

Millennium Development Goals interventions by area

Intervention area 1: investments in rural development

Investments in rural development include interventions in poverty and hunger reduction; domestic water supply, sanitation, and water management infrastructure; rural transport; and rural energy services.

Increasing agricultural productivity

Poverty and hunger reduction

Investments in soil health. Combinations of mineral fertilizers, agroforestry (use of trees to replenish soil nutrients), green manures, cover crops, return of crop residues, and soil erosion control, as appropriate, depending on soil characteristics, partly financed by market-oriented smart vouchers to food-insecure farmers.

Small-scale water management. Development of water management techniques and structures, pumps, drip irrigation, wells, and the like, as appropriate, partly financed by market-oriented smart vouchers to food-insecure farmers.

Improved inputs. Provision of seeds of improved varieties of crops, pastures, and trees, as well as improved breeds of livestock and fish,* with delivery systems accessible to food-insecure farmers, such as community tree nurseries.

*Farm diversification.** Incentives to farmers to diversify to high-value livestock, vegetables, and tree products, once they are food-secure.

Extension services. Strengthening of extension services with village-level paraprofessionals that have a strong participatory approach and up-to-date knowledge of soil health, small-scale water management, improved germplasm, high-value products, and other ecologically sound agricultural techniques.

* Interventions not included in the MDG needs assessment (chapter 17)

Agricultural research. Increased investments in national research systems for agriculture and natural resource management to 2 percent of agricultural GDP.

Special interventions to reach women farmers. Recruitment and training of women extension workers; provision of inputs (seeds, fertilizers, implements) targeted to reach women; promotion of women's property rights to land, water, trees, and fisheries, and access to information on agriculture, nutrition, marketing, finance, and environmental protection.

*Linking farmers
to markets*

*Storage, marketing, and agroprocessing facilities.** Construction of warehouses to reduce postharvest losses, construction of market spaces, provision of training and equipment to encourage small-scale agroprocessing industries in rural areas, supporting shifts to high-value farming and skill building, supporting rural input traders, and providing access to market information.

*Agrodealer networks.** Fostering local agrodealers to sell fertilizers, seeds for agroforestry, green manure, water management equipment, and improved seeds, redeeming smart vouchers and receiving training from extension workers.

*Support to farmer associations.** Investments to support farmer and rural laborer associations to organize to improve negotiating price outcomes and access to markets, with emphasis on cell phones and internet access modeled after the "biovillages" in South India and the Hunger Project's "epicenters" in Africa.

*Access to credit.** Extension of the formal banking system and provision of microcredit services.

Nutrition

Nutrition for infants, pregnant women, and nursing mothers. Promotion of mother- and baby-friendly community initiatives, including exclusive breastfeeding for first 6 months and complementary feeding with continuing breastfeeding for infants ages 7–24 months. HIV-positive mothers should use replacement feeding when it is acceptable, feasible, affordable, sustainable, and safe. Provision of sufficient calories, protein, and micronutrients to pregnant women and nursing mothers, supported by nutrition extension workers and using locally produced food to the extent possible.

Nutrition for undernourished children under five years. Complementary feeding, including fortified and blended foods with take-home rations supported by nutrition extension workers.

Nutrition for school-going children. Provision of balanced school meals with locally produced foods at the primary and secondary levels.

Addressing hidden hunger. Reduction of vitamin A and iron, zinc, and iodine deficiencies by increasing the production and consumption of micronutrient-rich foods, particularly local fruits, vegetables, livestock products, iodized salt, and fortified foods from local products (such as India Mix); special attention to nutrition needs of the above groups and people living with HIV/AIDS; support to research on biofortification of food.

*Emergency food assistance**

Early warning systems. Strengthening of early warning systems to cope with natural disasters.

Emergency response. Direct food aid to areas where droughts, floods, earthquakes, and civil wars threaten the acutely hungry with starvation.

Social safety nets. Investments in social safety net solutions such as food for work, cash for work, community grain banks, and environmental rehabilitation to mitigate shocks and reduce longer term food security risks, using locally produced food to the extent possible.

Domestic water supply, sanitation, and water management infrastructure

Domestic water supply

Water supply infrastructure. Provision and operation of infrastructure for water supply (such as standpipes, boreholes, dug wells, or rainwater harvesting), including water treatment as necessary.

Water management

*Water storage and other infrastructure for water management.** Construction and operation of water storage infrastructure for drinking water supply, agricultural water use, and hydropower; extension of large-scale water harvesting.

*Integrated water resources management.** Protection and allocation of water resources to agricultural, domestic, and industrial uses, as well as environmental needs based on comprehensive assessment of renewable and nonrenewable water resources.

*Hydrological monitoring.** Operation and extension of hydrological monitoring systems.

Sanitation

Sanitation infrastructure. Construction and operation of sanitation facilities (simple pit latrines, ventilated improved pit latrines, septic tanks, flush toilets, and the like), including emptying of pits and safe disposal of sillage.

Building awareness. Targeted awareness-building measures accompanying the provision of new sanitation infrastructure to ensure the informed choice of technology options and proper use by all household members.

Hygiene education Awareness campaigns (in primary schools, through community-based organizations, media, and so on) to promote hygienic behavior, with particular focus on hand washing and personal hygiene, as well as appropriate use of sanitation facilities and safe water storage.

Rural transport

Transport infrastructure *District roads.* Upgrading and construction of paved secondary or district roads.

Feeder and community roads. Upgrading and construction of small paved roads connecting villages and farmers to the nearest district road.

*Footpaths.** Extension and improvement of footpaths connecting individual rural farmers to feeder roads.

Road maintenance. Institutional structure and funding arrangements for adequate road maintenance (such as dedicated road funds).

Transport services *Vehicle supply.** Investments in supply and distribution systems for bicycles and motorized vehicles.

*Other interventions.** Deregulation of transport market to increase competition. Support to small-scale transport entrepreneurs to reduce barriers to market entry.

Rural energy services

Thermal energy *Improved cooking stoves.* Distribution and maintenance or replacement of appropriate cooking stoves (ceramic stoves, liquid petroleum gas stoves (LPG), ethanol stoves, charcoal stoves, and the like).

Modern cooking fuels. Strengthening of distribution and production systems for modern fuels (such as liquid petroleum gas, ethanol, dimethylsulfoxide, and kerosene), including safe containers.

Electricity *Off-grid electric power systems and batteries.* Provision of diesel generators, hybrid systems, or solar home systems together with necessary wiring to schools, hospital, clinics and health centers, and other community facilities. Provision of batteries and charging stations to remote rural communities.

Electric power generation capacity. Extension, upgrading, and maintenance of generation capacity (thermal energy plants, hydropower, or geothermal, as appropriate) to supply electricity grids.

Electric power grid. Extension of grid through high-voltage lines, medium- to low-voltage lines (including end-user connections), and other related infrastructure (such as transformer stations).

Provision of basic machinery for food processing and other motive power needs.

Intervention area 2: investments in urban development and slum upgrading

Investments in urban development and slum upgrading include interventions in urban hunger, slum upgrading, urban transport, energy services, domestic water supply and sanitation, environmental management, and industrial development.

Slum upgrading and urban planning

Slum upgrading

Housing. Incremental improvements to and construction of housing.

Infrastructure for slum upgrading. Upgrading and extension of roads and sidewalks, street lighting, storm drainage, and communications infrastructure within slums. (See below for domestic water supply, sanitation, and energy services.)

Tenure

*Security of tenure.** Improving the security of tenure through legislation against forced eviction and through legitimized occupancy or formal title.

*Enforcement of improved land tenure legislation.** Legal protection and enforcement of slum dwellers' rights.

City-wide urban planning and management

Urban infrastructure. Planning of urban infrastructure (roads, footpaths, sidewalks, street lighting, stormwater drainage, bus lanes, and other transport infrastructure). Providing health and educational systems without social or economic barriers for the urban poor.

Basic services. Provision of basic services (such as refuse collection and solid waste disposal, policing and security, and fire protection).

Urban transport

Transport infrastructure

Infrastructure for mass transport. For example, bus lanes.

Urban roads. Upgrading, construction, and maintenance of urban roads.

*Footpaths.** Extension and improvement of footpaths within cities.

Transport services *Mass transport system.* Operation of bus, rail, and other mass transport systems.

Small-scale transport providers. Reduce barriers to market entry for small-scale transport providers and ensure uniform safety and regulatory standards.

Urban energy services

Thermal energy systems *Improved cooking stoves.* Distribution and maintenance or replacement of appropriate cooking stoves (ceramic stoves, liquid petroleum gas stoves (LPG), ethanol stoves, charcoal stoves, and the like).

Modern cooking fuels. Strengthening of distribution and production systems for modern fuels (such as liquid petroleum gas, ethanol, dimethylsulfoxide, and kerosene), including safe containers.

Electricity *Electric power generation capacity.* Extension, upgrading, and maintenance of electric power generation capacity (thermal energy plants, hydropower, or geothermal, as appropriate) to supply electric power grids.

Electric power grid. Extension of electricity grid through high-voltage lines, medium- to low-voltage lines (including end-user connections), and other related infrastructure (such as transformer stations).

Domestic water supply and sanitation

Water supply *Water supply infrastructure.* Provision and operation of infrastructure for water supply (such as household connections, standpipes, or boreholes), including water treatment as necessary.

Trunk water infrastructure. Maintenance and extension of trunk infrastructure for urban water supply, including treatment facilities and reservoirs.

Other water management infrastructure *Storm drainage and flood control measures.* Extension and rehabilitation of storm drainage infrastructure, including conversion of sanitation infrastructure to serve as storm drainage.

Sanitation *Sanitation infrastructure.* Construction and operation of sanitation facilities (simple pit latrines, ventilated improved pit latrines, septic tanks, flush toilets, and the like) and sewers, including emptying of pits and safe disposal of sullage.

Sewage treatment. Construction and operation of simple sewage and other wastewater treatment facilities (such as waste stabilization ponds or other forms of primary treatment) where needed in dense urban settlements or because of specific environmental concerns (such as eutrophication of freshwater lakes).

Awareness building. Targeted awareness-building measures accompanying the provision of new sanitation infrastructure to ensure the choice of the adequate technology option and proper use by all household members.

Hygiene *Hygiene education.* Awareness campaigns (in primary schools, through community-based organizations, media, and so on) to promote hygienic behavior, with particular focus on hand washing and personal hygiene, as well as appropriate use of sanitation facilities and safe water storage.

Urban environmental management

Pollution control *Air pollution control.** Adoption and enforcement of regulatory standards and investments in pollution abatement technologies.

*Water pollution control.** For example, industrial wastewater treatment to complement sewage treatment, as necessary.

*Solid waste and soil pollution control.** Construction and maintenance of technically sound landfills.

Urban industrial development

Private sector development *Industrial promotion.** Supportive policies, including tax concessions and grants, as well as provision of additional infrastructure for development of manufacturing and service industries.

*Export processing zones.** Provision of export processing zones, industrial parks, and other designated areas for private sector development.

Urban hunger

Food production *Urban agriculture.* Promote urban and periurban food production, particularly of root and tuber crops, bananas, fruit trees, vegetables, and small-scale livestock.

Nutrition *Nutrition for infants, pregnant women, and nursing mothers.* Promotion of mother- and baby-friendly community initiatives, including exclusive breastfeeding for first 6 months and complementary feeding with continuing breastfeeding for infants ages 7 to 24 months. Provision of sufficient calories, protein, and micronutrients to pregnant women and nursing mothers, supported by nutrition extension workers. Universal access to reproductive and sexual health services is also needed to ensure that women are able to delay first pregnancy and properly space births to avoid cumulative nutritional deficits and reduce the risk of complications for themselves and their children.

Nutrition for undernourished children under five years. Complementary feeding, including fortified and blended foods, with take-home rations supported by nutrition extension workers.

Nutrition for school-going children. Provision of balanced school meals with locally produced foods at the primary and secondary level.

Addressing hidden hunger. Reduction of vitamin A and iron, zinc, and iodine deficiencies by increasing the production and consumption of micronutrient-rich foods, particularly local fruits, vegetables, livestock products, and iodized salt and fortified foods from local products (such as India Mix); special attention to nutrition needs of the above groups and people living with HIV/AIDS; support to research on biofortification of food.

Emergency food assistance

Early warning systems. Strengthening of early warning systems to cope with natural disasters.

Emergency response. Direct food aid for areas where droughts, floods, earthquakes, and civil wars threaten the acutely hungry with starvation.

Social safety nets. Investments in social safety nets such as food for work, cash for work, community grain banks, and environmental rehabilitation to mitigate shocks and reduce longer term food security risks.

Intervention area 3: investments in the health system

Investments in the health system include interventions in child and maternal health; prevention, care, and treatment of HIV/AIDS, TB, and malaria; access to essential medicines; measures to strengthen health systems management and health services delivery; and sexual and reproductive health.

Health

Child health

Neonatal integrated package. Clean delivery, newborn resuscitation, prevention of hypothermia, kangaroo care (skin-to-skin contact), antibiotics for infection, tetanus toxoid, breastfeeding education (including education on replacement feeding for HIV-positive mothers), and hygiene education.

Integrated management of childhood illness plus immunization. Integrated approach to reduce child mortality, illness, and disability, which includes both preventive and curative elements to address leading causes of child mortality such as oral rehydration therapy and antibiotics for diarrheal disease, antibiotics for acute respiratory infection, care for measles, antimalarials for malaria, and nutritional supplements for malnutrition plus immunization.

Maternal health

Emergency obstetric care. Rapidly accessible treatment for delivery complications such as eclampsia, hemorrhage, obstructed labor, and sepsis. Emergency obstetric care requires functioning referral systems and well equipped and staffed district hospitals.

Skilled attendance, clean delivery, and postpartum care. Presence of trained and registered midwives, nurses, nurse-midwives, or doctors at birth with ability to diagnose and refer emergent complications as well as postpartum care (including counseling on nutrition, family planning, and parenthood skills*).

Antenatal care. Routine care during pregnancy, including preventive and curative interventions such as blood pressure and weight monitoring, treatment of infections, nutrition and smoking counseling, intermittent preventive treatment for malaria, and antiretrovirals for HIV-positive women to prevent mother-to-child transmission of HIV.

Safe abortion services. Access to postabortion care, access to abortion counseling and, where permitted by law, safe abortion services.

HIV/AIDS prevention

Improved linkages. Effective joint programming between reproductive health and HIV/AIDS programs.*

Behavior change programs. Programs to encourage safer sexual behavior, including condom social marketing, peer-based education, mass media campaigns, work-based programs, and school-based HIV education.

Control of sexually transmitted diseases. Routine screening and effective treatment of sexually transmitted diseases (such as syphilis, gonorrhea, and chlamydia).

Voluntary counseling and testing. Pre- and post-test counseling and HIV testing.

Harm reduction for injecting drug users. Actions to prevent transmission of HIV and other infections that occur through sharing of nonsterile injection equipment and drug preparations; specific programs include provision of sterile syringes and needles and drug substitution treatment.

Prevention of mother-to-child transmission. Prevention of transmission of HIV from infected women to their infants during pregnancy, labor, and delivery, as well as during breastfeeding (that is, replacement feeding when it is acceptable, feasible, affordable, sustainable, and safe); includes short-term antiretroviral prophylactic treatment; infant feeding, counseling, and support; and the use of safer infant feeding methods.

Blood safety interventions. Measures to reduce the risk of receiving infected blood through a transfusion, including HIV antibody screening, protocols to avoid unnecessary blood transfusions, and policies to exclude high-risk donors.

HIV/AIDS care and treatment

Antiretroviral therapy. Combination drug therapy to treat AIDS.

Treatment of opportunistic infections. Treatment of any infection caused by a microorganism that would not normally cause disease in a healthy individual.

Orphan support. Provision of support to orphans to minimize the impact of AIDS on their lives; includes school fee support, community support, and support to extended families.

TB *DOTS.* Internationally recommended TB control strategy combining five elements: political commitment, microscopy services, drug supplies, surveillance and monitoring systems, and use of highly efficacious regimes with direct observation of treatment.

Adaptation of treatment to high-prevalence TB/HIV and multidrug-resistant (MDR) TB settings. Integration with HIV diagnosis and treatment for high HIV-prevalence settings; use of effective diagnostics and treatment protocols for areas with MDR TB.

Malaria *Insecticide-treated bed-nets.* Provision of antimosquito bed-nets that are treated with insecticide, providing a physical and chemical barrier to mosquitoes, shortening the mosquito's life span, and thus reducing incidence of malaria.

*Indoor residual spraying.** Periodic spraying of indoor surfaces with insecticide to reduce malaria transmission.

Artemisinin combination treatment. Combination of drugs used to treat first-line-drug-resistant falciparum malaria, which is now widespread in Africa.

*Larviciding, drainage, and house improvement.** Measures designed to reduce mosquito breeding. Focal use of these measures is especially important in urban areas.

Access to essential medicines *Interventions to ensure availability, affordability, and appropriate use.* Incentives to direct research and development processes toward appropriate medicines for developing countries; establishment of national essential medicines lists (including preventive, curative, and reproductive health commodities, equipment, and supplies); ensuring reliable procurement and distribution systems; prequalifying quality suppliers and procurement and distribution facilities; monitoring systems to assure drug quality; elimination of user fees for essential medicines; programs to improve the way drugs are prescribed, dispensed, and used, including public media campaigns and education of providers.

Health systems *Multiple interventions to strengthen health system.* Human resource training and salary enhancement, improving management capacity, enhancing monitoring and evaluation, strengthening quality control, strengthening medical information

systems, increasing capacity for research and development, enhancing community demand, and improving infrastructure.

Sexual and reproductive health (elements of integrated programming not covered under maternal health, child health, HIV/AIDS programs)

Counseling on contraception and birth spacing. Information and education on benefits and methods of family planning and birth spacing; appropriate follow-up on method satisfaction, consistent and correct use of method, and options for appropriate method switching.

Universal access to contraception. Program to ensure universal access to family planning choices, including effective modern contraceptive methods, and to guarantee reliably available and affordable supplies and choice among methods.

*Age-appropriate sexuality education and services (especially for adolescents).** School and community-based education programs, mass media education programs, youth-friendly information and service delivery, beneficiary-driven programming to meet the information and service needs of diverse adolescent groups (including married adolescents), and programs to educate parents to improve adolescent reproductive health.

Prevention and treatment of sexually transmitted infections. Programs to detect and treat sexually transmitted infections (such as syphilis, gonorrhea, and chlamydia) and other reproductive tract infections that can increase the risk of HIV/AIDS and infertility and affect the choice of appropriate contraceptive methods.

*Outreach to men to increase participation and support in reproductive health.** Counseling and information services for men to address their reproductive health needs, support the decisions of their partners, and change gender and relationship norms to ensure greater gender equality; prevent gender violence and harmful traditional practices and promote collaborative decisionmaking; information and services for reproductive health in the army and police forces, including efforts to combat gender violence.

Intervention area 4: investments in education at all levels

Investments in education at all levels include interventions in primary and postprimary education and adult literacy.

Primary and postprimary education¹

Demand-side incentives. Elimination or reduction of school fees, conditional cash transfers to parents, school feeding (and take-home food rations where needed), school health programs such as deworming and iron supplementation, targeted subsidies to girls, and vulnerable populations such as ethnic groups or HIV/AIDS orphans, provision of school material such as textbooks and uniforms, and so on.

*Local control and management.** Systems to involve parents in school management: parent committees, school-based management, financing, auditing, and expenditure management systems that are consistent with more local control.

*Information/assessment.** Provision of transparent information regarding resources, greater access to information through school report cards, better data systems, and better learning outcomes.

*Improving and evaluating learning outcomes.** Learning evaluation systems that assess acquisition of skills and knowledge, and learning outcomes.

Special packages to make schools safe for girls. Training teachers and administrators in gender sensitivity, hiring female teachers, and investing in gender-sensitive infrastructure such as latrine facilities.

*Special packages for children with disabilities.** Investments in infrastructure, special training for teachers, specific outreach and retention efforts, and separate performance assessments.

*Special packages for education in conflict and postconflict situations.** Community participation to increase coverage of children affected by conflict and efforts involving private institutions and NGOs to create a participatory and culturally and environmentally sensitive learning environment through training of teachers and relevant learning material.

Adult literacy¹

Adult literacy for women. Providing informal educational opportunities to uneducated and/or illiterate mothers of young children, particularly in settings where there are pockets of undereducated women, such as ethnic minority/indigenous communities, and in areas where parental literacy is a constraint on children's enrollment and completion.

Other core interventions for primary and postprimary schooling

Infrastructure. Provision of schools, including classrooms, furniture, transportation, and other facilities such as libraries, laboratories, and sports facilities, where needed for primary and postprimary schooling.

Teachers. Recruitment of teachers, with provision of incentives (such as adequate salaries and housing in rural areas where applicable) and ensuring adequate preservice and in-service training.

Curriculum reform. Implementation of curriculum reform, where necessary, to improve education content, quality, and relevance, with a focus on vocational and informal training as necessary to prepare students for transition to work and to adulthood.

Higher education

Extension and maintenance of higher education system, with a particular focus on science and engineering education.

Intervention area 5: investments in gender equality

Investments in gender equality include interventions for sexual and reproductive health, access to property rights and work, security, participation and institutional reform, and data collection and monitoring.

Gender equality
Sexual and reproductive health

Universal access to sexual and reproductive health information and services and protection of reproductive rights. (Service packages described under health interventions above.) Legislation* and awareness campaigns to protect the rights of individuals and couples to plan their families; to ensure access to sexual and reproductive health information and services; to discourage early marriage (at ages posing health risks), female genital mutilation, and other traditional harmful practices; and to expand access to safe abortions (where permitted by law) and review the legal status of abortion in order to improve public health while respecting national sovereignty, cultural values, and diversity.*

Access to property rights and work

Equal access to and treatment at work. Provision and enforcement of equal opportunity legislation* and legislation promoting gender-sensitive policies, such as provision of maternity and dependent care leave and training,* and support programs for women entrepreneurs and young girls training to transition to work (including care centers for young children to ensure early childhood development).

*Equal access to property rights.** Legislation and administrative support to provide and protect women's equal rights to property and other inherited and acquired assets.

Security

Security for girls and women from violence. Legislation and administrative actions to protect women against violence,* promotion of awareness of women's right to seek redress, protection from perpetrators of violence (through access to shelters, services, and so on), and mechanisms to dispense justice to perpetrators.

Participation and institutional reform

Political representation. Mechanisms* (such as quotas and reservations) to allow for adequate representation at all levels of government, along with adequate training.

*Involvement of women's groups at the community level.** Recognition of and support to women's groups organized at the community level to encourage women to be partners in the design and delivery of public services.

National women's machineries. Legislative and financial support to national women's machineries (defined by the United Nations as “a single body or complex organized system of bodies, often under different authorities, but recognized by the government as the institution dealing with the promotion of the status of women”).

*Data collection and monitoring**

Gender-disaggregated data. Collection of gender-disaggregated statistics on health, education outcomes, access to assets and infrastructure, conditions of work and employment, political representation, and gender-specific violence.

Intervention area 6: investments in environmental sustainability

Investments in environmental sustainability include interventions in improved environmental management, integration of environmental sustainability into sector strategies, strengthening regulatory and institutional mechanisms, and monitoring.

Natural resource management

Improved environmental management

*Soil management and prevention of desertification.** Implementation of soil erosion control (by wind and water) by planting windbreaks and cover crops; improvements in soil fertility with agroforestry systems, cover crops, and conservation of ground and surface water.

*Forest management.** Implementation of sustainable forest management techniques, forest plantations in appropriate areas to satisfy demand for forestry products, and tree seedlings and other measures to support afforestation.

*Watershed management.** Promotion of reforestation and afforestation to protect selected water catchment areas.

*Management of coastal ecosystems and fisheries.** Elimination of destructive technologies (for example, dynamite and cyanide, bottom trawling); design and implementation of fisheries rebuilding plans to restore depleted fish populations to target levels (biomass at maximum sustainable yield); implementation of a representative network of fully protected marine and coastal areas to restore fisheries.

*Management of freshwater resources and ecosystems.** Institution of Integrated Water Resources Management plans; promotion of reforestation to protect selected catchment areas; increasing efficiency of cropping systems; and monitoring of wells and groundwater-dependent systems.

<i>Technical support</i>	<i>Integration of environmental sustainability into sector strategies</i> <i>Advisory mechanisms.</i> Strengthening institutions for environmental management (such as ministries and environmental protection agencies) to provide technical support to the development of sector strategies.
<i>Impact assessments</i>	<i>Environmental impact assessments.*</i> Carry out strategic environmental impact assessments for large-scale infrastructure projects and other development strategies that are likely to have a major impact on the environment.

<i>Property rights</i>	<i>Strengthening regulatory and institutional mechanisms</i> <i>Access to tenure and rights.*</i> Local ownership of natural resources, including common property and provision of access rights.
<i>Regulation of pollution</i>	<i>Pollution control.*</i> Development and implementation of pollution control standards.
<i>Market-based strategies</i>	<i>Reformation of tax laws.*</i> Taxation of environmental “bads” (such as pollution and degradation), and appropriate carbon tax systems. <i>Transformation of market incentives.*</i> Revision of subsidies in forestry and fisheries that cause overexploitation of these resources, design of agricultural subsidy programs to prevent overuse, development of an internationally credible system of certification of raw natural resource materials.

Monitoring and enforcement

*Environmental monitoring systems.** Better dissemination and use of existing environmental monitoring and assessments at national and local levels; provision of funds, technical support, and tools for countries to undertake monitoring, data collection, and harmonization based on established standards (based on core set of indicators).

*Enforcement of environmental regulation.** Strengthening systems for monitoring environmental pollution to help enforce regulation for pollution control.

Intervention area 7: investments in science, technology, and innovation

Investments in science, technology, and innovation include interventions in science and technology institutions and information and communication technologies.

<i>Science and technology institutions</i>	<i>Science, technology, and innovation</i> <i>Science and technology advice.*</i> Creation of independent body charged with providing scientific advice and technology forecasting to policymakers.
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*Science and technology research.** Extension and maintenance of centers of excellence for scientific research, including the financing of research at universities.

*Science parks and business incubators.** Establishment of science parks and incubators for technology-based companies.

*Information and
communication
technologies*

*Telecommunications infrastructure.** Provision of telecommunications infrastructure, including international and trunk fiber infrastructure; provision of connectivity to hospitals and schools.

Millennium Development Goals interventions by target

Income poverty (Goal 1, target 1)

Agriculture. Increasing agricultural productivity directly raises the incomes of the rural poor and generates rural jobs.

Nutrition. Better nutrition contributes to human capital accumulation and improved labor productivity.

Education. Education increases human capital, which contributes to economic growth. Education is linked to lower fertility rates, which are in turn linked to increases in economic growth per capita.

Gender equality. Awareness of and access to reproductive health rights and services enable and empower women to plan their families, leading to lower fertility rates and reduced poverty. Empowerment through access to work, property rights, political representation, and safety from violence leads to increased participation of women in economic activity.

Health. Improved health has pervasive direct and indirect effects on raising both the level and the growth rate of income.

Environment. Many poor people depend on natural resources for their livelihoods. Improving natural resource management can sustain or even raise their incomes.

Water and sanitation. Improved water supply for productive activities can raise economic growth through agriculture and the urban manufacturing and service sectors.

Slum upgrading and urban planning. Providing security of tenure can improve labor market participation and access to credit markets. Urban infrastructure, including transport systems, is necessary for establishing manufacturing and service industries.

Science and technology. Science and technology institutions improve technological learning in society and improve the adoption of technology by the private sector. Higher education can open new employment opportunities.

Energy. Access to electricity, motive power, and improved thermal energy systems is necessary for manufacturing, service, or cottage industries.

Transport. Roads, railroads, and ports lower transport costs and thereby increase the real incomes of the poor. In urban areas improved transport infrastructure supports manufacturing and service industries, contributing to employment.

Hunger (Goal 1, target 2)

Agriculture. Increasing agricultural productivity through investments in soil health, water management, extension services, and research increases food availability.

Rural incomes and access to markets. Improved access to credit, storage facilities, processing, and value-added technologies can help raise incomes, together with access to markets, farmer cooperatives/associations, and physical market spaces.

Nutrition. Nutrition interventions are needed for vulnerable populations and to ensure micronutrient intake. Direct food assistance in food-scarce areas alleviates short-term hunger.

Education. Education leads to more productive farming and better management of nutritional needs.

Gender equality. Land rights allow women to increase agricultural production. Increased access to work and higher incomes enable women to purchase adequate food for themselves and their families. Equal access to productive inputs increases plot yields.

Health. Reducing parasitic and infectious disease burden improves nutrition levels. Birth spacing protects maternal and child nutrition and health.

Environment. Improved water resource management and protection of water catchment areas can raise crop yields. Biodiversity protection sustains pollination and seed dispersal mechanisms necessary for agricultural production.

Water and sanitation. Safe drinking water reduces the incidence of diarrheal diseases, which contribute to malnourishment. Drinking water supplied through wells and boreholes can help irrigate fields during droughts. Access to sanitation reduces the incidence of diarrheal disease and thereby increases nutrient uptake. Integrated water resources management sustains adequate water supply for agriculture. Water storage and water management infrastructure improve water management for agriculture.

Slum upgrading and urban planning. Slum upgrading and accompanying interventions help raise incomes and reduce urban hunger. Improved transport infrastructure lowers the cost of food products, further reducing hunger.

Science and technology. Increased agricultural research is critical for improving seed varieties, cropping systems, pest control, and water management to increase agricultural productivity, thus reducing hunger. Increased access to higher education can help increase the number of agricultural extension workers. Information and communications technology improves farmers' market information, raising agricultural production.

Energy. Improved access to electricity and liquid fuels can power diesel pumps for irrigation, facilitate agricultural mechanization, and power agroprocessing machinery, thus increasing agricultural output and reducing hunger. Improved energy services lower transportation and marketing costs, which reduces food prices. Access to improved cooking fuels is necessary to ensure safe cooking of food.

Transport. Footpaths, roads, and improved transport services lower the cost of agricultural inputs, increase farmgate prices, and facilitate marketing, which can increase agricultural production. Improved transport infrastructure reduces postharvest losses through accelerated transport of products to markets.

Primary education (Goal 2, target 3)

Education interventions. Provide demand-side incentives to retain children in school, management systems to increase parental involvement and school-based management, increased transparency and information, evaluation of learning outcomes, special packages to attract girls and children with disabilities and those in conflict and postconflict situations, adult literacy for women in particular, together with other core interventions such as building schools, providing trained teachers, and developing appropriate curricula, these will increase enrollment and retention of children at primary and postprimary levels.

Agriculture. Agricultural interventions to improve soils, seeds, and water management raise rural incomes and reduce the time young children spend in the field, freeing them to attend school.

Nutrition. Nutrition interventions for infants improve cognitive development and improve learning outcomes in the future.

Gender equality. Maternal education contributes strongly to higher primary enrollment.

Health. Improved health enhances educational outcomes by improving cognitive abilities and attendance rates. AIDS prevention and treatment reduce the disease's impact on teacher attendance and attrition. AIDS prevention and treatment reduce the number of orphans, who are less likely to complete primary education. Reproductive health services reduce the withdrawal of girls from school related to sibling care burdens caused by unplanned pregnancies or due to adolescent pregnancy.

Environment. Improved natural resource management can free up children's time and increase school attendance.

Water and sanitation. Improved access to water frees up children's time, thus allowing them to attend school. Improved health through sanitation and hygiene reduces school absenteeism. Installing girls' toilets in schools can increase girls' enrollment and completion rates.

Slum upgrading and urban planning. Security of land tenure and a fixed address are often necessary for children to be allowed to attend school.

Science and technology. Higher education is essential to training secondary school teachers and provides additional incentives to complete primary and secondary school. Information and communications infrastructure can improve the quality of education.

Energy. Access to electric power and improved cooking fuels lowers time spent by children (especially girls) collecting fuelwood, thus facilitating school attendance. Improved access to liquid fuels is necessary to render mechanized school transport more affordable. Electrification permits children to read and study for longer hours, thus improving school outcomes.

Transport. Improved transport infrastructure and services increase incentives for teachers to work in rural areas, reducing the time it takes for children to reach school and allowing them to travel farther, raising enrollment rates, reducing the time required for households to fetch fuel and water and to carry out other tasks, and lowering the opportunity cost of children attending school.

Gender equality (Goal 3, target 4)

Gender interventions (not specified elsewhere). Reduce violence against women, improve their property and other rights, ensure full access to reproductive health services, including contraception, and improve women's participation in decisionmaking processes.

Agriculture. Improved soils, seeds, and water provision can reduce the time girls spend in the field, freeing them to attend school. Providing fuelwood on farms through agroforestry trees decreases women's labor in search of firewood. Providing small-scale water management such as water harvesting decreases women and girls' transport burden to fetch water. Increased agricultural production increases the incomes of women farmers.

Nutrition. Nutrition interventions for girls (infants and children) lead to better health and education outcomes.

Education. Education contributes to increased employment opportunities, improved decisionmaking, and empowerment of women more broadly.

Health. Family planning services facilitate employment and social participation opportunities for women, strengthen partner relationships, and provide a greater sense of well-being and agency. Access to emergency obstetric care in the event of pregnancy and delivery complications saves women's lives.

Environment. Women benefit disproportionately from improved management of natural resources, including through time saving and reduced transport burden.

Water and sanitation. Improved access to water generates time savings for women and girls. Improved access to water reduces the need to carry heavy loads over long distances, thus improving women's health. Increasing access to toilets reduces women's exposure to harassment and improves personal hygiene and well-being.

Slum upgrading and urban planning. Women benefit disproportionately from slum upgrading, since it reduces their transport burden and time-poverty, improves their health, and provides them with additional income-generating opportunities.

Energy. Improved access to electricity and fuels reduces the time-poverty of women and lowers their daily transport burden. Improved access to energy creates additional employment opportunities for women.

Transport. Improved transport infrastructure and services reduce women's time-poverty and transport burden. Roads improve communication and lower transactions costs, thus increasing employment opportunities for women.

Child mortality (Goal 4, target 5)

Health interventions. Provide the neonatal integrated package of interventions, immunization, the integrated management of childhood illness, and the range of preventive approaches (such as mass distribution of insecticide-treated bednets). Family planning can delay first births and reduce very short and very long birth intervals, thereby improving child health outcomes. Strengthening health systems will also be critical to achieving this Goal.

Agriculture. Increased rural incomes and food availability lead to improved health outcomes.

Nutrition. Nutrition interventions for pregnant women lead to higher birth-weight, an important determinant of child survival. Exclusive breastfeeding, complementary feeding after six months (HIV-positive mothers should use replacement feeding when it is acceptable, feasible, affordable, sustainable, and safe), and micronutrient supplementation reduce child mortality.

Education. Postprimary education increases the age of marriage, lowers fertility rates, and increases care seeking for child illnesses. Adult literacy programs increase awareness of the causes and prevention of child mortality.

Gender equality. Women's empowerment leads in multiple ways to greater awareness of child health issues.

Environment. Reducing pollution of water and air can lower child morbidity and mortality.

Water and sanitation. Access to clean water, sanitation, and improved hygiene reduce the incidence of waterborne disease.

Slum upgrading and urban planning. Slum upgrading, improved urban infrastructure, and access to basic services (including solid waste disposal) can reduce exposure to pollutants and thereby reduce child mortality rates. Road curbing and street lighting can reduce traffic deaths.

Science and technology. Information and communications technology improves diffusion of hygiene education and thereby lowers child mortality. Access to higher education increases the supply of health workers.

Energy. Reducing indoor air pollution through improved cooking fuels and stoves decreases respiratory infections. Improved access to energy allows households to boil water, thus reducing incidence of waterborne diseases.

Transport. Improved transport infrastructure increases access to healthcare clinics and services and reduces costs for healthcare workers to serve rural areas.

Maternal mortality (Goal 5, target 6)

Health interventions. Ensure access to emergency obstetric care, skilled birth attendance and clean delivery, antenatal care and postpartum counseling, as well as safe abortion (where permitted by law). Access to family planning can reduce the number of unwanted and ill-timed pregnancies, reducing the lifetime exposure to the risk of maternal mortality and preventing recourse to abortion. Strengthening health systems will be critical to achieving this Goal.

Agriculture. Increased rural incomes and food intake lead to improved health outcomes.

Nutrition. Nutrition interventions, such as adequate caloric intake and iron supplementation for women of reproductive age, reduce risk during pregnancy and childbirth.

Education. Postprimary education increases the age of marriage, contraceptive use, and access to prenatal care and safe delivery, all of which reduce maternal mortality. Adult literacy programs increase awareness of the causes and prevention of maternal mortality.

Gender equality. Women's empowerment leads to greater effective demand for family planning services, prenatal care, and safe delivery.

Water and sanitation. Running water and sanitation facilities are essential for provision of prenatal care and emergency obstetric care. Access to sanitation and hygienic behavior improve women's health.

Slum upgrading and urban planning. Slum upgrading and security of land tenure improve women's access to health systems and emergency obstetric care.

Science and technology. Information and communications technology is critical for providing adequate access to emergency obstetric care. Access to higher education increases the supply of health workers.

Energy. Improved access to energy services improves communication and transport, which are critical for emergency obstetric care. Modern energy services reduce costs for healthcare workers serving in rural areas.

Transport. Feeder roads and emergency transport are critical for providing timely access to emergency obstetric care. Improved transport infrastructure reduces the cost for healthcare workers serving in rural areas.

HIV/AIDS (Goal 6, target 7)

Health interventions. Provide comprehensive HIV/AIDS prevention programs, orphan support, voluntary counseling and testing, harm reduction for drug users, prevention of mother-to-child transmission, antiretroviral treatment, and treatment of opportunistic infections. Linking reproductive health and HIV/AIDS program efforts can increase effectiveness, coverage, and efficiency of service delivery. Strengthening health systems will be critical to achieving this Goal.

Agriculture. Increased agricultural incomes improve access to prevention and treatment.

Nutrition. Adequate nutrition can improve survival and quality of life for people with HIV. Nutritional supplementation programs for people with HIV improve antiretroviral adherence.

Education. With education, people are less likely to contract HIV and more likely to use health services effectively.

Gender equality. Women's empowerment leads to greater effective demand for HIV/AIDS prevention and treatment, including the ability to negotiate safe sexual practices.

Water and sanitation. Improving access to clean water and sanitation improves the nutritional status of people with HIV.

Slum upgrading and urban planning. Slum upgrading and security of land tenure improve access to HIV/AIDS treatment and prevention.

Science and technology. Scientific research can improve diagnosis and treatment of HIV. Information and communications technology is critical for media-based HIV prevention. Access to higher education increases the supply of health workers.

Energy. Electricity and modern energy services support functioning health clinics and hospitals. Modern energy services increase incentives for healthcare workers to work in rural areas.

Transport. Improved transport infrastructure and services facilitate treatment and prevention of HIV/AIDS. Improved transport infrastructure reduces costs for health workers serving in rural areas.

Malaria and other major diseases (Goal 6, target 8)

Health interventions. For malaria, comprehensive use of insecticide-treated bed-nets, indoor residual spraying where appropriate, effective malaria treatment (using artemisinin combination therapies, where indicated), epidemic control measures, and promotion of new diagnostics, drugs, and vaccines. Strengthening health systems will be critical to achieving this Goal.

For TB, expansion of DOTS, DOTS-plus for multidrug-resistant TB, adaptation of TB treatment in high HIV prevalence settings, and promotion of new diagnostics, drugs, and vaccines. Strengthening health systems will be critical to achieving this Goal.

Agriculture. An increase in agricultural incomes improves access to and information on ways of preventing and treating malaria and TB.

Education. Education and literacy programs increase awareness of ways to prevent and treat malaria and TB.

Gender equality. Women's empowerment leads to greater effective demand for insecticide-treated bed-nets and effective malaria and TB treatment.

Environment. In some instances environmental control can contribute to containing malaria and TB.

Water and sanitation. Improved water management in urban areas can contribute to containing mosquito breeding sites and transmission.

Slum upgrading and urban planning. Improving housing and urban water management infrastructure can reduce the incidence of malaria and especially TB (which has a higher rate of transmission in overcrowded slum conditions). Slum upgrading improves access to appropriate malaria and TB treatment.

Science and technology. Research is necessary to develop new drugs and diagnostics for malaria and TB. Access to higher education increases the supply of health workers.

Energy. Electricity and modern energy services improve healthcare. Modern energy services reduce cost for healthcare workers serving in rural areas.

Transport. Improved transport infrastructure and services reduce the cost of distributing bed-nets and essential health services including malaria and TB treatment. Improved transport infrastructure increases incentives for health-care workers to work in rural areas.

Access to essential medicines (Goal 8, target 17)

Health interventions. Improve supply and distribution systems for essential medicines together with strengthening quality control, quality assurance, and programs to promote rational use. Strengthening health systems will be critical to achieving this Goal.

Agriculture. An increase in agricultural incomes makes all medicines more affordable.

Education. Education and literacy programs increase access to and appropriate use of essential medicines.

Gender equality. Women's empowerment leads to greater effective demand for essential medicines of good quality, including reproductive health commodities and supplies.

Science and technology. Research can generate new essential medicines and increase the effectiveness of existing ones.

Transport. Improved transport infrastructure and services lower the cost of essential medicines and improves access.

Reverse loss of environmental resources (Goal 7, target 9)

Environmental interventions. Improve management of natural resources through market mechanisms, strengthened regulation and enforcement, and investments in the management of critical ecosystems.

Agriculture. Investments in soil health replenish soils and prevent further land degradation. Labor-intensive agricultural production is an alternative to slash-and-burn and to the deforestation that results. Agroforestry and other organic incomes increase agro-biodiversity and sequester carbon. Small-scale water management can restore water tables and reduce runoff. Food-for-work programs can help restore degraded ecosystems.

Gender equality. Equal access to property rights allows women, as primary users, to manage natural resources in a sustainable manner.

Health. Access to family planning services reduces total fertility rates to levels people desire, thus mitigating population pressures on the environment.

Water and sanitation. Improved sanitation and sewage treatment can reduce environmental pollution. Integrated water resources management can maintain ecosystem functioning. Hydrological monitoring systems can help protect aquifers and freshwater ecosystems from excessive withdrawals.

Slum upgrading and urban planning. Slum upgrading and improved urban water and waste management infrastructure reduce environmental pollution.

Science and technology. Research can improve natural resource management (including management of freshwater ecosystems and wetlands, and biodiversity conservation).

Energy. Access to modern cooking fuels reduces demand for biomass, thus reducing pressure on marginal lands and forests. Improved energy services reduce indoor labor and outdoor air pollution as well as carbon emissions.

Water and sanitation (Goal 7, target 10)

Water and sanitation interventions. Provide, operate, and maintain water and sanitation infrastructure and services in conjunction with behavior change programs to improve household hygiene.

Agriculture. Small-scale water management increases water availability for rural farmers.

Education. Education and literacy programs improve hygiene and help ensure proper operation of water and sanitation facilities.

Gender equality. Political representation allows women to ensure that access to water is a priority in local decisionmaking.

Environment. Improved management of wetlands, water catchment areas, and freshwater ecosystems is critical for ensuring access to drinking water. Control of industrial pollution improves drinking water quality.

Slum upgrading and urban planning. Slum upgrading reduces water pollution and improves drinking water quality. Improved urban infrastructure ensures the separation of sewage from drinking water supplies.

Science and technology. Research can help improve sanitation and water management techniques. Access to higher education increases the supply of trained workers to design and manage water supply and sewer infrastructure.

Energy. Electricity and improved access to modern fuels are necessary to power water supply infrastructure and water treatment systems.

Transport. Improved transport infrastructure and services facilitate the provision, operation, and maintenance of water supply and sanitation systems. Improved transport systems reduce the costs of providing hygiene education through community workers.

Improve the lives of slum dwellers (Goal 7, target 11)

Urban investments and slum-upgrading. Scale up slum-upgrading with the support of improved urban planning and investments in core urban infrastructure as well as basic services.

Agriculture. Investing in urban agriculture increases agricultural productivity and the incomes of slum dwellers.

Nutrition. Nutrition interventions improve the health outcomes of urban populations.

Education. Education and literacy programs improve the employment prospects of slum dwellers.

Gender equality. Equal access to property rights, political representation, and security for girls and women allows women living in slums to improve their lives and the lives of their families.

Health. Access to preventive and curative health services, including sexual and reproductive health information and services, reduces the burden of ill health for slum dwellers.

Environment. Improving solid waste disposal and water treatment can improve health outcomes.

Water and sanitation. Improved access to water supply and sanitation services can reduce household expenditure on water. Sewage treatment can further improve health outcomes in urban areas. Storm water drainage systems are improved through sanitation infrastructure, thus minimizing the risk of flooding.

Science and technology. Higher education provides new employment opportunities for the urban poor. Information and communications technology reduces the cost of income-generating activities.

Energy. Improving access to electricity and modern fuels lowers indoor air pollution. Access to electricity and modern fuels can lower household expenditure on energy services, thus raising incomes. Improved energy services lower the cost of urban transport.

Transport. Improved rural transport infrastructure and services reduce the cost of food in urban areas, thus increasing disposable incomes of slum dwellers. Improved urban transport infrastructure is critical to enhancing income-generating opportunities as well as access to social services. Proper sidewalks and curbing are critical to reduce traffic deaths.

Information and communications technology (Goal 8, target 18)

Direct interventions. Strengthen science advisory mechanisms, invest in higher education and research, promote private sector development, and improve access to communications technologies.

Agriculture. Increased agricultural incomes improve access to information and communications technology.

Education. Postprimary education prepares students for ability to provide, use, and manage information and communications technology.

Energy. Electricity is necessary to power information and communications technology applications and to operate research institutions.

Assumptions underlying the resource estimates in chapter 17

Throughout, we have used the OECD/DAC deflator to rebase estimates to 2003 U.S. dollars.

Notes to table 17.1—Per capita MDG investment needs and MDG financing gaps

UN Millennium Project (forthcoming) contains a detailed description of the national needs assessments by the UN Millennium Project and explains the technical assumptions underlying the estimates for MDG investment needs and sources of financing. It also presents more detailed country-level results including a breakdown by operating and capital expenditures.

ODA for direct MDG support in 2002. This is calculated by subtracting the following items from net official development assistance: assistance for emergency and distress relief, food aid, and technical cooperation, and ODA channeled through NGOs (OECD/DAC 2004e). We assume that 75 percent of this residual assistance directly supports investments for achieving the Goals and add 40 percent of the ODA channeled through NGOs (see table 13.2).

Notes to table 17.2—Cofinancing the MDGs in low-income countries

MDG investment needs. We estimate aggregate MDG investment needs across low-income countries using a two-step approach. First, the unadjusted MDG investment need in each country is calculated. Second, we adjust for the relative price level in each country.

MDG investment needs cover the following areas: hunger and agriculture, primary education, secondary education, adult literacy, gender equality, health, water supply and sanitation, improving the lives of slum dwellers, energy services, and roads. To take into account the variation in per capita

investment needs across countries, we identified the key drivers of variation in the sample of five countries and used them to adjust for differences in needs across countries. For example, since health interventions will be more expensive in countries with high rates of HIV prevalence, higher per capita costs are assigned to countries that have high rates of HIV prevalence. Likewise, MDG investment needs in the road sector are driven largely by the current stock of paved roads, which is therefore used to scale costs. In other areas, such as primary education or water supply, cross-country variation is relatively low, so we assume uniform per capita MDG investment needs.

In the next step, MDG investment needs are adjusted to the relative price level in each country to account for differences in salaries, materials costs, and other prices. In the absence of sufficiently disaggregated price indicators that would allow a disaggregation of tradables and nontradables, the analysis focuses on changes in the overall level of prices. It is assumed that the adjusted cost of MDG investments scales linearly with a country's price level, defined as the ratio of GDP per capita expressed in international U.S. dollars to GDP per capita in purchasing power parity-adjusted dollars. The price level depends on GDP expressed in international dollars, according to

$$price(GDP_{USD}) = a * GDP_{USD}^b$$

The constants a and b have been estimated using 2002 GDP data for all countries (World Bank 2004c).

Domestic resource mobilization. We first project GDP per capita in 2006 by extrapolating the five-year average growth rate from 1997 to 2002 forward to 2006. It is assumed that as a result of the MDG investments, real per capita growth rates accelerate in regions that have experienced slow growth (table A3.1). Price levels are adjusted for each year as described above.

Government expenditures on the Goals in 2006 are estimated by income group and expressed as a percentage of GDP. We project that the share of national income devoted to public expenditures on social services and infrastructure rises with national income (table A3.2). In some countries where domestic resource mobilization in 2002 deviates substantially from the income group's average, these assumptions were modified.¹ As discussed in chapter 17,

Table A3.1	Region	Projected growth in per capita GDP, 2006–15
Annual per capita GDP growth assumptions for 2006–15, by region <i>Percent</i>	East Asia and Pacific	5.0
	Europe and Central Asia	3.2
	Latin America and the Caribbean	3.2
	Middle East and North Africa	3.2
	South Asia	5.0
	Sub-Saharan Africa	3.2

Source: Authors' calculations.

Table A3.2	2006	2015
Estimated government resource mobilization		
<i>Government expenditures for the MDGs as a share of GDP (percent)</i>		
<i>Source: Authors' calculations.</i>		
Least Developed Countries (per capita GDP less than \$450)	5	9
Low-income countries (per capita GDP \$450–\$734)	7	11
Lower-middle-income countries (per capita GDP \$735–\$2,935)	9	13
Upper-middle- and high-income countries (per capita GDP greater than \$2,935)	10	14

government resource mobilization is projected to rise by up to four percentage points of GDP between 2006 and 2015.

As in the country-level needs assessments, partial cost recovery from households is restricted to secondary education, water and sanitation, and energy services. We assume that people below the poverty line will not pay any user fees.

MDG financing gap. This is calculated by subtracting projected domestic resource mobilization from projected MDG investment needs. For 2002 we estimate that up to \$12 billion was provided as ODA for direct MDG support. This amount does not include technical cooperation for capacity building or other investments that have not been estimated in the MDG needs assessments.

Notes to table 17.3—Estimated cost of meeting the MDGs in all countries

MDG support needs in low-income countries

MDG financing gap. Referenced from table 17.2.

Capacity building to achieve the Goals. As recommended by the OECD/DAC it is assumed that 60 percent of technical cooperation provided to low-income countries in 2002, or \$5 billion, directly supports achieving the Goals—largely through capacity building (OECD/DAC 2004e). Also included in this line item is 60 percent of all ODA currently provided through NGOs. We estimate that to support the scaling up of MDG interventions, donor support for capacity building in low-income countries will need to rise by 50 percent to \$7 billion. As described in the text, major human resource training efforts need to be prioritized in the scaling up of MDG interventions.

Grants in support of heavy debt burden. Countries that require official development assistance to meet the Goals, but that will graduate from assistance before 2015 (“graduating countries”), may nevertheless require grants to support the repayment of heavy debt burden. We assume that such grants will be

provided if a country's domestic resource mobilization is insufficient to finance debt service payments for nonconcessional loans in addition to all MDG-related expenditures.² We use a three-year average of debt repayments for 1999 to 2002 (World Bank 2004b) as a proxy for projected annual debt service payments for 2006 to 2015. Aggregate debt service payments will need to be reduced by an estimated \$7 billion in 2006, falling to \$1 billion by 2015, to ensure that all countries can finance MDG investments.

Debt relief. Based on the criterion for debt sustainability proposed in chapter 13, countries that require substantial ODA transfers to finance the Goals through 2015 are eligible for debt cancellation. Using Global Development Finance data, outstanding debt stocks for all "nongraduating countries" are estimated for 2002 to amount to \$174 billion in concessional loans and \$63 billion in nonconcessional loans (World Bank 2004b). Both stocks are assumed to have stayed constant through 2005 and to be canceled over the 10 years from 2006 to 2015. Under the rules of the OECD/DAC, only the cancellation of nonconcessional loans can be booked as debt relief that counts toward official development assistance. We make the simple assumption that the stock of nonconcessional debt is written down in equal installments of \$6.3 billion a year.

Repayments of concessional loans. The 2002 flow of loan repayments is estimated on the basis of OECD/DAC data (2004a). We assume that loan repayments from all nongraduating countries that receive full debt cancellation will be set to zero since their domestic resource mobilization is too low to finance the MDG investments.

MDG support needs in middle-income countries

Direct support to government. Some middle-income countries with particularly severe pockets of poverty will likely have investment needs that cannot be financed through domestic resource mobilization alone. We suggest that \$10 billion will be required in official development assistance for direct MDG support in these countries.

Capacity building to achieve the Goals. Technical cooperation for the Goals, estimated at 60 percent of total technical cooperation in 2002, will concentrate on assisting countries in regions that are currently underserved, such as urban slums or remote rural areas (OECD/DAC 2004e). Also included in this line item is assistance currently provided directly to NGOs. The budget for technical cooperation is expected to stay constant through 2015.

Repayments of concessional loans. Loan repayments by middle-income countries in 2002 are estimated on the basis of data from OECD/DAC (2004a). World Bank (2004b) data on outstanding loans suggests that middle-income

countries are unlikely to require outright debt relief to finance the Goals. Some countries will require a reduction in their loan service payments to make the investments necessary for meeting the Goals. Using the same approach as for low-income countries we estimate that repayments of concessional loans may need to be reduced by some \$3 billion in 2006, compared with 2002, and only \$0.2 billion by 2015.

MDG support needs at the international level

Regional cooperation and infrastructure. These needs are projected to require an extra \$9 billion a year by 2015, in addition to investments financed through national budgets. The estimate of current assistance for regional cooperation and infrastructure is based on Birdsall (2004).

Funding for global research. Official development assistance for research in 2002 has been estimated by OECD/DAC (table A3.3) (OECD/DAC 2004e). They are expected to rise to \$7 billion by 2015, focusing on public health, agriculture and natural resource management, low-cost and sustainable energy technologies, and adaptation to long-term climate change in developing countries. Projected investments in public health are based on recommendations by the WHO Commission on Macroeconomics and Health (2001). The remaining projections are made by the UN Millennium Project.

Implementing the Rio conventions. Current assistance for implementing the environment conventions agreed to in Rio in 1992 is estimated on the basis of OECD/DAC (2002). Unfortunately, few cost estimates exist for implementing these and other environmental agreements. We have included the cost of implementing the Desertification Convention based on UNEP (1991). The estimates have been revised downward by focusing on preventive and corrective measures and excluding the cost of rehabilitation. To limit the possibility of a double-counting of interventions included in the agricultural component of our national MDG needs assessments, we reduce the cost of preventive measures by 50 percent.

Table A3.3

Breakdown of funding for global research

2003 US\$ billions

Note: Numbers in table may not sum to totals due to rounding.

Source: 2002 data based on OECD/DAC Secretariat, personal communication, 2004. Projections for public health from WHO 2001. All other projections are authors' calculations.

	2002	2006	2010	2015
Public health	0.3	2	4	4
Agriculture and natural resource management	0.4	1	1	1
Low-cost and sustainable energy technologies	0.1	1	1	1
Adaptation to long-term climate change in developing countries	0.1	1	1	1
Total	1.0	5	7	7

Other available cost data for the environment point to major discrepancies in the estimates. For example, the cost of maintaining biodiversity ranges from \$23 billion to \$45 billion a year depending on the source (Balmford and others 2002; Zhou 2003). Since neither cost estimate is underpinned by an operational strategy for maintaining biodiversity, we have not included the cost of biodiversity protection in the table. Likewise, no robust estimates exist for the cost of adaptation to climate change in developing countries.

Technical cooperation by international organizations. The 2002 ODA flows to UN agencies, funds, and programs are estimated at \$5 billion, based on OECD/DAC (2004a). We assume that funding for these organizations will need to increase by 50 percent over the coming 10 years. The bulk of this funding will go toward improving the technical advisory capacities of the UN system and for providing extensive training programs.

Notes to table 17.4—Plausible ODA needs to meet the MDGs

Baseline ODA for the Goals in 2002. Equal to 2002 ODA for direct MDG support only, as in table 17.3.

Incremental MDG investment needs. Calculated as the difference between the estimated cost of meeting the Goals (as in table 17.3) and baseline assistance.

Adjustment for nonqualifying countries due to inadequate governance. To adjust for nonqualifying countries we construct an aggregate governance indicator by calculating the mean of five variables measuring control of corruption, government effectiveness, quality of institutions, regulatory quality, and the rule of law (Kaufmann, Kraay, and Mastruzzi 2003). We then make the simplified assumption that countries need to score within one standard deviation below the mean of this indicator to qualify for ODA for direct MDG support. Of course, actual decisions on whether MDG support can be provided at the scale necessary to achieve the Goals must be made case by case.

Based on this assumption, total ODA needs in 2006 will be reduced by approximately \$21 billion to account for countries with inadequate governance. If no currently nonqualifying countries were to qualify for assistance by 2015, this adjustment factor would rise to \$42 billion. It is assumed that a number of countries will improve their governance to qualify for ODA for direct MDG support, so that the adjustment factor rises to only \$25 billion in 2015.

Reprogramming of existing ODA. It is assumed that 20 percent of the following ODA items can be reprogrammed toward the Goals in 2006: technical assistance not directed toward the Goals, development food aid, and other official development assistance that does not directly support the Goals. These items

amounted to \$30 billion in 2002. We assume that by 2015, 30 percent can be reprogrammed toward supporting the Millennium Development Goals.

Emergency and distress relief. This is an integral part of financing the Goals. In 2002, emergency assistance amounted to \$4 billion (OECD/DAC 2004a). Even if the Goals are met, the need for emergency assistance will rise since an important share of needs are not currently met.³ In addition, rising population numbers and the effects of long-term climate change will increase the incidence and severity of natural disasters, as well as their impact. It is projected that total emergency assistance, excluding the cost of peacekeeping and security operations, will rise by 50 percent by 2015.

Other ODA. This line item contains all assistance not included elsewhere in the table. In particular, we account for the cost to bilateral agencies of effectively managing higher ODA flows. Data on operational and administrative costs to donors in 2002 are taken from OECD/DAC (2004d). We assume that the cost of managing incremental ODA amounts to 2 percent of the bilateral aid that is not channeled through multilateral organizations, estimated at 70 percent of total ODA volumes (OECD/DAC 2004e).

Percentage of OECD countries' GNI. We assume that the 2002 GNI of all OECD countries (\$28 trillion in 2003 U.S. dollars) grows in real terms at 2 percent per capita per year to reach \$36 trillion (in 2003 US dollars) in 2015.

ODA to Least Developed Countries. In reference to the Monterrey target for ODA to Least Developed Countries, we estimate total ODA needed for direct MDG support and MDG capacity building required for these countries. The estimates include the adjustment for nonqualifying countries due to inadequate governance.

Methodology and data sources for projecting progress toward the Goals in table 18.1

The following discussion describes the methodology used to determine the number of lives affected by meeting the Millennium Development Goals (table 18.1). In the first scenario, labeled “current trend extrapolated to 2015,” outcomes for 2005 and 2015 are estimated for each indicator by extrapolating population-weighted regional averages from 2002 figures using population projections (United Nations Population Division 2003a) and trend data for 1990–2002 (unless otherwise noted).

The “MDG scenario for 2015” is created by assuming that, subsequent to 2005, countries accelerate progress to meet the Goals in 2015 or continue on their current trajectory if the historical rate of progress exceeds what is needed to achieve the Goals. In the text, the number of lives described as improved or saved by achieving the Goals is calculated as the difference between outcomes under the MDG scenario in 2015 and the 2005 estimates.

Indicator-specific notes

Poverty headcount

Poverty headcounts are calculated as the percentage of people with incomes below \$1.08 a day in 1993 PPP (purchasing power parity) dollars. Regional trends are extrapolated from data for 1990 and 2001 using estimates and regional definitions from Chen and Ravallion (2004).

GDP per capita

GDP per capita statistics are based on data from *World Development Indicators* (World Bank 2004c). All GDP data are adjusted to 2003 dollars using the OECD/DAC deflator¹ and divided by population numbers to obtain per capita GDP. Growth rates for both scenarios differ by region. In East Asia and the Pacific and in South Asia, growth rates over the past decade have been on

track to achieve the poverty headcount Goal assuming standard elasticities between growth and poverty reduction. In these regions, we assume that per capita incomes will continue to grow at 5 percent under both scenarios. For the other regions, we extrapolate current trends by using the average growth rate that the region experienced from 1990 to 2002, except in Europe and Central Asia, where we extrapolate growth rates since 1997 (as a more representative post-transition trend over five years). We project the MDG scenario for these slower growing regions by assuming an acceleration of real per capita growth to 3.2 percent.

Undernourishment

Undernourishment trends by region are calculated using population-weighted country data from 1990 and 2000 from FAO (2003a) for all regions except Europe and Central Asia, where data from 1994 to 2000 are used. Trends are extrapolated to 2005 and 2015 to estimate undernourishment under the assumption that current trends continue. The MDG scenario is calculated assuming that the share of undernourished people halves in each country between 1990 and 2015.

Child mortality

Regional under-five mortality rates are calculated using population-weighted national mortality rates (per 1,000 live births) for 1990 and 2002 and extrapolating them through 2005 and 2015. We then multiply these estimates by projected birth rates (United Nations Population Division 2003a) to calculate children's lives lost on trends. The MDG scenario is calculated by projecting a fall in mortality by two-thirds from the 1990 rate and interpolating linearly between 2005 and 2015. The number of lives lost under the MDG scenario was calculated by applying this trajectory to projected birth rates, assuming that countries that have exceeded progress required to meet the target will continue on their historic trend.

Maternal mortality

Insufficient national data are available to estimate regional averages for maternal mortality ratios. We therefore use global totals. According to statistics compiled from UNFPA, UNICEF, and WHO, the global maternal mortality ratio did not change between 1995 and 2000 (400 deaths per 100,000 live births) (WHO and UNICEF 1996; WHO, UNICEF, and UNFPA 2003). We assume further that it remains unchanged through to 2005. Since the worldwide rate was 430 per 100,000 live births in 1990, achieving the Goal would require reducing the worldwide rate to 108 (a 75 percent reduction). So under the MDG scenario the maternal mortality ratio will fall linearly from 400 in 2005 to 108 in 2015. If current trends continue, the maternal mortality ratio will stay constant at 400 through to 2015. We calculate the number

of deaths under the two scenarios, and then take the difference between the outcome under the MDG scenario in 2015 (of meeting the maternal mortality ratio target of 108 deaths per 100,000 live births) and the 2005 estimates to determine the number of lives that would be saved.

New HIV infections prevented

Data and calculations are from Stover and others (2002), who project the cumulative number of new HIV infections between 2002 and 2010 in a baseline trajectory and compare it with an expanded response scenario, as outlined in the July 2001 United Nations General Assembly Special Session (UNGASS). The difference between these two scenarios yields the infections averted by an expanded response by 2010. Although the expanded response scenario is not extended through 2015 and uses assumptions that differ slightly from those recommended by the UN Millennium Project Working Group on HIV/AIDS, it illustrates what an MDG scenario for HIV/AIDS might look like.

Water and sanitation

We use data on access to improved water supply and sanitation from the WHO/UNICEF Joint Monitoring Program (WHO and UNICEF 2004). As for other indicators, we extrapolate current trends, estimate an MDG scenario, and calculate the difference between the outcomes under the MDG scenario in 2015 and the 2005 estimates to determine the number of lives affected between 2005 and 2015.

Individuals living in slum conditions

We use country-level statistics for urban populations in 2001 (United Nations Population Division 2003a) and the proportion of urban populations living in slums (UN-HABITAT 2003) to determine the number of slum dwellers today. The number of slum dwellers in 2020 given current trends is estimated by holding constant the share of urban populations living in slums and multiplying it with projected urban populations in 2020 (United Nations Population Division 2001, 2003a). The MDG scenario is estimated by holding constant the total number of slum dwellers in 2001, assuming that the formation of new slums will be halted, and subtracting a further 100 million people in accord with target 11. The 100 million were distributed across the regions on a pro rata basis.