

Human Flourishing And The Environment

Abstract

In this paper I outline the main questions of ecological sustainability in relation to human flourishing. Below I offer a summary of major risks to flourishing from environmental damage. I then outline a Christian model of flourishing, and link this to considerations of ecological integrity.

The paper then makes parallels between a Christian understanding of environmentally sustainable development and the long secular critique of the Growth Model, which has drawn attention to what I call the 'great forgetting' of the natural world and has prompted a 'great reminding' of our embeddedness in 'nature' and of dependence on ecological systems, part of what Christians and others call common goods. The paper then translates the main aspects of Christian understanding of environment and human flourishing into secular policy terms, focusing on policies for fair action on climate, pro-poor 'Green development' and low-carbon growth, environmentally sound economic policies, governance and safeguarding of biodiversity.

1. The state we're in

Ecological disruption and risks to development

When we think about human flourishing, we often emphasise the social and economic elements of well-being - love, companionship, meaningful work, an income that secures decent shelter, health, and so on. The nature of 'developed' life in urbanised industrial societies means that we can overlook, or even forget (as discussed further in section 3), the ultimate dependence of human well-being on the Earth, the biophysical environments from which we make our livings. The fact is that there can be an environment without society or economy; there can be no society or economy without a functioning web of ecosystems

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providing the 'life support' we all need. A stable climate system; healthy and renewed soils; clean watercourses; undamaged common resources for fresh water, timber and game - all these have been present, if often over-exploited locally, during the era of human civilisation and post-Ice Age development. The ultimate dependence of human wellbeing on terrestrial ecosystems ought to be obvious, but it has taken the shocks of ozone layer depletion in the 1980s and the diagnosis of human-induced climate change over the past 20 years to remind developed societies of the need to sustain our terrestrial life support systems.

Climate change has come to dominate political debate on 'the environment', although it has yet to generate, as seen at the December 2009 Copenhagen conference, a sense of existential urgency among decision-makers, media and citizens. But climate change is not the only phenomenon presenting deep challenges to development and flourishing. The political focus on climate risks downplaying many other ecological problems. These concern our ability to produce enough food, use wisely our freshwater resources, sustain healthy soils, protect a rich variety of species and habitats, conserve forests and the services they provide, and manage common resources fairly as scarcities begin to bite. Climate disruption makes all this more difficult to achieve, and is likely to exacerbate many processes already in train, such as deforestation. This has profound social and economic consequences, especially for the poorest people in developing countries, whose livelihoods are often less shielded from localised environmental damage than those of urban dwellers, and whose wealth is dependent on the richness of natural resources. Ecological damage can worsen poverty, dislocation, conflict and ill-health, and put at risk achievement of major policies such as the Millennium Development Goals.

There are multiple challenges to ecological stability, all stemming from the interaction of the rise in human population over two centuries and especially since 1950, with enormous growth in consumption in the industrialised countries and in the capacities of modern technology. This is summed up in the Ehrlich-Holdren 'sustainability equation' $I=PAT$, where impact I is the product of population, affluence (a measure of rate and scale of consumption) and technology. I can be modified by reductions in population, consumption or use of technologies, or in all of them. Impacts on climate and ecosystems reflect all these aspects of human development, and in particular the effect of massive increases in per capita consumption of resources (and consequent emissions of waste) in 'developed' countries in the past half-century. Impact over the past two centuries has become globalised along with trade, industrialisation and population growth. We have moved from a 'frontier world' in which resources appeared to be inexhaustible, to a 'full world' (Daly, 1992) in which scope for growth in population and consumption is highly constrained unless it is at the expense of potentially ruinous increases in ecological impact.

Two international research initiatives indicate the scale of the problems. First, the United Nations International Panel on Climate Change (IPCC) has produced several large-scale assessments of literature on our collective impacts on the climate system. The IPCC reports show to a very high degree of confidence that human activities are the main element in the recent observed heating trend : if unchecked will very probably lead to average temperature rises by the end of this century that will cause serious disruption to ecosystems, economies, communities and security, with a large spike in the already high rate of species extinctions (see for example Houghton, 2009).

Second, the Millennium Ecosystems Assessment process (MEA) initiated in 2001 has shown that 60% of ecosystems for which adequate data can be compiled are being degraded or exploited unsustainably (MEA, 2005). Ecosystems provide 'services' - the life-support systems on which human welfare and that of other creatures ultimately depend - and these are being damaged by the impacts of population growth, consumption and pollution and powerful technologies (over-fishing provides the most striking example of technological capabilities overwhelming the capacity for renewal). The MEA makes explicit the dependence of wellbeing on irreplaceable ecosystems whose integrity we are undermining.

The environmental movements of the past half-century have been in the vanguard of those advancing a critique of modernity that rejects the equation of flourishing and progress with the dominant economic model, insisting that growth is not the same as development, and that development as we have known it is not producing the conditions for human flourishing (see Hawken, 2007). Some see growth as incompatible with sustainable well-being (see NEF, 2010) and some see it as an essential means to human ends (see Stern, 2009); all agree that however we regard growth, it cannot be treated as an end in itself, as has been the case for generations in the developed world. Here we can see important points of convergence with what I take to be a Christian critique of existing 'development' and a Christian account of human flourishing in relation to the environment, and hence points of consensus and actual and potential collaboration in policymaking and practice. Below I outline the main points of a Christian critique and account of flourishing, and indicate areas of convergence with secular critiques and proposals for new models of development.

2. Christian perspectives on human flourishing and the environment

The papers from Nick Spencer, Celia Deane-Drummond and Severine Deneulin for this project all develop a fuller account of Christian views of human flourishing than I can offer

here. I draw on their discussions and summarise the main features as follows. (See also Pope Benedict XVI and Koenig-Bricker, 2009 for a set of 'ten commandments' on the environment that elaborate on these themes.)

First, human flourishing is at heart a matter of *right relationship*: with God, with fellow humans, and with other creatures. The Growth Model of development, like all utilitarian schemes, focuses on *individuals* and their consumption within a system of choices and consequences. It neglects the social and environmental relationships in which people are 'always already' embedded. In a Christian framework, we thrive *relationally*, not as atomised consumers and maximisers of utility. We need to develop in relation to God as ultimate source and destination; to others as members of a common body of mutually obligated and responsible persons, whose individual flourishing depends on the actions and values of others (love your neighbour as yourself); and to fellow creatures as sources of value embedded like us in a cosmic scheme that precedes us all, a Creation that belongs not to us but to God, and whose goodness is intrinsic and derived from God, rather than from our calculus of utility. In environmental terms, we are embedded in a web of ecological relationships essential to our well-being and life-chances. Moreover, this web extends indefinitely in time, and must be sustained over generations: the injunction *love thy neighbour* can be seen as part of a covenant that enjoins us to ensure that the conditions for human flourishing extend beyond our own place and time.

Second, human flourishing depends on the quality of *common goods*. This follows from the recognition of well-being as a relational quality. There is a limit to individual well-being in a larger social and environmental setting in which others are failing to thrive and in which common goods are endangered. Where peace is at risk, my individual well-being might be defensible for a while, but I am unable to flourish indefinitely when others are suffering from the loss or decay of common goods. The sustaining of global and local public goods essential to human flourishing is, or ought to be, fundamental to development.

Third, human flourishing is bound up with *work* and *stewardship* of the world's resources. As Nick Spencer notes, in Catholic Social Teaching there is an emphasis on work and its relationship to flourishing as a whole person in right relationship with God and others. But work and enterprise can become disconnected from both, rupturing relationship with human dignity, exploiting people and environment, and undermining the prospects of human flourishing. Models of business and work that are wholly instrumental, that disconnect us from concern for others' well-being and that undermine the public goods on which all depend are unjust and unsustainable. Our stewardship of the natural world stems from our unique consciousness, but not from our separation from it: we are privileged creatures, but

creatures all the same. Stewardship and wise tilling of the Earth are not identical with 'dominion' understood as domination and separateness. The 'dominion' idea has been misunderstood and abused often over the Christian centuries, and recent 'eco-theology' has begun to restore a sense of human humility and interdependence to Christian views of the natural world (see for example Barker (2010), pp 214-216; Deane-Drummond (2008); Northcott, (1996)). 'Dominion' in Genesis is a concept rooted in respectful use of God's creation: it does not give permission for domination and pillage. Ecological regulation of work and cultivation of the Earth is encapsulated in the messages of Leviticus 25: our flourishing depends among other things on knowing when to *stop and leave be*.

Fourth, human flourishing is bound up with *justice*. We are enjoined to act justly and love mercy. Injustice is the result of a forgetting of responsibilities towards one another and towards God. It is the outcome of the failure to love one's neighbour, in the fullest sense, as oneself, and to respect the integrity of common goods on which everyone's flourishing depends. This concept of justice is a social one, not an individualistic one. It pays great attention to the needs and capabilities of the poor, and to the responsibilities of the wealthy and fortunate towards them (the 'bias to the poor'). This has inter-generational aspects as well as a focus on the present. Van der Weyer (2010) argues that the sin of usury can be interpreted as a prohibition on *inequitable transfer of risk* in all exchanges of goods and services, and that loading the costs of pollution on to the poor in the present and on to future generations is a form of usury, and hence of injustice.

These perspectives all contain ideas and values capable of being 'translated' into secular policy terms, with a focus on *fair economy, just governance, wise use of and relationship with nature, and sharing of common resources essential for a decent life*. We will come back to these in later sections.

3. Development, growth and the 'great forgetting'

'Development' as growth, industrialisation and urbanisation has brought great gains for humanity and also in some ways for the natural world. Before we embark on critique of growth this must be acknowledged. Growth and its public goods have been associated with disruptions but also with gains for billions in longevity, reduction in vulnerability to disease and violence, improvements in health, shelter and nutrition. It could even be argued that development-via-growth has enabled the affluent to take a positive protective interest in the natural world, an interest of a kind that hardly existed in pre-industrial societies or industrialising ones, though it found expression in hunter-gatherer cultures.

Discussion of growth sometimes overlooks a major aspect of its impact on culture and perception of the world. It has intensified greatly a process of distancing of people from intimacy and identification with the natural world that arguably began with agriculture. Hunter-gatherer societies see themselves as a part of a natural order, embedded in it and sharing a world with other creatures. Such a world has many virtues, as well as hardships and insecurities, but it is a form of culture now passing from experience (Brody, 2002). It is a possible model of human flourishing in habitats where population numbers are low and sustainable. (Not that it should be romanticised - pre-industrial cultures were often quite capable of unsustainable damage to their own or others' environments.)

With the coming of agriculture, population rises, and identification with the created world weakens: domesticated animals have to be protected against wild creatures and other humans; shelter has to become permanent instead of mobile, and the local environment has to be reshaped, managed and defended. Agriculture begins a process of distancing: nature becomes 'other' in ways it cannot be in hunter-gatherer and pastoralist cultures. Industrial modernity has completed this process of distancing and in many ways has started a 'great forgetting' of the natural world, which becomes seen as 'other' - a backdrop to our lives, a realm whose fate is subject to what we do, rather than a creation in which we are embedded and dependent creatures. Urbanisation and technological change take us further away from the sources of our food, water, waste disposal, etc; large-scale infrastructures screen us from harvesting, butchering, sewage and waste management. Cities, offices and houses are amongst other things machines for the suppression of the seasons.

Electronic media continue the process of shielding and distancing. There is evidence in the most affluent countries - and now also in the burgeoning cities of the global South - of a 'forgetting' of the natural world among urban people, in that many have little or no knowledge of wildlife, farming, food provenance and even the everyday 'nature' on the doorstep (Louv, 2005; Pretty, 2007). 'Nature' reaches many of us in highly processed forms - wildlife documentary films on TV, or holidays or visits to local parks. Policymakers in all sectors lead urbanised and protected lives, and the places in which they gather for decision-making are invariably subject to high security, located in cities or towns and far removed from locations where 'Nature' is making itself felt on 'development'. The sense that humanity depends on ecosystem services is an alien one to most of us much of the time, and especially to insulated and urbanised decision-makers, people to whom the Growth Model of development is the dominant reality and generator of norms. It takes great ruptures of normality - in fiction as well as in experience - to remind us in the affluent shielded world of our dependence and the risks we run in forgetting: see for example the reception of Cormac McCarthy's novel *The Road* (McCarthy, 2006) and the film of the book, in which the

goodness of the created world and our dependence on it are dramatised to shattering effect by the biosphere's *removal* via an unspecified calamity. The effect of the novel's great final paragraph is all the greater, as McCarthy restores a vision of the natural world as it is, a Creation that could not 'be made right again' *by us* if we humans wreck it, in which 'all things were older than Man' and 'hummed of mystery', the mystery of God.

4. The 'great remembering': ecological limits to growth

Modern critiques of growth

Ever since modern 'development' began in earnest in the late 18th century, there have been voices of radical dissent. Critique of growth took two main forms. One was a modern variant of the Romantic critique of the cultural and social damage done by industrialism. The other was a variant on Malthus's analysis of supposedly inevitable famine as population grew, focusing not only on population but also on limits to resource extraction. The former attack considered the self-defeating nature of growth in consumption and the limits to growth in GDP as a measure of advancement. The argument is based on the fact that GDP growth is routinely used as a master indicator and proxy for progress, but in reality is simply a measure of activity. GDP wraps up in one measure not only activity that is genuinely a sign of well-being but also activity that harms us; and it does not reflect the mass of work that is not measured (the 'love economy' of domestic care, for example) or the costs of environmental and social damage not measured in national accounts. So a wrecked oil tanker and the clean-up of the oil slick are good for growth: the tanker has to be replaced and the slick cleaned up; the costs of damage are not counted.

The critique goes further: beyond a certain point, which varies from country to country, there seems to be only a weak, or even no, connection between GDP growth and reported well-being (Jackson, 2009). Growth *is* associated with real gains in well-being for the *poor*, but beyond a given level of satisfaction of basic needs for material goods, growth is subject to diminishing returns. (The problem for the affluent is knowing when and how to stop and change course, since diminishing returns are *returns* all the same, not easily perceived as signs of impending trouble, whether at the personal or societal level.)

Gains in, and sustained experience of, well-being are linked not mainly, if at all, to growth in consumption, but to social and environmental goods - family, friends, work, peace, love and purposefulness. Growth can create 'positional competition' that generates social frictions and does not increase well-being even if it offers more material plenty. Numerous

economists have tackled these issues and connected them to the ecological case against indefinite growth on the finite Earth (see for example, Daly, 1992; Jackson, 2009).

All these critiques combine with the advances in our understanding of ecosystems and climate to generate a 'great remembering' of industrial culture about its ultimate dependence on, and participation in, a natural order that cannot be transcended. There is obvious convergence here with a Christian perspective on dependence on Creation, on membership of the Body of Christ, and on the need for right relationship with God's Earth. Recent work inspired by the great American zoologist EO Wilson has suggested that the 'forgetting' of the natural world is profoundly at odds with deep structures of 'biophilia' in consciousness, evolved over millions of years and reflecting the vastly greater part of history in which people have been hunter-gatherers embedded in landscapes and encounters with animals (Wilson, 1984). Research into wellbeing in recent years has suggested that distancing from the natural world is bad for us in many respects and that reconnection with green spaces and animals can improve physical and mental health (see for example Pretty, 2007). Modern societies are 'conflicted': there is eagerness for the technological novelties and conveniences that distance us and help us forget our dependence on Nature, and at the same time in many people a deep love of fellow creatures and landscapes, with which they feel *in relationship* and which inspires a spiritual response of varying kinds and intensities.

The two lines of attack also come together in the case against GDP as anything more than an indiscriminate measure of activity and quantitative growth for its own sake. Policymakers, businesses and voters call for growth regardless of the question of '*growth of what, for what purpose, and with what impacts?*' GDP in its current form simply ignores environmental costs and benefits of growth: it has no means of counting them. Yet the growth economy depends on ecological systems and key resources. What if it were undermining its own ecological foundations? We would not know it from our measures of growth.

Ecological limits: sinks and services

The past two decades have seen a renewal of concerns over growth. Growth in global demand for energy and raw materials has highlighted concerns about how long we have (if any time at all) before the supply of oil peaks, and by anxieties about availability and security of supply of other materials (groundwater, gas, rare earth minerals, etc) essential to modern economies, especially in the light of vast and growing demand from China.

But the core of the new case against indefinite growth is that it threatens to breach limits of *capacity in ecological sinks and services*. Sinks are the parts of the environment that absorb

our waste emissions - atmosphere, soils, oceans, forests; services are the 'life support' systems provided by these sinks and by habitats and creatures (such as flood absorption, pollination, etc). Earlier critiques failed to take into full account the risks from failure of sinks (most plain and urgent, climate disruption and ocean acidification from waste greenhouse gases) and of ecosystem services (loss of food and medicine stores from deforestation; loss of flood defences from mangrove removal, etc). Here the pro-growth argument that we can find substitutes for depleted resources fails: we cannot create artificial ecosystem services to replace collapsing habitats and climate stability. The 'new limits to growth' are set by the 'critical ecological capital' of ecosystem services and sink capacity (Rockstrom et al, 2009). These limits must be respected. The question is, what growth models, if any, can work *within* them?

The argument is summed up in the point that at present rates of consumption, for all humans to live as Westerners do would require at least two Earths (WWF, 2008). If this is the case, then we come up sharply against a range of solutions to the I=PAT equation. Either we sustain consumption in the rich world by keeping the poor in poverty indefinitely; by allowing nature to solve the population problem in Malthusian fashion; by attempting to commandeer the entire biosphere for human needs and hoping we can manage the grave ecological consequences; or by changing radically the nature of growth and consumption, on lines that provide for human flourishing within the 'bounds of the ecologically possible' (WCED, 1987) and equitable use of the world's resources. Only the latter is ethically acceptable. How can it be done?

Escape routes from the dilemma of growth

Pro-growth economists argue that the problem of sinks and services can be overcome in the same way as we overcome the sources issue. Growth itself will create the wealth, technologies and ingenuity to solve the problems. But maintenance of a growth economy as we have known it seems to demand invention of 'rescue technologies' on a timetable and scale that is incredible. See for example Tim Jackson's analysis of the heroic rate of decarbonisation needed in the economy to maintain Western consumption while providing greater equity for poor countries - a 55-fold increase in 'carbon efficiency' of the economy by 2050 (Jackson, 2009). All this will have to take place in conditions of growing ecological damage, rising population (heading for some 9 billion people worldwide by mid-century) and competition for resources.

Yet if there are few credible escape routes for pro-growth proponents, there are few compelling accounts from their critics about a transition to a low-impact economy that can

restore healthy and sustainable relationship with the environment and yet still supply the employment, welfare gains and hope for the poor that growth has brought. Moreover, critiques of growth as 'impossible' for sustainable development (see NEF, 2010) are as politically naive as pro-growth proponents have often been blind or indifferent to ecological factors. The interests vested in growth worldwide - not only in the rich world - and the need for 'headroom' for development and increased consumption in the poor world, make any idea of a wholesale retreat from the growth model of development politically unimaginable except in conditions of ecological emergency.

As Jackson notes, we seem unable to live with growth ecologically but unable to live without it given what it provides for welfare and work (Jackson, 2009). He sketches some of the essential ingredients for a transition away from the Growth Model:

- *radical revision of accounting systems to take account of ecological goods and services;*
- *investment in low-carbon and low-throughput, highly resource-efficient food and manufacturing production technologies, buildings, energy and water infrastructures and assets;*
- *investment in labour-intensive services and in reduced working hours per job ;*
- *tackling the 'social logic' of growth and consumerism- strengthening social capital, reducing inequalities and 'dismantling the culture of consumerism'.*

The final point here is crucial. If there is no technological rescue for the fossil-fuel growth model as we know it, then a coordinated 'descent' from current high-impact and high-carbon modes of consumption is needed, and it must be led by the 'haves' globally so that the poor can have growth in consumption and living standards without breaching ecological limits. Critics of growth economics all converge on the need not only for a new 'engine' for energy supply, but also for a rediscovery by the West of frugality, conviviality, cultural restraints on consumption, sharing, empathy and mutuality, and appreciation of the natural world and our place in it.

Is there a replacement 'engine for growth'? The goal is to achieve 'absolute de-coupling' between gains in wellbeing and input of fossil fuels and other resources subject to scarcity and/or major ecological impact. There are many analyses now of potential 'low-carbon transitions' and 'development pathways' that could secure continued growth (see for example Stern, 2009). They depend on a complex set of transitions from dependence on oil,

gas and coal, and associated infrastructures, towards a rich mix of low- or no-carbon energy sources (including nuclear as well as existing and projected renewable energy systems) and on drastic gains - sustained over decades - in energy, water and materials efficiency. The pathways also require huge investment in, and success of, *carbon capture and storage* (CCS) as a transitional technology as dependence on oil, gas and coal are reduced, and in recognition of the vast coal reserves in China, India, Australia and USA, all large emitters.

None of this can be accomplished without immense investment and consistent incentives, or without the policy and cultural changes noted by Jackson (2009) above. There needs to be a transition not only to new forms of energy inputs but to new production and consumption systems that reduce and eliminate pressure on ecological sinks and services as well as cut the risks of resource depletion. This means a complex transition to use of renewable energy systems, accounting systems that give full value to environmental damage and services, bio-mimicry in materials, indefinite recycling of product components, low-input and integrated farming systems, and so on. It may be that adoption of new generations of hitherto highly controversial and unpopular technologies will be needed in order to achieve the goal of increasing consumption for the poor, sustaining ecological systems, reducing impacts on land from consumption and population growth, and cutting GHG emissions. Thus, *provided* they do not crowd out more affordable and environmentally friendly technologies and drain sources of funding to support other needed innovations, some forms of nuclear power, GM crops and biofuels derived from crop waste (not displacing food crops) could all become part of the rich mix of many technologies needed for a transition to sustainable development. More is said on technology in section 6 below.

All this requires not just massive technical innovation but also social innovation so that new technologies are adopted and used sustainably - which includes the cultivation of virtues, qualities and practices (such as proper accounting for environmental value) that eliminate damaging forms of production and consumption. Social innovations are also vital for ensuring that population growth stabilises worldwide, essential for more 'room to consume' for the poor world as transitions develop for low- and zero-carbon production. These include: greater investment in education and work for girls and women, in child health, and in education and services for family planning education and services, with family planning education sensitively designed to take account of the cultural and religious contexts of people's understanding of sexuality and the family.

If all this were achieved, then we would have created a system of growth that could be the basis for sustained investment in public goods and a fair distribution of wealth and opportunities, without putting the ecological life-support systems of the world at risk. This

could be seen as a 'sustainable growth' model. It calls for profound policy and social innovation: it is not a matter of bolting new technologies on to the growth model we currently have.

This analysis converges with Christian critiques of Growth and consumerism: all point to the need for a fundamental rethinking of the Growth Model, of its identification with 'development', and of the nature of human flourishing in a 'full world'. Growth without limits is sprawl: it cannot happen in a finite system. What makes sense is the idea of growth as a normal phase of quantitative advance in a system (such as a person) that comes to an appropriate end; and of growth in qualitative dimensions (such as knowledge) as a more meaningful idea that can be related to human flourishing as a goal. 'Bounded growth' would arise from varieties of economic activity and production that respect ecological limits and resource constraints and promote qualitative development of capacities and relationships (see Daly and Cobb, 1990; Deb, 2009). Such growth would not be identified with 'development' but would help secure it. Development in a 'full world' of approaching 9 billion people would be about *sustaining and improving the conditions for wellbeing* for those alive now, especially the poorest, and those to come in an indefinite future.

This brings us towards both Christian critiques of the Growth Model and also a version of Amartya Sen's concept of human *capabilities* - the tools, life-chances and conditions we need to be able to thrive and pursue our life-projects (Sen, 1999). Bounded economic growth would be a means of development that respects and enhances these capabilities and adds to them the conservation of the *ecological capabilities* on which all our life-chances depend. These would include: healthy soils, freshwater supplies, resilient services from the classes of ecosystems, including urban ones (MEA, 2005), maintenance of forest cover and services, requisite variety in wildlife and habitats, and a stable climate system; and the legal and political means to debate, cooperate and seek redress in respects of all of them. More controversially, one might add the capability to enjoy access to the natural world, whether in urban green spaces or in 'wild' land, in order to have the opportunity to satisfy our innate need for encounter with the living world beyond the human sphere (see Orr, 1993).

None of these 'capabilities' is wholly in our gift, nor can they be guaranteed *ad infinitum*; but to the extent that we understand them and their fragility, and have the means to manage them sustainably (see the next section), our policies, technologies and governance systems should be oriented to enhancing and sustaining them. The question arises: have we collectively the capacity to do all this?

5. Sustaining the commons

In making faster and better progress worldwide towards what I have called development based on 'bounded growth' and respect for *ecological capabilities* crucial to human flourishing, we need models of *collaborative environmental management* at different scales capable of achieving sustainable use of resources, respect for limits, cross-sector/boundary cooperation, and fair shares.

Sustainable management of resources

For development to be sustainable - capable of providing wellbeing for all indefinitely while conserving the richness of the world's ecosystems and resources - we need clear models of decision-making, design of technology and governance of common resources (Porritt, 2007 and 2009; Birkeland, 2008; WCED, 1987). The 2009 Economics Nobel Prize winner Elinor Ostrom and colleagues have documented many such common pool resource management systems at *community scales* in many countries (Ostrom, 1990). These can be shown to work on the basis of a set of rules, governing values and patterns of cooperation and equitable use that transcend particular places and can be applied to problems of unsustainable resource use now (see box below). An urgent task in the wake of the hobbling of the climate change negotiations and of slow progress in other areas (such as fisheries) is to learn from this important body of work.

Ostrom's work underlines the effectiveness of community-scale resource management in sustaining harvests and avoiding ecological overload or depletion. Much damage has arisen from neglect or destruction of such local knowledge and practice. RP Chhetri of World Mission for Nepal (personal communication) notes the impact of misdirected aid or development conditions imposed by agencies such as the IMF and World Bank on countries such as Nepal, under-valuing and preventing the involvement of local people in assessing new technologies and their impact. Local knowledge of sustainable use of forests has been neglected, yet can hold the key to sustainable development and wise use of resources. For instance, recent research indicates (Chhatre and Agarwal, 2009) that community ownership of forests is associated with much better rates of carbon sequestration in a large sample of tropical forests than is state ownership.

Ostrom's principles have clear connections to classic elements of Catholic Social Teaching such as *solidarity* and *subsidiarity*, two indispensable features for example of any global deal for equitable management of climate change and emissions reduction. Solidarity is vital

because it underpins motivations and virtues for implementing policies for fairness within and between peoples and generations. Subsidiarity - the principle of decision-making at the nearest level of governance to those affected by the decisions - relates to the need for environmental management to be undertaken and controlled by people as close as possible to the ecosystems in question. Remoteness of decision-making, as seen time and again in cases of 'imposed development' (such as major dam projects, state concessions to loggers of forests) tends to be bad for ecosystems, self-defeating in economics, and damaging to human flourishing. Ostrom's research also points clearly to the 'fit' between sustainable resource management and particular models of ownership and enterprise: towards mutuality, cooperatives, community enterprises and small business associations.

Elinor Ostrom's principles and design elements for sustainable use of the commons:

- *clear boundaries* that describe the system to be regulated (from a pastureland to the greenhouse gas emissions to the atmosphere) and the people involved;
- *locally appropriate rules* that make sense for the ecosystems and societies living in and with them;
- *collective agreement*: sustainable management of a commons depends on achievement and maintenance of cooperation and consensus;
- *monitoring*: clear processes for accountability and checks against 'free-riding';
- *graduated sanctions*: breaches of the cooperative system are not punished at once with maximum rigour, but repeated infringements incur rising penalties;
- *conflict resolution mechanisms*: means of restoring consensus and dealing with conflicts of interest or interpretation without resort to coercion;
- *rights to organise*: people operating a common-pool management system need the capability to organise themselves autonomously, i.e. not be subject to arbitrary interference by higher jurisdictions;
- *nested enterprises*: a commons that extends over several scales and boundaries needs to be managed by a hierarchy of networks all respecting the overall goals and design of the management system.

Other models for sustainable management of common resources and development of ecological and social capabilities include the fast-growing Transition Town movement (Hopkins, 2008) and similar initiatives at local level worldwide. The classic example is Fair Trade, offering a just way to connect consumers and producers, to recognise social and environmental value in the supply chain, and to generate fair incomes for the poor.

Cavanaugh (2008) draws attention also to the Economy of Communion project (www.edc-online.org) of the Focolare Movement, a Catholic model of sponsorship for enterprises that divide their profits equally between direct aid for the poor, educational projects and further development of the business. Faith communities and organisations can build on these as they develop their own visions and policies for environmental care and sustainable living (see Gottlieb, 2006; Church of England, 2009; Pope Benedict XVI, 2009; www.arcworld.org; and see appendix 1 below citing the CELAM Declaration).

6. Priorities for policy - and some questions

In conclusion, I outline some policy implications and priorities from the Christian perspectives mentioned earlier, which highlight as vital for human flourishing the following elements: fair economy, just governance, wise use of and relationship with nature, and sharing of common resources essential for a decent life.

Principles to action: bias to the poor and social justice

The principle of 'bias to the poor' and the fundamental importance of social justice points to the need for the interests of the worst-off to be recognised in all international and more local negotiations and regulations on environmental impact. Some implications for policy that should count as priorities in the light of this include:

- **fairness and equitable distribution for the poor in any capping system** for curbing unsustainable use of resources, from water to fossil fuel emissions. Given inequitable distributions of wealth and capabilities worldwide, any capping of resource use risks entrenching disadvantage for the poorest. Therefore management of resource limits must embed equity and distributional effects in design of policies for sustainability;
- this implies solidarity with the poor in relation to greenhouse gas emission cuts, with recognition of the need for poorer countries and communities to have more 'room to emit' as development proceeds and also to have **generous assistance in making the transition to low-carbon development paths** (see below, on decarbonisation); climate justice frameworks such as Contraction and Convergence and Greenhouse Development Rights should be investigated and refined. Nick Spencer (2010) has suggested that **tradeable carbon quotas** might offer a modern way to implement the vision of Leviticus 25 in relation to fair shares in use of fossil fuels and the climate system. Schemes such as these have potential to bring about fairer distributions of 'ecological capabilities';

- all of these ideas point to a basic conclusion: the poor must be enabled to claim their fair share of global and local ecological capabilities and common goods, and the well-off must find ways to constrain and redirect their consumption in order to allow for this, where there is no scope to increase consumption levels for all; and to allow this to happen, governance systems must make room for, recognise and support effective **local community-level stewardship of common resources such as forests**, providing rewards for sustainable management and supporting models of community ownership;
- inequalities of wealth and power mean that the poorest countries have grossly inadequate voice and scope for representation at international negotiations (climate, trade etc) and in international governance. A bias to the poor implies the need for a **global fund for negotiating capability**, enabling G77 delegations to be represented and supported on terms equal with those of the OECD countries;
- the majority of the poorest people are rural dwellers dependent on farming. They are at risk from climate change, inequitable power relationships in globalising supply chains, insecure property rights, conflicts, pressure to adopt costly and input-intensive farming techniques, and pressure on precarious incomes as interests further down the supply chain press for more margins and 'efficiencies'. Support for small-scale producers' incomes via regulation of retailers and wholesalers, and promotion of **high-yield, low-input 'conservation farming' systems** and **diversification for local food security and scope for value-added export**, would increase well-being and security for the rural poor.

Principles to action: a programme of Jubilee measures

The Jubilee idea and ethos have been renewed in recent years in the global campaign for debt relief and forgiveness, Jubilee 2000. The concept can be taken further by Christians and in initiatives connecting all the major faiths and secular groups too, focusing on the need for 'letting the Earth be' to recover fertility, protect habitats and species, and reduce our collective impact from consumption. The Jubilee idea can bring together campaigns, concerns and initiatives about 'slow food', sustainable consumption, reduction in working and shopping time, avoidance of excessive harvesting of resources, and so on. Christians and others should develop **a Jubilee 2050 programme of campaigns and projects** to highlight and put into practice the idea of 'letting the Earth be' for particular times and in particular vulnerable places. The box below contains suggestions for a Jubilee 2050

programme that would support and complement other policies proposed in this paper, and would draw on the vision of human flourishing offered earlier.

Jubilee 2050

- A renewed campaign for a programme of debt relief and forgiveness based on the trade-off of accumulated Western '*ecological debt*' against developing country liabilities: this could be geared to guarantees of investment of released funds by developing country governments in low-carbon transition programmes and protection of habitats and species (including much better payment of local people for stewardship of these places and creatures);
- A global campaign for a comprehensive network worldwide of '*no-take zones*' for fisheries, allowing regeneration of over-fished areas, protection of at-risk species, bans on damaging technologies for trawling, and transfer of lessons worldwide about sustainable harvesting of fisheries;
- A global campaign for a similar network of '*no-logging zones*', ending industrialised logging and clearance of vulnerable forests and creating conditions for sustainable harvesting of forest resources;
- A multi-faith and secular alliance to promote voluntary widespread take-up of a weekly *Day of Restoration*, on which everyday consumption would be avoided or minimised and action would be taken to help restore local environments, improve conditions for wildlife, contribute to local climate change mitigation and adaptation projects, etc.

Principles to action: ecological capabilities as essential for flourishing

A related point stems from recognition of the *global common good* in relation to the Creation. All people have fundamental needs that must be met, via solidarity, love and cooperation, if their full flourishing is to be secured. If these are not met, then deep personal and social damage is done, leading in the end to conflict. For the poorest, these needs are met at best precariously, and often barely at all. A means of recognising the foundational nature of **universal environmental public goods** - what we have called **ecological capabilities** - such as clean water, energy for light and warmth etc, and of securing the basic capabilities for the worst off as well as everyone else, is the concept of **rising block tariffs**. This means that pricing is affordable to all for an agreed '**decent minimum**' of such services - a measure per head of water per day, for example; and if individuals or households or other units consume above the decent minimum, the price goes up for defined 'blocks' of consumption. Such a scheme is compatible with many ownership models but depends on an Ostrom-like set of rules and design principles to work, and needs careful implementation depending on context (eg urban versus rural settings; family size) so that the poor are not disadvantaged further as demand is managed. It can be applied most clearly to water and energy supply; but could be extended to cover other goods (and could also be part of an

equitable carbon allocation scheme). Recognition of the reality of universal environmental public goods that are irreplaceable - freshwater systems, a stable climate, secure sources of light and warmth - also implies policies to ensure their *continuation*. This connects solidarity with the poor with the need for subsidiarity and integrity in management systems (for example, application of Ostrom's design features).

Principles to action: Metrics

This all raises the basic question of how we are to measure and account for progress and flourishing. The critique of GDP as a measure of anything but 'business' (Jackson 2009) is extensive: GDP retains its place as a proxy for progress and wellbeing through sheer inertia and deceptive simplicity. Metrics for a richer conception of human flourishing are on the policy agenda in the UK and France, and at local level in many places: the UK has an extensive set of metrics for measuring sustainable development, though these have yet to challenge GDP as the 'gold standard' for policymaking and political rhetoric about progress; and the French Government accepted in 2009 a report from Joseph Stiglitz and Amartya Sen, among other experts, on the deficiencies of GDP as a measure and the need for human wellbeing to be better reflected in indices of economic activity (Commission, 2009). There is growing recognition of the need for richer and more holistic indices of development, reflecting social and environmental goods and also aspects of economic growth that deplete both. A Christian model for sustainable development would embrace alternative measurement systems for assessing progress and for 'living in ecological truth' (Nick Robins, personal communication). These would need to:

- include in accounts a **full costing of depreciation** of environmental and social assets;
- assign (via taxes and/or trading schemes) **'truth-telling' prices** to emissions that risk destabilising fundamental systems (carbon, nitrates, etc);
- correct GDP for **losses of non-renewable resources and habitats**;
- recognise the 'critical natural capital' supplied by **unsubstitutable ecosystem services**: any pricing of these is bound to be arbitrary, as their value if irreplaceable and foundational is effectively infinite, but costing of ecosystem services at least makes visible and unignorable the fact that they are not in any sense 'free' or dispensable;

- recognise the **difference between gains in GDP and 'genuine investment'** in the economic and environmental capital of nations (Dasgupta, 2001, pp154-161);
- show how **gains in wellbeing and decreases in ecological impact** can be combined.

The New Economics Foundation has produced sophisticated alternatives to GDP, and the **Happy Planet Index** (Abdallah et al, 2009) is the most advanced yet: it is based on correcting the GDP picture of progress by using measures of self-reported happiness and of ecological footprint. GDP growth is poorly or even negatively correlated with reported wellbeing and with ecological footprints. The **Index of Sustainable Economic Welfare** (and the related **Genuine Progress Index**), devised by Daly and Cobb (1990) and refined by Jackson and Marks (1999), is based on subtracting from GDP the costs of 'defensive' expenditures (such as paying for unemployment and crime) and of ecological degradation (so the oil slick counts as a loss). It is open to critique on the grounds of its assumptions about the costing of such subtractions, but it is powerful as an approximation of the gap between GDP and 'genuine progress'. WWF's **Living Planet Index** (WWF, 2008) highlights the cost in ecological damage of growth in present patterns of consumption. Further development and use by policymakers of such measures, and as importantly the relegation of GDP in public discourse, should be supported by Christian campaigners.

What none of the available models has yet achieved is adequate reflection of trade-offs between aspects of wellbeing and reductions in environmental impact; and they all are open to objections about weighting of variables. (On the other hand, identification of GDP growth with progress is open to the undeniable charge of inappropriate simplification and disregard of key variables.) None has yet fully factored in the **value of ecosystem services**, including the aesthetic and spiritual value associated with irreplaceable creatures and places. Arguably this cannot be done solely or mainly via an index of activity and progress, and the attempt to do so would be to repeat in a new form the mistake of instrumental utilitarianism embodied in the misuse of GDP as a master measure. The point is underlined by the question of fundamental respect for Creation as Gift.

Principles to action: Creation as Gift

The Christian vision, and that also of many other faiths and 'deep Green' secular worldviews, includes respect for the world as a Gift from a transcendent source. This is of course alien to the Growth Model insofar as the latter represents an 'immanent' and utilitarian understanding of the natural world. The 'transcendent' view by contrast implies for

Christians and others an attitude of loving care, respect, reverence and gratitude for God's Gift of a bountiful Earth. Does this translate into secular policy terms? It can, I think, in respect of major human interventions in the environment that run the risk of massive and irreparable disruption of ecosystem services. The ruin of the Aral Sea through hydro-engineering, devoid of any concern for environment and local human wellbeing, is a warning of what can go wrong when complex systems are massively disturbed through ignorance and disrespect. Plans for possible 'emergency' geo-engineering of the atmosphere if we fail to change our production and consumption in a timely way to cut fossil fuel emissions contain the risk of terminal hubris and ecological nemesis. The chances of human 'fine tuning' of the climate system working without major and probably unwelcome side-effects must be reckoned as zero. The Christian principle here translates into a secular precautionary principle: **do not act so as to put at risk universal ecological public goods, and do not use 'technofixes' as a means of sustaining inequitable and sinful patterns of over-consumption.** This means a strong presumption against geo-engineering except as a measure to be used **only once a hierarchy of sustainable measures has been applied in full.** (However, as noted below, identifying the point at which a technology becomes a threat to the integrity of complex ecological systems is not straightforward. There is a spectrum of geo-engineering possibilities that represents different, yet hard to calculate, levels of intervention and potential disruption.)

Policy priorities and issues for Christian thinking and action

Decarbonisation

A vital task in the next two decades is to 'peak' GHG emissions in the West (and begin to do so in the developing world) and achieve heroic gains in the efficiency of fossil fuel use and deep cuts in greenhouse gas emissions. To do this while securing affordable energy services for all, and making a transition to renewable and non-fossil energy systems, will be an immense task. Policy needs to focus on climate and energy security for the poor within the rich world and developing world; it is essential to provide major resources, of **at least \$150 billion a year from 2013** (Gallagher 2009b; Shaw, 2009; Stern, 2009), for poor communities for **climate change adaptation, mitigation and low carbon development, including transfer of new technologies.** This scale of action calls for a **stronger institutional system to integrate the emerging elements of the Copenhagen Accord within the UNFCCC process,** provide accountability, an equitable process for negotiation,

representation, dispute resolution, and a reliable mechanism for securing adaptation/technology funds and channelling them to the right recipients.

To illustrate the scale of the need, we can consider as an exemplary case Kenya, a developing country with a fast-growing population and cities, and considerable vulnerability to drought, climate disruption of farming and wildlands, loss of wildlife and revenues. Kenya's experience, potential risks and scope for progress reflect those of many other developing countries and regions. The Stockholm Environmental Institute (SEI, 2009) has estimated potential losses to Kenya from climate change at 3% of GDP by 2030. In the context of rising population, and the need for better living standards for the poor, this is serious. SEI estimates that by 2030 the costs of climate action (adaptation and transfer of low/zero-carbon technologies, plus changes in policy) will be some £500m - 1bn pa. These costs are affordable (see below) and they would make an effective transition to sustainable development much more likely and feasible. A key task is for Kenya and donors to **develop strategies for development that avoid 'lock-in' to high-carbon infrastructures and dependence on fossil fuels**, and to assess the climate risks of investment and development proposals. If this were to be done, the gains could be great: the SEI study of a low-carbon pathway for Kenya finds that there could be:

...a large number of 'no regrets' options that would enhance economic growth, as well as allowing further access to international carbon credits.

They also have economic benefits from greater energy security and diversity, reduced air pollution, reduced environmental impacts. The study estimates energy related emission savings of 22% could be achieved by 2020, relative to the baseline, even for a small selection of options. Over 80% of these options can be realized at net negative cost. When carbon credits are included, this amount is likely to be even higher.

Overall, because of its location, availability of resources and socio-economic conditions, the study concludes that there are significant economic benefits for Kenya in following a low carbon development path, as well as large environmental and social benefits. (SEI, 2009, p.i)

To help Kenya and other developing countries make a timely, equitable and effective shift to a low-carbon development path that holds out hope of sustainable wellbeing requires three conditions to be in place. These are: a) adequate recognition from the developed world of

the responsibility it bears to fund low-carbon development for sustainability in the developing world; b) large-scale reliable funding systems that channel finance to the communities and enterprises that need it and are not undermined by corruption or commercial oligopolies or monopolies; and c) packages of aid, trade reform and development support that assist in policy, social and technical innovations and diffusion of appropriate technologies and market incentives. It is critical that there should be a *predictable flow of resources* (from whatever source) to enable communities and countries to embark with confidence on long-term transitions in energy and production. Developed countries need to commit themselves to radical mitigation measures at home, including changes in energy consumption patterns, and also to support for low-carbon transition 'pathways' for developing nations (Shaw, 2009).

The cost - transfers of around \$150-200bn pa for many decades for developing countries, plus domestic investment in the rich world - looks enormous. But it amounts to well under 5% of global GDP - 2% in Stern's estimate (see Stern, 2009, ch. 3), whereas he and others have assessed the potential global costs of inaction and eventual climate disruption at many times this amount, perhaps producing costs on the scale of depressions and World Wars.

Campaigners and faiths should press hard for these funds to be **additional to aid pledges for development**, especially in the light of signals post-Copenhagen that some Western pledges would amount to reclassification of budgeted aid monies as climate funds. Climate change funding is not 'charity' but compensatory and anticipatory investment and payment for a debt of justice owed by developed countries. Where can the money be found?

First, by putting a price on carbon (via **emission trading systems** or **carbon taxes** or both: current evidence suggests cap-and-trade schemes are not sufficient, especially for the needs of the poor - see Gallagher 2009a) will drive changes in technology and emission cuts. This can generate large funds that should be channelled into low carbon investments in developed and developing countries. Second, alternative models of generating funds also need to be explored. The imposition of a **Tobin Tax on financial transactions** is now being taken seriously in policy circles in the West and could generate half the revenues needed for developing country mitigation of and adaptation to climate change (Gallagher, 2009b). The model of **tax-and-dividend** advanced by the climate scientist Jim Hansen should be considered: this would tax carbon at source, at the point of energy generation, and distribute revenues to citizens on an equitable basis. If business properly internalises the currently externalised costs of fossil fuel use, this will have systemic effects on supply chains and patterns of development, promoting innovation and rethinking of forms of production and trade that have been damaging to environments and to local economies over recent

decades. For Christians and their churches, and for other faiths, the clear implication is the need to pioneer in the West the transition from fossil fuel dependence to use of renewable energy systems and much greater energy efficiency, and to enable developing countries to 'peak' their fossil emissions as early as possible before 2050, and also to have the means to drive up energy efficiency and drive down emissions via alternative technologies. A third source of funds that should continue to be a focus for campaigners and faith communities is the enormous amount of subsidies from states for fossil fuel extraction and use, industrial-scale fishing, unsustainable logging, etc. **Ending subsidies** to high-impact sectors and products and transferring start-up funding to support sustainable investments and new market models and incentives is urgent.

A complex and momentous set of decisions face us in relation to four options for securing energy supplies and avoiding ruinous increases in global average temperature. First is the use of **nuclear power**. Does this constitute wise use of technology? It can be seen as a low-carbon technology with scope for scaling up to provide a much higher proportion of energy services. But it implies loading responsibilities for waste management on to generations into the remote future. Is this compatible with a Christian respect for Creation and with care for neighbours in time and space? Moreover, nuclear power represents a very large opportunity cost: will it divert investment that can be spent on renewables, or can these co-exist? Second, there is the use of carbon capture and storage (CCS) to sequester carbon dioxide underground (eg in emptied oil wells). The same questions arise: CCS could enable us to 'buy time' while renewable energy systems and (perhaps) new values and attitudes emerge, but it could equally well be used as a means of enabling 'Growth As Usual' to continue.

Third, there is the prospect of **new generations of biofuels and genetically engineered crops** that could help meet energy needs, potentially at the cost of farmland or of intensification of farming via genetic modification. Does GM technology have a role in reducing land take and allowing for more 'fallowness' (compatible with the Jubilee idea) in our relationship with ecosystems? Or is it an unacceptable intrusion into the core of biological systems, potentially imposing great costs on future generations? GM crops so far seem to be safe for human health, and potentially could assist in reducing or eliminating the use of high-impact pesticides and fertilisers that damage crops, wildlife, health, water and soils. But their use has led to further domination of farming systems by corporations. As with nuclear power, new generations of GM might have a role to play but must not crowd out investment in low-impact techniques for intensive yields from less land with less pollution, or from support for local sustainable farming practices.

Choices about decarbonisation technologies need to be guided by clear principles and hierarchies of action. For this the framework of sustainable development, and principles such as those expressed by the Pope, are vital. But specific choices in highly complex areas also need to be guided by experience and the balance of risks. Some minds have changed in the environmental movements about nuclear power; and resistance to GM on ideological grounds may not survive scrutiny as new generations of technology emerge that can be shown to be compatible with SD: see Brand (2010), for pragmatic arguments in this vein. Emissions trading schemes are not working well so far; but it may be that they can be improved, provided that better governance, caps and incentives are established, perhaps via combination with carbon taxes. What is vital is that technologies and policy processes are firmly governed in an accountable and open framework informed by principles of sustainable development and with clear outcomes and targets enshrined.

Food security

Climate change will increase risks of famine and poor harvests and soil degradation. Food security for the poor is again a major concern in the light of climate change models and existing changes in conditions in Africa, Asia and Latin America. A vital task, after decades of reliance on monocultures, high input farming and Western models of intensification, is to **increase research and development into models of diverse, productive and low-impact mixed farming** in all parts of the world. As noted above, controversies remain, and will grow, about the extent to which genetic modification technologies are essential for our capacity to feed the world. Research shows that a larger population can be fed with lower impact on the environment, if old and new lessons are learned about empowering small-scale producers and safeguarding them from corporate powers that reduce competition and control innovation, and about sustainable land management, care for the soil, water efficiency and integration with local ecosystems (Tudge, 2003; Pretty, 2007; DeWitt, 2009). Again, **reductions and abolition of subsidies for intensive monoculture farming and industrial fishing**, and redirection of support to sustainable farming and fishing models should be a priority for campaigning.

Water security

Population growth, inadequate management of water use (for example in intensive farming), and climate change are a potentially lethal combination of factors in increasing water stress and shortages in coming decades. Over one billion people live in places affected by physical

water scarcity. Already development targets for reducing water stress and improving sanitation - immensely important for improved health and development in the poor world - are at risk. Improved infrastructures for water efficiency in farming and cities are needed, along with the social networks for effective governance of water use (see Carter, 2009; Tearfund, 2009). As noted above, **rising block tariffs**, well designed for specific contexts and with a fair deal for poor communities, could help ensure access to a decent minimum of water for all. Above all, **water management policy and systems need to be 'climate-proofed'** and security of supply to all, and especially to vulnerable groups, assessed and ensured. Climate - water system interactions need to be part of joined-up policymaking across sectors, such as farming and mining, and policy needs to respect and reflect local community knowledge of risks and sustainable use of water resources (Tearfund, 2009).

Land use

Food production and water use form part of a vast and complex set of questions about future land use. As population rises and climate disruption affects existing patterns of settlement, habitat and production, so contests for land use grow in intensity and complexity. Land is needed for food, housing, wildlife, energy production and industrial development. A current controversy concerns use of farmlands for biofuels; this is the pattern for contested policy decisions to come. Processes for collaborative decision-making are needed to ensure that policy on land use is developed in accordance with sustainability and justice.

We also face complex decisions about conservation of biodiversity and the habitats needed for it in a situation in which human populations are growing and potentially being displaced (along with wildlife) by climate change. What is the level of requisite variety in biodiversity that must be conserved and sustained? How can this be done while securing human wellbeing in regions of rapid population growth? A Christian perspective here is as hard to turn into effective and just policy as are secular views. The major recent statement of research and policy on the value of ecosystems and protection of biodiversity (and we need a better, richer, less technocratic word!) is from the UNEP's research project TEEB (economics of ecosystems and biodiversity). TEEB (2009) identifies **policy priorities and successful projects** that are consistent with the vision of flourishing we have considered and that fit into the frameworks of SD and community governance of the commons:

- **recognition in policymaking of the 'deep link' between ecological damage and persistence of rural poverty** and risks of regress in pursuit of the Millennium Development Goals;

- action to save and restore **global fisheries**;
- **halting deforestation** and forest degradation;
- protecting **coral reef ecosystems** and the livelihoods of the people living near them and using the services they provide;
- **clarifying rights to resource use** and giving formal recognition to traditional rights (see also the discussion of Ostrom's principles above) and recognising through payments and other rewards the value of community ownership models in achieving desired outcomes such as carbon sequestration ;
- harnessing the power of economic incentives to improve incomes for rural households and communities, safeguard biodiversity, local management of resources and resilient habitats, for example through **Payment for Ecosystem Services (PES)** at local or larger scales. PES schemes include the Grain to Greens programme in China, which involves payments to households for converting cropland to forest and maintaining forest cover, as contributions to flood prevention, wildlife protection (sustaining panda habitat) and avoidance of soil erosion. In Madagascar Durrell Wildlife has run projects offering financial incentives to rural communities to cultivate local farm plots and forest habitats that restore and enhance the variety of wild species as well as providing the basis for food and other goods. PES could provide transfers and income - and incentives for sustainable livelihood - to countries, communities and households.

Urbanisation and the environment

More humans now live in cities than in the countryside - an unprecedented situation. This brings with it a paradox for sustainable development and ecological connectedness. On the one hand, it is likely that concentration of people in cities *could* offer a pathway to sustainable consumption by achieving economies of scale for appropriate technologies and by reducing 'sprawl' of human impacts on land and biodiversity. On the other hand, increasing urbanisation risks yet more distancing and 'forgetting' of nature in modern culture. A way ahead is offered by the creation of urban environments that bring the natural world in to the city, from **parks to 'green buildings' and corridors for wildlife and urban gardening and farming**. Cities can also become a focus for climate mitigation and adaptation, through such measures as **reflective painting of roofs and urban tree-planting**. The 're-membering' of urban populations of interdependence with the natural

world needs to become a core principle and practice in urban planning and community development, and in **worship, celebration, low-carbon building, climate adaptation and community action by churches**, in order to reinforce the values of sustainable development and to underpin the 'ecological capabilities' for flourishing discussed earlier.

It is important to note that the assumption that urban concentration is automatically better for sustainable land use may not hold. DeFries et al (2010) suggest that urban population growth and demand for food via globalised trade are contributing to tropical deforestation. Policies for **urban development and sustainable farming need to be connected**, with emphasis on **intensification of yields from existing rural land and from new plots in cities**, so as to reduce and avoid further loss of forest land to unsustainable agriculture.

Empathy and biophilia

A final point on ecological capabilities and human flourishing relates to the issues of empathy with distant others (the remote poor, future generations and non-human creatures) and biophilia (love and respect for Creation). These are hardly the staples of policymaking in the modern world. But if it is the case that technological change alone cannot be sufficient for sustainable development, and that to contain our population and consumption within the bounds of the ecologically possible and sustain key ecosystem services we need changes in values and behaviour, then questions must be faced about the witness and modelling of new and old values that are needed to bring about large-scale changes of heart and action. At Copenhagen there was a massive 'empathy deficit' (Homer-Dixon, 2000; Krznaric, 2008); if the world's leaders truly believed the diagnosis of climate disruption and felt it deeply, their actions would be more urgent and concerted. The problems of ecological insecurity seem remote to many in the rich world and among the elites of the developing world.

We need new means to convey the risks to our place in the Earth's system, and to be reminded at deep levels of our dependence on it, of its presence as precious Gift, whether or not we believe that Gift stems from God. A change of values depends on a heightened sense of empathy with those in the frontline of ecological degradation and in generations unborn, and so we need new means of generating empathy and expressing the awe, gratitude and love that the faiths call stewardship for Creation and that others might call biophilia and the respect that must underpin our management of the environment. Krznaric (2008) has proposed '**climate twinning**' **schemes** between communities worldwide to generate mutual understanding and empathy about climate and environmental risks, and this is an element in numerous commitments from faith groups in the UNDP/ARC

programme of environmental plans for 'generational change' for the major religions (see www.arcworld.org).

Another policy idea, which I advance in all seriousness, is that meetings of decision-makers must take place in locations that will make for empathy, urgency, learning and humility. Consider the setting at Copenhagen: meetings in conference rooms sealed off from the world, often without windows, always with no view of trees, horizons or natural beauty. The routine setting for environmental policymaking is an urban building with no visible connections to the natural world, set in an affluent city, with high-tech home comforts all around. Processes for 'revelation' and building respect, and maybe also reverence, need to take decision-makers away from their normal environments. The wildlife film-maker Michaela Denis wrote in her 1955 autobiography that if she could, she would ensure that all politicians spent a night deep in a rainforest, to bring home the awe-inspiring interconnections of nature and our dependence on it. Taking this idea seriously, **we should be campaigning to move global summits away from comfortable Western urban venues to convene in the most disadvantaged and at-risk places compatible with security**, so that unsustainable development and the ecological risks we run can be seen up close and taken personally by delegates; and so that delegates can also see potential solutions in development and action. This is not the normal fare of policy debate, but something like it is surely essential if the process of changing hearts, minds and values is to be accelerated in the cause of sustainable development.

Here too, in relation to empathy and urgency, the faiths have a distinctive and vital role: they have the idioms, learning, stories, reach into the poorest communities worldwide, and sense of deep time that can help generate empathy and care for Creation. Finding new and collaborative tools and projects to meet their potential in this respect is a vital task for the major faith traditions. A particular responsibility falls on the Catholic Church, given its global reach and influence and the depth of its social teaching, and on the evangelical churches, given their explosive growth and reach. It should be a priority for the Catholic Church to produce an **encyclical summing up its vision of ecological sustainability and human flourishing in a 'full world'**, and for it and its partners in the evangelical churches to develop plans for partnerships for ecologically sustainable and just development.

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Appendix 1

Extracts from CELAM Declaration of the **Latin American Bishops Conference – Department of Justice and Solidarity, February 2010**

Today more than ever the promotion of a true ecological responsibility is needed. The defence of ecology should be included among those social interests which demand full legal protection, and which exceed the limit of national law because it affects the international community. ... The Bishops call for an ecological education that helps to:

Evangelize our peoples to discover the gift of creation, knowing how to contemplate and care for it as home of all living beings and source of the planet's life, in order to exercise human stewardship over the earth and its resources responsibly, so that it may render all its fruits as intended for all, by educating for a sober and austere way of life in solidarity.

This is reiterated by Pope Benedict XVI who states very clearly that we need to “*strengthen this alliance between human beings and the environment.*” (Caritas in Veritate, #50)