

*Chapter 11***Quality of Life and the Distribution of Wealth and Resources**

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**Abstract**

Enhancing and sustaining the quality of human life is a primary goal of environmental, economic, and social policy. But how do we define and measure quality of life (QOL)? How is QOL distributed among people in the current generation and among the current and future generations? How do we model the dependence of QOL on the full range of environmental, economic, and social variables? Answering these questions is fundamental to understanding and solving environmental problems in the 21st century.

**1. How is Quality of Life (QOL) defined?**

If we are to assess the impact of distribution of wealth and resources on QOL, we must have some clear idea of what QOL actually is. Is it synonymous with satisfaction? With happiness? With human well-being? With consumption? A quick perusal of the literature shows that QOL is a topic of research in a broad range of disciplines. In fields as disparate as advertising, economics, engineering, industry, medicine, politics, psychology, and sociology, improving QOL is often claimed as a primary goal. However, real paradoxes in interpretations of QOL exist. For example, a substantial motivation behind the environmental movement is to improve human QOL, and the same motivation can be argued for the industries (e.g., logging, mining, auto) that are so often its foes. Farquhar (1995, cited in Haas, 1999) claims that the term may be one of the most multidisciplinary in common use, yet even within a discipline there seems to be little consensus regarding its actual definition. In fact, a common criticism against the phrase 'Quality of Life' is that "the concept lacks specificity; it has as many meanings as life has aspects" (Schuessler and Fisher, 1985).

It seems that improving human QOL should be the dominant policy objective of any government (Schuessler and Fisher, 1985), yet over the past 50 years

this priority has been given to increasing the production of goods and services for consumption (Ekins and Max-Neef, 1992). It would seem to follow that policymakers implicitly assume that consumption is a suitable proxy for QOL. How far is this from the truth in modern consumerist society? Consumerism has been defined as a cultural orientation that holds that “the possession and use of an increasing number and variety of goods and services is the principal cultural aspiration and the surest perceived route to personal happiness, social status and national success” (Ekins, 1991). In 1990, nearly three-quarters of entering college students in the USA believed that being ‘very well off financially’ was ‘essential’, presumably for their QOL (Durning, 1992). Bloom et al. (2000) assert that “few statements in the development literature command as much universal assent as the claim that higher incomes lead to higher human development”, where ‘human development’ implies QOL. Some believe that our economy depends on consumption to the extent that we must *make* it the vehicle by which we improve our QOL, if it is not already. In the words of retailing analyst Victor Lebow, “our enormously productive economy ... demands that we make consumption our way of life, that we seek our spiritual satisfaction, our ego satisfaction, in consumption ... We need things consumed, burned up, worn out, replaced and discarded at an ever increasing rate” (quoted in Durning, 1992, p. 22). However, the term QOL first came into common usage in the 1960s to address the issue of increasing crime and violence in the midst of growing material prosperity (Haas, 1999), explicitly distinguishing QOL from consumption. The American Heritage Dictionary defines QOL as “the degree of emotional, intellectual, or cultural satisfaction in a person’s everyday life *as distinct from the degree of material comfort*” (The American Heritage Dictionary of the English Language, 1992; emphasis added). In addition, while people may believe that greater consumption would increase their QOL, psychology studies find little correlation between consumption and happiness (Durning, 1992).

The definition of QOL has evolved through time since the phrase first became widely used in the early 1960s. Early researchers often sought objective definitions (e.g., Mishan, 1967). However, empirical studies generally find poor correlation between objectively measured and subjectively assessed QOL. Hence, since the late 1970s, there has been a growing consensus that QOL is not an objective condition at all, but is rather a subjective one, concerned with people’s own estimations of their individual welfare. Evidence suggests that individuals subjectively interpret their own QOL relative to an ideal standard or to a reference group (Haas, 1999). Thus, communities with low standards of living are sometimes found to rate their QOL as the same or even better than communities with higher standards of living, presumably because they aspire to less or compare themselves to others of similarly modest circumstances (Schuessler and Fisher, 1985). Encompassing these various considerations, Haas (1999) defines QOL as “a multidimensional evaluation of an individual’s current life circumstances in

the context of the culture in which they live and the values they hold. QOL is primarily a subjective sense of well-being encompassing physical, psychological, social, and spiritual dimensions. In some circumstances, objective indicators may supplement or, in the case of individuals unable to subjectively perceive, serve as a proxy assessment of QOL”.

There are four noteworthy elements in Haas’s definition of QOL. First, while much of the literature emphasizes the subjective nature of QOL, this definition allows for objective indicators. Two goals of this and the following chapter will be to suggest policies for improving QOL, and to suggest objective indicators for determining the success of such policies. While QOL may be primarily subjective, it is easier to advance and assess the success of policies that have measurable objective goals rather than subjective ones. Second, the emphasis on the subjective nature of QOL opens the door to policies designed to influence people’s perceptions of their own QOL. Third, in this definition, the physical dimension of QOL (i.e., wealth and resources) is only one element of many and is the only one that has physical limits. Since the concern of this chapter is the relationship among wealth, resources, distribution, and QOL, these latter two elements of Haas’s definition open up the possibility that we can distribute wealth and resources more equitably without compromising the QOL of those who currently possess the lion’s share. The fourth element of interest in Haas’s definition is that QOL is determined in the context of culture and values. Many economists argue that preferences are fixed and given. The economist’s goal is simply to determine how those preferences can most efficiently be satisfied, and the policymakers’ goal is to create the conditions to facilitate this. However, since cultures and values can change, it follows that the specific determinants of QOL can as well.

If the second and last elements of Haas’s definition are correct, they suggest that a society could increase the QOL of its citizens by purposefully changing their preferences. The idea of purposefully changing people’s preferences may seem patronizing and against the liberal view that it is the inalienable right of the individual to have sovereign preferences. However, the reality is that one person’s actions do have impacts on others’ well-being, and the advertising industry is actively devoted to changing our preferences every day. If we are concerned with the QOL of the entire world and of future generations, then it seems reasonable to argue that we are justified in changing preferences in such a way that maintaining or enhancing the QOL of one country or generation does not compromise that of others. Since wealth and resources are the only components of QOL that can be physically depleted, they are the only components whose excessive consumption (and dissipation into waste) can threaten the QOL of others.

The laws of thermodynamics ensure that the ultimate source of wealth and resources, and the ultimate recipient of the waste products from their use, is our environment (fig. 1). Therefore, we must closely examine the relationship

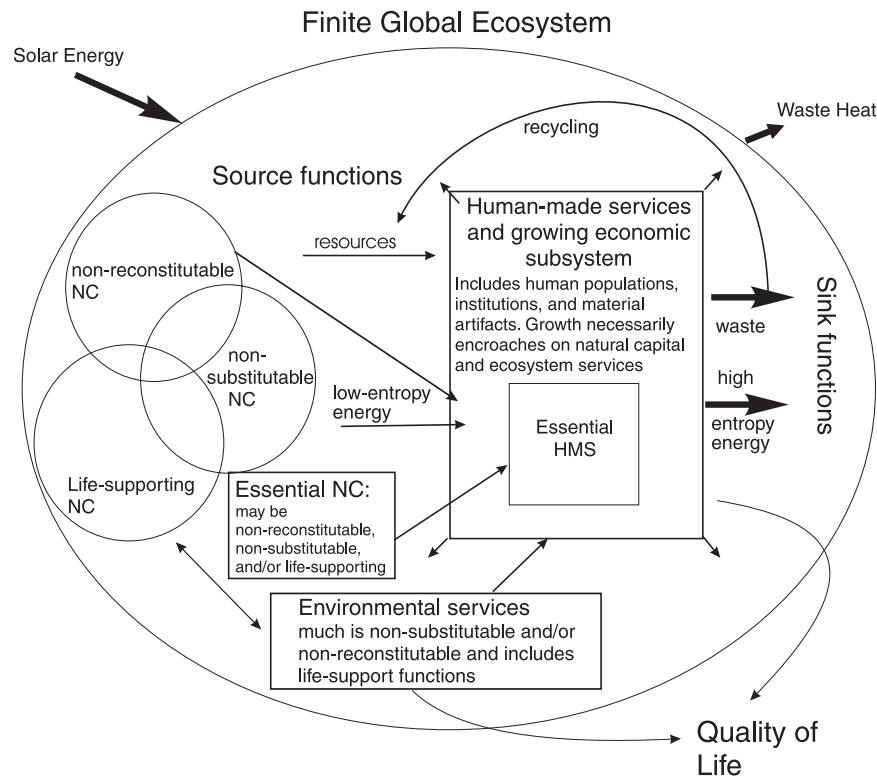


Fig. 1. Conceptual model of the dual threat (increased stress and reduced response/resistance that human population growth and activity pose to ecosystem and human health. Adapted from Collados and Duane (1999).

between QOL and the natural environment. Collados and Duane (1999) provide an appropriate framework. The natural environment (whose resource stocks and the services they generate will hereafter be referred to as natural capital) generates numerous environmental goods and services that enhance QOL in three ways. First, they provide the materials used by the human economy to produce all human-made products. Second, they directly provide humans with benefits of a type that cannot be imported from elsewhere. Third, they are essential for the reproduction of additional environmental goods and services. Of the human-made products produced from natural capital, some are essential for human life (though 'essentiality' may be culture-specific) while all others are non-essential. Natural capital can be divided into four classifications according to its ability to produce environmental services. First, natural capital required to make essential human capital is itself essential. Second, natural capital required for the reproduction of

itself is life supporting. Third, natural capital for which no human-made substitutes exist is non-substitutable, and fourth, that which cannot be regenerated once it is destroyed is non-reconstitutable. Specific stocks of natural capital may exhibit none, any, or all of these properties. Clearly then, the relationship between QOL and the natural environment is critical.

In summary, QOL is a complex, multi-dimensional concept that may be largely subjective but whose enhancement is probably facilitated by certain objective factors. Policy goals for improving or maintaining QOL can seek to create the objective conditions associated with a superior QOL, or attempt to change people's subjective assessment of conditions in a way that improves their QOL. As the only element of QOL that can be physically depleted, the use of wealth and resources by some countries or generations can affect the QOL of others. Further, the depletion of wealth and resources can threaten natural life-support functions without which human life itself is threatened. The appropriate distribution of wealth and resources is therefore a critical element in any effort to sustain and improve the QOL we now enjoy. If we are to pursue policies towards this end, however, we must first be able to measure the outcomes of these policies, a topic to which we now turn.

## **2. How has Quality of Life been measured?**

### *2.1. Economic income, economic welfare, and human welfare*

If improving QOL is indeed the goal of social policies and programs, it follows that appropriate national aggregate accounting systems should attempt to measure the extent to which policies actually improve QOL, and this is arguably a fair statement of what they are intended to do. Although QOL is largely a subjective assessment, in practice, it must be measured with objective proxies. The number of existing and proposed aggregate accounting systems reflects considerable disagreement over what are the most suitable proxies, and the requirements for different systems differ depending on what proxies are used. Such proxies include (1) the level and pattern of economic activity, (2) sustainable economic income – the amount that can be consumed without depleting capital stocks (Hicks, 1946), (3) economic welfare – the net economic component of total welfare (Daly and Cobb, 1989), and (4) human welfare – the degree to which human needs are fulfilled (Max-Neef, 1992). This range of proxies is arrayed in fig. 2 and table 1.

### *2.2. Level and pattern of economic activity: gross national product*

The simplest objective for an aggregate accounting system is to develop an indicator of the production of goods and services in the economy for comparisons either across space or time. In order to avoid double counting, one can focus only on “final” goods and services (i.e., those which attain their final point of use during the accounting period, and are not intermediate in the sense of being destined for

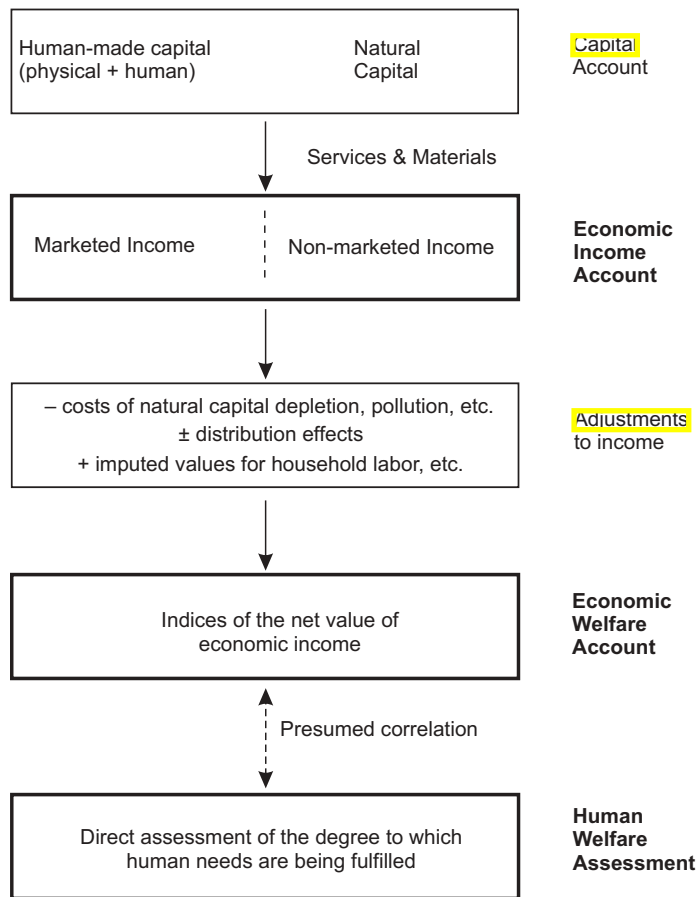


Fig. 2. Distinctions between economic income, economic welfare, and human welfare.

incorporation into further goods and services). As an accounting procedure, if production activity is fully compensated by monetary payments, *either* aggregate incomes obtained from production activity or aggregate expenditures can be used as an indicator. These two ways of measuring the total (income or expenditure) should be equal. This measure is referred to as Gross National Product (GNP; table 1, column 1), and is by far the most widely used of the measures presented.

There are a number of serious flaws with GNP as an indicator of QOL. Economic income is a measure of the production and use of goods and services, with variations (i.e., between columns 1–3 in table 1) concerning the treatment of environmental services, natural capital, and other non-marketed products. Clearly, total economic income is ultimately generated from the stocks of both human-

Table 1  
A range of goals for national accounting and their corresponding frameworks and measures

Goal	Economic income			Economic welfare	Human welfare
	Marketed 1	Weak sustainability 2	Strong sustainability 3		
Basic framework	value of marketed goods and services produced and consumed in an economy	1 + non-marketed goods and services consumption	2 + preserve essential natural capital	value of the welfare effects of income and other factors (including distribution, household work, loss of natural capital, etc.)	assessment of the degree to which human needs are fulfilled
Non-environmentally adjusted measures	<b>GNP</b> (Gross National Product) <b>GDP</b> (Gross Domestic Product) <b>NNP</b> (Net National Product)			<b>MEW</b> (Measure of Economic Welfare)	<b>HDI</b> (Human Development Index)
Environmentally adjusted measures	<b>NNP'</b> (Net National Product including non-produced assets)	<b>ENNP</b> (Environmental Net National Product) <b>SEEA</b> (System of Environmental Economic Accounts)	<b>SNI</b> (Sustainable National Income) <b>SEEA</b> (System of Environmental Economic Accounts)	<b>ISEW</b> (Index of Sustainable Economic Welfare)	<b>HNA</b> (Human Needs Assessment)

made and natural capital (the “wealth” accounts) and includes both marketed and non-marketed items. But conventional measures of marketed economic income and expenditure (i.e., GNP) do not adequately pick this up. Measures of *sustainable* economic income attempt to incorporate non-marketed natural capital changes. If it is assumed that natural and human-made capital are substitutable, then the goal is to measure *weakly sustainable income* (column 2). If it is assumed that natural and human-made capital are not substitutable in all cases, then the goal is to measure *strongly sustainable income* (column 3). But increases in economic *income* may not correlate with increases in economic *welfare* (loosely speaking, welfare is a synonym for QOL), especially if the income measures do not adequately distinguish “costs” from “benefits”.

Economic welfare (column 4, table 1) attempts to look at not just how much income is generated, but also at how much economic welfare is produced. As shown in fig. 2, these measures generally adjust income to better reflect which items in the income measures are costs and benefits. They do this by subtracting costs (such as natural capital depletion and pollution), imputing values to missing services (such as household labor), and adjusting for income distribution effects using indices of income distribution. Finally, economic welfare measured as the production of net benefits may still not correlate with overall human welfare, since many human needs are not related to consumption of economic products or services (Max-Neef, 1992). Human welfare (column 5, table 1) looks directly at the degree to which human needs are being met, economic production being only one of many possible means to these ends. These distinctions and the specifics of sustainable economic income, economic welfare, and human welfare are further elaborated below.

### 2.3. Sustainable economic income

“Accounting Income”, as measured by GNP, is simply the sum of monetary payments to owners of the inputs used in production during an accounting period. “Hicksian Income”, however, subtracts from accounting income the costs of maintaining the productive capacity of capital stock (Hicks, 1946). These costs may include a variety of defensive actions that maintain effective capital stock, such as replacement, repair, and maintenance. It also includes avoidance costs that are designed to avoid losses in capital productivity. Weitzman (1976), Atkinson et al. (1997), and others have shown that Net National Product as measured by national income statistics – consumption plus net investment, or GNP – is theoretically equivalent to sustainable income, or at least would be under some ‘heroic’ assumptions, such as the inclusion of all forms of capital, investment, and consumption in national accounts.

How could we extend NNP to include other forms of capital, for example, marketed natural capital? While the principle is the same as that outlined above, the actual adjustment is more complicated for natural capital stocks. We can distinguish between two types of marketed natural capital, renewable and non-

renewable<sup>1</sup>, and the adjustment method differs somewhat for each. In either case, the method of adjustment (net cost or user cost) depends on the cheapest manner in which the lost productive capacity of the natural capital stock can be replaced (El Serafy, 1989; Costanza et al., 2001).

### 2.3.1. *Green accounting*

An effective measure of sustainable income must also account for non-marketed goods and services, in particular, those produced by healthy ecosystems. Efforts to incorporate these goods and services into national accounts are referred to as 'green accounting' (e.g., Nordhaus and Kokkelenberg, 1999). In addition to deducting the loss of natural capital from GNP, green accounting adjustments for full income require valuations of income flows from natural capital. A variety of methods can be used to estimate these flows, depending on the type of income received. Table 2 outlines some of these valuation methods. The previous section described a number of methods to account for sustainable income from natural capital. Without too much oversimplification, green accounting changes these methods primarily by redefining productive capacity to account for both marketed and non-marketed benefits of this capital. For further details on specific methodologies, see Costanza et al. (2001) or Nordhaus and Kokkelenberg (1999).

Clearly then, green accounting demands that cost adjustments be made for losses in natural capital as well as human-made capital. As human-made capital is, by definition, replicable at a cost, cost adjustments to account for capital losses are relatively simple; but for natural capital it is far more difficult to calculate future incomes lost or costs necessary to replace or avoid the loss or degradation in capital productivity. This is true for several reasons.

1. There are no well-functioning markets for measuring prices of all natural capital forms.
2. There are no well-functioning markets that would equate the price of natural capital with its replacement cost, and, of course, non-substitutable, non-reconstitutable natural capital, as defined above, cannot be replaced.
3. Natural capital productivity is more complex and less amenable to measurement than human-made capital.
4. The productive state, or health, of natural capital is more difficult to measure than that of human-made capital.
5. We are profoundly ignorant of how human impacts change ecosystem health, how ecosystem health affects natural capital productivity, and when deterioration in ecosystem health leads to irreversible impacts on ecosystem productivity.

<sup>1</sup> It is worth noting that non-renewables, such as oil, are difficult to exhaust, since eventually it becomes more expensive to discover and extract than it is worth. Renewables, such as trees, can be exhausted.

Table 2  
Valuation techniques for some environmental functions<sup>a</sup>

Functions	Valuation technique
System value Erosion control Local flood reduction Regulation of streamflows	Change in productivity, preventive expenditure, trade-off games, cost effective analysis, replacement cost
Ecological values Fixing and cycling nutrients Soil formation Cleansing air and water	Change in productivity, loss of earnings, opportunity cost, trade-off games, cost effective analysis, replacement cost
Biodiversity Gene resource Species protection	Opportunity cost, cost effective analysis, replacement cost, shadow project, relocation cost
Aesthetic	Property value, wage differential
Recreation	Travel cost
Cultural	Travel cost

<sup>a</sup> Modified from Dixon and Sherman (1990).

These difficulties are most severe for ecosystems, which provide a variety of goods and services in a complex manner. Forests and wetlands are good examples, both representing complex ecosystems where measurements of health and productivity are complicated, where some goods and service flows are marketable and others are not, and where private market values of the capital forms do not necessarily reflect their value or cost of replacement (Daily, 1997; Costanza et al., 1997).

### 2.3.2. *Weak vs. strong sustainability*

The sustainability of income requires replacement, or avoidance of loss, of some forms of capital sufficient to maintain consumption opportunities. This means that substitutability plays a crucial role in implementing any sustainable income adjustments to GNP. "Weak" sustainability requires maintenance of the total capital stock. It assumes a high degree of substitutability between all forms of capital. "Strong" sustainability presumes limited substitutability between natural capital and other capital forms; therefore, strong sustainability requires the maintenance of some natural capital separately from other capital forms (Costanza and Daly, 1992; Pearce, 1993; El Serafy, 1996). Ultimately, of course, we cannot make something from nothing, which means that natural capital is an essential input into any other form of capital. However, the fact that it is also impossible to make nothing from something means that some natural capital will always be available, even if only in states of very high entropy, and the argument for weak

sustainability implies that improvements in human capital could allow us to use even the highest entropy natural capital.

A wide range of replacement cost options are available under the weak sustainability case, including the forms of capital lost or degraded as well as substitute forms of capital. In the case of strong sustainability, degraded natural capital must be replaced in comparable form. There is no well-defined line dividing the two cases of weak and strong sustainability. The essence of the distinction relies on the ability of various capital forms to provide a flow of income; i.e., the degree of substitutability between capital forms. There are no reasonable substitute capital forms for those types of natural capital which provide basic life-support functions at large spatial and temporal scales (such as availability of the proper mix of ambient gases, hydrologic flows, protection from ultraviolet rays, etc.), although there may be substitutability at small scales.

Risk and uncertainty are critical elements in the debate between strong and weak sustainability. We do not understand ecosystems sufficiently to predict the impacts of human action on their ability to reconstitute themselves, nor can we predict what technologies will evolve in the future to substitute for ecosystem functions. Therefore, we could define strong sustainability as a social notion. A society may need to identify a level of natural capital beyond which it will not substitute for fear of approaching an irreversible ecological threshold. For example, society could define levels of biodiversity below a certain threshold as unacceptable. Accounting adjustments for degradation beyond these points require estimates of costs of repair to acceptable levels. That is, if biodiversity in a wetland falls below the threshold level, adjustments to income must account for the cost of repair. This cost of repair may be the engineering costs of wetland restoration and include restoration of extirpated species. If engineering methods will not successfully repair the damages, and natural processes will, accounting adjustments must be made for income losses attributable to not using those wetlands during their natural regeneration period.

The Environmental Net National Product (ENNP) (Mäler, 1991; Hamilton and Lutz, 1996) and the UN's System of Environmental Economic Accounts (SEEA; Bartelmus, 1994) are both measures that account for weak sustainability. Accounting for strong sustainability requires adjusting for the cost to return specific forms of degraded natural capital to their "acceptable" conditions (Huetting, 1989). The Sustainable National Income (SNI; Huetting, 1995) and some versions of the SEEA incorporate this perspective.

#### *2.4. Measuring economic welfare*

So far, we have been discussing various measures of economic income, with various adjustments for the sustainability of that income. Column 4 in table 1 moves from the goal of Economic Income assessment to the goal of Economic

Welfare assessment. The latter goal is more complex and requires clearly distinguishing between costs and benefits. While this distinction between costs and benefits is absolutely essential if one wants to talk about welfare rather than income, it is inherently a difficult and somewhat subjective and arbitrary distinction.

#### *2.4.1. Adjusting for defensive expenditures*

Both sustainable income measures and green accounting as outlined here do not necessarily adjust GNP for expenditures designed to reduce or mitigate the impacts of environmental degradation and pollution. Such costs, referred to as 'defensive expenditures', contribute to GNP when undertaken by households or the government (when undertaken by businesses, they show up as intermediate costs) (Markandya and Perrings, 1993). A problem in adjusting for defensive expenditures is distinguishing between "incurred" and "defensive" expenditures. For example, medical expenses may be purely to offset adverse consequences of economic activity and permit the maintenance of original welfare levels (i.e., fully repair or avoid degrading human capital). On the other hand, some medical expenses may truly result in improvements in welfare above original levels, and thus should be considered net investment in human capital stock. In practice, distinguishing between these two types of expenditures, one welfare-enhancing and the other welfare-maintaining, is difficult. Furthermore, there may be costs associated with economic activities that are not mitigated by defensive expenditures. For example, untreated health costs from pollution or work days lost from pollution are not explicit defensive expenditures. Increased time costs necessary to catch recreational fish or diminished recreational enjoyment attributable to a degraded watershed do not have explicit defensive expenditures that can be observed and used for adjusting GNP. These costs would have to be deducted from income to obtain a net income measure since they do not reflect positive utility-creating consumables. Explicitly defensive expenditures, such as the increased travel time costs necessary to access an adequate recreational facility when a former one becomes too degraded for use, should be deducted from income as costs. However, traditional accounting would add them into income, erroneously suggesting welfare improvements.

Nordhaus and Tobin (1972) produced an early version of this kind of indicator in their Measure of Economic Welfare (MEW). MEW starts with GNP and makes three types of adjustments: "Reclassification of GNP expenditures as consumption, investment, and intermediate; imputation for the services of consumer capital, for leisure, and for the product of household work; and a correction for some of the disamenities of urbanization" (Nordhaus and Tobin, 1972, p. 5).

MEW focuses on the aggregation of individual welfare; it is "atomistic". MEW does not include any adjustments for distributional effects or for environmental costs. Daly and Cobb (1989) developed an Index of Sustainable Economic Welfare (ISEW) that takes consumption as a starting point, but incorporates some

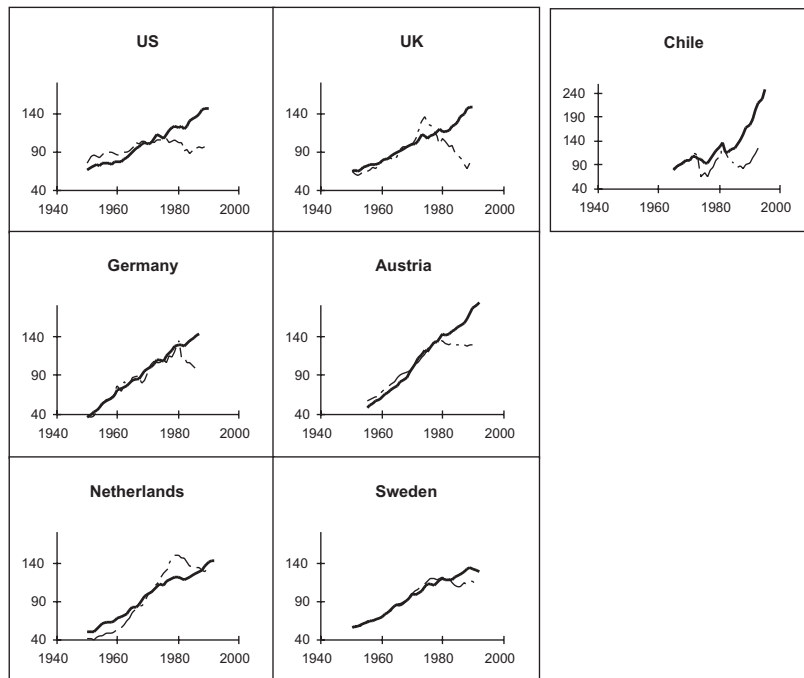


Fig. 3. Indices of GNP (solid) and ISEW (dashed) for several countries. 1970 = 100 in all cases.

of the environmental and distributional issues ignored by MEW. To summarize, the ISEW

- Allows for an income distribution adjustment;
- Includes changes in the stock of fixed reproducible capital, but excludes land and human capital in this calculation;
- Includes estimates for the costs of air, water, and noise pollution;
- Includes estimates of costs of the loss of wetlands and farmlands, depletion of non-renewable resources, commuting, urbanization, auto accidents, advertising, and long-term environmental damage;
- Includes imputed values for the value of unpaid household labor; and
- Omits any imputation of the value of leisure.

Daly and Cobb (1989) and Cobb and Cobb (1994) calculated ISEW for the US economy for the period 1950 to 1993. Other researchers estimated ISEW for several other countries and the indices of ISEW for several cases are shown in fig. 3 along with GNP indices for the same countries. In most of these cases, ISEW and GNP per capita run parallel for some initial period, but separate during the 1970s and 1980s. Max-Neef (1995) has postulated that this separation is evidence for a “threshold hypothesis” in which growth of economic income

increases welfare only until a threshold is reached where the costs of additional growth (which are counted as benefits in GNP) begin to outweigh the real benefits. Nordhaus and Tobin (1972) calculated their MEW in 1972 before the threshold was reached, concluding that GNP was an adequate proxy for economic welfare.

The ISEW is certainly far from a perfect measure of Economic Welfare or QOL, but it is decidedly better than GNP for this purpose. This is because, as we have pointed out, GNP is not a welfare measure at **all** but only an income measure.

### 2.5. Assessing human welfare directly

While the ISEW provides a measure of environmentally adjusted economic welfare, it is still based on measuring how much is being consumed, with the tacit assumption that more consumption leads to more welfare. A completely different approach would be to look directly at actual well-being or QOL achieved. This would separate the means (consumption) from the ends (QOL) without assuming one is correlated with the other (fig. 2). The UN's Human Development Index (HDI) is a crude attempt to assess human well-being by using an index comprised of generally available data on four basic needs variables at the country level: (1) life expectancy at birth; (2) literacy; (3) average number of years of schooling; and (4) GDP per capita (converted at purchasing power parity). Although it includes more than economic income by adding the other three elements, it is still based on "means" assessment and excludes any measures of environmental degradation. Max-Neef (1992), in contrast, has developed a matrix of human needs and has begun to address well-being more directly from the "ends" perspective by involving people in interactive dialogues to perform a Human Needs Assessment (HNA; table 3). The key idea is that humans do not have primary needs for the products of the economy; the economy is only a means to an end. The end is the satisfaction of primary human needs. Food and shelter are ways of satisfying the need for subsistence. Insurance systems are ways to meet the need for protection. Religion is a means to meet the need for identity. Max-Neef suggests,

Having established a difference between the concepts of needs and satisfiers, it is possible to state two postulates: first, fundamental human needs are finite, few and classifiable; second, fundamental human needs (such as those contained in the system proposed) are the same in all cultures and in all historical periods. What changes, both over time and through cultures, is the way or the means by which the needs are satisfied. *Max-Neef (1992, pp. 199–200)*

This is a very different conceptual framework from the others in table 1, which assume that human desires are infinite and that, all else being equal, more consumption is always better. According to the alternative conceptual well-being framework, we should be directly measuring how well basic human needs are being satisfied since overall human well-being and consumption are not necessarily correlated and may, in fact, be going in opposite directions. Quantifying HNA, however, is even more difficult than HDI or ISEW or other

Table 3  
Matrix of human needs

Axiological categories	Existential categories		
	Being <sup>b</sup>	Having <sup>c</sup>	Doing <sup>d</sup>
Subsistence	Physical health, mental health, equilibrium, sense of humor, adaptability	Food, shelter, work	Feed, procreate, rest, work
Protection	Care, adaptability, autonomy, equilibrium, solidarity	Insurance systems, savings, social security, health systems, rights, family, work	Cooperate, prevent, plan, take care of, cure, help
Affection	Self-esteem, solidarity, respect, tolerance, generosity, receptiveness, passion, determination, sensuality, sense of humor	Friendships, family, partnerships, relationships with nature	Make love, caress, express emotions, share, take care of, cultivate, appreciate
<b>Understanding</b>	Critical conscience, receptiveness, curiosity, astonishment, discipline, intuition, rationality	Literature, teachers, method, educational policies, communication policies	Investigate, study, experiment, educate, analyze, meditate
Participation	Adaptability, receptiveness, solidarity, willingness, determination, dedication, respect, passion, sense of humor	Rights, responsibilities, duties, privileges, work	Become affiliated, cooperate, propose, share, dissent, obey, interact, agree on, express opinions
Idleness	Curiosity, receptiveness, imagination, recklessness, sense of humor, tranquility, sensuality	Games, spectacles, clubs, parties, peace of mind	Daydream, brood, dream, recall old times, give way to fantasies, remember, relax, have fun, play

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Table 3, continued

Axiological categories	Existential categories		
	Being <sup>b</sup>	Having <sup>c</sup>	Doing <sup>d</sup>
Creation	Passion, determination, intuition, imagination, boldness, rationality, autonomy, inventiveness, curiosity	Abilities, skills, method, work	Work, invent, build, design, interpret
Identity	Sense of belonging, consistency, differentiation, self-esteem, assertiveness	Symbols, language, religion, habits, customs, reference groups, sexuality, values, norms, historical, memory, work	Commit oneself, integrate oneself, confront, decide on, get to know oneself, recognize oneself, actualize oneself, grow
Freedom	Autonomy, self-esteem, determination, passion, assertiveness, openmindedness, boldness, rebelliousness, tolerance	Equal rights	Dissent, choose, be different from, run risks, develop awareness, commit oneself, disobey
			Temporal/spatial plasticity
			Productive and feedback settings, workshops, cultural groups, audiences, spaces for expressions, temporal freedom
			Social rhythms, everyday settings, settings in which one belongs, maturation stages

<sup>a</sup> From Max-Neef (1992).

<sup>b</sup> The column of **Being** registers attributes, personal or collective, that are expressed as nouns.

<sup>c</sup> The column of **Having** registers institutions, norms, mechanisms, tools (not in material sense), laws, etc., that can be expressed in one or more words.

<sup>d</sup> The column of **Doing** registers locations and milieus (as time and spaces). It stands for the Spanish **Estar** or the German **Finden**, in the sense of time and space.

<sup>e</sup> Since there is no corresponding word in English, **Interacting** was chosen à fait de mieux.

“means”-based measures, especially across time and between different countries – those conditions for which we would most like to have the quantification for comparisons. This is obviously an area in need of much further research.

In summary, we have presented several alternative frameworks for measuring national income and well-being, all of which are intended in some degree to measure QOL. As one moves to the right in table 1, the suggested changes to simple national income accounts become more controversial and difficult, but also many would argue, more closely reflective of QOL. The correlation between QOL and the accumulation and consumption of wealth and resources also grows increasingly tenuous as we move to the right. Establishing that the connection between wealth and resources and QOL is not necessarily a one to one monotonic relationship has important implications for the following discussion on fairness and distribution.

### **3. A comparison of two approaches to fairness in the distribution of wealth and resources**

Any concern for distribution implicitly assumes some normative goal. In this discussion of the distribution of wealth and resources, the explicit normative goal is fairness, both within the current generation and between generations. We will lay out two approaches to fairness, first the procedural approach of market economics, and second an explicitly outcome-based approach derived from theories of justice. While market economics is not traditionally viewed as laying out a ‘theory of fairness’, it is the dominant system determining the distribution of wealth and resources on the planet and, therefore, its implications for fairness must be assessed.

#### *3.1. Fairness across individuals in space*

Free market economists claim that economics is a positive science with no normative judgements involved. However, if forced to, they would probably define fairness as an inevitable outcome of the freedom of choice allowed by a free market economy; markets are fair because they (theoretically) offer the “justice of earned deserts” (Lane, 1986, p. 1). All wages are fair since the individual is free not to work for that wage if he/she believes it to be unfair. All prices are fair since no one is physically coerced into buying or selling anything. It may not be fair that some individuals are born more intelligent, beautiful, or talented than others and therefore do better than others within a free market; however, this disparity in genetic assets is simply a fact of nature and there is no reason it should be dealt with differently in human society than it is in nature. In addition, because the free market provides abundant incentives for production and innovation, it leads to continuous increases in consumption and invention. The resulting new discoveries and declining prices make people with poorer genetic endowments better off than

they would have been under a different system. It is not only economists who might pursue such a line of reasoning. Polls have shown that at least as recently as 1977, the majority of Americans believed that the free enterprise system is “fair and wise” (82%), “gives everyone a fair chance” (65%), and is a “fair and efficient system” (63%) (McClosky and Zaller, 1985, cited in Lane, 1986). This theory of justice will hereafter be referred to as the ‘just deserts’ theory.

Ultimately, the test of whether or not the market system is fair should be the fairness of wealth and resource distribution as determined by that system. Industrial countries with only 25% of the planet’s population consume 40–86% of the earth’s various natural resources (Durning, 1992, p. 50). The USA alone, with 4% of the global population, consumes 25% of global resources and generates a similar percentage of global waste. Bill Gates controls the same wealth as 45% of the poorest households in the USA, and the three most well-to-do individuals in the world control wealth greater than the combined GDP of the 48 least-developed countries. Both within and between nations, the concentration of wealth is becoming ever more pronounced (Gates, 1999). Given these facts, it becomes increasingly difficult to argue that the market system produces fair outcomes, even if we believe it to be procedurally fair. However, economics is largely a prescriptive ‘science’, not a descriptive one. When the empirical facts contradict economic theory, the standard response of economists is not to change their theory, but rather to suggest policies that will bring the world more in line with that theory. Thus, to prove to many economists that the market system is unfair we must show that the theory is unfair on its own terms.

A variety of market failures such as externalities, public goods, and missing markets do make economic theory unfair on its own terms, especially when this theory drives the allocation of natural capital. We will define and discuss the impact of externalities in section 4 (*Can we measure fairness?*), and define and discuss public goods and missing markets in chapter 12. In the meantime, we will look at fairness from a theory of justice point of view.

Based largely on market outcomes, many justice theorists (and average citizens) find the lack of fairness to be one of the weak points of the market system (Lane, 1986). Many justice theorists argue that fairness is an essential condition for justice, and in some senses the two are virtually indistinguishable. As Barry states, “the central issue in any theory of justice is the defensibility of unequal relations between people” (Barry, 1989, p. 3).

One theory of justice, introduced in Plato’s *Republic*, is that justice arises from mutual advantage. Succinctly, “[j]ustice is the name we give to the constraints on themselves that rational self-interested people would agree to as the minimum price that has to be paid in order to obtain the cooperation of others” (Barry, 1989, p. 7). Glaucon in Plato’s *Republic* says that someone capable of inflicting injustice without suffering it would be ‘insane’ to make a pact prohibiting him from doing so. In this view, there is no such thing as intergenerational justice, since we are

capable of inflicting any injustice on future generations without fear of reprisals. If we accept that we have ethical duties to future generations, then we must believe in an alternative theory of justice.

Perhaps the most widely accepted alternative theory is commonly referred to as 'justice as impartiality', or 'justice as fairness'. Under this theory, it is just to give to others that which they cannot demand, but which would be fair (Shue, 1992). It is this understanding of justice that motivated John Rawls's *A Theory of Justice* (1971), in which he lays out precisely what is 'fair'. Given the extensive influence of this work, it is worth briefly laying out Rawls's approach.

Rawls used the thought experiment of a 'veil of ignorance' to arrive at the criteria for a just society. The idea was that if rational people could decide on the type of society they would want to live in without knowing anything about what role they would play in that society or what their personal attributes would be (i.e., from behind a 'veil of ignorance'), the resulting society must be just. Rawls first assumed that a person's wealth and position in society arose as a result of three morally arbitrary lotteries: one for parentage and natal social position, a second for luck, and a third for genetic potential. Since all inequalities in wealth and power arose from morally arbitrary lotteries, the only initially justifiable position must be one of equal distribution. However, equal distributions remove incentives. By providing incentives, allowing inequality would lead to greater wealth, and could improve the welfare of everyone over the initial equal distribution. As long as increasing inequalities improved the welfare of everyone (Pareto improvements<sup>2</sup>), everyone would agree to it. However, beyond a certain point, increasing inequality might make some groups better off while making others worse off. If we would arrive at one of these positions starting from equality, we are going beyond mere Pareto improvements.

What Rawls concludes is that inequality should be increased until it maximizes the welfare of the worst-off group. While those at the bottom should favor this since it maximizes their welfare, it is possible that some groups would have higher welfare with lower inequality, and would therefore favor a stop to increasing inequality where they maximized their welfare. Rawls asserts roughly that as differences arise from morally arbitrary advantages in the first place, what was fair to the worst-off group must also be fair to any group better off than they are. Basically then, the worst-off group has veto power over the degree of inequality. Rawls refers to this concept as 'the difference principle'. However, Rawls does not venture to explicitly outline what sort of system meets these criteria. The Rawlsian theory outlined here will hereafter be referred to as 'justice theory'.

<sup>2</sup> A Pareto improvement is any change in distribution or allocation that leaves at least one person better off without leaving anyone worse off. Theoretically, all market transactions lead to Pareto improvements, since market transactions are voluntary, and no one would undertake a voluntary transaction if it left her worse off.

Many people would argue that although they arrive there from different starting points, believers in ‘just deserts’ and ‘justice theory’ might reach the same practical conclusion. The argument is that a free market economy is indeed the institution that, by providing adequate incentives, leads to the greatest QOL for the worst-off individual. Economists have explicitly argued that the statistical data reveal an “inescapable relationship”, that is, “the greater the concentration of wealth, i.e., income, in the hands of the few, the greater the capital supply, and therefore the greater the gain in national well-being” (Snyder, 1936). Supply-side economics, popularly known as ‘trickle down theory’, makes the same basic assumptions. If it is true that the market system is just in the Rawlsian sense, it must mean either that remaining poverty is a result of market imperfections that can be eliminated, or else society has insufficient resources to end poverty. While it may seem absurd to think that the western nations lack the resources to end poverty, some people do believe that steps taken to redistribute wealth in order to eliminate poverty would inevitably destroy the incentive structure to such an extent that in the long run poverty would actually increase<sup>3</sup>. However, a market economy is unlikely to generate conditions more fair than those from which it begins. That is, a market economy might be able to allocate goods fairly, but only if the initial distribution of wealth and resources is fair. Further, even in theory a market allocation is only fair (in the sense of ‘just deserts’) if market conditions prevail for all resources, which we will show later is clearly not the case.

### 3.2. *Fairness across individuals in time*

While the above discussion applies to fairness across individuals in space, fairness through time is considerably more complex. There are three important ways the current generation can have an impact on future generations: population growth, the quality and quantity of man-made capital created, and the quality and quantity of natural capital preserved. Man-made capital can be sub-divided into capital goods (infrastructure, machinery, etc.) and knowledge (technology, culture, etc.). Natural capital can be subdivided into three categories with distinct attributes: non-renewable natural resources, renewable resources (defined to include the waste absorption capacity of the environment), and environmental services (which

<sup>3</sup> For example, Milton Friedman implicitly makes this argument when he states that “few trends could so thoroughly undermine the very foundation of our free society as the acceptance by corporate officials of a social responsibility other than to make as much money for their stockholders as possible” (Friedman, 1963). The same is true for followers of Ayn Rand, who explicitly presents the thesis in her fiction and non-fiction works that a more equal re-distribution of wealth will lead to increasing misery for all (e.g., Rand and Peikoff, 1996; Rand, 1964). It is interesting to note that Alan Greenspan, the current chairman of the Federal Reserve, is a professed admirer of Ayn Rand’s philosophy, and has contributed to one of her books (Ramo, 1999).

include life-support functions of ecosystems, amenity values, genetic resources, climate stability, etc.). Further, natural capital can be essential, life supporting, non-substitutable and/or non-reconstitutable, as defined in the first section of this chapter.

Economists rarely hesitate in supporting the free market economy as the ‘fairest’ system across space and time. Up through the mid-20th century, continuous advances in technology and standards of living led most intergenerational economic analysis to focus on the optimal savings rate issue. How much capital should one generation accumulate for the next, at the cost of current consumption? One of the most influential results of this analysis was Phelps’s Golden Rule of Capital Accumulation (Phelps, 1961, 1965). Basically, the idea was that current generations should sacrifice for future generations until the maximum sustainable per capita consumption was achieved. Since successive generations were living better owing to the contributions of past generations, it was virtually taken for granted that we should sacrifice for the greater well-being of future generations.

As human populations and per capita resource consumption continued to grow, it became clear that humans had the potential to exhaust certain resources in the foreseeable future. The intergenerational distribution debate in economics shifted to the question of non-renewable resource use and non-sustainable use of renewable resources. Hotelling (1931) offered perhaps the earliest important contribution, that a non-renewable resource should be exhausted at such a rate that the price increases at the same rate as returns on capital<sup>4</sup>. With regards to renewable resources, economists suggested that harvesting rates which maintained the maximum sustainable yield were unlikely to be economically optimal, while in some cases, resource extinction could be (e.g., Clark, 1990). However, these conclusions were reached by maximizing the net present value of the resource in question. This implicitly assumes that all rights to that resource belong to the present, and none to the future. In fact, this assumption is virtually essential for economic analysis<sup>5</sup>. If instead economists assumed that future generations did have rights to resources, the market could no longer be used to allocate resources, for clearly it would be impossible for generations not yet born to participate in the market for resources. The assumption that the future has no rights to wealth and resources would hardly meet anyone’s definition of fair.

<sup>4</sup> While theoretically compelling, there is little if any empirical evidence that this ever holds true.

<sup>5</sup> To quote from Arrow et al. (2000, p. 1402): “That the utility discount rate is positive is, according to Koopmans, a mathematical necessity. Otherwise, we would not be able to define preferences for the consequences from now and into the infinite future ... The discount rate ... is perhaps the most influential parameter governing cost–benefit analysis and management choices, yet its proper choice is extremely difficult”. Thus, economists appear to recognize that discounting is driven by methodology (mathematics) and not by the problem, which in this case is the explicitly ethical issue of intergenerational equity.

Solow (1974) and others explored the implications of resource exhaustion for intergenerational equity. The emerging consensus appeared to be that imminent resource exhaustion led to higher prices and, hence, incentives to innovate substitute resources or use existing backstop resources. Self-regulating market mechanisms made non-market intervention unnecessary. Therefore, in a free market economy, resources through time are infinite for all practical purposes, and we really need not concern ourselves with fairness towards future generations. While many scientists were alarmed by the imminence of resource exhaustion (e.g., Meadows et al., 1972), economists generally tended towards greater complacency.

The 1960s and 1970s also brought increasing attention to environmental degradation. Pollution was becoming a serious problem, which many economists recognized as a market failure. The field of environmental economics evolved quickly and developed mechanisms for valuing environmental goods and internalizing externalities to the production/consumption process. Economists recognized that uncertainty and irreversibility were critical aspects of environmental issues and incorporated these into their models. Still, the general belief has been that if we resolve the problems of externalities and public goods (i.e., extend the free market to cover all goods and resources) and include option values to compensate for uncertainty, market prices will determine the optimal usage of resources and environmental goods for the present and ensure the invention of substitute resources for future generations. The entire ethical argument from free market economists then is finessed through faith in technological advance induced by market forces.

Rawls's analysis cannot easily be extended to deal with intergenerational fairness either. It is clear in Rawls's work that the dominant intergenerational question in his mind was that of capital accumulation rather than resource depletion, and applying Rawls's difference principle to intergenerational justice would lead to us doing nothing to make future generations better off than we are. Rawls himself realized this problem, and did not attempt to apply the difference principle to issues of intergenerational justice. In fact, Rawls states that

... the question of justice between generations ... subjects any ethical theory to severe if not impossible tests ... I believe that it is not possible, at present anyway, to define precise limits on what the rate of savings should be. How the burden of capital accumulation and of raising the standard of civilization is to be shared between generations seems to admit of no definite answer. *(quoted in Solow, 1974)*

Instead, Rawls offers a

deliberately vaguer principle, given by the balance between what a typical person feels it is reasonable to ask of his parents and what this same person is prepared to do for his children. *(quoted in Solow, 1974)*

This ‘vaguer principle’ is similar to the frequently heard claim that as long as we care about our children and grandchildren, the free market will lead to the appropriate amount of resources for future generations. This might be true if determining an optimal savings rate were the only problem, but it ignores the potential for very long-term environmental problems, such as global warming, nuclear wastes, etc. Our actions today can affect generations far enough in the future that kinship is scarcely felt.

Rawls’s problem with applying his difference principle to intergenerational issues was apparently his belief that ‘raising the standard of civilization’ should be a goal. The difference principle fails because it does not lead to the increased well-being of future generations. Since Rawls wrote, however, the intergenerational distribution debate has increasingly shifted towards sustainability, i.e., making sure future generations have as much as we have, or at least enough to comfortably survive. We are no longer at all certain that future generations will be better off than our own, and the worry is that they may be worse off. What implications does this have for extending Rawls’s analysis to intergenerational issues?

Certainly, the generation into which someone is born is morally arbitrary. This would then imply that an equitable division of resources and capital between generations would be just. Renewable resources could only be used at the rate which they can replace themselves, a constant capital stock would be maintained and passed on to the next generation, and exhaustible resources would be divided equally among generations. There are two absurdities inherent in this result. First, human-made capital accumulates as we make advances in science and technology; in the absence of catastrophe or fundamental changes in human society, future generations will inherit more knowledge. Second, equitable division of exhaustible resources over infinite generations leads to each generation receiving an infinitely small amount. Any other division which awards finite quantities to a finite number of generations is a Pareto improvement; those generations receiving the resource will be better off, while those not receiving it will be no worse off than before.

The difference principle would not hold one generation responsible for making the next generation better off, but at a minimum it would seem to forbid one generation from causing subsequent ones to be worse off than itself *and* worse off than they would have been with equal division of resources. Since equal division of resources implies zero use of non-renewable resources, there would appear to be no special obligation for one generation to share non-renewable resources with future generations, as long as the following conditions are met:

- Future generations are not left dependent for survival upon non-renewable resources in danger of exhaustion. This implies that human populations cannot rely on non-renewable resources to exceed the carrying capacity of the earth, or at least must cease to do so before the necessary resources are exhausted.
- If in the absence of the non-renewable resource some generations would be worse off than others, then these generations have the right to use those

resources. While lack of knowledge of the future makes this impossible to know for certain, it implies that when the future is likely to be better off than the present (which was the case for much of history) then the present has the right to non-renewable resource use. If the future is likely to be worse off (as increasingly appears to be the case), then those resources should be saved for the future, especially if the future is being made worse off by current use of those resources in excess of the waste absorption capacity of the environment.

- When one generation extracts and uses non-renewable resources at a rate that generates sufficient waste flows and degradation to destroy renewable resources, the resulting destruction of renewable resources meets the criteria for the fair use of renewable resources outlined below.

The difference principle has different implications for different types of renewable natural capital (RNC). Essential RNC must be maintained above the amount required to make sufficient essential human capital to meet future needs. We must maintain sufficient life supporting natural capital to guarantee adequate provision of all forms of natural capital. Yields from non-substitutable RNC must be maintained intact, or at least in sufficient quantities that the marginal contribution to QOL is zero, because by definition, it is not possible to compensate the future for its loss. If non-essential, substitutable RNC is harvested at greater than maximum sustainable yield (where yield is taken to include both market and non-market goods and services), the future must be compensated. If yields exceed this maximum yet remain sustainable (i.e., the same yield may be taken every year, without further degradation of the resource), compensation (in the form of increased quantities of other forms of capital) need only make up for the QOL lost by a future generation decreasing its harvest of the renewable resource until stocks increase sufficiently to again support the maximum sustainable yield. If non-essential, substitutable, and non-reconstitutable RNC is harvested beyond its capacity to recuperate, this is a finite loss for infinite time, and compensation must be an equivalent resource flow from an alternative capital stock for infinite time.

Almost certainly, in the real world some resources are being depleted at such a rate that future generations may suffer the negative impacts of the resource use without having the benefits of the resource itself. Fossil fuel use leading to global warming is a good example. Future generations are also being left dependent for survival upon exhaustible resources. Without oil for energy, fertilizers, pesticides, and transportation, it might be very difficult to maintain sufficient agricultural output to feed Earth's population. Many renewable resource stocks are also threatened by irreversible exhaustion. Any sense of fairness to future generations demands we leave intact the life-support functions of natural capital, and the non-substitutable natural capital.

The question is, does our accumulation of man-made capital compensate future generations for the loss of substitutable, non-reconstitutable capital? The answer depends on the unknown costs of environmental damage to future generations, the

unknown benefits of man-made capital accumulation, and the unknown ability of human-made capital (particularly future inventions) to substitute for natural capital (where we are not entirely sure what natural capital is non-substitutable) and the unknown thresholds below which natural capital becomes non-reconstitutable. Uncertainty therefore is a crucial factor that must be considered.

The treatment of uncertainty in ethical analysis is difficult, but as a rule of thumb, we might say a gamble is appropriate if the gains from winning the gamble are approximately equal to the losses from losing<sup>6</sup>. In this case, are the gains from gambling that man-made capital is a substitute for natural capital approximately equal to the losses if it is not? Summarizing the differences between human-made and natural capital can help us answer the question. Perhaps the most important distinction is that natural capital can be irreversibly damaged or destroyed, but we typically do not know when irreversible change occurs in ecosystems or renewable resource dynamics, and in the ecosystem case we rarely understand the full implications. Second, the first law of thermodynamics tells us that man-made capital must always rely on natural capital – the two are ultimately complements, and man-made capital can never completely substitute for natural capital. Third, there is as yet little evidence that man-made capital can substitute for the life-support functions of ecosystems, and we are not certain which ecosystem resources are critical to generating these **life support** functions. Fourth, capital goods depreciate, and if they are left to the future in compensation for an exhausted renewable resource, the resource flow necessary to maintain them must be left as well. Fifth, man-made capital tends towards obsolescence<sup>7</sup>. Sixth, technology is not always beneficial, and even beneficial technologies may have seriously negative side effects, many of which are not immediately apparent. Seventh, probably the most important man-made resource we leave for future generations is accumulated knowledge, which will lead to new technologies. However, prior to the invention of a new technology, nothing can be said with certainty about what it will be<sup>8</sup>. Thus,

<sup>6</sup> Theoretically, a risk-neutral individual is indifferent towards a gamble with payoffs of A or B if the probability of outcome A times the value of outcome A is equal to the probability of outcome B times the value of outcome B. However, in the type of uncertainty we are discussing, we do not know the probabilities of each outcome.

<sup>7</sup> A well-maintained road system left for the future to compensate for global warming will be of limited use if the future no longer uses cars. If global warming becomes a serious problem, many of our fossil-fuel consuming technologies may become obsolete even before fossil fuels are exhausted. Any technology that relies on exhaustible resources will eventually become obsolete.

<sup>8</sup> Clearly, many inventions are predicted. Jules Verne, for example, predicted travel to the moon and submarines. He could not have assigned any realistic probabilities to when these inventions might occur. This only became possible when knowledge and technology had reached a more advanced level. Verne could not have predicted the mechanics of jet engines, nor the computer technology required for space flight, nor the transistor, which set off the computer revolution. Application of known principles is less invention than innovation (Proops and Faber, 1990).

we cannot say with certainty if future technologies will compensate for natural resource depletion. The benefit of winning the substitution gamble is presumably higher levels of consumption now and in the future, with most of the people benefiting from this being those in the highest consumption class in human history. The potential loss is damaging non-reconstitutable, life-supporting RNC, which would have potentially catastrophic consequences for the QOL of all humans and even for human survival.

Even if weak sustainability were to hold true, and production in a world with virtually no resources were possible, still this would not mean that we could ignore resource scarcity. First of all, while scarcity does induce innovation, technological advance is a function of accumulated knowledge. Accumulation of knowledge requires both time and effort. Natural resource prices respond to political turmoil, imperfect markets, and imperfect knowledge, so price increases may thus be far faster than expected (Reynolds, 1999), greatly decreasing the time available for developing substitutes and more efficient technologies. Also, the quicker a resource is exhausted, or the more sudden the price surge as a crucial resource nears exhaustion, the more likely is economic disruption. Severe disruption can slow down the creation of substitute resources. For example, during the great depression, or the recent breakup of the Soviet Union, economic chaos led to the unemployment of numerous scientists and decreased investments in research and development. Yet, the faster resources are depleted, the more rapidly technology will have to advance to compensate. Thus, there is no guarantee that efficiency-increasing and resource-substituting technologies will develop at the same rate as depletion of resources. This implies that justice demands we slow resource use while substitutes are being developed rather than await imminent resource exhaustion to trigger research into alternatives<sup>9</sup>. Regulations slowing resource use create artificial scarcity, inducing research into substitutes more quickly, and avoid the economic disruption which may accompany more sudden resource exhaustion.

Nor does the fact that Malthus has so far been wrong prove the assumption of infinite substitutability of resources. We are living in a constantly evolving world. Every day sees a greater increase in the world population and a greater depletion of renewable and non-renewable resources than any previous day. Population growth

<sup>9</sup> Modern agriculture provides a good example. We currently depend on petroleum for producing and running farm equipment, for transporting goods produced, for manufacture of pesticides, herbicides and fertilizers, and indirectly for almost every other facet of modern agricultural production. There are feasible substitutes for all of these petroleum-based inputs, but to implement all substitutes as rapidly as petroleum supplies run down will be costly. Food supplies might suffer, and the consequences could be severe. Given the instability of oil prices, and the paramount importance of maintaining constant food supplies, relying on as-yet-undiscovered technologies may be a very risky strategy.

has accelerated far beyond what it was in Malthus's time. It is difficult to base predictions on past experience when such unprecedented changes are occurring. Blind faith in the ability of technology in a free market system to overcome resource and environmental constraints as they occur, and thus compensate for depleted natural resources, seriously jeopardizes the QOL of this and future generations<sup>10</sup>.

With respect to uncertainty, then, fairness demands that we assume strong sustainability until proven otherwise. That is, we should only deplete resources when substitutes have been proven, and not before. Only when the survival of the current generation is threatened is it free to use resources to meet current needs even when it risks the survival of future generations, as those generations living at or below the subsistence level arguably have no obligations to future generations. This last point suggests that some level of intragenerational fairness is a prerequisite for intergenerational fairness.

### *3.3. Fairness across countries in space and time*

In theory, there is nothing in the economic or in the justice theory 'definition' of fairness that is affected by geography. Market economics, however, is in the midst of a historically unprecedented rate of expansion, unprecedented not just for an economic system but for any type of human institution. Yet the claims of fairness for market economics are only valid when the actual market system is an accurate depiction of the theoretical system<sup>11</sup>. Unfortunately, the global market place is far less 'perfect' than most national markets. In the first place, market fairness across countries would require capital immobility (Daly, 1996), while market fairness for individuals within a global economy would require labor mobility. Instead, capital is free to move across international boundaries, yet labor is not. Second, market fairness requires a very large number of nearly identical firms, not a handful of grain exporters, oil companies and car companies that dominate the world market. Third, market fairness requires that firms make profits by competing with each other, not by 'rent seeking' activities such as bribing politicians for lucrative contracts. It is widely recognized that international companies routinely bribe government officials in less-developed countries, and that businessmen in

<sup>10</sup> A good example is nuclear power. When nuclear generators were first built, the full dangers of radiation were not understood. The assumption in the 1950s was that technology would develop a means for safely disposing of nuclear wastes when they became a problem. The half-life of plutonium is 24300 years, and we are no closer to solving the disposal problem than we were in 1950.

<sup>11</sup> While most scientists seek theories that are an accurate depiction of reality, economists have developed a theory that does not accurately depict reality, but is widely used as guide for policies designed to bring reality closer to that theory.

Europe can actually write the bribes off as tax deductions (Trade Compliance Center, 2001). Fourth, in Adam Smith's classic, *The Wealth of Nations*, he points out that trade secrets (read 'patents' in today's world) are essentially a form of monopoly and "the monopolists by keeping the market constantly understocked, by never fully supplying the effectual demand, sell their commodities much above the natural price . . . The price of monopoly is upon every occasion the highest which can be got" (Smith, 1970, p. 164). Citizens of developed countries currently hold 97% of global patents, and even within less-developed countries, they hold 80%. Empirically, in countries undergoing rapid trade liberalization, wage inequality has increased and unskilled workers have suffered **often-dramatic** drops in real wages (Wallach and Sforza, 1999). In Latin America over the last five years, the number of people living below poverty level has soared in the countries most avidly pursuing trade liberalization (Faiola, 1999), and globally over the same time period the number of people living in absolute poverty has increased by 20%. By any measures of QOL presented above, the worst off have suffered a decline with increasing integration into the world market system.

#### 4. Can we measure fairness?

Rawls's theory of justice fails to provide an empirical measure of fairness. It does, however, suggest a means to measure progress towards fairness; if the worst off are becoming better off, then society is becoming fairer. If the worst off are becoming even worse off, then society is becoming less fair. Economic theory is supposedly value-neutral, but many people do believe that economics is fair in terms of awarding just deserts, and further contend that the free market system provides the appropriate incentives to maximize the QOL of the worst off. This suggests that from the just deserts viewpoint, an appropriate measure of *intragenerational* fairness might be society's proximity to a perfect free market system. This is a highly contentious assumption, skirts the issue of the fairness of the initial distribution of resources before market transactions take place, and is still quite difficult to measure. However, it would allow us to assume that goods and services not distributed in accordance with free market principles are unlikely to be fairly distributed, even procedurally, and focus our attention on these. In terms of *intergenerational* fairness, the main difficulty lies with ensuring the provision of sufficient natural services to ensure an acceptable QOL for future generations. Any consideration of *intergenerational* fairness from market economics hinges on the ability of human-made capital to replace natural services, which is taken on faith. It is perhaps more reasonable, therefore, to measure *intergenerational* fairness as the extent to which our society ensures the provision of natural services in accordance with Rawls's theory modified for *intergenerational* issues as laid out above. However, when we recognize that the *intragenerational* allocation of natural capital is plagued by market failures, it becomes clear that the allocation

of natural capital is a reasonable focus for assessing fairness both within and among generations.

Our emphasis on natural capital makes even more sense when we remind ourselves that environmental services are essential and indispensable to human society. Without them, society has no material or energy resources with which to produce goods, and perishes in its own waste. A degraded or diminished environmental base reduces the long-term QOL because it contributes less service to individual humans, society, and the economy<sup>12</sup>. Conserving sources and sinks means that more will be available for future generations, so intergenerational equity is served, and there is a greater chance for a sustainable society.

The environment can be viewed as infrastructure that contributes to QOL and the economy in the same fashion as the more traditional infrastructure of water delivery systems, solid waste and sewerage disposal, and other public services. The public welfare suffers if water and waste disposal systems are abused; environmental abuse will also result in lowered public welfare. If resource use and waste releases exceed the environment's capacity to provide these services, then natural capital is diminished and pollution rises. Those benefiting from the activity are externalizing some of their costs to the public domain and are, in effect, appropriating public property rights to the open access sources and sinks for their own use without compensation – unfair by any standards. For example, polluters can gain an internal subsidy by spending less than their peers on pollution control, thus externalizing their pollution costs by consuming more public natural capital. Reappropriation of these public property rights by the reduction of pollution and the associated subsidies would improve environmental quality, and as we shall see, reduce poverty and inequality. Society normally penalizes those who steal or embezzle public *financial* capital, but it is unclear why we allow the unauthorized appropriation of public *natural* capital for private gain. Perhaps it is related to the fact that society has not yet recognized natural capital as a valuable form of capital. Since economists' models and theories rarely recognize the value of natural capital in creating wealth, perhaps we should not expect the public to act differently.

The effect of externalities on markets and the need for prices to reflect all production costs has been of concern to economists since Adam Smith. A theme running through ecological economics is that *laissez-faire* free market activities

<sup>12</sup> For example, industrial discharges that exceed the assimilation capacity of the environment can accumulate in fish and wildlife and inhibit commercial and sport fishing. Acid rain and other forms of air pollution slow crop and tree growth and reduce economic returns. Cities and regions that maintain clean air and an appealing aesthetic environment are more pleasant places to live and have a better chance of attracting businesses and tourists and their dollars. Clean, unpolluted surface or ground water available for human consumption without much treatment means better health and less public expense. In addition, pollution often results in the loss of more jobs than are created by the economic activity that produced the discharge.

using common resources inevitably lead to market failure, ecological abuse and inequity due, primarily, to externalities or spillover costs (Hardin, 1968; Perrings, 1987; Tisdell, 1991; Ophuls and Boyan, 1992). If prices do not reflect all costs, then market failure results with all of its attendant inefficiencies and inequities. However, while many recognize that externalities are pervasive and growing (Bromley, 1986; Baumol, 1967), few economists seem overly concerned with their effects on public welfare. In addition, it is apparent that many, if not most, externalities create subsidies for those externalizing their costs (Templet, 1995a) and subsidies contribute to distributional inequality.

Most observers agree that when a negative externality occurs, a cost is transferred from the initiator of the externality to the receiver. For example, pollution from a facility causes nearby residents breathing the fumes to bear a cost which may range from merely irritating to life threatening. External effects are generally accepted as pervasive (Baumol and Oates, 1979, p. 77; Goodland and Daly, 1993) in market systems, and many economists have discussed them (Mishan, 1971; Cowen, 1988), but there is significant debate about whether they are a major problem, and if so, what to do about them. For example, Coase (1960) argues that external costs can be bargained away by the affected parties without government intervention although transaction costs, which accompany the bargaining transaction, will arise. Oates (1986) points out that Coase's bargaining approach will not work in the large group case due to excessive transaction costs.

However, there is little discussion of the fact that the initiator also secures an implicit subsidy by having caused the externality. For example, a firm releasing pollution to the environment, rather than internalizing the cost, is enjoying an internal subsidy of the retained dollars which would have been spent on pollution control if the firm's pollution spending equaled the US average. The result is higher pollution levels and corporate profits but increased costs, including health costs, to those burdened with the pollution. The polluter has appropriated natural capital from the public and public welfare declines as pollution rises (Templet and Farber, 1994). The pollution subsidy is a useful measure of appropriation of the sink side of natural capital. Subsidy creation also occurs when tax structures and energy pricing, and possibly other costs of production, are manipulated by government, generally at the urging of the firms which benefit, to reduce costs to one sector. In earlier analyses, Templet developed indicators of inequality in pollution, energy pricing and taxes, which were then used to calculate an equity index (Templet, 1995b) and subsidies per capita by state (Templet, 1995a). These measures were statistically compared to a number of state socioeconomic indicators, including poverty. Poverty was lower when equity was higher and when subsidies were low. The study found that as subsidies increase, economic health and sustainability both decline. In the case of taxes and energy pricing, the public directly pays the external cost and functions as a type of socioeconomic commons. Externalized energy costs are a useful measure of the extent of appropriation of the resource

side of natural capital while externalized taxes affect both sources and sinks. Tax measures were included because realignment of taxes offers a means of reappropriating natural capital by forcing the internalization of costs not currently captured in market prices or disposal costs.

Generally, if costs can be passed on to others, then potential expenditures can be foregone and internal corporate dollars go unspent. In the pollution example, the costs that are externalized include impacts on people, property, and ecosystems. If these costs are greater than the internal subsidy gained by the firm, optimality, potential Pareto or otherwise, is not achieved. The effect of the externalization is, generally, a net loss to public welfare with private interests benefiting while public interests lose considerably more; public costs exceed private benefits and distributional inequities escalate.

In this way, externalities lead to subsidies and inequalities that are among the most important driving forces leading to poverty. The subsidies increase wealth for some, which is then used to maintain and increase existing subsidies through campaign contributions and political action. While externalities increase wealth for a few, they diminish wealth for many others because there are costs involved. Externalized costs diminish natural capital through resource depletion and pollution and negatively affect human, social, and built capital. The impacts can be grouped in three ways: 1) direct impacts that diminish health and QOL and reduce disposable incomes through lost productivity and other costs; 2) fiscal impacts that occur because subsidies deprive government of revenues, some of which would have helped the poor, e.g., better educational and health care systems (fiscal impacts have not been examined in this chapter); 3) power distribution impacts that heighten inequalities in political power and wealth and allow the wealthy to more effectively manipulate government and markets to their advantage. These results are summarized in fig. 4 (overleaf).

### **5. What is the relationship between fairness and QOL?**

When private entities appropriate public assets, as discussed in the previous section, this reduces the QOL of the general public directly and through a number of indirect feedbacks. However, there is a secondary effect as well. There is substantial evidence that individuals assess their QOL relative to a reference group or an ideal state (Schuessler and Fisher, 1985; Frank, 1999; Galbraith, 1969). The greater the difference between one's own circumstances and this ideal state, the lower one's subjective QOL. The greater the inequality in society, presumably the more likely one's reference group or ideal state will be considerably better off than oneself. Thus, if unfair appropriation of wealth and resources by one group makes them better off than another, the losers in this transaction have a doubly negative impact on their QOL.

This possibility has very serious implications for government policy. Currently, most governments in the world are seeking to increase QOL through continuous

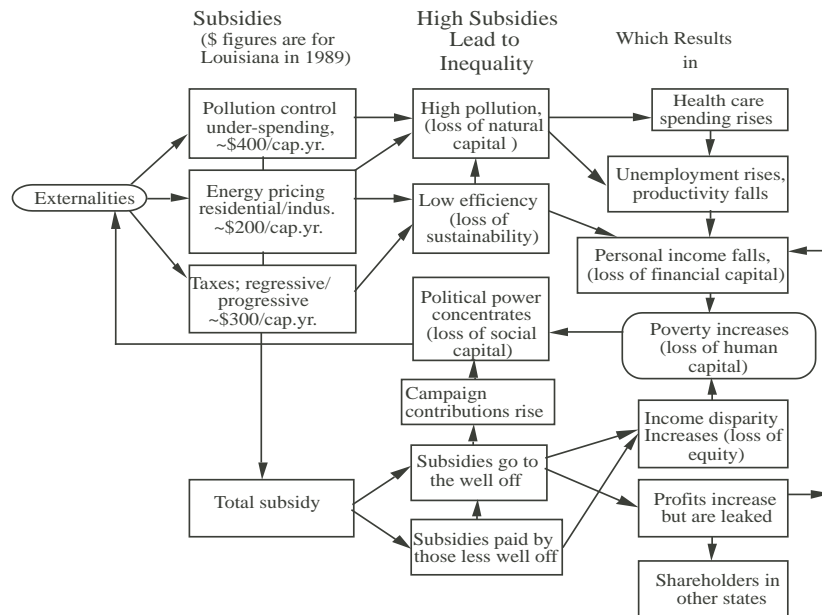


Fig. 4. The relationship among externalities, natural capital, and Quality of Life.

economic growth. While this approach will clearly increase QOL if it brings people from poverty to subsistence level or above (for it is obvious that below the subsistence level, QOL is probably not a relative measure), it may not be a fruitful policy for populations that have already met their basic needs. For example, economic growth may allow me to purchase a fancy car, which I desire because my neighbor has one. However, if my neighbor also benefits from the economic growth, she may now purchase an even nicer car. As I rate my QOL relative to hers, I am no better off than before in terms of human-made capital, and the production and use of the two cars has degraded natural capital and the QOL-enhancing services it provides. What is more, those who do not benefit from the economic growth are worse off, even if their absolute incomes are unchanged. We cannot simply grow our way to a better QOL if this is the case, and growth accompanied by increasing disparity in income distribution, as is the case in much of the world right now, will actually make some poor people worse off even if their absolute incomes increase.

It is also fairly clear that inequality in the distribution of material wealth and resources leads to an unequal distribution of political power, which can then be used to accumulate even greater wealth. A typical case is when corporations contribute to politicians in exchange for support on legislation that allows the private sector to appropriate public wealth. In an empirical study,

Templet (1995a) finds that the size of campaign contributions per candidate for congressional offices across states relates significantly and negatively to congressional environmental voting records (League of Conservation Voters, 1990). The higher the contributions, the poorer the voting scores on environmental issues. In addition, **state level** subsidies per capita are significantly and negatively related to congressional environmental voting records. Finally, the size of campaign contributions is positively related to the size of the manufacturing industry within a state, indicating that the manufacturing sector is a significant contributor to federal campaigns. While these relationships do not establish a conclusive case between elected **representatives** voting patterns and campaign contributions, they do suggest a role for campaign contributions in influencing voting, and probably other political prerogatives, to promote subsidies for vested interests. In support of this view, Boyce et al. (1999) have found that as political power concentrates, pollution increases and public health and welfare decline. To restate in the terms used above, as political power concentrates in vested interests, larger externalities and subsidies are created through political action that then lead to higher pollution and other **inequalities**. With these linkages it is apparent that vicious feedback cycles exist **between** subsidies, political power, and poverty, which make the subsidy–poverty cycle very difficult to change. Simply put, great disparities in wealth undermine democracy. If it is true that democratic systems are most likely to provide for the needs of their citizens, then this erosion of democracy associated with unequal distribution will further reduce QOL.

Finally, empirical studies show that people have strong negative reactions to unfairness, which may directly impact their QOL. Studies suggest that these negative reactions can be so intense that people perceiving inequitable inequalities frequently experience cognitive tensions sufficient to cause them to change their values (Walster et al., 1976, cited in Alwin, 1987).

## **6. Principles for achieving a sustainable, fair, and high-QOL society**

Obviously, a basic requirement for creating a fair and sustainable society that offers high QOL to current and future generations is the willingness of its members to pursue such a goal. One of the major obstacles to generating the necessary will has been the perception that fairness requires a reallocation of access to resources from the well-to-do to the poor, and sustainability requires a reallocation of access to resources from the present to the future. Both circumstances would force some groups to consume less so that others might consume more. The dominant economic paradigm on the planet today measures QOL by consumption. Under this paradigm, consuming less implies a lower QOL for the well-to-do and the present generation. As shown above, in modern societies wealth equals power. Clearly, the present generation also has power over the resources left to future generations. Thus, those who have the power to impose change are those

who would stand to lose by it, and change is unlikely to happen. One of the more important implications of the discussion in this chapter is that additional consumption may not be closely associated with increased QOL, and conversely, the well-to-do could reduce their consumption without reducing their QOL. To the extent people accept this argument, it dramatically increases the potential for creating a fair, sustainable, and high QOL society.

What else would be required to create a sustainable society? Costanza et al. (1998) have outlined six core principles, an indivisible collection “that embody the essential criteria for sustainable government” (p. 198). To quote at length, these are:

- Principle 1: Responsibility. Access to environmental resources carries attendant responsibilities to use them in an ecologically sustainable, economically efficient, and socially fair manner. Individual and corporate responsibilities and incentives should be aligned with each other and with broad social and ecological goals.
- Principle 2: Scale matching. Ecological problems are rarely confined to a single scale. Decisionmaking on environmental resources should (i) be assigned to institutional levels that maximize ecological input, (ii) ensure the flow of ecological information between institutional levels, (iii) take ownership and actors into account, and (iv) internalize costs and benefits. Appropriate scales of governance will have to be those that have the most relevant information, can respond quickly and efficiently, and are able to integrate across scale boundaries.
- Principle 3: Precaution. In the face of uncertainty about potentially irreversible environmental impacts, decisions concerning their use should err on the side of caution. The burden of proof should shift to those whose activities potentially damage the environment.
- Principle 4: Adaptive management. Given that some level of uncertainty always exists in environmental resource management, decisionmakers should continuously gather and integrate appropriate ecological, social and economic information with the goal of adaptive improvement.
- Principle 5: Full cost allocation. All of the international and external costs and benefits, including social and ecological, of alternative decisions concerning the use of environmental resources should be identified and allocated. When appropriate, markets should be adjusted to reflect full costs.
- Principle 6: Participation. All stakeholders should be engaged in the formulation and implementation of decisions concerning environmental resources. Full stakeholder awareness and participation contributes to credible, accepted rules that identify and assign the corresponding responsibilities appropriately.

What is required to create a fair society? Economic theorists would argue just deserts, and Rawlsian justice would call for making the poor as well off as possible. An additional prerequisite suggested by material presented here is adequate access to environmental resources for all. We have already shown that the market failure of negative externalities can deprive society's members of these resources, and the following chapter will show how other market failures do the same. Thus, unregulated market allocation of such resources is unfair, and non-market institutions will be required to ensure adequate access for current and future generations. Gross concentrations of wealth, unfair in their own regard, also convert to political power that introduces even greater inequities in the distribution of natural capital.

How do we create a society with higher QOL? We focus on the satisfaction of human needs rather than ever-greater production. To create a society that provides a high QOL and is sustainable and fair, we will need to alter society's preferences towards satisfiers that are non-consumptive, so that meeting the needs of one group or generation does not impose on those of another.

The following chapter will flesh out these ideas in greater detail and suggest concrete policies to achieve our objectives.

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*Chapter 12***Quality of Life and the Distribution of Wealth and Resources**

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**Abstract**

All anthropocentric definitions of sustainability, at least implicitly, place a central focus on sustaining an acceptable level of human quality of life (QOL). Within the dominant ideology of free market capitalism, it is believed that reducing wealth and resource consumption also reduces QOL within a generation, yet it appears that excessive resource consumption on the part of the current generation threatens dramatic reductions to the QOL of future generations. Continued economic growth substantially increases this threat. If current levels of QOL do indeed depend on current consumption levels, this would mean that ensuring sustainability for future generations requires a reduction in QOL for at least some of the people alive today. We show in this chapter that in reality, above a certain level, greater wealth and resource consumption are not tightly linked to QOL. Thus, a more fair distribution of resources and wealth within and between generations need not require a sacrifice in QOL for the current generation, increasing the feasibility of policies directed towards this outcome.

**1. How do we define Quality of Life (QOL)?**

Philosophers have been discussing the issue of QOL at least since the time of Aristotle, and have yet to reach any kind of consensus on what it means. In chapter 11, we presented the following definition of QOL, “a multidimensional evaluation of an individual’s current life circumstances in the context of the culture in which they live and the values they hold. QOL is primarily a subjective sense of well-being encompassing physical, psychological, social, and spiritual dimensions. In some circumstances, objective indicators may supplement or, in the case of individuals unable to subjectively perceive, serve as a proxy assessment of QOL” (Haas, 1999).

We also drew upon the work of Max-Neef to present a discussion of human needs. Integrating human needs with the above definition suggests a concise working definition of the determinants of QOL with practical policy implications: Quality of life is determined by our ability to satisfy our needs and wants.

### *1.1. What are human needs?*

This definition requires that we clearly define what we mean by needs. First, we define absolute needs as those required for survival, which are biologically determined. Some 1.2 billion individuals globally and 28% of the population in the third world currently live in extreme poverty (World Bank, 2000; Bloom et al., 2000), and have difficulty meeting even these absolute needs. For this group, greater consumption is probably very closely correlated to greater QOL. Once absolute needs have been met, as is the case for about 80% of the human race, then QOL is determined by the satisfaction of a whole suite of primary human needs that have evolved with us as a species. Numerous researchers have proposed a variety of human needs, typically claiming that they are pursued in hierarchical order – Maslow’s hierarchy (Maslow, 1954) being only the most famous. The hierarchical ordering, though generally not seen as rigid by these researchers, still leaves something to be desired. Even the 1.2 billion people living in absolute poverty seek to fulfill needs other than mere subsistence. For example, malnourished children have not met their basic physiological needs, but will still seek love and protection. And as Maslow recognized, numerous people have gone on hunger strikes or risked life and limb to pursue higher needs for esteem and self-actualization (the highest levels in the Maslow hierarchy). Max-Neef (1992), in contrast, has summarized and organized human needs into non-hierarchical axiological and existential categories (table 3 of chapter 11). In this non-hierarchical framework, needs are interrelated and interactive, many needs are complementary, and different needs can be pursued simultaneously. In our opinion, this reflects reality better than a hierarchy in which we only pursue higher needs after lower ones have been fulfilled. Another important point to make is that in Max-Neef’s conception, needs are both few and finite. This stands in stark contrast to the dominant belief across countries and ideologies that unending economic growth is the best way to meet human needs.

### *1.2. Satisfiers and wants*

We are not concerned solely with the needs themselves, but also with the means we use to satisfy our needs, which we shall call satisfiers (table 3 of chapter 11). While needs remain consistent across time and across cultures, satisfiers differ. In general, different satisfiers may be required by different people to meet a given need, and the same satisfiers can meet given needs to a different extent for different

people. Further, and in contrast to neo-classical economic theory, people do not always make optimal choices among satisfiers to meet their needs. In fact, many apparent satisfiers are not satisfiers at all. Max-Neef defines ‘violators and destructors’ as supposed satisfiers intended to satisfy a need, but which in fact “annihilate the possibility of its satisfaction, [and] also render the adequate satisfaction of other needs impossible” (Max-Neef, 1992, p. 208). He provides the example of an arms race intended to provide protection but which actually makes us less safe, while at the same time depriving us of resources useful in meeting other needs. At the national level, an example would be the increasing private ownership of weapons in the USA. He next defines ‘pseudo-satisfiers’ as “elements that stimulate a false sensation of satisfying a given need” (Max-Neef, 1992, p. 208). Visiting a prostitute may be a pseudo-satisfier for someone’s need for affection. Finally, ‘inhibiting satisfiers’ are those that satisfy (or over-satisfy) one need, but simultaneously inhibit the satisfaction of others. For example, commercial television satisfies our need for leisure, but inhibits understanding, identity, and creation. We define the desire for violators and destructors, pseudo-satisfiers, and (to a lesser extent) inhibiting satisfiers as ‘wants’ which are quite distinct from needs.

Additional examples may be helpful. First, recall the definition of consumerism offered in chapter 11 as the cultural orientation that holds that “the possession and use of an increasing number and variety of goods and services is the principal cultural aspiration and the surest perceived route to personal happiness, social status and national success” (Ekins, 1991). By this definition, consumption should satisfy our needs for happiness, status, and success, clearly seen as elements of a good QOL. However, though we consume more than twice as much as our grandparents’ generation, it is not readily apparent that we enjoy a higher QOL. Increasingly, studies find the opposite: there is a pronounced trend towards greater rates of depression and suicide in the market democracies, and especially in America where the number of people who declare themselves ‘very happy’ in studies of subjective well-being is declining<sup>1</sup> (Lane, 2000). Empirical studies find that regardless of income, people believe they would be happier if only they earned twice as much (Lapham, 1988, in Durning, 1992). Income and consumption in this context are thus pseudo-satisfiers; many pursue them without fulfilling their needs. If carried to the extreme of damaging ecological services, as we increasingly risk doing, consumption becomes a violator and destructor. Similarly, sufferers of anorexia nervosa believe they would be more attractive and thus better able to fulfill their need for affection if only they could lose a few more pounds. Many

<sup>1</sup> For individual domains of life, the same trend is found. Between 1972 and 1994, studies found a decreasing percentage of Americans declared themselves ‘very happy’ with their marriage, ‘very satisfied’ with their jobs, ‘pretty well-satisfied’ with their financial situation, or very satisfied with their place of residence (Lane, 2000).

weight lifters believe they are small and would be attractive if only they could add bit more muscle mass. When taken to the extremes of starvation and steroid abuse, thinness and muscularity as measures of beauty also become destructors and violators. Thus, demand for the wrong types of satisfiers may be infinite precisely because they fail to satisfy our finite needs.

### *1.3. Implications of our definition for improving QOL*

Now that we have defined needs and wants, of what use is our new definition, in particular with respect to the distribution of wealth and resources? Concisely put, it provides us with three general policy paths towards greater QOL for all. Most obviously, we can attempt to increase people's ability to satisfy a given set of needs or wants. This can be done by providing greater access to the necessary satisfiers or by using satisfiers more efficiently. The latter approach is particularly appropriate when the satisfiers in question consume finite physical resources, and thus use by one person reduces the amount available for others. For example, we mentioned several studies in chapter 11 suggesting that relative amounts of wealth and resources affected QOL more than absolute amounts. Thus, if some people meet their need for identity by consuming more than others to enhance their self-esteem, we could reduce everyone's material consumption above and beyond absolute needs by half without affecting relative consumption nor anyone's ability to fulfill the need for identity. We would need to work less to meet our consumption demands and would have more time to devote to satisfying other needs. A second option is to change society's preferences<sup>2</sup>. One approach would be to intentionally alter a society's cultural preferences for satisfiers in such a way that fewer resources allow us to better meet our needs. Decreasing our dependence on single occupancy vehicles for leisure and participation needs comes readily to mind. Similarly, society could work to reduce or eliminate the individual's wants, where wants are defined as the demand for satisfiers that in some way

<sup>2</sup> Undoubtedly, any suggestions for manipulating wants, needs, and cultural preferences will be viewed with concern by those who fear it impinges on personal freedoms, and rightfully so. Needs and wants can be manipulated towards different ends, many of which would not be morally acceptable to the majority of us. But we should not let a valid concern over appropriate ends obfuscate the fact that our wants and needs are already constantly being manipulated. As Rawls (1971) points out, "an economic system is not only an institutional device for satisfying existing wants and needs but a way of creating and fashioning wants in the future. How men work together now to satisfy their present desires affects the desires they will have later on, the kind of person they will be. These matters are of course, perfectly obvious and have always been recognized. They were stressed by economists as different as Marshall and Marx" (pp. 259–260; quoted in Goodwin, 1997). And advertising, of course, is an enormous industry that does little else than manipulate wants. We must simply ensure that any efforts to manipulate wants and needs involve public discussion, are transparent, and are subject to the principle of adaptive management.

diminish our ability to satisfy our needs, as described above. This is a particularly promising approach, because unlike needs, wants can be infinite, and many wants are for wealth and resources. As wealth and resources are the only physical components of satisfiers and hence QOL, they are the only ones that can be depleted, and thus the ones most relevant to the questions of distribution, fairness, and sustainability. Third, society should avoid anything that would increase wants or needs without simultaneously increasing the ability to satisfy them, since that creates the conditions for lowering QOL.

#### *1.4. QOL and the four capitals*

Recent research in the social sciences can provide us with useful insights into the nature of potential satisfiers for human needs. While it is clear from table 3 of chapter 11 that economic production only provides satisfiers for some human needs, a focus on economic production can still provide insights into what is required to satisfy our needs. Economic production is not only the result of man-made (built) capital; it also requires inputs from natural capital, human capital, and social capital. For example, all built capital requires inputs of some sort, which are ultimately derived from natural capital. The technology and knowledge inherent in the production process is the product of human knowledge, or human capital. Social capital refers to the institutions, relationships, and norms that shape the quality and quantity of a society's social interactions. Social capital is not just the sum of the institutions that underpin a society; it is the glue that holds them together (World Bank, 2001). Social capital reduces transaction costs via co-operation and lubricates social interactions. It is thus essential to the production process in society. Hence, economic production requires inputs from all four of these capitals.

In an analogous manner, all four capitals are required to satisfy human needs and generate QOL. Natural capital supplies not only the basic raw materials essential for our survival, but also recycles our wastes, regulates our climate, and provides us with clean air and water. According to the 'biophilia' hypothesis (Wilson, 1986; Kellert and Wilson, 1993), humans have an innate affection for nature, which may be as important to our psychological well-being as forming personal attachments with other humans. Studies have shown that people experience lower levels of stress-related illness, lower blood pressure, faster postoperative recovery, greater levels of happiness, and reduced fear when exposed to nature scenes rather than urban scenes (Ulrich et al., 1991). Immersion in nature can generate self-reported feelings of 'wholeness' and comfort (Kaplan and Kaplan, 1989). Nature also fulfills spiritual, cultural, and aesthetic needs, and has intrinsic values unrelated to consumption of its material bounty. In fact, we must emphasize the primacy that natural capital holds in determining QOL, both in history and actuality. Long before we evolved into thinking, social, tool users,

most of our needs were met directly by nature, and even today nature contributes substantially to the continued satisfaction of all of our human needs.

Humans are also innately social creatures, and human relationships, trust, and community are essential components of our well-being. Just as the biophilia hypothesis asserts a genetic basis for our love of nature, eons of evolution as a social creature have no doubt engendered a similar need for social capital. Human capital in the form of acquired knowledge and skills and physical health further contributes to our QOL. An education, it has been said, makes your mind a better place to spend your leisure time. Skills and knowledge instill pride and status and offer greater opportunities for less dangerous, more fulfilling employment. And few would deny that health plays an important role in QOL. In historical terms, it is built capital that is the most recent arrival, and the basic needs of the human psyche were no doubt largely established before the first tools were invented. While built capital also contributes to fulfilling many human needs, it has shown continuous growth for several centuries, has the greatest negative impact on natural capital, and is becoming increasingly abundant relative to the other forms of capital (Daly, 1993). Thus, increasing built capital, so long emphasized as the critical element in achieving a high QOL, and in the past perhaps justifiably so, may now play a relatively minor role. Built capital continues to play a major role, however, in the depletion of resources, and ownership of built capital strongly influences the distribution of wealth in the current economic system.

## 2. How can we measure QOL?

We must recognize that existing national accounts focus primarily on built capital. To the extent this is true, it would appear that these national accounts may be better measures of our ability to pursue wants rather than needs. If we are to know if our policies for maintaining and increasing QOL both now and in the future are successful, then we will need to develop measurable indicators that serve as suitable proxies for needs fulfillment and QOL.

To state the obvious, we cannot precisely measure QOL. In the words of Clifford Cobb (2000, p. 5) “[t]he most important fact to understand about QOL indicators is that all measures of quality are proxies – indirect measures of the true condition we are seeking to judge. If quality could be quantified, it would cease to be quality. Instead, it would be quantity. Quantitative measures should not be judged as true or false, but only in terms of their adequacy in bringing us closer to an unattainable goal. They can never directly ascertain quality.”

### 2.1. Are objective measures suitable?

In chapter 11, we reviewed several different approaches to objectively measuring the generation of wealth, both natural and human-made, on a national scale. All of

the approaches that have been operationalized appear inadequate as measures of QOL. The problem is that numerous studies have found only weak relationships between objective measures of QOL and the subjective assessments of the same by the subjects concerned (Haas, 1999). However, both these studies and the various types of national accounts seem to include a relatively narrow range of objective indicators, and often place what we consider to be an excessive emphasis on consumption. Quite possibly the problem is that QOL is too rich a gumbo to allow us to recapture its flavor with so few ingredients. We propose then, as a research agenda, a serious effort to measure access to satisfiers for Max-Neef's axiological and existential categories of human needs, for use as indicators of QOL.

Using Max-Neef's human needs as the basis of a QOL measure is a dramatic departure from existing national accounts as well as from most of the proposed alternatives reviewed in chapter 11, differing even in its theoretical underpinnings. Neo-classical economics and GNP are explicitly utilitarian. Within utilitarian philosophy, individual QOL is determined by the degree to which individuals can satisfy their desires, and it is generally accepted that the goal of society is to provide the maximum amount of 'utility' for its citizens. As utilitarian philosophy has been operationalized by neoclassical economics, citizens are best able to determine what provides utility. As it is extremely difficult to measure 'utility' directly, economists have taken to using revealed preferences as a proxy. Preferences are revealed by people's objectively measurable choices in the market. In the market economy, preferences are revealed through market decisions. Market decisions can only be made with money, and even Jeremy Bentham (one of the founding fathers of utilitarianism) believed that "[m]oney is the most accurate measure of the quantity of pain or pleasure a man can be made to receive" (Bentham, 1830). Under this conception of utilitarianism, the philosophy only values end states and requires only 'having' such things as possessions and experiences. Sustainable income accounting, green accounting and measurements of economic welfare are basically just extensions of this philosophy and similarly value only 'having' (Cobb, 2000). In Max-Neef's framework, having things is important, but is only one of the elements required to meet our needs. Thus, a benevolent dictator with the resources to provide us with all the physical things we require for happiness would fail to meet our existential needs for being, doing, and interacting, as well as our axiological needs for creation, participation, and freedom. Also, within Max-Neef's conception, people are not always best able to determine what contributes to their QOL, as discussed above when we distinguished between 'needs' and 'wants'.

The approach we propose, which values human actions independently of their outcomes, has been dubbed the "human development" approach to QOL. Its main proponents include Nobel Prize winning economist Amartya Sen and Martha Nussbaum. In a similar tone to Max-Neef, they argue that 'capabilities' and 'functionings' are critical to QOL (Cobb, 2000; Sugden, 1993; Nussbaum, 1990).

Roughly speaking, functionings correspond to human needs, while capabilities include both states of being and opportunities for doing. In utilitarian theory, we might have several different options, of which we choose one. If all options but that one were eliminated, it would not affect our QOL. In the human development approach, losing options restricts our capabilities and would therefore affect our QOL. In a stark illustration, there is a fundamental difference between someone fasting out of choice or fasting because he or she does not have the option of eating (Kiron, 1997). The human development approach is less concerned with the actual choices that people make than with the options they are free to choose from, and the marketplace is only one of many spheres in which choice is important.

## *2.2. Operationalizing human needs assessment as a measure of QOL*

Measuring the extent to which human needs are satisfied is, of course, an exceptionally difficult task and a highly subjective one. Following the lead of Sen and Nussbaum, it would be most useful to measure capabilities, that is, the extent to which individuals have access to satisfiers. However, as noted in chapter 11 and above, specific satisfiers may vary by culture, and the difference in satisfiers required to meet a human need may indeed be one of the key elements that defines a culture. This means that objective 'QOL accounts' must be very culture specific. Second, as discussed earlier, some satisfiers might help fulfill several human needs, while other needs require several satisfiers. Further complicating matters, satisfiers may change through time. And humans are social creatures who inhabit a complex environment; needs are not satisfied only in regards to the individual, but also in regards to the social group and the environment in which individuals find themselves (Max-Neef, 1992). Finally, while needs are interactive and may complement each other, they are nonetheless different and distinct, and therefore not additive. Abundant access to satisfiers for one set of needs does not compensate for a lack of satisfiers for another set of needs. This suggests that separate 'accounts' should be kept for access to satisfiers of different needs.

In developing QOL accounts based on Human Needs Assessment (HNA), it would be useful to test measurements of satisfiers empirically in studies comparing these objective measures against subjective assessments of QOL to determine their effectiveness. These empirical tests as well as efforts to operationalize HNA accounts must involve people in interactive dialogues which will confirm or refute the validity of the needs Max-Neef specifies, as well as the validity of the satisfiers we use to assess the degree to which needs are met. Such dialogues would almost certainly elicit additions and alternatives to the satisfiers shown in table 3 of chapter 11. While the average person may not always know exactly what satisfiers will best meet his or her needs, interactive discussion with people is nonetheless essential to select and test appropriate indicators. We would also need to develop

group-based methodologies to determine the effectiveness of our indicators in a social setting.

### *2.3. Ecosystem services: indicators to integrate with QOL*

Finally, when measuring QOL, we must account for its relationship with ecosystem services generated by natural capital. In some way or another, all of the human needs listed by Max-Neef depend on natural capital. However, we are tremendously ignorant concerning how ecosystem structure generates ecosystem function, how ecosystem function generates services valuable to humans, how human impacts affect ecosystem functions, and where the thresholds lie beyond which natural capital fails to reconstitute itself. Hence, it is virtually impossible to say precisely how specific ecosystem functions affect specific human needs. Nonetheless, we recognize that the relationship between ecosystem services and human needs is absolutely fundamental. Given the unacceptable risks of overestimating ecosystem resilience or underestimating human dependence on the ecosystem, we assert that a healthy ecosystem is essential to human well-being<sup>3</sup>. A healthy ecosystem is defined as well-functioning, and well-functioning means an ecosystem's ability to supply services. Hence, ecosystem health is a prerequisite to fulfilling Max-Neef's human needs matrix, and any accounting system designed to measure human QOL through time must account for ecosystem health.

### *2.4. The implications of using HNA as a measure of QOL*

It is clear that Max-Neef's approach is very difficult to operationalize, even if theoretically more compelling than the alternatives presented. The debate over which approach to take to national accounting – theoretically sound measures or ease of accounting – is old. As Irving Fisher argued back in 1906, the appropriate measure even of income is one that captures the psychic flux of service (i.e., satisfaction of needs and wants) and not simply the final costs of goods and services (Daly and Cobb, 1989). And at the time Fisher wrote, the absence of suitable data for calculating either psychic flux of service or final costs no doubt led many to ignore the debate as entirely academic, as no doubt some will regard the arguments we are putting forth here. The widespread use of GNP indicates that in practice Fisher lost this earlier debate. However, measures such as the ISEW (preceding chapter; Daly and Cobb, 1989) suggest that the GNP is becoming

<sup>3</sup> Assessing ecosystem health will require another set of indicators and measurements. While we lack space here to discuss the nature of appropriate indicators, Costanza (1992) suggests that indicators must cover at least 3 aspects of ecosystem health, including (1) vigor, which is a measure of system activity, metabolism, or productivity; (2) organization, referring to the number and diversity of interactions between system components; and (3) resilience, referring to a system's ability to maintain its structure and pattern of behavior in the presence of stress.

increasingly less capable of measuring economic welfare, much less QOL. Even if we can never quantify access to satisfiers as accurately as we currently quantify GNP, as Amartya Sen suggests, perhaps it is better to be vaguely right than precisely wrong (Crocker, 1995).

Accepting Max-Neef's human needs matrix as a framework for the specific elements of human QOL, and access to satisfiers as potentially the best objective indicator of QOL, has profound implications with respect to the distribution of wealth and resources and our capacity to sustain human QOL. First, most of the possible indicators suggested by Max-Neef require few, if any, material resources, and hence are not subject to physical exhaustion. Thus, for most elements of human QOL use by one person or generation does not leave less for others. Second, by explicitly accepting that there is a limit to needs, we can limit consumption without sacrificing QOL. This result is critical, because the laws of thermodynamics make it impossible to delink physical consumption from resource use and waste production. As abundant evidence suggests, current levels of consumption could not be sustainably met with renewable resources alone, and therefore, we must limit consumption or else threaten the supply for future generations of life-supporting, non-substitutable, and essential natural capital.

Yet within the current dominant ideology of neoclassical economics with its belief in insatiable wants (which are not distinguished in any way from needs) and the use of GNP as a proxy for QOL, it is unlikely that the current generation will voluntarily limit its consumption for the sake of the future. People are extremely reluctant to sacrifice their own well-being for others, and if wealthy individuals and nations refuse to make sacrifices for the poor alive today, how much less likely are they to do it for those yet to be born? Since in reality wealth translates to power and the powerful make the rules, rules that 'punish' the powerful rarely evolve. In addition, the dominant institution for distributing wealth and resources in use today is the market system; yet it is absolutely impossible for future generations to participate in this system. Only if people accept that limiting current consumption of material resources beyond a certain threshold has little negative impact on the QOL of people alive today, are we likely to create a more sustainable society for the future.

From this perspective, the difficulty of operationalizing Max-Neef's framework may actually be a point in its favor. Why is it that we want to measure QOL in the first place? It is not just to track the rise or fall of QOL, but also to help us create policies to improve it. Simply providing statistical data on QOL is insufficient to achieve this end. It is also necessary to relate those data to theories that show not only why the data are relevant, but also how change can be achieved. Theories concerning QOL and its appropriate indicators are little more than ideologies, and the ideology behind HNA as the basis for QOL accounts provides an important alternative to the ideology behind GNP. To attain a more just distribution of goods and services that generates a greater QOL for all, we

must change people's perceptions about what actually contributes to our QOL. This requires a compelling story supported by statistical measures of QOL, and the story we present is based on the ideological assumptions inherent in the human-development approach to QOL. The very effort to operationalize HNA-based QOL accounts and the extensive dialogue it requires will expose people to the theory behind it. Exposure to a theory is the first step towards acceptance. Once people accept this theory, leaving vital resources for future generations will not be viewed as much of a sacrifice by the current generation. This perception is a vital step towards meeting our goals (Cobb, 2000).

### **3. Development of indicators of fairness in the distribution of wealth and resources**

In chapter 11 we presented the argument that the market system was potentially fair within a generation, since it awarded people their 'just deserts'. However, many of the outcomes we actually see from this system are clearly not fair in most people's eyes. Two possible explanations of this unfairness include the fact that the economic system is only fair if the starting point of all the players is fair, and the fact that there are market failures for many resources, in particular those provided by natural capital. Turning now to justice theory, Rawls defines a fair society as one in which the worst-off individuals are as well off as possible, but does not state what that society looks like. For practical purposes we are left only with the notion that a society is becoming increasingly fair if the worst-off are improving their lot and less fair if the converse is true.

In terms of intergenerational justice, market economics confronts more serious difficulties; future generations cannot participate in today's markets, hence the market system no longer functions. There is no guarantee that these future generations will receive their 'just deserts'. Still, many supporters of the system are reluctant to admit defeat. Instead, they argue that as resources become scarce, prices increase, inducing innovation of substitutes. Thus, future generations will always be provided for<sup>4</sup>. However, if the market fails to place the appropriate price on a resource to begin with, then the price will not respond correctly to scarcity, and there will be no incentive for the market to develop substitutes. By definition, goods and services characterized by market failures are not appropriately priced

<sup>4</sup> However, substantial evidence suggests that previous civilizations have perished from over-exploitation of resources. If we believe the market system is to avoid this fate, we must assume that the profit motive is more powerful than the survival motive, or else that technology has reached a point where infinite substitution is possible. Either assumption is based on faith and inductive reasoning, not science, and cannot be ethically justified if we accept that we have obligations to future generations.

by the market. Justice theory, as we have presented it, would demand three things for intergenerational justice: do not leave the future worse off than it would have been with an equal intergenerational distribution of resources, assume strong sustainability until proven otherwise, and maintain the yields from non-substitutable natural capital.

Rather than attempt the perhaps impossible task of developing a detailed theory of fairness acceptable to 'just deserts' and justice theorists alike, we will seek instead to draw forth a limited number of specific indicators of unfairness and requisites to fairness on which both approaches should agree. These can then form the basis for objective measures of fairness in the following section.

### 3.1. *Natural capital and market failures*

Natural resources, and ecosystem services in particular, are plagued by market failures. As we have argued above, natural capital plays a critical role in meeting human needs and in providing a satisfactory QOL. We can assess how market failures relate to fairness through a close examination of two specific market failures: public goods and externalities (for details, see chapter 11).

#### 3.1.1. *Excludability and 'rivalness'*

Virtually any good or service (or at least specific properties of any good or service) can be classified according to two characteristics: excludability and 'rivalness'. Excludability is essentially a question of enforceable property rights. An excludable good is one that an individual or an institution can keep others from using, and a non-excludable good is one where this is not possible. Since a person can use non-excludable goods whether she pays for them or not, few individuals will pay, and the market will not provide them. A rival good is one where use by one person leaves less for use by someone else and a non-rival good is one where use by one person does not affect the quantity or quality of the good remaining for another user. Essentially, the cost of an additional person using a non-rival good is zero. Since economic efficiency demands that the price of a good be equal to its marginal cost, market provision of non-rival goods will be inefficient. In other words, if there is a price on a non-rival good, a person will use less than if it were free, potentially resulting in a lower QOL for that person; yet additional use would not incur additional costs for society.

Any goods that are not both excludable and rival are therefore not efficiently provided by the market<sup>5</sup>. This is a market failure. Goods such as oceanic fisheries

<sup>5</sup> Note that if people are not the rational maximizers of self-interest depicted by neoclassical economic theory, a market economy could supply public goods and minimize externalities. However, if we accept this supposition to argue that market failures are not a problem, we also undermine the assumptions on which the optimality of market allocation is based.

that are non-excludable and rival are ‘open access’ resources subject to the ‘tragedy of the commons’, and will be overexploited by market forces. Goods such as information (for example, the information stored in biodiversity) that are non-rival, but can be made excludable through appropriate institutions can be provided by the market, but the resulting price will not be efficient. Goods such as the ozone layer or global climate regulation that are both non-rival and non-excludable are pure public goods, and will only be efficiently provided (or preserved) by extra-market institutions. Many types of natural capital are complex mixtures of these different categories of goods. For example, trees in the Amazon when seen simply as timber are market goods, but when in areas too vast to monitor, they are open access resources. Genetic information contained within those trees could be made excludable by the Convention on Biodiversity, but the information is not depleted no matter how many people use it. As contributors to rainforest function, these trees provide the ecosystem services of climate regulation, gas regulation, disturbance regulation, habitat, and a host of other pure public goods. It is worth noting that most life-supporting services of natural capital are pure public goods.

The relationship between excludability, rivalness, and fair distribution can now be drawn out. *Open access resources* in a market system are subject to first-come first-serve treatment, and lacking proper institutions, those who arrive too late receive nothing. Few disagree that this outcome is both unfair and inefficient. *Non-rival excludable goods* will not be efficiently distributed according to economic theory, but it can be difficult to assess what is fair in this case. If someone invents something, it is probably fair that she receives some payment for it, yet she would not receive payment if it were made non-excludable. If the inventor receives payment from individuals using the invention, then it is likely to be used less than is socially optimal (at least assuming that it is an invention that makes a positive contribution to QOL). If we accept the economists’ contention that the free market is fair, then the distribution of *market goods* will also be fair, but only if we assume a fair initial distribution of resources. However, once a *pure public good* is made available, fair distribution is automatic. Whoever wants to use it can do so, and to the extent they desire without leaving less for anyone else. It follows then that destruction of public goods for private gain is clearly unfair.

The next issue we must examine then is the relationship between natural capital, market goods, and public goods. We can distinguish two types of natural capital: goods and services. Goods are simply the raw material inputs from nature, such as timber, fish, and minerals. All natural capital goods are rival, in that if one person removes a tree from the forest or a fish from the ocean, it is no longer there for someone else to remove. Whether or not natural capital goods are excludable depends on property rights and how well they are enforced. For example, oceanic fisheries are mostly non-excludable, while forests on private land are theoretically excludable. On private land in the middle of the Amazon, of course, it may not be possible to enforce property rights, and the trees become non-excludable.

Once a natural capital good is harvested, however, it is almost always excludable. Hence, natural capital goods are essentially market goods. Natural capital services, on the other hand, include such things as climate regulation, gas regulation, water regulation, etc., which for the most part cannot be owned, and use does not lead directly to depletion. These services are public goods.

What is the relationship between natural capital goods and services? Natural capital goods as described here can be thought of as components of ecosystem structure – that is, they are the mineral resources, organic matter, and individuals and communities of plants and animals of which an ecosystem is composed. When all the structural elements of an ecosystem are in place, they create a whole that is greater than the sum of the parts, and generate ecosystem functions as an emergent phenomenon from the complexity of ecosystem structure. An ecosystem function that has value to human beings is called an ecosystem service. As all market goods must be produced from the structural elements of natural capital, and depletion of structure diminishes function, production of market goods in general must reduce the ability of the ecosystem to generate public goods (Farley, 1999).

How does this relate to the fairness question? Market goods specifically benefit individuals and public goods benefit everyone, hence the production of market goods implies the destruction of public goods for individual benefit. Thus, there is built-in unfairness in the production of market goods. ‘Just deserts’ would demand that whoever produces or consumes a market good compensate all those who suffer from its loss. Justice theory would tolerate the increasing unfairness inherent in ever-greater conversion of natural capital to market goods only as long as it continues to make the worse off better off. Eventually, excessive production of market goods may undermine ecosystem health and the ability of global ecosystems to generate critical life-support functions, making everyone worse off. The outcome in this case would be extreme unfairness, particularly towards future generations.

### 3.1.2. Externalities

Another market failure closely related to distribution and fairness is that of externalities. Externalities occur when one actor’s activity causes unintended impacts on another actor, and no compensation occurs. Because no compensation occurs, externalities do not enter into market decisions. Many negative externalities are in the form of destruction of public goods provided by natural services. In fact, this is exactly what was described in the discussion of public goods; one actor harvests ecosystem structure, which has an uncompensated negative impact on other individuals who previously benefited from the ecosystem services generated by that structure. Similarly, all negative externalities are likely to contribute to unfair distributions of wealth and resources, as some individuals benefit while others pay the costs. Templet (1995a) and chapter 11 provide many empirical examples of this.

Hence, both justice theory and ‘just deserts’ should agree that to the extent society allocates resources (and particularly essential ones) characterized by market failures via the market system, society is unfair to both the present and the future.

### 3.2. *The elimination of poverty*

A second point of agreement should be that poverty – broadly defined as the lack of access to the satisfiers required to fulfill human needs – in a society with sufficient resources to prevent it is unfair. This is very clear in the case of Rawlsian analysis. The poorest individuals are the worst off, and if an alternative society would make them better off, then the society in which they exist is unfair. Neoclassical welfare economics, whose foundations are utilitarian philosophy and diminishing marginal utility, certainly should call for elimination of poverty. If the goal of society is to maximize utility summed over individuals, and wealth and income offer diminishing marginal utility, then clearly an additional unit of wealth for a poor person provides more utility than the same unit would provide for a wealthy person. Economists reluctant to accept this conclusion have asserted that different people have immeasurably different capacities to enjoy, and hence we cannot make interpersonal comparisons of utility. Thus, economists have focused on maximizing production rather than utility, which effectively skirts the distribution issue (Robinson, 1964). However, can anyone be foolish enough to believe that on average a unit of additional income would not benefit someone living in absolute poverty more than the same amount would benefit a millionaire? People may have different capacities to enjoy at some level, but our biological needs are the same, and the additional utility when one moves from below these needs to above them is obviously immense.

It is far less obvious why the ‘just deserts’ principle should call for alleviation of poverty. Solow (1993) has pointed out that the whole discussion of sustainability generally assumes that some sacrifices may be required by this generation to make future generations better off. If we are concerned about the potential poverty of people not yet born, what ethical system will allow us to ignore the actual poverty of those alive today? The ‘just deserts’ theorists might claim that the market is fair within a generation, but not between them, because future generations cannot participate in today’s market. Therefore, ‘just deserts’ could justify concern for providing sufficient resources for potential future generations while essentially ignoring poverty today, strange as this may sound. Further, most Americans profess to believe that the current distribution of income in the USA is unjust, yet they remain reluctant to provide income to those who have not ‘earned’ it. However, the ‘just deserts’ argument basically claims that people are paid according to their contribution to society. Yet the last two centuries have seen a fairly steady upward trend in real incomes. This is not so much because people

make more substantial contributions to society on their own, but because they benefit from past contributions to productivity. That is, many people are awarded more than their just deserts already, and if anybody is to be awarded more than they deserve, shouldn't it be the worst-off? Further, if a lack of opportunity is the cause of poverty, then the fairness criterion of 'just deserts' is not met. It would appear then that the 'just deserts' argument should at a minimum favor equal opportunity. Perhaps direct transfer payments to the poor are inappropriate under this ethical system, but at a minimum, guaranteed jobs at a living wage and equal access to education and job advancement could be defended (Lane, 1986).

### 3.3. *Maximum income level*

A third point of agreement should be that unlimited income and accumulation of material wealth on a planet with finite resources is unfair. Justice theorists could argue that allowing unlimited accumulation of wealth creates incentives that increase total production and make the worst-off better off than before. 'Just deserts' theorists could argue that the wealthy are wealthy solely because they have earned it, and society has no right to take away someone's just deserts. However, on a finite planet subject to the laws of thermodynamics, if too many people consume too much, they will reduce the resources available to future generations. This means that in the future, society may be worse off than it is today, or individuals in the future will have to work harder than individuals today to consume as much. Thus, the 'just deserts' principle would not apply between generations. 'Just deserts' would demand that society today cannot consume so much that future generations lack the same opportunities to be rewarded for their work as we enjoy. We have already argued that society is consuming too much by these standards. However, to demand that society as a whole must reduce consumption and yet not demand that those in society who have the most also restrict consumption simply cannot be defended in terms of 'fairness'. Some people might go on to argue that the wealthiest are not necessarily the largest consumers. If this is so, then there is even greater reason not to allow unlimited accumulation of wealth, as we shall explain.

Why would anyone accumulate wealth if they do not intend to consume it? The only reasonable answer is to amass power and status. Certainly, no one can rationally argue that wealth does not bring power in existing political systems. While many people argue that inequitable distribution of wealth is acceptable, far fewer accept that inequitable distribution of power is (Lane, 1986), at least in those countries that profess to be democratic. What's more, once people have accumulated power, they then use that power to accumulate even more wealth and power. For example, it is painfully clear that corporate donations to political parties in most countries are not made to strengthen democracy, but rather to promote legislation that provides greater economic advantage for the contributors. Great

wealth allows people to get more than their 'just deserts' in the political arena, and then use that power to take unfair advantage in the economic arena as well. Examples of this were provided in chapter 11, and also in Templet (1995a,b). Strangely enough, however, Americans are far more opposed to limiting maximum income than they are to ensuring a minimum income (Lane, 1986). Americans seem to have two completely incompatible core beliefs: we live in a democratic society, and anyone is entitled to become filthy rich. However, as Supreme Court Justice Louis Brandeis said, "We can have a democratic society, or we can have the concentration of great wealth in the hands of the few. We cannot have both."<sup>6</sup>

These last two shared principles of a fair society outlined here are hardly modern. Perhaps the earliest known western philosopher, Thales of Miletus, wrote in 1600 BC: "If there is neither excessive wealth nor immoderate poverty in a nation, then justice may be said to prevail" (Quoted in Durning, 1992, p. 143).

### 3.4. *Geographical fairness*

Notions of fairness should not depend on geographical proximity. Historically, there may have been a genetic justification for greater fairness towards one's neighbors, since they were more likely to share one's genes. In some countries this may still hold. In others, immigration mixes the gene pool, and ease of travel continues to do so. In any case, we have argued that we have ethical obligations to the future, including far distant generations that are as little related to us as anyone in the remotest corner of the earth. Thus, rather than searching for specific nuances of fairness that apply across space, we will instead focus on two particularly egregious examples of unfairness.

#### 3.4.1. *Third world debt*

Total third world and Eastern European debt is now in the neighborhood of \$2.6 trillion dollars, and in some countries up to 40% of government expenditures go towards servicing the debt. Currently there is net flow of debt-related financial capital from the poor countries to the rich, and this has been the case for at least

<sup>6</sup> One school of philosophy argues that simply ensuring a more equal distribution of wealth will do little good. There are numerous spheres of justice, each of which pertains to a different social arena. In western capitalist society, monetary wealth is dominant. Distributing wealth more equally would require a powerful political apparatus, and politics would replace wealth as the arena of dominance. If political power were divided more equally, than the dominance of monetary wealth would return. Justice is only achieved if we sever the links between the numerous spheres of justice so that inequality in one sphere cannot translate into inequality in another (e.g., Walzer, 1990). While the argument is compelling and autonomy of spheres of justice should be pursued to the extent possible, it seems that relying solely on this approach to justice would require far more radical changes to society than those we will propose.

10 of the last 20 years. Many of these poor countries are forced to spend more on debt service than on health and education combined (Roodman, 2001). Debt crises have caused considerable hardship, and most recently high loads of short-term debt were linked to currency crashes and severe depressions, which began in South East Asia. The unfair nature of this debt is obvious in the terms of 'justice theory'. Nonetheless, the 'just deserts' school claims that these countries entered into these agreements of their own free will and are therefore obliged to honor them. This argument holds little weight. First, despotic dictators acquired much of this debt. Marcos of the Philippines, Mobutu of Zaire, Suharto of Indonesia and the Duvaliers of Haiti are some of the most infamous, but there are dozens of examples. Some of the loans they acquired went to corrupt cronies, some went into bank accounts in Switzerland and other financial havens. Worse, much of the money was used to maintain illegitimate power. Now that these dictators have been thrown from power, western banks claim that the very people this money was used to subjugate must repay this debt. Even if the lenders were ignorant of how their money was used, and it is clear that they were not, they would not be morally entitled to collect this debt. Nor are they according to established precedence in international law. In 1898, after the USA essentially seized Cuba from Spain in the Spanish American war, the USA declared all Cuban debt to Spain null and void, because it was 'odious debt'. The argument was that the money had been loaned to dictators that did not represent the people, and therefore the people had no obligation to repay it (Chomsky, 1998). As John Maynard Keynes (1919, p. 210) maintained, "nations are not authorized, by religion or by natural morals, to visit on the children of their enemies the misdoings of parents or of rulers." If we cannot visit them on our enemies, we certainly cannot visit them on anyone else. Demanding repayment cannot be considered a case of 'just deserts'<sup>7</sup>. The numerous other arguments for canceling the debt typically accept the false premise that we are demanding payment from the actual debtors, and need not be reviewed here.

### 3.4.2. *Ecological debt*

If there is any moral obligation to repay a debt, it is the obligation of the overdeveloped countries (ODCs)<sup>8</sup> to pay the less developed countries (LDCs) for centuries of accumulated ecological damage. The ODCs are responsible for

<sup>7</sup> The fact that the USA and other western nations now insist (with minor concessions) on repayment of many similarly odious debts is based on a different but far more ancient concept, might makes right.

<sup>8</sup> We define overdeveloped countries as those where the net marginal benefits to aggregate QOL for the country from consumption and economic growth are less than or equal to zero, or alternatively, where the marginal external cost of this consumption imposed on other countries and future generations is greater than aggregate marginal benefits.

the vast majority of natural resource use and waste output. Even though much resource extraction takes place in the LDCs, it is the consumers in the ODCs who are ultimately responsible. Toxic chemicals produced in the ODCs are now found even in Antarctica (McGinn, 2000). Public outcry over pollution in the ODCs has forced many factories to shut down and relocate to the LDCs where environmental laws are weaker or enforcement is lax. Over-consumption of potentially renewable natural resources not only threatens to leave less for future generations but for the present as well. For example, European nations have purchased fishing rights from some West African countries, and the fishermen in those countries find the resulting depleted stocks are adversely affecting their livelihood (Brown, 1998). Oil production by western companies in the Nigerian delta region has severely damaged one of the world's largest mangrove ecosystems, with seriously adverse affects on the health of the local communities (Constitutional Rights Project, 1999). Worse, excessive burning of fossil fuels now threatens to induce (if it has not already) global climate change. Resulting sea-level rises will literally inundate low-lying island countries such as Mauritius and the Seychelles, and threaten coastal zones of numerous others. Hypocritically, the ODCs clamor that Brazil's destruction of the Amazon threatens biodiversity and will contribute to greenhouse gases, yet the clearing of forests over past centuries in OECD countries has contributed more CO<sub>2</sub> to the atmosphere than is contained in the entire Amazon (Bueno and Marcondes, 1991). The LDCs have far fewer resources with which to cope with global warming, are more dependent upon agriculture, which is the sector most affected, and hence will likely suffer more from the impacts. Now that ODC-caused problems such as ozone depletion and global warming have reached crisis proportions, all countries must cooperate to minimize damage. In many cases this might mean slower economic growth for those countries with the highest proportion of citizens in absolute poverty, who could still benefit from greater production and consumption. There is little serious talk of compensation for ecological damages caused, and most ODCs are arguing that technologies which reduce greenhouse gas emissions and replace ozone depleting substances should be sold to the LDCs, not given. Some 'just deserts' theorists such as Lawrence Summers (1991) argue that we should ship toxic wastes to the LDCs since (1) they are 'under-polluted', (2) they value safe environments less, and (3) the lives of people in LDCs are worth less. However, one cannot credibly argue that the poor countries receive their 'just deserts' when no compensation occurs for the harm they suffer at the hands of the ODCs.

#### **4. Approaches to measuring fairness**

Measuring an ethically based notion such as fairness is perhaps even more difficult than measuring QOL. In this section we will not lay out measures of fairness in detail, but rather suggest possibilities that would capture elements of fairness too

often ignored. Many of these suggestions would require substantial amounts of research and modification to be made practical. This does not mean that they are 'naïve'. Bear in mind that when GNP-style national accounts were first suggested, we did not have the data available to calculate them, and it took decades from first discussion to practical implementation. As suggested above, a good starting point for measuring fairness should focus on objective indicators of unfairness and requisites to fairness on which both the 'just deserts' and 'justice theory' schools agree. We will therefore look at ecosystem health and market failures affecting the environment as a measure of fairness, as well as income distribution and the ability of wealth to provide political power.

#### *4.1. Ecosystem health and functioning markets*

We concluded above that both damaging public goods for private gain and negative externalities are by nature unfair. Damage to public goods and negative externalities result from normally functioning markets. Extra market institutions, such as the government, must be responsible for supplying and preserving public goods. Thus, the extent to which a society supplies and preserves public goods and eliminates negative externalities (especially those which affect public goods) is probably a reasonable indicator of its fairness. Alternatively, if society subsidizes market goods or market-good production that do not generate positive externalities, and particularly if the market-good production in question degrades public goods, the subsidies are indicators of unfairness. Templet (1995a) has used various types of government subsidies as an indicator of unfairness, verifying their validity through statistical analysis (see chapter 11).

To reiterate, most environmental services are pure public goods. All market goods require raw material inputs and generate waste outputs, and raw materials are extracted from ecosystem structure that would otherwise generate ecosystem function. Thus, production of market goods in general creates negative externalities in the form of damage to environmental services. We defined ecosystem health above as the well-functioning of an ecosystem, where well-functioning is the ability of an ecosystem to generate services. Obviously, life-support functions – by which natural capital reconstitutes itself – are the most important of these services. Thus, a healthy ecosystem generates public goods, and is not too severely affected by the negative externalities of market-good production. Further, we have argued that ecosystem health plays an important role in the satisfaction of all human needs, some directly, some indirectly. Particularly in rural and coastal areas, many people depend directly on ecosystem goods and services for their livelihood, and the poorest often depend on healthy ecosystems for their survival. Some of the endless examples of this include mangrove ecosystems that provide building materials and food sources and act as a 'nursery' to many fish species upon which local populations depend (e.g., Nickerson, 1999); extractive reserves

in the Amazon that sustain a number of the region's poor (Schwartzman, 1989); or the forest services in Thailand and Ivory Coast (and no doubt worldwide) shown to significantly improve local crop yields (Panayatou and Parasuk, 1990; Ehui et al., 1990). Thus, it would appear that ecosystem health could serve as an important indicator of fairness both within and between generations.

However, accepting that ecosystem health is a reasonable indicator of fairness still provides little insight into how we could use it as an indicator. Some ecosystem services accrue to people at the local level, as described in the previous paragraph. Others are regional, such as the impact of deforestation on rainfall, regional climate, and agricultural yields hundreds or even thousands of miles away. Yet others are international, such as global climate regulation and planetary life-support systems. And just because someone lives far from unpolluted air and water, that does not necessarily imply unfairness. For example, Donald Trump at home in Trump towers with its carefully controlled climate is not exactly surrounded by direct and tangible ecosystem services, but he does have the capacity to substitute for them on a small scale, and he has access to them if he so desires. It would appear then that the appropriate indicator of fairness would be access to the services provided by healthy ecosystems. If someone lives in a degraded ecosystem because it is the only place they can afford to live, that is unfair. Considerable research is required to operationalize ecosystem health as an indicator of unfairness (see Costanza, 1992), but the concept does show promise.

#### *4.2. Poverities and pathologies*

If poverty is unfair as we argued above, then one measure of fairness should be the degree to which a society has eliminated poverty, defined as the inability to satisfy any one of the human needs. In this context, Max-Neef refers to 'poverities' and not just poverty. The problem with poverty is that it generates pathologies in the systems in which it is found. Max-Neef (1992, p. 200) provides the following examples: "... persistent economic pathologies are unemployment, external debt and hyperinflation. Common political pathologies are fear, violence, marginalization, and exile." This notion of system-wide pathology also has counterparts on the level of the individual. For example, subsistence poverty creates the pathology of malnutrition, protection poverty creates the pathology of preventable disease, affection poverty creates the pathologies of violence and intolerance. One could use the presence of such pathologies as indicators of poverities and hence as a measure of the fairness or unfairness of a given society.

#### *4.3. Wealth and power*

We have also argued that the concentration of material wealth and power is an indicator of an unfair society, through both space and time. The simplest measures of fairness include the percentage of the wealth owned by the top 1% of the

population and the top 20% relative to lower deciles, both within and between countries, and the trend in fairness can be determined by how these statistics change over time. In the USA in 1995, the Federal Reserve estimated that wealth of the top 1% was greater than that of the bottom 95%, up from the bottom 90% only three years earlier. In 1998, the people in well-to-do countries were 82 times better off than people in countries where the poorest 20% of the world's people live. Three decades ago, they were 'only' 30 times better off (Gates, 1999). Since wealth implies excessive consumption and power in modern society, concentration of the wealth is probably the best single indicator of its unfairness within a generation. In contrast, total wealth, independent of distribution, may be the best indicator of unfairness towards future generations. Thus, in terms of national measurements, we could consider societies such as the OECD countries the least fair through time, while the Latin American countries with their notoriously unequal distributions of wealth show greater domestic unfairness in the current period. By international measures, the OECD countries both benefit the most from current unfairness and impose the greatest costs on future generations.

We should also attempt to measure to what extent wealth buys political power. In the USA in the year 2000 election campaign, less than 1% of the population donated 71% of Bush's campaign donations, and 61% of Gore's. Not surprisingly, polls find that policies espoused by Bush and Gore were far more closely aligned with their big donors' views than with the views of average Americans. For example, Gore wanted to use the government surplus to pay down the national debt, and Bush proposed tax cuts. Almost two-thirds of voters preferred investment in health care and education, with the remaining one-third divided between debt reduction and tax cuts. In contrast, 52% of major donors favored tax cuts or debt reduction, with Republicans the most in favor of tax cuts (Lake and Borosage, 2000).

The simplest indicator of the influence of wealth on political power in nominally democratic societies would be to calculate the share of donations provided by the top 1%, 5%, and 10% of a society, as well as the percentage of the population that donates nothing. More difficult but more interesting would be to estimate the correlation between a politician's votes and the preferences of his largest donors vs. the preferences of his constituents. More difficult still but also interesting would be to calculate a Gini coefficient of political donations and lobbying expenditures by both eligible voters and corporations. Commonly used to compare income distribution between nations, the Gini coefficient (GC) is simply a measure of the area between the Lorenz Curve and the 45-degree equality line. The Lorenz curve is a diagram showing the cumulative percentage of national income (or in this case political donations) received by a certain percentage of individuals or households (or in this case donated by a certain percentage of individuals and corporations). A GC of zero refers to a perfectly equal distribution of voter donations (or income) and a coefficient of **one** to the case where one person makes all the donations (or earns all the income).

Corporations must be included in these calculations because their dollars have just as much influence as the dollars of citizens. Non-voting but eligible voters must also be included in a democratic society. This measure could be used to compare politicians within a country with each other and also to compare countries. Of course, this measure is only applicable in the nominally democratic societies on the higher end of the income scale, where individuals have sufficient resources to donate to politicians. Other measures must be developed for the bulk of the world's countries. The disadvantage with the GC measurement is that it requires explanation to understand what it measures, and therefore would be primarily useful for comparative purposes when the user only needs to understand that a higher GC indicates a less equal distribution than a lower one.

It would also be worthwhile to examine the relationship between gross political donations and voting records or political donation GCs and voting records on issues that affect the environment. As discussed in chapter 11, Templet (1995a,b) found that candidates with larger campaign donations have statistically significant worse environmental voting records as measured by the League of Conservation voters. More generally, Boyce et al. (1999) found that as political power concentrates, pollution increases and public health and welfare decline.

#### *4.4. A Quality of Life Gini Coefficient?*

While Gini Coefficients (GC) are used to calculate fairness in income distribution, our concern with fairness is not limited to the distribution of income, but also to the distribution of all the factors that contribute to a high QOL. This raises the question as to whether a GC based on the Human-Needs approach to QOL accounts proposed above – a Quality of Life Gini Coefficient (QOLGC) – might be a more appropriate measure of fairness. While quite an abstract concept and currently beyond our means to calculate, the QOLGC would capture many aspects of fairness not captured by the standard GC. However, there are some serious problems with this approach. First, we would need to assign a specific number to people's QOL derived from objective measures of people's access to satisfiers of human needs, or at the very least a cardinal measure of the level of satisfaction of each specific human need. Second, not all satisfiers depend on the consumption of physical resources. Those that do not consume physical resources then may not impinge on others' ability to enhance their own QOL, and hence it is not 'unfair' if one group has more than another. In addition, excessive consumption of physical resources is unfair, but beyond a certain level it probably fails to contribute substantially to QOL, and therefore would not be captured in objective measures of QOL. This point was discussed above in relation to 'violators and destructors', 'pseudo-satisfiers', and 'inhibiting satisfiers'. While these false satisfiers may ultimately be destructive of QOL, people may use considerable resources to gain access to them, and this access should be included

in any measure of fairness. That is, rather than a QOLGC, a more broad-spectrum GC designed to measure fairness should be based on access to satisfiers, violators and destructors, pseudo-satisfiers, and inhibiting satisfiers.

Further complications arise if we attempt a broad-spectrum GC-like measure of fairness across nations. Satisfiers are culturally specific, so it is very difficult to judge fairness in terms of access to satisfiers across culture. What's more, some countries emphasize satisfiers that are by nature less fair. Specifically, many national cultures emphasize consumption as a satisfier and consumption depletes the world of resources that could otherwise be used by other individuals and other generations. As noted earlier, consumption is often an inhibiting satisfier or for many human needs a pseudo-satisfier, and, in excess, a violator and destructor. Thus, attention in these cultures to consumption has probably led to reduced access to family, community, nature, etc., and reduced satisfaction of human needs. However, one cannot claim that American society, for example, has been treated unfairly because we build strip malls and sit through traffic jams that reduce our QOL.

For international measures of fairness then, perhaps the best approach is to calculate a simple income-based global Gini-coefficient. Income is probably the best measure of consumption of physical resources, which due to the laws of thermodynamics deprives others of access to those resources and spews waste into the environment, and hence may be the best indicator of fairness. To our knowledge, the GC has never been used to calculate trends in concentration of wealth on an international level. It would be possible to calculate the GC of all the nations by using per capita income or of the entire global population ignoring national boundaries and using individual incomes. In either case, it would be best to adjust for purchasing power parity. Both measures would convey useful information and statistics are readily available<sup>9</sup>. These measures could be tracked through time to indicate whether global fairness in income distribution is improving or declining.

## 5. Implications of the relationship between fairness and QOL

It is implicit in the definition of unfairness that those who experience it suffer as a result and enjoy a lower QOL than they would if treated fairly. However, unfairness that is attributable to the actions of others presumably would not occur unless someone else benefited from it or at least perceived a benefit from it. Certainly the common perception is that reducing unfairness must also reduce the QOL of those who benefit from it. The fear on the part of the affluent and powerful that a fairer allocation of resources will inevitably reduce their QOL is a major obstacle

<sup>9</sup> There is reasonably good data available on per capita income in different nations, but data on income distribution within nations is likely to be less accurate.

to greater fairness nationally, internationally, and intergenerationally. Since the affluent and powerful have the greatest ability to change the current distribution, this is a serious obstacle to greater fairness. However, significant evidence suggests that a fairer distribution of wealth and resources may actually improve the QOL, not only for those who are currently impoverished, but for the affluent as well.

### *5.1. Positional wealth*

First, we return to the fact that above a certain level, resource consumption and wealth may be 'positional', that is, we derive QOL from comparing our position with that of others. It appears that we are currently engaged in a never-ending wealth and consumption race, where greater consumption by our reference group demands greater consumption on our part simply to maintain the same relative position. With current economic growth patterns leading to greater concentration of the wealth in the hands of the few, the majority of the population is falling behind in this race. The wealthy obviously compare themselves with each other and not with the poor, and therefore they are not achieving greater QOL either. To the contrary, the blind pursuit of positional wealth and consumption places substantial demands on our time and resources, and leaves us with ever less ability to meet our other human needs (Frank, 1999; Broome, 1991). Further, as all market consumables must be produced from natural capital, we inevitably diminish the ability of natural capital to generate public goods. Hence, the more resources we consume in this positional race, the more natural capital is depleted and the fewer ecosystem services we enjoy. Eventually, we risk the destruction of life-supporting natural capital, threatening our very subsistence. Basic subsistence is certainly not a positional good and the loss of life-supporting natural capital will have an unacceptable, negative impact on global QOL. In Max-Neef's terms, excessive consumption or accumulation of natural capital is a pseudo-satisfier, and if carried to extremes becomes a violator and destructor.

If above a certain level, positional wealth and consumption matters more than absolute wealth and consumption, then if we could somehow reduce all consumption above that level by 90%, for example, people might suffer little direct change in their QOL. Indirectly, lower consumption needs would require less work, leaving more time to pursue satisfaction of other human needs. Ecosystem services would be more abundant, contributing to the fulfillment of all of our needs. We would move farther from ecological thresholds, be relieved of the stress of worrying about ecosystem degradation, and better fulfill our need for protection. Since ecosystem services are public goods, this would also be fairer to both current and future generations.

### *5.2. Income inequality as a detriment to QOL*

As mentioned earlier, QOL was first introduced as a concept to address issues such as increasing crime rates in a society experiencing ever-greater economic

production. Thus, almost by definition, crime – and in particular violent crime – reduces QOL. In terms of human needs assessment, violent crime reduces society's ability to satisfy the need for security. It is fairly obvious that absolute poverty provides an incentive to commit crime. However, numerous studies have found significant correlations not only between poverty and violent crime but also between income inequality and violent crime, even when controlling for poverty (Kennedy et al., 1998; Hsieh and Pugh, 1993; Fajnzylber et al., 1998). QOL is also an important concept in the field of medicine, and *ceteris paribus*, most people would agree that ill health reduces QOL. Again, numerous studies have found a significant correlation between poor health and income inequality (Lynch et al., 1998; Kawachi et al., 1997<sup>10</sup>). For example, Wilkinson (1996) found that among developed countries, it is not the richest societies that have the best health, but those that have the smallest income inequality between rich and poor. Both inequality and relative poverty translate into increased death rates. Many of these studies of both violence and health find that it is the lack of social cohesion, or social capital, resulting from income inequality that contributes to these undesirable outcomes. It is likely that social capital contributes to QOL in many other ways not captured by these studies and offers yet another reason that fairness contributes to QOL.

### *5.3. Do we still need incentives to produce?*

As a final thought on the relationship between fairness and QOL, Rawls (1971) initially justified some inequality because it provided incentives for greater production and hence increased the QOL of the worst-off. However, ever-greater production on a finite planet is impossible. Beyond some point, the costs economic growth imposes in terms of diminished ecosystem services outweigh the benefits of greater consumption. If we have not yet reached the point where this occurs, we are probably nearing it. Thus, it is increasingly likely that we would all be better off if there were fewer incentives to produce, not more. To the extent that this is the case, justice theory should call for greater equality.

## **6. How do we achieve sustainable, fair, and high QOL?**

The discussion so far has addressed the definition of QOL and of fairness, suggested indicators to serve as proxies for the two, and examined their relationship to each other. This discussion is only of use, however, to the extent that it can suggest policies that will lead to a fair distribution of wealth and resources, a prerequisite for ensuring the best possible QOL for this and future generations. What would such policies look like?

<sup>10</sup> See <http://www.worldbank.org/poverty/inequal/abstracts/health/read.htm> for other examples.

It is quite likely that current consumption levels are unsustainable and threaten the QOL of future generations, and continued economic growth is sure to make them so. We believe that to achieve sustainability at the local, national, and global levels, we must respect the 6 Lisbon Principles as outlined in chapter 11: responsibility, scale-matching, precaution, adaptive management, full cost allocation and participation (see chapter 11 or Costanza et al., 1998). Fairness requires (at a minimum) healthy ecosystems, an end to poverties, and limits on wealth and consumption. It is further enhanced by the provision of public goods and diminished by over-consumption of market goods. QOL is enhanced by increasing our ability to satisfy our human needs or by reducing our wants. Perhaps the most important conclusion of analysis up to this point is that QOL, fairness, and sustainability are intimately linked and predominately complementary. The question is, what general policies will help us achieve a sustainable future with a high QOL for all?

The issue that most directly links sustainability, fairness, and QOL is the accumulation and consumption of wealth and resources. At the risk of ad nauseam repetition, consumption of physical resources deprives others of access to those resources, degrades the environment, threatens our planetary life-support functions, and diminishes other environmental services that benefit all. While there is no fixed link between consumption above a certain level and QOL, there is the widespread and growing perception that we would all be happier if we could just consume a bit more, and governments measure their success in terms of how well they achieve this goal. This is an ideological position that is not well supported by existing evidence. If excessive consumption is not necessary for QOL (and in fact may reduce it) and is unfair and threatens sustainability, why is increasing our production and consumption not just a national but a global obsession? More important, how can this be changed?

We will present two important answers to the first question. Detailed answers to the second question do not yet exist and those that do exist are subject to intense debate and would require innumerable volumes to elucidate. We will, however, suggest some general policies for achieving this goal.

### *6.1. Current world setting*

#### *6.1.1. The changing world*

As the first part of our answer to the first question, we must remember that existing social, economic, and political institutions, as well as academic disciplines, evolved at a time when natural resources and ecological services were vast relative to the human presence, tightly bonded communities were essential to survival, and human impacts were relatively small and local. Scarcity of human-made and market goods were the binding constraints on improving QOL. Economics has been called the science of scarcity, dedicated to the allocation of scarce resources

among alternative ends, and the market system historically was remarkably good at producing consumer goods and improving the QOL (at least as measured by longevity and health) from generation to generation. The effectiveness of the market system in meeting our needs in a world of plenty influenced our value system, promoting those values of individualism, competition, and materialism, which helped the market economy to function. Now, however, natural resources and ecosystem services have become the scarce goods, but we are slow to adapt to this change. We must develop a system in which an economic equilibrium will be compatible with an ecological equilibrium, an issue neglected by traditional economics. That is, we must fit the scale of our economic system within the scale of the ecosystem that sustains it. Also, resource exhaustion and environmental degradation now threaten to make future generations worse off than the present, so the issue of distribution both within and between generations must become a central focus (Daly, 1991; Costanza et al., 1991).

The problem is that values that helped us achieve desirable ends under one set of circumstances seem to lead us towards undesirable ends under another, and cultural values can be slow to change.

Fortunately, human economic systems are dynamic; they evolve and adapt in response to changes in the human environment. For example, the development of agriculture required the innovation of property rights to land, with radical implications for existing economic systems. Now, a growing body of scientific literature suggests that human activities threaten resources such as the ozone layer and climate stability, whose efficient allocation is not amenable to the type of property rights and associated values underlying our current economic system. Hence, we require a fundamentally different way of looking at economic development taking place within the earth's life-support system. Sustainability demands that we extend our social goals to address the issues of scale and distribution in addition to efficient allocation. We have sacrificed other human needs on the altar of production and we must now attend to these if we hope to increase our QOL. However, social evolution is slow, and the changes we are discussing have arrived very quickly. People are slow to accept new ideas, and institutions and individuals in power are reluctant to alter the society that confers that power. Thus, many continue to act as if increasing consumption is the best path towards a high QOL.

#### 6.1.2. *"The Good Life at a Great Price, Guaranteed<sup>11</sup>"*

The second answer to why we have a global obsession with economic growth and consumption is that the market system as it currently exists provides a serious

<sup>11</sup> The Sears advertising slogan, which the Sears CEO says is "built around our core value proposition" (Martinez, 1999).

obstacle to the diffusion of ideas concerning the growing need for environmental services and non-marketed satisfiers of human needs. Most people get information and ideas through profit-driven media that depend on advertising for survival. In contrast to 70 years ago, when most words a person heard were spoken to them or to someone nearby, today most words we hear are direct sales pitches and the programs sponsored by them (Durning, 1992). Insidiously, advertising is only profitable if it convinces us to buy. Therefore, virtually all advertising is designed to stimulate our demand for market goods, and businesses are betting an estimated \$652 billion per year that the strategy is effective<sup>12</sup> (International Advertising Association, 2000). Virtually no money is spent convincing us to prefer public goods or other non-marketed satisfiers of human needs, and such advertising would not automatically generate the revenue to be self-supporting. Since we have limited time and income to spend on satisfying our needs, if we spend more on one thing, we must spend less on another. Economists argue that the consumer is sovereign and is best able to determine what activities most increase his/her QOL, so the impact of advertising on relative preferences need not be a problem. Advertising will make people spend more on market goods than non-market goods, but only because it has altered their psyche to make those goods have a higher impact on their QOL. Unfortunately, stimulating demand for consumer goods means greater depletion of natural resources and expulsion of waste into the environment. Essentially, advertising convinces us to damage or destroy public goods for individual gain. Sovereignty over preferences for market goods for some consumers denies other consumers sovereignty over their preferences for public goods.

Further, the existence of social traps means there is serious reason to doubt that people make the best decisions regarding their QOL. Costanza (1987) defines “[a] social trap [as] any situation in which the short-run, local reinforcements guiding individual behavior are inconsistent with the long-run, global best interest of the individual and society.” At least five types of social traps have been identified. First is time delay, where the reward is immediate and the negative impacts delayed. Second is ignorance, where we simply are not aware that long-run pay-offs are negative. Third is the sliding reinforcer, where the rewards change (diminish) over time. Fourth is the problem of externality discussed previously. Fifth is the collective trap, where an action is good for the individual, but when everyone engages in it, it is bad for society. Social traps may also be hybrid, combining two or more of these other traps. Thus, for a number of reasons we may make decisions that are not the best for our long-term QOL. From the examples offered above and numerous others, it would appear that

<sup>12</sup> To place this figure in context, only 7 countries in the world had GNP's higher than \$600 billion in 1997.

nature's services might be particularly prone to social traps. Hence, if advertising changes our preferences from public goods to private goods, it may be leading us into a hybrid social trap by persuading us to pursue activities that actually reduce our QOL. Thus, to the extent that consumption induced by advertising threatens life-supporting natural capital and sustainability and reduces the supply of public goods, advertising is unfair.

More needs to be said about how advertising affects the QOL. As stated earlier, our QOL improves if we are better able to meet our needs and wants, and diminishes if we are less able to meet our needs and wants. Advertising creates wants by making us believe we need some product or another, yet gives us no greater ability to satisfy that want. In this sense, advertising directly diminishes our QOL. In the words of the advertisers themselves, B. Earl Puckett, former head of Allied Stores Corporation, "it is our job to make women unhappy with what they have" (Quoted in Durning, 1992, pp. 119–120). Anthony Reilly, CEO of food conglomerate H.J. Heinz, claims that "[o]nce television is there, people of whatever shade, culture, or origin want roughly the same things" (Quoted in Durning, 1992, p. 126). Unfortunately, while even third world slum dwellers increasingly have access to TV, they do not have access to the resources necessary to satisfy the wants that TV creates. Advertisers are keenly aware of the wide variety of human needs and try to make us believe that consumption will meet those needs. In the words of Alan Durning (1992), "they cultivate needs by hitching their wares to the infinite existential yearnings of the human soul." Experts in consumer behavior claim that consumers identify with brands as a means to differentiate themselves from one another (Durning, 1992); that is, advertising makes us believe that a particular brand will satisfy our need for identity. Other human needs especially targeted by advertising include affection, participation, and freedom, though none are left out. In fact, advertisers often attempt to make us believe that consumption of a particular good is a 'synergistic satisfier', meeting several needs at once, when in reality it is at best a pseudo-satisfier or an inhibiting satisfier, and through excessive consumption it becomes a violator and destructor.

Max-Neef's (1992) work can shed even more light on the relationship between advertising and QOL. He points out that needs have a two-fold character, encompassing both deprivation and potential. When we lack something, we feel deprived, but we also are engaged, mobilized, and motivated to fulfill that need. Hence, the need for participation or the need for affection is potential for participation and affection. In this sense, needs are a resource. However, if we are led to believe that consumption will fill our need for affection or participation, we do not seek to fulfill it elsewhere and the potential inherent in the need is lost. In addition, while needs may be finite, and hence demand for satisfiers finite, if we attempt to fulfill our needs with a pseudo-satisfier, we are unable to do so. Demand for pseudo-satisfiers cannot be satiated. Thus, people in consumer

cultures, stimulated by advertising, continue to believe that if we only consumed a bit more or had twice our current income, we would attain the QOL we seek. In reality, this will not happen because consumption does not actually fulfill our needs.

## 6.2. *Policy suggestions*

### 6.2.1. *Curbing the impact of advertising*

We do not deny that advertising plays a useful role in providing us with information about the products that we consume. However, in most cases, the information content of advertising is quite low and often misleading. Most of the effort is designed instead to convince us that consumption is the best means to satisfy our human needs, yet it appears that current levels of consumption in the overdeveloped countries are incompatible with a sustainable future and are unfair. Reducing consumption levels will be exceedingly difficult in the presence of so much advertising. Thus, advertising has many elements of a ‘public bad’, and consequently should be curbed. People have argued that efforts to curb advertising interfere with the right to freedom of expression and furthermore are naïve. One rebuttal is that consumption induced by advertising interferes with the even more fundamental right to survival of future generations and the belief that we can substantially reduce consumption without limiting market-based advertising is exceedingly naïve. The problem is, what are the most feasible and effective means for controlling advertising for consumer goods? This is a very contentious issue but we present several possibilities here.

*6.2.1.1. Charging for airwaves and removing tax exempt status for advertising.* Currently, advertising over the airwaves in many countries is essentially subsidized. The airwaves are public property, but are typically given free of charge to communications corporations. Since airwaves have properties of public goods in that they are non-excludable and non-rival, there is a solid rationale for making them free. However, if the government charged corporations for the use of airwaves for advertising, it would target only that portion of the airwaves devoted to private profit.

Also, advertising is currently considered a business cost and is tax exempt. For the reasons listed above, however, it would be more appropriate to tax advertising. We do confront a problem with a tax on advertising, in that advertising can provide information, which is also a public good. Ideally, a tax should be targeted only at that portion of advertising that does not convey information. Unfortunately, it is extremely difficult to decide exactly what aspects of advertising do convey information (e.g., Coke tastes great!!). Such a tax would require a non-biased, non-government (due to the influence of money on politicians) institute, such as

the non-profit Consumer Guide, to make these decisions. Such an institute could be funded from sales of airwaves devoted to advertising.

*6.2.1.2. Full disclosure advertising and altering preferences.* While taxes would presumably reduce the quantity of ads, it would not help to generate concern for non-market satisfiers of human needs. There are several alternatives for helping achieve this goal. Perhaps most effective would be a law mandating ‘full disclosure’ advertising. Just as medicines are labeled with all their potential adverse side effects, so should advertisements list all the potential adverse side effects of the products they advertise. This would, of course, include all negative impacts on the environment and the implications of those negative impacts. While this would not directly attempt to stimulate demand for non-market goods, it would at least make people more aware of their existence and more aware of the impacts of their consumption on those goods. This would have to be accompanied by efforts to educate consumers on how to use this information, perhaps funded by the suggested tax on advertising. Another alternative would be to provide free airtime for public service announcements that specifically seek to create demand for environmental services and other non-consumptive satisfiers of human needs. The media is a phenomenally powerful tool for altering preferences for satisfiers. If we are to create a more sustainable and fair world, we must alter people’s preferences toward satisfiers that do not limit the ability of others, now and in the future, to attain a high QOL.

A problem with both of these restrictions on advertising, however, is that people will complain that they infringe on the basic right of free speech. However, the right to free speech does have restrictions. For example, no one is allowed to shout ‘fire!’ in a crowded theater if there is no fire, because it threatens the well-being of others. Shouting ‘fire!’ may not be fundamentally different from encouraging people to consume when such consumption threatens the well-being of future generations. Many nations already curb advertising on alcohol and tobacco, and the Australian Consumers Association has attacked the right to advertise unhealthy foods on children’s TV shows (Durning, 1992).

### *6.3. Natural capitalism, increased efficiency, industrial ecology, and dematerialization*

Given the political and economic power of large corporations and the advertising industry, the global dominance of the market paradigm, and the near universal belief that capitalism depends on growth for survival, is anything resembling a curb on markets at all feasible? One popular alternative that strives for reduced consumption of natural capital while allowing continued increases in consumption by consumers is the “natural capitalism” approach to business, which involves reducing resource consumption through business redesign. Natural capitalism aims to achieve major increases in ‘productivity of natural resources’, focusing on

biologically based production (e.g., closed-loop, waste-free production), solutions-based models of business, and reinvestment in natural capital (Hawken et al., 1999). Because increased energy efficiency, reduced waste, and increased product quality (e.g., fuel-cell technology for vehicles) present revenue opportunities, many argue that this can be successful business strategy.

Some questions arise, however. If natural capitalism can compete successfully with more resource- and waste-intensive industries, why is it not more widespread? Do the environmentalists extolling this approach understand more about earning profits than the corporations? In reality, it appears that under current conditions, in most cases natural capitalism is probably not more profitable than intensive resource use. However, it may be simpler to make such an approach competitive than it would be to curb advertising, and there are success stories. For example, The Natural Step has used intensive education to influence some businesses to move toward sustainable and natural capitalism, and Paul Hawken's *Ecology of Commerce* (1994) has introduced these concepts to business students. Educating citizens on the benefits of sustainability so that their market preferences drive businesses to provide sustainable options could further strengthen the natural-capitalism approach. Of course, obtaining the resources to carry out this educational task would be difficult, especially if it must overcome the \$650 billion spent annually educating people in the opposite direction. Also, to argue that people will voluntarily pay more to purchase goods that do less harm to public goods is to argue that people are inherently altruistic. While this may certainly be true, it is curious to argue that we can only make the market system compatible with sustainability by assuming that the underlying assumption of market economics – the primacy of 'rational' self-interest – is false. Perhaps the most effective approach to encouraging natural capitalism would be green taxes, discussed below. By increasing the costs of resource- and pollution-intensive industry, such taxes would make natural capitalism more competitive.

Even if we could bring about natural capitalism, would it be sufficient? Certainly there is enormous inefficiency in economic production that could be removed. Eventually, however, any industrial process must reach a limit beyond which it cannot become significantly less resource intensive. We cannot keep reducing the raw material inputs into consumer goods indefinitely: total dematerialization of production is physically impossible. No matter how efficient our production techniques, if consumption continues to grow we will continue to degrade natural capital and eventually threaten life-support functions. We will then be confronted with the current problems but at higher levels of consumption. Given our level of ignorance about ecosystem function and existing threats to ecosystem life-support functions, as well as the inevitable difficulties we will face in reducing consumption by consumers or producers, the precautionary principle suggests we should act on both fronts at once. We must strive to reduce final consumption while making production processes as efficient as possible.

### 6.3.1. Green taxes and human needs accounting

Green taxes were mentioned above as a way to stimulate natural capitalism. In general, green taxes could serve as path towards high QOL and sustainability. We use green taxes here as shorthand for a suite of financial mechanisms that incorporate the full cost of market production and consumption into market prices, as required by the Lisbon Principles. The basic idea is that if we have to pay for the ecological and social damage caused by our consumption, we will consume less and/or shift our consumption towards goods that have fewer negative impacts. Price increases will also encourage us to develop substitutes for those consumables that damage the environment. Even economists agree that market allocation is only efficient if prices reflect all costs.

Many governments under-price natural resources or even subsidize their extraction with the intention of promoting economic growth. Such subsidies are a direct transfer of resources from the public sector to the private sector, and indirectly lead to reduced public goods from environmental services. A first step must be to eliminate these distortions. Some of these subsidies are mentioned in chapter 11 and are discussed in greater detail in Templet (1995a). Others include the small stumpage fees charged by so many governments for logging rights, the below-market-price grazing fees charged by the US government, and the sale of timber rights to US national forests at times for even less than the cost of preparing the bids. There are numerous types of green financial mechanisms, including emissions taxes, tradable permits, and quotas, which have been outlined in great detail elsewhere, and would help reduce and shift consumption. Space does not permit discussion here, but for greater details, we refer you to Roodman (1998), Pearce and Turner (1990), Bernow et al. (1998). One point worth emphasizing is that while economists argue that quotas and taxes are quite similar, quotas ideally are determined by ecological factors, and are not subsequently affected by economic shocks<sup>13</sup>. Thus, they are more compatible with the precautionary principle and sustainable scale (Daly, 1996).

We would like to provide some details about two proposals that have received perhaps less attention than they deserve. The first is a highly progressive consumption tax, proposed by Frank (1999), that is particularly appropriate for

<sup>13</sup> Both taxes and tradable quotas/permits will provide an incentive for the individual to reduce pollution. With taxes, every reduction is a direct decrease in expenditures. With permits, reductions allow excess permits to be sold, increasing revenue. Fixed taxes apply a constant pressure to reduce pollution. If there are a fixed number of polluters generating an approximately constant amount of goods that pollute (i.e., the demand for pollution is constant), new innovations to reduce pollution will eventually decrease the demand for permits, driving the price down. Under this circumstance, permits may be less effective than taxes on reducing pollution. Alternatively, if the demand for pollution increases, the price of permits will increase, leading to an increase in price. Under these circumstances, taxes may be less effective than permits.

addressing the problem of positional wealth and over-consumption. The idea is to impose a highly progressive tax only on the portion of income that is spent on consumption. Such a tax would obviously deter consumption and would do so without threatening investment. Investment itself is a problem if it stimulates excessive growth. However, with limited ability to spend returns on market investments on personal consumption, the tax would provide greater incentives for investing in the public good (e.g., environmental restoration, community centers, and education)<sup>14</sup>. To the extent that consumption above and beyond a certain level is mostly positional, the big consumers would not suffer significant declines in their QOL. The negative impacts of excessive wealth accumulation would be avoided and there would be no need to impose unpopular caps on income.

The second proposal is an assurance bond on activities with potentially environmentally or socially damaging outcomes. Any individuals or corporations contemplating such activities would have to post a bond or purchase insurance sufficient to cover any potential damages from their activity. After the risk of environmental damage is past, the bond would be refunded and the insurance could be cancelled. These bonds would ensure that whoever causes environmental damage would be forced to pay for it, and market forces could set fair prices on the cost of insurance for any given project without the need for additional government regulation. Essentially, this is a market mechanism for implementing the precautionary principle (Costanza and Perrings, 1990).

To know if we are achieving our goals, we must be able to measure them. In the short run this implies the implementation of green accounts, and in the longer run, of accounts that measure our ability to sustainably satisfy human needs. These topics have already been sufficiently addressed in this chapter and the preceding one.

### *6.3.2. Poverty alleviation and income caps*

We laid out earlier the need for ending poverties (i.e., insufficient satisfiers for any of our needs) in a fair society and suggested some possible approaches (debt forgiveness, payment of the ecological debt, ensuring equal opportunity to all). The orthodox solution to ending poverty, increasing the size of the economic pie so that everyone can have a larger piece of it, has not proven itself effective over decades and even centuries of rapid growth, and it cannot be sustained indefinitely on a finite planet. In many ways it has already become counterproductive. A more fair distribution of existing wealth is the alternative to growth, but it is impossible in the space allowed to examine the myriad policies available for achieving this.

<sup>14</sup> Of course, there would be considerable danger that the wealthy would spend their money on politics, with negative consequences. Such a tax would have to be accompanied by limits to political donations.

However, the common denominator in any of these alternative policies is that they require political will. Political will is an expression of cultural values, even if only the cultural values of the ruling class in most countries. Hence, we argue that the prerequisite for any policy of poverty alleviation and income caps is a change in cultural values that will provide this political will. We will make our case with respect to two types of poverty: absolute poverty, where individuals fail to adequately meet their basic survival needs; and other poverties, where individuals fail to adequately satisfy the remaining human needs.

It would certainly seem that within the poorest countries economic growth (and population control) is required to end absolute poverty. However, this is not necessarily the case. For example, Amartya Sen (1984) has documented that even during many of the world's most severe famines, the countries where those famines occurred produced sufficient food for the starving population. The problem was one of entitlements, not abundance. When the poorest countries do produce more, in the current global system most of the wealth created goes abroad or to the upper classes, so economic growth seems to offer little hope. Certainly on a global scale there are sufficient resources to end global poverty, so the problem is one of distribution (although if populations continue to increase unchecked, inevitably absolute resource scarcity will also play a role). The wealthy and powerful have the capacity to create a system that will distribute resources more fairly, but their perception is that they would suffer a decrease in QOL if they ceased to capture the lion's share of global wealth and resources. This perception stems from an ideology (value system) that says material consumption meets all our insatiable needs, and the more we consume, the better they are met.

This value system similarly limits our ability to eliminate other poverties. Our obsession with economic growth and consumption, and their nature as pseudo-satisfiers, deprives us of the resources and the potential needed to pursue real satisfiers for our various needs. Thus, in direct contrast to the prevalent view, eliminating poverties requires ending this obsession with growth and consumption, which in turn demands a change in the dominant value system.

Values are also the crux of the matter in efforts to limit wealth. People believe enormous wealth brings enormous happiness, and they want the chance to be enormously happy. These values mean that capping maximum wealth may prove even more challenging politically than ending poverty. Again, a change in values is a necessary step<sup>15</sup>. The question is then, how do we change cultural values in a way that is conducive to a sustainable, fair, and high-QOL society?

<sup>15</sup> In the meantime, however, a highly progressive consumption tax could obviate the need for income caps, and might be more politically feasible.

### 6.3.3. *Education*

Education is critically important in increasing QOL on its own. It directly increases our human need for understanding, and dramatically increases our access to numerous other satisfiers of human needs. More important, it may be an essential means for changing people's values. As suggested earlier, value systems evolve in response to changing institutions, changing environments, and changing cultures, but the speed with which human activity is changing our environment suggests we cannot simply sit back and passively wait. Fomenting rapid change in values will require extensive education. Part of the problem is that people are unaware of the impacts of human activity on the environment. Without broader understanding of ecological processes, people will not recognize the constraints these processes pose on our development. If people are educated to the negative impacts of our current development path (or as they become too obvious to ignore), they will become ripe to accept alternatives, but only if informed of the options. However, the dominant 'solution' currently offered (by highly educated people) to the damages caused by economic growth is more of the same<sup>16</sup>. Education within very narrow limits is little more than indoctrination within an ideology. At universities, education is typically delivered within the boundaries of narrow disciplines. It is easy to accept neoclassical economics if one has no understanding of ecology, and it is difficult to transform insights from ecology into practical policies if one has no understanding of the social sciences. The problems inherent in developing a sustainable society and ensuring that the human system is in equilibrium with the ecological system that sustains it demand a broadly interdisciplinary education.

However, we must recognize that most people who are aware that our levels of consumption threaten the QOL of others alive today and of future generations nonetheless fail to change their consumption levels in response. The likely reason for this is the fear that reducing consumption will lower their QOL. This message is conveyed in formal education, but only to a limited extent outside of business and economics. The more powerful educating force for this message is the media. Unfortunately, as we made clear earlier, most media are market driven. It therefore reinforces the dominant value system of consumerism and monopolizes the time and resources that could be used to educate people to alternatives. Modern media offer the most powerful means of mass education in the history of humankind, and as long as market forces control them, it will be exceedingly difficult to educate people to alternatives. Achieving our goals will require at least equal access to the

<sup>16</sup> In the developed countries, the argument goes, air and water quality are improving, empirical proof that economic growth solves environmental problems. Those who propose this solution appear oblivious to the physical laws of thermodynamics, overlook the innumerable environmental problems that are not getting better, and ignore the fact that the overdeveloped countries have simply exported their most polluting industries to the third world.

media to spread alternative ideologies. We are the first to admit that our view of the good is an ideology but we believe it far healthier for society to have several ideologies to choose from rather than one. The dominant consumerist ideology may have been appropriate in the past, and the ideology we are promoting here may no longer be appropriate in the future. Thus, broadly interdisciplinary and broadly inter-ideological education **are requirements** for the principle of adaptive management necessary to achieve sustainability in a changing world.

#### 6.3.4. *Political reform*

Politics implies action and the political arena is where many of the needed changes must come about. In the short run, we should also take full advantage of existing political structures to promote our agenda. With this in mind, we have drawn up a ‘Sustainability Bill of Rights’ reproduced in the Appendix, and challenge activists to work with their representatives to bring some version of such a bill into the political debate.

Action requires political will, be it for poverty alleviation, curbs on advertising, or education reforms. Promoting the **sustainability bill of rights** will help, but unfortunately, under current conditions, political will is largely determined by the largest donors or simply the wealthiest individuals, depending on the country in question. In the short to medium run, to wrest control of political will from the wealthy will require campaign-finance reform in allegedly democratic nations, and other alternatives that limit the influence of the wealthy over the political agenda in other countries. The necessary political will is unlikely to spring from institutionalized parties, professional politicians, or established governments. Civil society must play a primary role not only in influencing governments, but also in providing the leadership for the development of the values and vision that must guide us.

In the longer run, a strong civil society can help create a strong participatory democracy, which is probably the form of government most conducive to creating a fair, sustainable, and high-QOL society (Prugh et al., 2000). In a participatory democracy, the people must discuss at length the issues that affect them to decide together how they should be resolved. This could directly meet people’s need for participation and identity, educate people to the relevant issues and alternative ideologies, and help direct society’s resources towards meeting human needs. As citizens come together in regular meetings to discuss the issues and work together to resolve them (even when substantial conflict exists), it should create strong bonds of social capital, and could play an essential role in forging a sense of community. This system will allow the people to define political will or government’s purpose. These civic meetings must forge a shared vision of the future to guide their actions. This vision cannot be static but must adapt to new information and new conditions as they emerge. The importance of vision is difficult to overemphasize, and requires elaboration.

### 6.3.5. *Vision*

A fundamental missing element from the discussion of QOL and the distribution of wealth and resources at the level of society is a *coherent, relatively detailed, shared vision of what a sustainable high-quality-of-life society would look like* (Costanza, 2000), and how we could move from here to there. The default vision of continued, unlimited increases in material consumption is probably unsustainable, but no credible alternative is available for public discussion. A prerequisite to achieving a sustainable society is thus the creation of a shared vision of what we as a society want to sustain and the central shared values that express our hopes for the future. This vision must incorporate a broad diversity of perspectives and be based on principles of fairness and respect for individual human rights. To develop this shared vision of a sustainable society in a way that is credible requires the active participation of all the major stakeholder groups in society. Otherwise, the vision will be regarded as just another special interest agenda.

This vision of a desirable society must lie within the constraints imposed upon us by our finite ecosystem, but also recognize that constraints posed by our present culture and its emphasis on consumer goods as satisfiers are less rigid. Building a sustainable society almost certainly requires that we accept that consumption is not an ultimate goal, but merely a means to an end. We must recognize that consumption cannot grow without limits, but that QOL does not depend on consumption, and is not bound by such physical laws. We must redefine efficiency, not as the maximum market value we can create from a given allocation of resources, but rather as the most human needs we can satisfy with the least amount of resources. Rather than simply lament the negative outcomes of our current development path, we must affirm a positive vision of a sustainable, desirable future.

## 7. **Conclusion**

In conclusion, we have a long way to go before reaching a fair, sustainable, and high-QOL society. Developing a positive shared vision and alternative values to consumerism will be but the starting point, and we have discussed only a very few of the additional steps that we will need to take to develop this society. Some of the ideas presented may work and some may not. In presenting some of these ideas, many will accuse us of idealism and naiveté. However, we must bear in mind that prior to its implementation, there were few ideas more naïve than democracy proposed to a world of monarchies, or emancipation proposed to a world of slavery. Goddard was accused of naiveté for thinking that rockets could travel in the vacuum of space, Bell was told that telephones would never be in demand, and in 1943, the president of IBM estimated the world demand for computers at five. Such criticisms are often little more than a crisis of imagination.

True naiveté lies in believing that we can achieve the desired society without bold and radical proposals for change.

### Appendix. The Sustainability Bill of Rights

- People have the right to live in natural environments, which will sustain their health and the health of future generations.
- The goal of sustainability is to improve or maintain Quality of Life over time.
- A sustainable society is one which will ensure fairness within a generation and across generations such that the natural capital one generation inherits is transferred intact or enhanced.
- Sustainability includes protection of biodiversity and respect for spiritual contact with nature.
- Social, geographical, and intergenerational fairness contribute to sustainability.
- Quality of Life depends directly and indirectly on four forms of capital:
  - Natural
  - Human
  - Social
  - Built
- Natural capital sustainability requires maintenance of natural services.
- Individuals must have an opportunity to challenge unsustainable activities through the courts and through dispute resolution via mediation in accordance with the precautionary principle.
- This bill will be reviewed through a stakeholder process at regular time intervals to allow adaptation to changes in knowledge, technology and environmental conditions.
- The **Government** will publish on a regular basis a list of sustainability indicators to compare progress.

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