



From Human Waste to Prosperity: The Sanitation Economy

About This Document

The Sanitation and Hygiene Fund (SHF) is dedicated to achieving universal access to sanitation, hygiene, and menstrual health through market-based approaches. Establishing a global footprint, SHF works with Low- and Middle-Income Countries (LMICs) to build robust sanitation economies and menstrual hygiene marketplaces through catalytic financing.

This document looks at the estimated economic value of these markets in five countries: Benin, Kenya, Nigeria, Sierra Leone and Uganda. The information, expressing the current value of the sanitation economy and menstrual hygiene marketplace, and projections points to opportunities for pipeline development and investment.

The *Sanitation Economy and Menstrual Hygiene Marketplace Assessment Methodology Note* explains the methodology behind the estimates.

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For more information visit: www.shfund.org

Cover page: © Sanivation: Staff loading furnace with solid fuel briquettes.

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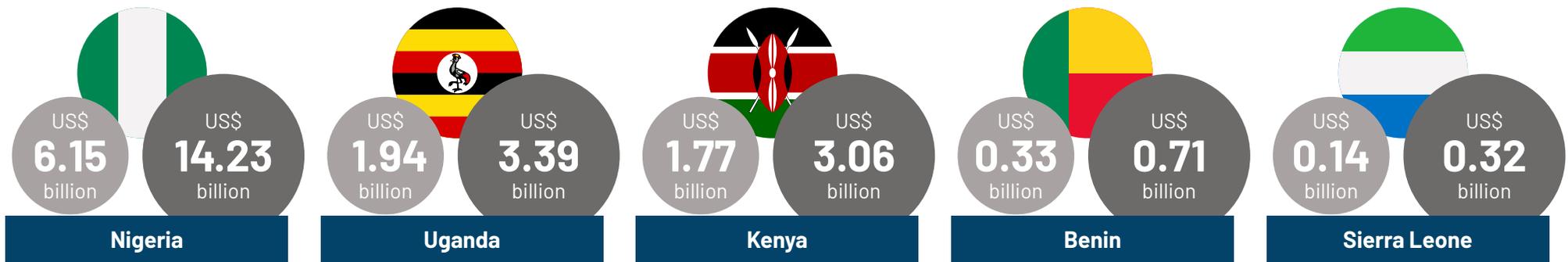
From Human Waste to Prosperity

Globally each day roughly 1,043,000 tonnes of human waste is produced¹ and more than 300 million people manage their period.² This vast amount of human waste, and its safe management, has an economic value.

Investment in sanitation, hygiene and menstrual health has the potential to revolutionize how people understand, access and use sanitation economy and menstrual hygiene marketplace products and services. The potential economic value is immense, with markets in bigger countries estimated to exceed billions of dollars.

In Africa, 779 million people have no basic sanitation services,³ 839 million without basic hygiene, and only 27% use safely managed sanitation services.⁴

Achieving the 2030 SDG target requires a 20x increase in rates of progress for safely managed sanitation services and a 42x increase for basic hygiene services.⁵



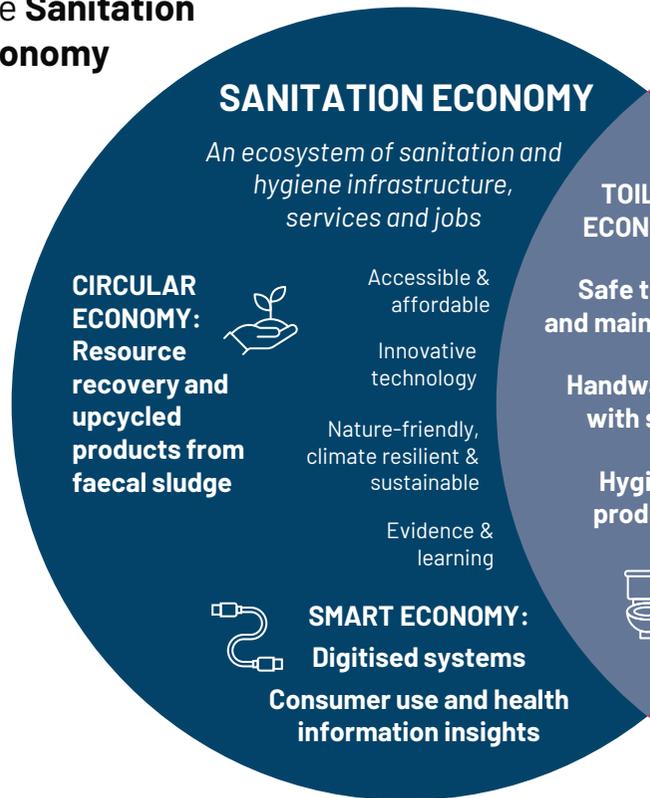
● 2022 ESTIMATE Baseline market size

● 2030 PROJECTION Universal access

Revolutionizing How We View Human Waste

Approaching human waste as a market economy opens the possibility for economic gain, job creation, women's empowerment, environmental protection, recycling and reuse. The **sanitation economy** and **menstrual hygiene marketplace** intersect around the toilet economy.

The **Sanitation Economy**



The **Menstrual Hygiene Marketplace**

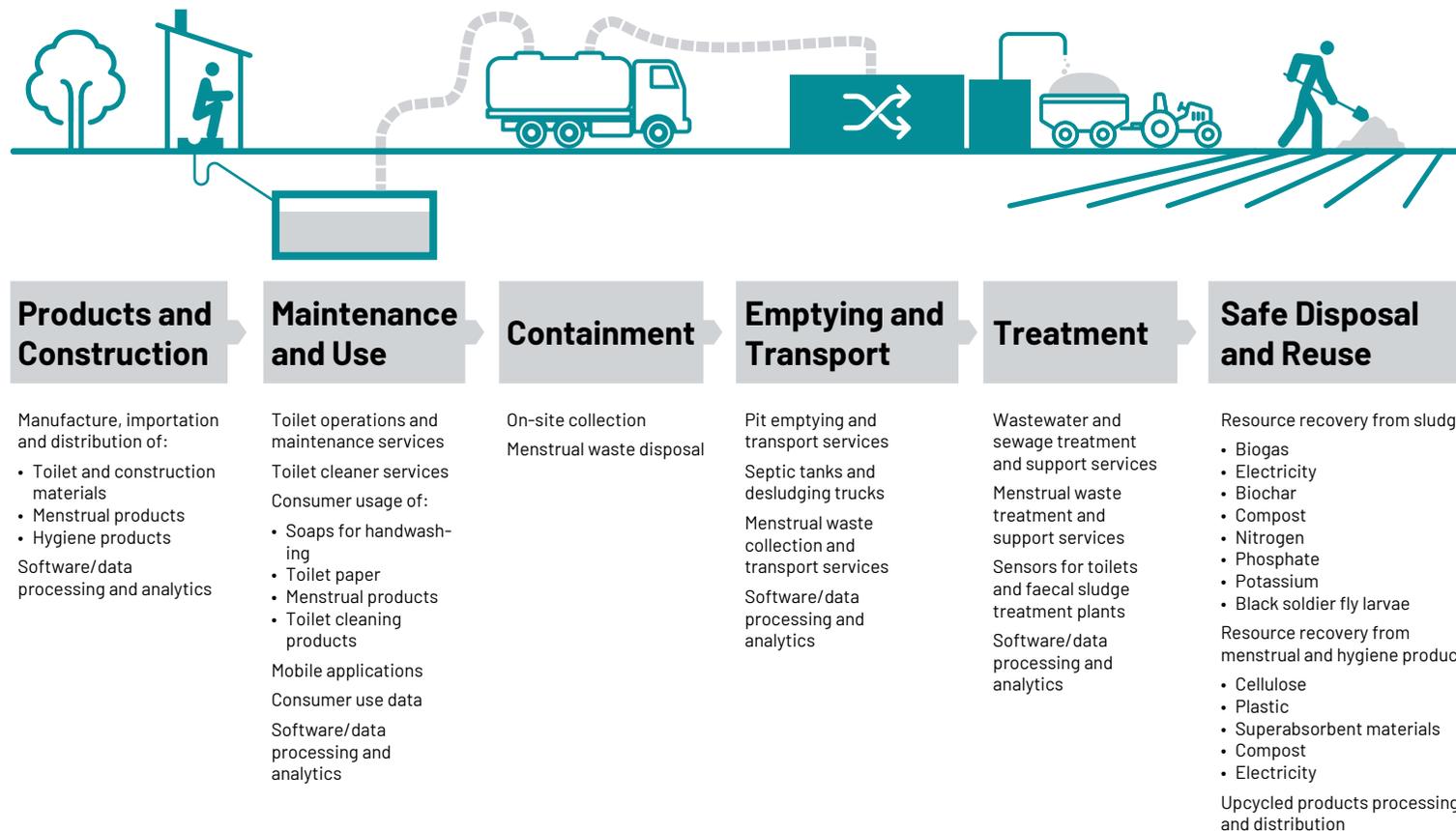


Homes - Schools - Health facilities - Workplaces - Public spaces



Opportunities For Job Creation

Analysis of the **sanitation value chain** exposes multiple entry points for market development and job creation via the private sector.



When Women Work, Economies Grow

Women's economic engagement advances gender equality, reduces poverty and vulnerability and boosts inclusive economic growth. Over half of working women in developing countries, which is twice as many as in developed countries, view entrepreneurship as a path to economic empowerment.⁶ It has been estimated that gender parity in entrepreneurship could add US\$ 5-6 trillion in net value to the global economy – and each women-led firm is six times more likely to hire female employees than male-led ones.

The sanitation economy and menstrual hygiene marketplace, with support from cultural, structural and financial reform, can provide opportunities for women to be leaders, entrepreneurs, employers, employees and consumers.

The estimated economic return on sanitation spending in Sub-Saharan Africa is US\$ 2.8 per US dollar invested,⁷ whilst inadequate access to sanitation is estimated to cost African countries 4.3% of their GDP.⁸ Currently households provide the largest proportion of funding for sanitation through connection tariffs, emptying service fees, and investment in toilets and on-site containment and treatment technologies.⁹

Thriving sanitation service chains require infrastructure and this requires investment. The sanitation economy has the potential to transform the economics of sanitation for public and private sector investors from unaffordable costs into sustainable business opportunities. It is estimated that with the sanitation economy approaches, the cost of sanitation provision can be transformed from a cost of US\$ 200 per person to a net value of US\$ 10 per person.¹⁰



Abigail Aruna, CEO of Clean Team Ghana Limited (CTGL) is succeeding in combining social impact with economic empowerment. Having made her way up the organization, she is leading a social enterprise that uses a product-as-a-service model, charging monthly fees for toilet servicing, rental, and regular waste collection.

Serving low-income urban households in Kumasi, Ghana, the business model provides an alternative to public toilets, improving sanitation access, convenience, and dignity, whilst also offering direct daily cost savings to the user. Waste is collected from the toilet facilities and disposed of at the CTGL waste treatment site.

An integral part of the enterprise's story, Abigail has since 2012 contributed to CTGL's growth from 100 users to more than 16,000 today. Abigail is passionate about leading the Clean Team to become a sustainable sanitation business that provides dignified toilets for all across Africa. She is also keen to mentor and support the growth of a new breed of authentic leaders for Africa.

"When it comes to the future of progress, there is one engine that can drive them all: women's economic power"

Melinda French-Gates, 2022"



© Abigail Aruna

The Toilet Economy

The toilet economy is the marketplace of products and services that provide safe toilet and handwashing access for all, whether public or private.

In countries across Africa - including Benin, Kenya, Nigeria, Sierra Leone and Uganda - there is evidence of a huge potential market for latrine construction, and the manufacturing and sale of cleaning products and hygiene articles.

With approximately two thirds of the population - or more than 200 million people - in these countries still without access to at least basic sanitation and hygiene,¹² the toilet economy is predicted to grow rapidly.

Estimates of the current size of the toilet economy range from US\$ 109.3 million in Sierra Leone to US\$ 4.7 billion in Nigeria, with a potential to grow to US\$ 171.8 million in Sierra Leone and US\$ 9.9 billion in Nigeria once universal access has been achieved.



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Toilet Economy Estimates For Kenya

The Kenyan toilet economy has the potential to grow from an estimated value of US\$ 1.5 billion in 2022 to US\$ 2.3 billion once universal access has been achieved. The household toilet market is valued at US\$ 1.2 billion in 2022 and has the potential to reach US\$ 1.9 billion, and the public toilet market is valued at US\$ 258.3 million in 2022 and could reach US\$ 362.4 million.

MARKET ESTIMATE FOR 2030 TOILET ECONOMY (IN US\$ MILLION) PROJECTION Universal Access



INSTITUTIONS



The Circular Sanitation Economy

The circular sanitation economy includes the systems that connect the biocycle, using multiple forms of biological waste, recovering nutrients and water, and creating value-adding products such as renewable energy, organic fertilizers and proteins.

This market is still nascent in many countries but an increasing number of companies are tapping into this potential.

The evidence for a growing need - and demand - for toilet emptying services is especially strong,¹³ translating into circular sanitation economy investment opportunities in the construction of faecal sludge treatment facilities and the manufacturing of products such as fuel pellets and briquettes, and fertilizer, with broad societal benefits including economic growth and reducing sanitation's environmental footprint.

Globally, faecal sludge (and poorly managed wastewater) is responsible for 2-6% of methane emissions and 1-3% of nitrous oxide emissions. In carbon accounting terms, one ton of methane is equal to 34tCO₂e, and one ton of nitrous oxide is worth 298tCO₂e. (Christopher Gasson, 2021)¹⁴



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Circular Sanitation Economy Estimates For Uganda

The Ugandan circular sanitation economy market for emptying and transport is already strong with an estimated value of US\$ 81.5 million in 2022, and the potential to reach US\$ 144.2 million by 2030. In terms of resource recovery, the biogas market has the largest economic potential, followed by protein meal (black soldier fly larvae).

MARKET ESTIMATE FOR 2030 CIRCULAR SANITATION ECONOMY* (IN US\$ MILLION)



\$144.22M
Emptying and Transport



\$17.54M
Biochar



\$10.96M
Phosphate



\$6,400.46M
Biogas



\$31.89M
Compost



\$8.75M
Potassium



\$209.89M
Electricity



\$12.19M
Nitrogen



\$1,115.94M
Protein meal - Black Soldier Fly Larvae



*Note that this report does not total the estimates in the Circular Sanitation Market as only one product can be produced from a volume of waste. Stakeholders are encouraged to look not only at the potential revenue of products but also, from a circular economy perspective, at retaining the value of the product. Biogas is the significant leader in financial potential but breaks the nutrient cycle as the compounds from food consumption are burned rather than returned to the food system. For the overall sanitation economy estimate, Protein Meal product is selected as it promises financial returns while contributing back to the food system.

The Smart Sanitation Economy

The smart sanitation economy includes the digitized sanitation and hygiene systems that optimize data for operating efficiencies, maintenance, plus consumer use and health information insights. Whilst this is a small economy in many countries, there is significant and increasing potential around smartphone mobile applications, smart payment schemes and real time facility monitoring. Among the countries featured in this report, the smart sanitation economy's market potential ranges from US\$ 15.6 million in Sierra Leone and US\$ 24.5 million in Nigeria.



© FG Trade/Gettyimages

Smart Sanitation Economy Estimates For Nigeria

The smart sanitation economy in Nigeria is valued at US\$ 8.3 million in 2022, with the potential to triple to US\$ 24.5 million. Growth is likely to accelerate as internet connectivity improves.

MARKET ESTIMATE FOR 2030 SMART SANITATION ECONOMY (IN US\$ MILLION) PROJECTION Universal Access

\$3.37M
Government investment
in smart sanitation

\$13.54M
Sensor and Smart
technologies for toilets

\$1.92M
Sensor and Smart
technologies for FSTPs

TOTAL PRODUCTS
\$18.83M

\$1.50M
Data Analytics
Services

\$4.19M
Mobile Application
Services

TOTAL SERVICES
\$5.68M

**SMART SANITATION
ECONOMY**

\$24.51M



The Menstrual Hygiene Marketplace

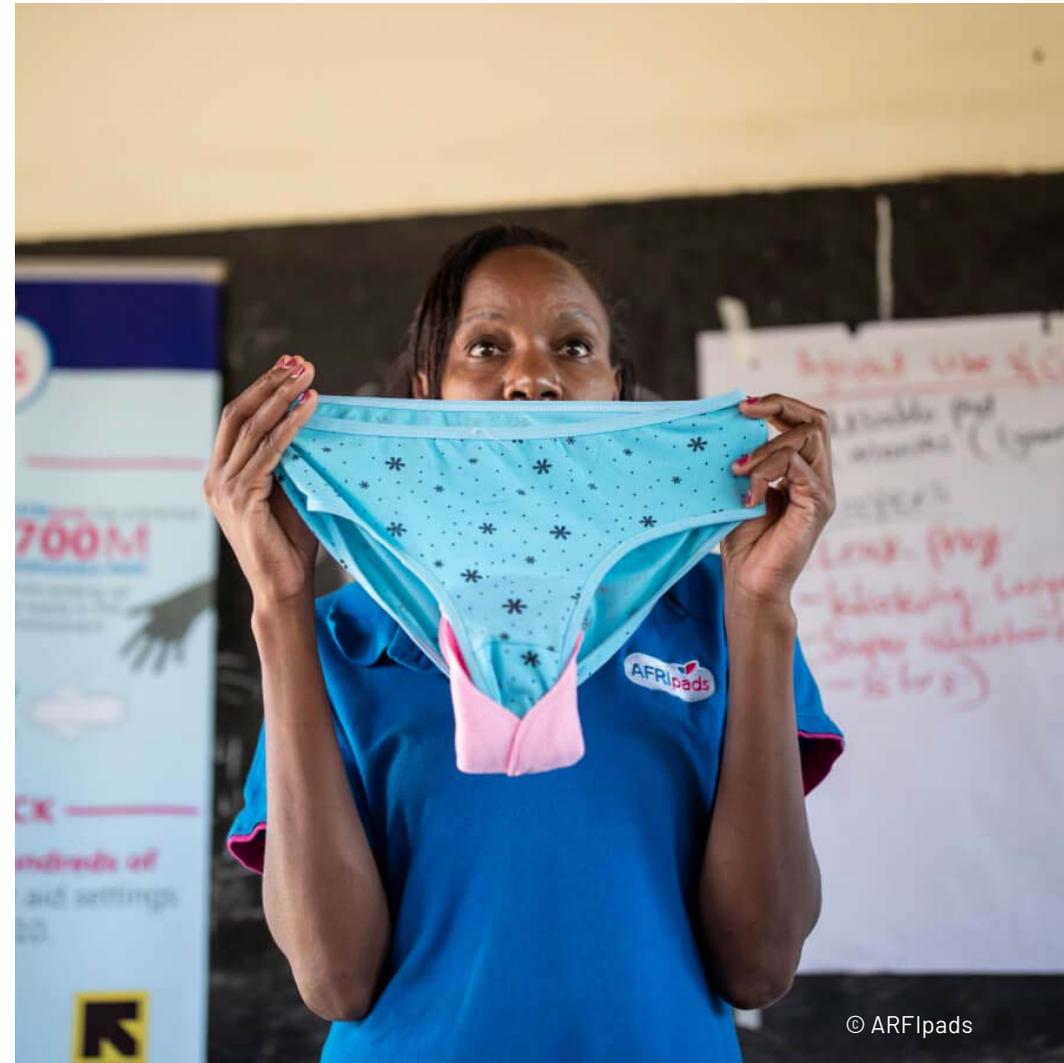
The menstrual hygiene marketplace provides access to products and services, including circular and smart menstrual hygiene solutions. This covers reusable and disposable menstrual products, the recycling and reuse of menstrual materials, and smart supply chains that extend reach as well as digital solutions such as tracking apps.

In a world in which an estimated 1 in 4 menstruators are unable to manage their period safely,¹⁵ there is a huge market potential for affordable menstrual hygiene products of choice. As product access increases, there also is increasing need - and demand for - solutions that reduce the environmental impact of single-use menstrual products in favor of environmental and climate-smart options.¹⁶

In the featured countries, the estimated current total value of the menstrual hygiene marketplace ranges from USD 4 million in Sierra Leone to US\$ 371.2 million in Nigeria. It is expected to reach US\$ 3 billion in the five countries combined once universal access has been achieved.

Dominated by the production and sale of menstrual products, estimates for the menstrual product market range from US\$ 4 million in Sierra Leone to US\$ 370.9 million in Nigeria in 2022, with the potential to drastically increase to US\$ 72.2 million in Sierra Leone and US\$ 1.76 billion in Nigeria once universal access has been achieved.

The circular MHH market has the potential to reach US\$ 0.7 million in Sierra Leone and US\$ 17.7 million in Nigeria, and the smart MHH market has the potential to reach US\$ 0.2 million in Sierra Leone and US\$ 5.7 million in Nigeria.



© ARFIpads

Menstrual Hygiene Marketplace Estimates For Kenya

The estimated current total value of the menstrual hygiene marketplace in Kenya is US\$ 58.7 million. Potentially, it can exceed US\$ 312.9 million once universal access has been achieved.

The menstrual products market is valued at US\$ 58.5 million and has the potential to reach US\$ 306.9 million. The circular MHH and smart MHH markets are only emerging, but they are expected to grow.

MARKET ESTIMATE FOR 2030 MENSTRUAL HYGIENE MARKETPLACE (IN US\$ MILLION) PROJECTION Universal Access

MENSTRUAL PRODUCTS

\$306.94M

-  **\$56.46M**
Reusable Menstrual Pads
-  **\$132.46M**
Menstrual Pads
-  **\$1.34M**
Tampons
-  **\$16.71M**
Menstrual Cups
-  **\$88.84M**
Organic Menstrual Pads
-  **\$4.46M**
Period Underwear
-  **\$6.46M**
Safe Disposal and Collection

CIRCULAR MHH*

\$1.76M

-  **\$0.69M**
Electricity
-  **\$1.06M**
Cellulose
-  **\$0.97M**
Plastic
-  **\$1.06M**
Super-Absorbent
-  **\$0.04M**
Compost

SMART MHH

\$2.85M

-  **\$2.85M**
MHH App services

**TOTAL
MENSTRUAL HYGIENE
MARKETPLACE**
\$312.92M



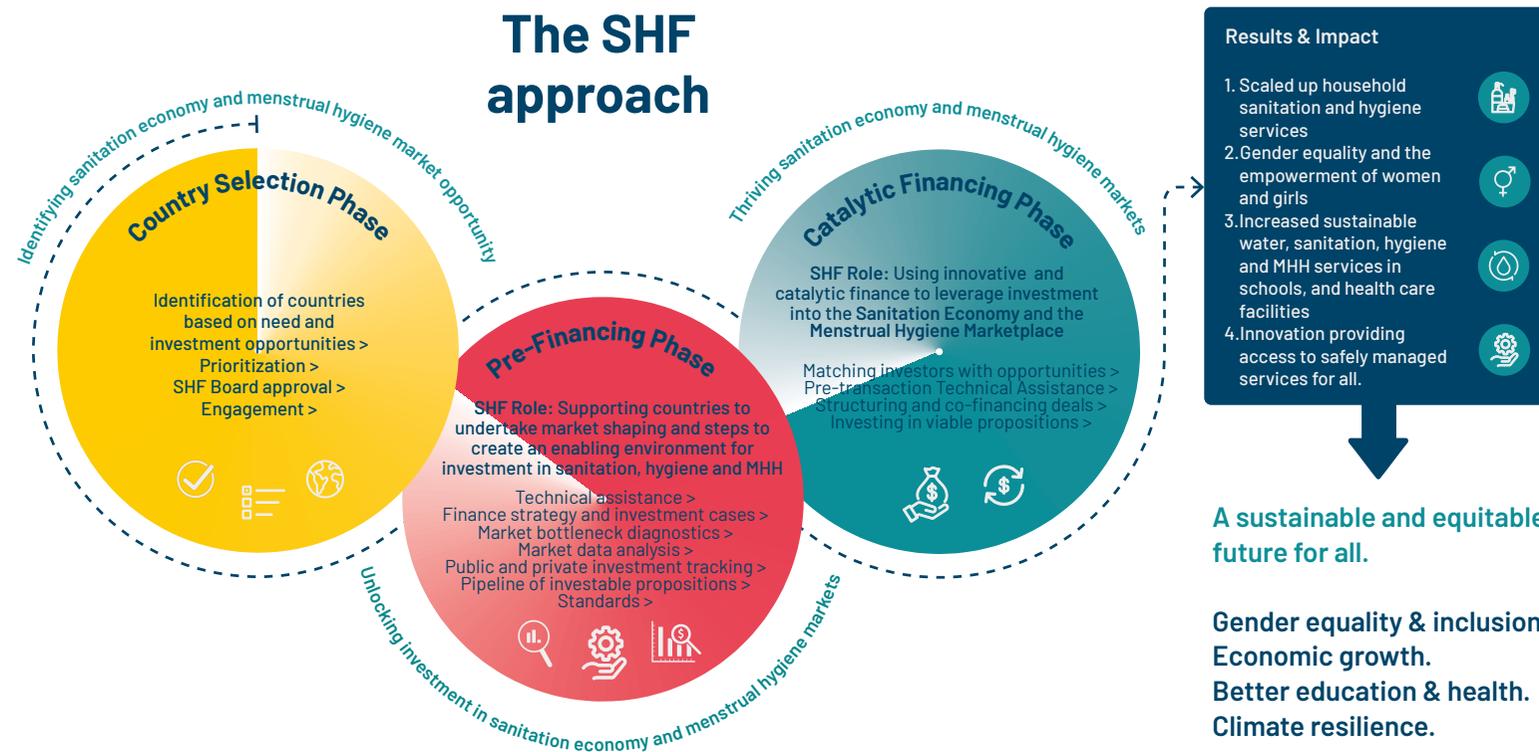
*Given that the circular economy production of electricity is exclusive to the production of other products, for the overarching market calculations the production of compost, cellulose, plastic and super absorbent materials was selected to represent, combined, the circular menstrual hygiene dimension.

Our Solution

The potential global market for impact investing is as much as US\$ 269 trillion (the financial assets held by institutions and households)¹⁷ while the size of the impact investing market currently stands at US\$ 1.2 trillion in assets under management.¹⁸ Channeling just a small proportion of this potential investment to social, environment and economic outcomes, would go a long way towards funding gaps. Public finance from

governments and donors can leverage significant private sector capital and deliver substantial new economic value.

Working globally and with an initial footprint in Africa, SHF is mobilizing resources to identify, develop and fund a pipeline of investable propositions to drive national sanitation targets and help women gain greater economic hold. SHF is committed to reaching scale by making its grants work harder using a catalytic approach that unlocks the resources of multilateral and national development banks, finance institutions and governments to enable the private sector to build ecosystems that can support sustainable sanitation economies and menstrual hygiene markets.



Working Together

Extending the sanitation economy and menstrual hygiene marketplace to the last mile requires that the private sector, entrepreneurs, new investors and governments work together.

Working together, it is possible to prove that the sanitation economy and the menstrual hygiene marketplace can generate accelerated financial return and social impact and become a viable entry point for job creation, financing climate, gender equality and diversity, supporting sustainability and promoting environmental, social and governance (ESG) stewardship.

Join our mission.

Contact and additional information

For additional information please contact info@shfund.org



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How these values were calculated and assumptions

The quoted values estimate the size of the sanitation economy and menstrual hygiene marketplace, their products and services, renewable resource flows, data and information for five countries: Benin, Kenya, Nigeria, Sierra Leone and Uganda. Generated based on selected indicators and verified data from published government and other available sources, they were then cross-validated by expert interviews. Estimates are provided for a baseline year (2022), and projected into the future (2025,

2030) on the assumption that universal access will be reached. As with all research, the estimates are subject to some assumptions and limitations. While care was taken to only use the best and most recent available data sources, some gaps remained. The projections assume steady progress towards universal access, however, these emerging markets are influenced by political, social and economic trends and developments, and might experience unexpected shocks that impact the outcomes.

Annex

Country Market Estimates Overview

The high level estimates shine a spotlight on the size and potential of the sanitation economy and menstrual hygiene marketplace

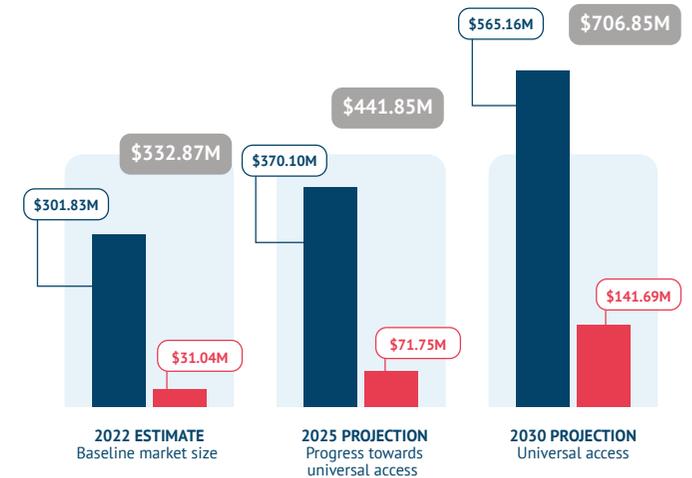
Benin

- Currently at 13 million people, Benin's population could grow 24% to 16 million by 2030.
- Up to 49% of Beninese are living in urban areas.
- It has a very young population with two-thirds under 25 years.
- Benin's economic growth improved in 2021 to 7.0% compared to 3.8% in 2020.

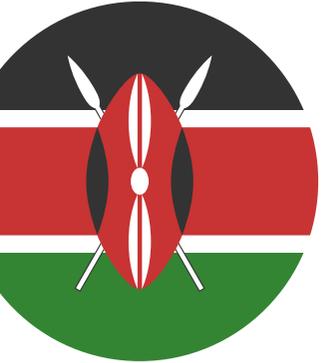
The sanitation economy and menstrual hygiene marketplace potential is currently estimated at US\$ 332.87 million. This estimate might increase by more than 2 times its value to US\$ 706.85 million.

MARKET ESTIMATE FOR SANITATION ECONOMY & MENSTRUAL HYGIENE MARKETPLACE (in US\$ million)

■ SANITATION ECONOMY ■ MENSTRUAL HYGIENE MARKETPLACE ■ TOTAL SANITATION ECONOMY & MENSTRUAL HYGIENE MARKETPLACE



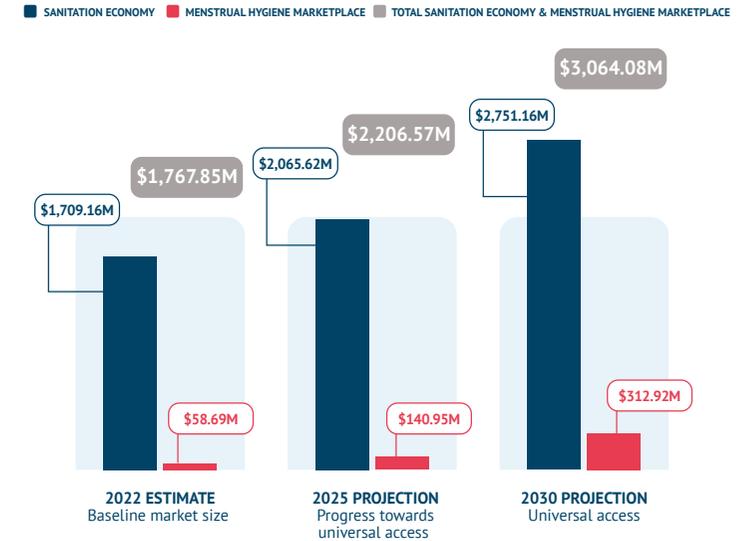
Kenya



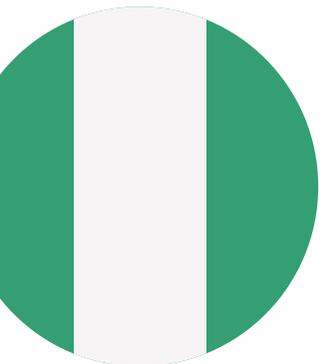
- Young and growing rapidly, the Kenyan population is estimated to almost reach 68 million in 2030.
- Up to 71% of the population still lived in rural areas in 2022.
- In the largest economy of the East African Community, sanitation is included as a basic right under the 2010 Kenya Constitution.

The sanitation economy and menstrual hygiene marketplace potential is currently estimated at US \$1.77 billion, with the potential to almost double to US \$3.06 billion.

MARKET ESTIMATE FOR SANITATION ECONOMY & MENSTRUAL HYGIENE MARKETPLACE (in US\$ million)

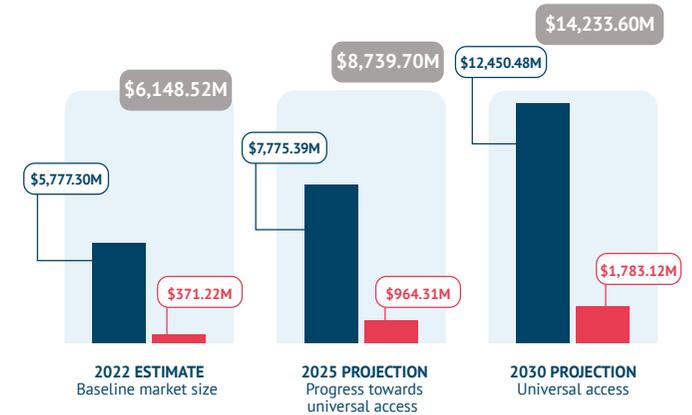


Nigeria

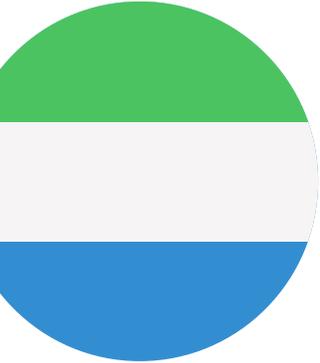


- The most populous country in Africa with a population of 211 million, it is estimated to reach 271 million by 2030.
- Up to 53% of Nigerians are living in urban areas.
- There are 49 million households, rising to 56 million in 2030
- Ranked the top economic power in Africa, it is expected to be in the top 20 world economies in 2030.

The sanitation economy and menstrual hygiene marketplace potential is currently estimated at US \$6.3 billion, with the potential to more than double to US \$14.2 billion.



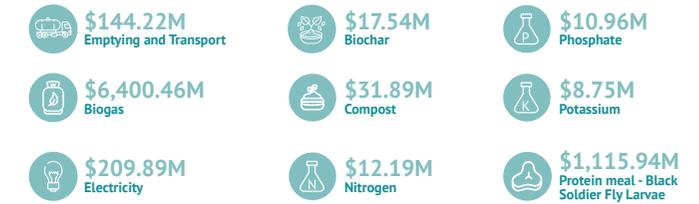
Sierra Leone



- The population of Sierra Leone is projected to reach 10 million by 2030.
- In 2021, 57% of the population still lived in rural areas.
- The IMF projected Sierra Leone's GDP to grow consistently at 2.4% in 2022, doubling to 5% in 2025.

The sanitation economy and menstrual hygiene marketplace potential in Sierra Leone is currently estimated at US\$ 135.61 million. This estimate has the potential to more than double to US\$ 320.82 million.

MARKET ESTIMATE FOR 2030 CIRCULAR SANITATION ECONOMY* (IN US\$ MILLION)



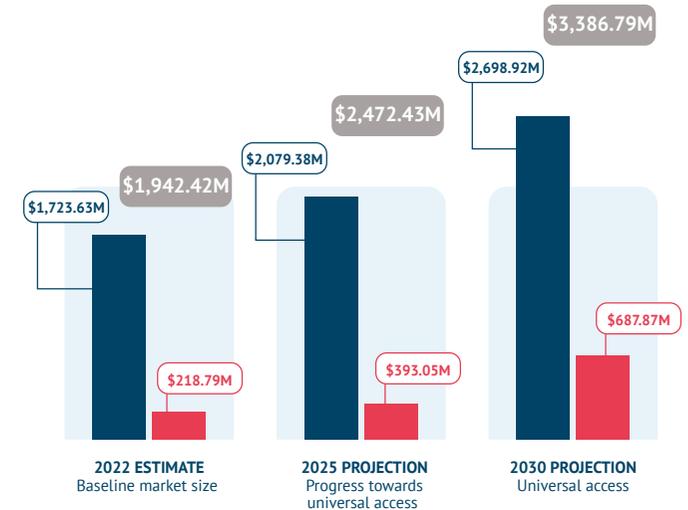
*Note that this report does not total the estimates in the Circular Sanitation Market as only one product can be produced from a volume of waste. Stakeholders are encouraged to look not only at the potential revenue of products but also, from a circular economy perspective, at retaining the value of the product. Biogas is the significant leader in financial potential but breaks the nutrient cycle as the compounds from food consumption are burned rather than returned to the food system. For the overall sanitation economy estimate, Protein Meal product is selected as it promises financial returns while contributing back to the food system.

Uganda



- With 45 million people, Uganda is one the most populous countries in Africa and could reach 63.8 million by 2030.
- Almost 3 out of 4 Ugandans live in rural areas.
- Up to 700,000 young people join the labor market each year.
- Uganda is the third largest economy in the East African Community, and it is expected to be among the fastest-growing economies by 2030.

The sanitation economy and menstrual hygiene marketplace potential is currently estimated at US \$1.94 billion, with the potential to increase to US \$3.39 billion.



Endnotes

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- 2 FSG (2018). Improving Sanitation by Exposing Gender Inequities. Available at: <https://www.fsg.org/blog/improving-sanitation-exposing-gender-inequities/>
- 3 Basic sanitation: Use of improved facilities which are not shared with other households. Improved sanitation facilities are those designed to hygienically separate excreta from human contact, and include: flush/pour flush toilets connected to piped sewer systems, septic tanks or pit latrines; pit latrines with slabs (including ventilated pit latrines), and composting toilets. Source: <https://washdata.org/monitoring/sanitation>
- 4 Safely managed sanitation: Use of improved facilities that are not shared with other households and where excreta are safely disposed of in situ or removed and treated offsite. Improved sanitation facilities are those designed to hygienically separate excreta from human contact, and include: flush/pour flush toilets connected to piped sewer systems, septic tanks or pit latrines; pit latrines with slabs (including ventilated pit latrines), and composting toilets. Source: <https://washdata.org/monitoring/sanitation>
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