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Towards a 'science of sustainability': Improving the way ecological economics understands human well-being

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Abstract

Ecological economics seeks to recognize what traditional economics often ignores; that the economy is embedded in wider social and biophysical systems. To date ecological economics has focused on the biophysical dimensions of these interactions. Yet achieving sustainable development will require difficult decisions regarding which environmental and other assets should be preserved, and in what form. This emphasizes the importance of understanding why particular environmental resources and services are important to human well-being, and how social and economic institutions may be structured to make the best use of these and other forms of capital. The paper thus examines a variety of approaches to well-being, characterizing these as interpreting well-being as a state of mind, as a state of the world, as human capability, or as the satisfaction of underlying needs. The literature surveyed is drawn largely from political philosophy and psychology, and includes classical utilitarianism and self-evaluative approaches, descriptive utilitarianism and preference-based approaches, the basic needs approach, functional approaches, and underlying needs-based and virtue-based approaches. Particular authors include Michalos, Scitovsky, Easterlin, Hirsch, Galbraith, Rawls, Sen, Maslow, Boyden and Max-Neef. The ideas examined are found to have significant implications for economic theory and policy, especially regarding the social construction of preferences, the treatment of distributional issues, the identification of universal underlying needs, and the relationship between the satisfaction of these needs and perceived well-being. These insights suggest that rising real incomes are unlikely to result in improved community well-being, calling into question the traditional economic view of progress. They also offer a new path to sustainable development, in which the primary focus is on the cultivation of appropriate institutions and attitudes, rather than on the better management of resources. The paper concludes that important aspects of social, economic and environmental systems are codetermined, and thus that achieving sustainable development will require an expansion of the scope of analysis to encompass a wider system dynamic. The most promising approaches to well-being in this context are those that identify universal underlying human needs, thus avoiding the commodity fetishism of mainstream economics. © 1997 Elsevier Science B.V.

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1. Introduction

Ecological economics seeks to recognize what traditional economics often ignores; that the economy is embedded in wider social and biophysical systems. To date ecological economics has focused on the biophysical dimensions of the interactions between human and environmental systems, reflecting concerns about the way in which economic activity is generating feedback effects which may threaten the health and sustainability of both ecological and human communities (Perrings et al., 1995).

The idea of sustainable development has emerged for similar reasons, affirming the need to improve the well-being of the currently poor, while at least maintaining the basis of future well-being. Thrust onto the world stage by the World Commission on Environment and Development (1987), sustainable development is an ethical position packaged for political purposes. Like ecological economics, it draws attention to the interrelationships between environment and economy, and emphasizes the need for integrated analysis and policies. Unlike ecological economics, sustainable development is explicitly normative, and seeks to build a consensus in favour of a set of general objectives. Ecological economics, by contrast, is largely conceived of as a scientific endeavour. Nevertheless, many practitioners of ecological economics are motivated by a desire to see the discipline as the 'science of sustainability', providing the analytical tools required to meet the challenges of the next century.

To date most of the contribution of ecological economics to the quest for sustainability has focused on maintaining the stream of goods and services which underpin human well-being (Dodds, 1995; Bartelmus, 1992). This 'supply side' perspective conceptualizes the challenge of sustainable development as at least maintaining the value (or per capita value) of a society's total capital stock over an indefinite future, including stocks of natural, built, human and cultural capital. Most ecological economists add an explicit requirement to maintain a sub-set of natural or critical capital, including ecological life support systems and irreplaceable cultural artifacts (Pearce and Warford, 1993; Costanza and Daly, 1992).

Not all natural capital can be preserved, however. In a world where trade-offs must occur, difficult decisions must be made regarding which environmental and other assets should be passed on, and in what form. From an economic perspective, this challenge is understood to be one of pricing—either directly through markets, or indirectly through the use of extended valuation techniques to inform public policy decisions. While these non-market techniques are important, they cannot capture all aspects of value. Estimating likely future preferences and values raises additional conceptual and practical problems.

This suggests that the dominant 'supply side' approach must be complemented by an appreciation of the 'demand side', emphasizing the importance of understanding why environmental resources and services are important to human well-being, and how social and economic institutions may be structured to make the best use of such assets. Yet ecological economics is ill equipped to respond to this challenge, as it largely continues to operate within the limited and often misleading conception of well-being inherited from mainstream neoclassical economics. The essential features of this model are that the consumption of goods and services (output) is understood to be positively related to well-being, work (labour input) is assumed to be negatively related to well-being at the margin and so is only undertaken in exchange for payment, while externalities may have a positive or negative impact on well-being (see Pearce and Turner, 1990 p. 40). Perhaps more importantly, economic theory posits that individuals behave rationally to maximize the satisfaction of exogenously determined preferences. Many of the assumptions that underlie this framework are no longer credible.

This article thus examines four broad approaches to well-being, characterized as focusing on well-being as a state of mind, as a state of the world, as human capability, or as the satisfaction of underlying needs. The ideas examined are found to have significant implications for economic theory and policy, especially regarding the social construction of preferences, the treatment of distributional issues, the identification of universal underlying needs, and the relationship between the satisfaction of these needs and perceived well-being. The paper concludes with some discussion of the social limits critique of economic growth, and remarks on the implications of the well-being literature for the practice of ecological economics and the pursuit of sustainable development.

2. Theories of well-being

Ideas of well-being are as old as human discourse, reflected in numerous discussions of 'the good life' and 'the good society'. Examination of the historical literature on happiness reveals, however, that it largely neglects to define its central term, focusing instead on the way or ways in which happiness may be achieved (see McGill, 1967; Tatarkiewicz, 1976). In a similar way, while economics is devoted to maximizing social well-being through the promotion of efficient resource use, economists have given little attention to the idea of well-being itself. Pigou (1948) p. 23), for example, notes that the notion of well-being is a very broad concept and so opts to focus on economic welfare, characterized as 'that group of satisfactions and dissatisfactions which can be brought into relation with a money measure'. More recent economic literature tends to follow suit, discussing factors that impact on social welfare or quality of life with little exploration of the concepts underlying these terms.

Theories of well-being tend to spring from political philosophy and associated policy debates, concerned with the nature of the good society, and psychology, which seeks to describe and explain the factors and states of mind which underpin and evidence personal development. The development of these theories is usually associated with attempts to address a particular problem or settle some disagreement. Psychologists, for example, have sought to develop a more comprehensive view of individual well-being that is consistent with the experience and requirements of counsellors and therapists. Similarly, the debate over the physical limits to economic growth between the late 1950s and mid-1970s also prompted a wide ranging discussion of the significance of economic growth for human well-being. A third strand of the recent well-being literature was initiated by the publication of Rawls 'Theory of Justice', (Rawls, 1971) with much of the ensuing discussion focusing on how to frame appropriate goals and strategies for social and economic development in low income countries. Examination of these different strands reveals four broad approaches to the idea and assessment of well-being, dealt with in turn below.

2.1. Well-being as a state of mind

The best known approach to well-being is the classical utilitarian position pioneered by Bentham, in which well-being is considered to consist of a favoured state of mind. From this perspective well-being and happiness are essentially synonyms, and are usually interpreted as having two basic meanings or components (see Tatarkiewicz, 1976; Veenhoven, 1984; Cohen, 1993). The first of these, usually described as pleasure, denotes an experiential quality related to the degree to which feelings, emotions and moods are pleasant ones, and is often an intense and therefore short-lived state. The second, here termed contentment, refers to the cognitive component of individual well-being arising from 'satisfaction with one's life in general' or the fulfillment of desire. As this involves some degree of implicit self-reflection and assessment, contentment is considered to be more of a judgment than an emotion.

Contentment relates to the degree to which an individual perceives that their preferences or aspirations are being met. Michalos (1980, 1985) provides a detailed theory of this aspect of happiness, asserting that psychological well-being is a function of seven perceived gaps between what one has and what one wants (*aspirations*), what relevant others have (*social comparison*), what one had in the past (*history*), what one expected to have three years ago (*disappointment*), what one expects to have after five years (*hope*), what one deserves (*equity*), and what one *needs*. Michalos' research indicates that gaps relating to aspirations, social comparison, equity and needs are the most accurate predictors of life satisfaction (Braithwaite, 1993).

The identification of two dimensions provide a more powerful explanation of happiness, and may help to resolve contradictions where the affective and cognitive components conflict. More sophisticated analytical frameworks may not offer more precision, however. Poiesz and von Grumbkow (1988), for example, suggest that economic well-being may be thought of as consisting of three related components: job satisfaction, income evaluation, and consumer satisfaction—but find that the integration of these different considerations into a single analytical framework is very difficult.

Scitovsky (1976) offers a slightly different approach, drawing attention to the difference between pleasure and comfort. Comfort, he suggests, is best understood as the absence of discomfort. The experience of pleasure is related to a change in one's level of comfort—implying that discomfort is a prerequisite of pleasure. Scitovsky suggests this gives rise to the paradox of development: that social and technological advances enable more comfortable lives, but simultaneously make pleasure more difficult to obtain.

Those emphasizing well-being as a state of mind generally draw on survey techniques to elicit people's assessment of their happiness or life-satisfaction. This approach is thus often referred to as subjective, as it relies on seemingly unverifiable self-assessments. This description is disputed, however, on the grounds that the responses of individuals are observable, and that these responses may be validated or checked for internal consistency in a number of ways. Accordingly, reason this approach is here referred to as 'evaluative' (following Erikson, 1993).

Strict utilitarianism, committed to maximizing the total happiness of all creatures capable of feeling pleasure or pain, implies that resources and opportunities should be directed to those who will derive the most pleasure and contentment from them. Combined with the law of diminishing marginal utility, this gives rise to an egalitarian bias within utilitarianism, suggesting that total happiness is likely to be maximized by a roughly equal distribution of resources within a community. This suggestion can only be a loose one, however, because the happiness inferred from preference rankings can only be interpreted ordinally, not cardinally. In the absence of other basis for aggregation, most utilitarians assume that individuals have the same capacity for happiness; that is that there is no class of 'pleasure specialists' who consistently derive more utility from given inputs. In combination with Michalos' gap theory, hedonic utilitarianism thus supports a set of social institutions in which individuals are rewarded in proportion to their effort, but which includes mechanisms to moderate inequality and ensure perceived needs are met, and is generally regarded by its members to be fair.

The identification of well-being with favourable mental states may be criticized at a methodological or philosophical level. The main methodological criticism of the evaluative approach is that offers only limited insight into collective well-being, although it is generally accepted as appropriate and useful in assessing individual mental states. It is also limited by its reliance on interview data on which to base assessments. In many instances, such as historical inquiries or large scale studies, interview-based reports of perceived well-being are simply not available, or would be extremely costly to undertake. Furthermore, where such data are available, there may be biases resulting from systematic differences in individuals' ability or willingness to express themselves, particularly in relation to negative views or evaluations. Allardt (1993) suggests, for example, that policies based solely on evaluative data risk being biased in favour of the better off, as 'underprivileged people are usually less able to articulate their misgivings'. Despite the development of techniques to minimize survey bias, the tools of the evaluative approach are often regarded as producing 'soft' numbers with considerable room for interpretation and significant error margins.

At a philosophical level, utilitarianism and the evaluative approach may be criticized for ignoring important aspects of well-being that are not related to ones mental state. In particular, much of the discussion of social well-being is driven by notions of justice, rather than happiness. Government is perceived to have a responsibility to treat its citizens fairly. Whether or not they are happy depends on what they make of their situation, and is thus their own responsibility. This suggests that an approach that understands well-being solely as a state of mind has limited application to many practical policy issues, as discussed below. These criticisms, along with doubts about the validity of self-reported evaluations, encourage many to adopt a descriptive approach to well-being.

2.2. *Well-being as a state of the world*

The descriptive approach to well-being seeks to identify measurable indicators that themselves constitute some component of the good life (such as health status or longevity), or are determinants of well-being (such as purchasing power or access to clean water), or correlate with some desirable state where a more direct indicator is not available (such as the measurement of infant weight gain as a proxy for nutrition). Thus the descriptive approach satisfies those who desire an interpretation of well-being that goes beyond desirable mental states and avoids relying on self-evaluations. The use of descriptive indicators also allows the construction of welfare measures from a wide variety of data types, much of which has already been collected for other purposes, rather than relying on interview data alone.

In principle, efforts to construct indicators of overall well-being begin by identifying significant spheres of activity which reflect the different constituents of well-being, and then find or develop quantifiable indicators of well-being within each of these domains. The factors chosen to indicate well-being vary in scope from quite minimalist approaches, such as agreed basic needs, to very broad views of the resources required to shape one's living conditions, encompassing things such as 'independence, security, money, accumulated possessions, mental and physical capacity, economic and political opportunities and the like' (Harris, 1993, see also Erikson, 1993). The United Nations *Human Development Report*, for example, ranks nations by per capita income, literacy and life expectancy (United Nations Development Programme, 1992; Miles, 1985; Taylor and Jodice, 1983). More ambitiously, Sullivan (1991) identifies five key 'global values'—peace, economic well-being, ecological balance, social justice and political participation—and attempts to develop performance measures for 162 countries. Others have focused on the development of social indicators and frameworks to guide various aspects of social policy, including youth work, poverty alleviation, community health care, support of the elderly, and the linkages between these (see Canadian Council on Social Development, 1996). These efforts have also informed the construction of indicators of economic welfare or relative economic performance, adjusting gross domestic product (GDP) for pollution, income distribution, hours worked and a range of other factors (World Commission on Environment and Development, 1987; Cobb, 1990; Dowrick and Quiggin, 1993).

Such efforts to construct measures are only useful to the extent that the particular indicators chosen relate to some underlying philosophical understanding of human well-being. Here the descriptive school is divided into two. The first of these identifies well-being with the satisfaction of preferences, and focuses on observable factors or conditions that enable favourable states of mind to be achieved. Opponents of this 'descriptive utilitarian' account assert that things other than favourable states of mind are relevant to well-being, and that many of the indicators associated with happiness deserve attention in their own right, regardless of the possible links between the state of the world and individuals' states of mind. This second school is most closely associated with those who identify well-being with the satisfaction of basic needs.

2.2.1. *The satisfaction of preferences*

Modern economics follows the utilitarian tradition, treating quality of life as 'the hedonistic quality of experience' associated with the 'capacity of an experience to give pleasure or pain' (Wingo, 1977 p. 14). In practice, however, the incommensurability of individual utility forces economists to rely on the satisfaction of revealed preferences as the measure of well-being. In the simplest case, information on individual preferences may be inferred from their choices: purchases of goods and services to consume, decisions about employment, selection of leisure activities, and so on. The satisfaction or non-satisfaction of these revealed preferences may then be thought of as alternative observable states of the world, providing proxies for individual states of mind.

This reliance on revealed preference is subject to two important types of criticism. The first of these is recognised within mainstream economics; freely functioning markets are only expected to maximize community well-being in the absence of market failure, including economies of scale, spillover effects or ill-defined property rights, and public goods (that is, goods or services which are non-excludable and non-rival in consumption). Such market failures require non-market responses, in which preferences are expressed through political processes and other institutional structures.

The second criticism of the revealed preference account is that all choices are accorded equal status. Denied the comparability of states of mind, economics adopts money as its common metric, assessing alternative states of the world against the notion of a potential welfare improvement whereby winners from a particular change would be able to compensate the losers. This substitution of market prices for well-being is described by Sen (1982) as a pervasive 'commodity fetishism', and assumes that the welfare implications of all relevant states of the world are able to be valued in monetary terms. More importantly, it also abandons the presumption in favour of equality in Bentham's hedonic calculus, effectively deeming the ability to experience happiness to be correlated with one's financial resources. This implies, for example, that a meal in a typical European restaurant makes the same contribution to human well-being as the seeds and tools that would enable an African family to produce a year's food; that an air conditioner provides the same improvement in well-being as drilling a village well. As these examples highlight, the disregard of distributional issues is particularly problematic when differences in income and resources are large. Thus standard cost-benefit analysis is biased towards the preferences of the relatively wealthy, who have higher willingness to pay and often face higher opportunity costs when these are measured in monetary terms. At the national level, increased per capita incomes may occur at the same time as increases in the incidence and depth of poverty.

The third, and most difficult to accomodate, criticism focuses on the strength of the link between individuals' choices and their well-being. Here critics note that the revealed preference account, although ostensibly objective, in fact relies on unverifiable judgments that an observed item or activity consistently correlates with an individual's evaluation of their well-being. This effectively assumes that 'a given physical and economic environment exercises a specific influence on the individual and does so independently of the social context' (d'Iribarne, 1974). There is considerable evidence, however, that the degree of pleasure or contentment associated with a particular experience will be influenced by factors such as an individual's physical characteristics, personality type, and expectations—each shaped to varying degrees by the individual's culture, class, and personal history. This suggests that inter-temporal and inter-cultural comparisons are unlikely to be valid. Easterlin (1972, 1973), for example, argues that Americans in the 1970s were no happier than they were two centuries earlier, despite considerable increases in real incomes. The explanation for this is that happiness is determined by the gap between actual and expected income. Economic growth thus traps individuals on a 'hedonic treadmill' in which expectations keep pace with economic performance. Most economists, however, have fallen victim to a fallacy of composition; assuming that a rise in all or average incomes will improve perceived social well-being because a rise in an individual's income improves their perceived well-being.

The dubious link between preferences and states of mind might be avoided by re-framing the utilitarian approach in terms of the fulfillment of desires, rather than the achievement of happiness or some other particular state of mind. Such a reformulation might be justified on the basis that 'people know what is good for them or at least that they know it better that any observer (... or) agency of society' (Kahnemann and Varey, 1991). This would suggest that the satisfaction of desire maximizes well-being. Yet it is clear that individuals often choose things that seem to be against their best interests, whether because of poor information, poor judgment, or a lack of will (perhaps compounded by addiction), leading to mistakes that would often be avoided by trained observers.

While these difficulties might be countered by framing utility as the fulfillment of 'informed desires', rather than actual desires, the necessity of eliminating potential mistakes of fact, irrational moments, and a lack of self-understanding betrays the instrumental nature of desire (see Scanlon, 1993; Sen and Williams, 1982). As Griffin (1986) points out, 'things are desired because they are valuable, not valued because they are desired... What makes us desire the things we desire, when informed, is something about them, their features or properties... and that points us, depending on what the objects (of desire) are, either back towards mental states or beyond utility altogether.'

Alternatively, the satisfaction of desire might be considered to be so integral to the idea of well-being that it constitutes an end in itself. Advocates of this position do not subscribe to utilitarianism, however, as they either deem the satisfaction of desire to be a basic right, or a universal human need, or both—implying an affirmation of libertarian values or the adoption a human development approach to well-being, as discussed below.

2.2.2. *The satisfaction of basic needs*

The opposing arm of the descriptive school arose largely in response to the shortcomings of the revealed preference account, and focuses on the satisfaction of basic needs.

The intellectual foundation of this approach was laid by Rawls' 'Theory of Justice'. Rawls (1971) begins from the liberal presumption that there are a plurality of conceptions of the good. This means that there can, at best, only ever be partial agreement on the nature of the good life and the good society. Rawls argues, however, that it is possible to identify an overlapping consensus on the means by which this plurality of visions should be independently pursued, and suggests that this will involve universal access to certain key social institutions. This implies that well-being involves the satisfaction of a hierarchically ordered set of needs, in which basic needs are common to all, more easily identified, and more important. Higher order needs, by contrast, are not expected to be ranked in the same way by different individuals, drawing attention to the importance of agency for well-being achievement. Rawls also acknowledges that strict equality of outcomes may reduce social well-being by suppressing incentives. He suggests that this tension is resolved by approving departures from equality if, and only if, they improve the well-being of the least well off in a society. This rule is described as the 'maximin principle'.

The logic underpinning the maximin principle catalyzed the formation of the basic needs approach to third world development, providing intellectual credibility to the opponents of the pro-market 'trickle down' school. In contrast to those who supported encouraging rapid economic growth, the basic needs school contended that priority should be given to providing for the basic needs of the poor; involving things such as sanitation, clean water, adequate food, and basic medical services. These things, they argued, are the stuff of life; fundamental to human well-being.

The greatest strength of the basic needs approach is that it asserts that there are absolute values—things that matter to all human beings—overcoming the relativism of economics (and its bias in favour of the status quo) and other preference-based accounts. This appeal is demonstrated by the way in which analysis of living standards now routinely incorporates measures of the satisfaction of basic needs (such as life expectancy and infant mortality), as well as indicators of access to particular goods or services (such as clean water, medical care, education, or specified consumer goods).

Yet, like all other approaches, the basic needs school has limitations. The chief of these is inherent in its title: the definition of basic needs. While it is possible to identify minimum requirements for physical survival (taking account of age, gender, environmental conditions and other factors), it is much more difficult to precisely quantify psychological or social needs, and more difficult still to draw the boundaries of where needs end and wants begin. As a result, the basic needs approach provides little guidance to well-being in medium and high income countries, in which subsistence requirements are met for the vast majority of the population.

2.3. Well-being as human capability

Although Rawls laid the groundwork for the basic needs school, he does not identify with this approach. Rather, he argues that social well-being is maximized through the adoption of just processes and institutions and so aims to provide a means for resolving questions of social justice. These institutions are described as the five primary goods: the basic liberties (such as freedom of thought and association, liberty of conscience); freedom of movement and occupational choice; the powers and prerogatives of office, particularly of the main political and economic institutions; income and wealth; and the social bases of self-respect (Rawls, 1971, 1982). His later works also argue that justice is the foundation of unity in diverse liberal societies, and thus of social cohesion (Rawls, 1982, 1993).

Sen also supports a functionally oriented approach, and agrees that the utilitarian approach provides an inadequate explanation of human well-being. Unlike Rawls, however, he offers an explicit alternative account in which well-being resides in 'a person's ability to do valuable acts or reach valuable states of being' (Sen, 1993 p. 30). This approach is distinguished from competing positions.

> "The capability approach to a person's advantage is concerned with evaluating it in terms of his or her actual ability to achieve various valuable functions as a part of living. It differs from other approaches using other informational focuses, for example, personal utility (focusing on pleasures, happiness, or desire fulfillment), absolute or relative opulence (focusing on commodity bundles, real income, or real wealth), assessments of negative freedoms (focusing on procedural fulfillment of libertarian rights and rules of non-interference), comparisons of means of freedom (e.g. focusing on holdings of 'primary goods', as in the Rawlsian theory of justice), and comparisons of resource holdings as a basis of equality (e.g. as in Dworkin's criterion of 'equality of resources')." Sen, 1982, p. 188

Happiness, he argues, is only prima facie evidence of a person's state, while access to commodities and institutions are only potential causes of well-being (see Cohen, 1993). Both the utilitarian and the basic needs conceptions neglect important elements of well-being, and so fail to provide an adequate explanation of the moral grounds for public action. Contrary to the common interpretation of the Rawlsian approach, low levels of access to basic needs would not justify intervention to improve an individual's situation if this was the result of an informed choice to take a risk which did not pay off. The same would be true if the risk resulted in low utility levels. Furthermore, high levels of utility would not justify inaction where 'a starving wreck, ravished by famine, buffeted by disease, is made happy through some mental conditioning—say, via the 'opium' of religion' (Sen, 1982). The resolution of this apparent dilemma, according to Sen, is to be found in affirming the idea of agency as both an inherent part of the substance of well-being, and a means of attaining other components of well-being. Thus Sen suggests that well-being involves both *doing*, encompassing ideas of freedom and agency, and *being*, encompassing both mental and physical states.

Sen's capability approach provides the most comprehensive and convincing philosophical account of the nature of human well-being yet encountered. In terms of public policy, this account suggests that providing individuals the freedom to pursue their own objectives is one of the most important of all social goals. Happiness is acknowledged as an important component of individual well-being, as are other mental states, but these are not considered to be a sufficient guide to collective action. Agency, or 'well-being freedom', is at least as important as 'well-being achievement'; indeed it may be more important in the context of justice—the moral basis of collective action (Sen, 1993 p. 36, Sen, 1982). This contrasts with Rawls, who draws attention to the importance of agency in the context of higher order needs, but also significantly constrains individual choice through the application of the maximin principle. Yet for all his emphasis on well-being, Sen offers little insight into how it is to be pursued; achieving the generality of the capability approach by abstracting from content. Thus Sen may be criticized for asserting that the 'central feature of well-being is to achieve valuable functionings' (Sen, 1982), but providing little guidance in interpreting what 'valuable' means in this context.

2.4. *Well-being as the satisfaction of underlying needs*

The final approach to well-being argues that there are universal underlying human needs, and that these underlying needs may be used to provide an analytical framework for understanding what constitutes a good or satisfying life without specifying the particular means of their gratification. This stance contrasts with the evaluative approach, which relies on individual self-assessments of well-being and gives only secondary importance to explaining those assessments. It also differs from descriptive approaches which specify particular indicators of well-being without regard to mental states, or to potential differences in aspirations, expectations, or environmental conditions across different individuals, sub-cultures, and societies. Indeed, one of the strengths of the underlying needs approach is that it offers, at least in principle, the possibility of reconciling the evaluative and descriptive approaches.

The best known example of this approach is Maslow's hierarchy of needs (Maslow, 1954). Maslow, a psychologist who sought to explain human motivation and personality, argued that people are motivated by a series of six innate types of needs, such as for safety, belonging and self-esteem. In summary, *Physiological needs* include requirements for food, water, sleep, warmth. *Safety needs* encompass the need for security, structure, order, avoidance of pain and protection. *Needs for belonging and love* occupy the next level of the pyramid, but unfortunately are often not satisfied in our increasingly urbanized, isolated and bureaucratic society, resulting in alienation. *Esteem needs* encompass self-respect and recognition by others of our worth and competence. *Aesthetic and cognitive needs* involve an awareness of knowledge, understanding, goodness, justice and beauty. *Self-actualization needs* involve the attainment of an individual's full potential, 'to become all you can become' (Maslow, 1954, see Phares, 1984 pp. 182–187). These needs lend meaning and satisfaction to life. Maslow also suggested that these needs must be satisfied in order of importance, as the persistent non-satisfaction of one category of need will prevent an individual graduating to the next level. As an individual satisfies one type of need, however, they are drawn to pursue the next. Maslow's theory is often represented as a pyramid, reflecting the likelihood that an individual's development may be blocked as the lower order needs (occupying more space in the pyramid) crowd out the pursuit of the higher order needs.

Manfred Max-Neef, the 'barefoot economist', provides a more general example of the underlying needs account. He begins with the uncontroversial view that 'quality of life depends on the possibilities people have to adequately satisfy their fundamental human needs.' (Max-Neef, 1991; see also Doyall and Gough, 1991). He then distinguishes these *needs*, such as for subsistence, affection, and identity, from possible *satisfiers* of those needs, such as a particular type of food or employment. This contrasts with the descriptive approach, adherents of which would accept the first statement but not the second. The significance of this distinction in Max-Neef's work is that 'fundamental human needs are finite, few and classifiable (... and) are the same in all cultures and in all historical periods' (p. 18). It is the means of satisfying these needs that are determined by culture and circumstances.

Max-Neef (1991) identifies nine types of fundamental needs: subsistence, protection, affection, understanding, participation, idleness, creation, identity, and freedom. Each of these needs may be satisfied in ways that involve being, having (in the sense of possessing rights or skills), doing, or interacting. It is important to note that the needs identified are not solely economic needs. Accordingly, the alleviation of poverty (traditionally understood as a lack of income) is replaced by the alleviation of *poverties* as the central idea of development. When these poverties are not adequately addressed they give rise to individual and collective pathologies: fears and frustrations that may undermine individual and social well-being, despite apparent improvements in average incomes and other traditional indicators of economic development.

One implication of an approach encompassing multiple poverties is that a shortfall in one area of community well-being may be compensated for by satisfying other types of needs to a greater degree. Inadequate income (a poverty of subsistence), for example, might be redressed through enhanced solidarity and mutuality to strengthen perceptions of protection, affection and participation. Sustainable development strategies might, for example, support strengthening or reestablishing traditional dance groups or other cultural activities. As most of these poverties are not directly related to per capita income, the idea of development, becomes the social analog of individual self-actualization, relevant to both North and South. This involves a radical reconstruction of the notion of development, and a dramatic reduction in the perceived significance of economic activity to community well-being.

Boyden (1992) adopts a biological approach to underlying needs, arguing that the central features of human physical and emotional health are the result of the evolutionary pressures, as are the innate characteristics of all species. Human health and well-being is thus defined as a state of body and mind similar to that which would be most likely to result in survival and successful reproduction before and during the long hunter-gatherer phase of human existence. This suggests that insights into universal human needs can be gained from studying the life conditions of recent hunter gatherers. Boyden is at pains to point out, however, that 'those who accept the biological view do not necessarily advocate a return to hunter-gather lifestyle, nor... deny the advantages of civilization'. Rather they emphasize that 'some of the *disadvantages* of civilization could be avoided if more thought were given to the evolutionary background and phylogenic characteristics of the species' (Boyden, 1987 p. 41).

This biopsychic state is influenced by an individual's (i) present natural environment and societal conditions, (ii) present behaviour pattern, and (iii) previous biopsychic state. Universal needs (involving requirements for health or survival) are distinguished from contingent needs (corresponding to Max-Neef's satisfiers) and desires (a particular state of mind). Boyden emphasizes that many human needs have an optimal range of satisfaction—that is, particular needs may be over-satisfied as well as under-satisfied. He also notes that perceptions and culture have both direct and indirect impacts on well-being, influencing both behaviour and states of mind. The perception that important desires are not satisfied, for example, is likely to interfere with well-being—even if these desires are not well-founded. Yet the principle of the optimum range also applies to the satisfaction of desire in general, implying that it is best for an individual to have a balance of satisfied and unsatisfied desires at any given time.

Other authors look to the Ancient Greek approach to virtue to provide a framework for understanding human well-being. Aristotle taught that *eudimon*, translated as 'the good life' or 'happiness', is characterized by excellence in the different spheres of citizenship. This attainment of the highest values in life, involving both living well and doing well, was to be achieved through the cultivation of the virtues; those character traits that best enable the discernment and achievement of this holistic excellence (Tatarkiewicz, 1976; Nussbaum, 1993). Virtues are only normative to the extent to which the pursuit of self-interest in this broad sense is implicitly affirmed as morally correct. This may be illustrated by the contrast with duty-based ethical theories. Kant (1785), for example, did not accept the notion—shared by the Greeks, stoics, utilitarians and early christian philosophers—that happiness was the supreme good, suggesting instead that the ultimate goal was to be *worthy* of happiness. While Kant emphasized the importance of the desire to do good, and acknowledged that living according to right precepts may be consistent with one's happiness, he was clear that the desire for happiness was not a sufficient basis for moral conduct, and should not form part of one's motivation for action. Rather, one should be motivated by duty, discerned through the application of reason (Kant, 1785; McGill, 1967 pp. 91–101). Nussbaum (1993) thus claims that virtue accounts offer a means of identifying non-relative values and proposes a list of universal spheres of human life and endeavour. Griffin (1986) approaches the issue from the other direction, suggesting five prudential values which closely correspond to the idea of underlying needs: accomplishment, the components of human existence (including agency, basic physical capabilities, and liberty), understanding, enjoyment, and deep personal relations.

These accounts of underlying needs derive from very different disciplines: psychology, economic development, biology and moral philosophy. Each of them emphasizes two things: that human well-being requires the satisfaction of both material and less-tangible needs; and that desire is a fickle guide to well-being (suggesting that the aggregation of desires through the market is unlikely to provide a sound basis for encouraging sustainable development). Interestingly, these accounts also offer a way of locating aspects of well-being highlighted by other disciplines. Sociology and anthropology, for example, draw attention to positive impact of identity and self-esteem and the negative impact of alienation and shaming. These values are difficult to link to observable indicators, and are neglected by the descriptive approach. Nor do they fit comfortably within the evaluative approach, as these mental states often operate subconsciously, and thus are not always easily identified and articulated by the individuals concerned. Yet they sit well within an underlying needs framework.

Underlying needs accounts offer the potential to extend the basic needs approach into a more comprehensive framework for examining the interaction between economic activity and human well-being (relevant to understanding economic mechanics) and defining social goals (relevant to understanding economic meaning). Such an approach would marry the strengths of the evaluative and descriptive approaches by grounding the observation of indirect indicators of well-being in an empirically based understanding of the relationships between expectations, activities, abilities, and physical and mental states. Although this is an ambitious agenda, if successful it would put some much needed flesh on the bones of Sen's notion of well-being as the capability to do and be valuable things.

3. The social limits to growth

Most economists view the substance of progress as a steady expansion in consumption opportunities, and associate this with the processes of industrialization and technological change. The combination of this interpretation of progress and the associated mischaracterization of GDP as national income has entrenched continuing economics at the heart of the normative agenda of economists and those they influence (see Nelson, 1991). Keynes (1930), for example, looked forward from the gloom of the Great Depression to the time when economic growth would abolish scarcity. Hicks (1959) described the same phenomenon as 'the law of diminishing marginal significance of economic activity', and echoed Keynes' view that increases in wealth should allow our focus to move to building a better rather than richer society in which equity is combined with responsibility, security with freedom.

Others, however, question whether economic growth and the current system delivers the progress it promises. Ecological economics draws attention to environmental feedback effects and biophysical constraints. Considerable effort has also been given to the critique of the use of GDP as an indicator of economic or social well-being. This has involved the construction of more informative accounting frameworks, adjusting for changes in assets values (including of natural capital), the quality of non-traded experiences, defensive expenditures, and shifts of activities in or out of the market sphere (see Dodds, 1997). Wilkinson (1973) draws attention to a particular form of defensive expenditure, arguing that ecological disequalibrium, particularly human population growth, requires increasing activity levels to maintain consumption, undermining the positive impacts of technological change. (This point is illustrated numerically by Common (1988b)). Along with the work of Scitovsky, this suggests the possibility of a 'technological treadmill' paralleling Easterlin's 'hedonic treadmill' (Pezzey, 1992). The general critique of GDP as an indicator of national income is well known, if not widely acted upon. Yet the pursuit of sustainable development seems to have neglected two more fundamental 'demand side' criticisms arising from the debate over the social limits to economic growth.

A first group of authors highlight the way in which social factors frame perceptions of well-being. As discussed above, Scitovsky (1976) argued that the benchmarks for satisfaction are largely culturally determined, agreeing with Easterlin (1973) that increased average incomes do not of themselves improve perceived well-being as perceptions of subsistence (and poverty and wealth) adjust over time. Indeed the expectation of such changes are one of the hallmarks of modernity. Hirsch (1977) rediscovered the notions of social scarcity and status goods central to the work of Adam Smith and David Hume whereby goods are valued because they denote the owner's relative position in a community, rather than for any intrinsic or direct benefit they provide. As the supply of status goods is inherently limited (although their particular form may change), these wants cannot be better satisfied by rising average incomes, undermining the link between income and well-being.

A second strand of criticism draws attention to an increasing imbalance between public and private goods. Galbraith (1958), for example, argued that the economies of scale and scope inherent to industrial capitalism allow the use of mass advertising to create a culture of consumption serving corporate interests rather than consumer needs, echoing the Marxist notion of false needs. Meanwhile, the very success of markets in allocating resources biases productive activity towards private consumption and away from collectively enjoyed goods, including environmental services, which by their nature must be communally provided or protected. This imbalance increases as money incomes rise. The resulting private affluence and public squalor may lead citizens to reflect on the 'curious unevenness of their blessings' (p. 192) as they drive luxurious cars on congested and poorly maintained roads, and eat exquisitely packaged food by polluted streams.

Some elements of this critique have been criticized for advocating an extremely relativist position, and for generalizing from the experience of affluent communities to communities with much lower living standards (see Veenhoven (1984) pp. 399–400). Social psychologists and others (see Heady and Wearing, 1992) have since explored the happiness-income relation in more depth, as reported below.

4. An improved view of human well-being

The above literature offers a far more nuanced view of human well-being than the simple generalizations of the economic model—increased income may not result in improved well-being, work may not be a negative experience, preferences are not fixed. The links between states of the world and states of mind are found to be complex. A number of views of well-being emphasize the importance or priority of physiological needs, but note that these may be addressed in a variety of ways. Once these basic needs are met, the main approaches draw attention to the social dimensions of well-being, and emphasize that happiness is influenced by the degree to which socially constructed expectations are met. Several approaches to well-being also draw attention to systematic processes that undermine the connection between social well-being and average income, including the process of adaptive expectations, social scarcity, and collectively irrational biases towards private consumption.

These criticisms suggest that increased incomes (even as measured by the most rigorous of adjusted national accounts) are unlikely to result in improvements in perceived well-being in the already affluent north, where positional goods comprise a large and growing share of economic activity. More pointedly, producer sovereignty and the market bias of industrial capitalism is likely to erode well-being, at least in societies with a dominant individualistic ethic.

These general points seem to be borne out by the experience of recent decades. In a detailed study of perceived well-being in a wide variety of countries, Heady and Wearing (1992) p. 114, report a positive association between happiness and democracy, affluence and equality. They note, however, that issues of freedom seem to be more important than those of wealth. In particular, the link between average income and well-being is only found to be moderate, and 'it must be open to doubt whether additional income would make much difference to well-being in the wealthiest countries' (p.103). Max-Neef (1991) points to numerous studies indicating declining well-being in Europe and North America. Common (1995) also observes that scarcity is alive and well, despite decades of unprecedented economic growth, and that the suggestion by Keynes and others that grubby economic relations and economic growth are a necessary but temporary evil seems to have proven hollow. The substantial increase in the 'economic cake' over this century seems yet to foster a more generous disposition towards the redistribution of income (including through charitable or official government development assistance), or to providing public services to the least well off, or to funding the functions of government through more progressive taxation.

These problems are central to the challenge of sustainable development, and suggest a need for ecological economics to develop a better understanding of the behaviour and well-being of humans as social animals; individuals located in community. Particular attention needs to be given to the complex relationship between states of the world and states of mind, including the identification of fundamental human needs, the impact of distribution on community well-being, the social construction of preferences, and the way in which cultural norms condition the satisfaction associated with a particular state of the world. These interlinkages, along with the institutionalist emphasis on how property rights and cultural norms underpin exchange relations, suggests that important aspects of social, economic and ecological systems are co-determined. Achieving sustainable development thus requires an expansion of the scope of analysis to encompass a wider system dynamic.

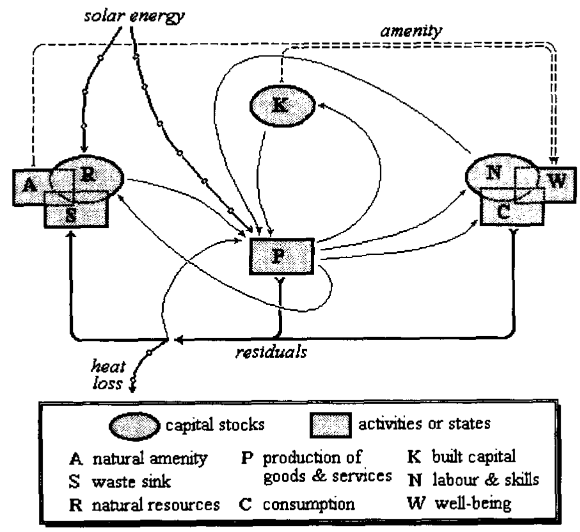

Fig. 1. Linking the economy, environment, and human well-being.

Recognizing these complex interactions calls for a new image of the relationships between economic activity, the environment, and human well-being. Accordingly, Fig. 1 suggests that the links between consumption, work and well-being are complex, and that these complexities may be thought of as mirroring the synergies and trade-offs that characterize the different economic functions of ecological systems (see Common, 1988a p. 13). Fig. 1 also draws attention to the different forms of capital which may contribute to human well-being (although institutional capital is not explicitly identified), and the flows of associated inputs and outputs highlighted by the supply side approach to sustainable development.

This figure puts the economy in its place, locating it between the social and physical worlds. This provides a sense of balance and perspective. Attention to the biophysical dimensions of economic activity reminds us of the economy's basis and ultimate constraints, while attention to well-being reminds us of its ultimate purpose, and of the multiplicity of ways in which human institutions may be configured to enhance or detract from well-being.

5. Towards a science of sustainability

Incorporating this type of analysis and insight into ecological economics would make an already challenging research agenda even more complex. Yet if ecological economics accepts this challenge, it will earn the right to be called the 'science of sustainability'—delineated as the study of human agency and well-being in the context of enmeshed economic, social and biophysical systems. The constrained optimization problem of this science of sustainability would be to identify social institutions and attitudes that optimize present human well-being within social and biophysical limits, while maintaining the ability of future generations to enjoy no less a level of well-being and satisfying our ethical obligations to the non-human world.

As always, the analysis of new aspects of a system offers the chance to discover new avenues for responding to problems. In this case, a broader ecological economics would provide the tools to map a new route to sustainable development; drawing attention to the design and adoption of institutions and attitudes that recognize natural social and biophysical limits.

This broader analytical framework would shift attention from people as consumers to their roles as citizens and participants in community. The most promising approaches to well-being in this context are those that focus on connecting underlying human needs to current problems and possibilities. Such underlying needs accounts have the potential to guide policies for sustainable development in the very different circumstances of the nations of the North and South, and to explain the intuition of declining well-being in the face of increasing affluence. This potential derives in large part from the way in which these underlying needs accounts provide an antidote to consumerism and commodity fetishism; bringing the poverty of affluence into focus and allowing us to move beyond it towards a more equitable and enjoyable future.

There is also a role for the continued development and use of environmentally adjusted national accounts and other income-based indexes, particularly where distributional issues or non-traded experiences are significant. The literature suggests, however, that these broader balance sheets should not be understood as indicators of happiness or favourable states of mind. Rather, they provide information on other aspects of well-being and draw attention to the qualities and impacts of economic activity, redressing the economism of current public policy.

The adoption of a more rounded analytical approach would also respond to calls for the adoption of a conservationist ethic; encouraging desires and aspirations that are able to be met without damaging the earth's natural heritage (see Birkeland et al., 1997). This turns the notion of scarcity on its head. Since Adam Smith economics has assumed restless desire, insatiably roaming ahead of the means of satisfaction, and argued that this promotes the good of all. Social and environmental limits, however, suggests the contrary: that insatiability undermines human well-being, just as the Ancient Greeks taught that unlimited desires, or *hubris*, unbalances the individual and threatens the polis (see Xenos, 1989). The first view is reflected in the supply side approach to sustainable development, and highlights the need to better understand and manage our resources. The second view accepts the need for prudent resource management, but considers that the more fundamental need is to better understand and manage ourselves and our desires.

Interestingly this perspective on sustainable development surfaced in similar circumstances more than a century ago in response to the natural limits proclaimed by Malthus (1798, 1826). In contrast to Malthus and Ricardo, who earned economics the title of 'the dismal science' for their demolition of Adam Smith's theory of the progressive state, authors such as Ruskin and J.S. Mill accepted the Malthusian argument, but continued to affirm the possibility of non-material progress. Indeed, natural limits were thought to make such progress in the 'Art of Living' all the more likely because of the way they draw attention to the way we live rather than the goods we can accumulate (see Heilbroner, 1986; Xenos, 1989). (Modern examples of this approach include Schumacher (1973), the Canadian Conserver Society Project (Valaskakis, 1976, 1979), and Max-Neef (1991).)

In a finite world, sustainable development requires a robust understanding of why environmental resources and services are important to human well-being, and how social and economic institutions may be structured to make the best use of these assets. Meeting this challenge will require a robust understanding of what constitutes 'the good life' and 'the good society'. In a pluralist world it is only appropriate that such an understanding be grounded in an appreciation of the mechanics and merits of a variety of conceptions of well-being.

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