

SUMMARY OF BACKGROUND PAPER 13

AFRICA INFRASTRUCTURE COUNTRY DIAGNOSTIC

Climbing the Ladder: The State of Sanitation in Sub-Saharan Africa

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About AICD

This study is part of the Africa Infrastructure Country Diagnostic (AICD), a project designed to expand the world's knowledge of physical infrastructure in Africa. AICD will provide a baseline against which future improvements in infrastructure services can be measured, making it possible to monitor the results achieved from donor support. It should also provide a more solid empirical foundation for prioritizing investments and designing policy reforms in the infrastructure sectors in Africa.



AICD will produce a series of reports (such as this one) that provide an overview of the status of public expenditure, investment needs, and sector performance in each of the main infrastructure sectors, including energy, information and communication technologies, irrigation, transport, and water and sanitation. The World Bank will publish a summary of AICD's findings in spring 2008. The underlying data will be made available to the public through an interactive Web site allowing users to download customized data reports and perform simple simulation exercises.



The first phase of AICD focuses on 24 countries that together account for 85 percent of the gross domestic product, population, and infrastructure aid flows of Sub-Saharan Africa. The countries are: Benin, Burkina Faso, Cape Verde, Cameroon, Chad, Congo (Democratic Republic of Congo), Côte d'Ivoire, Ethiopia, Ghana, Kenya, Madagascar, Malawi, Mali, Mozambique, Namibia, Niger, Nigeria, Rwanda, Senegal, South Africa, Sudan, Tanzania, Uganda, and Zambia. Under a second phase of the project, coverage will be expanded to include additional countries.



AICD is being implemented by the World Bank on behalf of a steering committee that represents the African Union, the New Partnership for Africa's Development (NEPAD), Africa's regional economic communities, the African Development Bank, and major infrastructure donors. Financing for AICD is provided by a multi-donor trust fund to which the main contributors are the Department for International Development (United Kingdom), the Public Private Infrastructure Advisory Facility, Agence Française de Développement, and the European Commission. A group of distinguished peer reviewers from policy making and academic circles in Africa and beyond reviews all of the major outputs of the study, with a view to assuring the technical quality of the work.



This and other papers analyzing key infrastructure topics, as well as the underlying data sources described above, will be available for download from www.infrastructureafrica.org. Freestanding summaries are available in English and French.

Inquiries concerning the availability of datasets should be directed to vfoster@worldbank.org.

Summary

Nearly all countries in Sub-Saharan Africa are likely to miss the Millennium Development Goal for access to improved sanitation—and by a wide margin. As of 2004, coverage of improved sanitation as defined by the Joint Monitoring Program responsible for tracking progress toward the goals stood at 37 percent. The target for 2015 is 66 percent.

A sanitation ladder

Sanitation can be provided at several levels that may be represented as rungs on a ladder. At the bottom of the ladder are those who lack any kind of sanitation facility and must still resort to open defecation. The first rung of the ladder is provided by the traditional latrine, which refers to various kinds of pits for disposal of excreta. Thereafter, come improved latrines—comprising SanPlat, VIP latrines, and chemical toilets—all of which ensure more hygienic separation of excreta from the immediate living environment. The final rung of the ladder is the flush toilet, which may be connected either to a septic tank or to a water-borne sewer network. Each successive rung of the ladder represents a higher unit cost but a correspondingly lower level of health risk. Standardized unit costs drawn from Senegal's experience set prices at US\$656 for a septic tank, US\$441 for a VIP latrine, and US\$49 for a traditional latrine.

The Joint Monitoring Program counts the top two rungs of the ladder as improved sanitation for purposes of measuring progress toward the MDG target. But, in practice, drawing a line between improved and unimproved forms of sanitation is not easy, owing to the wide variety of installations bundled together under these basic labels. Classification of traditional latrines is particularly difficult. A key issue is the extent to which a traditional latrine can or, with some modification, could provide improved sanitary protection. In addition, the boundary between traditional and improved latrines is somewhat porous, because the extent to which latrines deliver the intended health benefits depends on the way they are used. Even very basic latrines can provide protection *if* measures are taken to cover them, empty or replace them in a timely fashion, and ensure that, once removed, sludge is properly treated and disposed of. (Users must also wash their hands after using the latrine.) Conversely, even improved latrines can sometimes fail to provide sanitary protection if they are not properly used.

Throughout the world, the development of water-borne sewage networks generally lags substantially behind the evolution of the piped-water networks on which they depend. In the low-income countries of Africa, only 40 percent of the population enjoys private connections to piped water networks, and this already places a very low ceiling on the potential for water-borne sewerage.

Indeed, the prevalence of water-borne sewage systems is extremely low in Sub-Saharan Africa. Among utilities serving the largest cities, only half report operating a sewage network at all. In middle-income countries such as Namibia and South Africa, and in the exceptional case of Senegal, these utilities provide a high level of sewerage coverage. However, the more typical situation—in countries such as Côte d'Ivoire, Kenya, Madagascar, Malawi, Lesotho, and Uganda—is that even where sewer networks exist they reach barely 10 percent of the population in the service area. Little more than half of those with piped water also have flush toilets, in most cases connected to septic tanks rather than sewers.

Onto the bottom rung

Sanitation in Sub-Saharan Africa essentially consists of on-site sanitation of the types just described (table A). About half of the population—urban and rural alike—rely on traditional latrines. About 30 percent of the population continues to practice open defecation, this share being even higher in some countries. Improved modalities reach no more than 20 percent of the overall population. Curiously, the prevalence of improved latrines is no greater than that of septic tanks, even though there is a significant cost differential between the two.

Table A Patterns of access to sanitation

	Open defecation	Traditional latrine	Improved latrine	Septic tank
Urban	8	51	14	25
Rural	41	51	5	2
National	34	52	9	10

Source: AICD DH/MICS Survey Database, 2007.

A clear urban-rural divide emerges. In rural areas the bulk of the population still practices open defecation, and improved sanitation remains negligible. In urban areas, about 40 percent the population has access to improved modalities, with septic tanks much more common than improved latrines; fewer than 10 percent of urban dwellers practice open defecation. A typical pattern of urban sanitation is the practice of sharing sanitation facilities among multiple families—more than 40 percent of households report sharing their toilet facilities with other households.

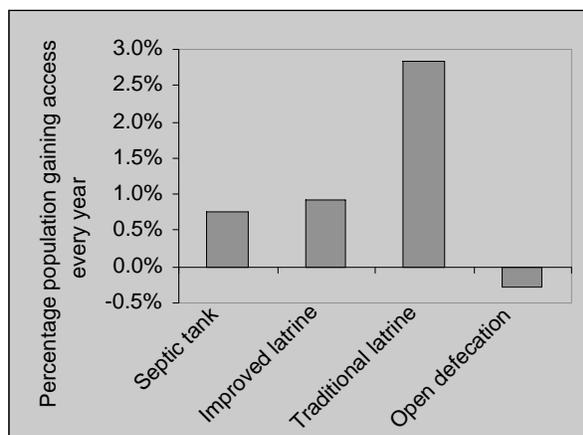
Patterns of sanitation access vary dramatically across the socioeconomic spectrum. Traditional latrines are by far the most egalitarian form of sanitation, accounting for about 50 percent of households across the income range. Conversely, the pattern of access for improved latrines tracks that for septic tanks very closely, suggesting that (despite their lower cost) improved latrines remain something of a luxury, having not penetrated the middle of the income distribution. In particular, improved latrines are virtually nonexistent in the poorest half of the population; even in the richest strata, they account for 20–30 percent of households.

Not only are traditional latrines the most common sanitation modality in Sub-Saharan Africa, they are also by far the fastest growing. In recent years, they have been reaching an additional 2.8 percent of the population each year in urban areas and an additional 1.8 percent in rural areas, more than twice the rate of expansion of flush toilets and improved latrines put together (figure A). As might be expected, the expansion in traditional latrines is concentrated in the poorer half of the population, that in improved latrines and flush toilets in the richer half.

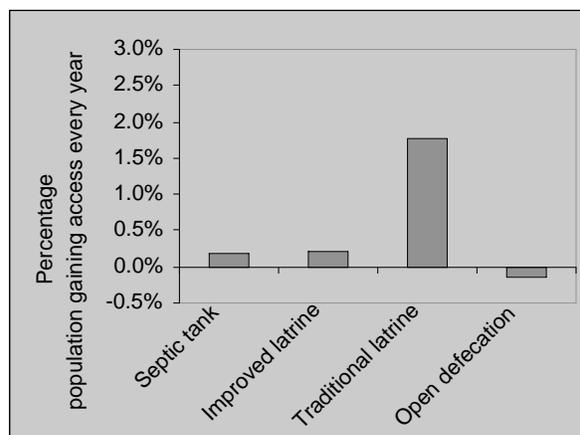
While the overall picture is bleak, there have been some important success stories in recent years. Because the target articulated in the Millennium Development Goal for sanitation focuses on the top two improved options, the rapid expansion of traditional latrines does not always appear clearly in the policy discussion. Another piece of good news is that open defecation has finally begun to decline in Sub-Saharan Africa, however modestly.

Figure A Rate of expansion of different sanitation modalities

1. Urban areas



2. Rural areas



Source: AICD DH/MICS Survey Database, 2007.

Several countries have succeeded in moving at least 3 percent of their populations across any particular rung of the sanitation ladder each year (figure B). At the bottom end of the ladder, countries such as Côte d’Ivoire, Ethiopia, and Uganda are switching more than 3 percent of their population each year into the use of traditional latrines. Ethiopia is making the most rapid progress in reducing open defecation, moving more than 2 percent of its population away from this practice each year. A second group of countries—comprising Burkina Faso, Madagascar, Rwanda—is succeeding in upgrading more than 3 percent of the population each year into some type of improved latrine. Finally, at the top end of the ladder, Senegal (and only Senegal) has achieved a comparable pace of expansion for septic tanks.

Patterns of practice across country groups ... and appropriate policy responses

Beyond this picture, the anatomy of the sanitation challenge differs markedly across different groups of Sub-Saharan countries, and also across urban and rural settings within individual countries (figure C).

In urban areas, one discerns three distinct types of country. The largest group relies primarily on traditional latrines for urban sanitation. In the second group, improved latrines prevail, but traditional latrines still constitute a large share of sanitation. The third, small group of countries exhibits a bimodal pattern of access: close to half of the population has septic tanks, while the other half continue to rely on traditional latrines, and there is virtually no middle ground in the form of improved latrines.

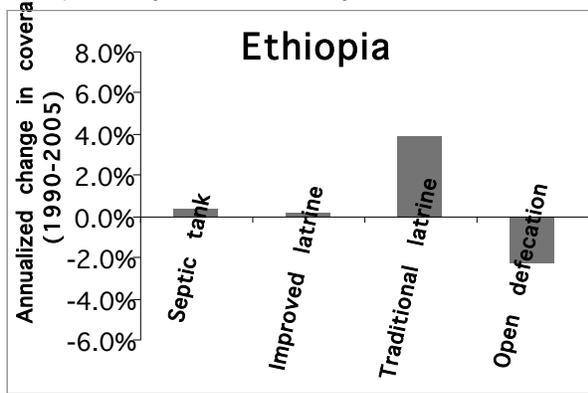
In rural areas, the three typologies are somewhat different. First, there is a group of countries in which open defecation is still practiced by the vast majority of the rural population. In the second and largest group of countries traditional latrines are the dominant sanitation mode in rural areas. A third group of countries has achieved significant coverage of improved latrines in rural areas, even though the majority still rely on traditional latrines or practice open defecation.

The implications of these major differences in the pattern of access to sanitation is that policies must be tailored to each setting. Where open defecation remains prevalent, promoting appropriate sanitary behavior is critical for two reasons. The first is to ensure that latrines are actually used when available, since there is widespread international evidence that such facilities may be altogether ignored by beneficiary households if there is no effort to engender behavioral change. The second is to ensure that latrines deliver the corresponding health benefits—less a matter of technology and material used and more a matter of good practices and behaviors.

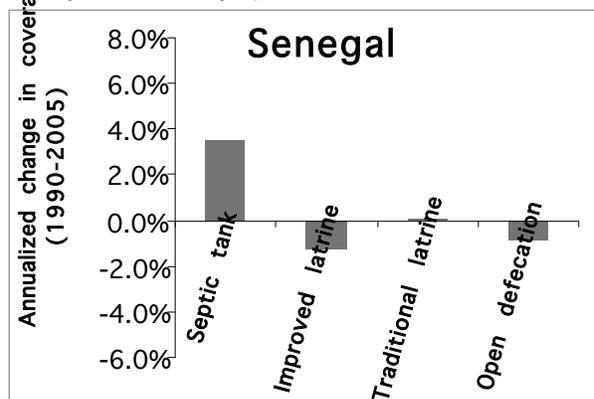
In settings where traditional latrines are already common, attention needs to focus on upgrading latrines to improved models. Here, the debate centers on whether the main bottleneck lies on the demand side of the market or on the supply side.

Figure B Successful examples from up and down the sanitation ladder

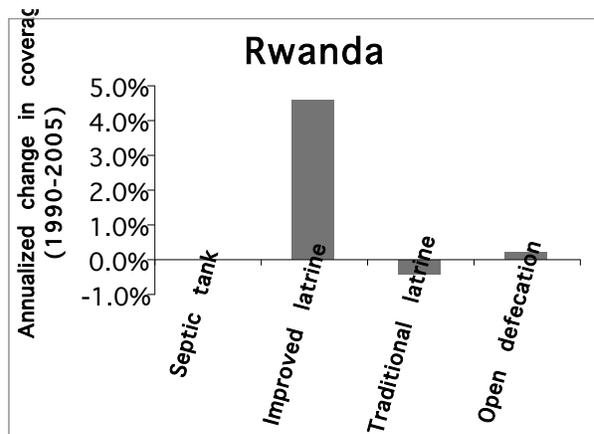
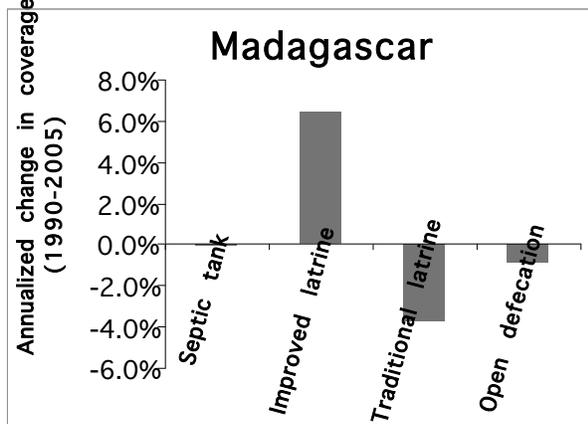
1. Ethiopia: Getting on to the bottom rung (below)



2. Senegal: Mainstreaming septic tanks



3. Madagascar and Rwanda: Upgrading latrines



Source: AICD DH/MICS Survey Database, 2007

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Figure C Patterns of access to sanitation across countries

Urban areas

Prevalence of traditional latrine: Central African Republic, Chad, Comoros, Republic of Congo, Ethiopia, Guinea, Lesotho, Malawi, Mali, Mauritania, Mozambique, Nigeria, Tanzania, Uganda, Sudan and Democratic Republic of Congo.

Prevalence of improved latrine: Benin, Burkina Faso, Cameroon, Ghana, Madagascar, Niger, Rwanda

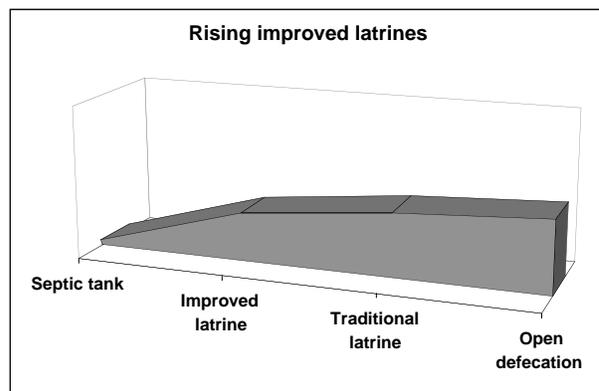
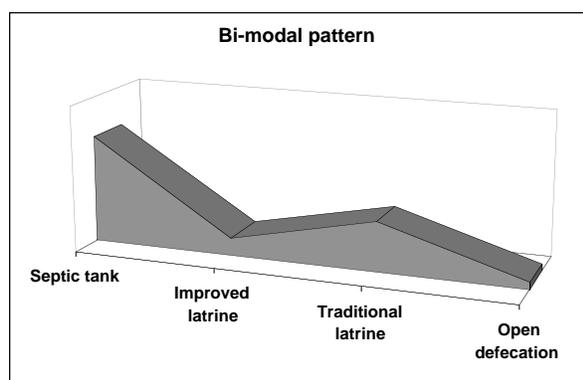
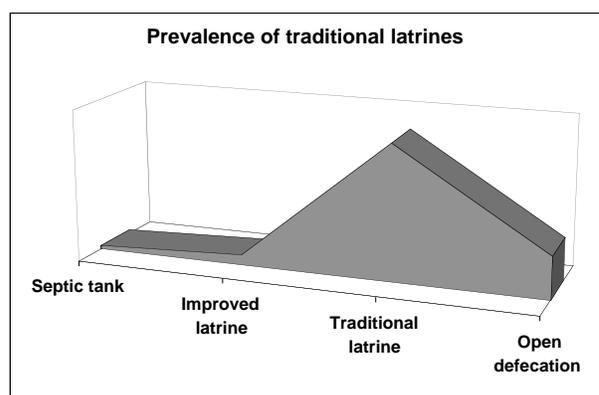
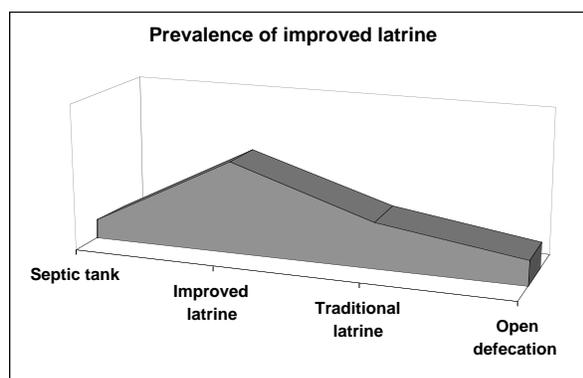
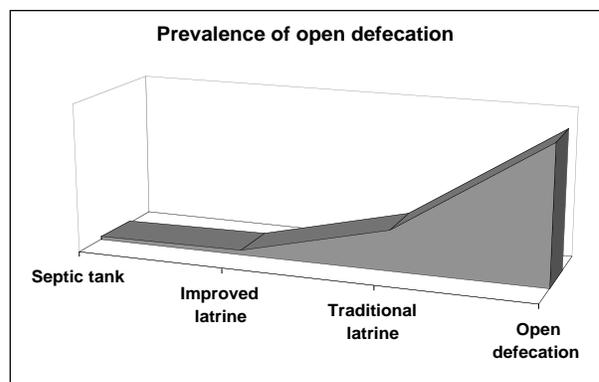
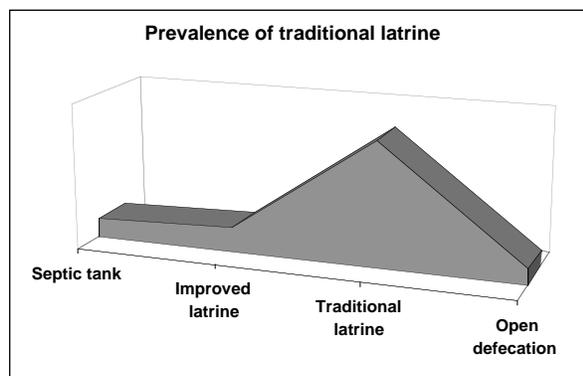
Bi-modal pattern: Côte d'Ivoire, Gabon, Kenya, Namibia, Senegal, South Africa, Zambia, Zimbabwe

Rural areas

Prevalence of open defecation: Benin, Burkina Faso, Chad, Côte d'Ivoire, Ethiopia, Mauritania, Mozambique, Namibia, Niger and Sudan

Prevalence of traditional latrines: Cameroon, Comoros, the Republic of Congo, Gabon, Ghana, Guinea, Kenya, Malawi, Mali, Nigeria, South Africa, Tanzania, Uganda, Zambia and Democratic Republic of Congo

Rising use of improved latrines: Central African Republic, Lesotho, Madagascar, Rwanda, Senegal, Zimbabwe



Source: AICD DH/MICS Survey Database, 2007.

From the supply side, the lack of improved latrines can be explained by limited knowledge in construction sectors of required designs, as well as the possible lack of key building materials in local markets. This hypothesis corresponds with the observed low prevalence of improved latrines across Africa (even in middle-income countries); traditional latrines serve a steady 40 to 50 percent of the population, even among the highest income groups, where the resources for more advanced facilities would appear to be available.

From the demand side, the low use of improved latrines may be a matter of affordability. Household incomes are low, and the higher capital costs of such facilities are relatively high. Analyses of sanitation investment costs in relation to very limited household budgets show that whereas traditional latrines appear quite affordable across the income spectrum, improved latrines represent more than a month of the household budget, even for households in the highest income group. This is consistent with the much-skewed distribution of improved latrines across the income spectrum.

It is likely that the low numbers of improved latrines can be traced to a combination of demand- and supply-side factors. Nevertheless, it is critical to tackle supply bottlenecks first. Otherwise, subsidy resources may be wasted on households that might have financed the facilities on their own had they been available. Moreover, allowing the local market to develop also provides space for innovation that may ultimately lower the cost of improved latrines and thereby at least partially address the affordability problem.

In cases where septic tanks have reached significant levels of penetration, the key issue becomes how to expand improved sanitation into lower-income segments of the population. While on-site sanitation is likely to remain predominant in Sub-Saharan Africa for some time to come, the method does have its limits. As urban population densities begin to increase, the limited availability of land will eventually become a binding constraint on the use of latrines. Furthermore, as private piped-water connections increase, per capita water consumption will also increase significantly, creating the challenge of safely returning large volumes of grey water. Sooner or later, Africa's burgeoning cities will be faced with the need to develop more extensive sewage networks. But given the acute affordability problems outlined above, it is critical to find ways to reduce the cost of sewer networks via technological innovation.

Greater visibility for an essential service

Across the region, the institutional framework for sanitation is fragmented. In contrast to the water-supply situation, the different elements of the supply chain—from hygiene promotion, to latrine construction, to latrine emptying—are in the hands of different public and private players, with multiple actors often present at each stage. This fragmentation prevents a single, powerful agency from emerging as champion of the sector and rescuing it from its neglected status. The recent trend toward decentralization of the sector has also made it more difficult to capture adequate public resources for sanitation, while allocating responsibilities to entities that may lack the requisite technical capacity to discharge them.

Some progress has been made in the region toward the adoption of national sanitation policies. The majority of countries have embraced a definition of sanitation and hygiene promotion relevant to establishment of a sanitation framework. Fifteen countries have also established national sanitation

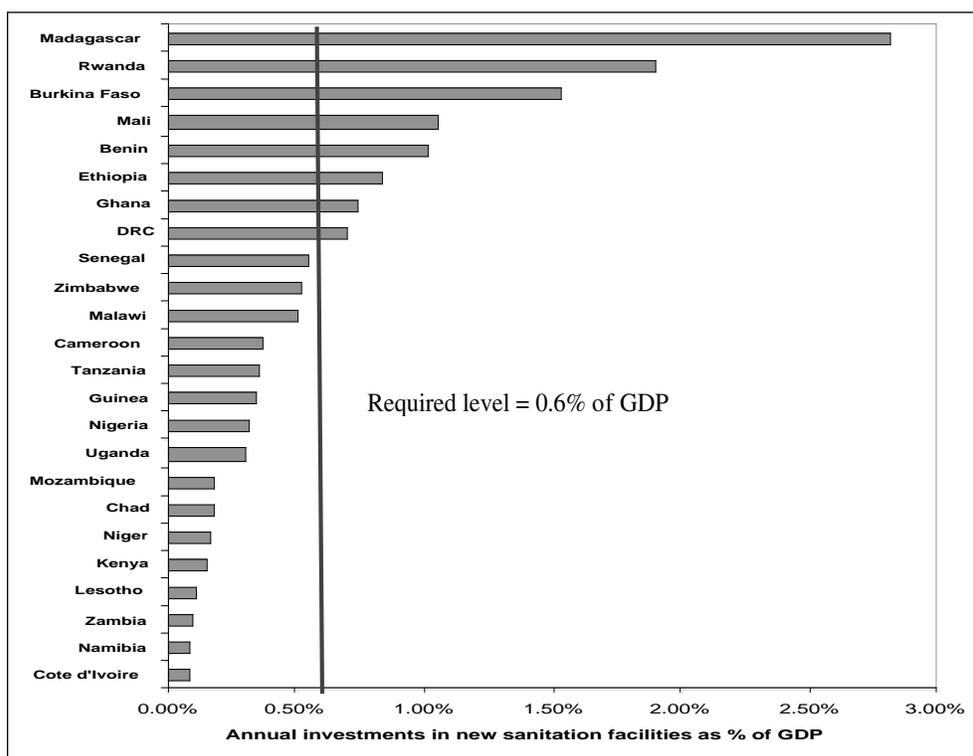
policies. That is progress. But key practical components of an effective sanitation regime—such as recovering operating costs, which is known to pay significant dividends—exist in only seven countries. And only eight countries have set up a sanitation fund or a dedicated budget line. In some cases, that fund or line is supplied exclusively by donors (as in Chad and Ethiopia). In others, funds come from a combination of government, sector levies, and donors.

Many ways to better sanitation

To meet the Millennium Development Goal for sanitation, Sub-Saharan Africa needs to invest an estimated 0.6 percent of its gross domestic product (GDP) annually in the sector. Meeting the target would bring substantial benefits in the form of reduced incidence of diarrhea, intestinal worms and trachoma—provided, of course, that the new sanitary facilities are accompanied by more hygienic behavior.

Using access trends, it is possible to estimate how much has in fact been invested by all parties in new sanitation facilities. The answer is 0.46 percent of GDP, not that far from the recommended level. But this overall average masks some differences across countries (figure D). Eight of the countries surveyed, including Madagascar,

Figure D Spending on new sanitation infrastructure as percentage of GDP



Source: AICD DH/MICS Survey Database, 2007.

Rwanda, Burkina Faso, Mali, Benin, Ethiopia, Ghana, and the Democratic Republic of Congo stand above this benchmark level. In particular, Madagascar and Rwanda, which have been noted as making very rapid progress, have been investing as much as 2–3 percent of their GDP in sanitation. Conversely, most countries have invested less than 0.6 percent of GDP—some as little as 0.1 percent.

Owing to decentralization and lack of clear accounting for sector expenditure, it is hard to pin down how much of the estimated total spending on sanitation comes from the public purse, as opposed to

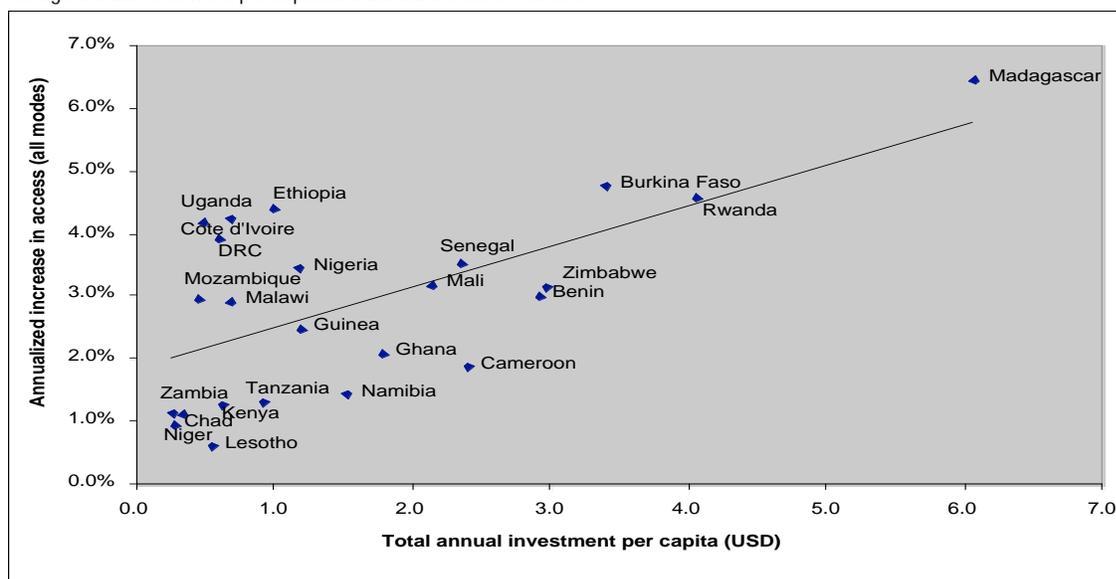
household budgets. The few countries with available evidence report average public spending on sanitation to be no more than 0.15 percent of GDP, about a third of estimated total spending. Households, then, appear to be footing the bill.

But here, too, country differences are great. For those countries where data are available, public investment may account for either a dominant or just a negligible fraction of the overall investment envelope. The limited evidence suggests that a substantial allocation of public resources is not always a prerequisite for significant progress. Rwanda, for example, has made rapid progress in extending improved sanitation with hardly any reported public expenditure. Côte de Ivoire, on the other hand, has been successful in spreading the use of traditional latrines, with the state covering a high proportion of the cost. Conversely, Kenya shows poor advances on sanitation despite a considerable level of government spending.

By comparing the annualized percentage increase in access to sanitation in all forms with per capita spending (both public and private) on sanitation, it is possible to summarize the relationship between spending and outcomes (figure E). Countries above the line are getting relatively rapid progress out of their estimated spending; countries below the line are not.

Figure E Investment in sanitation and increases in access to sanitation

Average annual investment per capita and annual increase in access



Source: AICD DH/MICS Survey Database, 2007.

Factors that contribute to putting countries above the line are effective sanitation policies, emphasis on relatively low cost sanitation modes, and, in some cases, large household sizes, which make it cheaper to expand access. A large share of countries are spending no more than US\$1 per capita per year on sanitation, but even within this group, countries such as Côte de Ivoire, Ethiopia, and Uganda have managed to make much faster progress than the rest. Countries making progress on the higher rungs of the ladder—such as Burkina Faso, Madagascar, Rwanda, and Senegal—tend to spend much larger amounts, ranging from US\$2 to US\$6 per capita per year.

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While the region has made insufficient progress toward the target for sanitation set forth in the Millennium Development Goals, there are hopeful signs, particularly on the bottom rung of the sanitation ladder, where most of the action is concentrated. The practice of open defecation is becoming a bit less common, but much social marketing remains to be done to encourage the adoption of sanitation. Several countries have set good examples of how to accelerate sanitation improvements at different levels. Although public spending on the sector remains very low, households themselves appear to be making substantial investments, particularly in traditional latrines, while intermediate service levels, notably the improved latrine, still look like too much of a luxury. The continued dominance of traditional latrines demands a more nuanced understanding of the level of protection this mode of sanitation does—or could, if accompanied by the right behaviors—provide.