

# Jane

**and the**



# Toilet

A collection of 32 open source Sanitation resources for practitioners in an exciting story of Jane's coincidences in a conference.

For online use with clickable links to download the resources

## Thoughts from other WASH (Water Sanitation & Hygiene) practitioners about the story:



**Engr. Lynda Bitrus** • 2nd

3mo \*\*\*

Past Chairman, Nigerian Institution of Environmental Engineers Abuja Chapter

Dr . This is quite interesting. Using the Art of story telling for information dissemination, and awareness creation. I looked forward to other episodes.



**Florence Randari** • 1st

3mo \*\*\*

I help teams build and sustain a learning culture | Program Learning & Adaptive Management (CLA) | Monitorin...

I have learned so much about Jane and toilets this morning! Thank you [Dr. George Wainaina!](#)

Great read and really informative for both WASH and non-WASH practioners!

The sex-specific considerations for toileting got me excited! Do we have any of this happening in Kenya?



**H el ene Higgins** • 2nd

3mo \*\*\*

Environmental and WASH consultant

These stories are absolutely fantastic and so packed with information, thank you very much for putting them together!



**Tordina Lhaba Tordina** • 3rd+

3mo \*\*\*

Expert enqu eteur ACHDR/OIM

Merci pour le partage de l'histoire Dr

[See translation](#)



**Vivienne Gray** • 2nd

3mo \*\*\*

Health Innovation Kent Surrey Sussex

Great template George. Happy World Toilet Day. Happy International Men's Day.

# Jane and the Toilet

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# 1. I Need to Pee!

Jane was sceptical about attending the Third International Sanitation Congress again only in a different town. She did not like travelling yet her actual name Ng'endo, translates to traveller. In the toilet of her hotel room that morning, she was earlier unsure whether to attend the sessions or just take a nap. She had no inspiration since previous Congresses had little innovation to show. But this quickly changed when she entered the exhibition hall.

Jane's eyes were immediately drawn to a booth that had what looked like a toilet. Next to it stood a man in his mid-thirties, smartly dressed and with an inviting smile.

"My name is John. You seem to have a question, may I tell you more about our Blue Diversion Autarky Toilet?" The man asked in a calming voice and a mild smile.



*The Blue Diversion Autarky Concept Toilet on display at Eawag. Photo credit: G. Wainaina*

Jane was caught off-guard! The man strikingly looked like another she knew, Crapper! A former boyfriend in her long-gone campus days, who had made her cry several times in the campus toilets.

She could see that John's attention was now split since others also wanted to ask questions. But she had to respond.

"Nice to meet you, John. I am Jane Ng'endo, a mid-level sanitation professional. I was wondering, what exactly is a Blue Diversion Autarky toilet? What does it do?" Jane asked, still a bit startled. Not sure whether by the toilet or John!

[The Blue Diversion Autarky](#) is a concept toilet that collects water, urine, and feces separately and treats them on-site in specific integrated but separable units. It recycles water for hand washing and flushing, recovers nutrients for fertilizer production, and inactivates pathogens reliably...

...This could be the future of toilets in places like Venice or some parts of Nairobi where full coverage with sewers is a challenge!” John replied hastily, occasionally stealing glances at others in the booth.

Then, he quickly wrote something at the back of a flyer, handed it to Jane and proceeded to answer questions from others who were already getting impatient. Jane grabbed the flier and tossed it in her kiondo (bag).

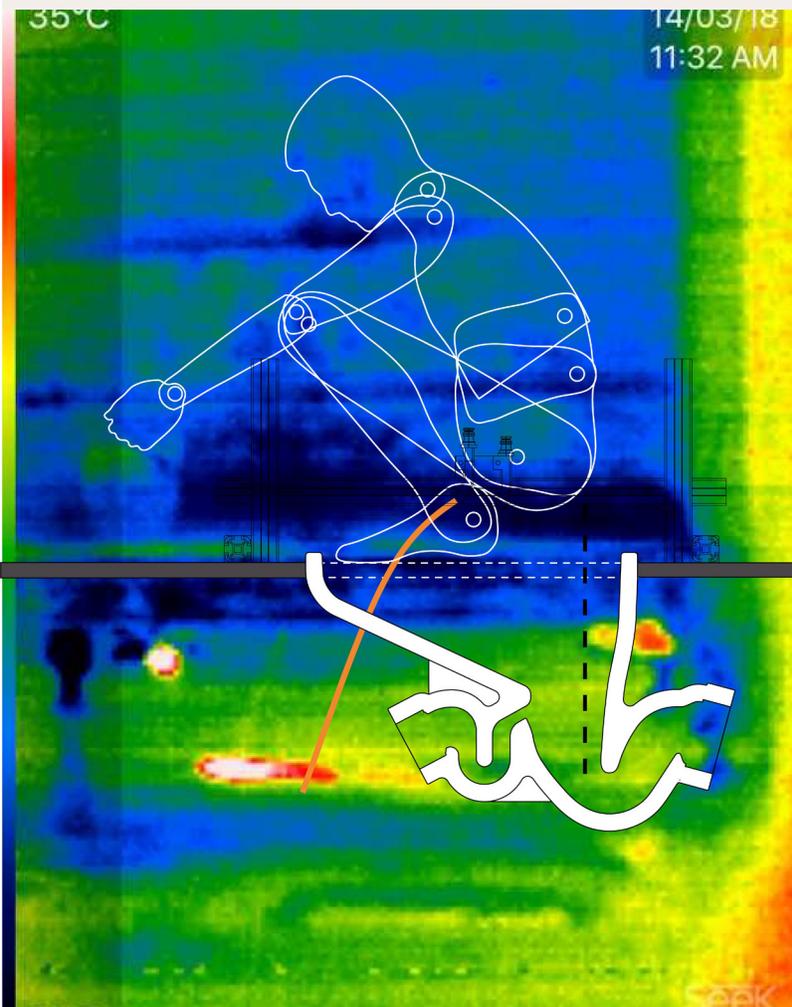
Right then, she felt confused. John had reminded her of a past with Crapper. A person she hated to love, and at the same time, John teleported her to the probable future of toilets. One that seemed on the horizon.

As if that was not confusing enough, who thought Venice and Nairobi’s periurban outskirts had anything in common? Nevertheless, Jane mindlessly wandered to the next booth.

Right in front of her was a mould for a toilet slab that seemed to have been constructed from concrete. It was labelled “[EOOS NEXT](#) pan for UDDT Systems and had an accompanying QR code to see more information.

Following the link, she was immersed into the world of separating urine and feces at the local scale, the potential resources that could be recovered, and the potential of small businesses making these slabs. This fully customisable slab could be adapted for different users and contexts. Jane loved the flexibility of the open-source model and how it democratised sanitation in her opinion. She also heard intriguing accounts of how researchers [tested](#) this in Nepal.

Wandering further, Jane arrived at a booth focused on gender-specific urination. The display at this booth analysed how different body structures affect optimal toilet positioning and use for men and women for urine-diverting toilets.



*Use of toilet interfaces by different genders. Photo credits: EEOS - NEXT*

“How did they study people peeing without invading their privacy?” Jane wondered aloud subconsciously.

“I read [here](#) that they conducted an infrared video study of real-world urination practices of 23 volunteers in India to understand sex-specific differences,” John said tapping her softly from the back and pointing to a website link on another flier.

Jane was startled. She had not noticed John behind her! Here he was bringing back memories of Crapper again!

At the same time, she was fascinated by the science and ergonomics involved in creating a comfortable peeing experience for both men and women. For once in 10 years, Jane felt separated from her thoughts. This was surely a morning she could have never imagined.

“Jane, let’s pass by that booth, I want to show you some research that is shaping quality indicators for shared toilets. Then we can go have coffee. By the way, did you know that the current JMP sanitation service level framework could be improved by refining technology types and using lockable doors, and tiling as criteria instead of a number of households sharing? That is a must-read study.” Inquired John showing her the [link](#) to the report.

“I will read it. Let’s grab that coffee. But I will have to pass by the toilet first,” Jane fumbled.

As she walked beside John, she could not help but wonder how he shared so many traits with Crapper, her former boyfriend. She looked at her reflection on the tiles on the floor and almost didn’t recognise herself. She excused herself and strolled towards a washroom as John headed on.



*QUISS staff inspect shared sanitation facility in Kisumu, Kenya. Photo credits: V. Schelbert*

## 2. Move, Hide, Coffee!

As Jane entered the toilet, she helped a young man on a wheelchair up a stair and then entered the “Ladies” side. Inside, she approached the third toilet in a ROW of five. The first one was stained and had toilet paper all over the seat, the fourth one was occupied and the cistern on the fifth one was broken.

She closed the door and sat on the squeaky toilet seat. While she felt relieved, she wished the seat was more comfortable. She needed the time alone more. She needed to get away from John. As she stood up to flush, she wondered where it all went to. Was the building sewer, did it go to a septic tank... where?

She pushed the button and wished she could do the same to John and Crapper. She was sure Crapper had already flushed her off his mind those long-gone days. Sad that his memories still lingered. Either way, it was

delightful but sad to flush nine liters of drinkable water.

“Such a waste!” She thought.

At the sink, she washed her hands, and noticed how so much unnecessary water flowed into the taps.

“Half of the flow could have done the job!” she remarked to herself, but what could she and others do?

As Jane walked out, she noticed a room that looked like a maze right across labelled “Welcome to Kampala”. She approached it for two reasons. She was curious about what the maze was all about and was avoiding meeting John again. Where best to hide than in a maze? The entrance led to a first common room that explained how researchers had installed GPS devices on fecal sludge-emptying [trucks](#).



*Photo credits: Eawag*

The researchers [tracked them](#) for more than 5000 trips over three months in Kampala in 2016. The common room had five doors each leading to a finding from the research but mazing through the interconnections of the five doors with themselves and city-scale planning. She entered the third door which summarised the research work. It concluded that planned treatment plants could reduce the travel distance of the trucks by two kilometres from the current 6.4 kilometres.

She had read that some trucks in cities hide from the authorities and dump the fecal sludge in rivers. But woe unto them if caught! On her way out, she realised the potential of GPS and GIS technologies in improving the logistics of basic services at the city scale.

Right outside the maze stood a big screen that challenged mobile app developers to partner with sanitation professionals and researchers in disrupting sanitation work, products, and services.

Jane wondered how app developers and scientists could collaborate. Before she could move ahead, the slide on the screen transitioned to a video about such a collaboration that led to an app.

“Take a photo of your feces and the app will tell you it’s characteristics without needing a laboratory!” A lady in the video said.

According to that lady, the app is called the [Sludge Snap App](#). It has a simple user interface for data collection, and a back-end server for image processing using machine learning models. In her mind, Jane wondered whether this had been tested beyond a lab environment. This was answered by the lady in the video soon afterward.

“Sludge Snap currently implements models developed for Lusaka, Zambia. To expand usage, data, and models from other cities are needed.”

As she walked on, Jane pondered the idea of how that app could enable practitioners to better characterise fecal sludge in the field for treatment, planning, and monitoring without analytical labs.

It had been a long but productive morning for Jane and she was feeling hungry. She figured out that by then, John had already finished his coffee and had left, so the coast was clear. She walked briskly across the lobby, grabbed a coffee since there was no brewed tea, wanted to grab a croissant but thought not, and exited to a different lobby.

She was curious why a crowd was gathered in one corner of that lobby but she wanted a sip of the coffee first. She sipped a mouthful and almost spit it out. But she couldn't! Neither could she swallow it.

“Tastes like bitter herbs!” She cursed in her mind.

She placed the mug on one of the tables and ran towards the washrooms. As she turned the corner, she bumped into a man, partly lost her balance, and alas! Her mouth was empty. She had just soiled John's shirt! She frantically apologised.

After gaining her composure, they both exchanged pleasantries and John reminded Jane to check the back of the flier in her kiondo. She then walked back into the lobby. John left for the store outside for a new shirt.

The crowd in the lobby still gathered around a device that looked like a camera tripod. Jane walked towards them and learned that the new device measured volumes of contents in pit latrines, septic tanks, and such containments. The device's name was "[Volaser](#)".

Indeed it was a laser device. It uses a laser distance sensor on a tripod along with a pole to take measurements and estimate volumes and has a smartphone app to

operate it.

A lady who was demonstrating how to use it informed Jane that it had been tested in India, Zambia, and Nepal and that it could make accurate volume measurements in ten minutes but it needed more testing and improvements through partners.

“It would be nice to combine the Volaser with other inspection and sampling tasks to improve fecal sludge quantification and characterisation. Maybe even the Sludge Snap App!” Jane commented.

Jane and the lady had a fruitful conversation and exchanged contacts. The lady also gave her a [book](#) on fecal sludge management.

“I see you have a lot of interest in emptying and transport of fecal sludge, [Chapter four of this book](#) provides a comprehensive overview of the various methods and

technologies, operational considerations, and health and safety aspects around fecal sludge collection and transport.” She said as she turned her attention to the others.

She also gave her one more book that [summarised the FSM book and included exercises](#) that are relevant for students. Jane’s head was spinning from the morning’s events. She also felt like she owed John for the shirt, yet hoped never to meet him again. She headed for lunch and took a nap in one of the nap rooms. Yes, they had one!

### 3. Money and Poo!

Jane was suddenly woken up by her phone alarm. She felt energised enough to see several more booths just before going back to her hotel room. But she could not get out of the nap room yet. She could hear John in a conversation right outside! She did not want to meet him. She sat on a couch in one of the corners of the room and waited. She planned to wait until John was gone.

While waiting, she skimmed through one of the [books](#) she had been given earlier. A full six chapters focused on the treatment of poop! It had comprehensive information on potential treatment technologies and enduse and disposal options.

For each technology, it explained the fundamental mechanisms, advantages, constraints, appropriate applications, design considerations, and guidance on operations and maintenance. All these had a focus on context, resource recovery, and protection of the

environment. She was surprised to learn that even a small amount of fecal sludge can overload sewage treatment plants!

She had been so engrossed in the book but was distracted by a cleaner who casually walked in. She quickly said "Hi", realised John was gone, and walked out of the nap room. She stealthily climbed the stairs to the second floor. On entering the alley to the file of rooms on the second floor, she noticed John's silhouette at the far end of the alley coming towards her. She quickly tiptoed into the room just to her right to avoid him.

There, a lady was presenting about a "[market driven approach](#)" for selecting faecal sludge treatment products to help engineers design appropriate treatment technologies." One statement caught Jane's attention:

"We wanted to identify products with the greatest market attractiveness to help ensure adequate treatment for safe

end use, generate revenue and meet customer demand.”

The lady said.

According to the lady, the methodology was developed and tested in cities like Kampala, Dakar, Accra, and Hanoi. It provides a consistent way to evaluate potential markets across contexts. Jane found the questionnaire and [Excel spreadsheet](#) to calculate market volume, growth, and attractiveness very useful for consultants working in the resource recovery space.

The lady also referenced an assessment of [business models](#) for energy, nutrients, and water reuse that caught Jane’s eye. She immediately connected this presentation to her earlier reading on treatment technologies in the nap room. Even with the presentation ending, Jane couldn’t gather the courage to leave that room. How could she when she did not know where John could be? She dreaded the sight of him.

A second presentation followed. This time a guy talking about removing liquids from poo! He called this dewatering fecal sludge.

“Why would that be important?” Jane wondered. Well, she was in for a ride!

The guy was very particular that the quicker the dewatering in a treatment plant, the easier it is to treat and manage poop. His argument, which he had [proof](#) for, was that fresh poop is different from poop that has stayed for long in pits or septic tanks. And he said it in very “geeky” terms. The explanation from his research for why the poop that has stayed longer dewateres faster was that it had time to break down or “stabilise” as he called it.

His experiments showed that cellulose fibres such as that from bamboo, cotton, or straw, made sludge dewater faster. Lignin a complex compound that comes from wood makes it take longer while fats make it cloudier. Mineral

salts in the poop didn't affect dewatering much. Fresh poop sludge had more tiny particles that can clog filters.

“I did not know that much about poop!” Jane silently remarked to herself.

“How can I do these experiments in my laboratory?” Jane asked loudly after the presentation.

“There is a [detailed book on methods of fecal sludge analysis](#) that is very relevant for lab technicians and researchers. But if you are new to this, a good starting point would be the [free online course on fecal sludge management](#) that [Sandec-Eawag](#) offers,” said the guy presenting.

Jane was surprised at how much she had learned by accident! When she turned to stand up and leave, John was right there in her face!

## 4. Lighthouse flies!

Jane had been avoiding John all day. But here she was, face to face with John! There was nowhere to run. Her mouth was dry. She tried saying something but nothing came out.

“Are you okay?” John asked.

He noticed she was a bit uncomfortable.

“Ye... Yes!” Jane blurted, not knowing what to say next.

“I got a nicer cotton shirt!” John intervened.

Jane had now regained her composure,

“It looks great on you, sorry for soiling your other one.”



*Photo credits: Sirajuddin Kurniawan*

John nodded to imply all was well and excused himself, “I have to pick up my brother who just flew in, I hope to see you later!”

Jane nodded and headed out with a sigh of relief. She still hoped to see him again.

Right across, stood a machine that looked like a home arcade game machine. Jane moved closer to explore it. It had an arcade game called “Flies Rule” based on insights from [a manual for biowaste processing using Black Soldier Flies](#) - BSF. She decided to try it out. The game had five levels and each had a different challenge.

Jane was glued to this game for about thirty minutes but did not even realise it, until someone tapped her shoulder.

“Did you like the game?” The man asked.

“Yes!” She answered excitedly and continued,

“I have learned about how to optimise the lifecycle of BSF. Rear larvae in a controlled environment and feed them biowaste. Harvest mature larvae and process them into marketable products. Analyse costs model scenarios, and plan BSF facility operations. I am even contemplating developing a BSF biowaste processing business back home. It was so much fun!”

“Sounds interesting, I also saw a video for Biowaste Processing with Black Soldier Fly Larvae online. Here is the [link](#),” the man responded.

“By the way, my name is Jane. Have you been to any interesting sessions today?” Jane asked.

She was happy to talk to another person besides John. She could not help notice his enthusiasm.

“Yes, I just came from one where they were talking about [successful scaling up of decentralised urban wastewater](#)

systems. It focused on lighthouse projects. One of the takeaways was the need for careful attention to develop appropriate governance arrangements that align policies, institutions, financing, and coordination between public agencies, the private sector, and communities. But this has to exist in the context of a mix of hierarchical governance for oversight, network governance for coordination, and market governance for implementation. It was also clear that capacity building and information sharing are also critical elements.” The man responded enthusiastically.

“And what are Lighthouse projects?” Jane asked.

Before the man could answer, a wave of foul smell suddenly crept through the room. It felt like someone had eaten too much beans for the day. Both Jane and the man looked at each other suspiciously.

The smell was too much to be from one human. It seemed to be coming from the balcony window near the

staircase.

“Let’s go see where the smell is coming from,” said the man beckoning towards the balcony.

## 5. Integrate the Flows!

At the balcony, a sewer line had burst and was overflowing to the road that was one street away. The foul smell would only get worse now. Jane now at least figured out where it actually went when she flushed. It was all sewered out there. As they were watching, the water company workers arrived at the scene and realised that the sewer had been blocked by accumulated trash.

“How do Shit Flow Diagrams account for fecal sludge from offices considering that that is where most people take a dump during the day!” said the man aloud

Jane’s thought process was distracted. She didn’t have a clear response on top of her head but she had to offer something,

“I am not sure, but I have a [link](#) that you can check. Have you used SFDs before?” She responded, holding out her phone for the man to see.



*Photo credits: Dorothee Spuhler*

The man took a photo of the link and responded, “Not yet. But I am planning to use one to communicate excreta flows in my city. I think I can get more funding for projects once they see just how much fecal sludge is poorly managed. Have you used other tools to visualise and communicate water and sanitation challenges?”

Jane thoughtfully explained about a recent tool called “[The urban water flow diagram](#)”.

“It is a visual tool that maps all the water resources and flows in a city and highlights the challenges and opportunities related to sustainable water management. There is a nice [quick guide](#) for how to implement it in a city. You should have a look.”

The workers were still unblocking the sewer. There was a huge pile of trash from the sewer. Plastics, diapers, and waste of all kinds.

“I will check how I can use that water flow diagram. I am also struggling with finding the right combination of different sanitation technologies and systems for different areas in my city. Do you have any tips? Also, my colleagues would love to know more about onsite sanitation. Any pointers?” The man was curious.

Jane narrated how she had seen a researcher test [SaniChoice in Nepal](#) in a Citywide Inclusive Sanitation planning exercise. SaniChoice helped engineers and planners select optimal combinations of sanitation technologies along the full sanitation chain. The researcher shared an [online](#) link to the tool. She also shared the link to the Planning and Design of Sanitation Systems and Technologies free [online course](#).

“Oh! Before I go, Lighthouse projects are tested innovative initiatives that are yet to scale but have wider potential beyond the locations where they were tested. Like the mandatory requirement to operate onsite water reuse

systems in [San Francisco](#), onsite treatment units in gated communities in [Bengaluru](#), or others in [Hamburg](#)” The man remarked thankfully.

He took her number and went back to the building leaving Jane relaxing on the balcony. The foul smell was still lingering but it was not better inside either. She preferred to stay outside. The pile of trash was still growing as the workers worked. Her kiondo slipped from her hands and fell to the floor. Its contents were scattered but luckily, none of them fell off the balcony. Lots of brochures on water, sanitation, and solid waste.

As she knelt to collect them, one stood out. The one on which John had scribbled that morning. She had not had time to see what was written.

“Let’s meet at the [Integrate](#) Session,” read the note.

Jane was looking forward to that session since she had been involved in organising it. It was due in twenty minutes. John must have figured this out from the programme! The session was about a recently started project that was exploring linkages between water, sanitation, and solid waste provision in small towns and how planning can ensure positive outcomes. Jane rose up slowly contemplating whether she would go to the session or not.

Suddenly, she heard a voice too familiar:

“Ng’endo!” A man called

It could not be! She turned swiftly to face where the voice came from. Two men stood. One with his arms open and another a bit startled.

Crapper was the brother who John had gone to pick up from the airport!

Author:

[Dr. George Wainaina](#)

[Eawag-Sandec](#)

[Info@sandec.ch](mailto:Info@sandec.ch)

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Reviewers:

[Dr. Christoph Lüthi](#)

[Laura Velásquez](#)

Copy Editor:

[Paul Donahue](#)



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aquatic research **ooo**