

# Global and Regional Costs of Achieving Universal Access to Sanitation to Meet SDG Target 6.2

November 2020

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## Acknowledgements

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## Summary



**To achieve universal sanitation**, as covered in Target 6.2 of the Sustainable Development Goals (SDG), one important piece of information to know is what expenditure is required to achieve it – how much is needed, where it is needed, and when it is needed. At the beginning of the SDG period, a cost study that included Targets 6.1 and 6.2 was published by the World Bank – it found that sanitation accounted for an important part – 60 per cent – of the US\$ 114 billion annual costs needed to achieve the SDG WASH targets 6.1 and 6.2. As progress is made towards the SDG targets, new estimates are needed to assess what is the current funding gap and also to support advocacy efforts to fill the gap. Hence, this study provides an update on the required expenditure to meet the 2030 global targets on household sanitation.



**The cost model used** by the previous World Bank study was utilized to estimate updated cost estimates for 13 years from 2017 to 2030, and it included the same 140 low- and middle-income countries. The results are presented by SDG region. The following were updated to 2017 estimates: sanitation coverage estimates on open defecation rates and household use of basic and safely managed sanitation facilities; unit costs were updated by the GDP deflator for each country; Gross Domestic Product of each country was updated to 2017 estimates using World Bank open data; and population estimates and projections were updated for both rural and urban areas.



**The figure overpage shows the annual costs** from 2017 to 2030, which are US\$ 105 billion to meet the sanitation component of SDG target 6.2, accounted for by US\$ 36 billion for basic sanitation and an additional US\$ 69 billion for safely managed sanitation. To eliminate open defecation, the first-time capital costs are US\$ 1.5 billion annually with significantly greater capital replacement costs of US\$ 3.9 billion annually.

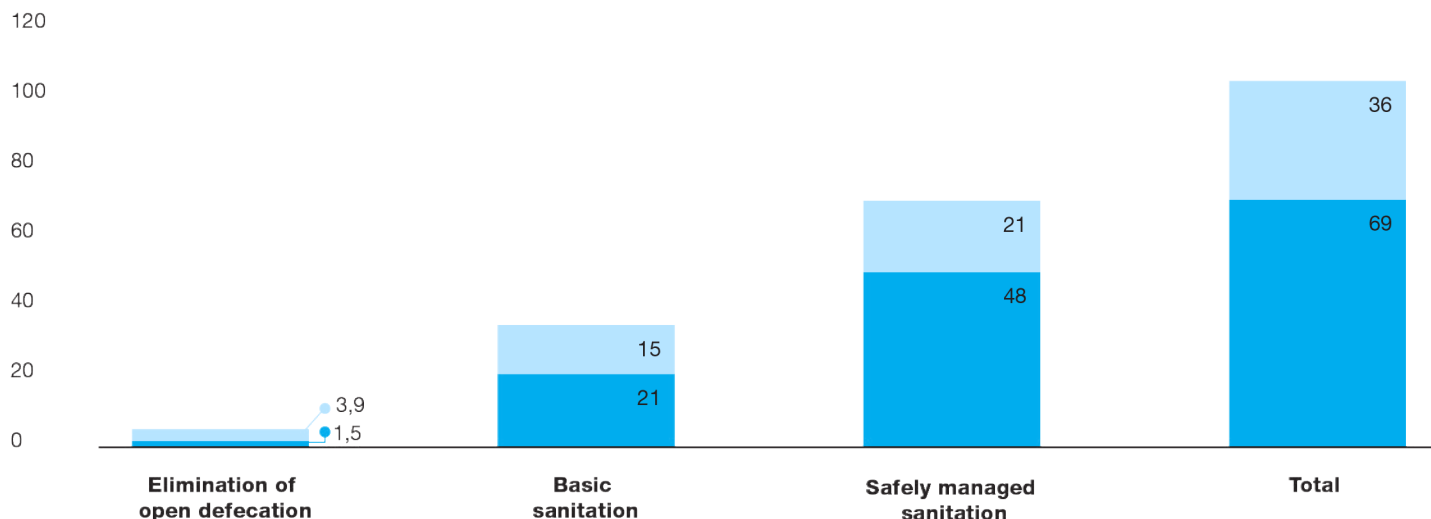
Côte d'Ivoire, April 23, 2018  
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## Annualized costs of achieving universal sanitation globally from 2017-2030, by service level and cost type

● Capital costs  
● O&M costs

US\$ Billion



**Sub-Saharan Africa (SSA)** accounts for nearly 50% of the costs of achieving basic access, and 39% of the global costs of achieving safely managed sanitation. Factors contributing to high costs for the SSA region include having the lowest sanitation coverage rates, high population numbers and high unit costs. When costs are expressed as a proportion of Gross Regional Product (GRP), sub-Saharan Africa also has the highest, where 0.6% and 1.6% of GRP is required to cover capital costs of extending basic and safely managed sanitation to the unserved, respectively, with an additional 0.4% and 0.8% of GRP needed for O&M costs for basic and safely managed sanitation, respectively.

**Globally, more than 70%** of annual costs of extending and maintaining basic sanitation services are in urban areas, compared to 65% for extending and maintaining safely managed sanitation services. Overall costs increase over time, accounted for by the growing O&M costs which increase from about 10% of the total costs in 2017 to 40% of total costs in 2029 for safely managed sanitation.

**While the primary aim** of this study is to provide updates on the global and regional costs of achieving universal sanitation within SDG Target 6.2, to be used for global and regional policy dialogue and fund-raising, its true purpose is to raise the importance of conducting more fine-tuned costing studies at country level and below. As a first step, countries can utilize the SWA WASH SDG costing tool, created by the World Bank and UNICEF, available on the tools portal of the Sanitation and Water for All (SWA) partnership. More in-depth costing studies are encouraged, reflecting the variations in technologies and unit costs at sub-national levels and for different population groups, as well as the need to rehabilitate or replace aging infrastructure. In addition, local risks (such as climate adaptation), customs and preferences need to be taken into consideration which have a bearing on technologies chosen, management models and their costs.

# 01 Introduction

To meet Target 6.2 of the Sustainable Development Goals (SDG), which includes sanitation<sup>1</sup>, one important piece of information to know is what expenditure is required to achieve it – how much is needed, where it is needed, and when it is needed.

At the beginning of the SDG period, a cost study that included Targets 6.1 and 6.2 was published by the World Bank (Hutton and Varughese, 2016). The study estimated that US\$ 114 billion is needed annually from 2015 to 2030 to cover the capital costs of expanding access to the unserved population to meet the global water, sanitation and hygiene (WASH) targets (SDG Targets 6.1 and 6.2). The study included 140 low- and middle-income countries as well as developed countries that had not yet achieved universal access to basic sanitation (see Annex). In the study, it was estimated that US\$ 19.5 billion was needed annually for basic sanitation and an additional US\$ 49.3 billion

annually for safely managed sanitation, totaling US\$ 68.8 billion annually. Therefore, sanitation accounted for an important part – 60 per cent – of the US\$ 114 billion annual costs needed to achieve the SDG WASH targets 6.1 and 6.2.

As progress is made towards the SDG targets, new estimates are needed to assess what is the current funding gap and also to support advocacy efforts to fill the gap. Hence, this study uses updated global coverage data on SDG target 6.2 from the WHO/UNICEF Joint Monitoring Programme (2019) for the year 2017 to estimate the required expenditure to meet the 2030 global targets on household sanitation.

<sup>1</sup> SDG Target 6.2: By 2030, achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations



India, December 17, 2019  
© UNICEF/ Narain

# 02 Methods

The cost model used by the World Bank study was utilized to estimate updated cost estimates for 13 years from 2017 to 2030, and the full methods and data sources can be found in that report (Hutton and Varughese, 2016). The model was updated to account for more recent global coverage estimates and the thirteen remaining years the world had in 2017 to meet the sanitation target within target 6.2, in order to estimate annualized costs in total and as a percentage of GDP.

The same 140 countries were included in this update as the original study (see Annex) and presented in SDG regions. The following variables were updated:

①

**Coverage estimates** from World Health Organisation and UNICEF Joint Monitoring Programme report 2019, with 2017 estimates for open defecation rates, coverage of basic sanitation and coverage of safely managed sanitation. For countries with missing data on safely managed sanitation, data from a closely matching country were used.

②

**All unit costs** were updated by the GDP deflator for each country to 2017 prices, which approximates the inflation rate, available from World Bank open data.

③

**The Gross Domestic Product** of each country was updated to 2017 estimates using World Bank open data, which enabled comparison of regional costs with the regionally aggregated GDP estimates or the Gross Regional product (GRP).

④

**Population estimates** and projections were updated from 2017 to 2030 for both rural and urban areas.

Hence the cost estimates in this update relate to the coverage gap reflected by the 2017 estimates, with 13 years of implementation until 2030.

The results are presented regionally and globally rather than at the country level for two reasons. First, the model made standard assumptions about which technologies would be adopted to meet the targets, which might not reflect the actual technologies selected by countries.

Second, data were extrapolated from other countries for many data points. For national estimates, the reader is encouraged to download a tool for estimating national WASH costs from the tools portal of the Sanitation and Water for All (SWA) partnership<sup>2</sup>. The tool is called the SWA WASH SDG costing tool, and it was created by the World Bank and UNICEF. It has been used by over 40 countries since 2017 to estimate SDG WASH costs and financing gaps.





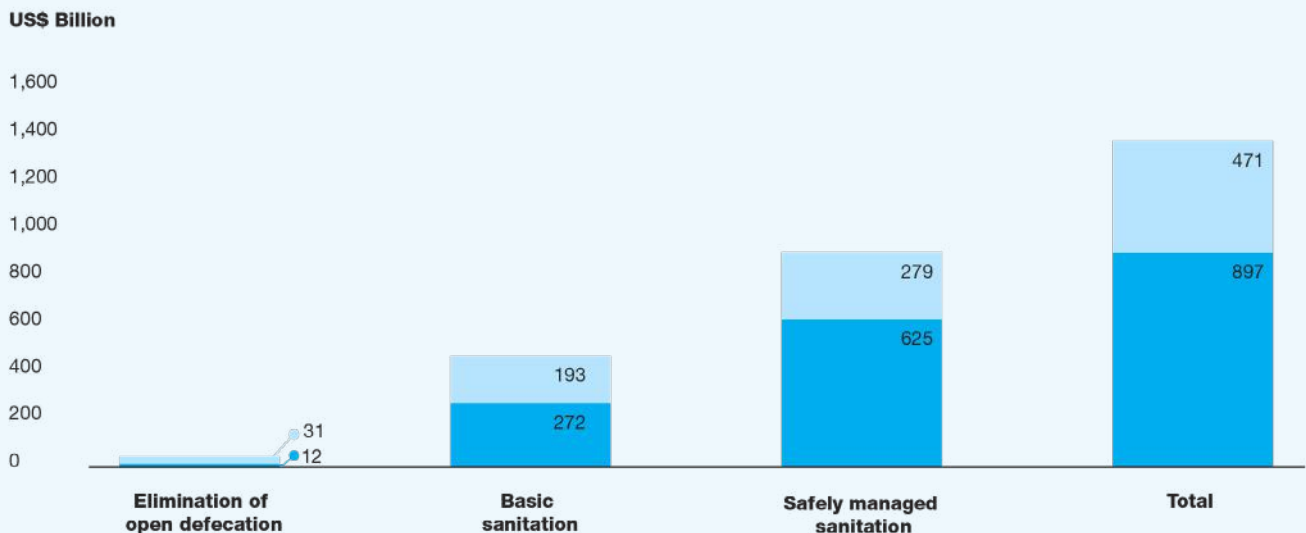
# 03 Results

## 03.1 Total and annualized costs of achieving universal sanitation

FIGURE 1 shows the total costs of achieving the sanitation component of SDG target 6.2 in the 13 years from 2017 to 2030 in 2017 dollars. The costs are US\$ 1.4 trillion, accounted for by US\$ 465 billion for basic sanitation and an additional US\$ 904 billion for safely managed<sup>3</sup> sanitation. Roughly two-thirds of the costs are accounted for by capital costs, as shown in Figure 1. Total capital cost needs are US\$ 897 billion. To eliminate open defecation in rural areas,

which assumes a short-lasting and unimproved pit latrine for all households currently practicing open defecation, the capital costs are US\$ 12 billion. Given the requirement for regular rebuilding of unimproved pits, the operational and maintenance (O&M) costs are significantly greater, at US\$ 31 billion from 2017 to 2030. However, it is recognized that unimproved pits with short life spans are not a long-term solution to the problem of open defecation.

**Figure 1. Total costs of achieving universal sanitation globally from 2017-2030, by service level and cost type**



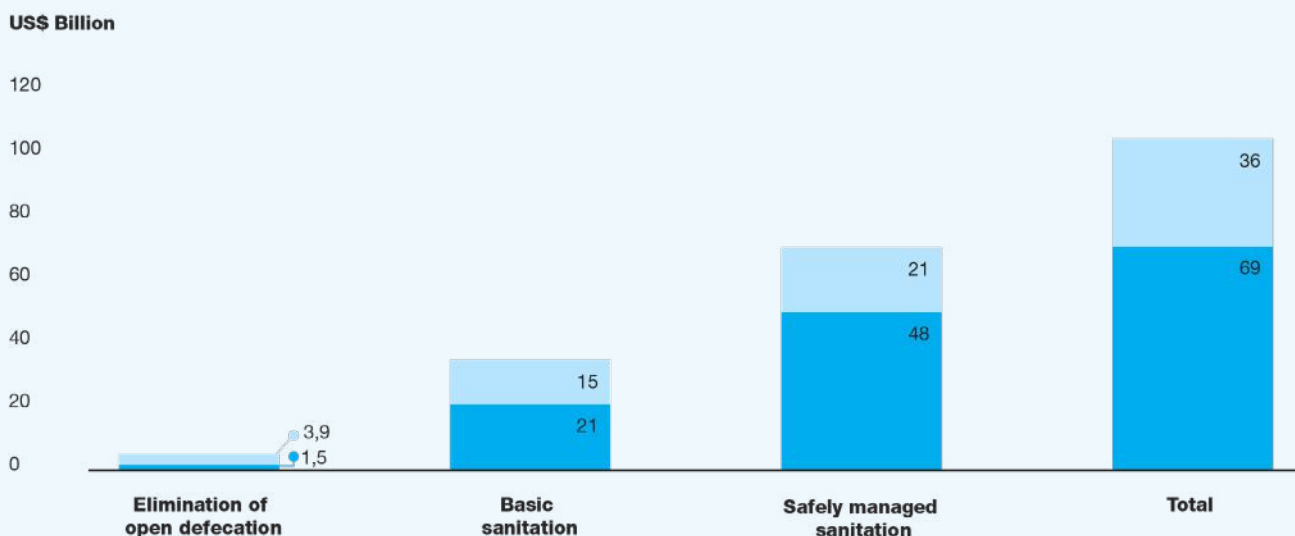
To estimate annualized costs, the total costs are divided by 13 years, which assumes a linear growth in coverage. However, alternative trajectories varying by country are expected. Figure 2 shows the annual costs from 2017 to 2030, which are US\$ 105 billion to meet the sanitation component of SDG target 6.2, accounted

for by US\$ 36 billion for basic sanitation and an additional US\$ 69 billion for safely managed sanitation. To eliminate open defecation, the capital costs are US\$ 1.5 billion annually with significantly greater O&M costs of US\$ 3.9 billion annually.

<sup>3</sup>As in the 2016 study, safely managed sanitation costs refer only to costs of safe excreta management. Costs of latrine are not included.

**Figure 2. Annualized costs of achieving universal sanitation globally from 2017-2030, by service level and cost type**

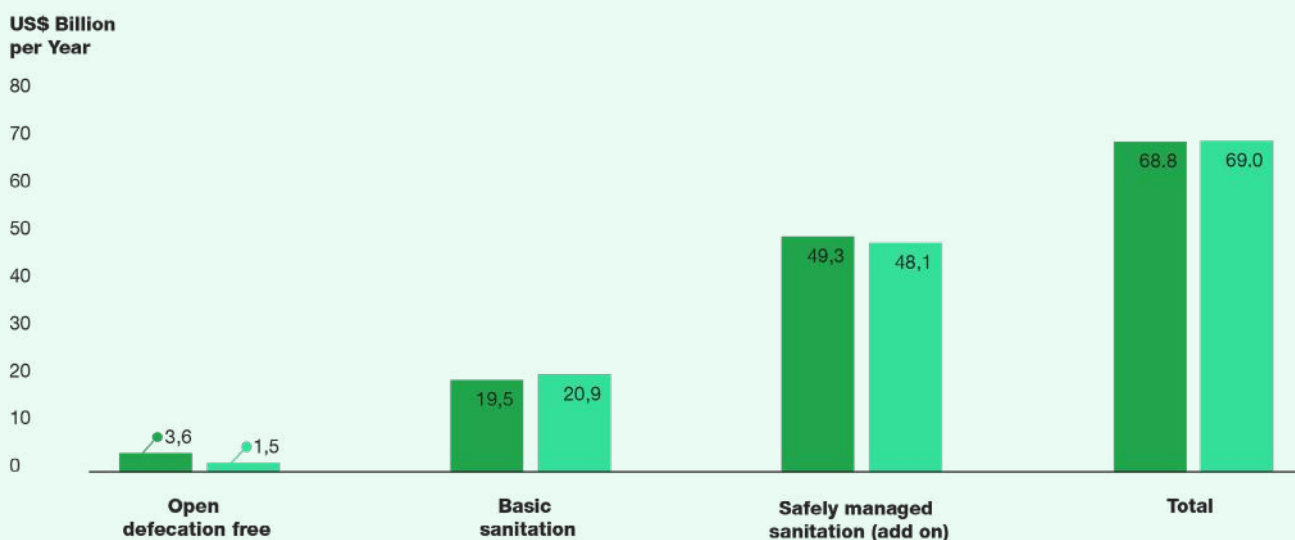
- Capital costs
- O&M costs



Compared with the previous World Bank study (Hutton and Varughese, 2016), which focused its presentation on the capital costs, the annualized costs for capital alone have remained roughly the same at US\$ 69 billion per year, as shown in [FIGURE 3](#).

**Figure 3. Comparison of global annualized capital costs between previous (2015) and current (2017) estimates**

- 2015 estimate
- 2017 estimate



- Several factors should be noted with regards to this similarity in annualized cost estimates between the two studies, caused by an interplay between inflationary and deflationary effects on cost estimates. There are three inflationary pressures leading to higher annualized costs

- 1 General price inflation leading to higher nominal costs. There is significant variation between countries. The weighted average across 140 countries is 7.3% over the two-year period 2015 to 2017.
- 2 The total cost is divided by 13 years instead of 15 years remaining until 2030.
- 3 Adjustments to the population of 140 countries for 2017, leading to an additional 76 million people compared to the projections in the original 2015 estimates.

- The main deflationary pressure is global progress made towards the target of universal sanitation coverage.

- 1 Six percentage point gain in coverage of at least basic sanitation - from 68% in 2015 to 74% in 2017 (WHO/UNICEF Joint Monitoring Programme report 2017).
- 2 Six percentage point gain in coverage of safely managed sanitation, from 39% in 2015 to 45% in 2017 (WHO/UNICEF Joint Monitoring Programme report 2017).

- As the 2016 World Bank study was conducted before the 2015 JMP baseline was established, coverage of safely managed sanitation was estimated using a mixture of data provided by WHO/UNICEF Joint Monitoring Programme and other published country studies on fecal sludge management, as described in Hutton and Varughese (2016). The average global coverage used by Hutton and Varughese (2016) was 26% in urban areas and 33.8% in rural areas. This compares with the actual JMP 2015 baseline estimate of 43% in urban and 35% in rural areas (WHO/UNICEF Joint Monitoring Programme report 2017). In other words, the earlier World Bank study underestimated urban coverage by 18 percentage points, which led to an overestimation of the urban costs of safely managed sanitation in Hutton and Varughese (2016). This was counterbalanced by the slow real progress from 2015 to 2017 on safely managed sanitation, which means the world still has to make considerable progress to meet the SDG target 6.2.
- This combination of factors, inflationary and deflationary pressures, accounts for the annual cost estimates being similar between the two studies.



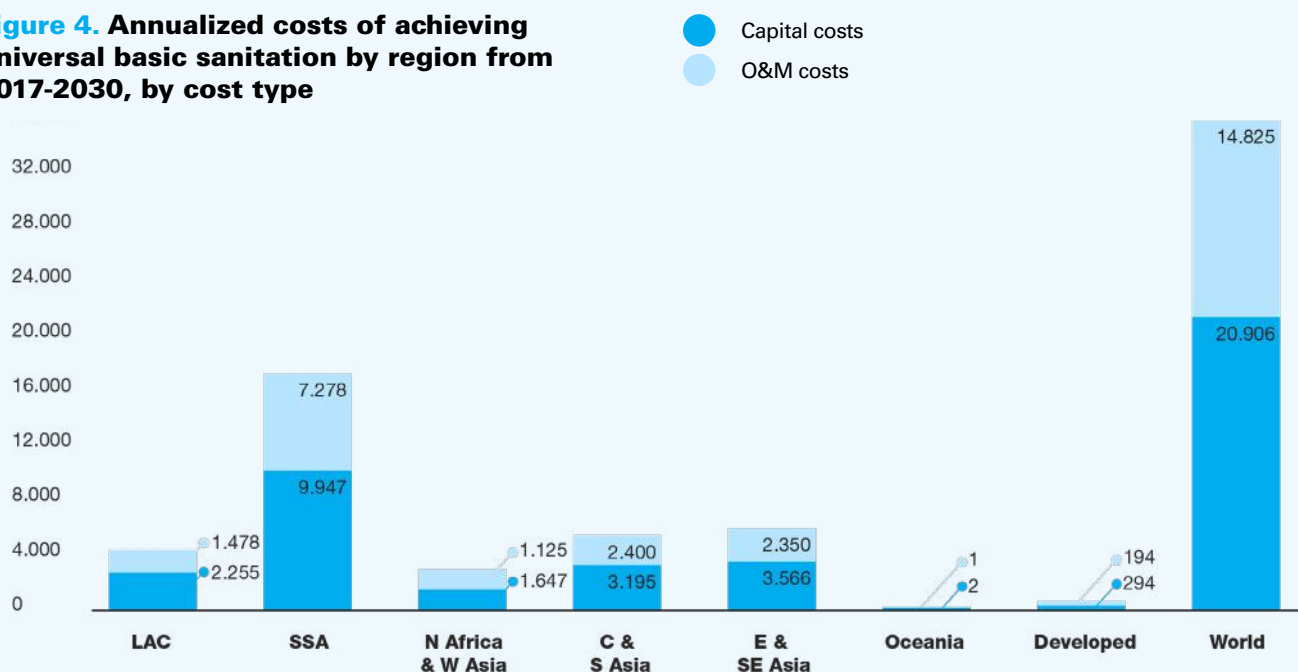
Kenya, November 14, 2012  
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### 03.2 Annual costs by region

FIGURE 4 shows the annualized costs of achieving basic sanitation by SDG region<sup>4</sup>. Sub-Saharan Africa (SSA) accounts for nearly 50% of the costs with average annual costs of US\$ 10 billion for capital and US\$ 7.5 billion for O&M. Factors contributing to high costs for the region include lowest coverage of basic

sanitation at 31% in 2017, and high population numbers and unit costs. SSA is followed by Eastern and South-Eastern Asia with annualized costs of US\$ 5.9 billion, and Central and Southern Asia with annualized costs of US\$ 5.6 billion, both contributing over 15% of the global costs.

**Figure 4. Annualized costs of achieving universal basic sanitation by region from 2017-2030, by cost type**



<sup>4</sup> Annual cost estimates for Oceania and Developed countries included in the study of US\$3 million and US\$488 million are not included in the graph, being of significantly smaller magnitude.



Somalia, November 05, 2019  
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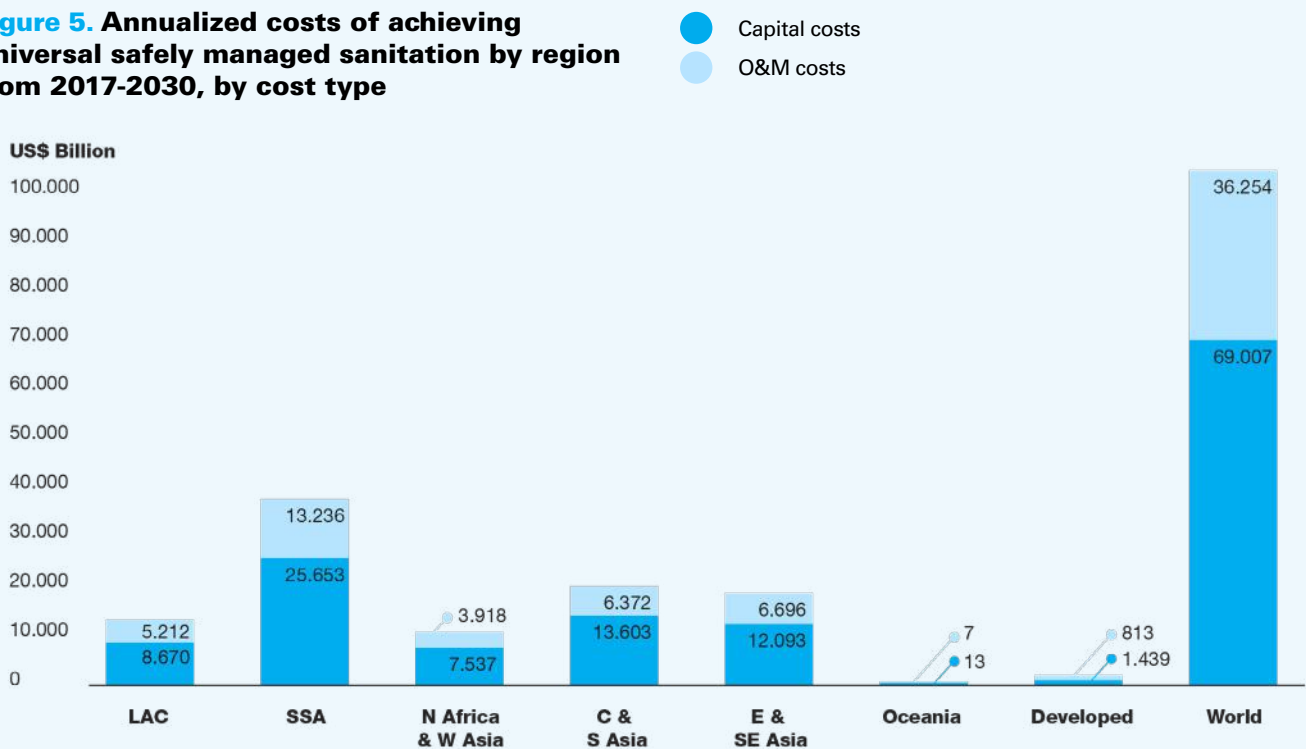


India, February 01, 2019  
© UNICEF/UNI289566/Narain

FIGURE 5 shows annualized costs of achieving safely managed sanitation by SDG region<sup>5</sup>. As in the case of basic sanitation, sub-Saharan Africa has the highest costs - accounting for 39% of the global total - with annual averages of US\$ 27 billion capital costs and US\$ 14 billion O&M costs. This is followed by Central

and Southern Asia with combined annual cost of US\$ 20 billion, or 19% of the global total. Eastern and South-Eastern Asia and Latin America and the Caribbean (LAC) regions account for 18% and 13% of the global costs, respectively.

**Figure 5. Annualized costs of achieving universal safely managed sanitation by region from 2017-2030, by cost type**



<sup>5</sup> Annual cost estimates for Oceania and Developed countries included in the study of US\$20 million and US\$2.2 billion are not included in the graph, being of significantly smaller magnitude than others.

### 03.3 Costs as a percentage of Gross Regional Product

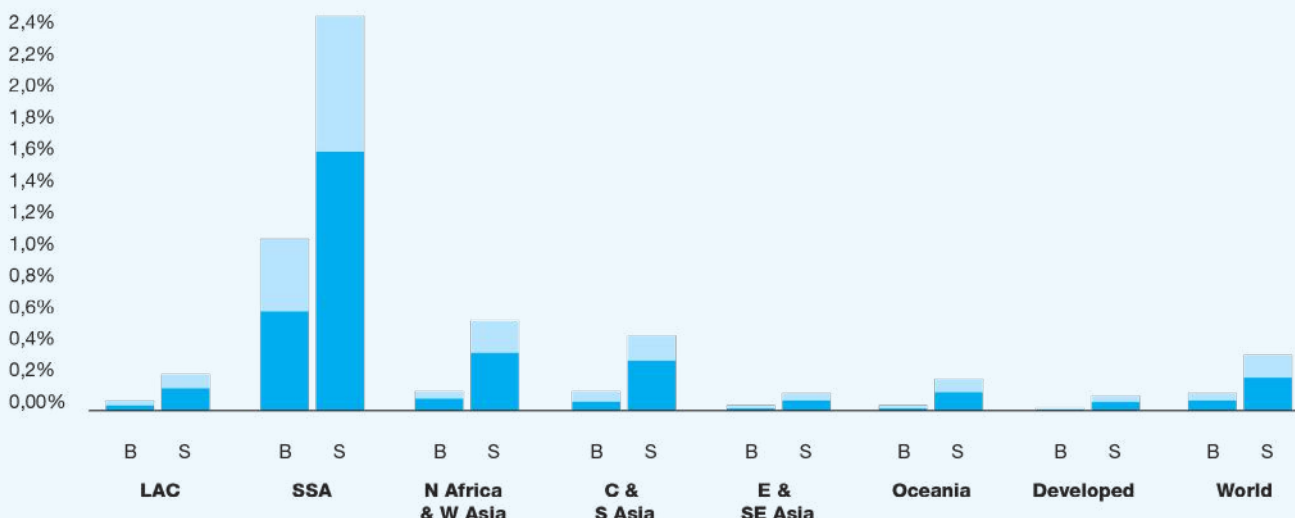
FIGURE 6 shows the average annual costs of basic and safely managed sanitation as a proportion of Gross Regional Product (GRP) in 2017. There remains wide variation across regions. The highest costs as a proportion of GRP are in sub-Saharan Africa, where 0.6% of GRP is required to cover capital costs of extending basic sanitation to the unserved, with an additional 0.4% of GRP needed for O&M costs for the same population. For safely managed sanitation,

the proportions increase to 1.6% and 0.8% of GRP, respectively, for capital and O&M costs. Other regions will require smaller fractions of their GRP to extend access to unserved populations. Highest among these are in North Africa and Western Asia, and Central and South Asia where 0.6% and 0.5% of GRP will need to be spent annually on extending access to safely managed services, respectively.

**Figure 6. Annualized costs of achieving basic and safely managed sanitation as a percentage of Gross Regional Product, by cost type and region**

● Capital costs      B - basic sanitation  
 ● O&M costs      S - safely managed sanitation

Average annual cost as a percent of GRP



India, November 26, 2018  
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Mali, 2020  
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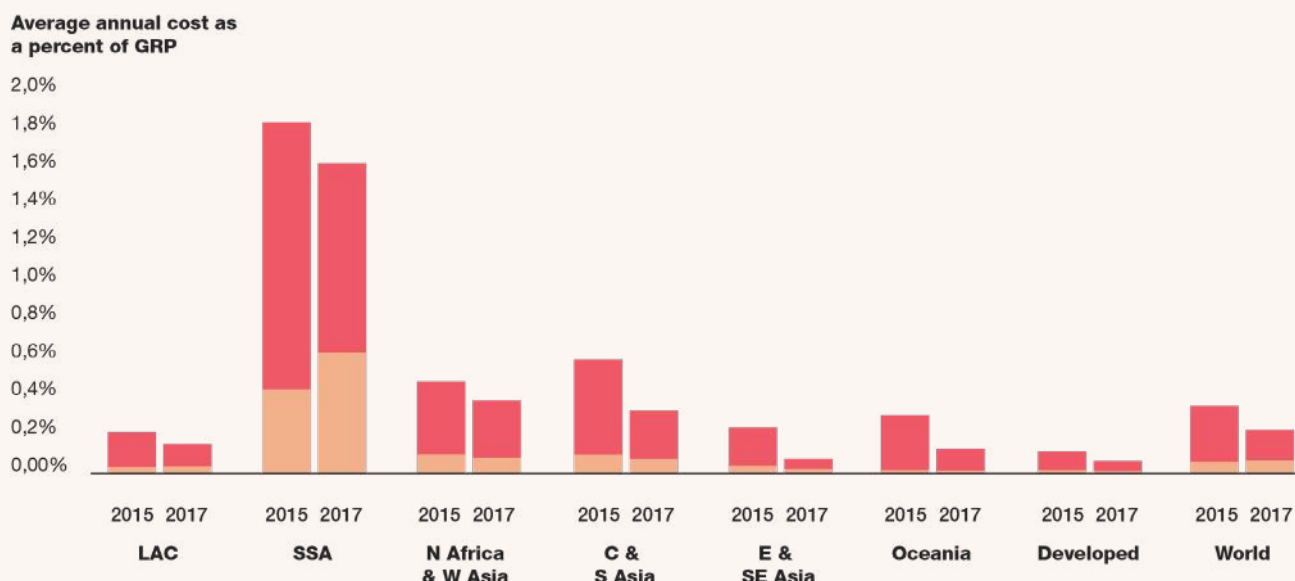
The question then arises as to how much the costs as a percentage of GRP have changed since the previous study in 2016. As the 2016 study focused the results reporting on capital costs, **FIGURE 7** compares how the combined annual capital costs of basic and safely managed sanitation as a percentage of GRP have changed between the two studies. For all regions, the overall percentage has reduced between the 2015 and 2017 estimates. For example, for sub-Saharan Africa the requirement has reduced from 1.8% to 1.6% of GRP, while for Central and Southern Asia it has reduced from 0.6% to 0.34% of GRP.

The expectation would have been that the required capital expenditure as a percentage of GRP would have increased between the two studies, given the slow progress on sanitation in some world regions. In regions where significant progress was made in

covering previously unserved populations, costs as a percentage of GRP have declined. For example in Central and Southern Asia region, the costs for basic sanitation have reduced from 0.1% of GRP in 2015 to 0.08% of GRP in 2017. An 11 percentage point increase in 'at least basic sanitation' during this period contributed to this decline. Meanwhile, slower progress in other regions contributed to increases in annualized capital costs for the remaining period to 2030. For example, in SSA which saw an increase of only 3 percentage points in 'at least basic sanitation', capital costs increased from 0.45% of GRP in 2015 to 0.63% of GRP in 2017. On the other hand, the decline in the costs of safely managed sanitation as a percentage of GRP in sub-Saharan Africa is due to the adjustment in coverage made from the 2016 World Bank study to the 2017 JMP estimates, as explained on page 11.

**Figure 7. Comparison between two studies (costs in 2015 and 2017) of universal sanitation costs as percentage of Gross Regional Product, by service level**

- Basic sanitation
- Safely managed sanitation



### 03.4 Geographical breakdown by rural-urban areas

FIGURE 8 shows the breakdown of annualized costs of basic sanitation, by capital and O&M costs across rural and urban areas in different SDG regions<sup>6</sup>, for the 13 years from 2017 to 2030. Globally, more than 70% of annual costs of extending and maintaining basic sanitation services are in urban areas. In sub-Saharan

Africa and Central and Southern Asia which together comprise over 72% of presently unserved populations, rural areas account for closer to 40% of total annual costs. Meanwhile many other regions require spending predominantly (>90%) in urban areas.

**Figure 8. Annual costs (Left) and Percent contribution (Right) for basic sanitation by urban and rural areas and by capital and O&M, by region**

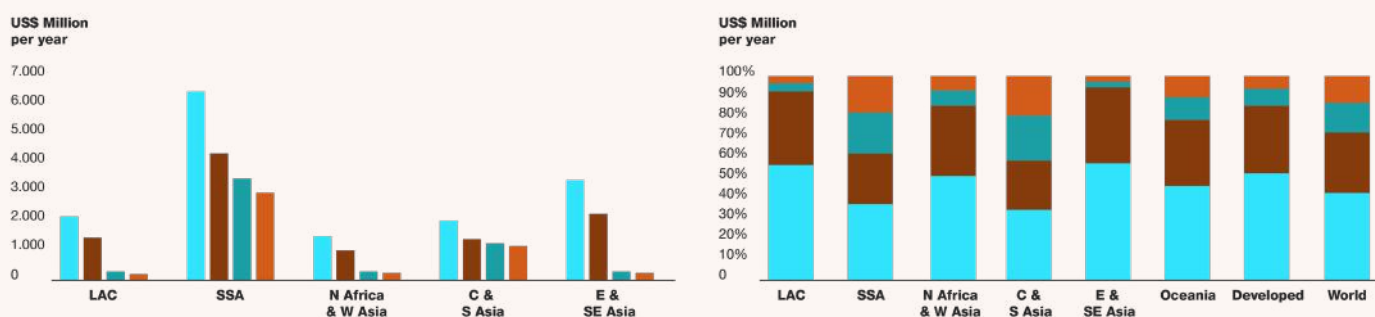
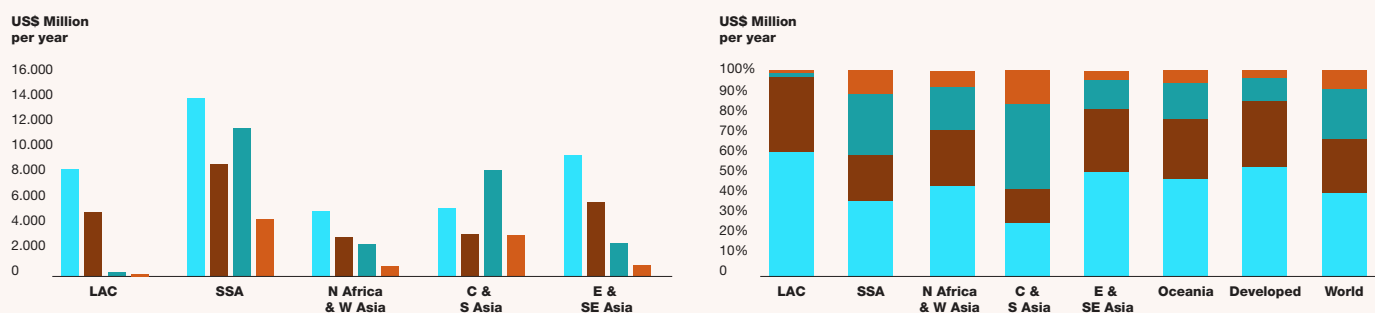


FIGURE 9 shows the breakdown of annualized costs of safely managed sanitation, by capital and O&M costs across rural and urban areas in different SDG regions, for the 13 years from 2017 to 2030. Globally, about 65% of annual costs of extending and maintaining safely managed sanitation services are in urban areas. In one

region – Central and South Asia, over 60% of costs are accounted for by rural costs, while in LAC, over 95% of costs accrue in urban areas. Both in Central and South Asia and sub-Saharan Africa, capital costs of expanding services in rural areas exceed those in urban areas.

**Figure 9. Annual costs (Left) and Percent contribution (Right) for safely managed sanitation by urban and rural areas and by capital and O&M, by region**



<sup>6</sup> Estimates for Oceania and Developed countries included in the study are not included in the annual costs graph, being of significantly smaller magnitude



### 03.5 Capital versus O&M cost over 2017 to 2029

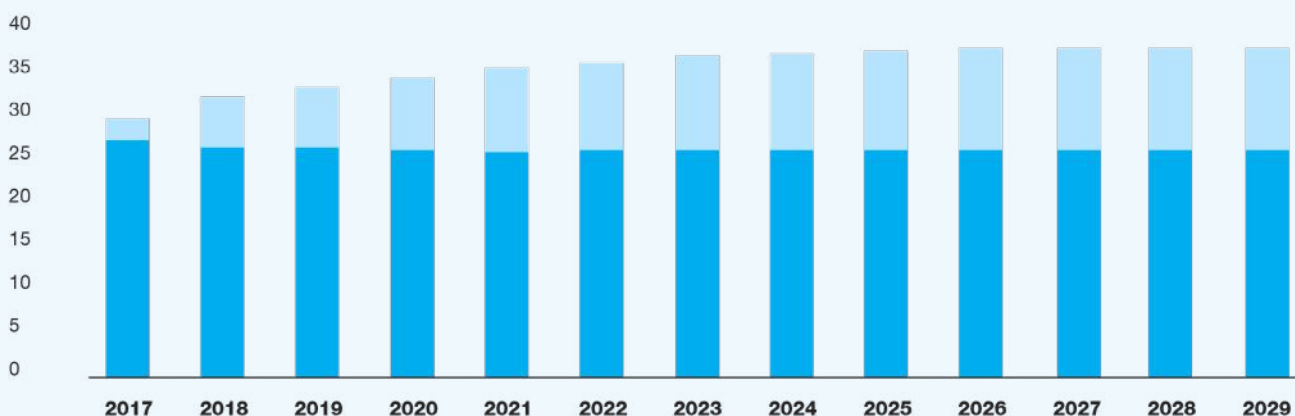
FIGURE 10 shows the time series of the global costs of achieving universal coverage of basic sanitation in 2030, while distinguishing between capital and O&M costs. The O&M costs shown only relate to the additional capacity built starting in 2017, and not pre-existing capacity. As can be seen, overall costs increase

over time, accounted for by the growing O&M costs which increase from about 10% of the total costs in 2017, to 30% of total costs in 2029. There is a similar story for all world regions highlighting the importance of financing for sustaining services built.

**Figure 10. Time-series of global costs of basic sanitation over time, comparing capital and O&M costs**

- Capital costs
- O&M costs

US\$ Billion



Lebanon, 2020  
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<https://www.unicef.org/wash/>



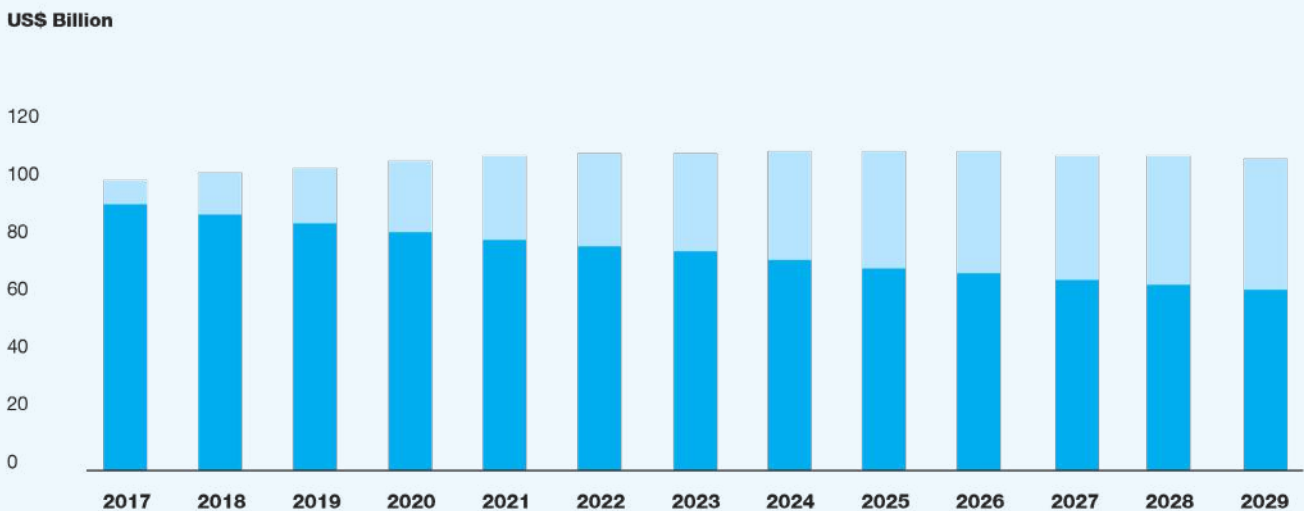
India, October 28, 2018  
© UNICEF/UN0267929/Akhbar Latif

FIGURE 11 shows the time series of global costs of achieving universal coverage of safely managed sanitation in 2030, while distinguishing between capital and O&M costs. As in the previous figure, overall costs

increase over time, accounted for by growing O&M costs which increase from under 10% of total costs in 2017 to over 40% by 2029. Similar variations are observed in all regions.

**Figure 11. Time-series of global costs of safely managed sanitation over time, comparing capital and O&M costs**

- Capital costs
- O&M costs

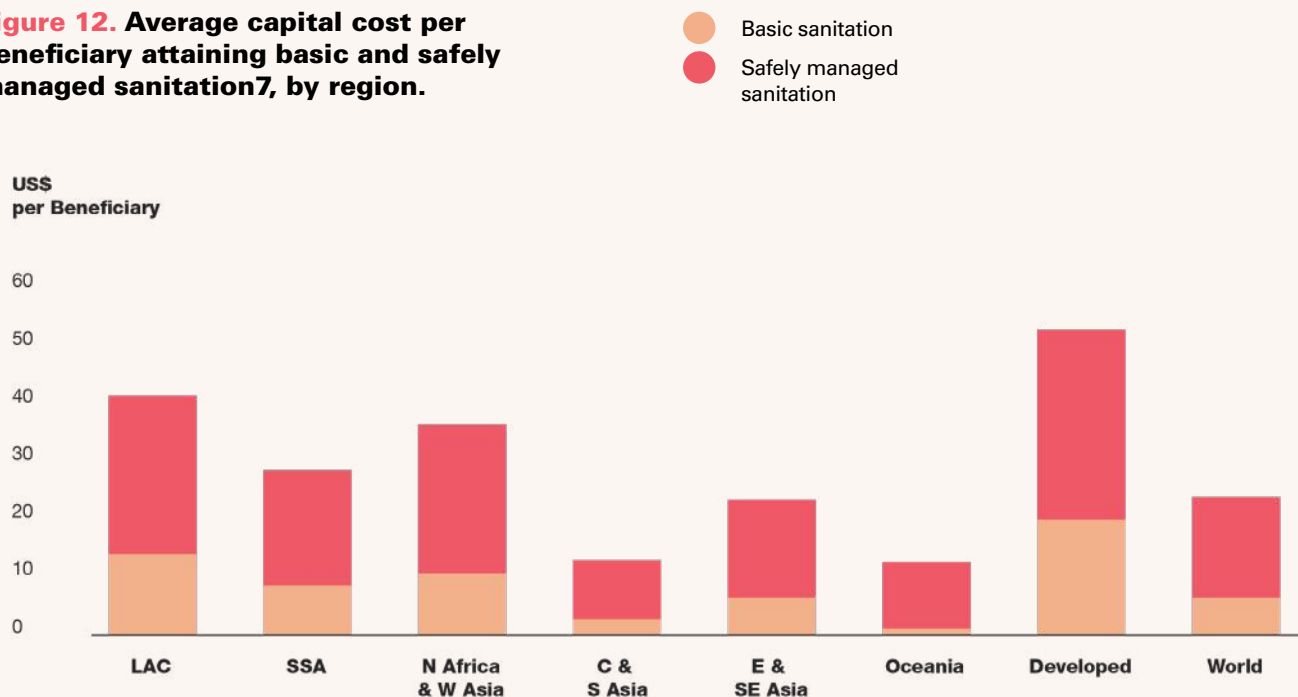


### 03.6 Capital cost per beneficiary

**FIGURE 12** shows the average capital cost per beneficiary gaining access to basic and safely managed sanitation. The global average is US\$ 24, varying from US\$ 13 in Central and Southern Asia, US\$ 28 in SSA, US\$ 41 in LAC, to over US\$ 50 in developed countries. While a variety of factors including choice

of technology and speed of expanding services will determine these costs, their relation to poverty incomes in the different regions is a measure of affordability of different service levels for the populations in these regions.

**Figure 12. Average capital cost per beneficiary attaining basic and safely managed sanitation<sup>7</sup>, by region.**



The World Bank study conducted an analysis of how capital and O&M costs compare with poverty incomes in urban and rural areas, and concluded that

if households have to pay the full costs, this would exceed 5% of poverty incomes in urban areas in majority of low-income African countries.



Madagascar, November 11, 2018  
© UNICEF/UN0267003/Raelison

<https://www.unicef.org/wash/>



Afghanistan, August 22, 2019  
© UNICEF/ Frank Dejongh

<https://www.unicef.org/wash/>

# 04 Conclusions

This update of the global costs of achieving the sanitation component of SDG Target 6.2 has been undertaken to make use of updated coverage numbers for basic and safe sanitation access available for 2017. It utilizes the methodology and underlying cost data<sup>8</sup> compiled under the previous World Bank study (Hutton and Varughese 2016), adjusting for inflation and population growth in the 2015-2017 period. Results presented are intended to assist with taking stock of changes and updates in the size and distribution of costs across regions, across capital versus O&M, and giving rural and urban breakdowns.

<sup>8</sup> Climate change induced extreme weather events and weather variability will necessitate updating of technology costs to include evolving climate resilience considerations. Efforts to cost these are presently underway at UNICEF and will inform finer tuning of results presented in a future iteration.



Indonesia, November 13, 2018  
© UNICEF/ UNI209339

- **Competing inflationary and deflationary factors cancel out** to maintain the annualized costs of achieving universal access to safe sanitation by 2030 approximately the same as estimated in 2016, at US\$ 68.8 billion. This estimate masks slower progress in regions such as sub-Saharan Africa and faster progress in Central and South Asia which in turn contribute to increases and decreases in the average annual costs to be spent in remaining years in these regions, respectively.
- **Sub-Saharan Africa** continues to lead in annual costs of achieving and maintaining basic and safely managed services coverage, contributing 50% and 40% of total global costs in basic and safely managed sanitation service levels, respectively. When expressed as a percentage of regional GDP, the region further widens this lead with 3.4% of GRP required to be spent on capital and O&M costs of basic and safely managed services annually. It should be noted that these figures refer to extending services to the unserved in the year 2017, but do not include the required costs for maintaining services for the already served, which includes rehabilitation and replacement of infrastructure as well as O&M to sustain services for all. These additional costs are important to take into account when planning and financing the sector, especially for those countries where these costs are still highly subsidized.
- **Globally and in most regions, urban areas will require the higher proportion of spending**, on both basic and safely managed services. One exception is found in Central and Southern Asia, where extending and sustaining safe sanitation services in rural areas will require greater funding than in urban areas. In the years leading up to 2030, as financing needs for capital decline, O&M costs will rise, reaching 30% and 40% of total annual costs of delivering basic and safe sanitation services, respectively.
- **Finally, at the population level, affordability can be gauged** using estimates of costs per person served as a proportion of total expenditure in different regions. Comparing WASH costs borne by poor households to the poverty line is one approach that is likely to have policy traction, although there is no universally accepted threshold value at which WASH costs become 'unaffordable' to poor households. To achieve safely managed sanitation in sub-Saharan Africa, if beneficiaries are asked to fund the required costs of US\$ 28 per person each year, many households living on or near the poverty line will spend a much larger proportion of their income than in most other regions.
- **While the primary aim of this study is to provide updates** on the global and regional costs of achieving universal sanitation within SDG Target 6.2, to be used for global and regional policy dialogue and fund-raising, its true purpose is to raise the importance of conducting more fine-tuned costing studies at country level and below. As a first step, countries can utilize the SWA WASH SDG costing tool, created by the World Bank and UNICEF, available on the tools portal of the Sanitation and Water for All (SWA) partnership<sup>9</sup>. More in-depth costing studies are encouraged, reflecting the variations in technologies and unit costs at sub-national levels and for different population groups, as well as the need to rehabilitate or replace aging infrastructure. In addition, local risks (such as climate adaptation), customs and preferences need to be taken into consideration which have a bearing on technologies chosen, management models and their costs.

<sup>9</sup> <https://sanitationandwaterforall.org/tools-portal/sector-financing>

# 05 Annex

## Countries included in study by SDG Region and World Bank Income Level

SDG REGION	LOW INCOME	LOWER-MIDDLE INCOME	UPPER-MIDDLE INCOME	HIGH INCOME
Latin America and the Caribbean	Haiti	Bolivia, El Salvador, Guatemala, Guyana, Honduras, Nicaragua, Paraguay	Argentina, Belize, Brazil, Colombia, Costa Rica, Cuba, Dominica, Dominican Republic, Ecuador, Grenada, Jamaica, Mexico, Panama, Peru, St. Lucia, St. Vincent and the Grenadines, Suriname, Trinidad and Tobago, Venezuela, RB	
Sub-Saharan Africa	Angola, Benin, Botswana, Burkina Faso, Burundi, Central African Republic, Chad, Comoros, Democratic Republic of Congo, Eritrea, Ethiopia, Gabon, Gambia (The), Guinea, Guinea-Bissau, Kenya, Liberia, Madagascar, Malawi, Mali, Mozambique, Niger, Rwanda, Sierra Leone, Somalia, Togo, Uganda, Tanzania, Zimbabwe	Cameroon, Cape Verde, Congo, Côte d'Ivoire, Djibouti, Ghana, Lesotho, Mauritania, Nigeria, São Tomé and Príncipe, Senegal, South Sudan, Swaziland, Zambia	Mauritius, Namibia, Seychelles, South Africa	Equatorial Guinea
Northern Africa & Western Asia		Arab Republic of Egypt, Armenia, Georgia, Morocco, Sudan, Syrian Arab Republic, Republic of Yemen	Algeria Azerbaijan,, Iraq, Jordan, Lebanon, Libya, Tunisia, Turkey	
Central and Southern Asia	Afghanistan, Bangladesh, Nepal, Tajikistan	Bhutan, India, Kyrgyz Republic, Pakistan, Sri Lanka, Uzbekistan	Islamic Republic of Iran, Kazakhstan, Maldives, Turkmenistan	
South-eastern Asia	Cambodia, Democratic People's Republic of Korea, Myanmar	Indonesia, Lao People's Democratic Republic, Mongolia, Philippines, Vietnam	China, Malaysia, Thailand, Timor-Leste	
Oceania		Federated States of Micronesia, Kiribati, Nauru, Niue, Papua New Guinea, Samoa, Solomon Islands, Vanuatu	Cook Islands, Fiji, Marshall Islands, Palau, Tonga, Tuvalu	
Developed countries		Moldova, Ukraine	Albania, Belarus, Bosnia and Herzegovina, Bulgaria, Serbia, the Former Yugoslav Republic of Macedonia (Northern Macedonia)	Romania, Russian Federation

Source: Hutton and Varughese (2016), Annex C.

Note: Classification using gross national income per capita in 2013 based on World Bank Atlas method. Low-income: <\$1,046; lower-middle income: \$1,046–\$4,125; upper-middle income, \$4,125–\$12,745; high income, >\$12,746.





# 06 References



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