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.

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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'sMaslow (1954) hierarchy (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 other needs 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 grandparent's 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 [1] (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 is thus a pseudo-satisfier; many pursue it 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 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

[1] 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).

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[2]. 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 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

[2] 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.

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[3]. 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

[3] The authors believe that Herman Daly once used a similar analogy, but could not remember the source.

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 their 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[4]. Where 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

[4] 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.

(preceding chapter; Daly and Cobb, 1989) suggest that the GNP is becoming 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 that 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[5]. 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,

[5] 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.

goods and services characterized by market failures are not appropriately priced 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 that both approaches should agree on. 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'

irtually 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[6]. This is a market failure. Goods such as oceanic fisheries

[6] 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."[7]

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

[7] 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 Phillipines, 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'[8]. 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)[9] to pay the less developed countries (LDCs) for centuries of accumulated ecological damage. The ODCs are responsible for the vast majority of natural-resource use and waste output. Even though much

[8] 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.

[9] 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.

resource extraction takes place in the LDCs, it is the consumers in the ODCs that 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_2 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 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 that both the 'just deserts' and 'justice theory' schools agree on. 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 regions' 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. Poverties 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 'poverties' 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 poverties 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 are indicators 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 donor's 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 provide 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 [10]. 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

[10] 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.

that a fairer allocation of resources will inevitably reduce their QOL is a major obstacle 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[11]). 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

[11] See http://www.worldbank.org/poverty/inequal/abstracts/health/read.htm for other examples.

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?

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[12]"

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 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[13] (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.

[12] The Sears advertising slogan, which the Sears CEO says is "built around our core value proposition" (Martinez, 1999).

[13] To place this figure in context, only 7 countries in the world had GNP's higher than $600 billion in 1997.

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 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 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 is currently attacking 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 turned the focus and force of business toward sustainable and natural capitalism through intensive education for business actors, and Paul Hawken's Ecology of Commerce (1994) has done this to some extent for 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.

1st proof, Understanding and Solving ..., p. 291

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 forest 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 (1989), 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[14]. 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

[14] 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)[15]. 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 satisifers 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. It many ways it has already become counterproductive. A more fair distribution of existing wealth is the alternative to growth, but it is impossible

[15] 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.

in the space allowed to examine the myriad policies available for achieving this. 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[16]. The question is then, how do we change cultural values in a way that is conducive to a sustainable, fair, and high-QOL society?

[16] 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[17]. 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 to 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

[17] 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 appendix 1, and challenge activists to work with their representatives to at least get some version of such a bill into the political debate.

Action requires political will, be it for poverty alleviation, curbs on advertising, or education. 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 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 QOL 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.
- QOL 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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