SUSTAINABILITY AND SUSTAINABLE DEVELOPMENT: HISTORICAL AND CONCEPTUAL REVIEW

Desta Mebratu

International Institute for Industrial Environmental Economics, Lund University

The vagueness of the concept of sustainable development, coupled with its increasing importance in national, international and corporate policies, has led to a large political battle for influence over our future by linking interpretation to the concept. This has resulted in a wide variety of definitions and interpretations that are skewed towards institutional and group prerogatives rather than compounding the essence of the concept, which has been inherent in traditional beliefs and practices. A systematic analysis of representative definitions and interpretations presented in this article reveals that most of the contemporary definitions focus on specific elements while failing to capture the whole spectrum. Such a historical and conceptual analysis focusing on the analysis of the metaphorical and epistemological basis of the different definitions is believed to be the first step towards developing a concrete body of theory on sustainability and sustainable development.   © 1998 Elsevier Science Inc.

Introduction

As we approach the end of the second millenium, we find ourselves overwhelmed by complexities unprecedented in human history. Today, mankind has the capacity to produce far more information than anyone can absorb, to foster far greater interdependency than anyone can manage, and to accelerate change far faster than anyone's ability to keep pace (Senge 1990). Parallel to (or as a result of) this unprecedented labyrinth of complexity, we have a myriad of systemic dysfunction, each with its own ecological, economic, and social dimensions without simple cause or solution. This has led to the evolution of new concepts, including that of sustainable development as a basis for overcoming the environmental challenges.

Address requests for reprints to: Desta Mebratu, International Institute for Industrial Environmental Economics, Lund University, P.O. Box 196, S-221 00 Lund, Sweden. E-mail: desta.mebratu@iiiee-lu.se

It has been nearly a decade since the terms "sustainable development" and "sustainability" "rose to the prominence of mantra—or a shibboleth" (Daly 1996) following the 1987 publication of the UN-sponsored World Commission on Environment and Development (WCED) report, *Our Common Future*. Despite its acclaimed vagueness and ambiguity, the WCED definition of sustainable development has been highly instrumental in developing a "global view" with respect to our planet's future.

Since then, thousands of initiatives have been taken at local, national, and global levels in an attempt to address different aspects of the environmental challenges. A number of encouraging local outcomes have ensued from these activities. However, their impact in shaping "our common future" on a more sustainable basis seems to be minimal when measured against the enormity of the global environmental challenges. This has led to an increasing level of frustration and disenchantment, even among the different groups promoting the concept of sustainable development (Mebratu 1996).

In the 1980s, some proclaimed that sustainable development was no more than a catch phrase that eventually would wither out as the concept of appropriate technology of the 1970s did. Contrary to this belief, the influence of the concept has increased significantly in national and international policy development, making it the core element of the policy documents of governments, international agencies, and business organizations. This has led to a widening of the discourse on the concept of sustainable development, resulting in a wide variety of definitions and interpretations.

This article reviews the environmental parallels in human history, the historical perspective of the evolution of the concept of sustainable development, and the current definitions and interpretations of sustainable development. Furthermore, the article identifies the major conceptual flaws of current definitions, together with the source of the flaws.

1. The Ecological Parallel

The natural system possesses self-regulating mechanisms, which are composed of a complex web of positive and negative feedback systems operating within the context of the carrying, regeneration, and assimilation capacity of the respective systems. Mobility of plants and animals, as an essential element of self-regulation of the biotic system, has played a major role in the evolution of the planet Earth. As an integral part of the animal kingdom, mobility governed by ecological factors has patterned the dominant lifestyle of mankind for millions of years.

About 8,000 years ago, after eons of slow accumulation, the human population reached the enormous (for the time) number of about 10 million (Meadows et al. 1992). These people lived as nomadic hunter-gatherers, but their numbers began to be abundant all around them. To adapt to the problem of dwindling wild resources, they did two things. Some of them

intensified their migratory lifestyle. They started to move out of their ancestral homes of Africa and the Middle East and into the rest of the game-rich world.

Other people began to domesticate animals and cultivate plants, and as a consequence settled in one place, which was a totally new idea. Simply by staying put, the proto-farmers altered the face of the planet and the thoughts of humankind in ways they could never have foreseen (Meadows et al. 1992). For example, for the first time it made sense to own land. Thus, the ideas of wealth, trade, money, and power were born.

As a result of this change in human behavior, history from 3000 B.C. to the present witnessed the development of more advanced agriculture, increasingly complex social divisions of labor and means of exploitation, and the continual creation of tools to delve and shape the earth and its products. Part of this development also witnessed the devaluation of "nature," the creation of exclusively masculine symbols for divinity, and the subjugation of women by patriarchal control over their reproductive and sexual status (Gottlieb 1996).

Nevertheless, agriculture was a successful response to wildlife scarcity faced by the hunter-gatherer society. It permitted continued slow population growth, which added up over centuries to an enormous increase, from about 10 million people to about 800 million by 1750 (Meadows et al. 1992). By that time, the larger population had created new scarcities, especially in land and energy, so another revolutionary step was necessary. Thus, the industrial revolution began in England with the substitution of abundant coal for vanishing trees. The use of coal raised immediate, practical problems of earth moving, mine construction, water pumping, transport, and controlled combustion. It required greater concentrations of labor around the mines and mills, and it necessitated the elevation of science and technology to prominent positions in human society.

Once again, everything changed in ways that no one could have imagined. Coal led to steam engines. Machines, not land, become the central means of production. That bare instrumentalism led to great material productivity and a world that today supports, at least partially, more than 5 billion people (Meadows et al. 1992). The far-flung markets led to environmental exploitation from the poles to the tropics, from the mountain tops to the ocean depths. The success of the industrial transformation, like the more limited successes of hunting-gathering and agricultural transformations, has led to ecological scarcities, not only in terms of natural resource supply, but also of the absorptive capacity of the natural sinks.

The contemporary environmental debate, predominantly, assumes that environmental concern is linked to the problem of industrial pollution and considers this to be a unique feature of the industrial society. Historically, however, hazards of pollution, deforestation, land degradation, and chemical food adulteration (Wall 1994) have dogged humanity, to a greater or

lesser extent, for most of its existence. Heavy metal pollution, especially lead pollution, is considered as one of the major factors that contributed to the fall of Rome (Niragu 1994). Furthermore, there is a growing consensus among environmental archaeologists that numerous ancient societies, including the Babylonian Empire, may have collapsed because of environmental degradation.

Besides the sweeping effect of environmental degradation, ecological factors have been one of the major driving forces behind every social transformation recorded in history, including the agricultural and the industrial transformations. In the historical context, it can be stated that the environmental past may, often, indicate useful parallels with the environmental present. Throughout most of human history, the growth of population, the degradation and depletion of resources, the restructuring of societies, and the development of new technologies have usually been so slow as to be imperceptible during an individual lifespan (Meadows et al. 1992). However, during the past two centuries, and especially during the last five decades, the global economy has shown incredible growth, transforming the character of the planet and especially of human life.

Through industrialization and globalization, the standard of living in the developed world has soared from bare subsistence to affluence, while the majority of people in the developing world still are subjected to destitution. The natural environment has reached a limit where it is beginning to give "vital signs" (Brown et al. 1995). Moreover, as was pointed out by Gottleib (1996), the continuous growth of technological and social power—and the attendant religious and political ideologies that support them—have strengthened the belief of mankind's fundamental difference from nature and is leading the human race to a point of ultimate destruction. It is in this womb that the embryo of contemporary environmentalism began to fertilize.

2. The Evolution of the Concept

The report, *Our Common Future*, published by WCED, is taken as a starting point for most current discussions on the concept of sustainable development. This report, a comprehensive one produced through a global partnership, constituted a major political turning point for the concept of sustainable development. But it is neither the starting point nor the possible end of the conceptual development process. As any conceptual process governed by general evolutionary theory, there are some significant conceptual precursors that have led to the WCED's definition of sustainable development, which in turn is followed by other conceptualization efforts.

This section focuses on reviewing the historical and conceptual precursors of the concept of sustainable development. It is categorized into three historical periods: Pre-Stockholm, covering the period until the Stockholm

Conference on Environment and Development (–1972); from Stockholm to WCED (1972–1987); and Post-WCED (1987–1997).

2.1 Pre-Stockholm

2.1.1 RELIGIOUS BELIEFS AND TRADITIONS. Historically, religions have taught us to perceive and act on non-human nature in terms of particular human interests, beliefs, and social structures. Through religious beliefs and laws we have socialized nature, framing it in human terms. And to a great extent we have done so to satisfy human needs, abilities, and power relations. Yet, at the same time, "religion has also represented the voice of nature to humanity" (Gottleib 1996). Spiritual teachings have celebrated and consecrated our ties with the non-human world, reminding us of our delicate and inescapable partnership with air, land, water, and other living beings.

To assess religion's view of nature and to see how contemporary theology deals with the environmental crisis, we must attend with care to the full range of writings and practices that religious traditions offer. Many writers have found the Judeo-Christian writings about "man's right to master the Earth" (Genesis 1:28) an essential source for the havoc wrecked by Western societies upon the earth. Other religious environmentalists have discovered environmentally positive passages in classic texts, and they claim that Judaism and Christianity are more environmentally minded than they seem at first glance (Kinsley 1996). A critical review of the writing on both sides leads to the conclusion that religions have neither been simple agents of environmental degradation nor unmixed repositories of ecological wisdom. As pointed out by Gottleib (1996), they have been both.

Besides the dominant religions of East and West, we have numerous indigenous beliefs and traditions that have been used as the basis for the traditional coping mechanisms long before the rise of any of the religious beliefs. One still can find numerous cases of such beliefs, based on indigenous traditions and values, being used as the basis of community life in the South. In Hawaiian thought, there are close parallels between humans and nature (Dudley 1996). Hawaiians traditionally have viewed the entire world as being alive in the same way that humans are alive. There was no such thing as emptiness in the world for a Lakota (Mathiessen 1984). Even in the sky there were no vacant places. Life was existent everywhere, visible and invisible, and every object imparted a great interest to life.

In the African view, the universe is both visible and invisible, unending, and without limits (Mbiti 1996). Events come and go in the form of minor and major rhythms. The minor rhythms are found in the lives of the living things of the earth (such as men, animals, and plants), in their birth, growth, procreation, and death. These rhythms are thought to occur in the lives of everybody and everything that has life. The major rhythms of time are

events like day and night, the seasons of rain and dry weather, and similar events of nature that come and go. In many communities, circles are used as symbols of eternity and continuity. For African tradition, man is not the master in the universe; he is only the center, the friend, the beneficiary, the user. For this reason, he must live in harmony with the universe, obeying the laws of natural, moral, and mystical order (Mbiti 1996). If these are unduly disturbed, it is man who suffers most.

Although they have different contexts and structures, the core element of all of the indigenous traditions and beliefs is the importance of living in harmony with nature. The most prominent positions on indigenous traditions and beliefs range from a hubristic write off as "primitive" to the advocacy of returning back to the indigenous tradition of "reverence to nature" as perceived by some ecological groups. The most important lesson to be drawn from indigenous traditions and beliefs is the "holistic vision" that is inherent in all of the beliefs and the importance attached to being in constant communication with nature.

Whatever environmental value we may find in the teachings of the different religions, East and West, and the indigenous traditions of the South, it would be unrealistic to advocate any of these traditions as the basis for addressing the environmental crisis today. Despite the brilliance or quality of revelation of founding teachings, we now live in a very different world of complexity that goes beyond the realm of these teachings. Nonetheless, traditional wisdom has much to offer in terms of *living in harmony with nature and in society*; this is one of the fundamental tenets of the concept of sustainability.

2.2.2 ECONOMICS AND THE "THEORY OF LIMITS". Thomas Robert Malthus (1766–1834) is considered to be the first economist to foresee the limits to growth caused by resource scarcity. While he fits into the classic economics tradition, Malthus is sufficiently at variance with some basic principles (Oser and Blanchfield 1995). By 1798, many of the evil effects of the industrial revolution had surfaced. Unemployment, poverty, and disease were already problems calling for remedial treatment. Contrary to the ideas of William Goldwin (1756–1836) and Marquis de Condorcet (1743–1794), Malthus said that the vices and misery that plague society are not due to evil human institutions, but are due to the fecundity of the human race. This led to his theory of population.

According to Malthus's theory, unchecked population increases geometrically, while subsistence increases arithmetically at best (Oser and Blanchfield 1997). Together with David Ricardo (1772–1823), who fundamentally agreed with his population theory, Malthus expressed his "environmental limits thinking" in terms of the limits on the supply of good quality agricultural land and the resultant diminishing returns in agricultural production (Pearce and Turner 1990). For Malthus, the fixed amount of land available

(absolute scarcity limit) meant that as the population grew, diminishing returns would reduce the per capita food supply. The standard of living would be forced down to a subsistence level, and the population would cease to grow. In Ricardo's more complex economic model, economic growth also peters out in the long run, because of a scarcity of natural resources. Diminishing returns set in, not so much because of absolute scarcity, but because the available land varies in quality; hence, society is forced to move on to successively less productive land.

The fundamental shortcoming of this theory is that, in both cases, the subject of diminishing returns was defined on the basis of keeping the total production curve fixed. In reality, technical innovations, such as the use of fertilizers, have shifted the total production curve upwards, increasing output per unit of input and offsetting, but not eliminating, the tendency towards diminishing returns. Still, the Malthusian theory of "environmental limits" may be considered a precursor to the concept of sustainable development.

2.2.3 Political economy and the "scale" of organization. Looking back at the history of political economics, one finds the "subterranean tradition" of organic and de-centralist economics, whose major spokesmen include Prince Kropotkin, Gustav Lanauer, Tolstoy, William Morris, Gandhi, Lewis Mumford, and, most recently, Alex Comfort, Paul Goodman, and Murray Bookchin. It is the tradition we might call anarchism—"libertarian political economy that distinguishes itself from orthodox socialism and capitalism by insisting that the scale of organisation must be treated as an independent and primary problem" (Roszak 1989).

The tradition, while closely affiliated with socialist values, nonetheless prefers mixed to "pure" economic systems. Bigness is the nemesis of anarchism, whether the bigness be that of public or private bureaucracies, because "bigness engenders impersonality, insensitivity, and a lust to concentrate abstract power" (Roszak 1989). Reaching backward, this tradition embraces communal, handicraft, tribal, guild, and village lifestyles as old as Neolithic cultures. According to Roszak (1989), if there is to be a humanly tolerable world on this dark side of the emergent technocratic world system, it surely will need to flower from this yet fragile renaissance of organic husbandry, communal households, and do-it yourself techniques as described by Ernest F. Schumacher (1979) in *Small Is Beautiful*.

Roszak (1989) said it would be no exaggeration to call Schumacher the Keynes of postindustrial society, by which he meant a society that has left behind its lethal obsession with those very megasystems of production and distribution that Keynes tried so hard to make manageable. The first work of Schumacher appeared in 1959 under the title, *The Crucial Problems of Modern Living*. His works culminated in international recognition and fame

after the publication of his famous book, *Small Is Beautiful*, in 1979. The
themes addressed in this book included, inter alia (McClaughry 1989):

- Sharp criticism of overorganized systems as destructive of the human
  spirit and of the planet alike;
- Concern about the rapid depletion of natural resources and the corre-
  sponding destruction of the environment;
- Concept of intermediate or appropriate technology and the importance
  of human scale, perhaps the thought for which the book is best known;
- Failure of traditional economics to bring incommensurable "non-eco-
  nomic factors" into the policy-making process; and
- Need for human beings to be close to the nurturing land, in both fact
  and spirit.

To a world awakening to the specter of global pollution, resource exhaus-
tion, corporate concentration, and the corresponding diminution of individ-
ual liberties, Schumacher's book was "a ray of hope" (McClaughry 1989).
As a result, in the mid 1970s, *Small Is Beautiful* became a rallying cry,
while the concept of appropriate and intermediate technology became the
catch phrase of the following decade. Although the book contains a number
of controversial and debatable ideas, Schumacher's concern about the ex-
haustion of the planet's resources gave new impetus to a whole generation
of environmental defenders, while his effort of looking at the economic,
ecological, and social aspects of a given system added a new dimension to
the discourse on the "scale of organisation."

Some experts believe that the concept of appropriate technology (defined
as technology that takes heed of the skill, levels of population, availability
of natural resources) and pressing social needs (defined by the people
themselves) is the immediate precursor to the concept of sustainable devel-
opment. According to DuBose et al. (1995), "sustainable development can
be traced back at least as far as the mid-1960s, when appropriate technology
was promoted as the way to develop the lesser developed countries." By
the early 1970s, many organizations and individuals promoted appropriate
technology for the developed world as well.

2.2 *From Stockholm to WCED*

The 1972 UN Conference on Human Environment in Stockholm, which
recognized the "importance of environmental management and the use of
environmental assessment as a management tool" (DuBose et al. 1995),
represents a major step forward in development of the concept of sustain-
able development. Even if the link between environmental and develop-
mental issues did not emerge strongly, there were indications that the form
of economic development would have to be altered.

At around the same time of the Stockholm Conference, a group of
eminent scientists and concerned citizens gathered in Rome to look at the

global environmental crisis that was expanding at an alarming rate. This group, later to be known as the Club of Rome, produced a comprehensive report on the state of the natural environment. This report emphasized that the industrial society was going to exceed most of the ecological limits within a matter of decades, if it continued to promote the kind of economic growth witnessed in the 1960s and the 1970s.

That environment and development could not for long remain in a state of conflict gradually became apparent after the 1972 UN Conference on the Human Environment. In the years following, the terminology evolved to terms like "environment and development," "development without destruction," and "environmentally sound development." Finally, the term "eco-development" appeared in the UN Environment Program review in 1978. By this time, it became recognized internationally that environmental and developmental ideas needed to be considered concurrently.

According to Tryzna (1995), however, the first major breakthrough in conceptual insight came from the International Union for the Conservation of Nature (IUCN). Working closely with the World Wildlife Fund for Nature and The United Nations Environment Programme, IUCN formulated the World Conservation Strategy, which was launched internationally in 1980. This was a major attempt to integrate the environment and development concerns into an umbrella concept of "conservation."

Although the term "sustainable development" did not appear in the text, the strategy's subtitle, "Living Resource Conservation for Sustainable Development," certainly highlighting the concept of sustainability (Khosla 1995). According to Khosla, by bringing the element of time directly into the environment and development debate, the strategy discovered a truly synthesizing factor in sustainability and was able to focus what earlier had been a rather diffuse idea.

The theme was picked up a few years later by the WCED. The report of WCED (also known as the Brundtland Commission), *Our Common Future*, holds the key statement of sustainable development, which defined it as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (WCED 1987). This definition marks the concept's political coming of age and establishes the content and structure of the present debate (Kirkby 1995).

The conceptual definition of the Brundtland Commission contains two key concepts:

- The concept of "needs," in particular the essential needs of the world's poor, to which overriding priority should be given; and
- The idea of limitations imposed by the state of technology and social organization on the environment's ability to meet present and future needs.

By doing so, the Commission underlines the strong linkage between poverty alleviation, environmental improvement, and social equitability

through sustainable economic growth. Not surprisingly, since it may be interpreted in so many different ways, the Brundtland Commission's definition of sustainable development has received a very wide acceptance. As noted by Pearce et al. (1989), it fits nicely into political sound-bites compared with its predecessor's "eco-development"; it is something to which everyone can agree, like motherhood and apple pie.

2.3 Post WCED

If IUCN takes credit for incorporating the phrase "sustainable development" for the first time into an international forum, the Brundtland Commission, through its report *Our Common Future* (1987), was the major political turning point that made the concept of great geopolitical significance and the catch phrase it has become today (Holmberg 1994). Since publication of this report, sustainable development increasingly has become the core element of environmental discourse, leading to a very broad acceptance with very diverse interpretations. According to Holmberg (1994), by 1994 there were more than 80 different definitions and interpretations fundamentally sharing the core concept of the WCED's definition.

The other major stumbling block after WCED is the UN Conference on Environment and Development (UNCED), which is also known as the "Rio Conference," or the "Earth Summit." Preparation for the Conference, held in June 1992, began in 1989. There were four International Preparatory Committee (PrepComs) meetings held in different parts of the world. Parallel to the PrepComs, each UN member country was expected to produce a national report covering current national environmental and developmental aspects and drawing up an action plan for promoting sustainable development within the national context.

UNCED led to production of major international documents such as the Rio Declaration, Agenda 21, and conventions on desertification, biodiversity, and climate change. Although a great deal of importance was attached to the documents and declarations signed at the end of the conference, the most important legacy of UNCED was the very nature of the preparatory process, which, in most countries, involved participation of major stakeholders down to the grassroots level. This process took the concept of sustainable development to every corner of the world, exposing it to questions such as: What does it really mean for each and every community? How can we get beyond generalities and put them into practice? How do we know if we are moving toward a sustainable world?

Most experts working on promotion of the concepts choose to shy away from these "down-to-earth," practical questions by saying that it is sufficient to accept the concept as a tool that guides us towards a better future and to focus on how to make the necessary changes. However, as pointed out by Daly (1996), "although there is an emerging political consensus on the

desirability of something called sustainable development, this term—touted by many and even institutionalized in some places—*is still dangerously vague*" to be used as a guide for making the desired changes. Reflecting the same apprehension, Goldin and Winters (1995) describe the concept as being "elusive," while Tryzna (1995) presents the growing frustration around the concept, underlined by it being branded as "*an oxymoron*" by its own protagonists. Holmberg (1994) states that "sustainable development as a concept has become devalued to the point where, to some, it is now just a *cliché.*"

Considering the institutional foundation of WCED and the global realities in the mid-1980s, the definition of sustainable development provided by WCED contains much practical wisdom. It has been highly instrumental in developing the new world view that is emerging today. Having a consensus on a vague concept, rather than disagreement over a sharply defined one, was a "good political strategy" (Daly 1996). By 1995, however, "this initial vagueness was no longer a basis for consensus, but a breeding ground for disagreement" (Daly 1996). Acceptance of a largely undefined term as a basis sets the stage for a situation where whoever can pin his or her definition to the term automatically will win a large political battle for influence over the future.

3. Conceptual Analysis

Beginning with the general position on the pending environmental crisis faced by humanity, one finds two extremely polarized variations. At one end of the environmental debate spectrum is the Limits to Growth school, advocated by such groups as the Club of Rome, "which has done much to dramatise (Bhaskar and Glyn 1995) the issue of environmental constraints by projecting a drastic showdown and even collapse." At the other end are the technocrat/economist optimists, exemplified perhaps by parts of the World Bank's World Development Report, who argue that resource constraints can be overcome at relatively little cost, provided the correct (usually market-oriented) policies are put in place.

Despite the range of positions within the debate, in the years following the 1972 Stockholm Conference, the scientific consensus on the occurrence of ecological imbalances has gradually focused, coming to the conclusion that the damage inflicted by human activities on the natural environment render those activities unsustainable (Ekins and Jacobs 1995). This has created a need for a new world view to serve as a basis for global consensus, which eventually led to the coining of the term "sustainable development."

Since the definition and subsequent popularization of the term by WCED in 1987, numerous efforts have been made by different groups, organizations, and individuals to capture the meaning of the concept. Although it is a cumbersome task to cover exhaustively all the definitions that are

mushrooming from diverse individual and group "needs" and "aspirations," in broad terms the existing variety of definitions of sustainable development can be categorized into three major groups, depending on the constituent representation reflected in their presentation. These are: (1) the Institutional Version, (2) the Ideological Version, and (3) the Academic Version.

All of these definitions are based on acceptance that the world is faced with an environmental crisis, that we must make a fundamental change to overcome the crisis. Instead of focusing on the semantics used in the different groups of definitions, the conceptual review focuses on: What is identified as the source of the crisis? What is the core approach to the solution? What is the proposed solution platform? What is the key instrument for the solution? Besides these questions, each group of definitions will be analyzed against the major drivers of the conceptualization effort.

3.1 Institutional Version

For the Institutional version, the definitions given by WCED, the International Institute of Environment and Development (IIED), and the World Business Council for Sustainable Development (WBCSD) can be taken as representative. A synoptic comparison of these definitions shows that they all share the same definition of sustainable development, which is very much based on *need satisfaction*, with a wide spectrum of interpretation. As can be seen from Table 1, the difference in interpretation is reflected in their differences regarding the identification of the *epicenter* of the solution, the *solution platform*, and the *leadership center* for actualizing the solution. These factors are very much influenced by the institutional objectives, which are the direct reflection of the interests of the Establishment.

The definition of sustainable development given by the Brundtland Commission serves as the core element for almost all of the establishment's definitions. According to some authors belonging to this group, the Brundtland Commission Report, *Our Common Future*, is the key statement of sustainable development, which is defined as "development that meets the

TABLE 1. Comparative Analysis of the Institutional Version of Sustainability

Institution	Drivers	Solution Epicenter	Solution Platform	Instruments (Leadership)
WCED	Political consensus	Sustainable growth	Nation-state	Governments and international organizations
IIED	Rural development	Primary environmental care (PEC)	Communities	National and international NGOs
WBCSD	Business interest	Eco-efficiency	Business and industry	Corporate leadership

needs of the present without compromising the ability of future generations to meet their own needs" (WCED 1987).

A related definition has been developed by the International Institute for Environment and Development (IIED).[1] This definition of sustainable development is based on the identification of three systems as basic to any process of development: the biological or ecological resource system, the economic system, and the social system. Human society applies a set of goals to each system, each with its own hierarchy of subgoals and targets (Holmberg 1994).

The objective of sustainable development will, then, be to maximize goal achievement across these three systems at one and the same time through an adaptive process of tradeoffs. IIED uses the term "primary environmental care" (PEC) to describe the process for progress toward sustainability at the "grassroots" level. The typical feature of the IIED definition is that its solution is based on the increasing empowerment of people to take charge of their own development, combined with a clear knowledge of environmental constraints and of requirements to meet basic needs. This position reflects the institute's primary focus on rural development in developing countries.

The other establishment version is the definition presented by the industrial business establishment, as epitomized by the WBCSD. As stated in the charter of WBCSD, "Business leaders are committed to sustainable development, to meeting the needs of the present without compromising the welfare of future generations. This concept recognises that economic growth and environmental protection are inextricably linked, and that the quality of present and future life rests on meeting basic human needs without destroying the environment upon which all life depends" (Schmidheiny 1992).

As a direct extension of the WCED definition, this version asserts that economic growth in all parts of the world is essential for improving the livelihood of the poor, for sustaining growing populations, and eventually for stabilizing population. New technologies will be needed to permit growth, while energy and other resources may be used more efficiently to produce less pollution.

This version asserts that the requirement for clean, equitable economic growth remains the single greatest difficulty within the larger scope of sustainable development. Proving that such growth is possible is certainly the greatest test for business and industry, which much devise strategies to maximize added value while minimizing resource and energy use through the implementation of the principles of eco-efficiency. According to this version, given the large technological and productive capacity of business,

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[1] IIED is one of the organizations that was said to be using the term "sustainable" long before IUCN in 1980, to stress the links between the environment and the need for development.

any progress toward sustainable development requires its active leadership (Schmidheiny 1992).

3.2 The Ideological Version

At the ideological level, although there are some factors that indicate the emergence of a distinct green ideology, the environmental versions of classic ideologies such as liberation theology, radical feminism, and Marxism are the dominant ones. Eco-feminism is considered to be the conceptual juncture at which point the four tectonic plates of liberation theory—those concerned with the oppressions of gender, race, class, and nature—finally come together (Plumwood 1993), while eco-socialism considers capitalist oppression as the major source of the environmental crisis (Pepper 1993) (Table 2).

The term eco-feminism was introduced in the mid-1970s by the French feminist writer, Francoise d'Eaubonne, who identified overpopulation and the destruction of natural resources as the two most immediate threats to our survival. In her view, the only way out would be women's destruction of "the Male System," which is the source of the threats. Then, "the planet in the feminine gender would become green again for all" (Braidotti et al. 1994).

Eco-feminism, today, refers to a significant stream within the feminist movement, containing a range of theoretical positions resting on the assumption that there is a critical correlation between the domination of nature and the domination of women. Eco-feminism points to the interconnections between feminist and ecological concerns. When it emerged, it promised to expose, challenge, and change dominant power structures, whether within the frameworks of meaning, in gender relations, or in economic systems. These promises have been based primarily on the idea of merging the critical and transformative potentials of ecology and feminism, which were expected to create a new, powerful movement for social and

TABLE 2. Comparative Analysis of the Ideological Version of Sustainability

Ideology	Liberation Theory	Source of the Environmental Crisis	Solution Epicenter	Leadership Center
Eco-theology	Liberation theology	Disrespect to divine providence	Spiritual revival	Churches and congregations
Eco-feminism	Radical feminism	Male-centered (androcentric) epistemology	Gynocentric value hierarchy	Women's movement
Eco-socialism	Marxism	Capitalism	Social egalitarianism	Labor movement

cultural change. Thus, eco-feminism has become a new, rather diversified, and decentralized movement.

With the rise of modern environmentalism in the 1970s, a new debate between red and green politics (socialist and environmentalist, respectively) emerged, which led to the evolution of the concept of eco-socialism. Eco-socialism is based on the assumption that sustainable, ecologically sound capitalist development is a contradiction in terms that never can be realized. The ecological crisis we are facing is a manifestation of the inherent crisis within the capitalist system, and it can be overcome only through ecologically oriented socialist development. The following are summarized as the major principles of eco-socialism (Pepper 1993).

- Eco-socialism is anthropocentric and humanist. It rejects the bioethic and mystification of nature and any anti-humanism that these may spawn, though it does attach importance to human spirituality and the need for this to be satisfied in part by non-material interaction with the rest of nature.
- Humans are not a pollutant, neither are they "guilty" of hubris, greed, aggression, overcompetitiveness, or other savageries. If they behave thus, it is not by virtue of unchangeable genetic inheritance, or corruption as in original sin: the prevailing socio-economic system is more likely the cause.
- Humans are not like other animals, but neither is non-human nature external to society. The nature that we perceive is socially perceived and produced. What humans do is natural.
- Thus, alienation from nature is separation from a part of ourselves. It can be overcome by reappropriating collective control over our relationship with nature, via common ownership of the means of production: for production is at the center of our relationship with nature even if it is not the whole of that relationship.
- We should not dominate or exploit nature in the sense of trying to transcend natural limits and laws, but we should collectively "dominate" (i.e., plan and control) our relationship with it for collective good.

The eco-socialist response to resource questions is not merely to fix on distribution. It maintains that there are no historical limits of immediate significance to human growth as socialist development. However, there are ultimate natural constraints that form the boundaries of human transformational power. Additionally, each form of socio-economic organization has its specific approach and dynamics of relating to its own specific set of historical conditions, including the non-human environment. So, the natural limits to a given mode of production are not universal limits, of a universally similar kind, on all modes of production. Changing the mode of production means changing many needs, and the resources to fill them, and also the set of ecological problems to be solved.

Pepper (1993) states that production and industry are not to be rejected *per se*. If unalienated, they are liberating. Capitalism initially developed productive forces, but now it hinders their unalienated and rational development. It, therefore, must be replaced by socialist development where technology (a) is adaptive to all nature (including human) and not destructive of it, and (b) strengthens the competency and controlling power of the producers. It further asserts that the labor movement must be a key force in social change, rediscovering its potential in this respect, and resurrecting its character as an environmental movement. However, it asserts that trying to smash capitalism violently will probably not work while capitalists control the state, so the state must be taken over and liberated in some way for the service of all (Pepper 1993).

The longstanding religious claim for absolute truth started to erode with the spread of both democracy and the critical intellectual tendencies embedded in Enlightenment philosophies and modern sciences. This has led some people to a complete rejection of religion. For many others, abandoning the claim to literal veracity of a particular theology allows adherents of very different traditions to recognize common ground and celebrate each other's spiritual gifts. With the rise of the feminist movement, the patriarchal biases in virtually all established traditions of religion became a major focus of criticism.

The rise of environmentalism opened a new door of criticism toward the traditional religions. The Judeo-Christian religious traditions were specifically singled-out by environmental groups as one of the major instruments enhancing the destruction of the natural environment through teaching man's domination over nature. It is against this background that a new breed of theologians known as ecotheologians have started to emerge. Ecotheologians have sought to reinterpret old traditions: finding and stressing passages in classic texts to help us face the current crisis. Thus, we are reminded (Gottlieb 1996) that the "Talmud instructs not to live in a city without trees; or that St. Francis' love of animals makes him a kind of early Christian Deep Ecologist."

Thinkers also have tried to extend more familiar religious beliefs, especially ethical ones concerning love and respect for other people, to non-human nature. Nature becomes the Body of the God, or the neighbor whom we must treat as we would like to be treated. Creative eco-theologians synthesize elements of different traditions. As part of the ecumenical tendency of contemporary spiritual life, we see some Christian thinkers unhesitatingly using Taoist images of humanity's integration into a natural setting, or Jews quoting Buddhist nature poetry. In particular, ideas from indigenous or native peoples, communities whose relationship to nature originated before the current mode of the domination of the earth, have been studied. Contemporary eco-theology voices the sorrow of a broken-hearted earth, expresses our despair over the past, and fear for the future. Simultaneously,

theoreticians of both religion and the environment question whether, and in what ways, religious energies can be connected to secular environmental philosophy and ecological activism.

Eco-theology is based fundamentally on the belief that mankind has simply ignored the wealth of ecologically relevant material in the religious traditions. Therefore, what we need to do now to have an adequate environmental theology is to dig up the appropriate texts and allow them to illuminate the present crisis. According to this thinking, "the main source of our predicament is simply human greed, and the solution lies in a renewed commitment to humility, to the virtue of detachment, and to the central religious posture of gratitude by which we accept the natural world as God's gift and treat it accordingly" (Haught 1996). Ecotheologians believe that if we allow our lives to be shaped by genuine religious virtue, our relation to nature will attain the appropriate balance, and we may avert the disaster that looms before us.

Despite the conceptual basis of eco-theology, eco-feminism, and eco-socialism being rooted in very different liberation theories (as may be seen in Table 2), there is a striking structural similarity among these versions in the identification of the *source* of the environmental crisis, the *solution epicenter*, and the *role of leadership*.

3.3 The Academic Version

In the Academic version (Table 3), the economist, ecologist, and sociologist conceptualizations reflect the response of the scientific community to the challenge of the environmental crisis of the twentieth century. At heart, the neoclassical approach to environmental economics has one aim (Jacobs 1994): to turn the environment into a commodity that can be analyzed just like other commodities. These economists are of the opinion that the environment is frequently undervalued: because it can often be used free of charge, it tends to be overused and, therefore, degraded. If the environment only were given its proper value in economic decision-making terms, it would be protected much more highly (Redclift and Benton 1994).

The solution package of neoclassical economics is composed mainly of two stages. The first stage is to determine the price of the environmental commodities by constructing supply and demand curves based on the outcome of the application of different valuation techniques. This enables the economist to identify the appropriate (optimal) level of environmental protection for society to adopt (Jacobs 1994). The second stage is to turn these imputed prices into real-life prices: either by changing the prices of the existing market activities by taxing environmental damage, by subsidizing environmental improvement, or by creating markets for environmental goods by issuing permits that are then tradeable between firms or consumers.

TABLE 3. Comparative Analysis of the Academic Version of Sustainability

Academic Discipline	Drivers (Epistemological Orientation)	Source of Environmental Crisis	Solutions Epicenter	Instruments (Mechanism of Solutions)
Environmental economics	Economic reductionism	Undervaluing of ecological goods	Internalization of externalities	Market instrument
Deep ecology	Ecological reductionism	Human domination over nature	Reverence and respect for nature	Biocentric egalitarianism
Social ecology	Reductionist-holistic	Domination of people and nature	Co-evolution of nature and humanity	Rethinking of the social hierarchy

Two factors may be identified as the basic premises for the ecological conception of sustainability (Carpenter 1995). First, nature, left alone, is a self-organizing system that changes, responds, and evolves over time through a highly variable set of quasi-stable conditions. It is sustainable in the sense that it has no discernible goals or purpose. Hence, every ecosystem is self-controlled within larger scale constraints. Second, human beings seek to impose some constancy and dependability of supply of needed products through deterministic interventions.

Based on these premises, there are quite a number of sustainability concepts within the disciplinary framework of ecology that may be categorized broadly into two domains: shallow ecology and deep ecology. Shallow ecology basically means (Clarke 1993) the treatment of environmental problems without tackling the underlying causes and without confronting the philosophical assumptions that underlie our current political and economic thinking. On the other hand, we find the concept of deep ecology formulated by the Norwegian philosopher, Arne Naess, in the early 1970s as a response to the limits of shallow ecology. His view was that, in the long run, environmental reforms of social and economic systems are not a viable solution to offset the accelerating destruction of the environment. Warning that the ecological crisis threatens the survival of humanity, Arne Naess identified the deeper roots of the crisis in Western culture and in particular in the cultural values legitimizing the domination of nature (Braidotti et al. 1994).

Seeking to overturn the epistemological foundations of Western culture, deep ecologists propose to replace anthropocentric hierarchies with biocentric egalitarianism. According to this view, "humanity is no more, but also no less, important than all other things on earth" (Zimmerman). Deep ecologists see richness and diversity of life as values in themselves and assume that human beings have no right to reduce these, except to satisfy their basic needs. They also stress the need for cultural diversity and diversity in social arrangements as necessary preconditions for the survival of the planet.

In an attempt to qualify deep ecology, ecologists have developed the concept of Gaia. The major tenet of this hypothesis is that Gaia is a total self-organizing and self-reproducing, organic, spatio-temporal, and teleological system with the goal of maintaining itself.

The Gaia hypothesis has caught the imagination of the ecological movement (Plumwood 1993) and has contributed to replacing the image of the "Earth as a machine" with the image of the "Earth as an organism." The contribution of the Gaia theory is to highlight interdependencies within and among the organic and inorganic world and to focus on Gaia-centrism instead of on anthropocentrism, competition, and individualistic aggression, typical of some other biological and social theories. The theoretical underpinnings of the Gaia theory touch upon the biocentric position: the survival

of the earth, Gaia, is the foundational image of the newly emerging eso-cratic rationality.

In general, the academic versions exhibit conceptual shortcomings of one type or another that are related to their reductionist epistemological foundations and reflected in their solution frameworks. Although the increasing acceptance of the interdisciplinary nature of the issue by the scientific community is a source of encouragement, there is a danger that the prevailing conflicts of views about the environmental crisis, which arise from being locked within the reductionist way of thinking, may harden into inflexible and polarized oppositions (Redclift and Benton 1994).

The source of the problem is that each rationality approaches the other in a reductionist fashion, seeking to impose its view of goals and procedures on the decision-making process (Tryzna 1995). In this respect, there is a growing consensus about the need for a new way of scientific thinking based on radical revision of existing approaches, with the objective of transcending the pervasive "dualism"—of subject/object, mind/matter, nature/society, and so on—that dominates modern thinking (Clark 1993).

4. Cross-Cutting Flaws

Alongside the variations of interpretation within the different versions, one observes fundamental flaws running across the different versions of sustainability. These cross-cutting flaws are discussed under the headings of epistemological flaws, the cosmic (mis) perception, the misconception of the "environment," and ethics and vision.

4.1 The Epistemological Flaws

The majority of the environmental literature on sustainability and sustainable development agrees on the limitation of reductionist, scientific thinking in understanding and addressing the environmental crisis. As an alternative to this limitation, a significant number of authors have inclined toward taking a value and ethics-based argumentation as the basis of their conceptualization. Some have gone to the extent of portraying science and scientific thinking as the major culprits of the environmental crisis. All of these tendencies have led to the development of a "misperceived polarity between the reductionist and holistic view" (Mebratu 1996) as the dominant trend of the environmental discourse.

In recent years, another group of literature has started to emerge that recognizes the mutual complementarity between reductionist and holistic thinking. One can observe two distinct approaches within this group that can be attributed to each domain of origin. Those who emerge from a strong holistic domain have the tendency to take the "whole" as the conceptual point of departure and take "factors of the parts" as an "add-on." On the other hand, those who emerge from a strong reductionist domain take

the "parts" as the point of departure and consider the "whole" as a linear summation of the parts.

In both cases they proclaim that their approach is based on the application of holistic thinking. However, in both cases, they are missing the most important element of holistic thinking, i.e., the interaction between the parts in "the whole" and between "the whole" and its environment. Such an approach leads to a solution framework with "detailed complexity" that makes practical implementation very difficult, if not impossible. Such an epistemological trap can be overcome only by recognizing that the holistic thinking is based on the "parts," the "whole," and, most importantly, the interaction between the parts and the whole.

4.2 The Cosmic (Mis) Perception

The generally accepted understanding of the cosmic world with respect to the environmental debate and the concept of sustainability is based on the recognition of the supposedly separate existence of the natural, economic, and social systems (Figure 1). This model suggests that (Holmberg 1994):

- The natural, economic, and social systems are independent systems and may be treated independently (Reductionist).
- The interactive zone where the three different systems interact is the solution area of integration where sustainability is achieved, whereas the area outside the interactive zone is assumed to be an area of contradiction (Bivalent).
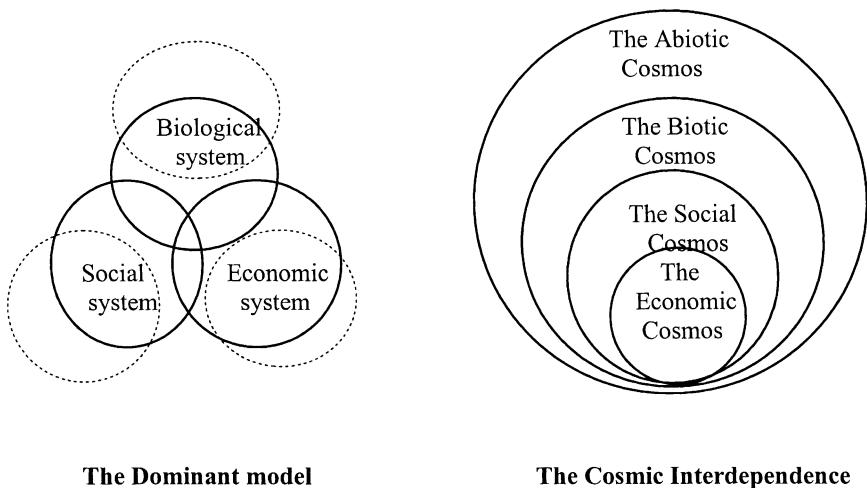

The Dominant model   **The Cosmic Interdependence**

FIGURE 1. The Cosmic perception.

- The ultimate objective of sustainability is the full integration of the natural, economic, and social systems, and this may be achieved through the integration of these objectives (Linear thinking).

To the contrary, the following are the conclusions to be drawn from the Cosmic Interdependence model developed based on the holistic-reductionist-holistic approach (Mebratu 1996).

- The human universe, in general, and the economic and social cosmos, in particular, never have been, and never will be, a separate system independent from the natural universe.
- The intersection area of the four cosmos is the area where we have millions of combinations of conflict and harmony serving as a seedbed for the process of coevolution of the natural and human universe.
- The vehicles of interaction within the interactive zone are millions of systems that do not belong exclusively to one cosmos but have a four-dimensional (or three-dimensional, if we put the biotic and abiotic under the ecological dimension) systemic parameter.
- The environmental crisis recorded throughout human history is an outcome of the cumulative effect of deliberate, or otherwise, human neglect of one or more of the systemic parameters, resulting in millions of feedback deficient systems.
- There is an abiotic region that is essentially free of interaction with the biotic, economic, and social cosmos; and by the same token there is a biotic region that is not yet in interaction with the human universe. However, neither of these regions can be claimed to be free from the second-degree effect of the interactive region.

4.3 Misconception of the "Environment"

The other major conceptual flaw that is becoming a source of confusion in the environmental debate is the conception of the term "environment." There are two basic problems that arise from this misconception. Primarily, environment and ecology have become increasingly synonymous, limiting the environmental focus to the natural environment. Second, there is a danger of abstraction due to the distended notion of the word "environment."

According to the 1995 Random House *Webster's College Dictionary*, *environment* is defined as: "the aggregate of surrounding things, conditions, or influences; surroundings, miliéu; the air, water, minerals, organisms and all other external factors surrounding and affecting a given organism at any time; the social and cultural forces that shape the life of a person or population." The same dictionary defines *ecology* as: "the branch of biology dealing with the relationships and interactions between organisms and the

(natural) environment; the set of relationships existing between organisms and their environment."

From these definitions, one can easily see that ecology and environment, although they are very much related, are not one and the same thing. First, an environment is something that an organism or a thing has, whereas ecology is the study of the relationship between the organism and the natural environment. Second, the environmental crisis includes the economic, social, political, and cultural crisis within the human universe, beside the ecological crisis between humans and the natural universe.

The distended notion of environment suggests a concept of the environment that is much too big. The environment for which we are supposed to feel reverence is nothing less than nature itself, and it is the whole natural order of which we are urged to regard ourselves as integral parts. According to this notion, each person's environmental concern is supposed to extend everywhere, "from the street corner to the stratosphere," as a currently popular adage has it (Cooper and Palmer 1992).

According to David Cooper (Cooper and Palmer 1992), an environment as milieu is not something a creature is merely in, but something it has. To speak in the language of phenomenology, a creature's relation to its environment is an inherent one. An environment is something for a creature, *a field of meanings or significance*. In calling an environment a field of significance, we mean that the items within it signify or point to one another, thereby forming a network of meanings. It is this which confers cohesion, a certain "wholeness," to an environment, rather as the episodes in a novel belong to a coherent narrative through pointing back and forth. Medieval scholars use to speak of the world as "the Book of God," an immense collection of "signs" provided for our benefit by God. On a smaller scale, and without the theological baggage, an environment might be called a "book of signs" for those whose practical mastery of the right "language" enables them to "read it" (Cooper).

4.4 Ethics and Vision

One of the outcomes of the lack of scientific understanding of the concept of sustainability is the monotonous nature of dialogue revolving around the question of ethics. In this connection, David Cooper says that he is "not alone in being depressed by the monotonous character of much of the literature, especially at the more popular end of the spectrum, which declaims the *new* ethic" (Cooper and Palmer 1992).

Although the importance of ethics to any sort of desirable social transformation is undeniable, the inability to develop a proper understanding and mechanism for sustainability has led to an out-of-proportion propagation of the role of "ethics," leading to the most dangerous mistake of considering it as the only means to the noble end. Basically, ethics is an important

attribute of a given means to an end rather than the means to the end. That is why most literature that emphatically advocates the need of ethical change, without treating the core element, has a hollow ring.

Benton (in Redclift and Benton 1994) underlines that "one of the most important insights that the social scientist can offer in the environmental debate is that the eminently rational appeal on the part of environmentalists for 'us' to change our attitudes, or lifestyles, so as to advance a general 'human interest' is likely to be ineffective." Meaningful choice of individuals is always governed by the existing physical, institutional, and intellectual structure. This structuralist emphasis on the patterned contexts in which individuals make choices clearly has much to offer for environmental analysis.

Furthermore, the "new" version of ethics that is emerging in connection with the sustainability debate embraces diverse themes among which there are real, yet generally unremarked, tensions—at both practical and theoretical levels. According to David Cooper (Cooper 1992), one of the tensions at a theoretical level is "the tension between the attitude of 'reverence' we are urged to accord nature and the 'holistic' theme of man as just one 'part of nature.' Worship of a nature that includes ourselves might betray that hubris of which 'new' ethicists typically complain." In other words, the advocates of ecocentric ethics, who adamantly criticize the anthropocentric ethics as being dangerously "human-centered," are reflecting an anthropocentric stance at its extreme by acting to play the role of "God." Although the prevailing ethical debate is based on polarizing the supposed tension between the anthropocentric and ecocentric positions, in the final analysis one cannot be ecocentric without being anthropocentric first.

Coming to the issue of vision, people see life through diverse prisms. What some consider as high priority may be trivial for others, and each individual's ability to imagine a positive future is constrained by his or her perspective. Nevertheless, one thing is clear: to alter a disappointing present course and assure a more promising and gratifying future, we must allow ourselves the luxury of dreaming. In this context, visioning is considered the most powerful tool for escaping from the confines of ideas and paradigms that lock us into many undesirable patterns of behavior and practice.

Although realistic visions have a prominent place in any social transformations, any vision that is not re-enforced with practical tools based on realistic observation has two potential dangers. First, vision is not an inherently positive phenomenon that always leads to desirable outcomes. History has recorded a number of destructive events due to actions based on individual vision. Genghis Khan, Alexander the Great, Napoleon, and Hitler sowed destruction far and wide through their vision of "Great . . ." by conquering the world. Many dictators in developing countries, with the support of their international "visionary" ally establishments, have led their countries to a point of destruction through "visionary leadership."

Second, in the absence of a common point of departure (such as a common definition on sustainability), it would be impossible to follow visionary directions that would lead to the same endpoint of achieving a sustainable world. This was substantiated by the findings of the study undertaken by the 2050 Project, which attempted "to pin down diverse 'sustainable features' expressed as vision and then identify a common end point at which many of them are compatible." In the project's attempt to delineate pathways to a sustainable future, it was realized that "a single, globally acceptable end point will either be so general as to invite the same old criticisms or so culturally specific that it will be rejected by many who do not identify with it" (Nagpal and Foltz 1995).[2]

Despite these limitations, amid the prevailing confusion and frustration, an increasing number of people have reverted to searching for new visions and ethics. As Schmidheiny (1992) points out, ". . . when politicians, industrialists, and environmentalists run out of practical advice, they often take refuge in appeals for a new vision, new values, a new commitment, and a new ethic. Such calls often ring hollow and rhetorical. This is the crux of the problem of sustainable development, and perhaps the main reason why there has been acceptance in principle, but less concrete actions to put into practice."

The appeal for a new ethic and vision increasingly is becoming the core message of many publications on the topic of sustainable development. Although there is no doubt about the importance of vision in any social transformation, actions based on visions that are not tested or guided by a concrete body of theory may lead to chaos instead of solutions (Mebratu 1996). Similarly, it would be "ineffective to appeal for new ethics and changes of attitudes without having a structural change on the patterned contexts in which individuals make choices and decisions" (Redclift and Benton 1994). In other words, the plea for a new vision and ethics is essentially a plea for a concrete body of theory on sustainable development.

Conclusion

Contrary to the dominant belief of attributing ecological disaster exclusively to the industrial society, there is strong historical evidence that ecological factors were key elements in the rise and fall of ancient civilization and in two of the major social transformations, namely, the agricultural and industrial transformations. An in-depth look at the different religious teachings, medieval philosophies, and traditional beliefs as the major repositories of human knowledge besides modern science reveals that, aside from the variation in semantics, most of them contain a strong component of living

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[2] The book, *Choosing Our Future: Vision of a Sustainable World*, is a report of a global survey undertaken by the 2050 Project, which covers the "vision" of diverse representative individuals from all over the world.

in harmony with nature and with one another. This is the logical essence of what we, today, call sustainability.

It is undeniable that the concept of "sustainable development" received higher currency and prominence after the publication of the *World Conservation Strategy* of IUCN (1980) and the report of WCED (1987), *Our Common Future*. Nevertheless, the earlier attempt of developing the "theory of environmental limits" by Thomas Malthus and David Ricardo and the different theories on the "scale of organization" that have been developed by the so-called "anarchists" school of thought may be considered as the major precursors for the concept.

The highly instrumental political expediency that has resulted from the vagueness of the WCED definition of sustainable development has led to diverse spectrum of definition and interpretation. As may be seen from the conceptual analysis, most of the effort of interpreting the concept is, to a large extent, influenced by the fundamental tenets of the specific group or organization. This has resulted in a narrow framework of interpretation that does not capture the whole picture. Moreover, in trying to win the environmental debate, the emphasis of conceptual development has shifted from logical coherence to that of semantics. This, in turn, has led to fundamental conceptual flaws in most of the definitions.

Strengthening the logical coherency within the concept by overcoming the influence of institutional and group interest is a prerequisite for developing our understanding of the concept and achieving a sustainable world. This is a challenge that must be faced by the scientific community as it becomes increasingly involved in promoting sustainable development.[3]

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[3] This paper is the first paper in my PhD research series. For further information on other series, refer to my research homepage at: <http://www.lu.se/IIIEE/staff/desta_mebratu/desta1.html>.

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