# PROFESSIONAL ENVIRONMENTAL EDUCATION

**Bhaskar Nath**
*European Centre for Pollution Research, London, United Kingdom*

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**Summary**

In multi-party democratic societies pressure for positive environmental change normally comes from the electorate, NGOs, the media and corporate stakeholders in the bottom-up fashion. Pressure generates ‘political will’ and the political process acts as the main instrument of change. Appropriate policies are then developed and implemented to address a particular environmental problem, or for improving the general quality of the environment, as deemed necessary.

Although environmental professionals may be asked by policy-makers to make inputs to policy development, their main responsibility is for implementing policy and for monitoring the performance of implemented policies to determine if they are working as

intended. Due to the unrelenting contamination of the natural environment by anthropogenic pollution, the work of environmental professionals is becoming increasingly important. The work of environmental professionals — in particular Environmental Planners, Environmental Managers, Environmental Impact Assessors and Environmental Monitors — is the subject-matter of this contribution. The work they do is outlined along with the professional knowledge and skills they need to have for discharging their professional responsibilities. Given the wider social responsibility of these professionals, it is argued that they need to be aware of a number of related economic, social, political and other issues, too. These issues are also elaborated.

## 1. Introduction

There cannot be many thinking people today unaware of the unrelenting damage which human activities for economic development, and increasingly consumptive life-styles of the affluent, have been causing to the natural environment and nature's life-support systems. Environmental damage continues to be so comprehensive that it is hard to find a single aspect of the natural environment that remains unaffected. The most serious problem today, which has potentially catastrophic consequences for life on earth, is global warming which has been causing climate change (e.g. ISSC, 2005; McCarthy, 2005) and ocean acidification (e.g. Royal Society, 2005) among others. Since early 2005 climate scientists have been warning in uncharacteristically stark terms that a 'tipping point' (point of no return) in climate change will occur with unpredictable, irreversible and probably calamitous consequences when the concentration of $CO_2$ in the atmosphere exceeds 400 ppmv; and that if current trends continue, that point will be reached in around 2015 (ISSC, 2005; McCarthy, 2005; Time, 2006). Currently $CO_2$ concentration is 380 ppmv and increasing by over 2 ppmv per annum. Curiously, still there are a dwindling number of scientists, politicians and others staunchly in denial of global warming and its predicted adverse consequences.

In a pluralistic democratic society pressure for social, political, economic and environmental change normally comes from the electorate, NGOs and corporate stakeholders in the bottom-up fashion. Pressure generates 'political will' and the political process acts as the main instrument of change. Appropriate policies are then developed and implemented. Unfortunately, in so far as environmental problems are concerned, global environmental problems in particular, even in the highly developed countries the political process seems to be inertia-bound and lacking in 'political will' to undertake what needs to be done without delay. Given the modalities of *realpolitik*, a plausible reason for this could be that elections are usually won and lost on mundane 'bread-and-butter' issues of life, not on the issues of intergenerational or intragenerational equity that are distant if not ethereal to the majority of people. There is thus a wide gap between political rhetoric and practice which, fortunately, appears to be narrowing of late. For example, the Government of the United Kingdom is considering introducing a Climate Change Bill in late 2006 with regular targets to reduce $CO_2$ emissions while, led by California, a number of the states of the USA have been implementing measures for reducing $CO_2$ emissions in line with the Kyoto Protocol.

Although environmental professionals make inputs to policy development, in the main they are responsible for implementing and monitoring policies designed to protect the

environment or to alleviate specific environmental problems. In general, overall policy objective is to promote and achieve sustainable economic growth within a framework of environmental sustainability. In most if not all cases this turns out to be an exercise in reconciling an improbable juxtaposition of opposites (Nath, 2006); or, more precisely, reconciling the imperatives of a healthy environment with the core requirements of sustained economic growth. Clearly, given the increasingly urgent need to protect the natural environment from further degradation in the interests of both present and future generations, the complexity and importance of the work of policy-makers and environmental professionals cannot be over-stated.

The work of Environmental Planners, Environmental Managers, Environmental Impact Assessors, and Environmental Monitors, and their educational and training needs is the subject-matter of this contribution. Clearly, they must be properly equipped with up-to-date knowledge and skills in their respective professional areas in order for them to be able to discharge their professional responsibility effectively and efficiently. However, considering that a proper understanding of earth's natural environment and the complex interactions among the multitude of its components demands a truly multi-disciplinary approach, and that human interventions have been degrading it relentlessly, it is argued that *all* environmental professionals need to be aware of a number of germane economic, political and other issues, too. These issues are also discussed along with the wider social responsibility of environmental professionals.

## 2. Some Of The Issues All Environmental Professionals Need To Be Aware Of

By all accounts, the United Nations Conference on the Human Environment, held in Stockholm in June 1972, was mainly responsible for the ascent of environmental concerns to the top of the international political agenda. The consensus among delegates to the conference was that remedial actions needed to be taken urgently to arrest, or if possible reverse, the unrelenting degradation of the natural environment being caused by human activities for economic development. Interestingly, before that conference (and during it, too, as could be judged from the stance of the majority of the delegates) environmental initiative lay mainly with those that loosely came under the generic umbrella of 'environmentalists' and 'ecologists' whose creed was (and still is) to restore man's primeval bond with nature and to genuinely protect the environment by so doing.

However, ever since that conference, and as may be judged by the avalanche of relevant publications since then, economists have been taking increasing interest in environmental sustainability and sustainable development to the extent that they are alleged by environmentalists to have hijacked the initiative from them. This is not surprising, considering that in the existing and evolving geo-political configuration of the world it is hard to imagine any aspect of life, including environmental concerns, that is not directly or indirectly touched by economics (see Box 1).

Arguably however, politicians, decision-makers and environmental professionals who subscribe to the primacy of economics in environmental protection and sustainable development — and many do — need to ponder the following (Sections 2.1 to 2.7) especially from the perspective of environmental economics and environmental management:

(The story narrated below is adapted from one in Greek Mythology. It was developed by the author to explain to students the strong economic implications of environmental projects and activities. Sincere apology is due to scholars of Greek Mythology for any material inaccuracy).

God Zeus, the god of all Greek gods, was bewitched by the celestial beauty and charm of young *Europa* who was the daughter of *Phoenix*, the King of Sidon. Inflamed by passion, God Zeus undertook a cunning ploy to seduce *Europa*. He transformed himself into strong and beautiful white bull, with horns like the crescent of the moon, and appeared in the field where *Europa* was playing with her friends. After a while the bull lay down in front of her and begged her to ride on him saying that it would be really exciting for her to do so. Though frightened at first, after a while she relented, albeit reluctantly.

As soon as *Europa* had mounted the bull, it made swiftly for the waves ignoring her piteous cries and galloped over and across the sea to the island of Crete. There God Zeus revealed Himself and lay with *Europa* under an enormous plane tree, beside a spring of fresh water, where she conceived the triplet, *Minos*, *Ecologos* and *Economos**. God Zeus granted the plane tree, the only and silent witness to this amorous act, the privilege of never again losing its foliage.

In the prime of their youth *Ecologos* and *Economos* came to the Rio Earth Summit where they saw a beautiful maiden called Sustainable Development (SD) (a terrible name for a beautiful young woman). The conversation between the brothers about SD went something like this:

*Economos:* "You see that beautiful young woman dear brother? Soon she will be mine."

*Ecologos:* "This is ridiculous. Just look at yourself. You are crude, greedy and materialistic. You see everyone and everything in terms of money, benefit and profit. Mammon is your god and fine sentiments mean nothing to you. How can you even imagine that a refined and cultured woman like SD could possibly love you? On the other hand, I am refined and cultured, love music and poetry, and beauty and nature mean much to me. These fine qualities I have are much more appealing to a refined woman like SD than the banality of wealth of which you are so proud and covetous. So dear brother, it would be best for you to forget SD. She will be mine, I promise you."

*Economos:* "That is all very well, dear poor brother. But in this material world everyone and everything needs money that is me to survive. Like it or not, that is the way it is. Love and fine sentiments do not and cannot pay the bills. She will be mine because she needs me, as you will see".

SD had no financial means of support and neither had *Ecologos*. And so it came to pass that ever since SD and *Economos* have been cohabiting in a loveless and uncomfortable union out of sheer necessity.

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|---|---|
| | * Actually *Minos, Sarpedon* and *Rhadamantus* according mythological texts |

*Source: (Nath, 2000)*

Box 1. A tale of two brothers
Source: (Nath, 2000)

### 2.1. The Fundamental Conflict

Whereas achievement of sustainable development is contingent upon the affluent adopting life-styles within the planet's ecological means (that is, adopting less consumptive and therefore less polluting life-styles) (WCED, 1987, page 9), the prevailing economic system works only if there is unfettered growth in production and consumption of goods and services increasingly to satisfy the apparently insatiable lust of the affluent between and within nations for hedonism. Thus, trying to achieve global sustainable development under the prevailing economic system is not unlike trying to fit a square peg in a round hole, notwithstanding public policy (Nath, 2002; Nath, 2006; also see Section 2.2 of *Formal Environmental Education at the Graduate Level*). Furthermore, whereas the authoritative definition of sustainable development, given in the Brundtland Commission Report (*Our Common Future*) is in terms of 'needs' (WCED, 1987, page 8), the prevailing economic system is increasingly geared to supplying the demands of subjective 'wants'.

### 2.2. Inadequacy of Environmental Standards

Many environmental professionals and decision-makers, and certainly the public at large, believe that the natural environment will be protected and environmental sustainability achieved if environmental standards are strictly enforced. Arguably, this would be the case if and only if the standards were set below earth's natural self-regenerative capacity (SRC) to deal with anthropogenic pollution. The fact that such pollution has been causing serious and wide-ranging environmental problems is sufficient proof that existing standards exceed earth's natural SRC and therefore not fit for purpose. Indeed, we do not even know how to calculate the SRC of specific jurisdictions let alone that of the Earth. Certainly, environmental professionals and decision-makers need to be aware of this. This topic is discussed in detail in Nath (2006) and Section 3.2.3 of *Formal Environmental Education at the Graduate Level*.

### 2.3. Discounting the Future

As we cannot predict the future in any detail and because there is no unique definition of well-being or a universal yardstick for measuring it, we cannot know with any degree of certainty how our present actions will impact on the well-being of future generations. Economists address this uncertainty by discounting a future cost or benefit using a 'discount rate' which reflects society's willingness to trade off present benefits for potential future benefits. A discounted future benefit represents the money value of a stream of future benefits, called 'Future value', compared to its money value today, called 'Present value'. Or, expressed mathematically,

$$Present\ value = Future\ value/(1.0+r)^N$$

In which $r$ denotes discount rate and $N$ the number of periods between the present and the future when benefits are expected to materialize. As an illustration, consider a proposed environmental restoration project which is expected to bring a stream of benefits estimated at $5,000,000 after 8 (= $N$) years. Then, using a discount rate ($r$) of, say, 3 percent, the above equation gives the Present value of the project as $3,947,046. In other words, if today the sum of $3,947,046 is invested in the project (as cost), in 8 years' time the benefit accruing from that investment will be $5,000,000, representing a benefit-cost ratio of 1.27. Discounting reflects society's attitude to economic resources and how it values them, while discount rates reflect the opportunity cost of capital. Economists justify discounting by what they call 'Time Preference' (see glossary).

In a free market whether or not a proposed project, including environmental projects, would be implemented is fundamentally determined by its economic soundness, as assessed from the benefit-cost ratio, and investor interest. The last naturally depends on the projected return on investment. Generally an environmental project, unlike a coal-fired power plant for example, attracts little or no private or corporate investor interest mainly because of uncertainty, risk and long pay-back periods. Typically, it is for this reason that the Global Environment Facility (GEF) has to rely on the governments of the rich, industrialized nations for its funding and not the market. Furthermore, environmental sustainability and sustainable development are processes, not events, with long time-horizons. Investors, on the other hand, prefer to have a quick return on their investment. Given that the prevailing *laissez-faire* economic system is almost universal in its scope today and considering the gathering pace of globalization, this mismatch does not augur well for global environmental sustainability, global sustainable development, or intergenerational or intragenerational equity. It also exposes the paucity of the environmental credentials of the prevailing economic system.

### 2.4. Scarcity

In the literature there are several definitions of economics whose common theme is: "Economics is the study of how societies use scarce resources to produce valuable commodities and distribute them among different groups" (Samuelson and Nordhaus, 1989). That is, economics is the study of how scarce resources are (or should be) allocated. Clearly, economics is primarily concerned with scarcity of resources (see glossary).

According to Paul Samuelson, who in 1970 was the first American to receive a Nobel Prize in economics, "The more there is of a commodity the less the relative desirability of its last little unit becomes, even though its total usefulness always grows as we get more of the commodity. So, it is obvious why a large amount of water has a low price, or why air is actually a free good, despite its vast usefulness. The many units pull down the market value of all the units" (Samuelson, 1983). In other words, a good must become scarce in order for it to be of economic value and, conversely, an abundant good has little or no economic value. This is of course true for market goods that are manufactured with factors of production and governed by the laws of supply and demand. The statement also implies, understandably, that the discipline of Environmental Economics would be redundant in a world with a pristine environment just as Medical Science would be in a utopian world without disease, old age, accident

and mortality. And conversely that Environmental Economics would command increasing interest as earth's natural environment becomes more and more polluted thereby making life-sustaining environmental resources (e.g. clean air and water, fertile soil) increasingly scarce.

However, the key question still remains. It is this: Can economics in general and environmental economics in particular effectively intervene to protect earth's natural environment to engender even a modest degree of global environmental sustainability or sustainable development? Judging by the mounting environmental problems occurring on all fronts, in particular the problem of climate change that has potentially catastrophic consequences for life on earth (e.g. ISSC, 2005; Royal Society, 2005), the answer to this question cannot be in the affirmative. (This observation is supported by the fact that despite their advanced scientific and economic knowledge and skills the highly developed countries of the West are still the biggest consumers and polluters with unsustainable life-styles to match (Nath, 2003; Nath and Kazashka-Hristozova, 2005)). On the contrary, the prevailing *laissez-faire* economic system itself, which promotes open-ended and conspicuous consumption, profligate use of natural resources, and unsustainable patterns of production and consumption, is demonstrably responsible for many of the environmental problems (Nath, 2003; also see Section 2.1 above and Section 2.2 of *Formal Environmental Education at the Graduate Level*).

The following observation on Samuelson's comments, noted above, typically conveys the concerns of committed environmentalists and ecologists over the role and potency of neoclassical economics (including environmental economics) to address the mounting predicament of environmental problems.

"…..neither our forests nor our soils, anymore than our wetlands, our rivers, our seas, or our coral reefs, have any value, until the economic process has so degraded and destroyed them that they become sufficiently scarce to acquire an economic value. But even when this has occurred it does not mean that what still remains of the natural world is now protected from the destructiveness of economic growth. The US agriculture is the most destructive in the world and agricultural land in the USA is being compacted, eroded, desertified and salinised, at an incredible rate…….However, it is uneconomic and thereby 'irrational' to return to sounder and hence more ecological farming practices. As we are told by eminent economists, "an adequate soil conservation" plan that would meet "soil loss tolerance levels for 20 years into the future" would increase "annualised private net farm income by only one percent"…".

(Goldsmith, 2003)

### 2.5. The Political Process

As pointed out in Section 2.3, global environmental sustainability and sustainable development are processes with long time-horizons. In pluralistic democratic societies the political process is, on the other hand, a short-term process in the sense that general elections are held every four or five years to elect a new government with a different manifesto and priorities. Understandably therefore, political parties focus on those popular policies which they judge would help them win the next election. In reality these policies are mainly but not exclusively concerned with the 'bread-and-butter'

issues of the day and seldom with global environmental sustainability, sustainable development, or intergenerational or intragenerational equity. There is thus a mismatch between the imperatives of environmental sustainability and modalities of the political process. And in good measure it explains the lack of political will of by far the majority of nation states to do what by all accounts needs to be done without delay to protect the natural environment for posterity.

Furthermore, there is no international authority empowered to discipline a sovereign nation state which, for example, degrades or destroys its rain forest for economic gain. Currently, the only over-arching international authority is the Security Council of the United Nations. However, under the UN Charter its remit is political, not environmental. In other words, it is empowered to intervene only if the problem to be addressed is of a political nature — for example, if a nation state implements policies, or engages in activities, deemed by the international community to seriously threaten regional or international peace and security, or commits a crime against humanity such as genocide. Also, the current rules of the World Trade Organisation (WTO) are geared to promoting international trade with little commitment to protecting the natural environment. Ensuring that international trade is conducted without let or hindrance is its priority, not environmental protection.

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**Biographical Sketch**

**Professor Bhaskar Nath** received his Bachelor's degree in Civil Engineering from the Indian Institute of Technology, Kharagpur, India, in 1960, followed by the Ph.D. degree from the University of Wales, UK, in 1964. In 1983 he was awarded the D.Sc. degree by the University of London for his outstanding original research (according to citation) in numerical mathematics. In 2001 he was awarded the Doctor Honoris Causa (Dr.H.C.) by the University of Chemical Technology and Metallurgy, Sofia, Bulgaria, for his contribution to environmental education.

After having taught at the University of London for more than 27 years, currently Professor Nath is Director of the European Centre for Pollution Research, London; Executive Director of International Centre for Technical Research, London; Editor of Environment, Development and Sustainability published by Springer; visiting professor to several European universities, and consultant to a number of international companies and organizations. Professor Nath's research interests include Numerical Mathematics, Elasto-Hydrodynamics, Philosophy, Environmental Economics, Sustainable Development, and Environmental Education. He has more than 100 scientific publications in these and related areas including 13 books.