The Quest for Sustainable, Healthy Communities

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Abstract Sustainability is a contested concept. Whilst the "triple bottom line" is sometimes used to describe the economic, social and ecological dimensions of sustainability, there are differing conceptions of what this notion implies. There are nevertheless some recurring themes that are outlined in this paper. There has also been some convergence in notions of "sustainable communities" and "healthy communities". Balanced integration of economic, social and ecological dimensions remains a challenge for policy-makers, educators and community members.

What is Sustainability?

In everyday language, the term "sustain" may include one or more of the following connotations: support, keep in existence, supply with the necessities of life, and continue without lessening. In recent years, the adjective "sustainable" or its opposite "unsustainable" has been applied to a wide variety of phenomena such as social practices, farming systems, resource use, economies, communities and societies. Sustainability can be defined broadly as the "ability to continue an activity or maintain a certain condition indefinitely" (Eckersley, 1998, p. 6).

So, for example, the World Conservation Union (IUCN), the United Nations Environment Program (UNEP) and the World Wide Fund for Nature (WWF) (1991, p. 211) define sustainable use as "use of an organism, ecosystem or other renewable resource at a rate within its capacity for renewal." Meadows, Meadows & Randers (1992, p. 209) define a sustainable society as "one that can persist over generations, one that is far-seeing enough, flexible enough, and wise enough not to undermine either its physical or its social systems of support." The word "flexible" in this definition clearly implies that a sustainable society is not necessarily static. A society or community may change in order to respond to various contingencies. For instance, it may change because its resource base has been damaged or depleted, in which case one may ask whether the previous organisational forms and activities would have been sustainable in the long term. On the other hand, a society or community may change because new resources have been identified or new technologies developed. Here, too, one could ask whether the new organisational forms and activities are sustainable in the long term.

When applied to communities or societies, sustainability is increasingly being seen as involving three interrelated pillars or dimensions – the economic, the social and the ecological.

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The ecological dimension of sustainability has to do with the extent to which ecological systems – on which all life depends – are capable of continuing to perform their essential functions into the future. This dimension of sustainability relates, for example, to the extent to which:

- ecosystem integrity is preserved;
- biological diversity is maintained;
- rates of use of renewable resources do not exceed regeneration rates; and
- rates of waste generation or pollution emission do not exceed the assimilative capacities of the environment.

The economic dimension of sustainability has to do with the extent to which economic systems are capable of continuing for the long term. Examples of this dimension of sustainability are the degree to which:

- systems of production, exchange and consumption can continue;
- satisfactory standards of living for all are being achieved and can be maintained;
- rates of use of non-renewable resources do not exceed the rate at which sustainable renewable substitutes are developed; and
- economic systems are able to adapt to various contingencies such as fluctuating environmental conditions (rainfall, temperature, geothermal activity, etc), demographic changes and technological developments.

The social dimension of sustainability has to do with the extent to which social values, social identities, social relationships and social institutions are capable of being maintained into the future. This dimension of sustainability can be illustrated by the extent to which:

- there are some widely accepted and enduring norms or values such as reciprocity, procedural equity and respect for law;
- both individual identity and cultural diversity can be maintained (this is the social equivalent of biodiversity);
- social institutions are able to make a continuing contribution to the fulfilment of people's needs; and
- social institutions are able to adapt to various contingencies such as fluctuating environmental conditions, economic changes and technological developments.

These three dimensions of sustainability are interrelated. Social and economic systems generally have an impact upon ecological systems, and vice versa. There is also a two-way interaction between economic systems and social systems. Balanced integration between the three dimensions is required in the quest for sustainability (Dale & Hill, 2001; Giddings, Hopwood, & O'Brien, 2002).

What, then, are the essential characteristics of a sustainable community? Here is a description proposed by Richardson (1994):

> A sustainable community has a stable, dependable and diversified economic base that does not over-stress the carrying capacity of natural systems, maintains the supply and quality of renewable resources, and strives continually to reduce its demands on non-renewable resources. Its economy provides both a range of opportunities for rewarding work, and a level of prosperity on the basis of which, equitably shared, the community actively and continuously works to satisfy the basic needs of every one of its members and to provide each with the opportunity to fulfil his or her potential, within a supportive social environment, a safe, liveable physical environment, and a clean, healthy, vital natural environment. A sustainable community does not achieve or maintain its own sustainability at the cost of the sustainability

> of other communities/ecosystems, including that of the broader community/ ecosystem of which it is a part.

That description, which integrates ecological, economic and social dimensions, could be seen as an ideal towards which a community might strive. There could, of course, be debate about the extent to which some of the listed characteristics are essential for community sustainability. For example, how essential is a diversified economic base? Economic diversity, though perhaps not essential, is nevertheless likely to give a community greater capacity to withstand changing circumstances in the wider economy, thus enhancing its prospects of being sustainable in the long term. Economic diversity can also help a community to be more self-sufficient, rather than being heavily dependent on goods and services produced elsewhere. Such self-sufficiency may be ecologically beneficial at global and national levels if it results in a global reduction of energy consumption (e.g., for transportation) and a consequent lessening of pollution emission.

The Sustainable Community Roundtable (1999) established in South Puget Sound (USA) proposed the following vision of what a sustainable community would be:

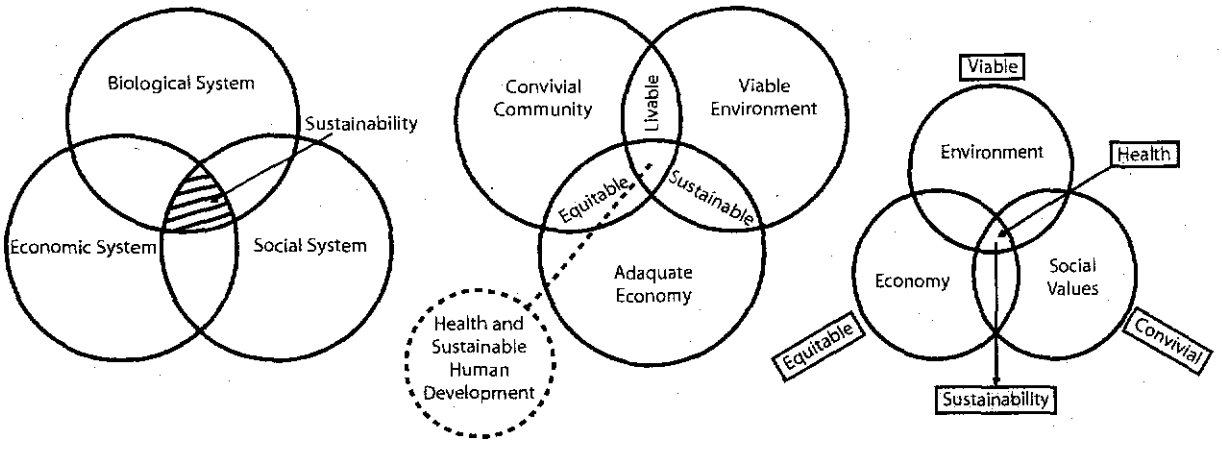
> A sustainable community continues to thrive from generation to generation because it has:
>
> - a healthy and diverse ecological system that continually performs life sustaining functions and provides other resources for humans and all other species;
> - a social foundation that provides for the health of all community members, respects cultural diversity, is equitable in all its actions, and considers the needs of future generations; and
> - a healthy and diverse economy that adapts to change, provides long-term security to residents, and recognises social and ecological limits.

That description again brings together ecological, social and economic dimensions of sustainability. As a vision it contains much that is commendable. In a small survey conducted in South Puget Sound in 1999, it was found that most respondents generally accepted the Roundtable's vision. There were, nevertheless, some constructive suggestions as to how the vision could be improved, and some people questioned the necessity of including one or another feature of it (Beck, 1999). This illustrates the difficulty of attaining complete consensus on what is meant by the term "sustainable community" and what are the conditions needed to attain it.

A somewhat similar but briefer description is contained in a publication of the Strengthening Communities Unit of the New South Wales Premier's Department (2001, p. 28):

> Sustainable communities ... maintain and improve their social, economic and environmental characteristics so that residents can continue to lead healthy, productive and enjoyable lives. Sustainable development in these communities is based on an understanding that a healthy environment and a healthy economy are both necessary for a healthy society.

This description, like the two previous ones, refers to the interdependence of economy, society and environment. It, too, uses the notion of health as part of its description. Whilst most people would agree with the desirability of the general ideals contained in the description, differences of opinion may exist over the criteria to be used in assessing what is "a healthy society", "a healthy economy" and "a healthy



Source: Barbier (1987) Source: Hancock (1996) Source: Price (1997)

FIGURE 1: Examples of interlocking rings models

environment" and especially as to what compromises, if any, may be made between these objectives.

In the literature, there are two main models for conceptualising the relationship between the three dimensions or pillars of sustainability: the interlocking rings model and the nested rings model.

Figure 1 provides examples of interlocking rings models. By representing economy, society and environment as rings of equal size, these models could be taken to imply that each is equally important for sustainability. Nevertheless, one could debate whether, as some interpretations suggest, sustainability has to do only with the area where all three rings overlap. Giddings et al. (2002, p. 189) argue that the interlocking rings models "assumes the separation and even autonomy of the economy, society and environment from each other ... This separation distracts from or underplays the fundamental connections between the economy, society and the environment. It leads to assumptions that trade-offs can be made between the three sectors."

On the other hand, the Western Australian State Sustainability Strategy, which adopts an interlocking rings model, as in Figure 2, defines sustainability as "meeting the needs of current and future generations through an integration of environmental protection, social advancement and economic prosperity" (Government of Western Australia, 2003, p. 24). The Strategy (p. 24) describes environmental protection as "minimising impacts and providing rehabilitation and renewal of damaged environments." The Strategy stresses the importance of achieving the abovementioned environmental, social and economic objectives synergistically and minimising trade-offs.

As an alternative to the interlocking rings model, Figure 3 depicts a nested rings model. Although Giddings et al. (2002) note that the latter model also has some limitations, they contend that it presents a more accurate representation of the relationship between economy, society and environment: the economy is nested within society, which in turn is nested within the environment. "Placing the economy in the centre does not mean that it should be seen as the hub around which the other sectors and activities move. Rather it is a subset of the others and is dependent on them" (Giddings et al., 2002, p. 191).

While the nested rings model may contain some useful insights, in the simple form presented in Figure 3 it does not portray the dynamics of the reciprocal interactions between economy, society and environment. Moreover, it (like the interlocking rings

closed economy[1] and sufficient substitutability between natural resources (exhaustible stocks) and produced capital (reproducible assets).

Consistent with that line of reasoning, Solow (1993) contends that the quest for sustainability is concerned, in essence, with ensuring the continuation of an economy's productive capacity so as to allow each future generation the option of being as well off as the generation that preceded it. As Solow (1986, p. 142) argued in an earlier paper:

> The current generation does not especially owe its successors a share of this or that particular resource. If it owes anything, it owes generalised productive capacity or, even more generally, access to a certain standard of living or level of consumption. Whether productive capacity should be transmitted across generations in the form of mineral deposits or capital equipment or technological knowledge is more a matter of efficiency than of equity.

In Solow's opinion, natural resources can safely be used up or run down, provided that sufficient investment is made in alternative forms of income-generating capacity. This version of sustainability is termed by Daly & Cobb (1989) "weak sustainability."

By contrast, Daly & Cobb (1989) advocate "strong sustainability." In their view, the resources and services provided by nature (sometimes spoken of as "natural capital") on the one hand and humanly produced capital on the other are complements rather than substitutes in most production functions; the concept of strong sustainability requires that each of these forms of capital be "maintained intact."

The requirement that natural capital be "maintained intact" means, according to Daly (1994, p. 24), that in some aggregate sense natural capital should remain constant. This principle leads Daly (1995, p. 50) to propound several rules for the management of production and consumption. With some rephrasing, these rules are as follows:

Output rule:

> Waste outputs should not exceed the natural absorptive capacities of the environment (that is, nature's *sink* services should not be depleted).

Input rules:

(a) For renewable inputs, harvest rates should not exceed regeneration rates (that is, nature's *source* services should not be depleted).

(b) For non-renewable inputs, the rate of depletion should not exceed the rate at which renewable substitutes can be developed.

(c) If a renewable stock is consciously divested (i.e., exploited non-renewably), it should be subject to the rule for non-renewables.

Although Rule (b) does envisage some substitutability, Daly insists that this should be a real substitution, not a merely financial one. For example, the income from depletion of fossil fuels should be invested in the development of new energy supplies from renewable sources.

Daly (1995) rejects the suggestion that the "strong" version of sustainability implies that no species should ever be allowed to become extinct or that any non-renewable source should ever be used. To insist on these additional conditions would, in his view, be to advocate "absurdly strong sustainability." Nevertheless, Holland (1997) has argued that no distinction of any substance can be drawn between weak and strong sustainability as defined by Daly, but that a version of what Daly has dubbed "absurdly strong sustainability" is not necessarily absurd after all.

Controversy over the distinction between "weak" and "strong" versions of sustainability has resulted in numerous publications, including several papers in

two recent collections (Dobson, 1999; O'Neill, Turner, & Bateman, 2001) plus a book devoted wholly to the topic (Neumayer, 1999). Proponents of the so-called weak version of sustainability do not concede that their perspective is morally or intellectually weak or that it is inferior to Daly's purportedly strong version. On the contrary, they see their own position as more defensible than his.

I would argue that proponents of "strong sustainability" are correct when they state that there are physical limits to various natural resources and to the stability and resilience of ecosystems. Likewise there are limits to humans' capacity to find or develop substitutes for these resources or for the services provided by existing ecosystems. But it is often difficult to know precisely what those limits are. The fact that humans have found or developed substitutes for some resources in the past is no guarantee that humankind will always be able to do so in the future. Conversely, a present inability to find or devise a substitute does not necessarily imply that no such substitute will ever be found or developed. The weak-versus-strong debate indicates again that sustainability continues to be a contested concept.

Principles of Sustainability

Despite various differences of opinion on essential criteria for sustainability, there are some recurring themes. From an extensive review of the literature, Gladwin, Kennelly & Krause (1995) have identified five interrelated principles, namely inclusivity, connectivity, equity, prudence and security. The Western Australian State Sustainability Strategy divides sustainability principles into two categories: foundation principles and process principles (Government of Western Australia, 2003, pp. 29–30). The exposition below draws partly on these sources, adopting or adapting their wording where appropriate. It is important to note that the principles are interrelated, and that there is some overlap between them. They should be read as a set, as some of the principles moderate one another. The distinction between foundation principles and process principles is not always obvious, and some writers treat as foundation principles what others might regard as process principles.

With these caveats, the following foundation principles are explicit or implicit in many conceptions of sustainability:

1. *Inclusiveness*. Sustainability relates to both human and environmental systems, both near and far, in both the present and the future. The maintenance of biodiversity and cultural diversity could be regarded as aspects of inclusiveness. So too is a recognition of the needs and rights of all persons, including those presently excluded from the mainstream of society, whether because of race, ethnicity, class, gender, age, physical location, ability or some other characteristic. Inclusiveness thus reaches across both time and space, and to each of the component parts of the manifest world. While not identical, the principles of connectedness and equity, discussed below, are both closely related to the principle of inclusiveness.
2. *Connectedness*. Sustainability requires a positive recognition of ecological, social and economic interdependence. Environmental protection, social advancement and economic prosperity should be sought in an integrated way, rather than these objectives being regarded as if they are necessarily antithetical to one another. Trade-offs between them should be minimised. If attainment of each objective is to be sustained for the long term, their interconnectedness must be recognised.
3. *Equity*. Sustainability requires an active concern for both intergenerational and intragenerational equity. The linkage between these two forms of equity becomes obvious when it is recognised that inequalities of access to resources can lead people to overexploit natural resources, out of ignorance, greed or simply an effort

to survive, with a consequent deficit in the legacy to subsequent generations. Planning for the common good requires equitable distribution of public resources such as air, water and open space so that ecosystem functions are maintained for the benefit all, both now and in the future. In societies such as our own, equity considerations may require that we reduce our ecological footprint (resource consumption and waste generation).

4. *Prudence*. Most conceptions of sustainability entail maintaining or enhancing the resilience of life-supporting ecosystems and related socio-economic systems, avoiding irreversibilities, and keeping the scale and impact of human activities within regenerative and carrying capacities. A precautionary approach seeks to anticipate and guard against adverse, irreversible outcomes of proposed new developments, generally shifting the burden of proof from opponents to proponents (O'Riordan & Cameron, 1994). Because human knowledge is imperfect, prudence also implies the adoption of safety margins, being prepared for the unexpected, and managing for adaptation where necessary.
5. *Security*. Security is an integral part of sustainability, and is generally essential if people are to achieve their full potential. Significant gaps in sufficiency, safety and opportunity endanger individuals and communities. Policies should aim to protect the productivity of the earth and the security of communities and their environments, enabling the fulfilment of basic needs such as food, air, water, shelter and safety. The principles of inclusiveness and equity imply that a community should not seek to achieve or maintain its own security at the cost of the security of other communities, whether now or in the future.

Important process principles include the following:

1. *Accountability, transparency and engagement*. People should have access to information on sustainability issues, institutions should have triple bottom line accountability, regular sustainability audits of programs and policies should be conducted, and public engagement in the quest for sustainability should be encouraged.
2. *Vision, learning, iterative change and hope*. Application of the foundation and process principles should help to generate a broad strategic vision for the earth, encourage processes of learning and iterative change, and generate well-grounded hope both now and into the future.

Implications for Environmental Educators

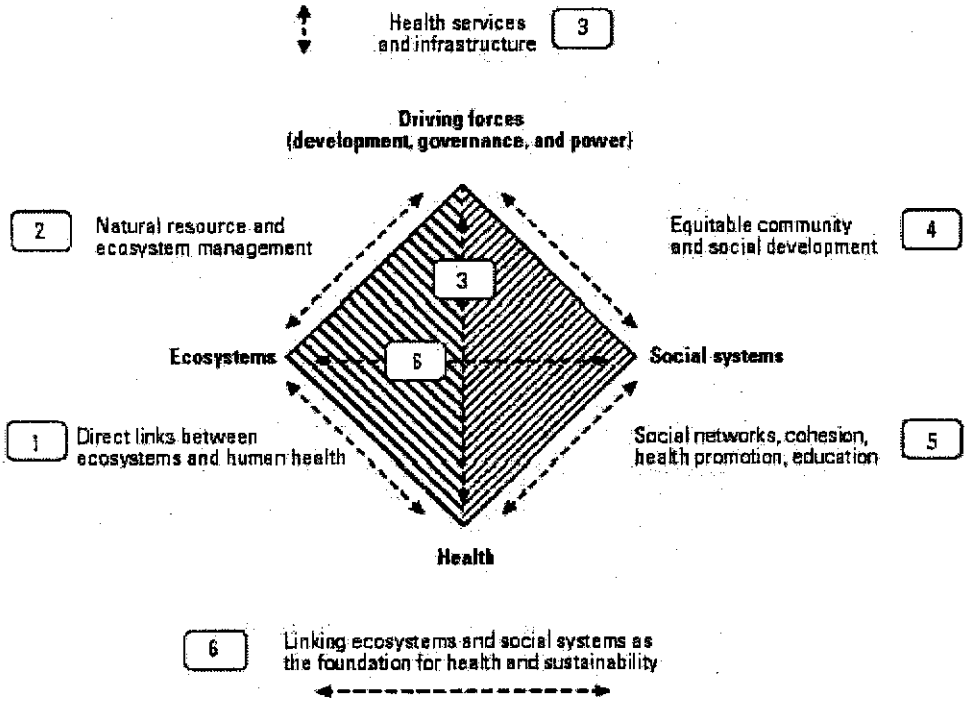
Many environmental educators have been trained in the biophysical sciences but have a much sketchier understanding of the social and economic sciences and thus of the social and economic dimensions of sustainability. There is an on-going need for research and professional practice that integrates biophysical, social and economic sciences in order to overcome limitations inherent in biophysical models.

The importance of the social dimension (and to some extent the economic dimension) can be illustrated with reference to issues of dryland salinity. In addressing these issues, the following are likely to be important:

- levels of trust, reciprocity, cooperation and active goodwill among individuals and groups within a catchment;
- patterns of leadership, extent of shared vision and sense of community within a catchment;

- accessibility of, and levels of confidence in, relevant agencies of local, state and federal government;
- the existence of policy instruments that facilitate and encourage appropriate farmer responses to salinity (e.g. local catchment management plans, land use regulations, financial penalties or incentives, and reliable sources of information); and
- willingness of urban populations to contribute to solutions.

Likewise, research and professional practice in environmental education can benefit from insights derived from the field of public health, which is increasingly being recognised as multi-disciplinary in scope. As indicated in Figure 1, the models presented by Hancock (1996) and Price (1997) suggest a close relationship between sustainability and health. Both those publications resulted from the Healthy Cities Project of the World Health Organization. The overall state of health of people living in human settlements is determined by a range of factors, including socio-economic conditions, lifestyles, the condition of the local environment, and the quality of health services and other social services. The interaction between these factors is complex and may vary in different circumstances. Although some large-scale effects are relatively well understood, much remains to be learned about how various activities and conditions affect health and how such information can be applied in policy-making (Price, 1997, p. 25).



1. Direct links between ecosystems and human health (traditional environmental health); 2. natural resource and ecosystem management (including land and water use); 3. health services and infrastructure (including water and sanitation services); 4. equitable community and social development (including socioeconomic determinants of health); 5. social networks, cohesion, health promotion, and education (including social capital); 6. linked socioecological systems (synergies between the environmental and socioeconomic determinants of health can arise when social processes generate health benefits through empowerment, justice, and social cohesion while also enhancing ecosystems).

FIGURE 4: The prism framework of health and sustainability (after Parkes et al. 2003)

A recent paper by Parkes, Panelli & Weinstein (2003) identifies converging themes from the fields of environmental health, ecology and health, and human ecology. Figure 4 presents a three-dimensional framework developed by these writers, with six interacting axes linking ecosystems and social systems as foundations for health and sustainability. The model portrays the range of stakeholders (disciplines, sectors, agencies and communities) involved in environmental and population health issues. Development, governance and power are depicted as drivers of both ecosystem and social change. The interactions depicted by the six axes indicate that dialogue and integration among diverse stakeholders are important for developing research, policy and education relating to sustainability, health and the wellbeing of communities.

Conclusion

This paper has argued that sustainability remains a contested concept but that there are some recurring themes. It should not be assumed that attempts to integrate insights from biophysical, social and economic sciences will necessarily produce community consensus on either the meaning of sustainability or the best ways to achieve it. It is to be hoped, however, that they will result in more comprehensive and well-grounded understandings of the issues involved, more informed assessments of the policy options, and a greater likelihood that progress will be made in achieving positive outcomes.

Keywords: Sustainability; contested concept; triple bottom line; communities; health.

Endnotes

1. Asheim (1986), Hartwick (1995) and Sefton & Weale (1996) have identified amendments to the Rule for open economies trading with one another (Neumayer, 1999).

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