

WORLD TOILET DAY – DIALOGUE AND LAUNCH OF NEXT-GENERATION SANITATION TECHNOLOGIES IN INFORMAL SETTLEMENTS

Date: Friday, 19 November 2021

Time: 10h00am - 13h00pm

Technologies:

Technology	Installed Location
Clear recirculation toilet	Mofolo North (Soweto)
New generator	Slovoville Informal Settlement (Soweto)

BACKGROUND

World Toilet Day (WTD) is celebrated annually on 19 November as a call to “encourage behavioural change and the implementation of policies to increase access to sanitation among the poor, along with a call to end the practice of open-air defecation, which it deemed “extremely harmful” to public health” <https://www.un.org/en/observances/toilet-day>). WTD celebrates toilets and raises awareness of the 4.2 billion people living without access to safely managed sanitation. It is about taking action to tackle the global sanitation crisis and achieve Sustainable Development Goal 6: water and sanitation for all by 2030. In 2015, the UN adopted 17 sustainable development goals which provides a shared blueprint for peace and prosperity for people and the planet, now and into the future (UN 2015). This year the theme remarks “Valuing Toilets” This year's campaign highlights the fact that in many parts of the world, toilets - and the sanitation systems that support them - are underfunded, poorly managed, or neglected. This has disastrous health, economic, and environmental effects, especially in the poorest and most marginalized people. Everyone must have sustainable sanitation, alongside clean water and handwashing facilities, to help protect and maintain our health security and stop the spread of deadly infectious diseases such as COVID-19, cholera, and typhoid.

South Africa's Water and Sanitation challenges and failures are well documented in the National Department Water and Sanitation Masterplan which states that as of 2017 14,1 million people still used sanitation facilities below the Reconstruction and Development Programme (RDP) standard. Only 10,3 million households (64%) have access to reliable water supply. Some of the access and supply challenges are linked to South Africa's arid to semi-arid climate, with an average annual rainfall of 465 mm (half the world average), producing a total annual runoff of approximately 49 000 million m³/a. If demand continues to grow at current levels, the deficit between water supply and demand could be between 2,7 and 3,8 billion m³/a by 2030, a gap of about 17% of available surface and ground water. Innovative sanitation systems will minimize pollution in our scarce groundwater and surface water catchments.

In addition to the physical constraints of water resource availability, climate models suggest longer droughts which implies that current storage practices will need to change and water use should be reserved for most productive uses rather than for example, flushing large volumes of water down toilets to move waste to a central point for treatment. It is estimated that current flush volumes are about 30% of the household water use with some toilets in SA still requiring between 12 to 8 L flush volume. Low flush systems will stem our demand for more water and additional built infrastructure.

Municipalities with high levels of indigent households are dependent on national grants to provide reliable and affordable water and sanitation services. In rural and/or smaller municipalities, the proportion of indigent households averages 77%. It is, therefore, difficult for municipalities with a low revenue base to address their backlogs and to allocate sufficient funds for maintaining and operating existing works (NWSMP, 2018). This calls for a radical rethink on the way to meet the policy requirements of sanitation for all. Research recommendations suggest that we look at alternate models that could enable a shift from a municipal managed and driven model to a municipal enabled and private sector driven model for non-sewered sanitation. In other words, a call for rolling out more innovative service delivery models and incentivizing private sector to invest in radical new technology and revenue scale up models to meet the sanitation gap by offering sustainable options.

South African policy and levels of service guidelines recommends waterborne systems (the gold standard) for urban areas and off-grid systems like VIP toilets for rural (the hole standard), while peri-urban areas and informal settlements get technology variations that is considered “most appropriate”. This policy recommendation has seen the proliferation of 2 consequences as seen through the experiences of both the municipal technical core and the communities itself. Research shows that municipalities have been unable to provide anything close to a sustainable sanitation solution for rural, peri-urban, and informal settlements. Research also shows many communities are not satisfied with the basic level of sanitation provided due to aesthetics, safety, health, and quality of products. Yet, the reality is that south Africa has continued to drive VIPs for remote settlements and low income urban and rural communities and waterborne for urban communities. Bold action needs to be taken now to achieve a national target of sustainable sanitation for all by 2030 (NSIP, 2019).

For these reasons, there has been concerted efforts to rethink sanitation and deploy innovation and next generation systems that promotes sustainable use of resources with minimal impact on the environment and to address current and emerging sanitation challenges. The WRC along with its partners have been investing in alternative sanitation solution systems and solutions. To fast-track the adoption of NSSS and other innovative sanitation solution, SASTEP was created.

Local governments in South Africa are mandated by the Constitution to provide water and sanitation services limited to potable water supply systems and domestic wastewater and sewage disposal. This obligation is outlined in the Water Services Act and the Municipal Systems Act. While there are various intersections and support provided by other structures of governments such as the national government through several national departments and various regional and provincial bodies, municipalities remain at the coalface of the delivery of sanitation services to the end-user, as such LGs are a major stakeholder in the emerging sanitation national system of innovation that SASTEP is coordinating. SASTEP has been collaborating with local governments (municipalities, metros and districts) as well as Water Services Authority (WSA) or Water Service Provider (WSP). Johannesburg Water (JW) is a SASTEP strategic partner.

SASTEP BACKGROUND

The South African Sanitation Technology Enterprise Programme (SASTEP) was initiated by the Water Research Commission in conjunction with Department of Science and Technology (DST) and the Bill and Melinda Gates Foundation BMGF). The mandate of the programme is to pilot and demonstrate local and international innovative sanitation technologies in South Africa, foster the development of a local sanitation industry (manufacturing and services) that would increase access to proper sanitation, reduce pollution, improve water security, create jobs and entrepreneurial opportunities that contributes to the country's GDP.

SASTEP aims to prioritise localisation, manufacturing and creating access to market and off take agreements of innovative sanitation technologies by both the private sector and public sector while promoting an enabling regulations and policy environment.

NON-SEWERED SANITATION SYSTEM (NSSS)

A non-sewered sanitation system (NSSS) is defined as a prefabricated integrated treatment unit with two main components: a front-end component (Toilet facility) and a back-end component (Treatment facility). The NSSS collects, conveys, and fully treats the specific input within the system, to allow for safe reuse or disposal of the generated solid, liquid, and gaseous output, (ISO30500, 2018).

NSS Systems operate without connection to any sewer or drainage network. The NSSS can be either manufactured as one package or manufactured as a set of prefabricated elements designed to be assembled without further fabrication or modification that influences the system function. The prefabricated components of NSSS are intended to require minimal work to be integrated and quickly provide fully functioning sanitation systems (ISO30500, 2018).

The inputs entering the NSSS consist of human faeces and urine, menstrual blood, bile, flushing water, anal cleansing water, toilet paper and other bodily fluids/solids. The outputs substances exiting the NSSS include the products of the backend treatment process such as solid output and effluent, as well as noise, air, and odour emissions, (ISO30500, 2018). The Clear Full Recirculation Toilet System and the NEWgenerator system have been licensed by Enviro-Options and WEC Project respectively and these systems will be commercialized and manufactured in South Africa. both technologies are in the later stages of localization with locally manufactured units expected before end of 2021.

JOHANNESBURG WATER – SASTEP DEMONSTRATION PLATFORM:

An agreement was signed between Johannesburg Water and the Water Research Commission to create a platform to demonstrate and showcase innovative sanitation technologies that are being commercialized on SASTEP. The platform aims to accelerate the adoption of next generation sanitation technologies and solution e.g., NSSS in households and locations especially in informal settlements and other areas not covered by the city's sewer reticulation system. This provides the opportunity to safely trial solutions that are able to address sanitation challenges, increase access to appropriate and dignified sanitation and improve livelihood of the city's citizenry.

NON-SEWERED SANITATION TECHNOLOGIES:

The following technologies have been installed on the demo platform:

Clear Full Recirculation Toilet System

The Clear toilet uses a full water cycling process for treatment of the sewage. A rainwater collecting system can also replenish the water to the processor for self-renewal. Blackwater from the toilet is pumped up to the sewage processor for treatment and then recycled to the storage tank for flushing. An advanced unique "Biofilm-MBR" treatment process is employed as the core technology for treatment, producing a stable and clean effluent that is further disinfected to ensure safety of the effluent for reuse. The Clear toilet was developed by Clear, a Chinese company specializing in Environmental Technologies, and will be manufactured locally by Enviro Options, a leading South African dry sanitation company with over 26 years of experience in manufacturing and supplying safe, off-the-grid, non sewered sanitation. Over 600 units have been sold and are in operation at sites across China.

The NEWgenerator system

The NEWgenerator system is a waterborne sanitation technology. The front-end unit consists of a toilet that uses recycled water and potable water for handwashing. The back-end unit consists of a compact, portable, and modular resource recovery machine that eliminates waste while recovering fertilizer nutrients, renewable energy, and clean water.

Draft Programme

FACILITATOR – TBC		
Time	Topic	Speaker
10:00 - 10:15	Opening and setting of the scene	Dr Valerie Naidoo, Executive Manager: WRC
10:15 - 10:30	Project cooperation and the impact thereof	Dr Mandla Msibi, Acting CEO: WRC
10:30 - 11:45	Reflections by BMGF as the project funder	Dr Doulaye Kone, Deputy Director of WASH: BMGF
11:45 - 12:15	Address by Minister	TBC
12:15 - 12:30	Implementer/impact of innovation	Mr. Tshepang Mosiea, Director of S&T for Sustainable Human Settlements: DSI
12:30 - 12:45	Response by the project implementer	Mr. Derrick Kgwale, Johannesburg Water
12:45 - 12:50	Video: Launch of the NEXT-Generation Sanitation Technologies	Facilitator
12:50 - 13:00	Hand-over and Ribbon cutting	Johannesburg Water/WRC
13:00	Closure	Facilitator