

THE TRUE COST OF POOR SANITATION

LIXIL

Link to Good Living

WaterAid

**OXFORD
ECONOMICS**



PREFACE

The UN Global Goals on Sustainable Development are a promise to eradicate extreme poverty and create a fairer, more sustainable world by 2030. Among these is Goal 6, to reach everyone everywhere with safe water and sanitation, without leaving anyone behind. Looking at past progress rates, providing adequate and equitable sanitation for all looks like a daunting challenge. But we know it is achievable if sanitation is prioritized, adequately financed and innovative ways to reach the unserved are found.

The fundamentals haven't changed since the 19th century when early industrialising countries implemented sanitation programmes. More recently, East Asian economies that have transitioned from low to high income status in the last 50 years have demonstrated that: political prioritization is critical (Korea's President Park issued new decrees building up sanitation policy almost every year, integrating it with education and rural development); innovative financing is needed, such as long-term government loans, local tax collection, and cross-sectoral subsidies (for example, through subsidised improved housing in Singapore); and new regulatory structures are required, developing accountability between the powerful and the poor.

The significant amount of funding mobilized played a role in these success stories, and similarly a step change is now required to extend sanitation coverage to those unserved by 2030. Some will say it will be too expensive. But the costs of failing are far greater, as this report highlights.

In addition to prioritization and finance, we need creative, innovative approaches to extend sanitation coverage to those living in challenging environments and facing environmental and resource constraints. This includes those living in slums and water-scarce or flood-prone areas, who are increasing in numbers as a result of urbanisation dynamics and the effects of climate change. Innovative technologies and services are an important part of the solution in these contexts.

The private sector has an important role to play. Global corporations like LIXIL can collaborate in platforms that advocate for the political prioritization of sanitation. With the taxes they pay, they contribute to strengthening national revenue systems that can finance sanitation services. And they can use their strong expertise and innovative ethos to solve some of the obstacles to making access to sanitation universal.

*Kaoru Takahashi
Executive Director
WaterAid Japan*



FOREWORD

It is increasingly well understood today that poor sanitation results in poor health and unnecessary deaths. From John Snow's 1854 discovery that disastrous outbreaks of diarrhea, cholera and dysentery could be prevented simply by removing the pump on a drinking well – preventing the inhabitants of London's Soho from drinking fatally contaminated water – to the latest 'space-age' technologies supported by the Bill and Melinda Gates Foundation's 'Reinvent the Toilet Challenge,' creative thinking and innovation have been central to the history of sanitation and to saving a countless number of lives.

However, for all the headway made in the last century, every day thousands of people die needlessly from diseases caused by poor sanitation. The human capacity to innovate seems limitless. And yet, while we have sent spacecrafts to explore worlds beyond our solar system, 1/3 of us living on this planet today still do not have a safe and clean place to go to use the toilet. One billion of us still defecate in the open. If we believe that access to a safe and clean toilet is about basic human dignity, the current situation is simply not acceptable. And we know that the lack of access to basic sanitation has significant implications for society and our economies.

New research in this report, building on pioneering work from the World Bank's Water and Sanitation Programme, underscores the hidden costs of poor sanitation. Death and disease are tearing families apart. Children drop out of school and fail to reach their potential, especially young girls. The research shows how poor sanitation has a substantial impact on the economy. Countries with poor access to sanitation are losing significant proportions of their GDP – in India, this figure is over 5%.

With such significant social and economic costs associated with poor sanitation, the argument for addressing this challenge cannot be ignored. More investment is needed, not just in terms of capital investment, but also in terms of a broader dialogue and discussion among governments, international organizations and the private sector about the need to prioritize this urgent issue. The time for concerted, coordinated action is now.

*Jin Montesano
Chief Public Affairs Officer
LIXIL Group Corporation*



RESEARCH METHODOLOGY

The research cited within this report was conducted by Oxford Economics on LIXIL's behalf. The work uses the same economic assumptions from previous research undertaken by the World Bank's Water and Sanitation Program (WSP), and uses modelling techniques to build on this prior work to produce an up-to-date and comprehensive estimation of the cost of poor sanitation.

Oxford Economics carried out bespoke econometric analysis to assess the relationship between costs estimated in the WSP study and a variety of driver variables. The Oxford Economics model calculates costs associated to poor sanitation in relation to four of the most significant dimensions originally analysed by the WSP:

1. MORTALITY:

The economic cost from related instances of premature death due to poor sanitation.

2. PRODUCTIVITY:

The value of economic activity lost due to sanitation-related sickness.

3. HEALTHCARE:

The cost of treating sanitation-related diseases including both public- and private- sector treatment.

4. ACCESS:

The value of time foregone due to people not having access to a toilet.

This analysis was then used to update the estimated cost in countries covered by the WSP research; and create cost estimates for other countries not covered in the WSP.

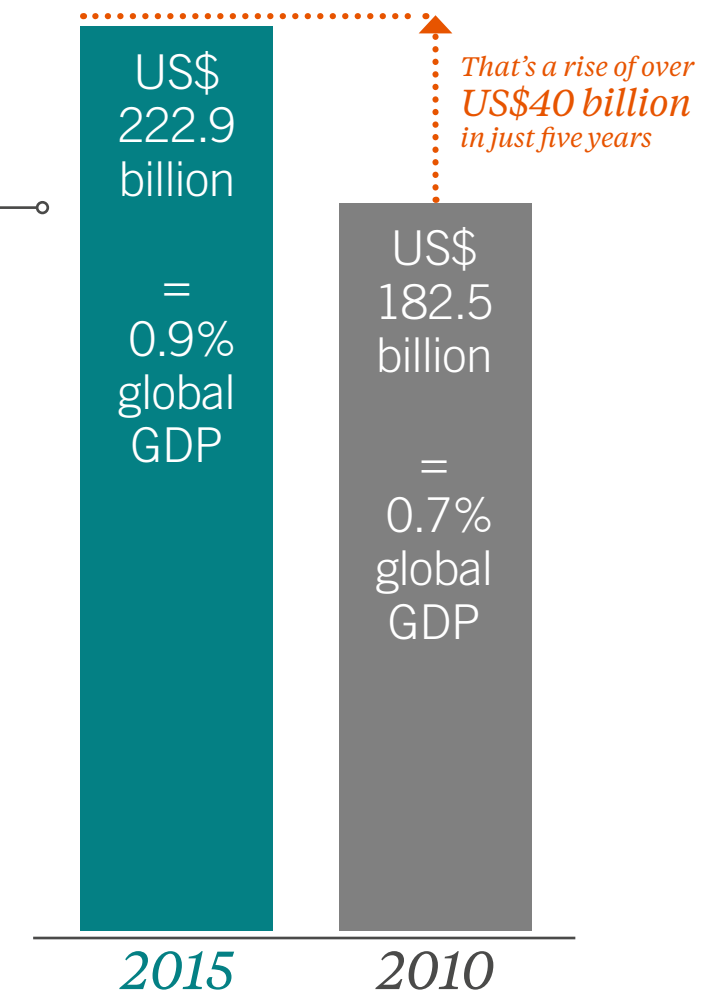
The research looks at the costs of poor sanitation for a total of 110 countries.

POOR SANITATION COST THE WORLD US\$222.9 BILLION IN 2015

Lack of access to sanitation cost the global economy US\$222.9 billion in 2015, up from US\$182.5 billion in 2010, a rise of over US\$40 billion in just five years. This figure constitutes an average 0.9% of gross domestic product (GDP) of the countries impacted by poor sanitation, which has risen from 0.7% of GDP just five years ago.

US\$222.9 billion is more...

-  ...than 50 times the cost of the Rio Olympics
-  ...than the Chinese defense budget
-  ...than the US education budget
-  ...than the GDP of Portugal, Greece or Vietnam





WHERE DO THESE COSTS COME FROM?

Poor sanitation has a range of negative impacts on society and the economy, from causing debilitating and deadly diseases via the contamination of drinking water sources and food with pathogen laden human waste, to associated losses in productivity due to sickness and toilet access, and increased healthcare costs from caring for the sick. Equally important, though difficult to measure in dollar terms, is the risk of attack faced by women and girls who must find a secluded place away from their homes to relieve themselves, children and young adults missing out on education because there is nowhere private to manage menstruation with dignity, or children suffering from malnutrition caused by diarrheal disease.

The cost dimensions that lead to such significant costs include:

MORTALITY

US\$122.8 BILLION

Diarrhoeal disease, of which unsafe water, inadequate sanitation and poor hygiene are the major contributing factor, is significant in communities with poor access to sanitation and it is according to the World Health Organization (WHO) the **7th biggest killer in the world, responsible for 1.5 million deaths in 2012**, higher than tuberculosis (900,000 deaths in 2012) and malaria (438,000 deaths in 2015).

Every life lost needlessly because of poor sanitation has an incalculable emotional cost on the family of the deceased. Each premature death also puts economic strain on the family and country of residence, calculated by the discounted potential income lost due to each life un-lived to its full potential.

PRODUCTIVITY

US\$16.5 BILLION

Aside from diarrhea related mortality, **millions of people are unable to maximize their economic productivity due to sickness and disease caused by the pathogens contained in human waste**. Billions of hours of labor are lost every year, with a significant impact on the global economy.

HEALTHCARE

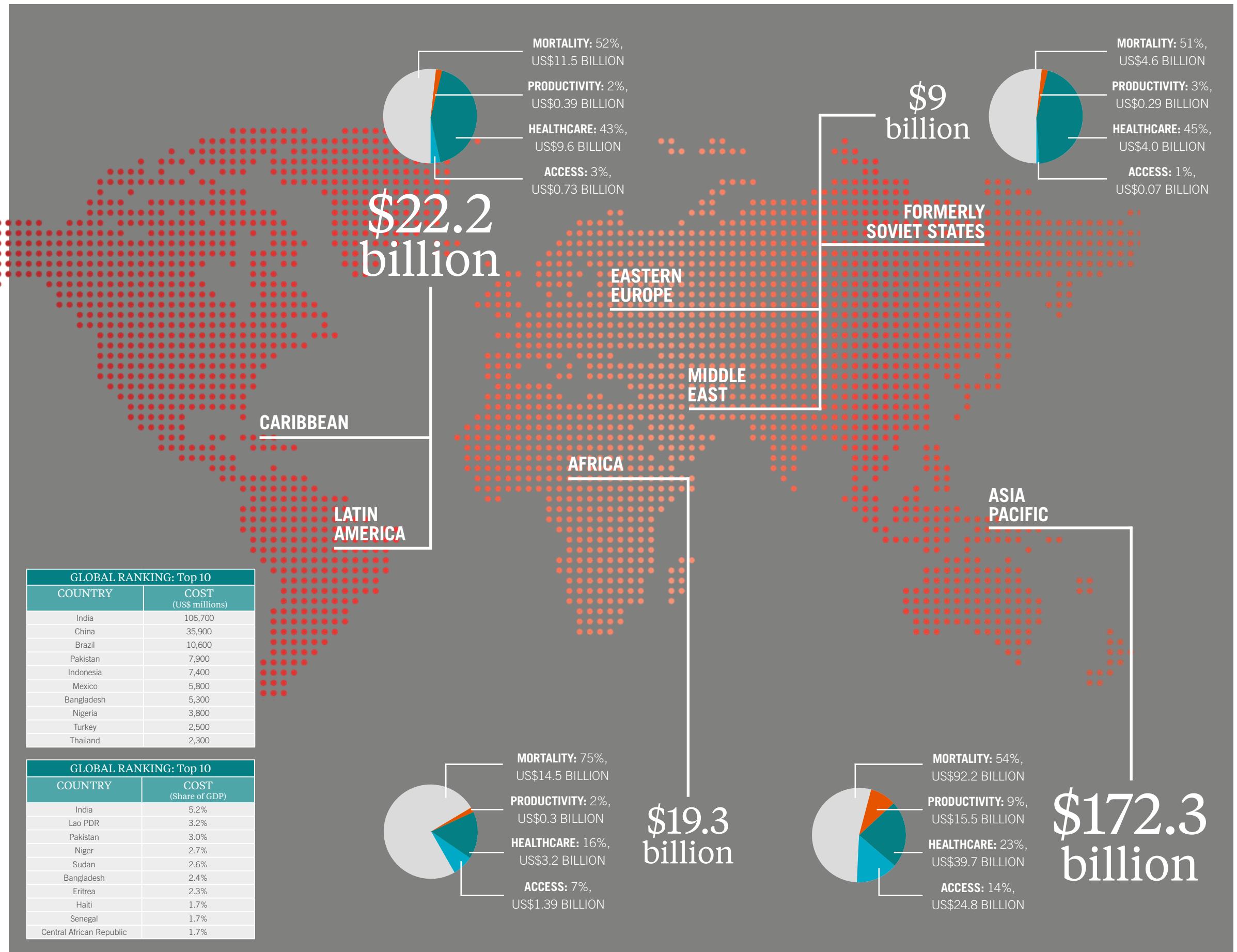
US\$56.6 BILLION

Treatment for sanitation related disease, whether provided by the state or paid for by the individual (in a child's case, their guardians) through insurance or direct payment, **takes money out of the economy that could otherwise have been spent differently**.

ACCESS TO SANITATION

US\$27 BILLION

In many countries, **a significant proportion of the population does not have easy access to a toilet** and therefore must use public facilities, which they must queue for, or find a place for open defecation. Both queuing and looking for a site for open defecation take time that could otherwise be used for economic pursuits, and therefore have a negative economic impact.



GLOBAL RANKING: Top 10	
COUNTRY	COST (US\$ millions)
India	106,700
China	35,900
Brazil	10,600
Pakistan	7,900
Indonesia	7,400
Mexico	5,800
Bangladesh	5,300
Nigeria	3,800
Turkey	2,500
Thailand	2,300

GLOBAL RANKING: Top 10	
COUNTRY	COST (Share of GDP)
India	5.2%
Lao PDR	3.2%
Pakistan	3.0%
Niger	2.7%
Sudan	2.6%
Bangladesh	2.4%
Eritrea	2.3%
Haiti	1.7%
Senegal	1.7%
Central African Republic	1.7%

ASIA PACIFIC CARRIES THE HEAVIEST BURDEN OF POOR SANITATION

Regionally, in terms of total US\$ value, the economic burden of poor sanitation is heaviest in Asia Pacific, which is accountable for a cost of US\$172.3 billion, over 3/4 of the total amount.

Latin America and the Caribbean, and Africa account for approximately 10% of the global cost each, with costs in Latin America and the Caribbean being US\$22.2 billion and US\$19.3 billion in Africa. Combined, Eastern Europe, the formerly Soviet states and the Middle East account for the remaining US\$9 billion of the global cost of poor sanitation.

In terms of losses to regional GDP, Asia Pacific suffers the greatest losses at 1.1% of GDP. The impact on African GDP caused by poor sanitation is a loss of 0.9%, in Latin America and the Caribbean it is 0.6% of GDP and 0.4% in Eastern Europe, the formerly Soviet states and the Middle East.

On a national level, in terms of total cost, India suffers by far the most, with US\$106.7 billion wiped off GDP in 2015, almost half of the total global losses, and 5.2% of the nation's GDP. While India comes out top with huge losses in both total US\$ economic losses and as a % of GDP, the rankings of countries by GDP and total US\$ diverge significantly due to the relative size of national economies, as shown by the tables on the facing page.

US\$1 invested in sanitation would give an economic return of between US\$3 and US\$34, depending on the region.

World Bank

HOW CAN WE TACKLE THE SANITATION CRISIS?

Working with our partners from across the spectrum of business and civil society, we have defined three priority areas that are key in ensuring sustainable sanitation solutions for all.

1 INNOVATION

Often, existing sanitation products are unsuited to the contexts of those living without access to a toilet. For instance, the typical 'western-style' flush toilet uses around 13 litres of water for each flush. With around 1/5 of the world's population living in areas of water scarcity – often coinciding with areas that also suffer poor sanitation coverage – such technology is not appropriate for the circumstances. Sanitation solutions that meet the specific needs of underserved communities must be developed, with considerations including, but not limited to:

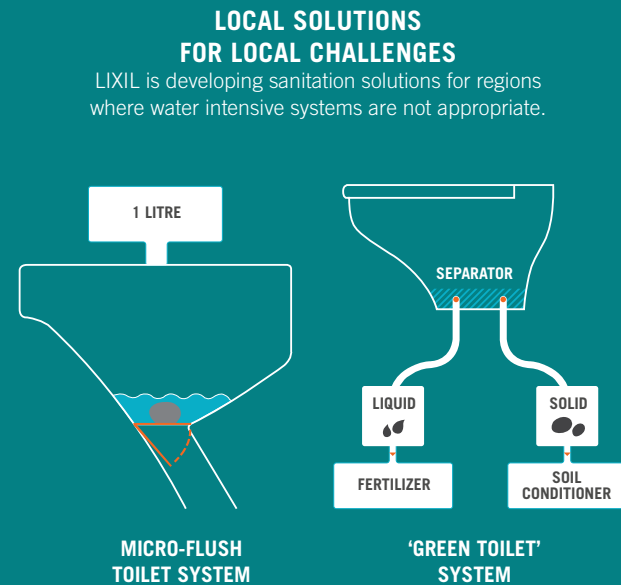
- » Limited water / waterless flushing
- » Integrating faecal sludge management considerations
- » Adaptations for various cultural / religious contexts
- » Reduced cost of purchase, installation and maintenance

Of course, innovation is not limited to designing new sanitation hardware. There is a key role for novel thinking in supply chains and logistics to ensure sanitation products reach the end consumers, in creating social enterprises suited to marketing products according to local contexts and in financing on both the supply and demand sides.

SaTo

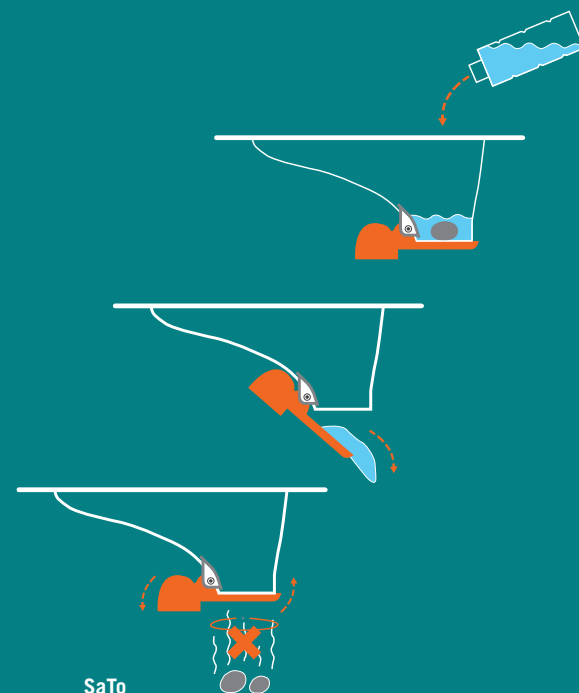
LIXIL is at the forefront of innovating to address the sanitation crisis. One of the solutions currently on the market is the SaTo (for Safe Toilet) pan, a low-cost, high-quality plastic pan for use with pit-latrines, initially developed by LIXIL's American Standard. The counterweighted trapdoor fits over the hole in the concrete slab, allowing waste to flow through, while sealing shut to keep out flies, other insects and odors. Since 2013, over 500,000 SaTo toilets have been donated to nongovernmental organizations for installation in homes and schools in Bangladesh, and another 530,000 have been sold around the world to consumers for less than \$2 each.

LIXIL has developed three retooled versions of the SaTo, the first of which was launched in Uganda in January this year, with the others to be commercialized in January 2017. These toilets provide the same benefits - eliminating the smell and sight of waste - but fit the constraints of sub-Saharan Africa, where concrete can be more expensive and water is too precious a commodity to use for toilet flushing.



The Micro-Flush Toilet System improves the water efficiency of toilet and sewage systems.

Another is the Green Toilet System, designed to treat human waste in an environmentally friendly way by separating liquid and solid waste and treating solid waste with a local microorganism to kill pathogens. Users are encouraged to complete the recycling process by bringing the solid waste to a nearby composting site and then using the compost to fertilize farmland.



2 POLITICAL PRIORITIZATION

The social and economic impacts of improving sanitation are irrefutable. Politicians at international, national and local levels must put sanitation firmly at the top of their agenda, and reflect this in national planning and budgeting. The research in this paper shows that sanitation impacts a range of development areas. The economic boost from improving sanitation would have a multiplier effect across themes as diverse as gender equality and education, nutrition and healthcare.

Ensuring the sustainability of new and existing services is critical to achieving universal access, and this requires national governments to establish and support the monitoring, operations and maintenance systems needed to ensure service failures are quickly and efficiently fixed, and provision is extended equitably and affordably.

With the 193 UN member states unanimously agreeing on the Sustainable Development Goals (SDGs) in September 2015, there is unprecedented political will to deliver the poverty reduction agenda by the 2030 deadline. Goal 6.2 seeks to "achieve access to adequate and equitable sanitation for all." This is no mean feat. Of all the Millennium Development Goals, the target for sanitation was missed by the widest margin. With the SDG targets now agreed, the focus has shifted to developing robust implementation plans.

There have been notable successes in delivering vastly improved sanitation coverage guided by high-level political leadership. Governments and policy makers seeking to emulate this success can look to Singapore, South Korea, Malaysia and Thailand and learn from their experiences.¹

"If we are able to provide access to basic sanitation, we will reduce the health risks that people are exposed to. It will also mean that school attendance will be much more frequent and, even for the adult population, absence from work due to illness will decrease, so it improves their ability to put food on the table and increases their productivity."

Health affects productivity. So, if we reduce that exposure to health risks, then certainly we are giving people a better chance to improve their economic status.

There is value for government in working with the private sector on this issue. If we could have resolved this issue alone, we would have done it a long time ago. Innovation is in the hands of the private sector and civil society. By seeking synergies between private companies, civil society and government, we stand a chance of coming up with innovative solutions to the problems we are facing currently. Government must create an environment where this kind of collaboration can take place."

*Mr. Patrick Tom Odongo
Nairobi County Executive Committee,
Member for Urban Renewal and Housing*



¹ For more information, see WaterAid, Achieving total sanitation and hygiene coverage within a generation – lessons from East Asia, 2016



3 COLLABORATION & COORDINATION

Addressing the sanitation crisis is a complex issue that no single person or institution could hope to solve alone. Collaboration among diverse players with different skill sets will drive disruption and encourage the innovation the situation needs. Coordinated efforts led by national governments working alongside intergovernmental organisations, NGOs, academia and the private sector will ensure brainpower and funding is put behind the most promising solutions. This approach enables each stakeholder to efficiently leverage their core skills, thereby ensuring that effective programmes can be taken to scale with the necessary speed.

The Sanitation and Water for All partnership, a global partnership to achieve universal access to clean water and adequate sanitation, has endorsed four 'collaborative behaviours' that governments and donor agencies should practice to ensure that financing can be as efficient and effective as possible.

› A. ENHANCE GOVERNMENT LEADERSHIP OF SECTOR PLANNING PROCESSES:

Government leadership is essential for directing and coordinating resources – including external support – around nationally agreed sector priorities, strategies and plans.

› B. STRENGTHEN AND USE COUNTRY SYSTEMS:

Core country systems (i.e. management of public finances, procurement and contracts) need to be made more effective and transparent. These systems are key to financing expenditures for water and sanitation services as well as for monitoring and regulating these services.

› C. USE ONE INFORMATION AND MUTUAL ACCOUNTABILITY PLATFORM:

In order to decide where to invest and how to sustain and improve water and sanitation services, it is critical that sectors have reliable data and hold each other to account on progress.

› D. BUILD SUSTAINABLE WATER AND SANITATION SECTOR FINANCING STRATEGIES:

Transparency and predictability of resources is important in allowing governments to exercise a leadership role. Sector financing strategies that incorporate financial data on taxes, tariffs and transfers and realistic estimates for all costs are critical components of effective sector planning in the medium and longer term.

The global private sector has an important role to play. Fundamentally, the private sector must contribute in three mission critical areas:

- » Businesses have the global reach and supply chains to deliver sanitation solutions to those in communities with no access to toilets.
- » Companies have the research and development resources, and capabilities to develop innovative services and products, turning a concept into a marketable product with the speed needed to address the sanitation crisis.
- » Creating a 'new normal' in behaviour and attitudes through marketing and market development activities. Many global corporations have the critical skillsets to increase consumer demand for proper sanitation by changing what are considered to be social norms in off-grid communities. There is good work being done in this area, but greater resources and more research needs to be committed to create the change we want to see – making access to safe sanitation the 'new normal'.

One example of public-private collaboration to tackle sanitation is the Toilet Board Coalition, co-founded by LIXIL and partners in 2014. The Toilet Board Coalition seeks to catalyse a new sector for innovative technology and business models that improve access to toilets in a commercially sustainable way.



IN CLOSING

Decisive actions guided by determined political leadership are needed to create sustainable, transformative change in sanitation coverage. Governments will need support from a range of actors, and LIXIL as well as other like-minded partners are committed to playing a part.

LIXIL aims to make its own contribution by enabling improved access to sanitation and hygiene for 100 million people by 2020. Product innovation is where the company's strength lies, and innovations like the SaTo portfolio will help it achieve this target.

However, more organizations in both the public and private sector need to take sanitation more seriously and recognize the impact of improving access to sanitation, both economic and societal. As this report makes evident, there is significant value in addressing one of the most pressing social and public health challenges of our time. But only with all sectors of society working together can we tackle the myriad of issues relating to poor sanitation and begin to drive change.

LIXIL

Link to Good Living

LIXIL is the most comprehensive and connected global company in the housing and building industry, with operations encompassing more than 80,000 employees in over 150 countries. Delivering core strengths in water, housing, building and kitchen technologies, our brands including LIXIL, GROHE, American Standard and Permasteelisa are leaders in the industries and regions in which they operate, bringing better living solutions today and for future generations.

www.lixil.com

WaterAid

WaterAid's vision is of a world where everyone has access to safe water and sanitation. The international organisation works in 37 countries across Africa, Asia, Central America and the Pacific Region to transform lives by improving access to safe water, hygiene and sanitation in some of the world's poorest communities. Since 1981, WaterAid has reached 23 million people with safe water and, since 2004, 21 million people with sanitation.

For more information, visit www.wateraid.org.

OXFORD ECONOMICS

Oxford Economics was founded in 1981 as a commercial venture with Oxford University's business college to provide economic forecasting and modelling to UK companies and financial institutions expanding abroad. Since then, it has become one of the world's foremost independent global advisory firms, providing reports, forecasts and analytical tools on 200 countries, 100 industrial sectors and over 3,000 cities. Oxford Economics' best-of-class global economic and industry models and analytical tools give an unparalleled ability to forecast external market trends and assess their economic, social and business impact.