
Valuing socio-diversity

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Sabine U. O'Hara

Rensselaer Polytechnic Institute, Troy, New York

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Introduction

Throughout human history economy and ecology have been intertwined. From early hunter-gatherers to agricultural and modern industrial societies, natural resources have provided the base for increased levels of output, produced and consumed in ever-more complex societies. In the process, human activity has altered much of the earth's ecosystems. Some of these alterations were sustainable over long periods of time, others were not[1]. More recently, the unprecedented growth rates in output and population and the resulting rates of waste, pollution and resource depletion, have raised pressing questions regarding the long-term sustainability of our own socio-economic system.

Often unrecognized next to problems of toxic waste build-up, ozone depletion and threats of global climate change, ecologists have pointed to the loss of bio-diversity as one of the most serious problems of our time (Eisner, 1991; Rolston, 1991; Wilson, 1992). Bio-diversity begets stability, and the ability to cope with crises (Tilam and Downing, 1994). Thus the loss of bio-diversity is one of the most disconcerting consequences of human activity globally. Wilson writes: "Biological diversity has increased slowly over geological time, with occasional setbacks through mass global extinctions. There have been five such extinctions so far. A sixth major decline is now under way as a result of human activity" (Wilson, 1992, p. 191). The current crisis of extinction, preceded in scope only by the most severe catastrophes at the end of the Palaeozoic and Mesozoic eras (some 220 and 65 million years ago, respectively), may even be more threatening since for the first time not only animal but also plant diversity is being lost (Knoll, 1984).

Yet not only is bio-diversity being lost at staggering rates, socio-diversity is being lost as well. By socio-diversity, I mean the diverse ways of social and economic arrangements by which peoples have organized their societies, particularly the underlying assumptions, goals, values and social behaviours guiding these economic arrangements and processes. While the recent loss of one way of socio-economic organization (namely the fall of the planned economies of eastern Europe) has drawn worldwide attention, most others have disappeared quietly and unnoticed. This is not because market and planned economies showed dramatic differences. To the contrary, I would suggest, that despite their organizational and ideological differences they in fact shared a number of important assumptions such as universal applicability, anthropocentrism, a high

The author would like to thank Romesh Diwan and John Gowdy for their helpful comments on an earlier draft of this article.

degree of social stratification, and the goal of material accumulation, to name just a few. The focus of this article, however, is not a comparison of these two largest economic systems. Nor does it suggest that every market economy is the same (Hampton-Turner, 1993). But it does suggest that the very assumptions and valuation concepts, on which mainline economic theory is based, lead to the successive loss of diverse economic systems and adaptations of such systems. What varieties and adaptations of economic arrangements we do have are preserved owing to factors outside the realm of economic theory and occur not because of, but rather in spite of, the worldwide conquest of mainline economic thought.

Like bio-diversity, so the loss of socio-diversity has consequences. Allen (1977) and Hern (1990) have pointed out that the increasing homogeneity of our world economy is particularly vulnerable to environmental and social disruption. What, then, are the lessons to be learned regarding the stability and sustainability of our increasingly global socio-economic system as we face increasing violence, a widening gap between rich and poor, and ecological impoverishment?

To pursue these questions, the following article examines the assumptions and valuation concepts underlying neo-classical or mainline economic theory and raises the question in what way this theory contributes to the loss of socio-economic diversity. In doing so, the article draws on ecological concepts relevant to bio-diversity, and proposes that mainline economic theory, its underlying assumptions and valuation concepts be expanded to consider such ecological concepts. By examining the links between ecological and economic systems, insights may be gained about the conditions necessary for long-term sustainability for our own socio-economic system.

Lessons from ecosystems

To draw on biological or ecological concepts to advance economic thought is not new. Darwin's concept of evolution through competition can be considered the very root of the perfect competition model of free market economics. Classical economic thought from the French Physiocrats to Adam Smith (1776) to Malthus (1836) has also drawn on the interconnectedness of humans and ecology, whereby the circulation of a materials stock and the productiveness of land formed both base and limitation for wealth creation and human development.

Modern neoclassical economic analysis, on the other hand, ignores such connections. Economics is independent of ecological limitations or processes. Neo-classical economics assumes that environmental impacts (as well as social impacts) can be accurately reflected by being described by an economic valuation framework which defines them as "external" (Anderson and Leal 1991; Nordhaus, 1992). This kind of analysis has been most influential in public policy. While market activity forms only a small portion of economic activity (namely those activities which find expression in the market's price system), this in turn is only a small portion of human activity within the larger context of human ecosystems' activity, the market activity framework which forms the basis for evaluation of virtually all other systems' components, whether economic, human, or ecosystem-related (see Figure 1).

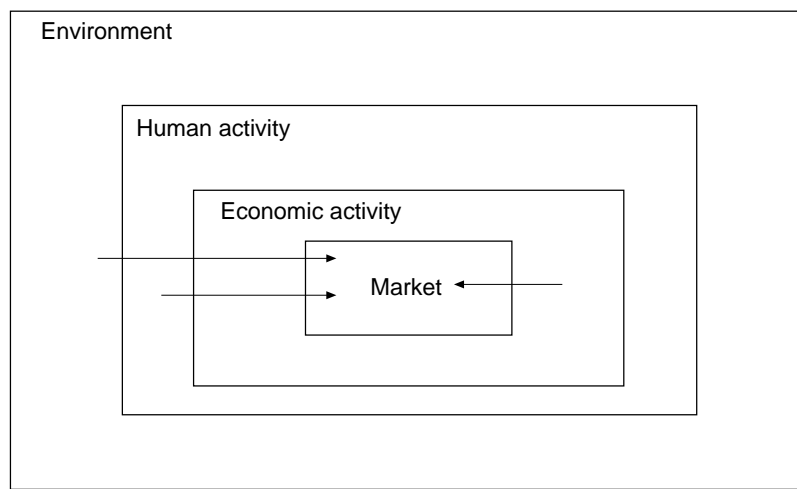


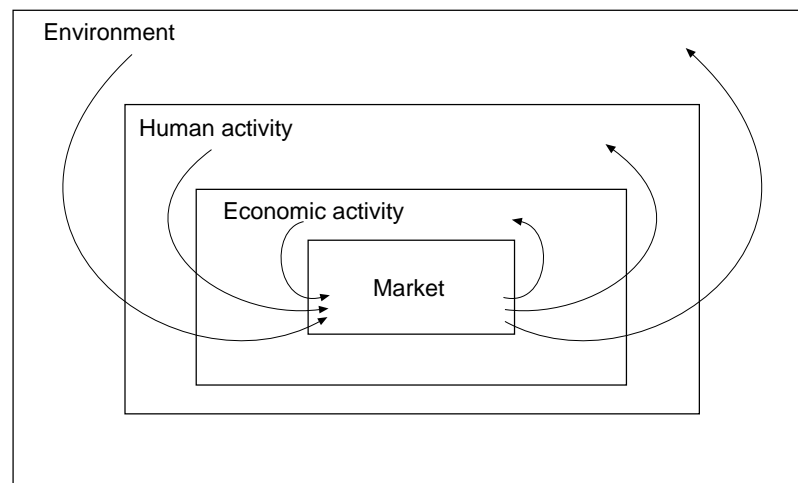
Figure 1.
Market-activity-
dominated valuation
framework

To analyse bio-diversity or socio-diversity from this market-centred perspective would be a contradiction in terms. Their analysis requires an explicit focus on ecological concepts relevant to bio-diversity. Applying biophysical concepts to economics follows a more classical understanding of economics, which has found expression in Saffra's basic commodities model (1960), Georgescu-Roegen's biological economics (1971), Schumpeter's evolutionary economics (1934), or concepts of ecological economics (Costanza, 1991; Daly, 1992; Gowdy 1994). All of these draw attention to the links between economic and ecological systems. The following considerations explore the links between economic and ecological systems by identifying criteria which form the basis for bio-diversity. They are: context, participation, place, limits and temporality. These criteria are reviewed as to their relevance to human socio-economic systems, and to sustaining the socio-diversity of these systems. Thus, market activity is not excluded, but rather put in its context (see Figure 2).

Context

Bio-diversity cannot be understood in isolation. Mutations, cross-fertilization, adaptations of parasitism and symbiosis are all examples of diversity being formed not just by place and environmental conditions such as climate, hydrological or soil conditions, but by sociality. Disturbance of this connectedness has dramatic effects. The destruction of ecosystems balance owing to the loss of a keystone species[2], experiments with insects foreign to a habitat as pest control measure, the loss of plant and animal species owing to pesticide use, or the forming of antibiotics-resistant strands of pneumonia and other infectious diseases owing to low-level food chain exposure to antibiotics have illustrated the effects of disturbances to the balance of bio-systems. Connectedness and interrelatedness are key to ecosystems health.

Figure 2.
Contextual valuation
framework



Consequently, the destruction of habitats poses as much of a threat to biodiversity as the extinction of individual species. Members of ecosystems receive their value not from their isolated contributions but from their contextual contribution to the whole, irrespective of the direct impact or measurability of these contributions.

This contrasts economic valuation systems. Yields, output, productive functions are determined by the individual contributions of productive inputs. Very limited notions of complementarity exist. Rather, value is assigned based on the distinctive and identifiable marginal product of individual production factors. An example is the practice of estimating maximum sustainable yields as a guideline for the valuation of resources (Pearce and Turner, 1990). Yet this practice has led to the consistent overuse of resources as, for example, in fisheries. Ludwig *et al.* (1993) have pointed out that it is, in fact, impossible to calculate productive or "yield" functions of biological resources with any degree of accuracy. Since such resources are part of complex systems, yields depend on numerous direct and indirect contextual influences.

The same applies to the evaluation of human contributions. Contributions are evaluated on the basis of their productivity evaluated not in physical units or structural contributions but in monetary contributions to marginal product. Sustaining functions, such as caring, nurture, support of physical and emotional wellbeing are undervalued or go unaccounted for since they are not easily measured in input/output ratios (O'Hara, 1995). It is telling that the sustaining functions of human communities are provided by the so-called "informal" sector, traditionally through women's work, or by the "external" function of nature. Neither sector is accounted for by customary measures of wealth in GNP or GDP, a fact which has long sparked discussions regarding the

adequacy of such measures (Boulding, 1971; Daly and Cobb, 1989; Hofmeister and Mazur, 1991; Illich, 1982; Mishan, 1967; Waring, 1988).

The reality of connectedness also contrasts economic assumptions of individual interest maximization as appropriate approximation of human motivation and economically rational behaviour. Etzioni, for example, points to the need for a “communitarian” corrective (Etzioni, 1988). In standard economic analysis, however, community interests remain outside the economic framework (i.e. in contractual arrangements) and are merely evaluated according to their relative undisturbance of the economic system itself and its optimal allocation goals (Buchanan, 1977; Coase, 1972). Rarely is a cultural perspective of community interest incorporated into economic analysis as in Diwan’s work on Gandhian economics (Diwan, 1991; Diwan and Lutz, 1985). While it is generally recognized that the neglect of unaccounted for sustaining functions or community considerations leads to social and ecological costs, they are captured in “externalities” or “market failures”. Consequently, they merely warrant “correctives” to the relevant measures of socio-economic achievement. The notion of a reverse corrective, namely that which is good for the individual has to be good for the whole, since it is the whole which sustains and supports the individual (including his/her productiveness), and therefore that which solely benefits the individual is to be considered “external”, does not enter this economic reason.

Such an understanding, however, is reflected in the valuation of individual versus social contributions of many tribal peoples. Tinker (1994) writes about his own nation the Osages:

There’s no head of the line, no hierarchical or pyramidal structure. The chief may be a chief, but is simply a leader among peers and has no special rights as a chief other than the responsibility of bringing people together to make decisions and carrying out those decisions. One’s status is not measured by what one accumulates. Certainly the accumulation of power and wealth is not socially rewarded in the Indian world. Rather one’s status is measured on the basis of what one’s contribution is to the community. Therefore the give-away becomes an important part of Indian life... One did not get to be on the council of Old Ones ... unless three times in one’s lifetime you had given away everything you own. And when you are appointed to the Council of Old Ones that would be the occasion for a fourth give-away of everything that you own. ... The point is twofold: your status depends upon your generosity and your willingness to humble yourself in the community to the point of not having anything. Secondly, the community can’t function in this kind of a system, unless the community has the will and the resources then to take care of the family that has given everything away. There’s a total relationship of interdependence (Tinker, 1994).

Similarly reciprocal and egalitarian structures characterized by equal access to productive means, little or no distinctions of wealth, power and status, and a high degree of flexibility in social roles, including those between men and women, are known in many indigenous and non-western societies[3]. “Selfishness is considered an immoral act”, writes Burger about the Sanema of Venezuela (Burger, 1990), and in Diwan’s Gandhian perspective “affluence... is a state in which a person is surrounded only and only by other persons for whom she/he cares and who care for this person” (Diwan, 1991; p. 14). As explicit in

Tinker's example of the give-away this understanding of social connectedness also translates into a social security or safety net[4]. Individual members and their needs and contributions are perceived not in isolation, but within the context of the community and interconnected with it. Such social arrangements encourage inclusion, rather than exclusion. As Sahlins has pointed out in his description of "immediate return" versus "delayed return" societies, the higher the degree of capital stock, storage, and "delayed return" (Sahlins, 1972), the higher the degree of social stratification and exclusion. Gowdy (1992) writes:

The egalitarianism of the peasant work ethic as defined by Georgescu-Roegen is appealing – equal opportunity and equal reward for equal work – but less egalitarian than the "primitive communism" of hunter-gatherers. Disdain for those not engaged in productive activity does not seem to be a "natural" human emotion (Gowdy, 1992; p. 144; see also Georgescu-Roegen, 1976).

Simply to discard such connections between the valuation of individual versus social contributions as purely cultural and unrelated to economic theory would be mistaken. It is a known fact that, while our minds shape our theories, so do our theories shape our minds. Not only is behaviour other than individual interest maximization considered irrational in mainline economic theory, it also seems increasingly to vanish even as a possibility as the mind-set of mainline economics gains in influence. As a recent study showed, there are clear indications that those trained in economic theory are more likely to behave opportunistically in social dilemmas than non-economists. Economists are also more likely to expect opportunistic and self-centred behaviour from others (Frank *et al.*, 1993).

This does not imply that economic theory has ignored the benefits of co-operation over/against competition altogether. Game theory-based research, vertical integration, and managerial theories have focused on strategic and co-operative models (Axelrod, 1984). Yet co-operative models on the firm level are not enough. Rather, they need to be conceptually expanded to find recognition also on the macro-economic level and in policy applications[5]. This gives recognition to the fact that both production and consumption processes take place within the wider context of socio-economic and ecological systems. Thus feedbacks occur between ecological and social structures as well as between micro- and macro-economic levels. Recent work on interdependent markets, product pricing in an innovation-driven global marketplace, socio-cultural influences on market economic systems and links between socio-economic and ecological valuation criteria have already raised conceptual questions regarding such feedbacks (Beckenbach, 1991; Drucker, 1992; Eaton, 1993). In addition, the very understanding of contextuality and connectedness which characterizes both bio- and socio-diversity moves us beyond concepts of rational choice and static equilibrium models. Since nothing is unaffected by our participation or even our observations, there is no laboratory in which factors can be isolated. Rather, the very contextuality of our observation changes our research. This fact has been likened to a social pendant of the Heisenberg theorem (Jaeger, 1993).

The understanding of connectedness between individual and community, and between ecology and sociality evident in indigenous and non-Western societies can help clarify needed expansions of assumptions and valuation criteria of economic theory. Reciprocity, mutual support, respect and awareness of the context of human sociality within the larger ecosystem form key concepts of a contextual economic system.

Participation

In ecosystems, no part of the whole is unimportant. No member is, or can be, excluded from participation in the interconnected whole. No validation of individual members' contributions is necessary. This understanding is reflected in the egalitarian and reciprocal social structure of "immediate return societies". In contrast, inclusion and participation remain conditional in industrial and post-industrial societies. Galbraith (1958) wrote:

An affluent society, that is both compassionate and rational, would, no doubt, secure to all who needed it the minimum income essential for decency and comfort. . . . To secure to each family a minimum standard, as a normal function of the society, would help insure that the misfortunes of parents, deserved or otherwise, were not visited on their children. It would help insure that poverty was not self-perpetuating.

Twenty-seven years later, we are further from, rather than closer to, Galbraith's standard or rationality. We have neither broken the cycle of poverty, nor loosened the preconditions for belonging as members of an affluent society. Social inclusion and participation remain conditional. Yet with global unemployment or underemployment exceeding 30 per cent, work no longer serves as the basis for achieving social inclusion. For those who have work, wage gaps are growing, leading to an increased polarization among those included and those excluded. Despite the continued importance of work as means of recognition, self-esteem and income generation, labour has lost in social relevance while consumption has surpassed it in importance. Not those without work, but those without the means to consume are excluded. Social participation is measured in affluence and the ability to accumulate. This makes evident the importance of the pursuit of individual interest as the motivating force of "rational" acting human beings. Individual interest is more than pure economic pursuit, it is the expression of inclusion, the right to participate and to be socially validated. The constant appeals of our elected officials are telling. We are no longer American voters, but American consumers.

If, however, we are participants via our consumptive activities, participation in and awareness of our participation as consumers becomes crucial. Participation through prices requires full and equal access to information, knowledge of the goods we consume, and how they are produced. As long as prices do not reflect externalities or social costs of our consumption patterns, they cannot serve as adequate signals for informed participants. In addition, participation via consumption would require that individuals or social groups be equally heard – one person, one vote. Who does in fact participate? With

increasing privatization and loss of common means of participation in the productive process on the one hand, and the diminishing importance of labour on the other, societal interests and responsibilities continue to drift apart: increasing isolation, passivity and disillusionment for some, increased access to political and economic participation for others.

Ensuing questions regarding the conflicting interests of various production sectors, of labour or consumers and their representation in the political process are nothing new[6]. All the more important to remember, however, seems the fact that markets were never expected to regulate the conflicting interests of participating societal groups. Rather, participation in a societal negotiating process was an essential component of Adam Smith's theory (1776) of the invisible hand. Only if wide and diverse participation is ensured can a common good be achieved that represents the diverse expressions of many individual interest maximizers.

Many have argued that the demise of the planned economies of Eastern Europe had its origin in its fostering passivity and non-participation in the political and the economic process. The intertwining of political and economic systems, marked by isolation and disillusionment rather than participation and social responsibility by the increasing number of market participants globally, should thus be viewed with discomfort. Neither democracy nor free markets can continue if left to a privileged few. An important corrective to evaluating socio-economic systems must, therefore, be seen in the amount of access and opportunity created for participation in both economic and political decision-making processes. The egalitarian and flexible structures of "immediate return" societies seem to ensure such participation. The highly stratified and inflexible structures of industrial and post-industrial societies need to recognize that no automatic mechanism exists that will ensure broad access and participation, but rather that participation needs to be an explicitly valued and intentionally pursued goal. Income distribution, access to education, the availability of employment opportunities and participation and representation in public discourse may function as criteria or measures of participation.

Place

Place is an important dimension of bio-diversity. Organisms are formed by their environment in allopathic specification (Wilson, 1992, p. 72). The place itself leaves its mark. Thus, variations of the same species can develop into distinctly different species within a relatively short distance owing to a natural barrier, a separation by place. As a result, distinctly different socialities may evolve as well.

Place also formed human communities. Early societies were shaped by place, by their living space, as are contemporary indigenous peoples (Burger, 1990; Layton *et al.*, 1991; Whittaker, 1975). Despite their remarkable degree of cultural, religious and organizational diversity, they share a deep concern for their place of life and origin[7]. A place orientation requires an intimate knowledge of the dynamics and balances within an area. Such knowledge about balance with the land which they are part of and within which they live is what

informed hunting-gathering societies (Gowdy, 1992; Lee, 1968), plains Indians (Tinker, 1993) and other indigenous peoples, and those sharing in their culture's traditional practices (Shiva, 1992).

In contrast, modern industrial societies have no consideration for place. Whether in agricultural or industrial production, it is the mark of modern economies that techniques are applicable, irrespective of place, with the possible exception of scale considerations. Hern writes:

A striking feature of human communities is that they are becoming indistinguishable in appearance. Ancient human communities frequently exhibited unique architecture and residence patterns that were characteristic and specific to a particular culture and area ... In more recent times, the boundaries of communities everywhere have become indistinct while they are becoming more extensive (Hern, 1990; p.15).

Particularly the financial and management centres of modern cities look alike anywhere in the world. Not only is place no longer relevant, but also the neglect of place is the very basis on which our highly-stratified and global economies were formed. Biologist MacNeill (1994) coined the term "fidelity to place" and points out that dating back to the Prussian military under Friedrich Wilhelm I and Friedrich dem Grossen a system of forced migration was developed to form solidarity to the institution rather than to place and local community. Adopted by the military, academic institutions, corporations and the church, particularly in the USA, where a high degree of mobility is more prevalent and more socially rewarded than even in European societies, it continues to be the trademark of modern industrialism (Slater, 1970). Forced migration of so-called "economic refugees" also illustrates the intimate connection between advancing economic institutions and the destruction of place orientation. MacNeill writes: "A culture of forced migration selects for individuals with fidelity to hierarchical institutions, at the expense of fidelity to place" (MacNeill, 1994, p. 5).

Neo-classical economic theory promotes the irrelevance of place. Since production theory is primarily concerned with the allocation of resources, it is in fact irrelevant where these resources come from or where they go to once they have become waste products of the production process. Within this framework of Pareto optimal allocation, resources are considered a given. Technology allows us to move beyond place, both literally and figuratively. Thus, in the neo-classical framework, place can simply be summarized in transport costs of either inputs or products, distance to resources, further product modification or consumer markets, and a given structure of productive, infrastructural or consumptive resources. Production and consumption are transferable and no longer tied to the dynamics of their location itself.

More recently, regional economics has recognized the importance of place, and of the boundaries of a location and its resources. Yet, much remains to be learned not just about regional characteristics of production, resourcing limits or the materials balance within a location, but also about the impact of a place orientation (rather than a mobility orientation) on the human sociality itself. MacNeill writes:

What evolutionary biologists have discovered is that co-operation evolves as the result of duration of relationship. Even bitter enemies can become intimate partners if held in frequent contact with one another over sufficiently long periods of time. Symbionts ... begin as parasites, or even predators of one another (MacNeill, 1994, p. 5; see also Margulis, 1984).

Our place shapes us, just as we shape it. In 1918, the psychoanalyst, C.G. Jung wrote, "Every ground has its mysteries. We carry their picture unconsciously in our soul: an interconnectedness between mind and body, and that between body and earth" (Jung, 1918, p. 26). These neglected psycho-social functions of place as source of identification, solidarity and social stability, must be given attention, particularly as institutional identifications are weakened. The rewards of local solidarity of the company town have long been a thing of the past. The rewards of institutional solidarity are quickly disappearing as long-time workers are laid off in a global marketplace. What will replace this loss of identification and community? Can the global market replace identities, or are the rising ethnic, racial and territorial conflicts, which we see, the result of destroyed belonging? As global migration has become the order of the day, more attention must be given to the social, as well as political costs, of uprooting and dislocation. In addition, regional input-output models can serve to provide measures for ecological sustainability.

Limits

Growth in ecosystems takes place within limits. To overstep these limits inevitably leads to collapse. This has been illustrated most clearly by agricultural systems (Pointing, 1991)[8]. As pressures for higher output rates increase, growing amounts of fossil fuels, irrigation, fertilizers and pesticides are necessary to maintain output levels. Much has been written about the limits to growth and needed adjustments of our growth-oriented industrial economies (Daly, 1992; Meadows *et al.*, 1972, 1992; Schumacher, 1973). Yet only within recent years has the goal of "sustainability" been more widely accepted. Definitions of sustainability remain confusing. While some argue for sustainable growth, others argue that sustainability and growth are mutually exclusive. The prevailing tensions are exemplified in the following statement from the WCED:

The concept of sustainable development does imply limits – not absolute limits but limitations imposed by the present state of technology and social organization on environmental resources and by the ability of the biosphere to absorb the effects of human activities. But technology and social organization can be both managed and improved to make way for a new era of economic growth (WCED, 1987, p. 8).

These tensions are not surprising since growth and accumulation are fundamental to mainline economic theory. Despite consumer theory's assumption of decreasing marginal utility, each indifference curve representing a higher level of consumption is associated with a higher preference level. In the transitivity framework of consumer theory logic, more is therefore always preferable to less. The goal of economic production becomes the means by which these ever-increasing consumer wants are met. And neo-classical production theory

considers its possibilities as virtually unlimited. Production takes place within a given framework of technology and resources. Yet given does not imply limits, but rather the present conditions for production possibilities. As conditions change, the framework within which production occurs is redefined as technology, and resource substitution serves as means to overcome limits (Nordhaus and Tobin, 1972)[9].

Following biological concepts of economics, some have long argued that not (substitutable) stocks but rather flows should be considered whereby production is to minimize throughput (Boulding, 1971; Daly, 1991, 1992; Georgescu-Roegen, 1971, 1976). This model seems to have been adopted particularly by Japanese corporations who pursue “lean production” methods which “...uses less of everything than a comparable mass-production operation” (Womack *et al.*, 1990). Applications of the minimal throughput model beyond the firm level, however, continue to be lacking, particularly in the USA, despite calls for waste reduction and increased energy efficiency.

In contrast, numerous pre-industrial societies as well as contemporary hunter-gatherers exemplify a flow-oriented mode of operation characterized by low stocks, equal access to food supply and resources, low “capital”, extraordinary knowledge of the land’s resources and balance, and an environmental ethic which includes respect of natural boundaries and limits (Gowdy, 1992; Lee, 1968; Woodburn, 1982). Such a throughput orientation of economics requires a whole new set of valuation criteria. Value cannot be assigned by material accumulation, but by meeting needs. Thus not output level and growth *per se*, but rather the degree to which a society meets its member’s needs constitutes its wealth. In this framework, uncontrolled growth does not improve welfare, but parallels a cancer, out of control and destined to ruin the organism it befalls. A healthy growth pattern follows an optimum function such as that of a standard plant production function which is characterized by an initial stress phase, at which the plant’s potential yield is not yet reached, an optimum phase during which additional intake does not lead to increased yield, and a third phase of “overabundance stress” in which additional intake leads to a decrease in the plant’s qualitative characteristics (O’Hara, 1984a). Likewise, while many have too little, far from reaching their potential, some have enough, and others struggle with having too much. Schumacher writes:

For the modern economist this (limits) is very difficult to understand. He is used to measuring the “standard of living” by the amount of annual consumption, assuming all the time that a man who consumes more is “better off” than a man who consumes less. A Buddhist economist would consider this approach excessively irrational: since consumption is merely a means to human wellbeing, the aim should be to obtain the maximum of wellbeing with the minimum of consumption...The ownership and the consumption of goods are a means to an end, and a Buddhist economics is the systematic study of how to attain given ends with the minimum of means (Schumacher, 1971; see also Sahlins’ definition of the Zen road to affluence; Sahlins, 1976, p. 2)[10].

Schumacher also points to the false assumption that such a religiously and culturally informed understanding of economics could be married with the

requirements of the development plans established by modern economics. He writes: "No one seems to think that a Buddhist way of life would call for Buddhist economics, just as the modern way of life has brought forth modern economics" (Schumacher, 1971, p. 120).

The production-consumption connection of mainline economic theory states almost the reverse notion. The goal of production is not to meet "givens" or needs, but ever increasing wants. More wants mean more production, more affluence (since more is preferable to less) and consequently wants must be created. The continuation of this myth of limitlessness is evident in much of today's global market argument despite the fact that global markets may allow us to exceed regional limits, but not global biospheric limits. Ehrlich points out that measured in net primary production (NPP) humanity's current direct and indirect use of global biomass is 30 per cent, and 40 per cent if the forgone NPP from converting more productive into less productive land use systems is added (Ehrlich, 1988)[11]. Considering projected population growth rates, current levels assume "...that our species can safely commandeer upwards of 80 per cent of terrestrial NPP, a preposterous notion to ecologists who already see the deadly impacts of today's level of human activity" (Ehrlich, 1988, p. 23). Despite human creativity and ingenuity we cannot exceed ecological limits. But maybe because of human creativity and ingenuity, we can learn from the experience and the knowledge sustainable societies adhered to for over 90 per cent of human existence. To ignore the limits within which we live has invariably led to collapse. The science that supposedly deals with scarcity and limits thus has to begin to acknowledge its limits. By doing so, our creativity may be freed to deal with pressing inter- and intra-generational distribution questions. Solow's (1991) argument that "...there is something faintly phoney about the deep concern for the future combined with callousness about the state of the world today" can only be reiterated. To maintain the myth of limitlessness in our economic theories and valuation criteria is therefore more than ignorant.

Temporality

Time is an important element in the dynamic, interactive processes of ecosystems. Bio-diversity evolves over time. Yet, this evolution over time is not an ordered predictable succession of events. Rather it is cyclical, ever changing and in flux:

When we think about the future of the world, we always have in mind its being in the place where it would be if it continued to move as we see it moving now. We do not realize that it moves not in a straight line, but in a curve, and that its direction is constantly changing (Wittgenstein, 1979, p. 14).

Economic theory, on the other hand, considers time simply as a predictable extension of current concepts and perceptions. This is evident in the assumption of pure time preference. Since market decisions are made by individuals at one point in time, positive discount rates are assumed to evaluate future

resource use and future consumption. Examples such as the discovery of medicinal qualities in plants, which were previously considered weeds and thus valueless, have raised serious questions about this now-centred concept of time. Its incompatibility with environmental sustainability has been pointed out by many economists (Daly, 1991; Georgescu-Roegen, 1971; Hampike, 1991; Pearce and Turner, 1990; Tietenberg, 1988). Some have called for a safe minimum standard approach to environmental policy to reflect our limited knowledge of a vast biosphere (Bishop, 1978). This concept of time consideration, however, does not reflect a valuation of time itself, but rather of use alternatives related to time[12]. What is used today is no longer available tomorrow. Time itself is irrelevant. There is no change, no evolution, no feedback from processes that enter into the standard economic valuation framework. Rather, an unchanged system is redefined within a changed framework of available resources, technology and consumer preferences. Time is static, a hindrance to economic processes in which more is better and faster is more, and thus the effect of time is to be minimized.

The contradictions between this understanding of time and economic valuations of leisure versus production time is easily evident (Schor, 1991). Diwan writes:

Mainstream economic analysis completely ignores the relevance, indeed importance, of discretionary time in human wellbeing. Somehow the assumption is made that time for consumption is always available. Time is brought into play in the conflict between labour, work and leisure. The exclusion of time from consumption results in an omission of reality itself. After all, what use is consumption if there is no time for it...? Time is an integral part of well-being (Diwan, 1991, p. 18).

Time spent with others, time spent in observation, time spent for renewal – without time neither productive, nor consumptive, neither creative nor communicative functions are possible. Tinker expresses this essential quality of time so foreign to Western thinking:

History in the sense that the West has understood it for maybe 200 years has not, until recently, existed for Indian people and it is imposed on us. Of course, Indian people understand the past; we tell stories of the past and pass on traditions that way... Where time is a factor it's always cyclical time. Even one's lifetime is considered a cycle of existence. The universe goes on when someone dies, and when a new baby is born the cycle begins over again. So that I like to insist, for instance, that notions of temporal progression in modern economics, for example, have to be replaced with a dynamic stasis in order to satisfy American Indian cultural values. The important thing is not progress or advancement but maintaining harmony and balance in the universe around us (Tinker, 1994).

Gould refers to this understanding of time as one essential for the practice of “historical science” (Gould, 1974; see also Cheetham, 1993). It requires patience, time spent in observation, in a concrete place and context, and it requires that we recover a relationship with the subjects of our inquiry. The Greek distinction between *chronos* and *chairo*s (both of which translate “time”), between merely passing time and decisive time, is telling. A historical economics in Gould's (1974) sense includes the recognition of our being part of and not outside of our

inquiries, the recognition that the assumptions on which we build our theories are only partial and do not hold for all times and all places. The consideration of temporality, therefore, requires a focus on long-term developments rather than short-term returns, precaution rather than the pretence of complete information, preservation rather than destruction, and prevention rather than a fix-it.

Conclusion

“Bio-diversity is our most valuable but least appreciated resource”, writes Wilson (1988, 1992, p. 281). The same can be said for socio-diversity. Pathology points to the destructiveness of “de-differentiation” (Hern, 1990). As social and ecological systems are linked, understanding the principles of socio-economic organization which govern societies which live in socio-ecological balance, contains invaluable lessons for our own sustainability. Five categories have been identified as pointing to the needed expansion of mainline economic theory and valuation criteria. They are: context, participation, place, limits and temporality. Table I gives a preliminary list of familiar indicators in an attempt to assign quantifiable measures to each of these valuation criteria. They can only be considered starting-points of evaluation. Much further definition is needed, while it must be recognized at the same time that reliance on quantitative criteria alone is not sufficient. Narrative and discursive methods need to be consulted as well.

The identified categories point to the need to expand, diversify and make concrete economic theory and methodology. Beyond regional adaptations of economic models distinctly spacial, cultural and ecological concepts which can

Category	Valuation criteria
Context	Stability (and diversity) of social structures – private/public expenditures on education, health care and preventive health care, infrastructural investments, household services, private/public expenditures for local economic development, ecological sustainability (i.e. energy and resource consumption, cost of air and water pollution, waste treatment)
Participation	Income distribution, rate of employment, per cent of labour force in education, job-training or labour-supportive services, voter participation, participation and representation in public discourse
Place	Regional input-output balance, effects of ecological sustainability (i.e. absorption capacity, loss and/or preservation of eco-systems as per cent of land use area), socio-cultural functions of place for employment, housing, transitions (regional influx and outflow as per cent of population)
Limits	Income distribution, consumption expenditures as per cent of disposable income, marginal propensity to consume, savings rate, infrastructural investments as per cent of expenditures
Temporality	Per cent of long-term investment as per cent of total investment expenditures, long-term economic performance assessments, long-term eco-systems assessment, precautionary principle under uncertainty

Table I.
Economic valuation
categories in the
expanded economic
theory model

move us from partial to holistic analysis, and from disciplinary isolation to multidisciplinary contextuality, are required. Thus questions about the self-understanding of economics as a discipline reminiscent of those raised in the “Methodenstreit” debate[13] are raised: Is economics inductive, holistic, and historic-ethical or is it deductive, unhistoric, individualistic and universal? I would argue it has to be both.

As we face the expansion of market economics in a post-planned-economy world we are confronted with a paradox: not increased homogeneity and abstraction, but rather increased diversity and concretion may hold the key to confronting socio-ecological problems. The theologian May writes: “...beyond bi-polarity it is no longer the East-West conflict with its ideological orientation, which is the topic, but it is cultural patterns of behaviour and their religious background which increase in significance” (May, 1992, p. 4). Only by moving from an “either-or” to a “both-and” concept, only by not discarding but contextualizing theory and methodology will we be able to account for the significance of socio-diverse concepts of economic, ecological and social organization.

Interestingly, the call to recover and reintegrate neglected inductive dimensions of inquiry has been raised not only in economics (Sen, 1987; Thurow, 1983; Ulrich, 1990), but in science as well (Levin, 1993). Its argument is that, in the light of pressing social and ecological problems, a multi-disciplinary approach to valuation is needed, which focuses on the linkages between socio-economic and ecological valuation criteria, human motivation, and risk consciousness (Ludwig *et al.*, 1993). While undeniably important lessons have been learned from the search for a universal core of theory, its focus needs to be re-stated as a web of interconnected and interactive processes confronts us with uncertainties no longer expressible in probabilities. The question, therefore, is not one of quantitative neutrality versus qualitative normativity but of what norms become operative: to confront a changing reality or to defend the reality familiar to us. Hampike writes:

Consider how future generations, whom we have left a destroyed earth, will despair when they learn of the unavoidability of their plight as they roam through old professional journals, and learn that it was in fact the calculation of integrals which compelled their forefathers to consume more than the integrity of the planet would allow (Hampike, 1991, p. 129).

Thus the challenge is to reframe economic theory within a changing framework of ecological and social conditions. To do so, lessons of our own time have to be incorporated into economic theory and valuation, just as Adam Smith’s “invisible hand” carries the mark of his own time. It is my hope that the thoughts outlined here will contribute to the intra- and inter-disciplinary debate necessary to meet this challenge.

Notes

1. For roughly 90 per cent of the time of our existence, we humans lived sustainably as hunter-gatherers; for numerous examples of the collapse of highly-organized civilizations owing to ecological boundaries as well as the effects of environmental change on human civilizations, see Pointing (1991).

2. A noted example was the explosion in fish populations owing to the loss of the sea-otter, a keystone species.
3. See also the characteristics of early matriarchal societies as described by Eisler (1988).
4. It has also been pointed out that a higher degree of social security and equality of women, particularly with respect to access to productive capital, has a significant impact on lowering population growth rates.
5. One attempt to combine the efficiency of the market with socially-oriented goals was the social market economy concept of post-Second World War Germany. It was designed as the "third way" between a pure market and a pure planned economy. "In the frame of a holistic order for the whole society, the economic order of competition and individual achievement was given a clearly-defined serving function" (Buescher, 1992, p. 10). However, in the light of the current financial pressures of struggling Eastern European economies to adapt to free market models, pressure to abandon more social-co-operation-oriented models seems to have increased rather than decreased.
6. See, for example, discussion of political representation of the industrial versus the agricultural sector and consumer interests during the great depression (Lee, 1988).
7. As known from language development, it is likely early societies formed a remarkably high degree of diversity even within relatively short distances owing to their strong connectedness to place. It is important, however, to understand that "place" here is to be understood as a "home range" within which migration took place in a highly-predictable cyclical pattern and not simply as a location.
8. See, for example, early agricultural societies from Mesopotamia to the Mayans.
9. For a more complete critique of this framework see Christensen (1989); Daly (1991, pp. 99-127).
10. This understanding of "given ends" or rather a level of satisfaction to be attained with a minimum of means is familiar also to other religious traditions.
11. Net primary production is a measure used to describe the human appropriation of the products of photosynthesis. It is the energy green plants bind into organic molecules minus the energy plants use for their own life process. Globally this amounts to 225 billion metric tons of organic matter produced annually, nearly 60 per cent of it on land.
12. This also illustrates the anthropocentric character of pure time preference, since evaluations of future use are based on current usefulness to humans not on ecologically useful or relevant criteria.
13. The "Methodenstreit" is personified in German economic history by the antagonists Schmollner and Menger. While the historic school (Schmollner) favoured an inductive, holistic, historic-ethical approach to economics, the analytical school (Menger) favoured an unhistoric, individualistic, universal and deductive in its methodology approach. For a summary see also Buescher (1992).

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