GLOBAL SUSTAINABILITY: RHETORIC AND REALITY, ANALYSIS AND ACTION—THE NEED FOR REMOVAL OF A KNOWLEDGE-APARTHEID WORLD

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Summary

It is neither legitimate, nor appropriate, to consider the challenges of global sustainability without making recourse to numerous evaluative, social, economic, institutional, demographic, and ethical considerations as well as to natural resource, scientific, and technological dimensions. All of these factors must be considered in their total *interactive* sense. This is not to say that the individual "dimensions" cannot, when sufficient attention is paid to them, play an important role in assisting in the furtherance of our goal toward global sustainability. But it is to emphasize that fact that it is essential to address the broad sweep and influence of many levels: the "evaluative and social," as well as the "physical and natural" if satisfactory, indeed meaningful, progress is to be made.

Numerous analysts and research groups have emphasized that physical sustainability is predicated upon social sustainability; that poverty does not permit good environmental performance and therefore the evaluative, economic, social and institutional factors, which mitigate against social equity are incompatible with physical sustainability. Such a statement applies, in particular, to the temporal "long run" analysis of global sustainability.

Whilst scientific creativity and technological innovation have an enormous part to play in relation to the addressing of sustainability, such physical innovations are a necessary

but not sufficient condition to offset the global concerns, which confront Humankind. Thus the *direction of scientific research*, the factors influencing the *rate and form of diffusion* of technology, the modes and *possibilities* of the organization of industry, commerce and trade must also be considered. One has only to recognize the enormous relative and absolute allocation of R&D funds to military research and armaments to recognize this problem.

Finally, the forms of life styles which presently distinguish the advanced industrialized economies of the world from that which pertains in the less economically developed regions of the world requires that the nature of the developing "global economy"—as well as the forms of life style and attendant economic and social structures which *both influence and derive from that global economy*—be critically considered.

Accordingly, this essay outlines various levels of discourse and action: it tries to consider the attempts made in recent decades to provide a theoretical and analytic framework to describe and understand the enormous complexity of the global economy and its influence on global sustainability; it comments on major policy actions and needs; and in so doing it considers the *gap*—whether analytical, conceptual or physical—which appears to remain with respect to the scale of the global challenge and contemporary actions which are being undertaken, or developed, to further the likelihood of achieving global sustainability. Many would be pessimistic, but there is much ground for hope

1. The Global Problem

In surveying the challenges which the world now faces with respect to addressing, let alone achieving, global sustainability three points need to be made: First, that the term "sustainability" has at its core, the notion that as a planet we will be able to survive—physically, socially, morally—across an almost considerable time span; not just for the next few hundred years, but throughout millennia. That is a tall order. Second, we have to recognize that the conditions and utilization of the "physical environment"—energy, materials, minerals, land, water, genetic stock, the atmosphere, the ocean, forests—is at base dependent upon the political, social structure of our global society and that in turn is predicated on an evaluative and ideological frameworks. It is not surprising, therefore, that environmentalism is sometimes seen as a potentially new form of totalitarianism: environmentalism certainly in its more "radical form" is not benign. What is radical depends on your viewpoint however—and the scale and form of the problem to be faced. Thus physical sustainability is predicated on social sustainability, and in the limit the ideological and attendant socioeconomic framework, which controls and shapes our various economic and institutional structures, determines social sustainability. Ultimately, therefore, problems of, say, global warming depend on human values, economic structure, and political will. "Technical fixes" are the means, in part, of amelioration but understanding the mechanics of the global economy (and the political nature of that economy) requires that the implementation of technical fixes be considered within that deeper framework: that in turn demands just as much social, economic and political and institutional innovation as it does scientific and technological. Third, as is indicated or contained within the first two points, the term

"environment" is misunderstood, erroneous, and misleading if it is taken to mean or imply only the physical dimension of life, that is, the *material* world.

Thus "environment" is *not* a derivative function, it is not a residual, but encompasses everything: physicality, economic structures, trade and tirade, institutional structures, values, attitudes, ethics, morality, terms of trade, laws, regulations, production schedules, research, and development agendas (and who, or what, determines the same), education, training, understanding, empathy. To not understand this, is to not understand the "global problematique." To not understand this is almost a guarantor that policies directed toward the enhancement of global sustainability will be piecemeal, inadequate and found wanting.

To properly understand the circumstances and the needs of our global dilemma requires us to understand the mechanics, the workings of the global economy in a historical, dynamic, interactive manner. In understanding, or attempting to understand, the ways in which the global economy functions (for there is much that we do not understand) we can begin to more fully comprehend and perceive the challenges which our planet, its populace, its fauna and flora, its physicality faces; and thereby even if not fully accommodate to that challenge, at least begin to acknowledge the nature of the problem to be faced. If we rely on technical fixes as a perceived means of solving 5 percent of the problem, when the sociopolitical scene is 95 percent of the problem, what do we achieve? Do we delude ourselves and in so doing go ever nearer to an environmental abyss? In acknowledging the true nature of the problem, then and only then, can we go to the drawing-board fully armed with the right questions, if not all of the answers.

In so doing we will begin to see that it is not simply the application of "technical fixes" (scientific and technological application) to the problems, say, of global warming, or ozone layer depletion, or deforestation, or energy and material depletion, or species loss, or increasing water scarcity, which will solely solve our global environmental problems. Nor will single-minded reliance on, say, renewable alternative energy systems, the recycling of materials, extensive treatment and purification of pollutive emissions, energy and materials efficiency, low energy catalytic techniques for the production of synthetic products, biotechnology, GMOs, nuclear energy generation (and thereby the reduction of CO_2 emissions), a hydrogen-economy or the like, energy taxes, carbon taxes, detailed life cycle analysis be a sufficient guarantor of, or ensure, global sustainability. On the contrary, successful technological progress may accentuate the problems of satisfactory attainment of global sustainability.

For example, more efficient cars obtained by significant technological innovation may well prolong an unwanted, ultimately unsustainable, transport systems-technology. Short-term gains may temporarily put our minds at rest and seriously delay, if not foreclose, fuller exploration of more benign technological systems. Much the same point could be made with respect to nuclear energy policy, or GMO innovations.

Therefore we need to see that since the technical side of life—material, energy, water, food, agriculture and land usage *is dependent on* social structure, values and attitude that an equal, possibly greater and deeper change is required to this "softer" infrastructural determinant of the physical level. Thus "the physical side of life"

together with all of its technical profiles not only requires amelioration, so does that which *determines* the physical side of life—that is, our attitudes and values, our morality, our ideologies—and hence our institutional structures, our global terms of trade, the nature of our global economic structures which underpins all. Therefore, to repeat, we have to understand the nature of the global economy and what this implies in relation to the physicality of our planet.

In seeking this understanding we will necessarily have to consider the ways in which the "North" (the OECD nations) and the "South" (less developed economies and newly industrialized countries of Asia, Africa and Latin America, and West and East, most especially China, India and South East Asia, Brazil and Mexico) interact in economic, social, and physical terms. We will have to see how developing nations, LDCs, NICs and OECD nations interact and trade. We will have to consider demography and population growth, social and economic dualism (both internal to a country and externally in international terms), integration-exclusion factors, center-periphery relations, trade dependency, WTO directives, IMF machinations. We will have to accept, much more than presently is the case, the importance of the term "externalities" and of the depth to which that term must be analyzed. We will have to recognize, in so doing, that "economic growth" ignores the vast depletion of our physical environmental stock in global and local terms—and that economic development, economic "growth" has to be viewed in new ways and that our present indices of performance ignores much that should not be ignored.

We will have to recognize the need of new patterns of trade; new more equitable linkage between North and South if global sustainability is to be obtained. We will have to recognize that trade influences population and demography. That the price of basic commodity goods from the South and high value-added manufactured goods from the North contains within it the seeds of global poverty, environmental degradation, and ignored externalities.

We will have to recognize the tremendous importance of both formal and informal education programs, of local indigenous capacity and capability and their combinatorial subsequent effects on the understanding and wider diffusion of scientific and technological innovations and application. We will have to come to realize that internationally coordinated proactive R&D programs could offer much with respect to the furtherance of global sustainability but cannot be left to the whims of the short-term market place or the special interests of multinational corporations.

We all have to recognize that even if, by the waving of some magic wand, we could *ensure* that the world population was not going to increase by another three billion individuals over the next few decades; in fact, if we could ensure that the population would not increase *at all*, that even then, even without the anticipated phenomenal increase, global sustainability would *still be* threatened. Why? Because at present 20 percent of the world's population consume nearly 80 percent of the material and energy production and leveling is imperative if social polarization is not to ensue and carry with it physical environmental degradation which is now running rampant. (We should recall that the ratio of energy use per capita can vary as much as 50:1 when comparing the

richer and poorer individuals, or social cohorts of some nations). This leveling-up requirement is not only a moral imperative; it is a physical environmental imperative.

But we will have to recognize that even if we can achieve economic leveling between nations over the next century or so (and over the past few decades only a few nations have managed to move up from the LDC league table to the NIC league -as indicated below) that in itself is only a stepping stone toward global sustainability—for entirely new social, technological and physical infra-structural trajectories will be required. Some would argue that even if Malthus was totally wrong-headed, that there are nevertheless absolute limits to the carrying capacity of the planet and that more equilibrist policies must be sought.

Thus, even if by some technological miracle we could obtain cheap almost "free" energy (nuclear fusion, greatly enhanced solar technology, the most miraculous alternative energy schemes based, say on almost inexhaustible Earth-core thermal energy), this would solve little and most probably would only lead to a secondary problem of over-production of material goods due to the reduced price of the energy-component in production. Thus the material interactive equation would only move us along to another form of pollution, or material loss. Thus, a more environmentally friendly energy system is not a unique, or possibly even quasi-automatic, solution to our *global* sustainability problems. We will have to recognize that more forests, less CO_2, less CFCs—whilst each helping in our fight against global warming, or ozone layer depletion, do not in themselves ensure our survival. For each and every one of these initiatives merely removes one of the rate determining steps, one of the evolutionary blind alleys, one of the socioenvironmental *cul-de-sacs* which we presently face. For all are piece-meal, they do not ensure a new planetary diet, or a new social route. They are important, extremely important. They may even be imperative. *They are a necessary condition, but they are not a sufficient condition to ensure global sustainability.* Sufficiency demands at the very least a radical restructuring of the global economy (in a political, ideological and evaluative sense) away from its present chaotic, irresponsible trajectory. This will imply very different patterns of control and power. It is therefore not surprising that though the majority of what has been outlined above is the everyday language of many development economists, political scientists, econo-environmentalists…it is not the language of *Realpolitik*. For Realpolitik is usually more concerned with the maintenance of the status quo of structure and power relationships and their supportive social structures rather than any emphasis upon radical change. Hence the task is gargantuan; not impossible—but nevertheless gargantuan. In one sense it is contrary to the historical development of the mass-production consumer society, the "free-market ethic," which has characterized the richer nations for the past two hundred years or so. What is not recognized, fully, is that no market is free, and that ignored externalities accrue and that ultimately the market place has nowhere to hide or to retreat to.

The final "sufficiency condition," beyond rectifying the mechanics of the global economy, is as argued by Rawls, to recognize that whatever new system we as a planet are ultimately able to engineer, that recognition of "intergenerational equity" is the quintessential requirement. That is a big demand. For to what degree do we consider future generations needs? How are we to do so? Is such a thing possible? Thus the

implication is that not only do we attend to present externalities to a degree never before contemplated in history but that we attach to that concern, a temporal dynamic which goes how far? To the next generation, or the next, or the next? In so doing it is mind-focusing to consider that the half-life of many of the waste products of nuclear power stations runs across thousands of years; that the military nuclear arsenals we presently possess can destroy the planet many times; that the germ warfare chemicals we possess can pollute the planet for aeons; that the unknown effects of genetic engineering, of GMOs may be an evolutionary Pandora's box as well a short term means of increasing food production; that the entropic build up of fossil fuels which took millions of years is being squandered, de-entropizing, in a matter of decades or a few hundred years. We should think on these things when we talk of sustainability and intergenerational equity.

Therefore, we must continually extend our notion of externalities to a more dynamic dimension. We will return to this in subsequent sections, but first let us not forget that these seemingly grandiose requirements, are not grandiose—they may imply life or death to the planet as we know it. Nevertheless, in terms of the structure of this short essay, we will consider in more prosaic terms the present approaches being taken, and the analytic frameworks, which influence those policies; we will comment to some extent on the sufficiency of policy and the challenges, which would appear to lie ahead. We will, in so doing, consider the contemporary "global environmental pressure points" and comment on our success to-date in attempting to reduce these "pressures" but we will return constantly to the need to understand the nature of global interaction, the need of global co-ordination and difficulties of so doing.

In undertaking this task, our treatment will fall into the following sections:

(i) The seemingly main environmental pressure points.
(ii) The track record to-date in addressing those difficulties.
(iii) The need for a deeper interactionist global environmental model.
(iv) The implications of the limited interactive models we presently possess.
(v) The present "global policies " which are emerging.
(vi) Outstanding contemporary policy needs.
(vii) Future challenges.
(viii) Barriers and obstacles to improvement.
(ix) Grounds for optimism.

2. The Main Pressure Points

Environmentalists, politicians and priests, the public at large, do not disagree, that much, as to what are the greatest "pressure points" on the physical side of our world, our global environment. A partial list might include the following:

- Enormous population pressure.
- The automobile and the whole traffic infrastructure.
- Build up of "greenhouse gases" (global warming).
- Ozone layer depletion.
- Oceanic despoliation (and loss of species).

- Deforestation and loss of biodiversity.
- Energy intensive agricultural systems.
- Over-use of Pesticides (and species loss).
- Excessive potable water use; lowering of water tables.
- Rapidly increasing desertification.
- Loss of wetlands.
- Loss of land species and genetic stock.
- Materials depletion.

All of the above might be called "first order" environmental problems. The deeper sources/causes of these first order environmental problems (which are merely symptoms of a deeper disease) are as follows:

Deeper problems which influence the physical environmental problems:

- North South divide.
- Rampant consumerism.
- Over reliance on mass production.
- Excessive private ownership and private industrial uncontrollability.
- Individualism and the expectancy of total freedom of action.
- Feelings of hopelessness regarding the possibility of fundamental change.
- Lack of sufficient mechanisms to achieve international coordination on the necessary scale.
- Societal unwillingness to pay what is required.
- Lack of consensus on the scale and form of the need/or policy response.
- The feeling that each country or trade-bloc should look after its own area of concern, that is, "localism" and the non-recognition of the global commons problem.

That being so, the question then arises as to whether or not the world can leave all of these problems to the "free market place" and hope that the necessary technical and social innovations will emerge in good time; or whether large scale interventionism is required, i.e. a directing of behavior? In either case a range of "policy fixes" are demanded. The options below contrast a typical non controversial list with a much more radical agenda.

A typical portfolio of policy fixes includes:

- Environmental regulations (e.g. emission controls).
- Water pollution standards.
- Recycling/re-use policies.
- Environmental standards (e.g. regarding food additives or GMOs).
- Energy policy (e.g. Carbon Taxes).
- Encouragement of mass transit systems.

A more radical approach to policy fixes includes:

- World population equilibrium.
- Enormous North-South Coordinatory Linkage (OECD/LDC) geared to scientific and technological exchange; total cancellation of international debt of the "South."
- Global rationing of materials; energy; food.
- International Technological Leapfrogging; minimization of IPR problems.
- International Proactive R&D programs geared to sustainable development.

In either case, the moderate or the radical, questions arise as to: what forms of incentive, what forms of reward, what mechanisms to arrive at priorities, how to best organize societal response and how best to ensure diffusion of knowledge and application? These questions are not easily answered— and in the case of the radical portfolio, enormous international policy issues, indeed ideological positions and questions obviously arise. If the radical approach (or need) is seen as necessary, then the world is a long way from achievement of the same.

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Biographical Sketch

Thomas G. Whiston has a strong interdisciplinary and multidisciplinary background with several degrees in both the natural and social sciences. For a decade or so he was a Lecturer in Psychology at the University of Manchester, UK and subsequently a Senior Research Fellow for twenty-five years at the Science Policy Research Unit, University of Sussex. During that latter period his research and teaching focused on three main areas: environmental policy and global sustainability issues; higher education policy relating to both developed and developing countries; innovation and Science and Technology policy and related corporate issues. He was a member of the team which over a period of ten years or so provided analysis and critiques of the global futures literature relating to the "Limits to growth" debate. He co-led the international research team involving forty or so researchers funded by the EU which addressed the issue of global sustainability in the program entitled "Global Perspective 2010—tasks for science and technology." He has researched and lectured in numerous European, North and South American, African and Asian countries. He is the author or co-author of approximately 150 texts, journal articles, and research reports. He is currently Professor of Environment at the University of Roskilde, Denmark, and Director of the international postgraduate course entitled "Environmental Policy and the Global Challenge. "