scientific realities, consensus on ethical principles, and considerations of long-term self-interest. There is a broad consensus that pursuing policies that imperil the welfare of future generations . . . is unfair. Most would agree that . . . consign[ing] a large share of the world's population to deprivation and poverty is also unfair. Pragmatic self-interest reinforces that belief. Poverty . . . underlies the deterioration of resources and the population growth in much of the world and affects everyone (Repetto, 1986a, p. 17).

"Pragmatic self interest," however, is as much an ethical value judgment as feelings of unfairness over poverty or over intergenerational inequity, while (presumably) scientific reality is not. Therefore, the above could be rephrased as:

> The current state of scientific knowledge (particularly insights obtained in the last few decades) about natural and social phenomena and their interactions leads inexorably to the conclusion that anyone driven by *either* long-term self interest, *or* concern for poverty, *or* concern for intergenerational equity should be willing to support the operational objectives of SD.

Assuming that concern for intergenerational equity coincides with broad environmental concerns, and adding concern for local participation to the list, this formulation of SD has, in theory, the potential for building a very broad and powerful consensus.

(c) *The premises of SD*

So what are these insights that appear to be pushing us toward such an operational consensus? Most people now admit that many human activities are currently reducing the long-term ability of the natural environment to provide goods and services, as well as adversely affecting current human health and well-being. Many would also accept that grinding poverty is devastating the lives of millions of individuals all over the world. But neither of these insights has been able to generate a consensus between those concerned about environmental issues and those focusing upon economic and developmental ones (or even within each of these groups).

The insights that have pushed us toward this consensus pertain to the feedback between social and environmental phenomena. There is now a growing consensus that "many environmental problems in developing countries originate from the *lack of development*, that is from the struggle to overcome extreme conditions of poverty" (Bartelmus, 1986, p. 18; emphasis added), that environmental degradation impoverishes those dependent directly on the natural environment for survival, and conversely, that development must be environmentally sound if it is to be permanent (Dampier, 1982). Thus, "environmental quality and economic development are interdependent and in the long term, mutually reinforcing" (Tolba, 1984b), and the question is no longer whether they contradict each other but how to achieve this (environmentally) sustainable (form of) development.

More precisely, the perception in mainstream SD thinking of the environment-society link is based upon the following premises:

(i) *Environmental degradation:*
- Environmental degradation is already affecting millions in the Third World, and is likely to severely reduce human well-being all across the globe within the next few generations.
- Environmental degradation is very often caused by poverty, because the poor have no option but to exploit resources for short-term survival.
- The interlinked nature of most environmental problems is such that environmental degradation ultimately affects everybody, although poorer individuals/nations may suffer more and sooner than richer ones.

(ii) *Traditional development objectives:*
- These are: providing basic needs and increasing the productivity of all resources (human, natural and economic) in developing countries, and maintaining the standard of living in the developed countries.
- These objectives do not necessarily conflict with the objective of ecological sustainability. In fact, achieving sustainable patterns of resource use is necessary for achieving these objectives permanently.
- It can be shown that, even for individual actors, environmentally sound methods are "profitable" in the long run, and often in the short run too.

(iii) *Process:*
- The process of development must be participatory to succeed (even in the short run).

Given these premises, the need for a process of development that achieves the traditional objectives, results in ecologically sustainable patterns of resource use, and is implemented in a participatory manner is obvious.

Most of the SD literature is devoted to showing that this process is also feasible and can be made attractive to the actors involved. SD has become a bundle of neat fixes: technological changes that make industrial production processes less polluting and less resource intensive and yet more productive and profitable, economic policy changes that incorporate environmental considerations and yet achieve greater economic growth, procedural changes that use local non-governmental organizations (NGOs) so as to ensure grassroots participation, agriculture that is less harmful, less resource intensive and yet more productive, and so on. In short, SD is a "metafix" that will unite everybody from the profit-minded industrialist and risk-minimizing subsistence farmer to the equity-seeking social worker, the pollution-concerned or wildlife-loving First Worlder, the growth-maximizing policy maker, the goal-oriented bureaucrat, and therefore, the vote-counting politician.

4. WEAKNESSES

The major impact of the SD movement is the rejection of the notion that environmental conservation necessarily constrains development or that development necessarily means environmental pollution — certainly not an insignificant gain. Where the SD movement has faltered is in its inability to develop a set of concepts, criteria and policies that are coherent or consistent — both externally (with physical and social reality) and internally (with each other). The mainstream formulation of SD suffers from significant weaknesses in:

(a) its characterization of the problems of poverty and environmental degradation;
(b) its conceptualization of the objectives of development, sustainability and participation; and
(c) the strategy it has adopted in the face of incomplete knowledge and uncertainty.

(a) *Poverty and environmental degradation: An incomplete characterization*

The fundamental premise of mainstream SD thinking is the two-way link between poverty and environmental degradation, shown schematically in Figure 2.

In fact, however, even a cursory examination of the vast amount of research that has been done on the links between social and environmental phenomena suggests that both poverty and environmental degradation have deep and complex causes. While substantive disagreements still exist regarding the primacy of these causes and the feasibility and efficacy of different remedies, the diagram in Figure 3 is probably a reasonable approximation of the general consensus on the nature of the causes and their links.[7]

To say that mainstream SD thinking has completely ignored these factors would be unfair. But it would be fair to say that it has focused on an eclectically chosen few. In particular, inadequate technical know-how and managerial capabilities, common property resource management, and pricing and subsidy policies (e.g., Repetto, 1986b; World Bank, 1987a) have been the major themes addressed, and the solutions suggested have been essentially techno-economic ones. This approach is reflected in the "principles" suggested for policy making, such as "designing for efficiency, proper resource pricing, managing common resources, attending to basics, and building management capability" (Repetto, 1986a, pp. 23–40). Deeper socio-political changes (such as land reform) or changes in cultural values (such as overconsumption in the North) are either ignored or paid lip-service.

This is not to say that problems of the global commons or of the lack of techno-managerial expertise are unimportant. But the intellectual discourse needs to begin with an acknowledgement that the big picture in Figure 3 (or something similar) essentially holds in all cases, and then proceed to developing analytical methods to help estimate the relative importance of each causal factor in specific cases and identify means of and scope for change.

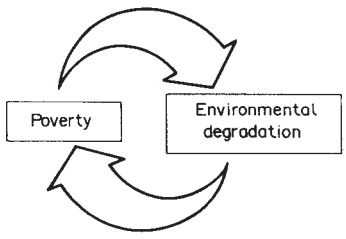


Figure 2. *The mainstream perception of the link between poverty and environmental degradation.*

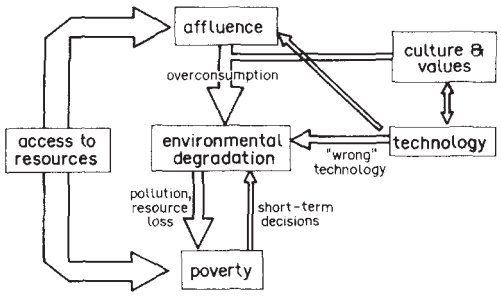


Figure 3. *A more realistic representation of the poverty-environmental degradation problem.*

(b) *Conceptual weaknesses*

Removal of poverty (the traditional developmental objective), sustainability and participation are really the three fundamental objectives of the SD paradigm. Unfortunately, the manner in which these objectives are conceptualized and operationalized leaves much to be desired. On the one hand, economic growth is being adopted as a major operational objective that is consistent with both removal of poverty and sustainability. On the other hand, the concepts of sustainability and participation are poorly articulated, making it difficult to determine whether a particular development project actually promotes a particular form of sustainability, or what kind of participation will lead to what kind of social (and consequently, environmental) outcome.

(i) *The role of economic growth*

By the mid-1970s, it had seemed that the economic growth and trickle-down theory of development had been firmly rejected, and the "basic needs approach" (Streeten, 1979) had taken root in development circles. Yet economic growth continues to feature in today's debate on SD. In fact, "reviving [economic] growth" heads WCED's list of operational objectives quoted earlier. Two arguments are implicit in this adoption of economic growth as an operational objective. The first, a somewhat defensive one, is that there is no fundamental contradiction between economic growth and sustainability, because growth in economic activity may occur simultaneously with either an improvement or a deterioration in environmental quality. Thus, "governments concerned with long-term sustainability need not seek to limit growth in economic output so long as they stabilize aggregate natural resource consumption" (Goodland and Ledec, 1987). But one could turn this argument around and suggest that, if economic growth is not correlated with environmental sustainability, there is no reason to have economic growth as an operational objective of SD.[8]

The second argument in favor of economic growth is more positive. The basic premise of SD is that poverty is largely responsible for environmental degradation. Therefore, removal of poverty (i.e., development) is necessary for environmental sustainability. This, it is argued, implies that economic growth is absolutely necessary for SD. The only thing that needs to be done is to "change the quality of [this] growth" (WCED, 1987, pp. 52–54) to ensure that it does not lead to environmental destruction. In drawing such an inference, however, there is the implicit belief that economic growth is necessary (if not sufficient) for the removal of poverty. But was it not the fact that economic growth *per se* could not ensure the removal of poverty that led to the adoption of the basic needs approach in the 1970s?

Thus, if economic growth by itself leads to neither environmental sustainability nor removal of poverty, it is clearly a "non-objective" for SD. The converse is a possibility worth exploring, viz., whether successful implementation of policies for poverty removal, long-term employment generation, environmental restoration and rural development will lead to growth in GNP, and, more important, to increases in investment, employment and income generation. This seems more than likely in developing countries, but not so certain in developed ones. In any case, economic growth may be the fallout of SD, but not its prime mover.

(ii) *Sustainability*

The World Conservation Strategy was probably the first attempt to carry the concept of sustainability beyond simple renewable resource systems. It suggested three ecological principles for ecological sustainability (see the nomenclature developed above), viz., "maintenance of essential ecological processes and life-support systems, the preservation of genetic diversity, and the sustainable utilization of species and resources" (IUCN, 1980). This definition, though a useful starting point, is clearly recursive as it invokes "sustainability" in resource use without defining it. Many subsequent attempts to discuss the notion are disturbingly muddled (e.g., Munn, 1988). There is a very real danger of the term becoming a meaningless cliché, unless a concerted effort is made to add precision and content to the discussion. While a detailed analysis of sustainability is given elsewhere (Lele, 1989), the following points may be made here.

Any discussion of sustainability must first

answer the questions "What is to be sustained? For whom? How long?" The value of the concept (like that of SD), however, lies in its ability to generate an operational consensus between groups with fundamentally different answers to these questions, i.e., those concerned either about the survival of future human generations, or about the survival of wildlife, or human health, or the satisfaction of immediate subsistence needs (food, fuel, fodder) with a low degree of risk. It is therefore vital to identify those aspects of sustainability that do actually cater to such diverse interests, and those that involve tradeoffs.

Differentiating between ecological and social sustainability could be a first step toward clarifying some of the discussion. Further, in the case of ecological sustainability, a distinction needs to be made between renewable resources, nonrenewable resources, and environmental processes that are crucial to human life, as well as to life at large. The few researchers who have begun to explore the idea of ecological sustainability emphasize its multidimensional and complex nature (e.g., Charoenwatana and Rambo, 1988).

In the context of sustainable use of renewable resources, it is necessary to go beyond the conventional simplistic notion of "harvesting the annual increment," and take into consideration the dynamic behavior of the resource, stochastic properties of and uncertainties about environmental conditions (e.g., climatic variations), the interactions between resources and activities (e.g., between forests, soils and agriculture), and between different uses or features of the "same" resource (e.g., tree foliage and stemwood).

In the rush to derive ecological principles of (ecological) sustainability, we cannot afford to lose sight of the social conditions that determine which of these principles are socially acceptable, and to what extent. Sociologists, eco-Marxists and political ecologists are pointing out the crucial role of socioeconomic structures and institutions in the pattern and extent of environmental degradation globally (also see discussion and notes in Section 4a). Neoclassical economists, whose theories have perhaps had the greatest influence in development policy making in the past and who therefore bear the responsibility for its social and environmental failures, however, have been very slow in modifying their theories and prescriptions. The SD movement will have to formulate a clear agenda for research in what is being called "ecological economics" (Ekins, 1986; Goodland and Ledec, 1987; Costanza, 1989) and press for its adoption by the mainstream of economics in order to ensure the possibility of real changes in policy making.

Social sustainability is a more nebulous concept than ecological sustainability. Brown *et al.* (1987), in a somewhat techno-economic vein, state that sustainability implies "the existence and operation of an infrastructure (transportation and communication), services (health, education, and culture), and government (agreements, laws, and enforcement)." Tisdell (1988) talks about "the sustainability of political and social structures" and Norgaard (1988) argues for cultural sustainability, which includes value and belief systems. Detailed analyses of the concept, however, seem to be nonexistent.[9] Perhaps achieving desired social situations is itself so difficult that discussing their maintainability is not very useful; perhaps goals are even more dynamic in a social context than in an ecological one, so that maintainability is not such an important attribute of social institutions/structures. There is, however, no contradiction between the social and ecological sustainability; rather, they can complement and inform each other.

(iii) *Participation*

A notable feature of "ecodevelopment" — SD's predecessor — as well as some of the earlier SD literature was the emphasis placed on equity and social justice. For instance, in the IUCN-sponsored conference in Ottawa in 1986, "advancing equity and social justice [was perceived to be] so important" that the phrase used was "sustainable and equitable development" (Jacobs, Gardner and Munro, 1987). Subsequently, however, the mainstream appears to have quietly dropped these terms (suggesting at least a deemphasizing of these objectives), and has instead focused on "local participation."

There are, however, three problems with this shift. First, by using the terms equity, participation and decentralization interchangeably, it is being suggested that participation and decentralization are equivalent, and that they can somehow substitute for equity and social justice. This suggestion is at best a naive one. While all of these concepts are quite complex, it seems clear that some form of participation is necessary but not sufficient for achieving equity and social justice.

Second, the manner in which participation is being operationalized shows up the narrow-minded, quick-fix and deceptive approach adopted by the mainstream promoters of SD. Cohen and Uphoff (1980) distinguished four types of participation — in decision making, implementation, benefit distribution and evaluation. Most of the SD literature does not make these distinctions at all. Mainstream SD litera-

ture blithely assumes and insists that "involvement of local NGOs" in project implementation will ensure project success (Maniates, 1990; he dubs this the "NGOization" of SD).

Third, there is an assumption that participation or at least equity and social justice will necessarily reinforce ecological sustainability. Attempts to test such assumptions rigorously have been rare. But preliminary results seem to suggest that equity in resource access may not lead to sustainable resource use unless new institutions for resource management are carefully built and nurtured. For instance, Jodha (1987) describes how land reform in Rajasthan (India) led to the neglect of village pastures that were well-maintained under the earlier feudal structure. Similarly, communal irrigation tanks in Tamil Nadu (India) fell into disrepair with the reduction in the feudal powers of the village landlords (von Oppen and Subba Rao, 1980). This should not be misconstrued as an argument against the need for equity, but rather as a word of caution against the tendency to believe that social equity automatically ensures environmental sustainability (or vice-versa).

5. POLICY PRESCRIPTIONS — INCONSISTENCIES AND INADEQUACIES

Given this confusion in terms, perceptions, and concepts, the policies being suggested by the mainstream of SD thinking cannot and do not conform to the basic idea of ecologically sound and socially equitable development. They are often seriously flawed, and reflect personal, organizational and political preferences. I use examples from three SD issues — international trade, agriculture, and tropical forests — to illustrate this argument.

(a) *International trade and economic relations*

Trade, multinational corporations, commercial lending and aid are the four dominant channels through which international economic relations manifest themselves today. That the manner in which these activities are currently pursued contradicts ecological sustainability and social well-being is being increasingly pointed out (Redclift, 1987; Rainforest Action Network, 1987). This is even being acknowledged in some cases by the parties involved (World Bank, 1987b).

Yet, the SD debate and policy prescriptions regarding international trade continue to be fundamentally flawed in two ways. First, the need to ensure a truly equitable basis for exchange by restructuring the international monetary system is completely ignored. Makhijani and Browne (1986) have described how the First World has in the past manipulated the system of exchange rates in order to maintain favorable terms of trade for itself. The International Monetary Fund (IMF) and the SD-promoting World Bank, however, continue to emphasize structural readjustment policies for debt-ridden Third World countries that include downward adjustment of exchange rates: in effect, maintaining the terms of trade of the colonial era.

Second, there seems to be a broad consensus cutting across almost all political and intellectual boundaries that free trade (interpreted as trade without any import or export barriers) is crucial to promoting SD. The Brandt Commission (1980 and 1983) argued that "the solution [to the dual problems facing the North and the South] is to make the South richer through increased trade." The WCED report cites protectionism as a major impediment to sustainable development (WCED, 1987, p. 83), and urges the removal of all such barriers. But this prescription is fundamentally flawed on the counts of development as well as sustainability.

In a succinct statement of the argument on the first count, Redclift (1987, p. 57) points out that although the neoclassical economics case is that "gains from [free] trade" outweigh the losses, (i) neoclassical theory itself acknowledges that the gains from trade may be very unevenly distributed between countries, (ii) in practice, there may be losers as well as gainers, and (iii) while freer trade will presumably stimulate economic growth, the assertion that economic growth is (socially) beneficial is questionable, to say the least.

Simultaneously, the contradictions between the neoclassical theory of international trade and ecological sustainability are being pointed out. Norgaard has described the impact of the modern globally integrated economy on biodiversity:

> [Comparative advantage, the efficiency of specialization, and the gains through exchange have] affected [biological] diversity in two ways. First, . . . development through capturing the gains of exchange has encouraged specialization and a reduction in crop and supporting species . . . [Second,] variation in aggregate economic welfare is reduced through increased variations in the activities of individual actors. This increased variation imposes stress on biological species that leads to extinction (Norgaard, 1987).

Further, he states, neoclassical trade theory assumes "that factors of production are mobile

(that labor, capital and land can shift between lines of production, that labor can move to new locations). . . . *But environmental services which give land its value cannot freely shift from one product to another*" (Norgaard, 1987; emphasis added).

Examining the controversy over the Free Trade Agreement between the United States and Canada, McRobert (1988) makes the additional point that economics research on trade policy has studiously ignored the massive hidden environmental externalities (in the form of pollution and climate change) of the transportation implicit in international trade.

(b) *Sustainable agriculture: What? How?*

Agriculture is one of the foundations of human society and a major activity at the human-environment interface. Attempts to operationalize ecological sustainability have therefore focused significantly on agriculture. Unfortunately, while the literature on sustainable agriculture or SD in agriculture is proliferating, it is marked by the same confusion that afflicts the larger debate on sustainability. This confusion is obvious from the manner in which the terms "sustainable agriculture," "low-input agriculture" and "organic farming" are being used interchangeably when they actually differ significantly (Buttel and Gillespie, Jr., 1988). "Agroecology" is being proposed as the foundation for sustainable agriculture (Dover and Talbot, 1987), but it lacks a firm, consensual theoretical and practical framework. Moreover, the ability of a pattern of agriculture to simultaneously provide fair returns to the farmer and laborer, and to satisfy the needs of the nonagricultural population in an ecologically sound manner depends not only on ecological interactions but also on complex social conditions — conditions that are even less well understood today.

Struggling with these inadequacies, the SD movement has been slow in coming up with a clear definition of and agenda for sustainable agriculture. This has not only hampered efforts to redirect international agencies' policies (e.g., Committee on Agricultural Sustainability in Developing Countries, 1987) but, more important, it has also allowed the conventional Green Revolution experts to sell their old wine in the new bottle of "sustainable agriculture." At the World Bank workshops on SD in agriculture (Davis and Schirmer, 1987) most "experts" interpreted sustainability in agriculture as simply maintaining growth in agricultural production! Other research efforts (as in Parikh, 1987) appear to be largely limited to designing and validating conventional crop production models, with simple environmental feedbacks added almost as an afterthought.

Not surprisingly, agricultural policy statements by the SD mainstream often give contradictory messages. For instance, the WCED report acknowledges that the increases in agricultural production in the Green Revolution have occurred through a nine-fold increase in fertilizer consumption, with reducing marginal gains, and at the cost of significant soil salinization and pollution. Nevertheless, it concludes that "many countries should increase yields by greater use of chemical fertilizers and pesticides, [although] countries can also improve yields by helping farmers use organic nutrients more efficiently" (WCED, 1987, p. 135).

(c) *Tropical Forests*

Tropical deforestation has been an item on the agenda of First World environmentalists for a long time (e.g., Myers, 1984). Rooted initially almost wholly in concern about wildlife and biological diversity, the movement to save the world's tropical forests broadened as the understanding of the phenomenon became more sophisticated in terms of the social context of forest use and the political economy of deforestation.

But when the World Resources Institute, the World Bank and the UNDP proposed their action plan for tropical forests (WRI, 1985), this plan — and a similar one outlined by the FAO (1985) — were both heavily criticized on exactly the same grounds of analytical incompleteness discussed earlier in Section 4. It suffices to quote Hildyard (1987):

> The WRI report is deeply flawed. . . . [First], it is based on the premise that poverty, over-population and ignorance are the prime cause of forest destruction. But making scapegoats of the poor and dispossessed not only obscures the reasons for their poverty but detracts from the real causes for deforestation, viz., the massive commercial development schemes being promoted in the Third World. [Second,] blaming the poor for deforestation also overlooks the fact that millions of peasant colonists have been actively encouraged to invade [forests] under government-sponsored colonization schemes. [Third,] blaming poverty also ignores the fact that best protected forests of the world are inhabited by those very tribal peoples who, by the standards of industrialized man, are among the world's poorest. [Fourth,] blaming the poor also serves to rationalise and hence legitimize the view that current development policies can (and should)

> continue unabated. Indeed, the WRI plan goes further [and] interprets the problem in such a way as to justify socially and ecologically destructive [though politically and economically expedient] schemes.

Ross and Donovan (1986) present a similar, though milder, critique. Clearly, some serious introspection and rethinking is needed in the SD community on this issue.

6. CONCLUDING REMARKS: DILEMMAS AND AGENDAS

The proponents of SD are faced with a dilemma that affects any program of political action and social change: the dilemma between the urge to take strong stands on fundamental concerns and the need to gain wide political acceptance and support. Learning from the experience of ecodevelopment, which tended toward the former, SD is being packaged as the inevitable outcome of objective scientific analysis, virtually an historical necessity, that does not contradict the deep-rooted normative notion of development as economic growth. In other words, SD is an attempt to have one's cake and eat it too.

It may be argued that this is indeed possible, that the things that are wrong and need to be changed are quite obvious, and there are many ways of fixing them without significantly conflicting with either age-old power structures or the modern drive for a higher material standard of living. Therefore, it is high time that environmentalists and development activists put aside their differences and joined hands under the banner of sustainable development to tackle the myriad of problems facing us today. If, by using the politically correct jargon of economic growth and development and by packaging SD in the manner mentioned above, it were possible to achieve even 50% success in implementing this bundle of "conceptually imprecise" policies, the net reduction achieved in environmental degradation and poverty would be unprecedented.

I believe, however, that (analogous to the arguments in SD) in the long run there is no contradiction between better articulation of the terms, concepts, analytical methods and policy-making principles, and gaining political strength and broad social acceptance — especially at the grassroots. In fact, such clarification and articulation is necessary if SD is to avoid either being dismissed as another development fad or being coopted by forces opposed to changes in the status quo. More specifically, proponents and analysts of SD need to:

(a) clearly reject the attempts (and temptation) to focus on economic growth as a means to poverty removal and/or environmental sustainability;
(b) recognize the internal inconsistencies and inadequacies in the theory and practice of neoclassical economics, particularly as it relates to environmental and distributional issues; in economic analyses, move away from arcane mathematical models toward exploring empirical questions such as limits to the substitution of capital for resources, impacts of different sustainability policies on different economic systems, etc.;
(c) accept the existence of structural, technological and cultural causes of both poverty and environmental degradation; develop methodologies for estimating the relative importance of and interactions between these causes in specific situations; and explore political, institutional and educational solutions to them;
(d) understand the multiple dimensions of sustainability, and attempt to develop measures, criteria and principles for them; and
(e) explore what patterns and levels of resource demand and use would be compatible with different forms or levels of ecological and social sustainability, and with different notions of equity and social justice.

There are, fortunately, some signs that a debate on these lines has now begun (see, e.g., the December 1988 issue of *Futures*; also SGN, 1988, and Daly, 1991).

In a sense, if SD is to be really "sustained" as a development paradigm, two apparently divergent efforts are called for: making SD more precise in its conceptual underpinnings, while allowing more flexibility and diversity of approaches in developing strategies that might lead to a society living in harmony with the environment and with itself.

NOTES

1. For instance, the International Institute for Applied Systems Analysis published a collection of papers entitled "Sustainable Development of the Biosphere" (Clark and Munn, 1986). But nowhere in this large

volume was there any attempt to define development, sustainability, or sustainable development.

2. This is not the first review of the SD literature. Since the middle of 1987, reviews have appeared in at least three journal articles (Brown *et al.*, 1987; Barbier, 1987; Tisdell, 1988) and one book (Redclift, 1987) — in itself a striking indication of the proliferation of the SD literature. But while these authors — Redclift and Barbier in particular — have contributed to the discussion on SD, a comprehensive review of the SD literature that critically examines the semantic and conceptual issues is still lacking.

3. This indicates the necessarily subjective starting point of this analysis, viz., that I find at least some of the arguments being made by the SD movement (outlined later) more plausible than the arguments of those who would have us believe that no major environmental and social problems confront us, and/or if they do, that no major shifts in our thinking and in our individual and collective behavior and policy making will be called for to navigate through these problems.

4. More precisely, there are ultimate limits to the stocks of material resources, the flows of energy resources, and (in the event of these being circumvented by a major breakthrough in fission/fusion technologies) to the environment's ability to absorb waste energy and other stresses. The limits-to-growth debate, while not conclusive as to specifics, appears to have effectively shifted the burden of proof about the absence of such fundamental limits onto the diehard "technological optimists" who deny the existence of such limits.

5. Of course, "meeting the needs" is a rather ambiguous phrase that may mean anything in practice. Substituting this phrase with "optimizing economic and other societal benefits" (Goodland and Ledec, 1987) or "managing all assets, natural resources and human resources, as well as financial and physical assets for increasing long-term wealth and well-being (Repetto, 1986a, p. 15) does not define the objectives of development more precisely, although the importance attached to economic benefits or wealth is rather obvious.

6. It is tempting to conclude that this nine-point formulation of SD is identical with the concept of "ecodevelopment" — the original term coined by Maurice Strong of UNEP for environmentally sound development (see Sachs, 1977 and Riddell, 1981). Certainly the differences are less obvious than the similarities. Nevertheless, some changes are significant — such as the dropping of the emphasis on "local self-reliance" and the renewed emphasis on economic growth.

7. The diagram is necessarily unsatisfactory and incomplete, since the problem is basically not amenable to neat representation. Its only purpose is to illustrate the importance of access to or control over resources and technological and cultural factors in influencing (if not determining) *both* poverty and environmental degradation. Redclift (1987), Blaikie (1985), Blaikie and Brookfield (1987), and Little and Horowitz (1987) contain elaborations of this theme. Grossman (1984) and Hecht (1985) are examples of region-specific analyses. Eckholm (1976) typifies simpler analyses that focus on poverty and population growth.

8. Economists have responded by suggesting that currently used indicators of economic growth (GNP in particular) could be modified so as to somehow "build in" this correlation (e.g., Peskin, 1981). To what extent this is possible and whether it will serve more than a marginal purpose are, however, open questions (Norgaard, 1989).

9. Three other "social" usages of sustainability need to be clarified. Sustainable economy (Daly, 1980) and sustainable society (Brown, 1981) are two of these. The focus there, however, is on the patterns and levels of resource use that might be ecologically sustainable while providing the goods and services necessary to maintain human well-being, and the social reorganization that might be required to make this possible. The third usage is Chambers' definition of "sustainable livelihoods" as "a level of wealth and of stocks and flows of food and cash which provide for physical and social well-being and security against becoming poorer" (Chambers, 1986). This can be thought of as a sophisticated version of "basic needs", in that security or risk-minimization is added to the list of needs. It is therefore relevant to any paradigm of development, rather than to SD in particular.

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