

Churches Together in Cumbria Environment Group
Sustainability
June 2009

Abstract

The collective impact of humanity threatens to destabilise planet-wide environmental systems and jeopardise the future of human societies. Climate change demands major alterations in how we live, and makes sustainability more essential than ever. It needs to be built on both ecological and economic understanding. Economic models need to place proper value on environmental resources and to cease from treating them as 'free goods'. Renewable resources must not be used beyond their regenerative capacity; production of wastes must not exceed the assimilative capacity of the environment and non-renewable resources must not be depleted faster than alternatives can be developed. Economists and politicians must think long-term. At the same time, economic development remains an imperative for many countries, and this in turn demands adjustment of global economic and trading patterns. The endless pursuit of economic growth and consumer goods in developed countries needs to be tempered by a recognition of 'enoughness' as a principle closely linked to sustainability. While there may be physical and ecological limits to growth, there are no limits to growth in knowledge, the arts, culture and spirituality. Christians need to adopt sustainability as an attribute of discipleship, reflecting our duty as stewards of the creation on Earth. The goal must be a society where each individual feels secure and enjoys an adequate quality of life.

The Issues

For the first time in the history of the Earth the actions of collective humanity threaten to perturb and destabilise some of the major environmental systems of the planet. Climate change is likely to alter the patterns of world vegetation, accelerate the extinction of maybe 35% of species, raise sea levels to an extent that renders some low-lying island states uninhabitable, expand deserts and have other impacts we cannot predict. At the same time, human population growth from 6 to 9 billion and economic growth, associated with expanding industrialization, bring an ever-increasing demand for food, energy and natural resource. Although global food production has, in general, kept up with rising numbers, in 2008 the UN Food and Agriculture Organisation (FAO) reported the biggest increase in malnourished people in decades, with nearly a billion people going hungry. Even when there is in theory enough food for everyone, millions suffer because shortage and surplus occur in different places, transport is either too costly or inefficient and the poor cannot afford to buy what they need.

On a finite planet, human consumption cannot increase indefinitely even though scientific skills have allowed the production of food and other essentials to grow to an extent undreamed of by Malthus and his contemporaries. Eventually, humanity must live within the 'carrying capacity' of the Earth. Sustainability means nurturing Earth's life support

system so that human needs can be met indefinitely: in the words of the World Commission on Environment and Development it means meeting the needs of the present without compromising the ability of future generations to meet their own needs. Global sustainability is the optimistic future scenario: catastrophic environmental collapse and mass mortality, at least in the regions hardest hit by climate change, are the pessimistic alternative.

For Christians sustainability is closely linked to stewardship. We have a duty to care for the whole creation on Earth as God's 'under managers', and that means avoiding the needless perturbation of planetary systems with consequences in terms of extinctions, reductions in biological productivity and catastrophe. Our duty to love our neighbours means sustaining, and wherever possible enhancing, the life-support system on which humans and all other species depend. It also requires an equitable sharing of natural resources, in ways that will assist human societies world-wide to escape from 'the pollution of poverty' and deprivation. It is closely linked to the concept of 'enoughness' under which, having achieved a good quality of life, societies do not constantly strive for more to the detriment of less favoured people or the habitats of non-human life forms.

Biological Sustainability

All living organisms on Earth interact with one another and with the physical environment. Complexes of interacting organisms, together with their physical settings, are termed ecosystems. Any ecosystem can be characterised in terms of the total amount of living material it contains (biomass), the apportionment of that biomass among different species (diversity), the amount of new living matter produced in the ecosystem in a particular time (productivity) and the flows of energy and materials through it (fluxes).

In any ecosystem, organisms are sustained by consuming the biomass of other organisms either as food or through the breakdown of dead organic matter by decomposers. Plants produce new biomass through photosynthesis, herbivores build up their bodies by consuming plant matter, and carnivores subsist on the meat of herbivores: the sequence is what we call a food chain. Provided that carnivores do not kill more prey animals than can be made good by reproduction, and herbivores do not destroy their food resources by overgrazing, the result is a sustainable ecosystem. Over-consumption on the other hand leads to changes, possibly with diminished total biomass or reduced total productivity. The new configuration may still be sustainable, but at a lower level.

Over thousands of years of history humans have successfully altered ecosystems by narrowing the range of component species to those directly useful to people. They have eliminated predators that kill their domesticated herbivores, and waged war on wild herbivores that compete with domesticated species for pasture or eat crops. Sustainable agriculture is about maintaining the productivity of cultivated lands or pastures indefinitely at the highest level attainable through 'good husbandry'. It is a testimony to the skill of farmers and crop-breeders that the yields per unit area of crops like wheat, or the production of meat or milk by sheep or cattle, have increased enormously in recent centuries. Selective breeding (which is an evolutionary process, with agricultural

selection replacing natural selection) continues to improve crop plants and domestic animals, and genetic engineering offers the prospect of taking the process along new pathways. However, some of the measures adopted to boost productivity, including large scale use of artificial fertilizers, cruel intensive livestock husbandry, modified plants are ethically and socially unacceptable and may be unsustainable.

Economic sustainability

Applied to economics, sustainability is the process whereby the products of human activity and creativity are generated in a way that meets human needs today and will continue to meet those needs in the future.

Sustainability may appear counter-cultural to many economists, because they have developed a model of the economic system in which growth continues indefinitely. In one sense they are right – we are nowhere near the limits to the potential growth in human creativity and ingenuity. But it is now clear that the natural resources of the planet are finite, as the planet itself is, and that human economic action has now reached the level at which care for humanity's environmental setting has to be factored into economic activity alongside care for humanity's created wealth. The Club of Rome's celebrated report *Limits to Growth*, published in 1970, examined the interlinked roles of human population, agriculture, industry, natural resources and pollution and concluded that these would inevitably constrain human numbers and the human standard of living. A recent up-date (in 2005) predicted growing hunger, oil shortages and ecological and economic collapse if nations did not rethink economic growth and ensure that it was contained within environmental limits.

As with biological sustainability, the critical questions relate to how far such limits to growth can be stretched by human ingenuity. It is not essential that either products or processes remain unchanged: indeed the advances of civilization have been secured by substituting new products, new technologies and new means of supplying energy for old. This is demonstrated succinctly in the terms applied to stages of human social development through the stone, bronze and iron ages. Wood was the source of heat in most societies for most of history and still boiled half the world's cooking pots in the 1970s: coal, oil and gas have been substituted in most industrialized nations because of their higher energy densities, and now humanity is being forced to shift its energy sources again to avert climate change. What matters is that needs continue to be met and human well-being enhanced, without undermining the productive base and hence compromising the ability of future generations to meet their needs.

Economists and ecologists often clash over substitution. In economic theory, if one activity declines but is counter-balanced by a growth in another, national prosperity is not impaired. But ecologists point out that chalk and cheese have different utilities. For example agriculture in the USA accounts for 3% of national GDP. Were that to decline to 2% the loss of one third of the food output could not be made good by economic output in new non-food technologies. Of course the substituted output could be exported, financing the import of food, but at a cost in food security and a risk of increased hunger in the countries providing the food. Energy security is one reason why the UK

Government is seeking to expand renewable energy and build new nuclear power stations in this country.

‘Green’ apologists often argue that sustainability is ‘good’ and unsustainability ‘bad’. However unsustainability can be the best way to meet an urgent or local need. Throughout history humanity has depleted some non-renewable resources, like rich sources of metallic ore, relying on technology to provide substitutes or allow lower-grade ores to be tapped at affordable rates later on. Likewise, living renewable resources can be over-exploited in the short term: shifting cultivation is sustainable provided that once productivity declines the cultivated patches are allowed to revert to forest and then left long enough for fertility to be renewed. What is important is that over a long time span a renewable resource is able to maintain itself and total production is as near the optimal as can be achieved. Local and short-term unsustainability should be embedded within wider strategies that are sustainable in aggregate.

The interaction between ecological and economic sustainability

It is a self-evident fact that the economic system depends on the ecological one. The Earth remains habitable because of the constant supply of solar energy. The fertility of the land depends on rainfall and on the activity of complex ecosystems within the soil. Living systems renew the oxygen in the air and recycle the elements. Humanity still depends on other life forms for food. Many medicines originate in plants or fungi. Naturally-produced raw materials like wood, wool and cotton are staple in many societies.

Generally speaking, environmental resources are most likely to be cared for if they are the property of individuals or communities whose prosperity clearly depends on their continuing yield. Farmers have an incentive to practise good husbandry. Conversely, resources that belong to nobody are at risk of competitive exploitation, with no incentive to conserve because restraint is seen as benefiting a rival. This is the basis of Garret Hardin’s ‘tragedy of the commons’, manifest in the destruction of the great whales, the over-exploitation of fisheries, ivory poaching and the wastage of tropical rain forests (even though the latter do lie within national jurisdictions and may be at least notionally state property). The situation can be made worse if countries or industries invest in equipment - such as more powerful fishing vessels – to capture a larger share of a declining resource, and exploitation is pressed to the point where the resource collapses as the cod stocks of the Newfoundland Grand Banks or the Antarctic populations of great whales did. History has shown that sustainability is only likely where such systems are brought within the reach of enforceable international or national laws.

One of the points of tension between economics and environmentalism has arisen because of the way environmental features are valued in economic models and equations. In the past some economists treated natural systems as ‘free goods’. For example, the ability of the environment to receive, dilute, disperse and recycle the wastes generated by human activities was regarded as a natural resource, and it was assumed that its capacity was almost infinite. While the scale of human activity was small in comparison to the dimensions of nature, this simplistic attitude was understandable, although the world

displays many manifestations of human mis-management dating from early in history. Now, with mounting human populations and widening industrialization – important though the latter is in the struggle to relieve poverty and deprivation – the need to regulate human impact on global systems is becoming inescapable. In the 1970s and 1980s the depletion of stratospheric ozone and consequent increased exposure of people and other living things to damaging ultra-violet radiation forced the abandonment of chlorofluorocarbons which were in other respects useful to humanity. The threat of climate change is forcing the phasing out of coal, oil and natural gas – the energy sources on which industrialization has been built. Some economists (notably Hermann Daly) have spoken of a ‘Great Ecological Spasm’ if action is not taken speedily. Some environmentalists assert that severe changes in global climate are now unavoidable and that humanity will have to adapt to a harsher environment. These developments have added force to the argument that environmental components must be re-valued in economist’s models, if the latter are to provide a dependable guide to social action in a world that can no longer treat nature as an infinite resource. It is clear that economists and politicians alike must think long-term.

Sustainability demands three interlinked actions:

- renewable resources must not be exploited faster than they can be regenerated;
- wastes must not be produced faster than they can be absorbed and recycled by the environment;
- depletion of non-renewable resources must not outstrip the development of new resources to replace them.

The ethics of sustainability

Sustainability rests on certain fundamental principles:

- we have a duty to care for the creation on Earth, and this includes a responsibility for sustaining ecological diversity and abstaining from using natural resources in ways that accelerate the extinction of other species;
- in using the production of the planet to sustain and enhance human life, we must live within the constraints of its ecology and sustain its resilience;
- where we use non-renewable resources (such as metallic ores) we need to do so carefully, not squandering irreplaceable assets and where possible ensuring that things made from them can be recycled when they are worn out;
- equity and justice should inspire our management of the natural resources of the planet. We should seek to give a decent quality of life to all people alive today and conserve nature’s capacity to support and enrich future generations;
- the use of resources outside the limits of national jurisdiction and ownership, such as high sea fisheries and ocean bed and lunar minerals should be governed by binding and enforceable international law;
- economic theory, as a guide to social action, should ensure that environmental resources are properly valued and that false assumptions about substitution have no place in economic models;

- the concept of enoughness should be set alongside sustainability as a guide to development goals.

While it is human nature always to seek better things, we should recognise that quality of life does not necessitate a vast array of complex material goods. Once a basic quality of life is attained, with adequate diet, shelter, health care, education and employment, and human numbers stabilise at sustainable levels, growth in material possessions may bring only modest rewards in terms of true satisfaction.

While there may be physical and ecological limits to economic growth, there are no such limits to growth in knowledge, arts and culture and the potential and value of these developments are increased by sharing. A sustainable economy need not be a smaller economy. Universal education, especially for women, leading on to enhanced employment opportunities, is fundamental. An educated society is more likely to be informed and tolerant. Research and development are needed to produce new technologies and products. New agricultural techniques may be essential as part of our adaptation to climate change. We currently face major challenge of enhancing energy efficiency and developing new sources of energy, thereby allowing drastically reduced use of fossil fuels. The concept of ‘sustainable communities’ is gaining ground in many parts of the world and there are examples in the UK which adopted a Sustainable Communities Act in 2007 and founded the Transition Town Initiative. In Cumbria a number of communities are seeking local environmental awareness and action.

Simplicity, adaptability and the things of the spirit are also attributes of true wealth, and spirituality has a potential for growth as part of the sustainable agenda. As Christians we need to make sustainable living part of the practice of our faith. We need to seek reconciliation between the planet and humanity through lifestyles that benefit both. That lifestyle might include the following ten components: live simply; do not let work consume all your energy and thought; meditate; strive to be well informed and thoughtful; consume less; avoid waste; do not use environmentally harmful products; walk wherever practicable; bake bread and grow vegetables; share in the community. Such a lifestyle can be aesthetically pleasing as life becomes more fulfilled and the acceptance of ‘enoughness’ is linked to kindness and sharing within the community.

Conclusions

Sustainability imposes severe challenges upon human societies. It asks us to accept major changes in our current lifestyle for the benefit of others, including those not yet conceived. It demands that we treat the whole of God’s living creation as neighbours to whom, and to whose life-support systems, we owe a duty of care. It challenges people in developed countries to constrain their economic growth so as to release resources for less developed communities – or modify technologies so that they deliver improved products at lower environmental and energetic cost.

Christians need to adopt sustainability as one manifestation of discipleship. Christ came 2000 years ago to offer sacrifice and salvation for generations not then born. Through many generations, the Church has acted as though Christ’s redemption was for humanity

alone, but now we realise, as Paul did when he wrote Romans 8, 20-24 that this sacrifice was for the whole of creation. Our role today is to be the co-creators of the future with God, recognising that “the Earth and its fullness is the Lord’s” (I Corinthians, 10, v. 26) and that we have to live as part of God’s Earth, not as detached beings able to exploit it to satisfy our worldly desires. We are not outside the laws through which God governs the created order. It has been suggested that the poor of the Earth, who have basic survival skills and are able to do much with little, may be better placed than the rich to make the adjustments that a sustainable future demands (see Matthew 5, vv. 1-16, especially v. 3 and Matthew 6, vv. 19, 25).

Global sustainability will only be achieved if there are changes in the political and personal structures which create, among other things, concerted action to mitigate and adapt to climate change and to safeguard biodiversity, support for sustainable development world-wide, radical changes in global and national energy policies and ‘green citizenship’ at personal level. The problems are so big that many people find them daunting, but an effective blend of science, technology and environmentally-sound economics, driven by political consensus and backed by personal actions based on environmental ethics can succeed. For Christians, as for people of other faiths, such actions need to be inspired by the belief that they are expressions of our duty to honour our covenant with God. The World Council of Churches Conference on Science and Technology in 1974 suggested that the ‘goal must be a robust sustainable society where each individual must feel secure and a quality of life maintained’. Humanity faces a century of challenge to build such a society.

Further reading.

- Daly, Hermann E.** Ecological Economics and Sustainable Development. Edward Elgar, 2007
- Daly, Herman E and Cobb, John B.** For the Common Good: Redirecting the Economy Toward Community, the Environment and a Sustainable Future. Beacon P. 1989.
- Dresner, Simon.** The Principles of Sustainability, 2nd ed. Earthscan, 2008
- Homer-Dixon., Thomas.** The Upside of Down, Catastrophe, Creativity and the Renewal of Civilisation. Souvenir, 2006
- Meadows, Donella and others.** Limits to Growth, Club of Rome, 1970
- Meadows, Donella and others.** Limits to Growth, The Thirty year Update, Earthscan, 2005
- Professional Practice for Sustainable Development Initiative.** Principles . n.d.
- Sustainable Communities Act, 2007.**
- World Commission on Environment and Development,** 1987