Towards sustainable consumption - visionary or illusory?

Human consumption of scarce resources in the world is rising rapidly. Urgent thought is being given to whether this increase is sustainable, that is, whether the availability of these resources to future generations is being threatened. Can we move towards more sustainable consumption? This Briefing addresses some of the issues involved.

Consumption means different things to different people. Economists focus on the generation of utility, anthropologists and sociologists concentrate on its social meanings. Scientists study the way humans use energy and transform materials. Part of their interest is to see whether any resources become less available for future use. They also monitor whether the use threatens human health, welfare or other things people value (Royal Society 1997).

Since less developed countries have just as much of a right to a standard of living comparable to that of more developed countries, consideration of the situation of some of the largest and fastest growing developing countries provides a sobering scenario. When, rather than if, their standard of living reaches levels similar to that of more developed countries the impact on global consumption patterns and resources will be immense.

Many people today, particularly those living in Western countries, have access on an unprecedented scale to an excess of consumer products including food, energy and manufactured goods. While many biological systems incorporate mechanisms to defend against times of deficiency there are, however, few mechanisms that compensate for excessive consumption. For example, the physiology of animals defends against body weight loss during a famine, but animals have only weak defences against body weight gain when food is abundant. The current epidemic of obesity is a consequence and the number of people who are over nourished and overweight rivals the number who are undernourished and underweight.

Consumption is a focus of attention for those who monitor the drivers of economic success, whereas the concept of sustainable consumption receives little support. This is not particularly surprising as sustainable consumption wins few votes, it threatens competitiveness and profitability and it goes against the economic mantra that encourages citizens to spend, spend, spend. Yet sustainable consumption is at the centre of sustainable development (which everyone seems to want). One of the great challenges of this century must be to understand what drives consumption, and how we can reduce consumption through increased efficiency.

Many more mouths...

Population growth is commonly assumed to be a key cause of unsustainable consumption. The world's population is now 6 billion people and growing by 220,000 each day. At the present rate it is estimated to reach 8 billion by the year 2030. Two examples, however, show that consumption is not simply determined by population growth, but also by economic activity, technology choices, social values, institutions and policies.

First, compare Bangladesh and Britain. Bangladesh's annual increase in population is about 2.4 million, while that of Britain is about 100,000. However, per capita carbon dioxide emissions (an indicator of consumption of fossil fuels) in Britain are 50 times higher than in Bangladesh. Consequently the 100,000 extra British residents cause more than twice the amount of carbon dioxide emissions than do the 2.4 million Bangladeshis.

Secondly, since 1950 the world's richest 20% has raised its per capita consumption of meat and timber two-fold, its car ownership four-fold, and its use of plastics five-fold. Over the same period, the poorest 20% has increased in number, but has hardly raised its consumption at all.

Supply and demand: 1) Food

Three topics, food, energy and materials (which includes water) are central to sustainable development. In 1798 Revd Thomas Malthus wrote his celebrated *Essay on the Principle of Population*. In it he predicted that population growth would outrun food supply. That this has not occurred on a global scale is mainly because of the impressive gains in cereal production, arising from scientific advances.

Such gains have raised questions about whether there are genuine threats to 'food security' - a term used to describe the availability of food and the rights of people to have access to it. During the 1980s, the overall world cereal output per capita plateaued. In South Asia, the Far East, Europe and the former Soviet Union, where over 70% of people

live, production per capita rose appreciably. Since 1990 output has continued to rise in Europe and the former Soviet Union. However, in Africa and some parts of South Asia food production has failed to keep ahead of population growth. The exception is India where great advances over the last 50 years have seen food production increase four-fold (from 50 to 200 million tonnes) while the population has risen only three-fold (from 330 to 960 million).

Today's farmers produce enough food to feed everyone. If the world's supply of food had been evenly distributed in 1994 it would have provided an adequate diet of about 2350 calories per day for 6.4 billion people, more than the world population. However moving this food from places of over-production to points of need would have been prohibitively expensive and the food would have been poorly suited to the dietary needs of many in less developed countries.

Modern farming methods may have increased production, but they have created many problems. Land has been lost to soil degradation and desertification. Agricultural practices in both the industrial and the developing countries have degraded the land's productivity by erosion, water-logging, compaction of soil, overgrazing, salination and pollution. The picture that emerges is clear - many modern agricultural production systems are not sustainable. If disastrous destruction of the resource base is to be avoided, new initiatives are needed.

Urbanisation is another cause of land loss. In 1961 the amount of cultivated land supporting food production was 0.44 hectares per person, today it is about 0.26 hectares and by 2050 it will be about 0.15 hectares. Expansion of arable land is now below 0.2% per year and it continues to fall. The remaining land often needs irrigating. Irrigation is now essential for 16% of the arable land on which about one-third of the world's crops is produced.

Food for a future

Just as the world would not be feeding itself today with the farming methods of the 1940s, so farmers can hardly expect to meet the increased global demand in 30 to 40 years time with their present methods of producing food. Without another agricultural revolution, the fate of the peoples of the less developed economies looks grim.

New approaches will be needed and biotechnology could in part provide the answer by developing new crops with increased yields and better storage properties, richer nutritive qualities and greater geographical flexibility (Anon, 2000). Different systems of production are also emerging using fewer chemicals and environmental pollutants. However, the chances of success are finely balanced. Many in the developed world, particularly in Europe, are suspicious about science and technology, and recent food scares have fuelled historical and ethical doubts about the safety and naturalness of 'modified foods'. There is also concern that new technologies will direct society down a slippery slope towards an ecological disaster. By contrast in North America the technology has been accepted as part and parcel of decent life in the 21st century.

Another problem is that biotechnology is expensive, both in terms of innovation and development, causing concerns about the equity with which it will be employed around the world. But it would be irresponsible to fail to establish partnerships with less developed countries—and to out-price and deprive them of advances; and could lead to confrontation.

2) Energy: the desire for power

The global consumption of energy rose at about 3% every year between 1960 and 1990. GDP, in the same period, rose by 4% a year. Energy use , however, is very unevenly distributed. In 1980 the USA used 60-70% more energy per unit of GDP than the UK, France, Germany or Japan. Present trends suggests a *doubling* of total energy demand by about the year 2020 when the less developed countries (in particular China and India) will require more than half of the world's energy production. Used at the current rate, known reserves of non-renewable fuels will run out after about 100 years, though new deposits and improvements in mining technologies are stretching this deadline to almost 600 years. If uranium using fast nuclear technology is included in the calculation, energy from non-renewable sources could last for almost 1400 years. Increased use of fossil fuels, however, leads to global warming and damaging climate change. To mitigate such change it is necessary that, during the next few decades, the energy industry reduces its use of fossil fuels (eg through efficiency), and moves to non-polluting (eg renewable) sources.

Already renewable energy sources (fuelwood, dung, crop residues and large hydroelectric schemes) and 'new' sources (solar, wind, biomass, ocean and small hydroelectric schemes) contribute 16% and 25% respectively to global energy use. With investment and incentives they could provide much more.

Nuclear power is often commended as 'clean' energy, as it results in little in the way of carbon dioxide emissions or other air pollution. However, other concerns about its use (eg disposal of radioactive waste, danger of accidents, proliferation of nuclear material) must be satisfactorily addressed before increased use of nuclear power will be acceptable.

Many bodies concerned with policy (eg the UK's National Academics Policy Advisory Group) have stressed the need to switch to renewable energy supplies. Attempts at intergovernmental meetings addressing the climate change issue, for instance at Kyoto in 1997 and The Hague in 2000, have illustrated, however, that to define and achieve targets consistent with sustainability presents a formidable challenge not only for scientists and engineers but even more for politicians.

3) Materials: Building a future

Material science shows how new knowledge can contribute to sustainable consumption. For example, per capita steel consumption in different countries has either remained constant or more usually has *decreased* as average income has increased. This principle is true for many engineering materials (tin, rubber and plastics), though not for commodities that are scarce or cannot be recycled.

The pessimistic view is that modern methods of intensive extraction, processing and disposal are unsustainable. If all the world used materials as intensively as the average American, world usage would increase 6-fold, with huge environmental damage.

Politics and policies

Draconian methods to reduce consumption are advocated by 'deep Greens'. More conventional policy-makers believe that politically inspired interventions such as price control are not feasible. Another approach to the introduction of sustainability is by reassessing the way that we measure "success".

The Gross National Product (GNP) is used to measure national performance and personal consumption, but many believe that its value is limited because it fails to include the net value of changes in externalities—such as the environment-resource base.

It has been proposed (Dasgupta 1997) that a new measure be introduced, the net national product (NNP), that represents a more realistic assessment of sustainable development. In a closed economy NNP is defined as: consumption *plus* the value of net investment in physical capital (ie buildings and infrastructure) *plus* the value of net change in human capital *plus* the value of net change in the stock of natural capital (stocks of renewable and non-renewable materials) *minus* the value of current environmental damages.

Subsequently, Myers (1999) suggested a controversial five-point plan:

1. Expand eco-technologies (world market worth $600 billion p.a.);
2. Get the prices right for key commodities such as gasoline/petrol;
3. Change the gross national product (GNP) as an economic indicator into an environmentally-sensitive index such as net national product (NNP);
4. Reform the tax system; and
5. Remove perverse subsidies.

An Index of Sustainable Economic Welfare (ISEW) has also been proposed, which adjusts the GNP per capita to account for a variety of similar social and environmental factors that are not generally included in measuring economic progress. Using this analysis, depletion of non-renewable resources, long-term environmental damage and ozone depletion gave the largest negative effects, which, in terms of long-term environmental management and resource conservation appeared to be more serious in the UK than in the USA.

Another attractive approach, Factor Four, has been put forward by Ernst von Weizsacker, Amory Lovins and L Hunter Lovins (1997). It demonstrates how, through the appropriate use of technology and efficient organisation, resource productivity can, and should, grow fourfold. With concerted directed action the amount of wealth extracted from one unit of natural resources can quadruple.

Though the future is hard to predict, as Nobel Laureate and inventor of holography, Dennis Gabor, wrote "futures can be invented". Will sustainable consumption be written into the future? Little support will be gained for it unless policy-makers, politicians and consumers (you and I included!) are persuaded that it would lead to an improvement in the quality of life, and that changes in consumer behaviour would make a difference.

Influencing consumers

Rather surprisingly, a recent analysis in the UK showed that the increase in expenditure during the past 40 years was related more to environmental and non-material needs than to material ones. Among the most striking examples in recent years has been the adoption of non-smoking areas at work and leisure on account of associated health risks. This would imply that the behaviour of consumers is susceptible to change at least in the non-material sector of expenditure.

A Kabelvag Workshop in Norway on *Consumption in a Sustainable World* (1998) identified the most important social drivers and behavioural mechanisms as the media and IT, the influence of the middle class, and, in particular, the role of women in shaping patterns of consumption. They predicted that public understanding of the relationship between globalisation and the need for equitable sharing will be crucial in any policy designed to move towards sustainable consumption, together with improved efficiency in the use of resources.

Choosing the appropriate policy measures is paramount since environmental degradation itself can be due to policy failures (Myers and Kent, 1998). Many subsidies only partially bring about the benefits for which they were imposed and often have damaging effects to the environment and to the overall economy. Such subsidies are called 'perverse subsidies'. In agriculture they have resulted in erosion of topsoil, pollution from fertilisers and pesticides, and the release of greenhouse gases. In energy they have promoted fossil fuels causing acid rain, urban smog and global warming. In transport they have resulted in traffic congestion. In water they have contributed to the misuse of supplies particularly in areas where reserves are scarce. In forestry and fisheries there has been over-harvesting leading to depletion of stocks.

Scientists, economists, social scientists and Non-Governmental Organisations (NGOs) need to take each other more seriously if the full costs of consumers' decisions are to be appreciated. Sustainable consumption will not be achieved by any of these groups alone. The United Nations has held five conferences on major issues of long-term global significance (Rio, 1992; Cairo, 1993; Copenhagen, 1994; Beijing, 1995; Istanbul, 1996), but sadly none of them focused on sustainability, consumption or the human dominance of eco-systems.

An informal network of the world's academies, the InterAcademy Panel on International Issues (IAP) addressed the subject Transition to Sustainability at an international conference in Tokyo in May 2000; details can be found on the Web (www.nationalacademies.org).

Conclusion

Consumption has joined the twin problems of population growth and environment as major challenges for the new century. Fortunately the opportunities to relieve consumption pressures are many (Myers, 1997). They will involve the use of improved technologies that come from the discovery of new knowledge, shifts in lifestyle that lead to more equitable sharing of the environment and social systems, and changes that are promoted by a range of policy initiatives. Whatever happens, we will need to learn to do more with less, or to achieve more in new ways. The drive to Sustainable Consumption is a particular challenge to Christians. Over-consumption, greed and exploitation are strongly condemned by the prophets of the Old Testament, for example by Amos, and by Jesus in the New Testament.

The Christian churches failed to take a lead over Green issues and lost the initiative to the NGOs. As a group with a redemptive commission, what a tragedy it would be if we failed to take - or even recognise - the initiative again!

Bibliography

Anon (1997) *Towards sustainable consumption*. The Royal Society, London.
Anon (2000) *Transgenic crops and World Agriculture.* The Royal Society, London.
Dasgupta P (1997) *The Environment & Emerging Development Issues.* Clarendon Press, Oxford.
Myers, N (1997) 'Consumption in relation to population, environment and development.' *The Environmentalist* 17, 33-44.
Myers and Kent (1998) *Perverse subsidies.* International Institute for Environment and Development, Winnipeg, Canada.
National Academies Policy Advisory Group (1995) *Energy and the environment in the 21st century.* The Royal Society, London.

This briefing was written in 2002 for the John Ray Initiative by Dr Pete Moore and the JRI Trustees based on material provided by Professor Brian Heap. This .pdf version prepared October 2016

For more information contact us at:
JRI, City Works, Alfred Street, Gloucester, GL1 4DF admin@jri.org.uk www.jri.org.uk

The John Ray Initiative promotes responsible environmental stewardship in accordance with Christian principles and the wise use of science and technology. JRI organises seminars and disseminates information on environmental stewardship. Inspiration for JRI is taken from John Ray (1627-1705), English naturalist, Christian theologian and first biological systematist of modern times, preceding Carl Linnaeus.