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Basic Principles of Sustainable Development

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1. The Concept of Development

Great ideas are usually simple ideas. While the specific analysis of any important topic will necessarily involve complexity and subtlety, the fundamental concepts which underlie powerful paradigms of thought are usually relatively straightforward and easy to grasp. In the area of social science, ideas which affect millions of people and guide the policies of nations must be accessible to all, not just to an elite. Only thus can they permeate institutions from the local to the global level, and become a part of the human landscape, part of the fabric within which we define our lives.

Such is the concept of development. Prior to the second half of the twentieth century, the idea of development as we know it today barely existed. The structures of imperial and colonial power which dominated the world in the nineteenth and early twentieth centuries made little provision for economic and social advance in what we now call the developing world. Colonial regions functioned primarily to supply imperial powers with raw materials and cheap labor – including slave labor as late as the mid-nineteenth century.

Within the richer countries of Europe, North America, and Japan, economic growth was of course central to the generally accepted goals of "progress" and "modernization", but there was relatively little concern for issues of equity and social justice. The desperate poverty and weak or non-existent social safety nets in Europe and the United States during the Great Depression showed how even in these countries, policy was not driven by the needs of the majority of people.

By the end of the Second World War, perceptions and policy had changed drastically. Economic and social improvement for the majority had become a major preoccupation of

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governments, and with the crumbling of colonial power relations this goal was extended to the poorer nations of the world. Economic development, with its social and institutional correlates, came to occupy an essential place in theory and policy, as well as in the Cold War competition between capitalism and communism. As the historian of economic thought Roger Backhouse puts it:

> Development economics in its modern form did not exist before the 1940's. The concern of development economics, as the term is now understood, is with countries or regions which are seen to be *under* or *less* developed relative to others, and which, it is commonly believed, *should*, if they are not to become ever poorer relative to the developed countries, be developed in some way.[2]

Within formal neoclassical economic theory, an effort has been made to achieve a positive rather than a normative perspective – that is, to describe what *is* rather than positing what *should be*. Development economics, in contrast, is explicitly normative, as Backhouse's description makes clear. As such, it cannot avoid concern with social and political issues, and must focus on goals, ideals, and ends, as well as economic means.

When W.W. Rostow published his ambitious overview of economic development, The Stages of Economic Growth, in 1960, he subtitled it "A Non-Communist Manifesto".[3] Conscious of the claims of Marxism to offer a path to a better future for the majority of the world's peoples, Rostow sought to counterpose a superior vision of social and economic goals. Notable in this perspective was a linear conception of economic development.

According to this view, all successfully developing countries would pass through a series of stages, from traditional society through economic "take-off" to maturity and high mass-consumption. The "less-developed" nations therefore might reasonably hope to achieve the "mature" status of the U.S. and Europe without the need for communist revolution. Rostow's concept of take-off, as well as his overall perspective of economic and social progress towards a goal of mass consumption, was widely accepted by development theorists.

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[2] Backhouse, Roger (1991). A History of Modern Economic Analysis. Oxford, UK: Basil Blackwell.

[3] Rostow, W.W. (1960). The Stages of Economic Growth: A Non-Communist Manifesto

Thus economists, other social scientists, and policymakers adopted a framework of thought which was much more ambitious in its scope than previous formulations of political economy. The clear goal of economic development policy was to raise living standards throughout the world, providing steadily more goods and services to an expanding population. The international institutional structures set up after the second world war, including the International Monetary Fund, the World Bank, and the United Nations, were specifically designed with this goal in mind.

As development policy has evolved, different approaches have been emphasized at different times. The original emphasis was on promoting more productive agriculture and industrialization. In the late 1970's a focus on basic needs was advocated by Paul Streeten, Mahbub Ul Haq, and others.[4] Education, nutrition, health, sanitation, and employment for the poor were the central components of this approach – reflecting an acknowledgment that the benefits of development did not necessarily "trickle down" to those who needed them most. This perspective inspired the creation of the United Nations Development Programme's Human Development Index, which uses health and education measures together with Gross Domestic Product (GDP) to calculate an overall index of development success.

In the 1980's the focus shifted to "structural adjustment", including liberalization of trade, eliminating government deficits and overvalued exchange rates, and dismantling inefficient parastatal organizations. Structural adjustment was seen as correcting the errors of earlier, government-centered development policies which had led to bloated bureaucracies, unbalanced budgets, and excessive debt. But critiques of structural adjustment policies have found them at odds with the basic needs priorities. Market-oriented reforms have often lead to greater inequality and hardship for the poor even as economic efficiency improved. A tension thus remains between the basic needs and market-oriented perspectives on development.

At the turn of the century, what is the 50-year record of the broad-reaching, and historically fairly young, effort at global development? The concept has been widely accepted, by countries of varied political structure. There have been remarkable successes – notably in East Asia – and worldwide progress both in standard GDP measures and in measures of human development such as life expectancy and education. There have also been areas of slow or negative growth, especially in Africa, where GDP increase was slow and food production per

[4] Streeten, Paul , with Shahid Burki, Mahbub Ul Haq, Norman Hicks, and Frances Stewart (1981). First Things First: Meeting Basic Human Needs in the Developing Countries. Published for the World Bank. New York and Oxford: Oxford University Press.

capita in decline even before the rapid spread of AIDS devastated many countries and dramatically lowered life expectancies.

Globally, most countries have made significant advances both in GDP and in Human Development Index measures. But overall, the record of development on a world scale is open to two major criticisms:

- The benefits of development have been distributed unevenly, with income inequalities remaining persistent and sometimes increasing over time. The global numbers of extremely poor and malnourished people have remained high, and in some areas have increased, even as a global middle class has achieved relative affluence.

- There have been major negative impacts of development on the environment and on existing social structures. Many traditional societies have been devastated by development of forests, water systems, and intensive fisheries. Urban areas in developing countries commonly suffer from extreme pollution and inadequate transportation, water, and sewer infrastructure. Environmental damage, if unchecked, may undermine the achievements of development and even lead to collapse of essential ecosystems.

These problems are not minor blemishes on an overall record of success. Rather, they appear to be endemic to development as it has taken place over the past half-century, and to threaten to turn success into failure. World Bank President James Wolfensohn and chief economist Joseph Stiglitz acknowledged in 1999 that these issues are crucial to address if global development is to succeed. Harsher critics of the development paradigm, such as Richard Norgaard, see them as indicative of fundamental error:

> Modernism, and its more recent manifestation as development, have betrayed progress . . . while a few have attained material abundance, resource depletion and environmental degradation now endanger many and threaten the hopes of all to come . . . Modernism betrayed progress by leading us into, preventing us from seeing, and keeping us from addressing interwoven environmental, organizational, and cultural problems.[5]

[5] Norgaard, Richard B. (1994). Development Betrayed: The End of Progress and a Coevolutionary Revisioning of the Future, p. 2. New York and London: Routledge.

Whether we seek a reform or a radical rethinking of the concept of development, it is evident that changes are required in both goals and methods. The straightforward view of development as an upward climb, common to all nations but with different countries at different stages, seems inadequate for the twenty-first century. The absolute gaps between rich and poor nations, and between rich and poor groups within individual countries, are widening, not narrowing. And even if we can imagine all nations reaching stable populations and satisfactory levels of GDP by, say, 2050, can we envision the planetary ecosystem surviving the greatly increased demands on its resources and environmental absorption capacity?

The growing awareness of these challenges to traditional development thinking has led to the increasingly wide acceptance of a new concept – that of sustainable development. Development which protects the environment, development which advances social justice -- phrases such as these have surrounded the introduction of what has been claimed to be a new paradigm. The new formulation has been eagerly adopted both by critics of standard development practice and by leaders of existing development institutions. But what does sustainable development really mean?

2. Sustainable Development: Defining a New Paradigm

When the World Commission on Environment and Development presented their 1987 report, Our Common Future, they sought to address the problem of conflicts between environment and development goals by formulating a definition of sustainable development:

> Sustainable development is development which meets the needs of the present without compromising the ability of future generations to meet their own needs.[6]

In the extensive discussion and use of the concept since then, there has generally been a recognition of three aspects of sustainable development[7]:

- **Economic:** An economically sustainable system must be able to produce goods and services on a continuing basis, to maintain manageable levels of government and

[6] World Commission on Environment and Development (1987). Our Common Future.

[7] See e.g. Holmberg ed. (1992), Making Development Sustainable, Chapter 1; Reed ed. (1997), Structural Adjustment, the Environment and Sustainable Development, Chapter 2.

external debt, and to avoid extreme sectoral imbalances which damage agricultural or industrial production.

- **Environmental:** An environmentally sustainable system must maintain a stable resource base, avoiding over-exploitation of renewable resource systems or environmental sink functions, and depleting non-renewable resources only to the extent that investment is made in adequate substitutes. This includes maintenance of biodiversity, atmospheric stability, and other ecosystem functions not ordinarily classed as economic resources.

- **Social:** A socially sustainable system must achieve distributional equity, adequate provision of social services including health and education, gender equity, and political accountability and participation.

Clearly, these three elements of sustainability introduce many potential complications to the original simple definition. The goals expressed or implied are multidimensional, raising the issue of how to balance objectives and how to judge success or failure. For example, what if provision of adequate food and water supplies appears to require changes in land use which will decrease biodiversity? What if non-polluting energy sources are more expensive, thus increasing the burden on the poor, for whom they represent a larger proportion of daily expenditure? Which goal will take precedence?

In the real world, we can rarely avoid trade-offs, and as Richard Norgaard points out, we can "maximize" only one objective at a time. Norgaard concludes that "it is impossible to define sustainable development in an operational manner in the detail and with the level of control presumed in the logic of modernity."[8] The strongly normative nature of the sustainable development concept makes it difficult to pin down analytically.

Nonetheless, the three principles outlined above do have resonance at a common-sense level. They satisfy the criterion set forth earlier for a powerful, easily grasped concept which can have wide applicability. Surely if we could move closer to achieving this tripartite goal, the world would be a better place – and equally surely we frequently fall short in all three respects. It may be easier to identify unsustainability than sustainability – and the identification of unsustainability can motivate us to take necessary policy action.

[8] Norgaard, op. cit. p.22.

It is instructive to examine the problem from different disciplinary perspectives. Certainly the goals set forth require the insights of multiple disciplines. Economists, one might assume, would tend to give greater weight to the economic objectives, ecologists to the environmental dimension, and social theorists to the social issues. But before we can attempt to balance these different perspectives, we need to understand them and explore their internal logics.

Each of the three areas is commonly referred to as a *system*: economic systems, environmental systems, and social systems each have their own logic. It is an impossible task to analyze all these systems at once. Therefore we must start by considering each separately, as suggested by the Balaton Group's report on sustainability indicators:

> The total system of which human society is a part, and on which it depends for support, is made up of a large number of component systems. The whole cannot function properly and is not viable and sustainable if individual component systems cannot function properly. . .sustainable development is possible only if component systems as well as the total system are viable. Despite the uncertainty of the direction of sustainable development, it is necessary to identify the essential component systems and to define indicators that can provide essential and reliable information about the viability of each and of the total system.[9]

This implies that we can use different indicators to measure different dimensions of sustainability. Indicators imply measurement; measurement implies the theoretical definition of concepts to measure. Let us examine what the three different disciplinary areas have to offer in this regard.

3. The Economic Perspective

From the point of view of neoclassical economic theory, sustainability can be defined in terms of the maximization of welfare over time. (This is assumed to be human welfare – we will introduce the claims of the non-human world when we consider the ecological perspective.) Most economists simplify further by identifying the maximization of welfare with the

[9] Bossell, Hartmut, ed. (1999). Indicators for Sustainable Development: Theory, Method, Applications: A Report to the Balaton Group, p.2. Winnipeg, Canada: International Institute for Sustainable Development (IISD).

maximization of utility derived from consumption. While this may be criticized as an oversimplification, it certainly includes many important elements of human welfare (food, clothing, housing, transportation, health and education services, etc.) and it has the analytical advantage of reducing the problem to a measurable single-dimensional indicator.

A formal economic analysis then raises the question of whether sustainability has any validity as an economic concept. According to standard economic theory, efficient resource allocation should have the effect of maximizing utility from consumption. If we accept the use of time discounting as a method of comparing the economic values of consumption in different time periods, then sustainability appears to mean nothing more than efficient resource allocation – a concept already well established in economics.

One line of criticism of this reductionist approach to sustainability centers on the use of discounting. At a discount rate of 10%, the value of $1 million one hundred years from now is the same as a mere $72 today. Thus it would apparently be justifiable to impose costs of up to $1 million on people in the year 2100 in order to enjoy $72 worth of consumption today. By this logic, much resource depletion and environmental damage could be considered acceptable, and even optimal, according to a criterion of economic efficiency.

The problem is that in accepting the use of a discount rate, we have implicitly imposed a specific choice regarding the relative welfare of present and future generations. Howarth and Norgaard have shown that the choice of a discount rate is equivalent to a choice of allocations among generations.[10] Use of a current market discount rate gives undue weight to the preferences of current consumers. When we consider issues such as soil erosion or atmospheric buildup of greenhouse gases, where the most damaging impacts are felt over decades or generations, this creates a strong bias against sustainability. Thus to achieve intergenerational equity, we must either impose a low discount rate[11] or some kind of sustainability rule regarding resource use and environmental impacts.

A related issue concerns the concept of natural capital. Soils and atmospheric functions are aspects of natural capital, which consists of all the natural resources and environmental services of the planet. Herman Daly has suggested that sustainable development

[10] Howarth, Richard B. and Richard B. Norgaard (1993). "Intergenerational Transfers and the Social Discount Rate." Environmental and Resource Economics 3 (Aug.): 337-58.

[11] William Cline has suggested the use of a discount rate of 1.5% for balancing long-term costs and benefits of global climate change abatement. See The Economics of Global Warming (1992), Chapters 6 and 7. Washington, D.C.: Institute for International Economics.

can be operationalized in terms of the conservation of natural capital.[12] This policy goal leads to two decision rules, one for renewable and the other for non-renewable resources. For renewables, the rule is to limit resource consumption to sustainable yield levels; for non-renewables the rule is to re-invest the proceeds from non-renewable resource exploitation into investment in renewable natural capital. Following these two rules will maintain a constant stock of natural capital. To maintain a constant *per capita* stock of natural capital also requires a stable level of human population, a factor which Daly has also emphasized.[13]

This suggestion of a specific sustainability decision rule for natural capital is quite different from the standard neo-classical approach. In the neo-classical view, there is no special reason to conserve natural capital. A well-known principle derived from work by Solow and Hartwick (the "Hartwick rule") states that consumption may remain constant, or increase, with declining non-renewable resources provided that the rents from these resources are reinvested in reproducible capital.[14] Unlike Daly's reinvestment rule, this does not require maintenance of any particular stock of *natural* capital.

The essential assumption involved in the Solow/Hartwick approach is that of *substitutability* of the two types of capital. If, for example, we cut down forests but build factories, we are better off provided the economic value of the new industrial plant exceeds the economic value of the lost forests. Daly's view is based on the opposite assumption, that "man-made and natural capital are fundamentally complements and only marginally substitutes."[15] If natural capital has a special and unique importance, then neo-classical economic efficiency will not suffice for sustainability.

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[12] Daly, Herman E. (1994). "Operationalizing Sustainable Development by Investing in Natural Capital," in AnnMari Jansson et al. eds., Investing in Natural Capital: The Ecological Economics Approach to Sustainability. Washington, D.C.: Island Press.

[13] Daly, Herman E. (1991). Steady State Economics (2nd ed.), Chapters 2 and 9. Washington, D.C.: Island Press.

[14] This principle is discussed in Mick Common and Charles Perrings (1992) "Towards an Ecological Economics of Sustainability," Ecological Economics 6 (1) pp. 7-34. See also Hartwick, J.M. 1977, "Intergenerational Equity and the Investing of Rents from Exhaustible Resources," American Economic Review 66 pp. 972-974; Solow, R.M. (1986) "On the Intertemporal Allocation of Natural Resources," Scandinavian Journal of Economics 88 pp.141-149.

[15] Daly, "Operationalizing Sustainable Development," p. 25.

Michael Toman has suggested that the issue may be resolved by recognizing that some issues can be appropriately dealt with through neo-classical market efficiency, while others require the application of a "safe minimum standard" approach to protect essential resources and environmental functions.[16] He suggests that the criteria of possible severity and irreversibility of ecological damages should be used to decide which theoretical framework is more appropriate:

> The concept of a safe minimum standard can be applied to concerns about intergenerational fairness, resource constraints, and human impact. The safe minimum standard posits a socially determined, albeit "fuzzy," dividing line between moral imperatives to preserve and enhance natural resource systems and the free play of resource trade-offs. . . Following a safe minimum standard, society would rule out actions that could result in natural impacts beyond a certain threshold of cost and irreversibility. Central to the safe minimum standards approach are the role of public decision making and the formation of societal values. The safe minimum standard will be defined differently by ecologists and economists, depending on moral judgement about moral imperatives and the value of discounting [17]

The adoption of this reasonable suggestion would have far-reaching implications for economic theory and policy. Note the essential role of "moral imperatives," "public decision making," and "the formation of social values" in Toman's suggested decision framework. None of these appear in the neo-classical economic model, where markets are presumed to be the best resource allocators, and the occasional correction of a "market imperfection" the only appropriate role for government. Thus Toman is in effect asserting the importance of sustainability as a concept independent of standard neo-classical economic analysis, one which requires an explicitly normative and socially determined process of decision-making.

This represents a fundamental shift in the economic paradigm. Much as the Keynesian revolution validated the concept of government intervention to achieve macroeconomic stability, the acceptance of sustainability as a valid social goal places a new complexion on all policy

[16] The "safe minimum standard" approach was originally proposed with reference to endangered species by Ciriancy-Wantrup. See Ciriancy Wantrup, S.V. (1952), Resource Conservation. Berkeley: University of California Press.

[17] Toman, Michael A. "The Difficulty in Defining Sustainability" (1992), Resources 106 pp.3-6, summarized in Rajaram Krishnan, Jonathan M. Harris, and Neva R. Goodwin eds.(1995), A Survey of Ecological Economics, p. 88-90. Washington, D.C.: Island Press.

issues concerning the relationship between human economic activity and the environment. Markets may be valuable and essential means, but they cannot determine the ends, which must be arrived at by a social decision process informed by different disciplinary viewpoints. This will require an unaccustomed humility on the part of economists, and a willingness to work together with other social and natural scientists. As Toman suggests:

> There is great scope for interdisciplinary work to address some key issues related to sustainability, including defining objectives, identifying constraints, and resolving the relevant disagreements. Economists could make greater use of ecological information and the implications of physical resource limits in an analysis of resource values. Social scientists can contribute to an understanding of how future generations might value different attributes of natural environments. Ecologists should provide ecological information in a manner that can be used in economic valuation. They should also take into account the role of economic incentives in ecological impact analysis.[18]

In order to explore further the implications of this approach, we need to examine the ecological and social dimensions of the issue. Then we can return to the question of whether a new paradigm for development policy has truly emerged from the multidisciplinary discussion on the nature of sustainability.

4. The Ecological Perspective

Unlike economists, whose models provide no upper bound on economic growth, physical scientists and ecologists are accustomed to the idea of limits. Natural systems must exist subject to the unyielding laws of thermodynamics, and the science of population ecology has explored the implications of these laws for living organisms. As ecologist C.S. Holling puts it:

> Two of the fundamental axioms of ecological and evolutionary biology are that organisms are exuberantly over-productive, and that limits set by time, space, and

[18] Toman, op. cit. p. 90.

> energy are inevitably encountered. The foundations for all modern ecology and evolutionary biology rest in part upon the consequences of these two axioms.[19]

In an ecological perspective, then, sustainability must involve limits on population and consumption levels. These limits apply to all biological systems. While humans may appear to evade them for a time, they must ultimately accept the boundaries of a finite planet. Ecologist Paul Ehrlich and colleagues have estimated that humans are now "consuming, co-opting, or eliminating some 40% of the basic energy supply for all terrestrial animals."[20] Clearly, a doubling of this demand, as might well be implied by a 33% growth in population (to 8 billion) and a 50% growth in per capita consumption by 2050, would leave little room for any other species on the planet.

However, this simple assertion of limits does not fully capture the contribution of ecologists to the discussion of sustainability. What C.S. Holling identifies as a third axiom of ecology has even more significant implications. The third axiom "concerns processes that generate variability and novelty"[21] – the generation of genetic diversity and the resultant processes of evolution and change in species and ecosystems.

Genetic diversity gives rise to *resilience* in ecosystems. Resilience is a "bounce-back" capacity which enables a system to respond to disturbances or damage. For example, a forest ecosystem may recover from a pest infestation through an increase in the population of predators which control the pest, an expansion of species unaffected by the pest, and possibly a development of pest resistance in affected species. The patterns of response will be widely variable, but the essential integrity of the ecosystem will be preserved. The key to resilience is the existence of a wide variety of species, interacting with each other and providing a reservoir of genetic forms which provide the potential to adapt to changing conditions.

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[19] Holling, C.S. (1994). "An Ecologist View of the Malthusian Conflict," in Kerstin Lindahl-Kiessling and Hans Landberg eds., Population, Economic Development, and the Environment, p. 84. New York and Oxford: Oxford University Press.

[20] Ehrlich, Paul R. "Ecological Economics and the Carrying Capacity of the Earth," in AnnMari Jansson et al eds., Investing in Natural Capital: The Ecological Economics Approach to Sustainability. Washington, D.C.: Island Press. Original research in Vitousek, P.M., P.R. Ehrlich , A.H. Ehrlich, and P.A. Matson, "Human Appropriation of the Products of Photosynthesis" (1986). BioScience 36 (6): 368-73.

[21] Holling, ibid.

For the ecologist, then, sustainability should be defined in terms of the maintenance of ecosystem resilience. This view of sustainability is clearly different from the human-centered conceptions put forward by the World Commission on Environment and Development and the consumption-based principles proposed by economic theorists. This contrast has been explored by Common and Perrings, who distinguish between "Solow-sustainability", derived from the economic model of stable or increasing consumption, and "Holling-sustainability", based on ecosystem resilience. They find that "the concepts of Solow-sustainability and Holling-sustainability are largely disjoint. This implies that there may be no close relationship between economic efficiency and ecological sustainability."[22]

The importance of the ecological perspective is increasingly evident, as more of the critical problems facing humanity arise from failures of ecological resilience. The resurgence of diseases due to the development of antibiotic resistance, the disruption of ecosystems by introduced species, the formation of "dead zones" in coastal waters, and the multiple ecological threats related to climate change and increased climate volatility, all testify to the impacts of expanding human economic activity. As Holling puts it:

> Increasing human populations in the South, and the planetary expansion of their influence, combined with exploitative management in both North and South, reduces functional diversity and increases spatial homogeneity not only in regions but on the whole planet. Functional diversity of the structuring processes and spatial heterogeneity are the two most critical determinants of ecological robustness and resilience, the attributes that provide the reserve of ecological services and of time that have allowed people to adapt and learn in the past. And now these critical attributes are being compromised at the level of the planet.[23]

The horrifying impact of AIDS, most especially on the African continent, is perhaps the worst example to date of the feedback effects of human destruction of ecosystem resilience. AIDS probably originated in rain-forest primates, and spread to humans through human intrusion into the forest. Rather than remaining isolated in small communities, it then spread worldwide through global commerce and travel, like many other destructive viruses and pests. Population checks through such drastic ecological backlash are, of course, familiar to

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[22] Mick Common and Charles Perrings, "Towards an Ecological Economics of Sustainability" (1992) Ecological Economics 6 pp. 7-34, summarized in Rajaram Krishnan, Jonathan M. Harris, and Neva R. Goodwin eds. (1995), A Survey of Ecological Economics, p. 108-112. Washington, D.C.: Island Press.

[23] Holling, op. cit. p. 93.

ecologists. But they are generally far from the thoughts of the economists and policymakers who up until now have shaped our conceptions of development.

Sustainability, then, is more than limits on population or restraint in consumption – though these are important. It means that in our choice of goods and technologies we must be oriented to the requirements of ecosystem integrity and species diversity. It also implies that the apparent independence of economics from biophysical science is a luxury we can no longer afford. Common and Perrings suggest that:

> An ecological economic approach requires that resources be allocated in such a fashion that they threaten neither the system as a whole nor the key components of the system. For the system to be sustainable it must serve consumption and production objectives that are themselves sustainable. If existing preferences and technologies, as perpetuated and sanctified in the concept of consumer sovereignty, are not sustainable, then the system as a whole will be unstable. The appropriate policy instruments to address these concerns are varied and complex. . . . What is important is that an ecological economics of sustainability privileges the needs of the system over those of individuals.[24]

Clearly, an integration of economics and ecology is required, and this can only be achieved with the assistance of the third element of the sustainability triad – the social perspective. If we cannot rely on unregulated markets to solve our problems, we must turn to conscious social action. But social action by whom, and at what level? And how do the environmental issues relate to the other great failure of development to date – the persistence of inequality? It is in the social area that we must seek the key to the formulation of policies for sustainable development.

5. The Social Perspective

Advocates of sustainable development, as we have noted, recognize the social component of development as an essential part of the new paradigm.[25] In doing so, they are

[24] Common and Perrings, op. cit. p.112.

[25] See Holmberg, op. cit note 6, and Reed op. cit. note 6.

validating the importance of a much older perspective. A "human development" approach emphasizing issues of basic needs and equity is well grounded in the history of economic theory. Sudhir Andand and Amartya Sen point out that concerns for these dimensions of economic development start with the earliest economic theorists, and contrast the human development approach to the wealth maximization approach which has dominated modern economics:

> There is . . . no foundational departure in making economic analysis and policy take extensive note of the demands of human development. This approach reclaims an existing heritage, rather than importing or implanting a new diversion. . . . The interest in human development has had to compete with other priorities and pursuits within the body of mainstream economics. The preoccupation with commodity production, opulence, and financial success can also be traced in economics through several centuries. . .Indeed, the dominant contemporary tradition of focusing on such variables as per capita gross national product (GNP) or national wealth is a continuation – perhaps even an intensification – of the old opulence-oriented approach.[26]

As we have noted, the focus on basic needs and equity in development has been represented by the United Nations Development Programme's series of Human Development Reports. In addition to calculating the Human Development Index which offers a different measure of development success from per capita GNP or GDP[27], the Human Development Reports focus each year on a different aspect of social and economic development, such as democratic governance (1993), gender inequity (1995), and poverty (1997).[28]

The HDI combines life expectancy, adult literacy, and school enrollment ratios with per capita GDP in a weighted average to get an index between 0 and 1. The results clearly show that development is a multidimensional process, and that higher GDP does not necessarily mean higher overall welfare. Some countries, such as Costa Rica (HDI = 0.883) and Sri Lanka (HDI= 0.704), stand out in terms of their human development well above others of almost

[26] Anand, Sudhir and Amartya K. Sen (1996) Sustainable Human Development: Concepts and Priorities. United Nations Development Programme, Office of Development Studies Discussion Paper Series.

[27] The statistical difference between GNP and GDP concerns the inclusion of foreign earnings, which may be significant in an analysis of financial flows but makes little difference to a broad measure of development.

[28] United Nations Development Programme, Human Development Report (1990-1998).

identical GDP per capita (Brazil and Turkey, comparable to Costa Rica in per capita GDP, have HDI = 0.804 and 0.792 respectively; Congo and Pakistan, almost identical in GDP to Sri Lanka, have HDI's of 0.538 and 0.483 respectively)[29].

While the HDI does not explicitly include any environmental measures, the 1994 report discussed the relationship between sustainability and equity:

> The concept of sustainable development raises the issue of whether present life-styles are acceptable and whether there is any reason to pass them on to the next generation. Because intergenerational equity must go hand in hand with intragenerational equity, a major restructuring of the world's income and consumption patterns may be a necessary precondition for any viable strategy of sustainable development . . . Development patterns that perpetuate today's inequities are neither sustainable nor worth sustaining.[30]

In the 1997 report, a section on "Resisting New Forces of Poverty" discusses factors which cause worsening conditions for the world's poor. Prominent among these are the HIV/AIDS pandemic which is "creating a new wave of impoverishment – and reversing earlier gains." (We have already noted the relationship of AIDS and resurgent diseases to ecological degradation.) Another factor is environmental degradation on marginal lands – the dry, swampy, saline, and steep areas where many of the rural poor struggle to survive.[31]

Clearly, the issue of environmental sustainability is intertwined with that of poverty and inequity. It has frequently been noted that the causative relationship runs both ways – increased poverty and loss of rural livelihoods accelerates environmental degradation as displaced people put greater pressure on forests, fisheries, and marginal lands.

If the problems of environment and equity are clearly related, then so must be the solutions. Third World critics of the standard, "Western" development model see that model itself as a significant cause of the problems. The sweeping optimism implicit in Rostow's

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[29] 1992 HDI comparison from Richard England and Jonathan Harris (1997), Alternatives to Gross National Product: A Critical Survey (Tufts University Global Development and Environment Institute Discussion Paper #5, http://www.tufts.edu/gdae.) Also in Frank Ackerman et al eds. (1997), Human Well-Being and Economic Goals, Part X (Washington, D.C.: Island Press)

[30] UNDP, Human Development Report 1994.

[31] UNDP Human Development Report 1997, Chapter 3.

original stages-of-growth paradigm ignores social and cultural differences between nations, as well as the fundamental power disparity between developed and developing nations. A view of development as a one-way journey to improved conditions fails to match the experience of many people whose livelihoods are threatened by globalization.

> . . .local experiences of western development in many localities of the third world have been closely associated with the dissolution of indigenous cultural, political, and economic systems; with increased inequalities in life chances between genders and among classes, castes, and ethnic groups; and with deterioration in, and removal of access to, the biophysical environment.[32]

As we seek for models of sustainable and equitable development, then, we must recognize the need for a fundamental revision in what Pablo Escobar refers to as a "development discourse" dominated by the power and "modernizing" vision of the West. A sustainable development process will have to be democratized, decentralized, and pluralistic. It will have to balance wealth-creation with wealth distribution. And it will have to include a healthy skepticism about Western models and the modernizing effects of global markets.

It is not only radical critics who are aware of the need for significant changes in the development paradigm. The World Bank has recently produced reports stressing the importance of social capital, the role of the state, and the importance of local government and non-governmental organizations in development.[33] From the Bank's more conventional perspective, participatory democracy, decentralization, and social capital represented by strong local organization, are compatible with, and beneficial to, standard measures of development such as GDP per capita. However, simply highlighting the importance of these factors is a new departure for market-oriented economic theorists.

In addition, the World Bank has produced research on indicators of sustainable development, in particular measures of *genuine savings:* "the true rate of savings in a nation after due account is taken of the depletion of natural resources and the damages caused by

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[32] Porter, Philip W. and Eric S. Sheppard (1998). "Views form the Periphery: Encountering Development," in Porter and Sheppard, A World of Difference: Society, Nature, Development. New York: Guilford Press.

[33] World Bank, World Development Report 1997: The State in a Changing World. New York: Oxford University Press.

pollution".[34] This new attention to a combination of social and environmental factors indicates that lines of thought formerly at the fringes of development policy are making their way into the mainstream.

What has been referred to as the "Washington consensus" on the virtues of free markets and globalization has also come under challenge from the World Bank's own chief economist, Joseph Stiglitz.[35] Stiglitz argues that there are many areas in which the operations of "free markets" are flawed by asymmetric control of information. This rather abstruse economic theory can be translated into an awareness of the importance of institutions and social norms in shaping market outcomes. This in turn justifies social and governmental action at both the micro and macro levels, and opens the way to a more explicitly normative theory of development. In this sense, Stiglitz is returning to the more goal-oriented perspective of the of the original theorists of development – except that the goals which now seem appropriate have much stronger social and environmental components.

While there are clearly wide differences of perspective and emphasis between the critics within and without the development establishment, there seems to be a widely felt discontent with present development theory and practice, and it appears that the elements of a new paradigm are emerging. Can we combine the economic, ecological, and social perspectives to provide a new vision of development in the twenty-first century?

6. A Synthesis of Perspectives

Let us briefly review some of the main themes developed thus far:

- The original idea of development was based on a straight-line progression from traditional to modern mass-consumption society. Within this framework, a tension developed between the promotion of economic growth and the equitable provision of basic needs. Development as it has proceeded over the last half-century has remained inequitable, and has had growing negative environmental impacts.

[34] World Bank (1997). Expanding the Measure of Wealth: Indicators of Environmentally Sustainable Development. Washington, D.C.: The World Bank.

[35] Stiglitz, J. (1997), An Agenda for Development for the Twenty-First Century", presented at the World Bank Ninth Annual Conference on Development Economics; and Stiglitz, J.(1998), " More Instruments and Broader Goals: Moving Toward the Post Washington Consensus." WIDER Annual Lectures No. 2, Helsinki.

- A concept of sustainable development must remedy social inequities and environmental damage, while maintaining a sound economic base.

- The conservation of natural capital is essential for sustainable economic production and intergenerational equity. Market mechanisms do not operate effectively to conserve natural capital, but tend to deplete and degrade it.

- From an ecological perspective, both population and total resource demand must be limited in scale, and the integrity of ecosystems and diversity of species must be maintained.

- Social equity, the fulfilment of basic health and educational needs, and participatory democracy are crucial elements of development, and are interrelated with environmental sustainability.

Taken together, these principles clearly suggest new guidelines for the development process. They also require a modification of the original goal of economic growth. Economic growth, especially for those who lack essentials, is clearly needed, but must be subject to global limits and should not be the prime objective for countries already at high levels of consumption. As Alan Durning has suggested, a moderate level of consumption, together with strong social institutions and a healthy environment, represents a better ideal than ever-increasing consumption.[36]

In pursuing these modified development goals, it will be necessary to recognize the limits of the market mechanism. During the structural adjustment phase of development policy, the virtues of free markets became an article of faith for policy-makers; this dogma will have to be revised, as the World Bank now acknowledges.[37] While markets may be excellent under some conditions at achieving economic efficiency, they are often counterproductive in terms of sustainability. Guided markets may often be useful tools for achieving specific environmental goals, and there is an extensive economic literature on "internalizing externalities" so as to reflect

[36] Durning, Alan (1992). How Much is Enough? The Consumer Society and the Future of Earth. Worldwatch Environmental Alert Series (Linda Starke ed.). New York and London: W.W.Norton.

[37] World Bank, World Development Report 1997, Foreword.

environmental costs and benefits in the market.[38] But in a broader perspective, it is the social and institutional processes of setting social and environmental goals and norms which must guide sustainable development policy.

As we seek to define the nature of sustainable development more precisely, it may be advisable to avoid two extremes. One is what might be called "mere sustainability" – simply ensuring that economic production can remain steady or increase. This approach, which as we have seen draws some support from neo-classical economic theory, gives short shrift to the social and ecological aspects of sustainability. If the only goal that matters is to keep production levels high, the problem of sustainability becomes deceptively easy to solve -- but the proposed solutions may only create worse problems.

Advocates of production-oriented sustainability tend to be oriented towards technological fixes which often have unintended consequences. Nuclear power as an alternative to fossil fuels, genetic engineering to increase crop yields, seeding the oceans with iron to increase plankton production and carbon fixation – all of these appeal to the mentality of technological management, but all have the potential for dangerous and irreversible consequences. Unsolved problems of nuclear waste management, the possibility of accidentally creating super-weeds and super-pests through genetic transfer and the development of resistance, unknown feedback effects from attempts to manipulate planetary climate control mechanisms – these should cause us to be cautious about optimistic plans for "sustainable growth".

At the other extreme, it may be tempting to add on to our definition of sustainable development every desirable goal which may be implied by our discussion of social and ecological issues. We want environmental conservation, improved health and education, gender equity, participatory democracy, peace and international cooperation – and all other good things. But what is the analytical value of this, and how will it help us to grapple with difficult trade-offs, deep-rooted social conflicts, and already-existing serious environmental damage?

If we are to reintroduce into the analysis of economic development some of the original normative content (but now with a different goal-orientation), we must be careful to establish a reasonable balance between the desired goals and the available means and resources.

[38] See, for example, Anil Markandya and Julie Richardson eds. (1993). Environmental Economics: A Reader, Part III: Instruments for Environmental Control and Applications. New York: St. Martin's Press.

To bring the argument down to earth, and to get a sense of what the principles summarized at the beginning of this section mean for development, we can examine some sectoral specifics. In each major area, it becomes clear that true sustainability means a major shift from existing techniques and organization of production.

- **Agriculture:** The need to feed an expanding population at higher per-capita levels of consumption is straining global soil and water systems.[39] The response to this must be twofold. On the production side, current high-input techniques which are leading to serious soil degradation and water pollution and overdraft must be replaced by organic soil rebuilding, integrated pest management, and efficient irrigation. This in turn implies much greater reliance on local knowledge and participatory input into the development of agricultural techniques.[40]
  On the consumption side, both limits on population growth and greater equity and efficiency in food distribution are of central importance given probable resource limitations on production.

- **Energy:** Both supply limits and environmental impacts, in particular the accumulation of greenhouse gases, mean that it will be necessary to accomplish a transition away from fossil fuels well before 2050.[41] A non-fossil energy system would be significantly more decentralized, adapted to local conditions and taking advantage of opportunities for wind, biomass, and off-grid solar power systems. This is unlikely to occur without a major mobilization of capital resources for renewable energy development in countries now rapidly expanding their energy systems.

- **Industry:** As the scale of global industrial production increases several-fold over current levels, which themselves represent a quadrupling over 1950 levels, it is apparent that "end-of-pipe" pollution control not be adequate. The new concept of "industrial

[39] Harris, Jonathan M. and Scott Kennedy (1999). "Carrying Capacity in Agriculture: Global and Regional Issues," Ecological Economics 29 (3) pp.443-461; Pinstrup-Andersen, Per, and Rajul Pandya-Lorch (1998) "Food Security and Sustainable Use of Natural Resources: A 2020 Vision," Ecological Economics 26 (1), pp. 1-10.

[40] Pretty, Jules, and Robert Chambers, "Towards a Learning Paradigm: New Professionalism and Institutions for Agriculture," in Jonathan M. Harris ed., Rethinking Sustainability: Power, Knowledge, and Institutions. University of Michigan Press, forthcoming 2000.

[41] MacKenzie, James J. (1996) Oil as a Finite Resource: When will Global Production Peak? Washington, D.C.: World Resources Institute; Ackerman, Frank et al., World Energy Modernization Plan, discussion paper available at http://www.wemp.org.

ecology" implies the restructuring of whole industrial sectors based on a goal of reducing emissions and reusing materials at all stages of the production cycle.[42] Corporate reform and "greening" as well as a broad cooperative effort between corporations and government will be needed to achieve goal.

- **Renewable Resource Systems:** World fisheries, forests and water systems are severely over-stressed[43]. With even greater demands on all systems expected in the next century, all levels of institutional management must be urgently reformed. Multilateral agreements and global funding are needed to conserve transboundary resources; national resource management systems must be shifted from goals of exploitation to conservation and sustainable harvesting; and local communities must be strongly involved in resource conservation.

Each of these areas poses challenges which are social and institutional as well as economic. It is clear that the social component of sustainability is not just an idealized goal, but a necessity for achieving the economic and ecological components. Existing institutions of all kinds, including corporations, local and national government, and transnational organizations, will have to adapt to the requirements of sustainable development if all the problems which motivated the development of concept are not to grow worse. Democratic governance, participation, and the satisfaction of basic needs are thus an essential part of a new development synthesis.

7. New Goals and New Policies for the Twenty-First Century

In 1998 W. W. Rostow, the originator of the stages-of-growth theory which has been so influential in shaping development policy for nearly half a century, published another overview of development issues, but this time looking forward to the twenty-first century.

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[42] Socolow, Robert et al. (1994). Industrial Ecology and Global Change. New York and Cambridge, England: Cambridge University Press; Powers, Charles W. and Marian R. Chertow, "Industrial Ecology: Overcoming Policy Fragmentation," in Marian Chertow and Daniel Esty eds (1997) Thinking Ecologically: The Next Generation of Environmental Policy. New Haven and London: Yale University Press.

[43] Platt-McGinn, A. (1998). Rocking the Boat: Conserving Fisheries and Protecting Jobs. Washington D.C., Worldwatch Institute; Myers, N. (1996). "The World's Forests: Problems and Potentials." Environmental Conservation 23 (2) pp.156-168; Postel, S. (1999). Pillar of Sand, Can the Irrigation Miracle Last? New York, W.W. Norton & Company.

Here he acknowledges the enormous impact of population and economic growth, and the ways in which the far greater scale of economic activity changes the requirements of development:

> The period from the present to the mid-21st century is likely to be the time of the maximum strain on resources and the environment and the interval of maximum readjustment in the locus of population , economic potential, and political influence in the international community. . .If the earth can carry a doubling of population in the next half century without a general catastrophe, we shall have two countries, with populations of about 1.5 billion each, that are essentially industrialized: India and China. This is, for each country, about five times the estimated peak population level of the United States. They should each command by the middle of the next century all the then-available industrial and agricultural techniques. Much the same can be said of the other major countries of Asia and Latin America . . . Thus, the period from now until 2050 will be a period not only of maximum strain on resources but also one in which new industrial powers will enter the world arena. [44]

Rostow thus recognizes the way in which the very success of the kind of development which he envisaged in 1960 has altered the global picture in such a way as to bring very different problems to the fore. The turn of the century is an appropriate to time to seek a new model which will address both the original problems of development – limited productive capacity, inadequate nutrition, and pervasive poverty – and the new problems of resource limitations, environmental stress, and unresolved or growing inequity.

We have outlined both some of the general principles and some of the specific requirements of sustainable development. The concept has been broadly accepted, but the implications of the tripartite theoretical restructuring which we have discussed are more far-reaching than may be apparent. Development theory, as we have noted, has always been normative as well as positive in its analytical vision. Today we require a new normative vision drawing on strong but neglected traditions in economics, political and social theory and combining traditional wisdom with modern technology.

What has been discussed here, reflecting a dialogue which has expanded rapidly since the World Commission on Environment and Development Report in 1987, is only an initial outline and overview. The devil is always in the details; fortunately there is now an extensive

[44] Rostow, W. W. (1998). The Great Population Spike and After: Reflections on the 21st Century. New York and Oxford, UK: Oxford University Press.

effort by theorists and practitioners from many disciplines to transform the concept of sustainable development into reality.

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