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World Sustainable Development Forum

**DSDS 2007**

Delhi Sustainable Development Summit

# Meeting the MDGs

Exploring the Natural Resource  
Dimensions

22–24 January 2007  
New Delhi, India

**Background paper**

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The Energy and Resources Institute





World Sustainable Development Forum

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# Prudent use of natural resources basis for sustainable development

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TERI, New Delhi

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# Prudent use of natural resources basis for sustainable development

## Introduction

‘Sustainable development’ has emerged as a term of common usage with diverse perspectives and numerous definitions. The concept of sustainable development stresses the long-term compatibility of the economic, social, and environmental dimensions of human well-being, while acknowledging their possible competition in the short term (OECD 2001). This gives rise to two conclusions—development must balance different objectives and exploit their synergies; and development must be undertaken with a long-term view of its implications and of the uncertainties that surround them. Simply stated, sustainable development is improved well-being of human beings and the ecosystem (IUCN 1997, 2001).

In 2000, 147 heads of state and 189 nations committed themselves to freeing the entire human race from want, with a focus on human rights and the billion-plus people living in extreme poverty. The MDGs (Millennium Development Goals), a set of eight time-bound and target-based goals, were formulated by the world community in 2000 to address the overriding concern of human deprivation as represented by income poverty and the inadequacy of enabling opportunities for all. Based on the Millennium Declaration adopted by all Member States of the United Nations, eight overarching goals for social development, environmental sustainability, and global solidarity were defined, to be achieved by 2015 on the basis of mutual commitment by both the developed and developing countries (Box 1). Subsequently, one of the critical issues of discussion at the WSSD (World Summit on Sustainable Development) in 2002 was the linkage between the concept of sustainable development and the MDGs, with one crucial element in that linkage being the environment–poverty nexus. The Millennium +5 Summit in New York in 2005 further emphasized the importance of sustainable management of environmental resources for the eradication of poverty and achievement of the MDGs.

DSDS (Delhi Sustainable Development Summit) 2007 reiterates the vital importance of natural resources in alleviating poverty and attaining the MDGs. With the understanding that 'investing in environmental sustainability is an effective and efficient leverage point for development' (Achim Steiner<sup>1</sup>), this paper provides a background to the development imperatives to be deliberated upon at the Summit against a scenario of unsustainable consumption and production patterns worldwide. The importance of sustained socio-economic progress in Africa, a continent endowed with a rich natural heritage, is also emphasized in DSDS 2007, as is the necessity of innovations and partnerships for sustainable development in the spheres of science and technology, governance, and development assistance. In the course of the sessions, the Summit seeks some specific answers to questions of critical importance to a society aiming to develop equitably and sustainably. These are highlighted in the relevant sections of concern through the course of this paper.

### Box 1 Attaining the MDGs: a global perspective

#### MDG 1: Eradicate extreme poverty and hunger

- Progress varied across regions with dramatic poverty reductions in Asia but a deterioration of the situation in sub-Saharan Africa.
- Hunger reduced in more than 30 countries, including 14 sub-Saharan countries, by at least 25% during 1999–2001.

#### MDG 2: Achieve universal primary education

- Steady progress in most regions; 86% increase in primary education enrolment in developing countries, including sub-Saharan Africa.
- Educational gender gap persists.

#### MDG 3: Promote gender equality and empower women

- Slight progress in women's status in labour markets; inequalities persist.
- Women's political power growing, though men still in the dominant position.

#### MDG 4: Reduce child mortality

- Survival prospects improved in all regions; but sub-Saharan Africa still trails behind.
- Vaccination of three-quarters of the world's children protected them effectively; but many still die of diseases.

#### MDG 5: Improve maternal health

- Maternal mortality still high despite gains in the number of assisted deliveries.

#### MDG 6: Combat HIV/AIDS, malaria, and other diseases

- Deaths and new infections continue despite preventive efforts proving successful.
- Efforts to curb malaria gaining popularity mainly through awareness campaigns; tuberculosis on the rise.

*Continued...*

<sup>1</sup> Details available at [http://www.wbcsd.org/web/complus/documents/article\\_hntiyamira.pdf](http://www.wbcsd.org/web/complus/documents/article_hntiyamira.pdf), last accessed on 7 January 2007.

### Box 1 Attaining the MDGs: a global perspective (*Continued...*)

#### MDG 7: Ensure environmental sustainability

- Rapid deforestation continues, though there is a slowdown of net loss in forested area.
- Efficient energy use practices increasing; though CO<sub>2</sub> emissions continue to rise globally.
- Access to safe drinking water and basic sanitation is still a distant target for many.

#### MDG 8: Develop a global partnership for development

- Led by debt relief, development assistance increases sharply but falls short of targets.
- Decrease in debt service burden, but for poor countries it is still quite high.

Source UNDESA (2006)

#### Summit queries: MDGs—the distance yet to be traversed

- What are the weakest links in meeting the MDGs and how can they be addressed?
- What mechanisms can be designed for leveraging natural resources towards poverty alleviation in a sustainable manner? Is natural resource degradation threatening to offset other initiatives aimed at poverty alleviation?
- How can we ensure access to services from cutting-edge technology to the underprivileged?
- How can learnings or successful experiments be shared most efficiently amongst countries?
- How can effective partnerships be formulated and scaled to yield desired outcomes?
- What institutional changes are required to ensure accelerated opportunities for growth/poverty alleviation while protecting our natural resource base?

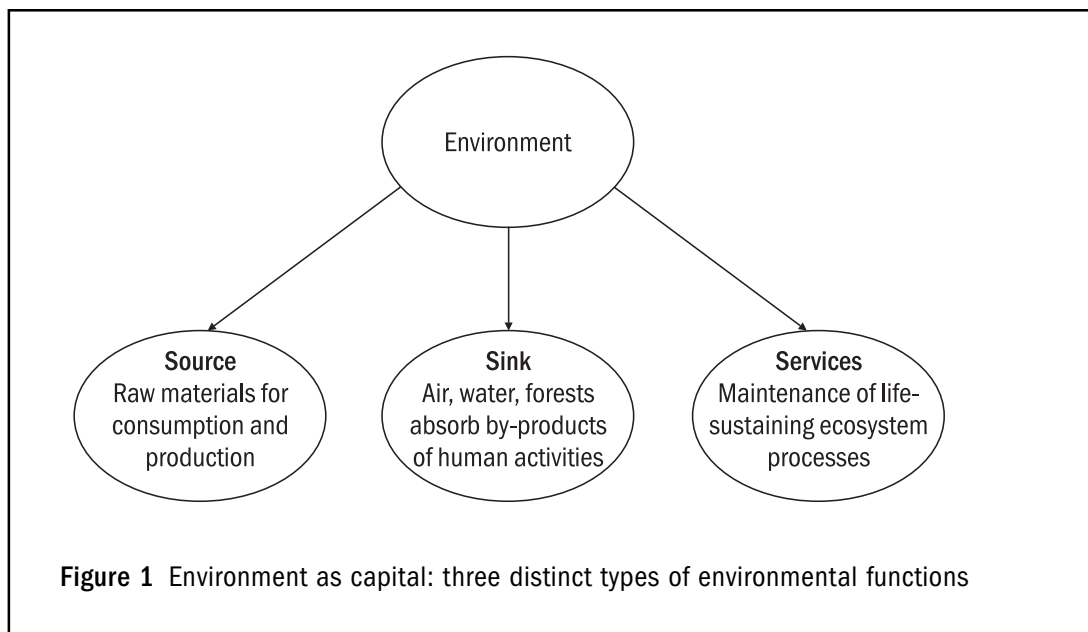
## Natural resources and human development

Despite considerable efforts undertaken by diverse players worldwide to realize the pledge of making poverty history by 2015, progress on the attainment of the MDGs has not been uniform across regions. More than one billion people remain below the poverty line of one dollar per day, and 20 000 die from poverty each day (UN 2005). In this context, the decline in natural capital through various forms of environmental degradation and depletion poses a disproportionately larger threat to the livelihoods of the poor, for ‘the world’s poorest people are the most dependant on fertile soil, clean water and healthy ecosystems for a living’ (Klaus Toepfer).<sup>2</sup> This dependence translates into a higher degree of vulnerability for the poor, thus hindering the achievement of the MDGs (*Millennium Ecosystem Assessment Report 2004*).<sup>3</sup>

Broadly, the importance of nature for human development derives from three distinct environmental functions: a source of productive resources to aid human

<sup>2</sup> Details available at [http://www.wbcsd.org/web/compluss/documents/article\\_hntiyamira.pdf](http://www.wbcsd.org/web/compluss/documents/article_hntiyamira.pdf), last accessed on 7 January 2007.

<sup>3</sup> Details available at [http://www.wri.org/biodiv/pubs\\_description.cfm?pid=3927](http://www.wri.org/biodiv/pubs_description.cfm?pid=3927), last accessed on 7 January 2007.



consumption and production requirements; a sink for assimilation of anthropogenic wastes; and the provision of services for the maintenance of vital life-sustaining ecosystem processes, for example, maintaining the protective ozone layer (Figure 1). The capacity of ecosystem goods and services to provide a capital base for socio-economic advancement is also underlined by development methodologies like the sustainable livelihood framework, which identifies natural capital as one of the five forms of capital essential for enabling improved livelihood conditions of the poor.<sup>4</sup>

Indiscriminate and continued environmental damage disproportionately impacts the poor in two ways: direct livelihood losses due to the depletion of the source function; and indirect impacts of degradation in the sink and services function. Estimates reveal that about 90% of the world's poor depend on forests for at least some part of their income (WRI 2005). A study in Uganda showed that the key variable explaining income levels for rural households in the country was access to land and livestock.<sup>5</sup> In addition to the direct risks associated with the depletion of natural resources, the poor have lower capacities to defend themselves against the health and mortality repercussions of incessant environmental degradation (Table 1), manifested as air and water pollution, deforestation, climate change, and so on.

Apart from lower defensive capabilities, ill health amongst the poor reinforces the poverty cycle and acts as a negative asset. An ill household

<sup>4</sup> The five types of livelihood-enhancing capital identified by the sustainability framework, developed by DFID (Department for International Development), are physical capital, human capital, natural capital, social capital, and financial capital.

<sup>5</sup> Details available at <http://www.ied.org/Gov/mdgs/documents/MDG-ch4.pdf>, last accessed on 7 January 2007.



**Table 1** Global mortality statistics for major environmental risks

Environmental risk	Years of life lost (106 per year)		
	Male	Female	Total
Unsafe water, sanitation, hygiene	24.9	24.3	49.2
Indoor air pollution	17.3	17.8	35.1
Urban air pollution	3.5	2.9	6.4
Lead exposure	1.9	0.9	2.8
Climate change	2.4	2.5	4.9

Source WHO (2002), as produced in Goldemberg, Johansson, Reddy, *et al.* (2004)

member erodes the family's living standard and is a potential factor for the household's decline into abiding poverty (WRI 2005). For example, families that face a health shock (such as an ailing earning household member) often cope by pulling children out of school and sending them to earn additional income, thus impacting the child's future well-being.

Safeguarding the environment is, therefore, extremely important for the attainment of the MDGs. An unsustainable environment (MDG 7) has the ability to reinforce the cycle of poverty (MDG 1), thus undermining health care (MDGs 4, 5, 6). The above may combine to further derail efforts to secure enhancements in prevailing socio-economic processes (MDGs 1, 2 and 3). Moreover, ensuring environmental sustainability is equally a responsibility of the developed and developing countries, and thus, necessitates partnerships for change (MDG 8). These partnerships must recognize that because of their dependence on ecosystem goods and services, the poor are especially vulnerable to environmental damage—thus there is a need to 'produce and consume differently' (World Bank 1992).

#### Summit queries: sustainable use of natural resources

- Is poverty the worst polluter? Can ecosystems be the wealth of the poor?
- What are the critical linkages between natural resource degradation and livelihood options for the poor?
- What are the prerequisites for ensuring that ecosystem management does not exacerbate poverty and exclude the poor?
- Will payment for environmental services solve the conundrum?
- Do institutions and initiatives such as joint/community forestry management or water panchayats ensure a confluence of interests? What could be the role of governance?

## Unsustainable consumption and production pathways

Humanity's stake in environmental protection is enormous, especially against the backdrop of past development strategies, which have often been associated with large-scale environmental depletion and degradation. This assumes

importance for most developing countries, where industrial development is an important element in the pursuit of economic growth. However, the growing economic wealth of nations tends to increase inequities in income distribution.<sup>6</sup> There are also instances of highly polluting industries being relocated from crowded urban areas to peri-urban and rural areas to avoid clean-up costs.<sup>7</sup> Both of the above expose the poor to the debilitating consequences of air and water pollution. On the other hand, private consumption expenditure has increased fourfold since 1960, with growing economic wealth leading people to adopt unsustainable lifestyle patterns, thus adding to the stresses on the natural resource base. With reference to current patterns of user behaviour and lifestyles, the Worldwatch Institute (2004) reported that approximately 1.7 billion people across the world had entered the ‘consumer class’, adopting diets, transportation systems, and lifestyles that were limited to the rich nations in the last century. Private consumption expenditures have also increased fourfold since 1960.

The rise in consumption is reflected in mankind’s ‘ecological footprint’ – the demands placed by human beings on the natural world – having increased to the point where the earth is unable to regenerate renewable resources at the rate at which they are being used. An estimation was done of the amount of productive land and sea needed to provide the earth’s population with adequate energy, food, water, and materials used in everyday life, as well as absorb anthropogenic wastes. It was calculated that until 2003, the earth’s ecological footprint exceeded its bio-capacity by about 25%. The ecological overshoot began in the late 1980s; the footprint having been calculated for the period 1961–2003 (Figure 2).<sup>8</sup>

In 1992, Agenda 21<sup>9</sup> succinctly noted, ‘The major cause of the continued deterioration of the global environment is an unsustainable pattern of consumption and production.’ Subsequently, the JPoI (Johannesburg Plan of Implementation) adopted at the WSSD (2002) stated that changes in the way societies produced and consumed were indispensable for achieving global sustainable development. The changes require regional and national initiatives to promote less resource-intensive and more efficient production processes that lead to a reduction in resource degradation, pollution, and waste.<sup>10</sup> Therefore, DSDS calls for patterns of socio-economic development that respect the

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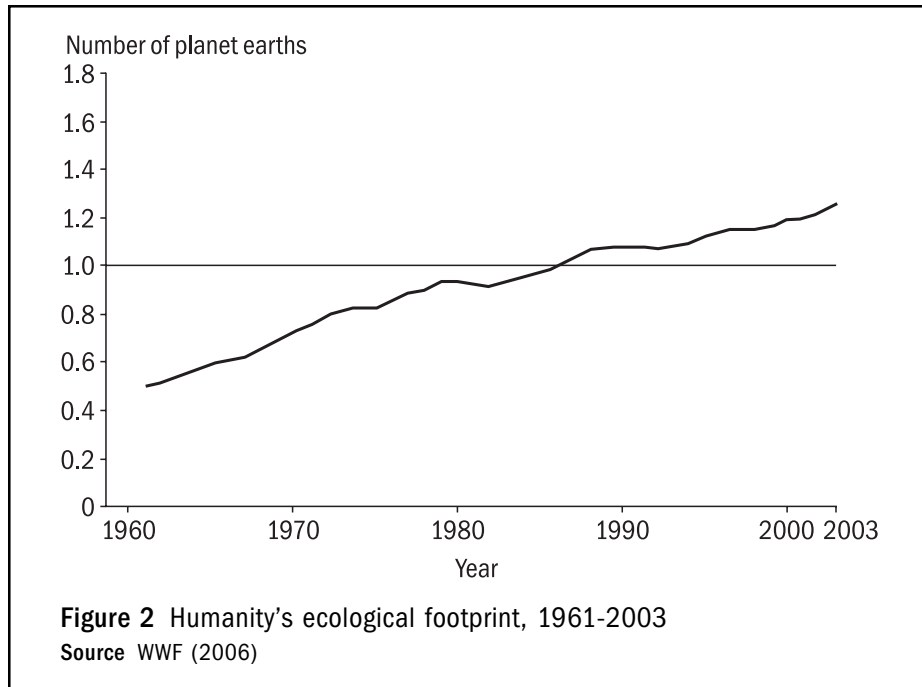
<sup>6</sup> For example, in Latin America, the incidence of poverty has increased in the last decade even as gross domestic product per capita has increased (WRI 2005).

<sup>7</sup> For example, in China: details available in WRI (2005).

<sup>8</sup> World Wide Fund for Nature and Global Footprint Network, *The Living Planet Report 2006*, available at [http://www.footprintnetwork.org/newsletters/gfn\\_blast\\_0610.html](http://www.footprintnetwork.org/newsletters/gfn_blast_0610.html), last accessed on 6 January 2007.

<sup>9</sup> Blueprint of Plan of Action proposed for sustainable development, formulated at the United Nations Conference on Environment and Development, Rio de Janeiro, 1992.

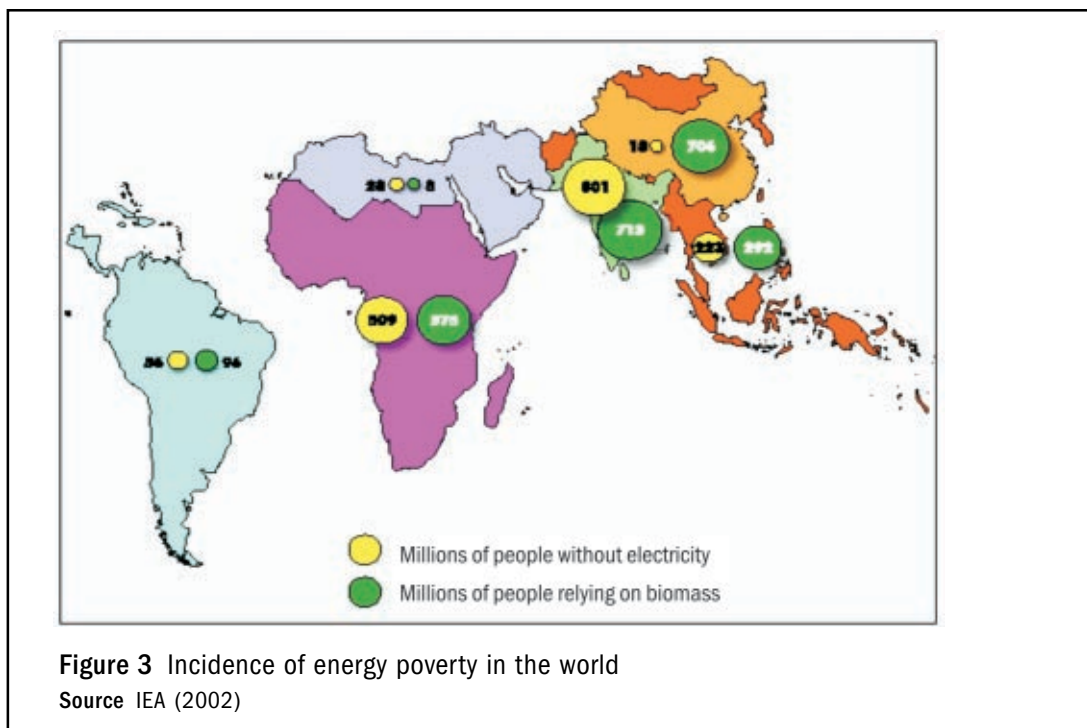
<sup>10</sup> Para 14 and 15, JPoI (Johannesburg Plan of Implementation), United Nations website <[www.un.org](http://www.un.org)>.



carrying capacity of ecosystems such that extreme damages due to the pursuit of unsustainable pathways can be restricted. It highlights two critical manifestations of unsustainable production and consumption patterns: water insecurity and climate change. It also acknowledges that sustainable growth would require, at a very fundamental level, more environment-friendly adaptations and innovations in the energy sector.

### *Securing energy sustainability*

Energy services have a significant role in facilitating both economic and social development. Energy underpins economic activity, enhances productivity, and provides access to markets for trading purposes. It also enables the fulfilment of basic human needs of nutrition, warmth, and lighting, in addition to education and public health. While increased access to energy services does not result in enhanced socio-economic development by itself, the lack of adequate energy input acts as a severe constraint on the development process, and thereby the attainment of the MDGs. The association between access to efficient energy carriers and development levels is also brought out by the fact that the relatively poorer continents of Africa, Asia, and Latin America are also characterized by large concentrations of people who are energy-poor, relying to a considerable extent on traditional biomass fuels, while simultaneously lacking access to modern electricity services (Figure 3).



At a very basic household level, a measure of energy poverty relates to the inability to use modern cooking fuels and the lack of a bare minimum of electric lighting. This corresponds to an estimated 50 kgoe (kilograms of oil equivalent) of annual commercial energy consumption per capita. Out of this, approximately 40 kgoe per capita has been estimated as the energy requirement for cooking purposes, and the remainder as fuel for electricity (World Bank/UNDP 2005). In general, the implications of lack of access to efficient energy sources are manifold for the absolute poor, with women in particular – especially in rural areas – being disproportionately affected. An ESMAP (Energy Sector Management Assistance Programme) study (2002) in rural India, for example, indicated that about 37 hours per month were required for fuelwood collection, with women suffering the maximum amount of drudgery due to this activity (World Bank/UNDP 2005). A recent comprehensive countrywide assessment on household solid fuel<sup>11</sup> use also argues that curbing indoor air pollution from solid fuels can make a substantial contribution towards reducing child mortality (MDG 4) and improving maternal health (MDG 5), since women and young children are most exposed to indoor smoke from the use of solid fuels in poorly vented stoves (Box 2). The above is in addition to contributing to the attainment of other MDGs (Rehfuess, Mehta, and Prüss-Üstün 2006).

<sup>11</sup>Solid fuels include biomass fuels, such as wood, charcoal, crops or other agricultural waste, dung, shrubs and straw, and coal (Details available at <http://www.who.int/whosis/whostat2006SolidFuels.pdf>, last accessed on 7 January 2007).

## Box 2 Choking under smoke

The WHO (World Health Organization) has identified indoor air pollution as a global environmental risk causing some 1.6 million premature deaths per year worldwide. An average life-shortening of more than 20 years is associated with these premature deaths, and the overall mortality risk is about 50% higher for women (who do the most cooking). Children exposed to indoor air pollution from household solid fuel have a 2.3 times higher risk of lower respiratory infection, while women exposed to such indoor air pollution have a 3.2 times higher risk of chronic obstructive pulmonary disease.

Source Goldemberg, Johansson, Reddy, *et al.* (2004)

However, environmental damage due to inefficient energy use patterns occurs due to the unsustainable mining of natural resources for energy generation, or the degradation of the natural capital base as a result of emissions arising from the combustion of energy forms. In general, the consumption and production of energy from various sources can harm, in various ways, all the three essential elements of the planet: air, land, and water (Table 2).

**Table 2** Impacts of modern energy sources on air, land, and water

Natural element impacted	Pathway of impact	Potential energy source of impacts	Broad categories of impact
Air	Emissions into the atmosphere due to the combustion of fossil fuels.	Coal, oil, natural gas (less polluting than coal and oil)	Smog; acid rain; haze; enhanced risks of climate change
Land	Land is used for the mining and extraction of fuels, and for constructing power generation facilities.	Coal, oil, natural gas, nuclear energy, hydro power	Soil erosion; loss of soil productivity; landslides; wasteful by-products of refining; power generation; fossil fuel combustion; as well as oil spills cause land contamination, and destruction of ecosystems and natural habitats
Water	Water resources are vital during the extraction and refining of raw forms of fossil fuel; used during the mechanics of power generation as well.	Coal, oil, nuclear energy, hydro power, natural gas	Drilling and mining operations can impact water quality and quantity, thereby affecting aquatic life and dependents on it, including humans; water discharges from power generation facilities often contain pollutants, including heavy metals like arsenic

Hence, while acknowledging the importance of energy services as an essential enabling factor for human progress, it is necessary to invest in the development and widespread disbursement of relatively cleaner RETs (renewable energy technologies).<sup>12</sup> Given the inevitable release of carbon dioxide, lead, methane, and other harmful GHGs (greenhouse gases) into the atmosphere due to the large-scale combustion of fossil fuels, the adoption of technologies for mitigating GHG emissions – like CCS (carbon dioxide capture and storage) – and the development of alternative sources of energy that are less harmful to the natural environment have almost become an exigency.

#### Summit queries: energy for sustainable development

- What are the challenges involved in diversifying and decarbonizing fuel mix in producing energy?
- What are the challenges for harnessing renewable energy technologies for affordable and accessible power?
- How can research and development in sustainable energy developments be accelerated?
- How can we better integrate and address environmental concerns (local and global) on energy supply side and environment dimensions of demand side impacts?
- What are the challenges in securing investments in the energy sector, especially in developing countries like India?

#### *Mitigating and adapting to the adverse impacts of climate change*

Climate change, a resultant of both natural and anthropogenic factors like changed land-use pattern, deforestation, and land degradation, is likely to exacerbate environmental vulnerability<sup>13</sup> on account of rising temperatures, changed precipitation patterns, rising sea levels, and greater intensity or frequency of extreme events. These adverse impacts could affect not only ecosystems but also social and economic systems, threatening to undermine sustainable development. In this context, it might be pertinent to recall former UN Secretary General Kofi Annan's assessment that 'one of the greatest environmental and development challenges in the twenty-first century will be that of controlling and coping with climate change' (Annan 2005).

Climate change adds to the vulnerability of the poor due to their high dependence on natural resources and limited capacity to adapt to the changing climate (UN 2006). The IPCC (Intergovernmental Panel on Climate Change) indicates a rise of about 0.6 °C in the earth's average temperature above the average global temperature of 15 °C. This rise is a matter of concern, especially for developing countries, and populations that rely critically on climate-sensitive

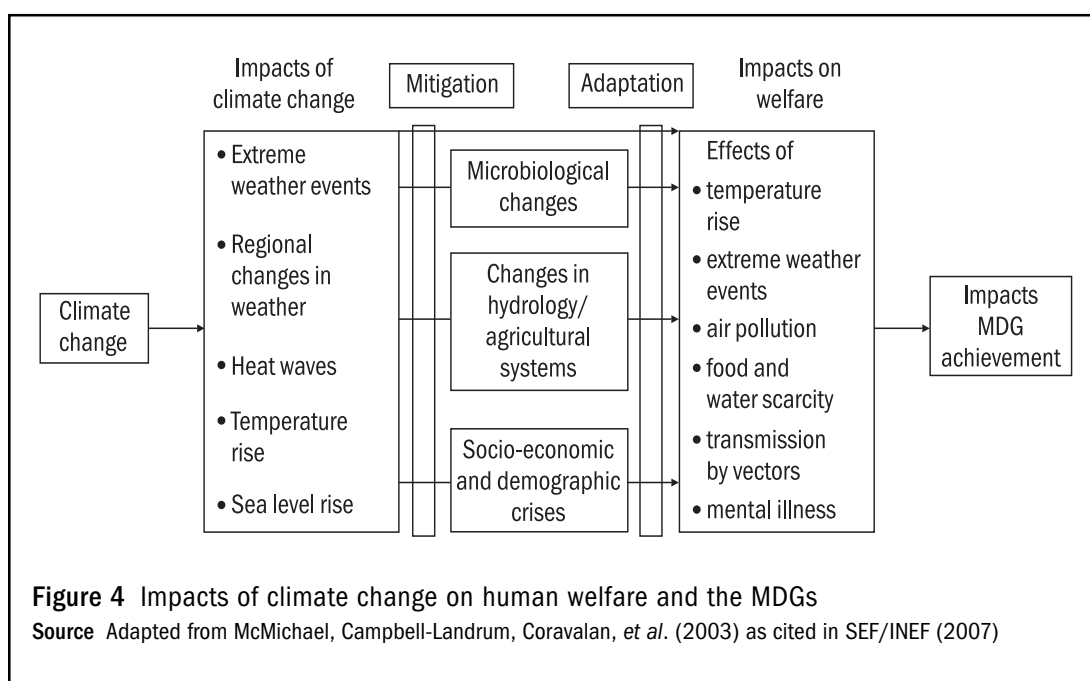
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<sup>12</sup>Oil, natural gas, and coal provide approximately 80% of the world's primary energy supplies (IEA 2006).

<sup>13</sup>Environmental vulnerability is defined as the degree to which the environment is likely to be affected by natural or anthropogenic hazards (TERI 2003).

sectors such as agriculture, forestry, and fisheries for their livelihoods. Such populations are also most vulnerable to environmental changes (pollution, drought, and so on) and sudden extreme events such as floods and cyclones.

Changes in climate are also expected to alter distribution of important vector species (for example, mosquitoes) and may, therefore, increase the spread of disease to new areas that lack adequate public health infrastructure (GoI 2004). Given that developing countries generally lack financial, technical, and institutional capacities to be able to cope effectively with expected changes (IPCC 2001), the potential impacts of climate change on human welfare and the attainment of the MDGs for a vast majority of the earth's population are immense (Figure 4).



A range of measures is required to mitigate and adapt to the adverse effects of climate change. These could comprise energy-efficiency improvements, adoption of new energy sources, carbon capture and storage technologies, and changes in unsustainable patterns of production and consumption. Funding for climate change mitigation and adaptation activities is, therefore, important for achieving sustainable development objectives. Since 1994, significant investments in core mitigation activities and in sectors in developing countries have been undertaken. The Kyoto Protocol is but a small step in directing efforts towards mitigation. The commitments, as outlined in the Kyoto Protocol, of reducing emissions in Annex I Parties by an average of 5.6% of their 1990 emissions, if achieved, will at best reduce 0.8 Gg (gigagram) of CO<sub>2</sub> (carbon dioxide). An assessment of the Annex I achievements in the period 1991–2003 reveals

that in 2003, GHG emissions from Annex I Parties may have declined by 7.4%, but this has been largely due to a 46.8% decline from EIT (economies in transition) countries. Emissions from non-EIT Parties have, in fact, increased by 12.4% in the same time period (UNFCCC 2005). It is in this context that accelerated efforts at mitigation assume further importance. The various processes launched in 2005, including the Gleneagles Plan of Action, the Asia-Pacific Partnership, and the long-term cooperative programme launched at the 11th Conference of the Parties in Montreal, are efforts to deal with this issue, though from different perspectives.

However, under-funding of adaptation is still a barrier to achieving the objectives of the Agenda 21 and WSSD—‘...we reaffirm our commitment to achieving the ultimate objective of stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system, within a time-frame sufficient to allow ecosystems to adapt naturally to climate change...’ (JPOI 2002, paragraph 38).<sup>14</sup> Subsequent to the WSSD, the Parties to the FCCC (Framework Convention on Climate Change) have directed the GEF (Global Environment Facility) to support adaptation efforts in developing countries, particularly LDCs (less developed countries) and SIDS (small island developing states). Currently, there are four avenues for funding projects aimed at enhancing adaptive capacities of the developing countries—the LDC Fund, SCC (Special Climate Change) Fund, Adaptation Fund, and the Strategic Priority on Adaptation under the GEF Trust Fund. Investments in adaptation-related projects, mostly in the water and agriculture sectors, have been made by various multilateral development banks. As on November 2005, the voluntary contributions to the LDC Fund established to support preparation of national adaptation programmes of action amounted to about \$32.9 million (UN 2006).

#### Summit queries: Climate change and sustainable development

- What will be the impact of climate change on efforts to meet the MDGs?
- How can we enhance international cooperation to mitigate climate change? Should the role of the Clean Development Mechanism be expanded?
- How should we distribute the financial burden of mitigation between countries, bearing in mind equity considerations and the imperatives of poverty eradication and achievement of MDGs?
- How can we adapt to climate change in order to minimize its negative impacts on MDG initiatives? How can funds be mobilized for adaptation?

## Water for life<sup>15</sup>

Water resource management is an essential component of socio-economic development and can impact the incidence of poverty, hunger, and ill health. It can also help ensure environmental sustainability and reduce gender

<sup>14</sup>Details available at <<http://www.un.org>>, last accessed on 4 January 2007.

<sup>15</sup>The decade 2005–2015 has been considered as the International Decade for Action ‘Water for Life’, wherein the United Nations and governments are seeking to galvanize efforts to meet the internationally agreed targets of halving the number of people without access to safe drinking water and basic sanitation by 2015. Details available at <<http://www.un.org/waterforlifedecade/>>, last accessed on 4 January 2007



inequalities. Clean water and sanitation are fundamental to ‘what people can do and what they can become – to their capabilities’ (UNDP 2006), and therefore, are prerequisites for attaining wider human development goals, including the MDGs. Recognizing access to safe water resources as a basic human requirement, the United Nations commented that ‘the human right to water entitles everyone to sufficient, safe, acceptable, physically accessible and affordable water for personal and domestic use.’<sup>16</sup>

However, competition, environmental stress, and unpredictability of access to water are powerful drivers of water insecurity for a large proportion of the global population, substantial to derail progress towards the MDGs and human development. As a result, more than 1 billion people continue to lack access to clean water, while 2.6 billion are denied the right to adequate sanitation (UNDP 2006). The critical importance of access to safe water and sanitation facilities for human well-being can be gauged by the fact that 1.8 million children die every year as a result of diarrhoea and other diseases caused by unclean water and poor sanitation (UNDP 2006). Illness caused by unsafe drinking water and inadequate sanitation generates costs that claim a large share of poor households’ incomes (Box 3). On the other hand, improved access to water supply and sanitation services, by reducing the time spent on accessing these amenities, has the potential to enhance possibilities for education or other livelihood generation. Studies also show that inadequate sanitation in school is a powerful deterrent in attending school, especially for girls (WRI 2005).

### Box 3 Clean water and basic sanitation facilities for human welfare: case studies

- The provision of safe water can reduce child death rates by more than 20% in Cameroon and Uganda.
- The presence of a flush toilet in the house reduces the risk of infant death by more than 30% in Egypt and Peru.

Source UNDP (2006)

While as a productive resource, water is essential in maintaining the livelihoods of the world’s most vulnerable people, it also has destructive properties, as witnessed by storms and floods. In this context, changes in rainfall and temperature, associated with climate change, make the poor particularly vulnerable to uncertainties in the manifestations of water flows, thereby making an integrated system of water management a necessity for sustainable development. This is extremely important, since until recently, policy-makers have treated water as an infinitely available resource to be diverted, drained or polluted in the course of generating economic wealth (UNDP 2006). It must also be kept in mind by the policy fraternity that in situations of scarcity and misallocations, intense competition for a vital life-sustaining resource creates socio-political tensions, apart from economic and social hardships—and water is a resource beyond political boundaries.

<sup>16</sup>UN General Comment No. 15 on the Right to Water, 2002, cited in UNDP (2006).

**Summit queries: water—the need for integrated water resource management systems**

- How does one address the prevalent contradictions in policy on integrated water management?
- What should be done to resolve interstate/international conflicts?
- How does one overcome the problems and constraints towards ensuring safe drinking water and sanitation?
- Can public-private partnerships help make water management more efficient? How?

## **Africa: a development imperative**

Although some countries are making rapid strides in meeting the MDGs, Africa as a region appears to be developing more slowly than the rest of the world. The global attainment of the MDGs is largely dependent on the progress made by African countries towards these stipulated targets. While at the global level, the proportion of the people with income levels less than \$1 a day has declined in the past decade, the situation has deteriorated in sub-Saharan Africa, which already has the highest poverty rate in the world. Chronic hunger remains widespread in African countries—as high as 40% in Central Africa.<sup>17</sup> Also, the growing population in the continent has been unable to find adequate productive employment opportunities, and HIV/AIDS has taken a brutal toll on the most productive segment of the population. Africa's efforts to achieve sustainable development have been also hindered by a number of other factors. These include an underdeveloped agricultural sector vulnerable to the vagaries of adverse weather conditions, conflict, political instability, insufficient investment levels, inadequate infrastructure, limited market access opportunities, supply side constraints, and unsustainable debt burdens.

Africa possesses great potential, particularly because of its abundant natural wealth, which includes significant energy potential in the form of oil and gas reserves, hydro power resources, and a perennially exploitable solar resource. Therefore, the efficient management of Africa's natural resources in the form of energy reserves, as well as availability of abundant arable land, water, minerals, and forests hold a key to the continent's sustainable development prospects. Internally within the continent too, the need for a sustainable pathway to socio-economic progress has been concretely acknowledged in the form of initiatives between countries, such as the New Partnership for Africa's Development, which provide a road map to eradicate poverty and move towards a path of sustainable development. The development potential of Africa has also been harnessed successfully in many spheres by international efforts like the Millennium Villages Project (Box 4).

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<sup>17</sup>Details available at <<http://www.un.org/africa/osaa/reports/Achieving%20Food%20Security%20in%20Africa-Challenges%20and%20Issues.pdf>>, last accessed on 4 January 2007

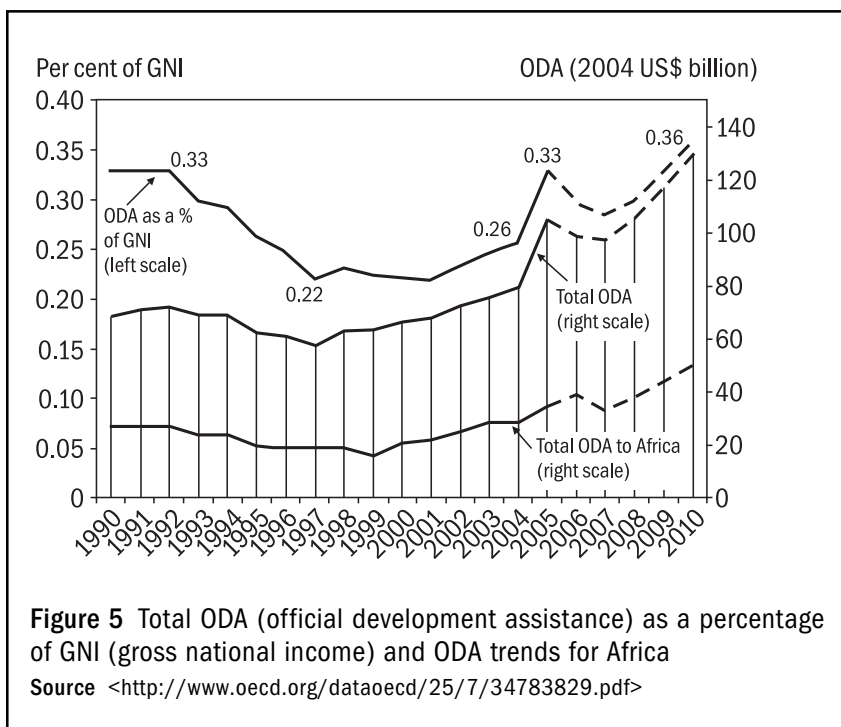
### Box 4 Millennium Villages Project: the success story of Sauri in Kenya

The Millennium Village Project is an attempt to bring villages in developing countries out of the poverty trap. The project's underlying principles include community empowerment, interventions based on scientific research, strengthening of local institutions, and self-sustenance. Under this project, Sauri in Kenya was adopted as a millennium village in 2005. Sauri is a village of approximately 4600 people with a strong community system, which lacks financial resources to sustain economic growth. Before being adopted as a millennium village, the vast majority of households in Sauri reported chronic hunger due to inadequate food production. However, since the Millennium Project's interventions in the village, recent harvests of food crops have more than doubled. These efforts have been recognized, and Sauri has been commended for its success in achieving the first Millennium Development Goal at the 2006 Africities Summit in Nairobi.

**Source** UN (2006), *UN Millennium Project Report*

Details available at <[http://www.unmillenniumproject.org/reports/index\\_overview.htm](http://www.unmillenniumproject.org/reports/index_overview.htm)>, last accessed on 6 January 2007

Mobilizing resources through higher levels of development aid, enhancing technological know-how, and building capacities of local people have an important role to play in the advancement of human welfare in Africa, along with good governance practices. Encouragingly, the total ODA (official development assistance) to Africa has been on the rise (Figure 5) although a gap still remains between the actual ODA disbursed and the levels committed to by the international community at the WSSD 2002. In 2004, the net ODA to



Africa was \$29 080 million. This accrued mostly to the social sector, in particular, education and health,<sup>18</sup> thus reflecting the importance attached to capacity building and adequate formation of human capital in the continent, in addition to direct scientific and technical interventions for sustainable development.

#### Summit queries: sustainable development in Africa

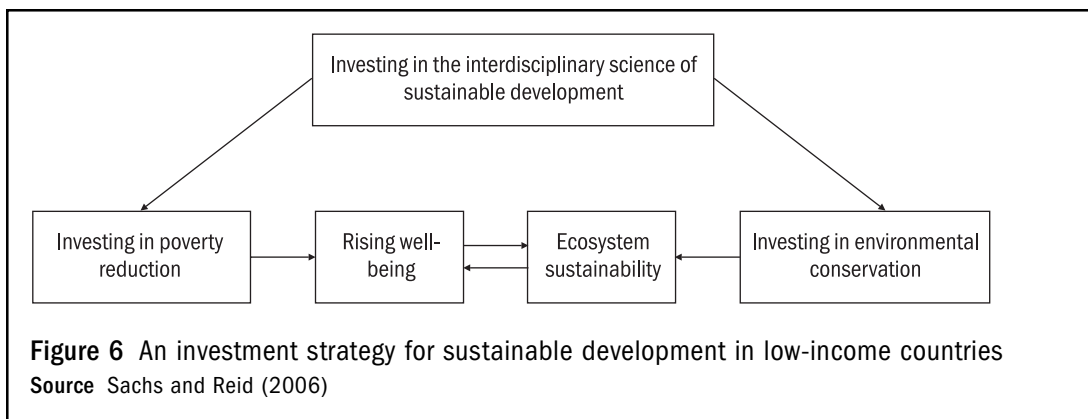
- How can we understand the nature of conflicts in African countries? Does their increased international attraction as raw material sources add to local conflicts?
- HIV/AIDS is impacting all sectors in sub-Saharan Africa and increasing the disease burden. What natural management strategies can contribute to alleviate the burden of HIV/AIDS in Africa and increase coping capacity?
- It is well established that disease and ill health can cause a slide into poverty. How can this vicious cycle of disease-poverty-disease in Africa be broken?
- How does one build a research culture in Africa? How can collaborative research links be established between Africa and the rest of the world? What innovative funding can be developed to develop science and technology in Africa?
- How can one address the energy needs of the poor in Africa? How can one rope in the large resource companies operating in Africa to invest in affordable and efficient energy systems?
- What empowering multilateral initiatives can be taken in Africa to build human capacity to address issues that relate to water, health, education, energy, agriculture, and the environment?
- How can India draw on its own development experience to address specific problems that Africa faces?

## Science and technology for sustainable development

Effective harnessing of existing and emerging technologies is central to facilitating the achievement of the MDGs (UNCTAD 2005). A comprehensive scientific vision and political commitment thus forms a fulcrum for achieving a sustained form of development, which helps alleviate human suffering while conserving the natural capital base (Figure 6). However, a lack of national capacity to acquire and harness technology potential prevents most developing countries from investing in innovations and fully leveraging the options offered by scientific and technical knowledge for attaining their development objectives in a sustainable manner.

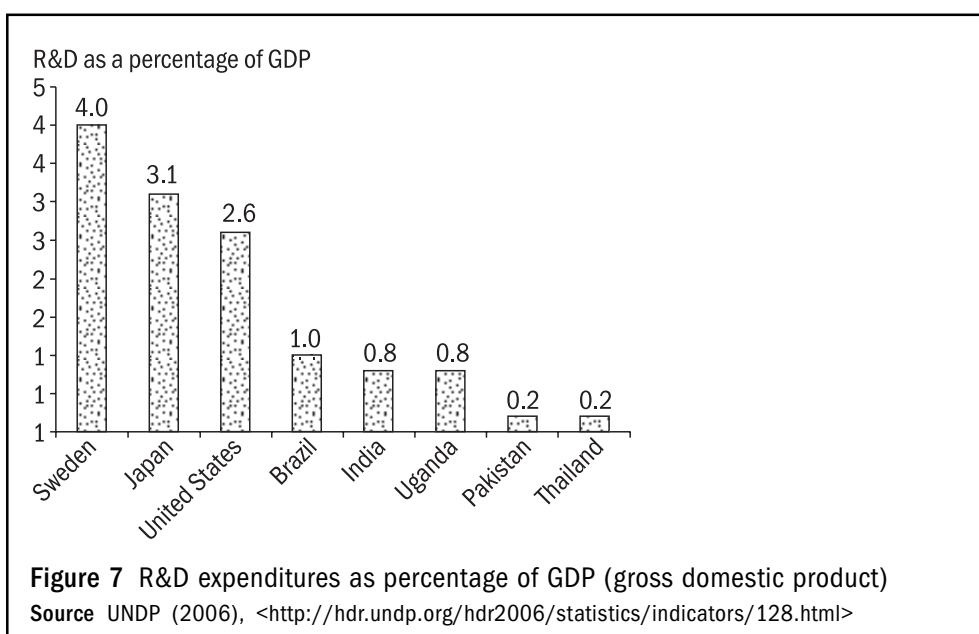
In comparison to developed countries, most developing countries are found to under-invest in R&D (research and development). India, for instance, incurs a per capita R&D expenditure of about \$5.5, a negligible amount compared to the per capita R&D expenditures of the United States (\$705) and Japan (\$978). In general, developed countries like Japan and Sweden spend a larger

<sup>18</sup>Details available at <<http://www.oecd.org/dataoecd/40/27/7504863.PDF>>, last accessed on 7 January 2007



proportion of their GDP (gross domestic product) on research activities as compared to developing countries like India and Thailand (Figure 7).

In addition to building local capabilities, it is also important to facilitate technology transfer and technical cooperation between developed and developing countries. This was emphasized at the WSSD, which stressed the need to, ‘take further action to mobilize the provision of financial resources, technology transfer, capacity building, and the diffusion of environmentally sound technologies’ (JPOI, paragraph 20(a)). An example of an innovative approach of technology diffusion to the masses was the experiment by the Centre for Cognitive Sciences in India in 1999, where the installation of a computer with free and unlimited access to the Internet outside the office building led to street-children learning functional computer skills within days. The World Bank expanded this initiative throughout India, with more than 75 computer kiosks set up, benefiting thousands of children in rural and urban India (UNCTAD 2005).



Both developed and developing countries are equally responsible for the penetration of new knowledge and technology worldwide, although their roles differ. While developed countries must ensure the dissemination of scientific and technological knowledge to low-income countries, the formulation of national innovation policies, clear technology visions, and sound governance systems conducive for adapting and adopting to new technologies in developing countries remain equally relevant.

#### Summit queries: sustainable development technologies for the poor

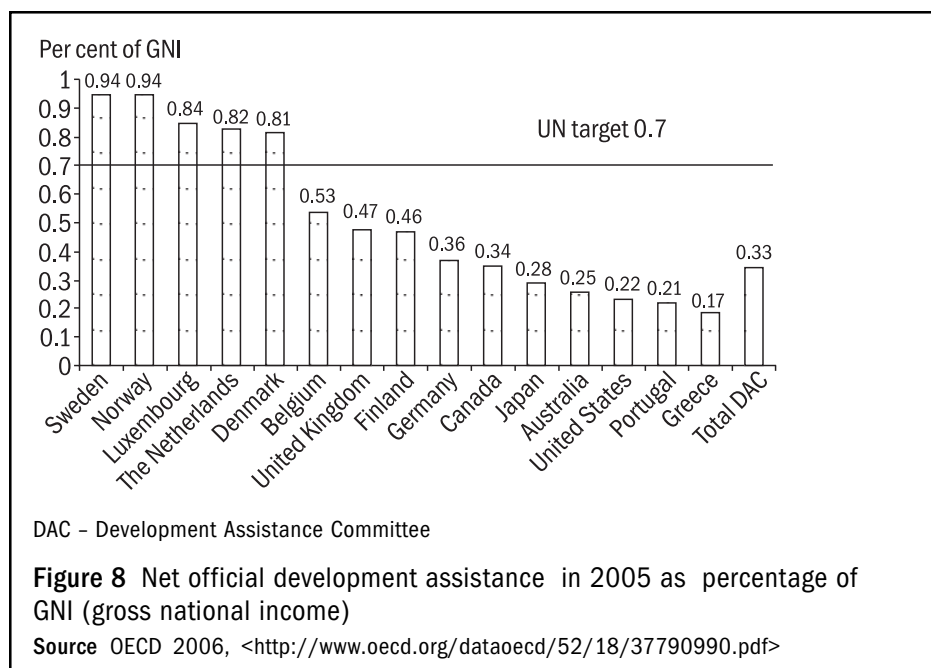
- How can technology act as a means for efficient and effective delivery of services required to meet the MDGs?
- In what ways can the use of modern technology by the poor be instrumental in fighting poverty? Are there enough case studies supporting this?
- How can the technical know-how for developing/customizing/servicing modern as well as traditional technologies be transferred at the grass-roots level to enable them to provide reliable solutions to meeting the MDG challenge?

## Financing for sustainable development

The MDG framework was formulated based on a vision of developed countries partnering developing countries to achieve a sustained enhancement in human well-being. This was captured in Goal 8, which requires ‘a global partnership for development’. In this context, meeting the MDGs requires adequate financial assistance to be imparted, along with overall policy reforms and improvements in service delivery. Aid plays a crucial role mainly in countries where the policy and institutional environment is conducive to poverty reduction.

It has been estimated that the cost of attaining the MDGs globally is in the range of \$40–\$60 billion, in addition to foreign aid (World Bank 2005). The richer nations have, however, faltered endlessly on their commitment to contributing 0.7% of GNP (gross national product) as ODA to the developing countries. While these commitments have repeatedly been articulated at several forums (Rio Summit 1992, Monterrey 2001, WSSD 2002), not much has been achieved in terms of ensuring financial flows. Trends, in fact, reveal that ODA levels have decreased through the 1990s, especially as a proportion of GNI (gross national income) (Figure 8).

Apart from ODA, the enhanced mobilization of resources through increased government expenditure levels is also necessary to finance the meeting of the MDG targets. This additional resource requirement needs to be raised through other financing options such as global taxes, currency transaction taxes, environmental taxes to finance defensive expenditures against environmental damage, and so on. An important source of aid could be through the creation of opportunities for developing countries to sell their produce in international markets.



## Governance: innovating, delegating, and partnering for change

Ensuring good governance remains at the core of sustainable development. Innovative governance policies that recognize the importance of delegation and partnerships within an integrated system are crucial for attaining development objectives. Governance involves a host of issues relating to institutions, delivery mechanisms, and the supporting structure of legislation, rules, and procedures. An aspect that is often overlooked is the lack of a holistic view while formulating policy, which, to a large extent, stems from the compartmentalization of issues amongst various departments, each working in isolation. This organizational vacuum with fragmented responsibilities, therefore, remains a key challenge to be addressed, especially in the context of the multi-dimensionalities inherent in the paradigm of sustainable development. These multi-dimensional objectives, encompassing the society, the economy, and the environment in a framework that includes the present and the future, require the involvement of diverse administrative units within an integrated approach to overall human welfare.

Therefore, ensuring synergies across different levels of governance is crucial. In a number of instances, implementation happens at the grass-roots level, in which case local bodies like municipalities should be assigned greater responsibility and powers. Community participation also reaps positive results; this has been witnessed in the water and sanitation sector in many developing countries. In areas where the community acquires a substantial part of the knowledge required for the design and operation of a project, efficiency improvement through increased ownership tends to deliver efficient results. User participation also makes services and service providers more responsive and

accountable to beneficiaries, and aligns the provision of services with users' needs and ability to pay, thereby improving cost recovery and sustainability (TERI 2004).

Another key issue to be addressed in the context of environmental management is a conducive institutional set-up with a strong legal framework. This can be built through partnerships, strong accountability systems, and enhanced capacities of local bodies. Partnerships can act as a powerful tool in attaining several development objectives. In the sanitation sector, for instance, rapid progress has been achieved as a result of close associations between local communities and governments. Examples of this include slum dweller associations such as the National Slum Dwellers' Federation in India, the Orangi Pilot Project in Pakistan, and the total Sanitation Campaign in Bangladesh, which have effectively used the power of communities to mobilize resources and bring sanitation to millions of people (UNDP 2006).

Ensuring adequate governance for sustainable development requires efficient expenditure management and effective targeting of incentives such that resources earmarked for particular schemes reach the intended beneficiaries (Lopes, Nandi, and Murugesan 2006). Essentially, there remains an urgent need for a comprehensive result-oriented public expenditure management system to enable nations to improve their governance systems such that natural resources are harnessed sustainably, while environmental damages – both actual and potential – in the course of social-economic activity are addressed in a focused manner (Box 5).

#### Box 5 Examples of sustainable initiatives in Indian states

- **Andhra Pradesh:** Livelihood generation for tribal communities through the use of natural resources (bamboo).
- **Chhattisgarh:** Biofuel Development Programme, which aims at utilization of government's barren lands for jatropha cultivation for producing bio-diesel.
- **Gujarat:** Recharging of Kabootri and other abandoned mines with run-off water to conserve and improve the water-table level.
- **Karnataka:** Capacity-building of the stakeholders in natural resource management through activities of the Environment Management and Policy Research Institute's awareness creation and skill development.
- **Kerala:** Biodiversity conservation and educating community about the need for conservation activities.
- **Maharashtra:** Akshay Prakash Yojna, a project to provide uninterrupted power supply to villages.
- **Orissa:** Protection of biosphere and tiger reserve by forming 'Sabuja Vahinee', or Green brigade, a group of volunteers to assist forest personnel in better forest protection.
- **Punjab:** Development of technologies for sewage disposal.
- **Rajasthan:** Sustainable Water Campaign – Jal Chetna Yatra – to ensure integrated water resource management.

*Continued...*



### Box 5 Examples of sustainable initiatives in Indian states (*continued...*)

- **Uttar Pradesh:** Improving quality of river water by controlling pollution from distilleries and pulp and paper industries.
- **Uttaranchal:** Natural resource management in selected degraded micro-watersheds using water-treatment technologies and community participation; student's involvement in plantation activities for conserving and managing forest areas.
- **West Bengal:** Ecological security to Kolkata through the East Kolkata wetlands, which use the city's waste water for enhancing output from the fish ponds.

**Source** Based on input provided by the respective states for the TERI award on innovative initiatives for managing natural resources.

## Conclusion

The all-pervasive impact of human activity on the world's natural resource endowments is gradually threatening the security of human activity itself: a threat the world has finally woken up to. The challenge before sustainable development practitioners is thus to align the world's development imperatives with natural resource management in such a manner that balance is restored between human well-being and environmental health, especially since it is the poor who are disproportionately impacted by the ramifications of environmental degradation and depletion. DSDS 2007, therefore, sets out to explore the natural resource dimensions of sustainable development, keeping in mind Mahatma Gandhi's assessment:

*The difference between what we do and what we are capable of doing would suffice to solve most of the world's problems.*

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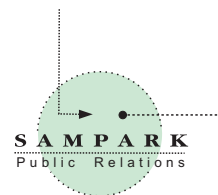
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