

Everyone in the world depends on nature and ecosystem services for a decent, healthy and secure life. The pressures on ecosystems will increase globally in the coming decades unless we change our attitudes and actions. A crucial question is how the

loss of services derived from ecosystems will affect the achievement of the MDGs to reduce poverty, hunger, and disease. Nor should we forget the importance of the link between environmental degradation and the long-term well-being of the human

Ecosystems protection, a key to development

By **Tim Hirsch**, *BBC News environment correspondent*

In March Britain's Chancellor of the Exchequer Gordon Brown broke new ground in a speech to a gathering of finance and environment ministers from the G8 "club" of leading world economies.

For the first time, a politician in charge of economic policy for a major industrial nation was explicitly stating the inextricable link between environmental degradation and the long-term well-being of the human population.

Mr Brown told his audience: "If our economies are to flourish, if global poverty is to be banished and if the well-being of the world's people enhanced – not just in this generation but in succeeding generations – we must make sure we take care of the natural environment and resources on which our economic activity depends [...] Across a range of environmental issues – from soil erosion to the depletion of marine stocks, from water scarcity to air pollution – it is clear now not just that economic activity is their cause, but that these problems in themselves threaten future economic activity and growth.

And it is the poorest members of the community – those most dependent on the natural world for their survival and those with the fewest resources to buy their way out of unhealthy environments – that suffer the most."

A few days after Brown delivered his elegant manifesto for integrating environmental and development policies, a meeting was held in New York to finalise the main documents of the Millennium Ecosystem Assessment (MA). To the surprise of many of the experts gathered at the UN for the meeting, Brown – or at least his advisers – appeared to have "got" some of the key messages of the assessment before it had even been published.

Crucially, the chancellor recognised that one environmental challenge – the fight against climate change – had the potential to "overwhelm" attempts to meet the Millennium Development Goals (MDGs).

With the arrival of the five-year anniversary of the Millennium Declaration, the analysis contained in the MA could not be more timely. It identifies an alarming decline in the services provided to humans by ecosystems, which, if allowed

to continue unchecked, will threaten not just the goal of environmental sustainability but other MDG objectives such as reducing poverty, hunger and disease as well. The continued degradation of ecosystems could jeopardise even goals such as reducing gender inequality and improving access to education.

While it is important to recognise these links, care must be taken to avoid caricature or an over-simplification of the message. The MA does clearly state that social and economic policies will play the primary role in achieving the 2015 targets set out in the Millennium Declaration. However, the General Synthesis Report of the MA finds that "many of the targets (and goals) are unlikely to be achieved without significant improvement in management of ecosystems."

One of the more striking findings of the MA is that the regions of the world facing the most serious decline in the services provided by ecosystems are the very areas showing the slowest progress in achieving the MDGs. Therefore, in sub-Saharan Africa, Central and South Asia and parts of Latin America, the burden of poverty, hunger and disease coincides with acute deterioration of natural services such as the supply of fresh water, the formation of soils able to support crops and the availability of natural resources such as fish, fuelwood and medicines derived from plants.

Concern for the natural environment is often portrayed as a luxury of the rich, an issue of little consequence to the world's poor, who inevitably care more about feeding their children than about the disappearance of endangered species. Yet, as Brown recognised in the passage quoted above, it is the poor who are most vulnerable to ecosystem deterioration.

There is thus a clear link between environmental policies and the first of the MDG 2015 targets: to halve the proportion of the world's population living in poverty. Of the 1.1 billion people living on less than \$1 a day, around 70% live in rural areas where they depend heavily on subsistence agriculture, grazing and hunting; activities that require healthy ecosystems.

One problem is that conventional measures of wealth often overlook this dependence. In a study quoted by the MA, for example, it was found that 22% of household income for communities in

forested areas came from sources typically excluded from national statistics, such as harvesting wild food, fuel wood, fodder, medicinal plants and timber. So while the conversion of a forest to more "productive" uses such as agriculture may show up as a net benefit to the national economy, it can have a devastating impact on the income of poor families.

Similarly, the MDG target of reducing hunger hinges on improving ecosystem management. Crop and livestock production are recognised in the MA analysis as ecosystem services. Globally they are among the few to show improvement – though at the expense of others such as the watershed and climate functions of forests that could eventually limit our ability to feed a growing population.

And, once again, the regions suffering most acutely from ecosystem degradation are those facing the gravest hunger crises. Sub-Saharan Africa is the only region in the world to have shown an overall decline in food production, made worse by the vicious cycle of poverty and the deterioration of soils in the drylands. Development policies which fail to address this link stand little chance of long-term success.

The issue of food production also illustrates the danger of focusing narrowly on policies designed to meet a specific MDG objective while failing to recognise the negative impacts which can arise from the destruction of ecosystems. The expansion of crop and livestock production into the Brazilian Amazon and savannas, for example, may lead to a short-term increase in the total availability of food. However, this expansion may also result in future problems of soil erosion, loss of pollination services and instability of the regional climate, which could in turn cause increased long-term hunger.

The MDG objectives relating to disease, child mortality and maternal health have less obvious links with the state of ecosystems, but they are nonetheless well illustrated in the MA. One of the diseases singled out in the targets, malaria, has been closely associated with the disturbance of tropical ecosystems through deforestation; it is also linked to climate change. A rise in temperatures in Papua New Guinea, for example, is expected to spread malaria-carrying mosquitoes to highland areas where human populations have less resistance to the disease.

The health of mothers and babies also has clear links to lack of nutrition and inadequate supplies of fresh water, issues that are both strongly affected by the deterioration of ecosystems. Degraded environments which produce large areas of standing water, for example, can be breeding grounds for a range of diseases.

Even those MDG objectives which at first appear to be influenced by purely social factors can also have important links to environmental choices. An interesting observation in the MA is the impact of deforestation and unsustainable use of freshwater sources on gender equality and education. A mother who has to spend much of her day – often accompanied by her daughters – walking to collect scarce firewood or carrying water from a remote well has little time to devote to family responsibilities. These tasks can also be a major factor in keeping girls away from school.

Equally, in rural societies, it is often the women who have the primary responsibility for growing staple crops like rice, wheat and maize. Therefore, it is the women who will bear the brunt of environmental degradation that threatens this essential household activity.

Therefore, for many of the Millennium Declaration objectives, long-term success or failure may be strongly influenced by the extent to which development policies take into account the responsible management of ecosystems. A major complaint within the MA is the low priority recipient countries give to environmental factors in the preparation of the poverty reduction strategies they submit to lending institutions or bilateral donors. With recognition of these links from leading players such as the British chancellor, it will be interesting to see whether they are given a more prominent role in future overseas development programmes.

However it would be wrong to see this issue as one that affects only the developing world and the aid programmes designed to enhance the well-being of its populations. Another of the key messages of the MA is that consumption and wealth-creation in richer societies can have "negative trade-offs" in the availability of ecosystem services to the world's poor, thus jeopardising the MDGs.

One example is the massive over-exploitation of the world's marine fish stocks. This has led to anomalies such as the

negotiation of coastal fishing rights off West Africa for European super-trawlers, depriving local subsistence fishing communities of valuable sources of protein.

Perhaps the primary example, however, is climate change. As Brown observed, failure by the industrialised world to take serious steps to reduce greenhouse gas emissions may jeopardise progress towards meeting the MDGs. It is the drylands of Africa, the low-lying delta of Bangladesh and the glacier-fed mountain croplands of South America which stand to lose most from accelerated global warming.

Therefore, achieving the MDGs is not just a matter of "greening" development policies. It requires the developed world to look very closely at the impact of its own behaviour on the entire planet.

The UK presidency of the G8 this year would have been the ideal platform from which to firmly anchor these links as part of a new approach to the debate over greenhouse gas emissions. Armed with the MA analysis, supporters of radical steps to curb fossil fuel combustion could make a strong case for this being as much a part of the development agenda as increased overseas aid or fairer trade rules.

Yet in the run-up to the Gleneagles summit in July, the priorities of Africa and climate change set by the United Kingdom's Prime Minister Tony Blair were largely portrayed as separate issues. Spectacular progress made in areas such as debt cancellation, development funds and Aids treatment stood in stark contrast to the loosely-worded compromises on global warming.

In a sense, that the G8 heads of government may have felt less pressure to act decisively on climate change than on other issues on their agenda is not surprising. In the sensational channelling of worldwide public opinion through events such as the Live 8 concerts, global warming and its implications received scarcely a mention.

A major challenge remains, therefore, for those urging closer coordination between environmental and development policies. Until pop stars and their fans can be mobilised to shame politicians into radical emission cuts or protection of tropical forests, the gains from Gleneagles may yet be "overwhelmed" – to use Brown's own phrase – by degradation of the natural systems on which we all depend.

"Poverty has many dimensions, and they combine to create and sustain powerlessness, lack of voice, and a lack of freedom of choice and action."

Deepa Narayan, 2000. *Voices of the Poor*

"Poverty anywhere is a danger to prosperity everywhere"

The Philadelphia Declaration, 1944

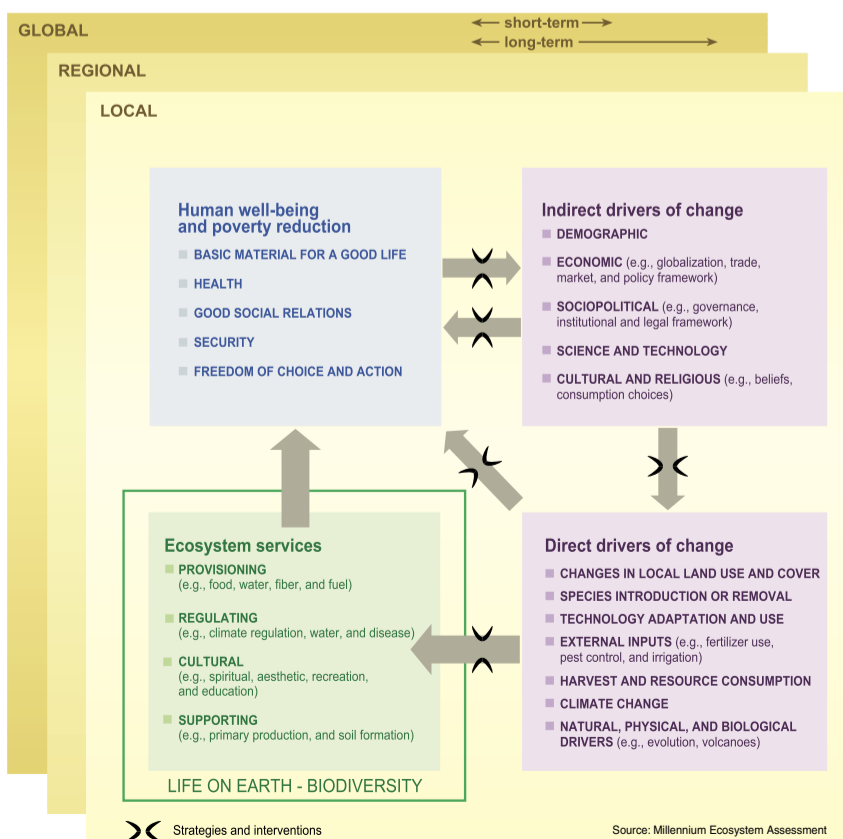
The end of poverty

By **Jeffrey Sachs**, *director of The Earth Institute at Columbia University and head of the UN Millennium Project*

It is still midmorning in Malawi when we arrive at a small village, Nthandire, about an hour outside of Lilongwe, the capital. We have come over dirt roads, passing women and children walking barefoot with water jugs, wood for fuel and other bundles. This midmorning temperature is sweltering. In this subsistence maize-growing region of a poor, landlocked country in southern Africa, families cling to life on an unforgiving terrain, this year has been a lot more difficult than usual because the rains have failed. The crops are withering in the fields that we pass.

If the village were filled with able-bodied men, who could have built rainwater-collecting unites on rooftops and in the fields, the situation would not be so dire. But as we arrive in the village, we see no able-bodied young men at all. In fact, older women and dozens of children greet us, but there is not a young man or woman in sight. Where, we ask, are the workers? Out in the fields? The aid worker who has led us to the village shakes his head sadly and says no. Nearly all are dead, the village has been devastated by Aids.

The presence of death in Nthandire has been overwhelming in recent years. The grandmothers whom we meet are guardians for their orphaned grandchildren.



The conceptual framework for the MA posits that people are integral parts of ecosystems and that a dynamic interaction exists between them and other parts of ecosystems, with the changing human condition driving, both directly and indirectly, changes in ecosystems and thereby causing changes in human well-being. Drivers that indirectly affect biodiversity, such as population, technology, and lifestyle, can lead to changes in drivers directly affecting biodiversity, such as the catch of fish or the application of fertilizers. These result in changes to ecosystems and the services they provide, thereby affecting human well-being. These interactions can take place at more than one scale and can cross scales. For example, an international demand for timber may lead to a regional loss of forest cover, which increases flood magnitude along a local stretch of a river. Similarly, the interactions can take place across different time scales. Different strategies and interventions can be applied at many points in this framework to enhance human well-being and conserve ecosystems.

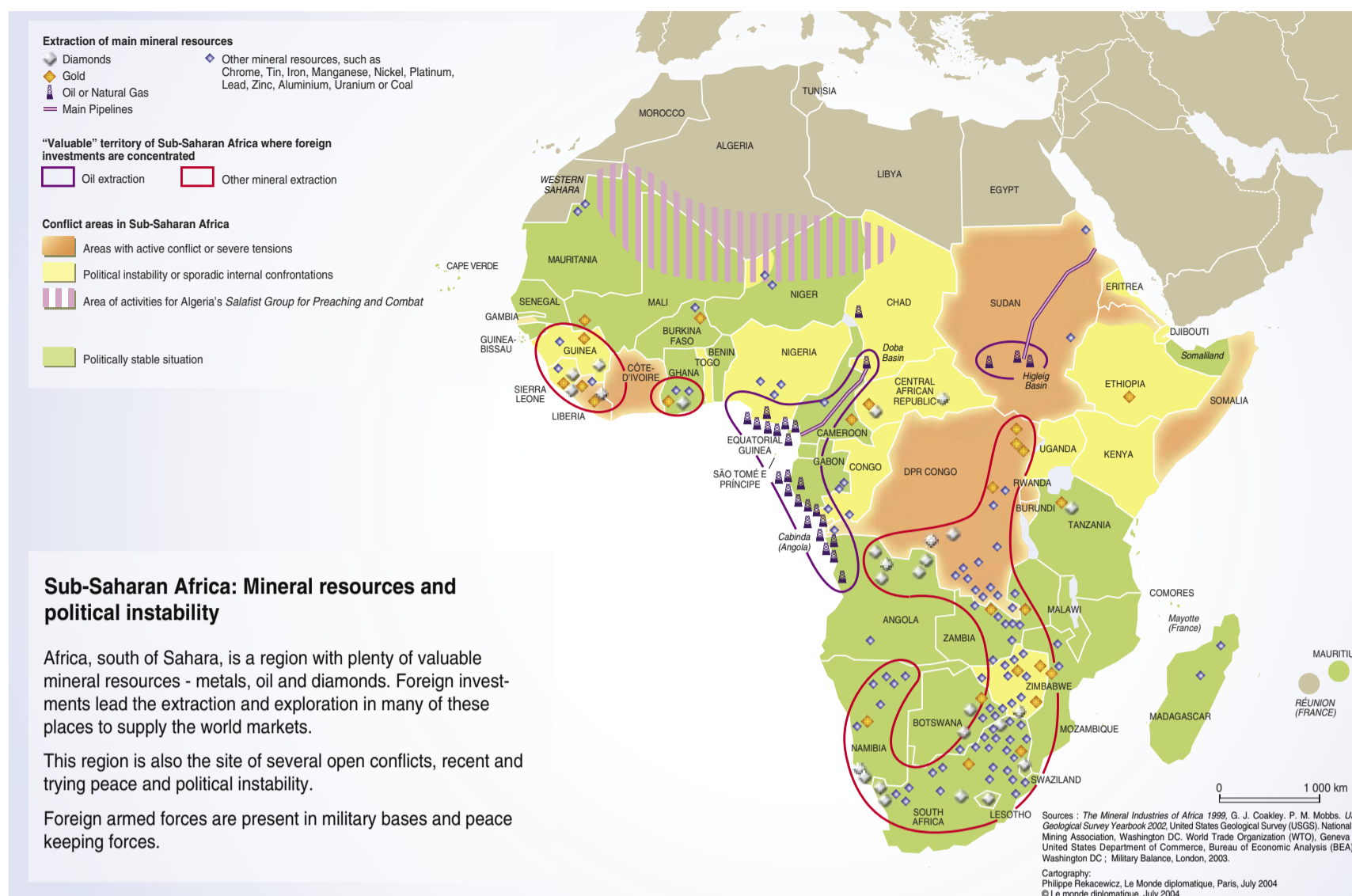
The Millennium Ecosystem Assessment (MA) is a four-year assessment designed by a partnership of UN agencies, international scientific organizations and development agencies, with private sector and civil society input, in response to Mr. Kofi Annan's call for global support of the Millennium Development Goals (MDGs). More than 1,300 scientists in 95 countries were involved.

Focus on the Millennium Development Goals

In September 2000, at the first meeting of the General Assembly of the United Nations, heads of state or government from 189 countries signed a solemn declaration setting eight goals of global importance. Under the declaration the international community agreed to work together to achieve the following goals by the year 2015:

1. Eradicate extreme poverty and hunger
2. Achieve universal primary education
3. Promote gender equality and empower women
4. Reduce child mortality
5. Improve maternal health
6. Combat HIV/AIDS, malaria and other diseases
7. Ensure environmental sustainability
8. Develop a global partnership for development

It is worth noting that, in reaching a consensus on these goals for the new millennium, the international community agreed, for the first time ever, on a "global package" that effectively summed up and reframed a number of prior agreements. In addition, the goals are clearly stated and based on concrete results that can be monitored and checked.



Why ecosystem services matter

By **Erin Bohensky**, co-editor of the *Gariiep basin component of the Southern African Millennium Ecosystem Assessment (SAfMA)*, 2004

Ecosystem services – the array of benefits provided by nature – are the lifeblood of human societies, economies and identities around the world. For many rural populations, ecosystem services form an essential part of daily activities and longstanding traditions. City dwellers may claim less direct dependence on ecosystem services, but they derive a variety of benefits from them, including “goods” such as food, water, fibre and pharmaceutical products, and “services” such as soil fertility and climate regulation that help to maintain a healthy, inhabitable environment. Ecosystems also provide cultural services through which people relate to, appreciate and enjoy nature. It is therefore in the best interest of societies as a whole to strive to maintain them. However, though their value is tremendous, ecosystem services are being seriously degraded, as recently demonstrated by the findings of the Millennium Ecosystem Assessment (MA)¹, a four-year initiative to provide decision-makers with relevant scientific information about the relationships between ecosystem change and various aspects of human well-being². If current trends continue, these services are expected to deteriorate even further and are likely to compromise the achievement of the Millennium Development Goals.

Understanding the links between ecosystem change and human well-being requires analysis not only at the global scale, but at finer scales – such as a river basin or village – where many key decisions about how to use and manage ecosystems are made. The Southern African Millennium Ecosystem Assessment (SAfMA)³ investigated these links in southern Africa. SAfMA adopted the unique multi-scale approach used in the MA, with assessments taking place at the scale of the whole region, in two large river basins and at several local community sites. Assessing ecosystem services at multiple scales provided an understanding of how different processes affect the availability of these services at each scale. For example, the availability of water in southern Africa depends on regional climate. However, in a given river basin, the availability of water may depend on factors including land use and national policy. In a village, factors such as local topography and adaptive practices may be at play. In addition, ecosystem processes do not conform to political boundaries; most southern African river basins are shared between two or more countries and wildlife migration routes frequently cross international borders. Thus, by focusing on regions and ecosystems rather than political units such as nations, provinces or districts, we obtain a richer and more comprehensive picture of the processes at work. SAfMA also employed the integrated approach used in the MA to explore the trade-offs between

different services across time and space. Clear-cutting a forest today, for example, reduces the likelihood of benefiting from services that an intact forest can provide in the future, while the diversion of water to irrigate crops upstream may limit the availability of water for users and ecosystems downstream.

In terms of human well-being, southern Africa has some of the world’s poorest conditions when measured with standard indicators. Though the reasons for this are multi-faceted, poor human well-being is often linked to the degradation of or lack of access to ecosystem services. Some services are unable to ensure human well-being because of biophysical constraints – water is relatively scarce in the arid and semi-arid zones south of the Zambezi River, for example. However, many problems are due largely to governance issues such as ineffective or inappropriate policies. The SAfMA analysis revealed that policies that were implemented to secure benefits from ecosystem services at one spatial scale sometimes had negative impacts at another. Large irrigation projects in the Gariiep basin intended to benefit South Africa’s commercial agriculture sector often displaced local communities and compromised their ability to maintain their livelihoods. This caused the displaced populations to put significant pressure on the environment in the areas to which they were relocated. Similarly, policies based on narrow sectoral object-

ives rather than on an integrated ecosystem approach often had unintended consequences. Massive dams stabilized the flow regime of the Gariiep River, but the altered river conditions allowed a pest black fly species to proliferate, negatively affecting livestock productivity and, ultimately, imposing significant costs on the very farmers the irrigation projects were meant to serve.

It appears that some of the most promising ecosystem service management solutions are integrated strategies in which synergies between the maintenance of ecological integrity and the achievement of development objectives are present. The South African government’s Working for Water Programme, with the twin goals of poverty alleviation through job creation and eradication of invasive alien plants, is a notable example. However, the assessment highlighted the difficulty of implementing such initiatives in the absence of strong governance. It works both ways: the sustainable delivery of ecosystem services to people generally requires sound governance structures, while governance may be challenged when they deteriorate, due to increasing conflict over a declining resource base and a loss of options. The ability to choose among a variety of options when using such services as a source of one’s livelihood was shown to be fundamentally important. In fact, it is choice that decreases dependence on any one service and enables a more proac-

tive, strategic approach to ecosystem management.

What does this mean for development and the Millennium Development Goals? SAfMA observed that the achievement of four of the Millennium Development Goals - reducing hunger, reducing child mortality, combating diseases and ensuring environmental sustainability - will face some serious challenges in the region if development plans do not explicitly address ecosystem services. Achieving the goals will require more than a passing mention of these services; it will demand a true appreciation of the links described above. Ecosystem services matter to everyone. The boundaries by which we live and govern our societies are invisible in terms of many of the physical, social and economic consequences of their degradation.

1. www.millenniumassessment.org
2. The MA regards human well-being as having multiple components: basic material income, health and nutrition, good social relations, environmental security and, fundamentally, freedom and choice.
3. Biggs, R., E. Bohensky, C. Fabricius, T. Lynnam, A. Misselhorn, C. Musvoto, M. Mutale, B. Reyers, R. J. Scholes, S. Shikongo, and A.S. van Jaarsveld. 2004. Nature supporting people: the Southern African Millennium Ecosystem Assessment. Council for Scientific and Industrial Research (CSIR), Pretoria. Available at www.millenniumassessment.org/en/subglobal.safma.aspx

The margin of survival is extraordinarily narrow; sometimes it closes entirely: One woman we meet in front of her mud hut has 15 orphaned grandchildren. Her small farm plot, a little more than an acre in all, would be too small to feed her family even if the rains had been plentiful. The soil nutrients have been depleted so significantly in this part of Malawi that crop yields reach only about a half-ton per acre, about one-third of normal. This year, because of the drought, she will get almost nothing: She reaches into her apron and pulls out a handful of semi-rotten, bug-infested millet, which will be the basis for the gruel she will prepare for the meal that evening. It will be the one meal the children have that day.

I ask her about the health of the children. She points to a child of about 4 and says that the girl contracted malaria the week before. The woman had carried her grandchild on her back for the six miles to the local hospital. When we got there, there was no quinine, the antimalarial medicine, available that day. With the child in high fever, the two were sent home and told to return the next day. In a small miracle, when they returned after another 6-mile trek, the quinine had come in, and the child responded to treatment and survived. It was close a call though. More than a million African children, and perhaps as many as 3 million, succumb to malaria each year.

As we proceed through the village, I stoop down to ask on one of the young girls her name and age. She looks about 7 or 8 but is actually 12, stunted form years of undernutrition. When I ask her what her dreams are for her own life, she says that she wants to be a teacher and that she is prepared to study and work hard to achieve that. I know that her chances of surviving to go on to secondary school and a teachers college are slim under the circumstances.

The plight of Malawi has been rightly described by Carrol Bellamy, head of UNICEF, as the perfect storm of human deprivation, one that brings together climatic disaster, impoverishment, the

Aids pandemic and the long-standing burdens of malaria, schistosomiasis and other diseases. In the face of this horrific maelstrom, the world community has so far displayed a fair bit of hand-wringing and even some high-minded rhetoric, but precious little action. It is no good to lecture the dying that they should have done better with their lot in life. Rather it is our task to help them onto the ladder of development, to give them at least a foothold on the bottom rung, from which they can then proceed to climb on their own.

This is a story about ending poverty in our time. It is not a forecast. I am not predicting what will happen, only explaining

what can happen. Currently, more than 8 million people around the world die each year because they are too poor to stay alive. Every morning our newspapers could report, “more than 20,000 people perished yesterday of extreme poverty. How? The poor die in hospital wards that lack drugs, in villages that lack antimalarial bed nets, in houses that lack safe drinking water. They die namelessly without public comment. Sadly such stories get seldom written.

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