

## 4. What actions are required to address the health consequences of ecosystem change?

In principle, two courses of action are available whereby disease and injury caused by ecosystem disruption may be avoided. One avenue is the prevention, limitation, or management of environmental damage (mitigation strategies). A second course of action involves making necessary changes to protect individuals and populations from the consequences of ecosystem change (adaptation strategies). We do not elaborate on the first approach because it is not unique to health and is explored at length in each of the other MA reports. In this section we begin by outlining ways of reducing human vulnerability to the effects of ecosystem change. We draw attention, however, to the connections between actions taken to reduce human vulnerability and actions that may protect the environment. In many instances, similar actions will indeed serve both goals. Nonetheless, where populations are weighed down by very immediate problems, such as a heavy burden of disease, it may be much more difficult to advance sustainable development and environmental management strategies that require a longer-term perspective. In this context, the MDGs offer a framework for international action.

### 4.1 Reducing vulnerability

**Two closely-related issues need to be considered to understand the potential negative health impacts of ecosystem change: current vulnerability states and capacity for future adaptation (R16).** In many cases, the forces that place human populations at risk (such as poverty and high burdens of disease) also impair their capacity to prepare for the future. The burden of HIV/AIDS in Africa, for example, is a major impediment to all development programmes, including those focused on sustainable land use, ecosystem protection and poverty reduction.

**Populations, subgroups and systems that cannot or will not adapt are more vulnerable (R16).** Some population subgroups may not have the resilience to adapt because of a lack of material resources, relevant information, and public health infrastructure, as well as a lack of effective governance and civil institutions. Appropriate targeting of interventions requires understanding of the demographic or geographical



*Many of the health consequences of ecosystem change are borne by children - through increased morbidity and mortality from diseases related to unsafe water and sanitation, indoor air pollution, as well as vector-borne diseases such as malaria.*

subpopulations most at risk, the factors that contribute to their vulnerability, and factors that potentially may be modified within the context of a particular time and setting. Individual, community and geographical factors determine vulnerability.

## 4.2 The Millennium Development Goals

The Millennium Development Goals (MDGs) were adopted by the United Nations General Assembly following endorsement of the Millennium Declaration by heads of state and government representatives at the United Nations Millennium Summit in September 2000.

The MDGs aim to improve human well-being by reducing poverty, hunger, and child and maternal mortality; ensuring education for all; controlling and managing diseases; reducing gender disparities; ensuring sustainable development; and pursuing global partnerships. For each MDG, targets have been set to be achieved by 2015 – referring to 1990 as the baseline. The goals are not comprehensive, and even if all were achieved, this would not ensure equitable and sustainable development.

The United Nations Millennium Project established Millennium Task Forces to address the individual goals and identify specific interventions for each goal. Some approaches considered for achieving the MDGs may be relatively sparing of ecosystems; others would very likely incur much heavier environmental costs (R19).

**The ongoing degradation of ecosystem services is a significant barrier to achieving the MDGs and the harmful consequences of this degradation could grow significantly worse during the first half of the 21st century.** The MDGs can best be met through integrated, synergistic strategies rather than isolated interventions. Particular emphasis needs to be placed on the sustainable intensification of existing cultivated ecosystems in order to satisfy growing demand for food - alongside the preservation of other important ecosystem services, e.g. water filtration and purification. Balancing such dual objectives is a major challenge, particularly as many social and economic issues also need to be addressed in order to reduce hunger (R19).



*Deforestation in Latin America.*



*Learning to run a nursery for agroforestry in the dry country of South Nyanza, Kenya.*

**As part of a strategy for achieving the MDGs, improved ecosystem management needs to address a complex set of drivers of environmental change through cross-sectoral policies, institutional actions, and investments at local, national, regional and global levels** (see Box 4.1). Improved capacity for cross sectoral policy-making is required not only at local levels, but also at global levels e.g. to address issues such as climate change and depletion of international fisheries (R19).

## Box 4.1 ECOSYSTEM CHANGE AND THE MDGs AND TARGETS

### Goal 1. Eradicate extreme poverty and hunger

*Target 1: Halve, between 1990 and 2015, the proportion of people whose income is less than US\$ 1 per day.* The Millennium Declaration identifies global poverty as the most daunting of all global problems. A clear understanding of the complex and dynamic relationship between poverty and the environment is required in order to address this. Numerous interventions, many with ecosystem implications, are possible to halt the negative spiral of poverty and environmental degradation. Many of these interventions have positive impacts for health, education and other goals. For example, granting land or resource tenure to poor rural people can increase conservation incentives, capital investment in production and livelihood security.

*Target 2: Halve, between 1990 and 2015, the proportion of people who suffer from hunger.* FAO estimates that 840 million people go to bed hungry each night. Hunger is at least as much of an economic (income) and social (equity and distribution) issue as it is an issue related to ecosystem services. Access to adequate food is particularly important for poor rural populations. Interventions that increase agricultural yield and area have significant implications for ecosystem services. The MA findings illuminate many aspects of these complex and dynamic relationships. The way that ecosystems are managed has a significant impact on the availability and price of food and thus on the achievement of this target (R19).

### Goal 2. Achieve universal primary education

*Target 3: Ensure that by 2015 children everywhere, boys and girls alike, will be able to complete a full course of primary schooling.* The expansion of primary education is likely to have many long-term positive impacts for ecosystem services, especially by enhancing human capital and individual and social capability. Yet better education fosters increased hope, expectations and capacity that some could view as potentially increasing the short- to mid-term pressure on ecosystem services by increasing the per capita ecological footprint. In the long run, however, education is likely to reduce the total size of this footprint. A better-educated population is likely to be in a stronger position to protect, preserve and

restore essential ecosystem services, including by accelerating the demographic transition in countries where fertility rates remain high or above replacement level.

### Goal 3. Promote gender equality and empower women

*Target 4: Eliminate gender disparity in primary and secondary education preferably by 2005 and at all levels of education no later than 2015.* Gender equity is an essential goal in itself and critical for meeting the other MDGs. The date set for achieving gender parity in primary and secondary education is 2005 - 10 years before the other goals. Among the more than 780 million adults who cannot read or write, nearly two thirds are women. Many poor populations are particularly dependent on locally available ecosystem services for their health and other elements of well-being (R19). Women and girls are especially vulnerable. Often they lack not only proportionate access to already limited economic resources but also frequently bear disproportionate responsibility for providing the human services that partially compensate for diminished local ecosystem services, such as collecting water and fuelwood from often-increasing distances. Such heavy labour constrains the ability of girls to attend school and can sap energy and concentration even when they do.

### Goal 4. Reduce child mortality

*Target 5: Reduce by two thirds, between 1990 and 2015, the under-five mortality rate.* Despite progress in some countries reducing child mortality in children less than five years old, still more than 10 million children die unnecessarily each year, almost all in poor countries. In many countries, infant and childhood mortality rates are falling more slowly, in some countries rates have stagnated or are rising. Undernutrition is the underlying cause of a substantial proportion of all child deaths. The systematic application of an ecosystems approach to the MDGs, as well as synergies from the other goals, will benefit reduction of the under-five mortality rate, including through improved nutrition of children and mothers (R19).

Unhygienic and unsafe environments place children's health at risk. The causal links

between infectious disease and ecosystems and their services are complex but are seen most clearly among impoverished communities that lack the buffers that the rich can afford (R16). Ingestion of unsafe water, inadequate water for hygiene and lack of access to sanitation contribute to millions of children's deaths, a significant portion from diarrhoea. Degraded and modified ecosystems, especially those that allow considerable amounts of standing water, are frequent sources of water- and vector-borne diseases (such as diarrhoeal diseases, malaria and dengue fever) to which children are susceptible. Poor nutritional status and micronutrient deficiencies among children decrease their immune and non-immune host defences, making many of them more vulnerable to infectious diseases.



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### Goal 5. Improve maternal health

*Target 6: Reduce by three quarters, between 1990 and 2015, the maternal mortality ratio.* Maternal mortality can be reduced by increasing health and gender equity through the provision of knowledge about reproductive alternatives, antenatal care, nutrition and disease. Ensuring that women have greater control over their reproductive health, including access to family planning, can help reduce population growth and consequent pressures on ecosystems.

### Goal 6. Combat HIV/AIDS, malaria and other diseases

*Target 7: Have halted by 2015, and begun to reverse, the spread of HIV/AIDS.* Most of the interventions needed to address HIV/AIDS are medical, educational and political rather than ecological. Reduced poverty and

improved gender equity will reduce livelihood choices, including prostitution, that increase the risk of HIV/AIDS. In some countries where the HIV/AIDS epidemic is very severe, such as parts of sub-Saharan Africa, the disease is having a direct impact on ecosystems, such as by lowering agricultural production. HIV/AIDS also has a direct impact on the economy by cutting production, earnings and taxes, thereby eroding the resources needed to deal with the epidemic (R19).

*Target 8: Have halted by 2015, and begun to reverse, the incidence of malaria and other major diseases.* One billion people live in malaria-endemic areas and malaria is responsible for over a million deaths annually. Malaria alone is responsible for 11% of the disease burden in Africa (R12). Ecosystem change, including forest



Global Fund to Fight AIDS, Tuberculosis and Malaria (GFATM)

clearance and irrigated agriculture, often is responsible for increasing the incidence of malaria. Better ecosystem management, in conjunction with primary and secondary prevention, is central to addressing this problem. Integrated vector management provides a range of environmental management tools within an ecosystem framework, including modification of the environment, biological and chemical controls.

### Goal 7. Ensure environmental sustainability

*Target 9: Integrate the principles of sustainable development into country policies and programmes and reverse the loss of environmental resources.* There is growing appreciation that the value of the human economy is subsidized by innumerable ecosystem services. As the ecological footprint of the human economy grows, thresholds of ecosystem service loss and degradation draw inexorably nearer,

placing at risk the sustainability of human well-being and development. Preserving and restoring environmental integrity while reducing poverty when the global population continues to grow is an immense challenge. Improved ecological valuation methods that better account for the economic values of ecological goods and services ignored by markets are an important tool for meeting this challenge.

*Target 10: Halve, by 2015, the proportion of people without sustainable access to safe drinking-water and basic sanitation.* During the 1990s, around 80 million people per year, on average, gained access to an improved drinking-water supply; and a similar number, to improved sanitation. Still, in order to meet Target 10 of the MDGs, this achievement needs to be scaled up, so that an additional 100 million people per year, on average, gain access to an improved drinking-water supply, and an additional 140 million people per year, on average, gain access to improved sanitation. In many regions, achieving the targets on water and sanitation without parallel investments in water treatment can threaten freshwater and coastal ecosystems and the services they provide.

*Target 11: By 2020, achieve significant improvement in the lives of at least 100 million slum dwellers.* Urbanization is transforming the world fundamentally. Close to 50% of the world population lives in urban areas, compared with only 15% in 1900. Currently it is estimated that over 900 million people live in slums, roughly one third of the world's urban population. More than 70% of the urban population in the least developed countries and sub-Saharan Africa live in slum-like conditions. This number is set to increase to roughly 2 billion by 2020 unless current trends change substantially. The challenge is particularly acute in sub-Saharan Africa, where urbanization proceeds at a very high pace. The most extreme forms of environmental degradation tend to be found in slums. Chronic pollution of water sources, high disease prevalence and deterioration of public health conditions are common features in many of these unplanned urban settlements. This target has a limited overall impact on rates of urbanization and total urban demand for ecosystem services, since the targeted 100 million slum dwellers account for only a relatively small share of the total urban slum population (R1).

### Goal 8. Develop a global partnership for development

*Target 12: Develop further an open trading and financial system, including a commitment to good governance, development and poverty reduction, nationally and internationally.* Globalization is a multifaceted collection of processes, a central part of which is the expansion of world trade. The MDGs aim to better harness globalization to reduce poverty. Goal 8 complements the first seven. It calls for an open, rule-based trading and financial system and increased aid and debt relief to countries committed to poverty reduction. There are significant opportunities to integrate aid and debt relief with innovative "debt for MDG" swaps (R19).

*Targets 13-15: Address the special needs of least developed countries, landlocked and small island developing states and highly indebted poor countries.* Many landlocked, small island and highly indebted nations lack the basic health, education and infrastructure capacities needed to gain adequate access to expanded markets and make the most of more open trade regimes. Therefore, special terms of trade, official development assistance and debt relief are required to finance new infrastructure and to address land and water sustainability issues.

*Targets 16-18: In cooperation with developing countries and the private sector, address youth unemployment, access to affordable essential drugs and access to the benefits of new technologies.* In harnessing globalization to reduce poverty and achieve sustainable development, the implications for ecosystems and their services must be a primary consideration. Recent estimates place the value of the world's ecosystems at more than the total value of the world's economy, taking into account the value of freshwater purification, pollination, clean air, flood control, soil stability and climate regulation (R19). Nevertheless, recognition of ecosystem services seldom penetrates policy debates. In making trade-offs between progress on human development goals and maintenance of ecosystem services, and in order to make better choices possible, improved ecological valuation methods need to be used to take more account of the economic values of ecological goods and services ignored by markets.