



Millennium Development Goals Needs Assessments:

**Country Case Studies of
Bangladesh, Cambodia, Ghana, Tanzania and Uganda**

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Executive Summary

1. Executive Summary

1.1. *Motivation*

The Millennium Development Goals (MDGs) are a set of quantified and time-bound goals for dramatically improving the human condition by 2015. They have been agreed by all member states of the United Nations and were reaffirmed at the Monterrey Conference on Financing for Development and the World Summit on Sustainable Development in Johannesburg. While many countries have made significant progress towards the Goals, dozens are far off track from achieving them unless progress is accelerated dramatically. These “Priority” MDG countries are concentrated in sub-Saharan Africa, Central America and the Andes, Central Asia, and parts of Southeast Asia.

In attempt to identify the range of interventions and investments required to achieve the MDGs in a cross-section of countries, this paper presents five country case studies for Bangladesh, Cambodia, Ghana, Tanzania and Uganda. The ambition of these country studies is to outline how countries could identify their MDG needs and to inform long term plans for achieving the MDGs. To this end, the paper proposes a template for conducting needs assessments with as much rigor as possible. The importance of such needs assessments is driven by the following considerations:

A. The MDGs need to form the core ambition of national poverty reduction planning processes, including PRSPs

As the international community’s quantified and time-bound targets for the reduction of income and non-income poverty, the MDGs should be central to development planning in low-income countries and guide the formulation of national planning documents, including the PRSPs. At present this is not systematically the case, since planning horizons are frequently too short and targets are not set in a manner consistent with the Goals. To plan effectively for the Goals, countries need to adopt a mid- to long-term approach through 2015 to identify all the necessary steps that need to be undertaken by working backwards from the Goals themselves. Based on a long-term needs assessment countries can identify the trajectory they need to follow in order meet the Goals. This trajectory can then form the basis for making the PRSP, medium-term expenditure frameworks, and other core frameworks and processes consistent with achieving the MDGs.

While the country studies do not aim to develop a definitive investment plan, they seek to provide a methodology together with a preliminary answer to the question of what it would take over 11 years to achieve the MDGs in five countries. This paper thus aims to provide a technical template to begin the process of planning for MDG success at the country-level.

B. The Millennium Development Compact needs to be operationalized

Achieving the Goals is possible in low-income countries that are well governed relative to their level of income and that develop sound plans, but success will also require

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increased support from developed countries. As outlined in the *Human Development Report 2003 (HDR)* many countries are caught in poverty traps that they cannot escape on their own. It is for this reason that the international system needs to provide assistance on the basis of long-term development plans developed by poor countries that are technically rigorous and can be transparently evaluated for progress.

These mutual responsibilities of rich and poor countries form the core of the Monterrey Consensus and the Millennium Development Compact published in the HDR¹. Operationalizing this compact requires a clear approach to assessing countries' needs for meeting the MDGs. The case studies presented in this paper attempt to provide a first answer to the question of how this can be done transparently and with technical rigor.

C. Countries need to plan comprehensively across all sectors

No 'magic bullets' exist for achieving the MDGs as no single set of interventions will be sufficient to make the necessary progress towards all the Goals. Mutually reinforcing investments need to be made across all sectors. For example, investments in education will not yield adequate results without investments in health, which in turn require investments in clean water, which in turn increase educational enrolments. We have therefore developed a comprehensive set of interventions that can serve as a first template for guiding national planning processes.

D. An improve understanding of 'absorptive capacity constraints' is needed

'Absorptive capacity' constraints, defined as limited human resources, managerial skills, monitoring and evaluation systems, infrastructure, and so forth, are real and pose binding constraints on countries' ability to scale up interventions in the short term. However, each of these constraints can be relaxed substantially over the medium term through systematic investments in human resources, administrative capacity, or infrastructure. Our country case studies attempt to take a first step towards systematically thinking through the question of how absorptive capacity can be built up.

Indeed it is only through the long-term planning approach advocated here that critical absorptive capacity constraints can be addressed and resolved. The significantly shorter timeframe of the PRSP and medium-term expenditure frameworks of 3-4 years tends to prevent many of these questions to be even addressed in the planning processes.

E. Public investments need to form the core of long-term MDG plans in Priority countries

In low-income countries many infrastructure investments and social services cannot be privately financed and therefore fall under the responsibility of the government. Therefore, our MDG needs assessments focus on *public* investments and services. This is part of a broader strategy proposed in the Millennium Development Compact to strengthen the role of governments in conjunction with continuing reforms to improve their accountability and quality of service delivery.

¹ Available at http://www.undp.org/hdr2003/pdf/hdr03_MDC.pdf.

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F. MDG needs assessments require transparent assumptions and shared results

Many sectoral and country-specific MDG needs assessments have been carried out in the past for low-income countries, though none are as comprehensive as the analysis presented in this paper. However, their underlying assumptions, methodology and models are rarely shared publicly. This makes it extremely difficult, if not impossible, for countries and organizations to use and build on existing work for their own long-term planning towards achieving the MDGs. To advance the technical debate on just how such planning can be carried out we develop a transparent ‘open-source’ approach to MDG planning.

1.2. Methodology

The five countries investigated in this paper were chosen based on their low per capita incomes, their geographic and political diversity, and their sound levels of governance relative to gross domestic product (GDP) per capita. Each country case study builds on sectorally-oriented work carried out by the Millennium Project Task Forces and existing sectoral costing studies prepared by UN agencies, the World Bank and other organizations. These sectoral estimates were then applied to each case study country in collaboration with the following respective research institutes:

- Bangladesh Institute of Development Studies;
- Cambodian Institute of Cooperation and Peace, in cooperation with the University of Cambodia;
- Institute of Statistical, Social and Economic Research (Ghana);
- Economic and Social Research Foundation (Tanzania); and
- Economic Policy Research Center (Uganda).

Our needs assessment methodology entails five basic steps, as outlined in Figure 1. The focus of the analysis is on identifying the range of *interventions* – defined broadly as the provision of goods and services as well as infrastructure – required for achieving the MDGs. It is important to note the distinction between interventions and *policies* or *institutions*. Whereas technical interventions, such as the provision of anti-retroviral drugs to treat HIV/AIDS or the construction of new schools to achieve the primary education goal, are crucial for developing an MDG investment plan, they are quite distinct from the policies or institutions that need to be used to deliver them. Since many different policies and institutions can conceivably deliver a specific intervention and differ significantly across countries, they can only be addressed in the context of detailed national planning processes and are thus not included here.

A critical advantage of our intervention-based approach over alternative costing methodologies is that it allows us to identify underlying gaps and overlaps between different ‘sectors’ to ensure a comprehensive analysis while avoiding any double counting.

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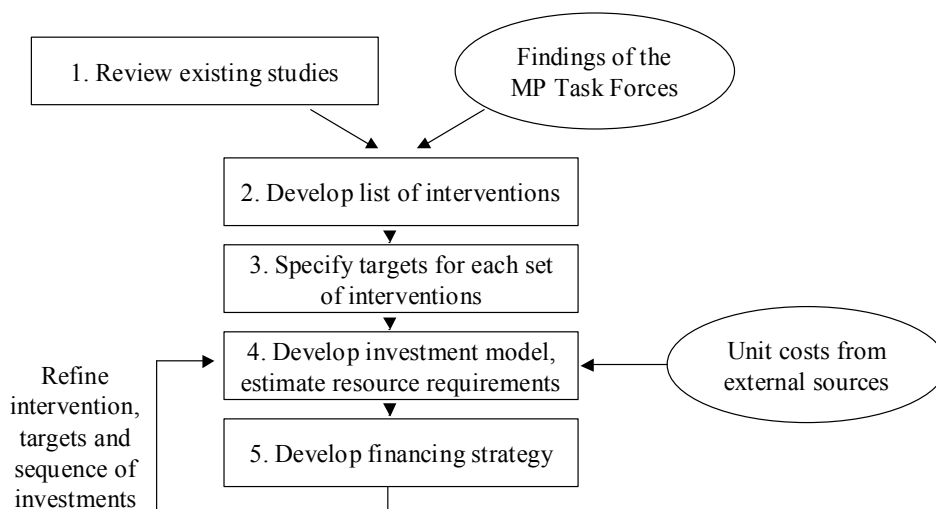


Figure 1: Summary of country-study methodology

In close consultation with the Millennium Project Task Forces we have developed detailed lists of interventions for Target that serve as a basis for estimating resource needs for meeting the MDGs. Table 1 summarizes key interventions for primary education, which form a subset of the full list of interventions for achieving Target 3, ‘Ensure that, by 2015, children everywhere, boys and girls alike, will be able to complete a full course of primary schooling’.

| Category | Intervention |
|--------------------------------|--|
| <i>Primary Education</i> | |
| Infrastructure | Build classrooms |
| | Construct girls' toilets |
| | Install furniture (blackboards, desks, chairs) |
| Teachers | Build teachers' houses |
| | Provide transportation facilities |
| | Recruit teachers |
| Materials | Recruit female teachers |
| | Provide pre-service training |
| | Provide in-service training |
| Demand side incentives | Provide textbooks |
| | Provide other learning materials (stationery, chalk etc.) |
| | Provide uniforms |
| Curriculum Reform | Provide subsidies to girls |
| | Provide school meals |
| | Provide take-home rations |
| Distance Education | Provide subsidies for vulnerable populations |
| | Keep HIV/AIDS orphans in school (*) |
| | Design new textbooks |
| | Provide learning aids |
| | Provide teacher training for new curriculum |
| | Improve a communication strategy to disseminate the curriculum changes |
| | Introduce distance education for hard-to-reach, out of school children |
| Provide IT equipment and radio | |
| Hire teachers/instructors | |
| Train teachers/instructors | |
| Provide learning material | |

Table 1: Subset of list of interventions for achieving MDG Target 3 on education.

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These comprehensive sets interventions are considered inputs to achieving the MDGs, going beyond the finite set of outcome targets defined by the Goals to include other input targets necessary to achieve the Goals. For example, while no concrete MDG Targets exist for sexual and reproductive health, sanitation and wastewater treatment, health systems, energy services, and transport infrastructure, the corresponding interventions are critical inputs for achieving the MDGs. For this reason our country case studies identify interventions across the following 14 areas:

- Hunger,
- Gender equality,
- Education,
- Health systems,
- Child health,
- Maternal and reproductive health,
- Infectious diseases (HIV/AIDS, TB and malaria),
- Access to essential medicines,
- Environmental sustainability,
- Water and sanitation,
- Improving the lives of slum dwellers,
- Science and technology,
- Energy services and energy infrastructure, and
- Transport infrastructure.

Wherever possible, intervention targets are based on the MDGs as well as other internationally agreed-upon targets such as the sanitation target established at the Johannesburg World Summit on Sustainable Development in 2002. In cases where no agreed targets exist, the Millennium Project secretariat worked with the Task Forces to derive targets and key parameters analytically. For example, based on best practice norms we have adopted concrete targets for primary-school completion rates and pupil-teacher ratios.

The needs assessment addresses capital as well as recurrent costs since both need to be properly financed to ensure adequate service delivery. In contrast to other methodologies we calculate total as opposed to incremental resource needs since the former is required for developing the financing strategy described towards the end of the paper.

Several of the interventions exhibit synergies or trade-offs with one another. While a comprehensive treatment of these critical interactions is beyond the scope of this paper, we identify those synergies, which we believe will generate the greatest cost savings. These tend to accrue in the health sector and have been accounted for in our resource estimates.

On the basis of the calculated total resource requirements for meeting the MDGs, we estimate a highly simplified financing strategy for each country, distinguishing between three sources of funding: (i) private out-of-pocket expenditure by households, (ii) government resources, and (iii) international transfers to fill the remaining financing gap.

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Household contributions are estimated based on two considerations: (i) the incentive effects of user fees, and (ii) households' overall ability to pay. Since user fees can play a critical role in preventing the poor from accessing basic services we preclude households from contributing to some sectors, such as basic healthcare and primary education. In turn we propose private out-of-pocket contributions towards the following sectors: energy, agriculture, secondary education, water and sanitation.

To account for increased government resource mobilization, we project that domestically-financed spending on MDG-related interventions will rise by 4 percentage points of GDP between 2005 and 2015 in addition to the increase in domestic resource availability resulting from GDP growth. As laid out in the Monterrey Consensus and the Millennium Development Compact, if the MDGs are to be achieved in all low-income countries, increased external finance will be required for interventions that cannot be financed through domestic resources alone.

1.3. Key findings from the country studies

By developing comprehensive lists of interventions, we have been able to make preliminary estimates of the human, infrastructure and financial resources required to achieve the MDGs in each of the five countries. Table 2 summarizes the financial component of these results. For each country the table reports average annual investment needs in million 2000 US\$ during the period from 2005 to 2015 as well per capita equivalents obtained by dividing investment needs by the country's population.

Our preliminary estimates suggest that annual investment needs average between \$1.5 billion for Ghana and \$14.1 billion for Bangladesh during the period from 2005 to 2015. On a per capita basis, total average needs vary between \$80 in Ghana and \$96 in Tanzania. It is important to note that per capita investment needs merely provide an abstract, but convenient presentation of total needs that facilitates cross-country comparisons. Finally, expressed as a share of gross domestic product, average resource needs vary from 15 percent of GDP in Bangladesh to 22 percent in Tanzania.

It is critical to note that these resource estimates are preliminary and exclude a number of important interventions that are likely to increase overall investment needs. Some of the most cost-intensive interventions that have so far not been addressed in the analysis include:

- Water storage and transport infrastructure, including large-scale irrigation,
- Improving the lives of slum dwellers,
- Interventions to ensure environmental sustainability,
- New infrastructure for health systems, such as hospitals and clinics,
- R&D expenditures (except for health) and higher education systems,
- Information and communication technologies,
- Ports and railways,
- Large-scale fuel distribution and storage infrastructure, and
- Disaster response and food aid.

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Importantly, country-level planning towards the MDGs will need to specify the corresponding interventions as well.

Summary of projected financial resources required for meeting the MDGs in Bangladesh, Cambodia, Ghana, Tanzania and Uganda (2005-2015)

| | Bangladesh | | Cambodia | | Ghana | | Tanzania | | Uganda | |
|--|------------------------|-------------------------|------------------------|-------------------------|------------------------|-------------------------|------------------------|-------------------------|------------------------|-------------------------|
| | Average per year (\$m) | Average per capita (\$) | Average per year (\$m) | Average per capita (\$) | Average per year (\$m) | Average per capita (\$) | Average per year (\$m) | Average per capita (\$) | Average per year (\$m) | Average per capita (\$) |
| Total Cost (Sum of A+B+C below) | | | | | | | | | | |
| Hunger | 844 | 5.1 | 145 | 8.7 | 117 | 4.9 | 304 | 7.2 | 272 | 8.2 |
| Education | 2,358 | 14.1 | 280 | 16.8 | 427 | 17.7 | 507 | 12.1 | 461 | 13.9 |
| Gender Equality | 336 | 2.0 | 37 | 2.2 | 51 | 2.1 | 99 | 2.4 | 78 | 2.3 |
| Health | 3,440 | 20.6 | 372 | 22.4 | 598 | 24.8 | 1,461 | 34.8 | 1,069 | 32.2 |
| Environment | tbd. | tbd. | tbd. | tbd. | tbd. | tbd. | tbd. | tbd. | tbd. | tbd. |
| Water Supply and Sanitation | 957 | 5.7 | 80 | 4.8 | 178 | 7.4 | 226 | 5.4 | 124 | 3.7 |
| Improving the Lives of Slum Dwellers | tbd. | tbd. | tbd. | tbd. | tbd. | tbd. | tbd. | tbd. | tbd. | tbd. |
| Science and Technology | tbd. | tbd. | tbd. | tbd. | tbd. | tbd. | tbd. | tbd. | tbd. | tbd. |
| Energy | 2,948 | 17.6 | 272 | 16.4 | 345 | 14.3 | 604 | 14.4 | 431 | 13.0 |
| Roads | 3,172 | 19.0 | 315 | 19.0 | 223 | 9.2 | 815 | 19.4 | 612 | 18.4 |
| Total | 14,056 | 84.1 | 1,501 | 90.3 | 1,939 | 80.4 | 4,015 | 95.5 | 3,046 | 91.8 |

Summary of projected sources of financing in Bangladesh, Cambodia, Ghana, Tanzania and Uganda (2005-2015)

| | Bangladesh | | Cambodia | | Ghana | | Tanzania | | Uganda | |
|--------------------------------------|------------------------|-------------------------|------------------------|-------------------------|------------------------|-------------------------|------------------------|-------------------------|------------------------|-------------------------|
| | Average per year (\$m) | Average per capita (\$) | Average per year (\$m) | Average per capita (\$) | Average per year (\$m) | Average per capita (\$) | Average per year (\$m) | Average per capita (\$) | Average per year (\$m) | Average per capita (\$) |
| A. Household Contributions | | | | | | | | | | |
| Hunger | - | - | - | - | - | - | - | - | - | - |
| Education | 316 | 1.9 | 54 | 3.3 | 23 | 0.9 | 29 | 0.7 | 67 | 2.0 |
| Gender Equality | - | - | - | - | - | - | - | - | - | - |
| Health | - | - | - | - | - | - | - | - | - | - |
| Environment | tbd. | tbd. | tbd. | tbd. | tbd. | tbd. | tbd. | tbd. | tbd. | tbd. |
| Water Supply and Sanitation | 375 | 2.2 | 36 | 2.2 | 81 | 3.4 | 107 | 2.6 | 57 | 1.7 |
| Improving the Lives of Slum Dwellers | tbd. | tbd. | tbd. | tbd. | tbd. | tbd. | tbd. | tbd. | tbd. | tbd. |
| Science and Technology | tbd. | tbd. | tbd. | tbd. | tbd. | tbd. | tbd. | tbd. | tbd. | tbd. |
| Energy | 669 | 4.0 | 78 | 4.7 | 112 | 4.7 | 216 | 5.1 | 143 | 4.3 |
| Roads | - | - | - | - | - | - | - | - | - | - |
| Total | 1,360 | 8.1 | 168 | 10.1 | 216 | 9.0 | 353 | 8.4 | 268 | 8.1 |

| | Bangladesh | | Cambodia | | Ghana | | Tanzania | | Uganda | |
|---|------------------------|-------------------------|------------------------|-------------------------|------------------------|-------------------------|------------------------|-------------------------|------------------------|-------------------------|
| | Average per year (\$m) | Average per capita (\$) | Average per year (\$m) | Average per capita (\$) | Average per year (\$m) | Average per capita (\$) | Average per year (\$m) | Average per capita (\$) | Average per year (\$m) | Average per capita (\$) |
| B. Domestically Financed Government Expenditures** | | | | | | | | | | |
| Hunger | 314 | 1.9 | 43 | 2.6 | 34 | 1.4 | 96 | 2.3 | 101 | 3.0 |
| Education | 876 | 5.2 | 83 | 5.0 | 124 | 5.2 | 160 | 3.8 | 171 | 5.2 |
| Gender Equality | 125 | 0.7 | 11 | 0.7 | 15 | 0.6 | 31 | 0.7 | 29 | 0.9 |
| Health | 1,278 | 7.6 | 110 | 6.6 | 174 | 7.2 | 462 | 11.0 | 397 | 12.0 |
| Environment | tbd. | tbd. | tbd. | tbd. | tbd. | tbd. | tbd. | tbd. | tbd. | tbd. |
| Water Supply and Sanitation | 355 | 2.1 | 24 | 1.4 | 52 | 2.2 | 71 | 1.7 | 46 | 1.4 |
| Improving the Lives of Slum Dwellers | tbd. | tbd. | tbd. | tbd. | tbd. | tbd. | tbd. | tbd. | tbd. | tbd. |
| Science and Technology | tbd. | tbd. | tbd. | tbd. | tbd. | tbd. | tbd. | tbd. | tbd. | tbd. |
| Energy | 1,095 | 6.6 | 81 | 4.9 | 100 | 4.2 | 191 | 4.5 | 160 | 4.8 |
| Roads | 1,178 | 7.1 | 93 | 5.6 | 65 | 2.7 | 257 | 6.1 | 227 | 6.9 |
| Total | 5,220 | 31.2 | 444 | 26.7 | 565 | 23.5 | 1,269 | 30.2 | 1,132 | 34.1 |

| | Bangladesh | | Cambodia | | Ghana | | Tanzania | | Uganda | |
|--|------------------------|-------------------------|------------------------|-------------------------|------------------------|-------------------------|------------------------|-------------------------|------------------------|-------------------------|
| | Average per year (\$m) | Average per capita (\$) | Average per year (\$m) | Average per capita (\$) | Average per year (\$m) | Average per capita (\$) | Average per year (\$m) | Average per capita (\$) | Average per year (\$m) | Average per capita (\$) |
| C. Required Total External Budget Support | | | | | | | | | | |
| Hunger | 531 | 3.2 | 102 | 6.2 | 83 | 3.4 | 208 | 4.9 | 171 | 5.1 |
| Education | 1,167 | 7.0 | 143 | 8.6 | 280 | 11.6 | 317 | 7.6 | 222 | 6.7 |
| Gender Equality | 211 | 1.3 | 26 | 1.6 | 36 | 1.5 | 68 | 1.6 | 49 | 1.5 |
| Health | 2,163 | 12.9 | 262 | 15.8 | 424 | 17.6 | 999 | 23.8 | 672 | 20.2 |
| Environment | tbd. | tbd. | tbd. | tbd. | tbd. | tbd. | tbd. | tbd. | tbd. | tbd. |
| Water Supply and Sanitation | 227 | 1.4 | 20 | 1.2 | 46 | 1.9 | 47 | 1.1 | 20 | 0.6 |
| Improving the Lives of Slum Dwellers | tbd. | tbd. | tbd. | tbd. | tbd. | tbd. | tbd. | tbd. | tbd. | tbd. |
| Science and Technology | tbd. | tbd. | tbd. | tbd. | tbd. | tbd. | tbd. | tbd. | tbd. | tbd. |
| Energy | 1,184 | 7.1 | 113 | 6.8 | 132 | 5.5 | 197 | 4.7 | 128 | 3.9 |
| Roads | 1,994 | 11.9 | 222 | 13.3 | 158 | 6.5 | 557 | 13.3 | 384 | 11.6 |
| Total | 7,476 | 44.7 | 888 | 53.4 | 1,158 | 48.0 | 2,393 | 57.0 | 1,646 | 49.6 |

* I.e. government expenditures on the MDGs, which are financed solely through domestic revenue generation

** On a pro forma basis, expenditures are allocated to budget line items based on their relative share of total costs above

Table 2: Summary results of country case studies (see text for explanation)

Our simple financing analysis calculates the scope for domestic resource mobilization through government expenditures and private out-of-pocket contributions. While these results require refinement, they suggest that the five countries will be able to finance roughly 40 to 50 percent of total investment needs through domestic sources. This translates into an average total need for external development assistance equivalent to \$44 to \$57 per capita.

Critically, external development assistance will need to be provided as grants and in the form of direct budget support. Our analysis suggests, however, that the required external

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finance will be significantly below the equivalent of 0.7 percent of rich countries' GDP – the international ODA target which is part of MDG 8 and to which donors have committed themselves repeatedly. Future extensions of the Millennium Project MDG case studies will provide more detailed estimates of global resource needs for meeting the MDGs.

Overall, the variation in projected per capita investment needs and domestic resource mobilization potential is relatively low across the five countries since Bangladesh, Cambodia, Ghana, Tanzania, and Uganda face broadly similar development challenges. Nevertheless, important differences can be identified across the countries, which are described in more detail below.

Bangladesh

As a result of its large and growing population, the country faces by far the highest absolute investment needs (including domestically and internationally financed) in our sample, averaging \$14.5 billion per year between 2005 and 2015. On a per capita basis, however, Bangladesh requires significantly less investment to meet the MDGs than does Cambodia, Tanzania or Uganda. It is noticeable that the country's household contributions to meeting the MDGs are the lowest of the five countries, since national survey data suggests that close to 50 percent of the population live below the basic needs poverty line – the highest share among the five countries. In contrast, Bangladesh's level of GDP per capita and rate of economic growth will permit the government to mobilize more incremental resources than many other poor countries. In terms of total ODA required for the MDGs, approximately \$45 per capita will be required, or \$7.5 billion per year.

The country faces tremendous human resource challenges. We estimate that the combined number of teachers for both primary and secondary schools will need to be increased from 350,000 in 2005 to 815,000 in 2015. Similarly, the demand for doctors will nearly double to 58,000 while the number of nurses and midwives has to be increased by a factor of four from 33,000 to 145,000.

The key cost drivers in per capita terms are the health sector followed closely by energy and roads. The investment need in the energy sector is high due to low existing generation capacity. Overall, though, per capita needs in Bangladesh tend to be lower than in the other four countries.

In addition to the gaps in our analysis listed above, we have so far not been able to include interventions for preventing and treating arsenic poisoning in our analysis. This is possibly the single largest health challenge faced by the country and will require important resources – particularly in the health and water sectors. However, at this point no consensus exists on how best to address the problem, so assessing the corresponding investment needs remains a challenge.

Cambodia

The country will require total average annual investments of \$1.5 billion to meet the MDGs, which is equivalent to \$90 on a per capita basis. This is substantially higher than

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for Bangladesh and in line with the resource needs of the East African countries. At the same time the potential for government resource mobilization is more limited in Cambodia at approximately \$444 million per year or \$27 per capita. This preliminary analysis suggests that the country requires particularly high per capita levels of external finance to meet the MDGs at \$53 per person or a total of \$888 million in aggregate per year.

In comparison to the other countries, Cambodia is projected to require particularly high investments to halve hunger, reach the education Goal and to ensure access to improved energy services. In particular the need to increase the number of secondary schools stands out as we project the need to triple the number of existing classrooms. Overall, these three sectors drive the high need for investments relative to the other countries.

So far our analysis does not include an assessment of the human and financial resources required to continue the process of demining the country after decades of armed conflict. As emphasized by the Government of Cambodia and UNDP demining is essential for the country to achieve the MDGs. At this point, though, we have not been able to carry out a detailed analysis of the required investments due to data limitations.

Ghana

In comparison to the two other African countries, Ghana's total investment needs for meeting the MDGs are significantly lower in aggregate and per capita terms, averaging \$1.9 billion per year or \$80 per capita. At \$1.1 billion the country is projected to require lower levels of annual external finance than Tanzania or Uganda. However, this need remains significantly above the \$758 million in ODA that donors committed to Ghana in 2001 for MDG and non-MDG-related activities. In addition to increasing aid levels, the nature and quality of external finance will need to shift towards budget support in the form of grants if the country is to meet the MDGs.

Relative to Tanzania and Uganda, Ghana requires substantially lower investments in the health sector, which are largely driven by the lower HIV/AIDS prevalence. Our projections are contingent upon maintaining HIV/AIDS prevalence at levels which are high by international standards, but relatively low for Sub-Saharan Africa. A second major reason for the relatively low per capita needs in Ghana is the fact that the country has a relatively extensive road network. While important investments in the sector will still be necessary to maintain the road system, no major extensions are projected at the level required for example in Tanzania and Uganda. In the latter two countries the current per capita density of paved roads is one sixth to one third of the density reported for Ghana.

The case of Ghana illustrates the dramatic investments required in many African countries to maintain current levels of service provision in cities that are growing at the fastest rates observed anywhere in the world. For example, while Ghana has extremely high rates of urban electrification in comparison to Tanzania or Uganda, the per capita resource requirements in the sector are about as high as in the latter two countries. This is driven largely by the need to invest substantially into extending the urban grid and

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providing fuel inputs just to maintain coverage rates in step with rapid urban population growth.

Tanzania

Among the countries in our sample, Tanzania faces the biggest challenges in meeting the MDGs. The country is one of the poorest in the world, although with good governance relative to its level of per capita GDP. We consequently project that the country requires the highest per capita levels of average investment and external finance to meet the MDGs at \$96 and \$57, respectively. These figures are equivalent to aggregate investment of \$4 billion per year and external finance of \$2.3 billion per year.

Approximately one third of Tanzania's total investments are required for achieving the health MDGs. HIV/AIDS and malaria stand out as the two critical diseases that require high levels of investments. In addition, infant mortality rates remain extremely high and have been rising during the past decade. To address its health needs, the country will need to dramatically scale up the number of doctors employed in the health system. In addition Tanzania requires urgent investments in the water and sanitation sector, where progress has been inadequate during the 1990s. We project that approximately 6.4 and 8.6 million people will need to be provided with improved access to water supply and sanitation, respectively, in order to meet the MDGs.

Similarly, meeting the education Goals will require a dramatic acceleration in progress. The country has one of the lowest enrolment rates for secondary education in the world, which will need to be raised. Otherwise it will be impossible to train sufficient numbers of adolescents to satisfy projected the increase in demand from public and private sector workforce required to meet the MDGs. Perhaps surprisingly, however, we project relatively low resource needs for secondary schools, but these estimates are driven by the fact that current levels of enrolment and therefore operating costs are extremely low. Since the gradual scaling up of secondary education will take time, total education resource needs are lower than in other countries.

Uganda

Uganda has made significant progress towards meeting the MDGs over the past decade. However, the country still remains off track to meeting the Goals in several areas, including hunger, health, water and sanitation. We project that the country will need to spend an average \$3 billion per year to meet the Goals. More than half of these investments will likely need to be financed externally, requiring an average of \$1.6 billion (or \$50 per capita) annually from 2005 through 2015.

The areas furthest off-track from the MDGs are those requiring relatively high levels of investment. Even though the needs of the health sector remain low in comparison to other countries in Sub-Saharan Africa, they continue to be high in absolute terms. Despite Uganda's remarkable progress in containing the HIV/AIDS epidemic, the country will need to substantially increase resources to fight this disease by stepping up the provision of anti-retroviral treatment.

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As in the case with the other countries, Uganda faces a critical challenge in extending access to improved water and sanitation as 10 and 13 million people, respectively, will need to be provided with access before 2015. With rapid increases in the rates of urbanization, a key focus of the corresponding investments will need to be on urban areas.

An important gap in our Uganda study is the transport and communication infrastructure required to provide the landlocked country with improved access to world markets. Critically, the Northern Corridor highway to Mombassa, Kenya is in urgent need of upgrading as is the rail infrastructure. Without these investments Uganda is unlikely to be able to maintain high rates of private-sector led economic growth.