Southern African Journal of Environmental Education, Vol. 24, 2007

Think Piece
Education, Environment and Sustainability

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Introduction

The appearance of environmental issues in the epistemological horizon of scientific disciplines has constituted a veritable revolution, in the same way as linguistics gave a new sense and created new subject matter in the social sciences in the middle of the 20th century.

The study of the environment in its connotation of 'Nature' has been part of school curricula and scientific research for a very long time. The qualitative difference in how environmental issues are now dealt with in education and scientific research has been influenced by, on the one hand, the momentum gained by environmental issues resulting from industrialisation, followed by globalisation. Industrialisation and globalisation have revealed a previously unheard of magnitude and complexity of environmental issues, two aspects that due to the type and depth of knowledge available previously, had not been adequately pondered. On the other hand, the political, economic, social and even philosophical (ethic, aesthetic, epistemological, ontological, etc.) dimensions now associated with environmental phenomena have gone way beyond what could have been expected when the first critiques and cries of alarm about environmental issues were raised. These early warnings on the methods of increasing productivity (Rachel Carson); the models of industrial production and occidental lifestyles (Barry Commoner and Fritz Schumacher); the loss of and tragedy of the commons (Garrett Hardin); and exponential demographic growth (Paul Ehrlich and Donella Meadows), are only a few of the better known (not in chronological order).

Environmental problems such as we know them today started to manifest themselves with clear resonance during the years following World War II: the initial concerns were smog, acid rain and water pollution with emphasis on their impact on human health. These concerns gradually spread more widely during the 1950s, independent of people's and countries' ideological and political affiliation. Thus, both capitalist and socialist countries were victims of the effects of air and water pollution, of toxic waste and materials, and the general decay of the environment. This led to the emergence of political parties such as the Green Party in Germany and England (Rudolf Bahro, Petra Kelly and Jonathon Porritt); to new economic models and their corresponding scientific 'subdisciplines' such as ecological economics, environmental economics and the economics of steady state (Herman Daly, Joan Martínez-Alier, David Pearce, Robert Constanza); wide-scale social projects such as bioregionalism (Kirkpatrick Sale) and eco-development (Maurice Strong and Ignacy Sachs); lines of thought and action such as social ecology (Murray Bookchin), eco-feminism (Vandana Shiva) and environmental education

(William Stapp and John Smyth); ethical and philosophical proposals (Arne Næss and Aldo Leopold); and environmental institutions and regulations, among many others.

In summary, it is impossible in an article such as this to even attempt an archaeology of the multiple and diverse influences that the environment has produced in contemporary life as a whole. The goal here is just to set a context for the idea that sustainable development is one of the outcomes of an already long process of analysis and construction of alternate policies and proposals that face the recurrent environmental crisis that defines the contours of this historical moment. Certainly, sustainability does not refer only to the environmental dimension, but it is also true that the proposal of sustainable development can be better understood as a product of the discussions about environmental problems, although different streams of thought in the concept of sustainable development are closely knit. In fact, it was the words of the World Commission of Environment and Development, headed by Gro Harlem Brundtland, captured in the report *Our Common Future* (WCED, 1987; also known as the Brundtland Report) which started the widespread use of the concept of sustainable development, clearly showing the roots of the term in relation to the emergence of environmental concerns.

'Sustainable' has a dynamic connotation 'to keep going continuously, endure without giving way'. But very soon there was an emphasis on time (that is why in French it is translated as 'durable') linked with vital processes 'to keep in existence, support vitality as long as possible'.

Defined in the Brundtland Report in intergenerational terms, as development which allows for the satisfaction of the needs of current generations, without compromising the capacity for future generations to satisfy theirs, sustainable development has been the subject of complex debates. These debates locate it as a significant contribution to both political and academic discussions. Thus, we find configurations reflecting a positive sense that sustainable development provides a 'horizon of civilisatory potential' and other configurations that reflect a more negative sense of sustainable development as a myth of the 'business as usual' neoliberal technocracy. Here I will deal with both configurations, for they are inextricably linked.

Sustainable Development

Independently of several hundred definitions, sustainable development constitutes a proposal for the interdependent articulation of environmental conservation, social equity and economic growth.[1] Despite this intention, and despite numerous examples that show how this interdependent articulation is possible, and that sustainable development has potential to be meaningfully located in a basis of environmental, economic and social issues, politics and priorities in the wider social context are now forcing a recognition that in the sustainability thesis economic criteria have come to prevail over the other two.

In 1980, the World Conservation Strategy of the International Union for the Conservation of Nature and Natural Resources (IUCN) established that development in its relation to nature should start from a critical consideration of the way in which humans were modifying the biosphere, in relation to the satisfaction of human needs and the betterment of quality of life (UICN, PNUMA & WWF, 1980). A decade later, in the second World Conservation Strategy entitled *Caring for the Earth* (IUCN, UNEP & WWF, 1991), sustainability is defined as the

betterment of the quality of human life without exceeding the capacity of the ecosystems that give it sustenance, and it establishes that to attain sustainability, people must live according to the following principles, which later were taken up and synthesised by the Earth Charter:

- Respect and the care of the community of living beings
- Betterment of the quality of human life
- Conservation of vitality and diversity
- Minimisation of deterioration of non-renewable resources
- Keep within the limits of carrying capacity
- Modify personal activities and practices
- Train communities to take care of their own environments
- Establish a national frame of reference for the integration of development and conservation
- Forge a world alliance (IUCN, UNEP & WWF, 1991: 9–12)

It is not difficult to see that in this conceptualisation of sustainable development there is more weight given to ecological factors. Thus, in this framing, sustainable development is a function of the characteristics of ecosystems and depends on the type and intensity of human activities which take place in them, and thus the notions of capacity for change and resilience of the system become fundamental.

From the economic perspective, Herman Daly (1973) argued that the conditions of sustainability imply assuring the existence of the human species for the most prolonged period possible. He argued that under current conditions, sustainability would only be feasible with a zero population growth and a stable or zero-growth economic situation. Daly also affirms that sustainable development – not growth – supposes an administration of renewable resources that is subjected to two principles: the rates of collection must be equal to the rates of recovery (sustainable production), and the rates of residue emission must be equal to the natural capacity of assimilation of the ecosystems where those residues are let out. Non-renewable resources, he argued, must be managed in such a way that their rate of utilisation is limited by the rate of creation of renewable substitutes. Other factors, such as the technology or the scales of the economy, must also be harmonised with sustainable development.

From a social point of view, Mooney (1993) defines sustainability in terms of quality of life, in which human needs and aspirations can be satisfied without altering ecological integrity. This view of sustainability implicitly includes a sense of time, for such levels of satisfaction must be met for an infinite period. The social component has incorporated concepts such as environmental justice regarding the equitable distribution of the benefits and costs of development among different social groups, independently of their economic, cultural, religious, ethnic and racial conditions. The social perspective is also credited for incorporating cultural issues in the discussion of sustainable development.

The three aforementioned components of sustainable development – ecological, economic and social – are dealt with as a whole in different combinations; for example, the Plan of Implementation which came out of the World Summit on Sustainable Development (Johannesburg, 2002) sets out that: 'Poverty eradication, changing unsustainable patterns of production and consumption and protecting and managing the natural resource base of

economic and social development are overarching objectives of, and essential requirements for, sustainable development' (Introduction, 2nd paragraph).

One of the critiques of sustainable development discourse has been related to the problems of communicating the aforementioned conceptions simply and clearly to the general population. Efforts to address this critique have led to the emergence of more operational definitions, which, in terms of political decisions, have included some relevant exercises in this direction.

Several strategies and procedures have been proposed to assist people to determine whether we are headed towards sustainability. For example, we find that cost/benefit analysis, life cycle analysis, and studies of load-bearing capacity, among many others, have emerged. However, little consensus has been achieved because it is difficult to establish specific criteria and ways of measuring and making operational the general concepts in specific cases and situations, even if there is an ongoing search for such criteria and indicators.

Forman (1990) has proposed a model to measure the transition towards sustainability on the basis of an Ecology of Landscape, on the basis that this can only be evaluated when long periods of time have passed. In this way, it is possible to see whether landscapes change or remain relatively stable against two sets of variables: those which characterise ecological integrity (soil, biological productivity, biodiversity, water and oceans) and those which characterise basic human needs, such as food, water, health, housing, fuel, social cohesion and cultural diversity. This author posits that knowing human aspirations we can construct scenarios of possible alteration to the landscape, since the changes of variables of soil, biodiversity, etc. are slower and easier to establish. To get closer to sustainability we must then achieve a stabilisation in these basic variables, so that landscapes are sustainable in the long run (Salinas & Middleton, 1998).

Other approaches to try to implement a sustainability index can be seen in *The Wellbeing of Nations* by Prescott-Allen (2001). This is a report constructed on the basis of surveys in 180 countries, utilising an average index called a sustainability barometer which is composed of two indices that are considered equivalent, each with their corresponding indicators (Table 1).

Table 1. The two indices and their corresponding indicators used to calculate the Barometer of Sustainability (WI)

(A) Human Sustainability (HWI)	(B) Sustainability of Ecosystems (EWI)
Health and population (2)	Soil (5)
Wealth (14)	Water (20)
Knowledge and culture (6)	Air (11)
Community (10)	Species and genes (4)
Equity (4)	Use of resources (11)

(Source: Prescott-Allen, 2001)

Both indices intersect to estimate the Barometer of Sustainability (WI); at the same time, this methodology determines what is called the Wellbeing Stress Index (WSI) which refers to the damage caused by society in attaining its development. In the resulting scales the minimum score required to reach sustainability is 81, where the best-positioned countries are Sweden (64), Finland (62.5), Norway (62.5), Iceland (61.5) and Austria (61). The USA is in place 27

with 52 points (73 [HWI] and 31 [EWI]) and Mexico in place 150 with only 33 points (45 [HWI] and 21 [EWI]). This implies that no country can consider itself sustainable and all are far from being so. In addition, this methodology does not take the international effects of the wellbeing index into account, and excludes data which are considered in other methodologies, such as that of ecological footprinting (Wackernagel & Rees, 2001).

Given the methodological complexity inherent in the concept, sustainable development is not taken as a predefined, unmovable goal in space and time, but rather as a process to advance civilisation in a new direction with a growth model that is equitable and which takes adequate account of the long-term conservation of the quality of the environment. Three additional positive elements can be derived from the debut of sustainability on the international scene:

- First, it has gradually made it clear that natural resources are not an unlimited capital for development but that, on the contrary, they are a limiting factor for it (Foladori, 1999)
- Second, it has strengthened, though still incipiently, politics of eco-efficiency, cleaner production and recycling, giving strength to scientific research and technological development in related areas, and even promoting new disciplines constructed at the interface of previously separate disciplines such as agroecology, ecological economics, bioethics, socioecology, etc.
- Third, it has allowed for a renewed debate on policy and styles of development, social equity and respect for differences which had gradually diminished with the Cold War, and as the thesis of neoliberal conceptions centered around the notion of a free market gained rapid prominence as the preferred policy and development driver following the end of the Cold War

Critique of Sustainability

There have been a range of diverse critiques of the concept of sustainable development. For example, there has been critique of the formulations stated in the Brundtland Report which demand a compromise and concern for future generations, when large numbers of the current generation are not yet able to satisfy their own needs (Bifani, 1992). Besides this, there are numerous questions related to the vagueness of the Brundtland definition of sustainable development. What necessities? How many generations? In fact there are those who affirm that it is precisely the lack of precision of this definition that elicits such a wide consensus and diverse following of the term 'sustainable development', since it has the potential to respond to the necessities of each discursive configuration.

Even the referents of ecological notions defended by other definitions such as as the concept of carrying capacity have been questioned because they refer to animal populations that an ecosystem can give territorial sustenance to, not considering the enormous variability of exosomatic consumption among individuals, social classes and countries, an inequality that is not reducible to biology because it has cultural aspects too (García, 1999:8). Thus, it is not possible to apply the concept of carrying capacity to human populations, without an appropriate approximation of what constitutes a minimum of acceptable wellbeing for all the world's populations. The Millenium Development Goals tried to establish a basic platform

to describe the needs of the poorest and most disadvantaged segment of society, but these minimums are obviously unacceptable if one takes the whole population into account. Why, for example, should only half of the world's hunger be reduced and not all? Furthermore, the world is not moving towards a fairer distribution of the benefits of development. According to the UNDP (PNUD, 2005:40) 'If extreme groups are measured, the gap between the average citizen of the richer and the poorer countries is enormous and continues to grow.' In 1990, the average American's income was 38 times larger than the income of the average Tanzanian citizen. Today the average American is 61 times richer than the average Tanzanian, despite massive economic growth and a global increase in poverty reduction policy and discourse.

But not only poverty is growing. According to the Millennium Ecosystem Assessment (MEA, 2005) the amount of water drawn from the rivers and lakes for irrigation, domestic and industrial use doubled in the last 40 years; from 1980 to date approximately 35% of mangroves have been lost and 20% of the coral reefs of the world have been destroyed and another 20% have been seriously degraded or destroyed. But the economy and consumerism have grown to levels never seen before.

This is why, from the beginning, many critiques of sustainable development have been directed against the noun 'development', considering that sustainable development is a largely self-indulgent phrase, due to its link to economic growth and with semantic overtones suggesting the failure of developmental policies. This explains why many prefer to speak simply of sustainability.

As I see it, the emergence of the paradigm of sustainable development has been one of the factors that have contributed to a weakening of ecological policies. A sad paradox, since, as we said before, it was in the context of deliberations regarding environmental issues that this notion was coined. The conjunction of economic, social and ecological factors in one concept sends us again to the old conflict of establishing priorities in public policies. It is the dilemma of the chicken or the egg. Resulting from the political space created by this debate for dominant (economic) interests to triumph, serious environmental public policies are once more being postponed, both at global and national levels. In the face of problems of unemployment, insecurity and poverty, environmental issues are no longer at the forefront of public policy, as if these issues are not closely interdependent, and as if they do not need to be faced simultaneously. It is the antagonism of what is apparently more urgent and important that seems to win the day, especially when electoral times approach within political models that are constructed according to short-term electoral (and associated economic) gains.

In comparing the arguments used in perspectives of ecological sustainability *versus* socio-ecological sustainability, I will rely here on the work of García (1999), who illustrates how the rigid criteria of ecological conservation become more flexible or relative when considerations of ethics, justice and politics are introduced (Table 2).

Table 2. A comparison of the criteria used to describe ecological sustainability vs ecological and social sustainability

Ecological Sustainability	Ecological and Social Sustainability
1. The extraction of renewable resources must be equal or inferior to the capacity of the natural regeneration of ecosystems and the emission of pollutants must be kept within the limits of the natural capacity of assimilation. 2. The extraction and consumption of non-renewable resources must be as slow as possible, consuming preferably more abundant renewable substitutes; and the emission of pollutants must be kept within the limits of the natural capacity of assimilation. 3. Technological change must be oriented to increasing the service rendered by every unit of natural resources consumed, and to extending the substitution of renewable for non-renewable resources. 4. The physical scale of economics must be kept within the capacity of sustainability of the ecosphere.	1. The desirable level of exploitation of renewable resources is equal or inferior to the capacity of regeneration/assimilation of ecosystems, as long as this allows for the satisfaction of needs deemed sufficient and acceptably equitable. 2. Adoption of a desirable rhythm of depletion of non-renewable natural resources, that is, a slower rhythm compatible with a level deemed sufficient of satisfaction of human needs and with an acceptable degree of fairness and equitableness in its distribution. 3. Technological change must be oriented to increasing the service rendered by each unit of natural resources consumed, and to extending the substitution of renewable for non-renewable resources, in the setting of acceptable and equitable levels of consumption. 4. The physical scale of economics must be kept sufficiently under the capacity of sustainability of the ecosphere so as to provide flexibility to social evolution, which is unpredictable.

(Source: García, 1999:32–38)

It is increasingly evident that sustainability jargon has become little more than a means of more sophisticated political and institutional discourse, a case of wishful thinking, a rhetorical excess which has been unable to modify the course of the objective process of development, in what pertains to decision making and distribution of power. This was being done by environmental policy, but it is this kind of policy precisely which is currently at risk of losing its place in national and international priorities. Sustainable development, says Reigota (2002:192), grew in popularity because it is a *cliché* that is closely linked to theoretical comfort, a notion that became familiar and took on 'common sense' status among the scientific, political and economical international *status quo*.

Gross (2002:23–30) introduces the consideration that in the face of so many discrepancies regarding terminology, in the scales that are used, as well as the fact that analysis and definitions rely on territories and physical spaces at different levels of aggregation, we must ask ourselves whether sustainability is possible for society as a whole, and how valid sustainable development is for the poorer sectors of society. In addressing these questions, García (1999:8–9) responds that 'conditions to ensure the sustainability of a society cannot be established theoretically. The most we can do are evaluations of the sustainability of determined social practices over others.' The discourses on sustainability of human society, including those of a more technical nature,

rely on foundational narratives of the style of myths and archetypes that underlie the deepest levels of culture.

Gudynas (2002:58–59) mentions that nowadays two important tendencies among the different conceptions of sustainable development can be observed. The first underlines economic components, specifically the notion of 'natural capital'. For this tendency, sustainable development implies keeping a constant total capital, adding up natural capital and the capital that results from human action. Gudynas says that this perspective is identified as *weak sustainability*, given that it admits the substitution of one capital for another, and it appeals strongly to traditional science, technocratic in nature and with low influence on politics.

The other tendency Gudynas identifies, *strong sustainability*, distrusts the substitution of one capital for the other and recommends increased utilisation of energy that comes from alternative (renewable) sources. In it, the environment is valued from multiple perspectives, relying on the concept of Natural Heritage that includes political issues, recognising in nature values that are its own, independent of its utility for human beings.

In this respect, Pierri and Foladori (2001) state that it has been moderate environmentalism, that is, weak sustainability, which has controlled international politics about sustainable development. But in this trend, affirms Naina Pierri, in giving preference to the technical dimension of the problem about what and how much natural capital to conserve and give greater importance to, that is, in giving preference to quantitative over qualitative issues, the social dimension gets raised only with a limited and unfair scope: that of reducing poverty inasmuch as it is responsible for environmental issues.

This is consistent with the results of a study of sustainability in Latin America and the Caribbean (Bárcena & Sánchez, 2002:19–20). This study affirms that in the decade leading to 1999 the region underwent a demographic transition and a progressive aging of its population. Poverty was reduced in relative terms, but the creation of jobs was slow and the level of inequality grew larger in many countries. There was progress in matters of gender equity, since the participation of women in the job market grew. Different important social policies were put into action in different sectors, even though it was evident that the incapacity for economic growth to satisfy the social need of sustainability was due more to the style of development – and the patterns of production and consumption it engenders – than to the annual rates of growth as such. This indicated that the historical patterns of accumulation in the region have not been successful in modifying the social asymmetries they produce, including during periods of fast growth. This demonstrates, once more, that beyond the imperatives of growth in the short term, it is urgent to put in place structural changes in the styles of development that exist in the region.

Seen this way, the institutional discourse of sustainable development seems to be more of the same, seasoned with an apparent integration of policies, even though seen by the set of governmental sectors as being within the jurisdiction of the environmental sector, which is the result of the process of construction of public policies on this matter. In this way, the sustainability of development, anchored in neo-liberal economic criteria, is paradoxically and ironically conceived as a policy that is more applicable to the environment than to society or the economy.

Several authors (e.g., Azuela, Carabias, Provencio & Quadri, 1993) report that sustainable development has been adopted by diverse visions and conceptual frameworks, which make the original problem more complicated. Initial formulations were not based on a conceptual elaboration that integrates them, but have rather adopted normative criteria to be fulfilled by the new strategies. That is why the framework has conceptual deficiencies as much in the economic perspective (difficulties to give economic value to nature; to determine the price of the component of the environment; to establish accountability systems for economic-environmental issues; to re-elaborate fiscal policies; to control externalities with efficient instruments and mechanisms; among many others) as in what pertains to the environment (the lack of an adequate framework for the integral management of natural resources; the lack of understanding of the ecological basis of traditional and modern technologies) or their interactions (lack of precise knowledge of the interaction between ecosystems and populations, poverty and environmental deterioration, for example). After more than a decade of the critique of these deficiencies, they are still present.

Closing Remarks about Education

Linked to the arguments that have been provided here, and in spite of the inherent complexity of this discussion, it is assumed that through education the social will and capacity to modify ways of life and civilisation that are in harmony with nature can be achieved. This naïve position overlooks or ignores the issue that the main reason for the current lack of symmetry and equality in the world derives from a pattern of distribution and enjoyment of the resources and wealth of the world that is intrinsically unfair, immoral, rapacious and criminal. What education *can* contribute to is putting a spotlight on this curtain, and it can develop capacities to deconstruct the trends that hide or distort the social order that underlies dominant discourse on the sustainability of development.

The 30 years after Tbilisi that we commemorate this year must be a turning point to give way to new and more fertile approaches to the programme, a new epistemology must be constructed, notwithstanding that there is already a heritage of thought around environmental education that cannot be erased by institutional mandate. There has been a substantial endeavour over the past three decades to contribute to 'liberate the world' through environmental education. It seems, however, that we have obviously fallen into numerous errors of interpretation and of action, but the goals that set us going are still alive, and we have constituted ourselves as a community that keeps fighting, in spite of the inherent obstacles to our task in a world that moves in the opposite direction due to suicidal and egotistic motives that we can more clearly identify now. It is a good moment to renew the bonds that unite us and strengthen our commitment to our common goals.

As the *Programa Centroamericano de Capacitación Interna* (WOLA, 2005) affirms, political action brings together the efforts of organised citizenry to shape the formulation and implementation of public policies and programmes, through persuasion and pressure with authorities, international financing organisations and other institutions of power. That is, they are activities directed to gaining access and influence over the people who have the power of decision in vital matters

for a group in particular or society in general.

This means that political action is a tool that can be used to strengthen the real participation of citizens in the decision-making processes of government or other powerful institutions. Involving different sectors of civil society in advancing their agendas so that they have an impact on public policies through participation in a democratic and systematic fashion in making the decisions that affect their lives is a way forward. Thus, we need to give new life to a new cycle of environmental education in which political action, with the explicit purpose of consciousness raising and citizenship education around the quality of the environment, is more prominent.

Notes on the Contributor

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Endnote

1 UNESCO has promoted a fourth dimension of sustainable development, culture, and this allows for emphasis on cultural diversity, and therefore different outlooks on development.

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Acknowledgement

This paper was translated by Lilian Alvarez-Arellano.