



## Connecting the Unconnected: Informal Toilets and a Safe Circular Water Economy

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## Proceedings of International Symposium

Lancaster University, UK, 28 – 29 March 2022

Convenors: Manoj Roy, Roger Pickup, Ella Foggitt & Nikita Mehta

### Symposium video documentary

[With sub-titles](#); [without sub-titles](#) (length: 7.23min)

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## Executive Summary

Water is unaffordable and undrinkable for most informal urban dwellers. Even when municipal water is accessible and relatively safe, faecal bacteria contaminate the water as it is dispensed at shared water points and transported by people to their homes. Consumption of unsafe water and poor access to safe sanitation have numerous negative consequences. Safely managed sanitation, on the other hand, has many positive impacts, such as climate change mitigation potential. A key challenge to realising this potential and achieving ambitious global targets, such as Sustainable Development Goal Target 6.2, is the absence of shared toilets from policy. *The symposium's purpose was to provide a venue for researchers, practitioners and policy makers to exchange knowledge and ideas on these issues.*

The symposium focussed on seven guiding questions:

- How extensive is faecal contamination of drinking water in informal settlements?
- What assumptions and practices contribute to the persistence of contamination?
- What value does society attribute to faecal waste, and can it be increased?
- Does supporting, rather than shunning, informal toilets make sense? How might it work?
- Is making 'invisible' faecal contamination 'visible' to stakeholders possible and useful?
- What are the pathways, actionable through policies, to 'connecting the unconnected'?
- What are the key barriers to making informal sanitation a political priority?

### Key discussion points:

- Safeguarding provisioned municipal water from faecal contamination is a global priority. However, municipal authorities in most developing countries prioritise drinking water provisioning over sewage management. Water is usually provided via community taps that have led to improved availability of potable water to many citizens of low-income settlements. However, it is in what we refer to as 'the last 100 meters' where water is carried from standpipe to home that problems arise. Through various pathways (e.g. leaking toilets, dirty buckets, unwashed hands, insect and rodent vectors) potable water and food is cross-contaminated with faecal bacteria, causing ill health and even death.
- There are important spatiality and temporal dynamics in sewage-derived contamination. The water quality is generally good in the authority-owned water supply system, but the water becomes unsafe once it arrives inside low-income settlements. Moreover, dilution in contamination may be expected during the rainy season, but in practice, many people use the rain as an opportunity to empty their toilets, so contamination in-fact increases.
- Faecal matter can be a 'resource', but its commercial viability needs to be proven for wider scale uptake of the circular economy of sanitation.
- More closely linking sanitation with other policy issues, such as climate change, may help to prioritise it on policy agendas and increase investment.
- Action needs to be taken at multiple levels and across scales – from local to global. At the community level, the 'youth' are important change agents.
- Common principles underpin attempts to 'connect the unconnected' but the specifics need to be context sensitive. Achieving a safe circular water economy requires effective interdisciplinary collaboration between academic and non-academic stakeholders.
- Greater pressure on governments is needed in order for sanitation to be prioritised. Despite lack of money often being used as an excuse by governments, the real problem is lack of political will to address sanitation.

## 1. Symposium Structure and Participants

The symposium followed a hybrid format to facilitate ease of access. The online component of the symposium took place on 28<sup>th</sup> March 2022 and was chaired by Dr Akanimo Odon. It featured a combination of online-only speakers, discussions and Mentimeter activities as well as live-streamed in-person plenary sessions.

The in-person event spanned across 28<sup>th</sup> and 29<sup>th</sup> March 2022 and was held at Lancaster University, UK. It was broadly divided into two halves. The first half examined the core challenges and problems of poor sanitation in informal urban settlements. On the second half, potential solutions were proposed and discussed. Some invited participants were unable to attend in-person, but many contributed to the online event instead.

A key feature of the symposium was its emphasis on South-South dialogue and knowledge exchange. Over 80% of its participants were from Africa or Asia. Delegates' expertise was varied but complementary, with social scientists, civil engineers and microbiologists among those represented. A significant proportion of delegates were early career researchers and community stakeholders. Attendees from outside academia included government officials, industry representatives, a school head teacher and NGO officials. Almost half of in-person presenters were female (44%).



Photo 1: A venue for South-South dialogue and knowledge exchange

## 2. Online Engagement

The online symposium assembled a group of senior analysts, heads of local and international NGOs, and policy makers. Their input was captured via two panel sessions linked to the symposium objectives. The first panel focused on the challenges of connecting informal toilets to a safe circular water economy. The second panel explored a sustainable set of actions required to capture and treat faecal matter from toilets within low-income settlements. These are to prevent the release of faecal contamination into the local environment and ultimately to the drinking water that the low-income dwellers consume.

The first panel featured Prof Alphonse Kyessi (Ardhi University, Tanzania), Dr Md Khairul Islam (Regional Director, Water Aid, South Asia), Professor Sabitri Tripathi (Nepal Engineering College), and Mr Vinod Mishra (Head-WASH India, UN Office for Project Services). The challenges

they highlighted included a lack of political will to address sanitation in low-income settlements, complex and problematic tenure status of these settlements and dwellers, and a lack of recognition of sanitation as a human right of the urban poor.

The panellists felt that although a major share of the urban population lives in these settlements, municipal authorities have difficulty recognising their tenure. This results in their neglect in official policies and programmes. Moreover, while it is encouraging that water, sanitation and hygiene issues facing the urban poor are being recognised, the politicians on the ground are more interested in provisioning water than improving sanitation. Mr Mishra coined the phrase "water is their boat to the power" to underline such political bias towards water.

In discussing how to address such policy neglect and political bias, Dr Islam highlighted that the state and its development partners needed to come together to ensure that safe sanitation was provided to those who remain unconnected or connected to unsafe sanitation. He stated, "At the end of the day, we are all committed to providing safely managed water and sanitation to all citizens by 2030, leaving no one behind. I believe that in terms of investment, this is very much doable. It is the political will and commitment, and the state's roles and responsibilities that can make this a reality and they should make it a reality."

Mishra touched on the importance of academic research, especially to identify evidence-driven pathways through which the unconnected (population and settlements) can be mainstreamed and why they have been left behind. He added, "We need to advocate for the unconnected to the industry so that they see the opportunity exists there as they do have the social responsibility to invest in the unconnected." Professor Tripathi echoed this and referred to the Brown Gold project she was involved in, "Faecal sludge is a source of energy and what we call brown gold. There is a high potential to generate resources from faecal matter, so let's use it to raise the economic status of the informal settlements."

The second panel consisted of Ms Charlotte Akwaah-Adjei (Ministry of Sanitation and Water Resources, Ghana), Dr Dibalok Singha (ED, Dushtha Shasthya Kendra [DSK], Bangladesh), Mr Samuel Dotse (CEO, HATOF Foundation in Ghana), and Ms Marian Akran (Founder, Agatha Obiageli Aghedo Memorial Foundation, Nigeria).

Dr Singha summarised key learnings from DSK's four decades of implementing sanitation projects in Bangladesh. He put particular emphasis on the challenging ground realities of sanitation in low-income settlements including poorly constructed septic tanks linked to storm water drainage or open drains. He stressed the importance of raising awareness about unsafe sanitation in the community and engaging with the community in doing so. "It is important to make target communities alert and aware about the danger of not having adequate and safe sanitation. We used community-led total sanitation approaches to make people aware that they were eating their own shit. As part of a large research collaboration [the Last 100 Meters project] we have recently developed communication tools to actively engage with youth volunteers, particularly the resident adolescent girls from the target communities."

Mr Dotse and Ms Akwaah-Adjei endorsed and re-emphasised the importance of having solutions designed through the participation of people within communities, especially women, children, civil society organisations (CSOs), community-based organisations (CBOs) and traditional leaders. CSOs and CBOs should begin to look at what strategies they can employ to get politicians to listen to them. In their advocacy strategy, water and sanitation need to be linked to other pressing issues like renewable energy, food security, nutrition, resilience, gender and social inclusion. Once these grassroots organisations demonstrate their commitment to such an integrated approach, they might be qualified/entrusted to receive state/donor support.

Dr Odon, who moderated the discussions, emphasised in his closing remarks the importance of bringing the ground realities of poor faecal management in low-income settlements to the attention of the political parties in power. This was the key message he brought to the final, in-person panel discussion (see Section 4).

### **3. In-Person Discussions**

#### **DAY ONE**

##### ***Plenary 1: Setting the Scene***

The opening plenary was chaired by Professor Roger Pickup from Lancaster University.

Professor Kirk Semple, the Director of RECIRCULATE and ACTUATE projects, opened the symposium. He described it in the context of international development research at Lancaster University and, more specifically, the GCRF-funded RECIRCULATE and ACTUATE projects. Professor Semple emphasised the importance of overcoming water-related challenges and highlighted the role of co-design, co-development and co-delivery in achieving this. He also identified 'youth' as change makers and realising the potential of a safe circular water economy as being routes to overcoming water-related challenges.

The conceptual foundation of 'connecting the unconnected' was presented by Dr Manoj Roy, the co-lead of RECIRCULATE's Water for Sanitation and Health work package. Dr Roy contextualised the informal urban sanitation challenge, drawing on the examples of Accra, Ghana and Dhaka, Bangladesh. He introduced the concept of the last 100 metres whereby drinking water is contaminated as it enters the 'people as infrastructure' of water transportation. The question of who should be responsible for providing safe sanitation services in informal urban contexts was raised. Dr Roy identified the 'youth' as a group of stakeholders who may hold the key to overcoming the informal sanitation challenge.

The second section featured a panel discussion. The first panellist, Dr Francis Boateng Agyenim, Director of CSIR-IIR, highlighted the disconnect between sanitation provision in high and low-income urban areas in developing countries. Dr Agyenim reiterated the potential role of the 'youth' in overcoming sanitation challenges and reminded the audience of the significant financial cost to governments of poor sanitation, by for example, significant amounts of money spent on treatment of water-related diseases, such as cholera.

Ms Charlotte Akwaah-Adjei from the Ministry of Sanitation and Water Resources Ghana was the second panellist and identified the challenges posed by illegal housing tenure and social dynamics. She discussed some initiatives implemented by the government to improve water and sanitation in Ghana.

The third panellist was Dr Reuben Larbi from Lancaster University who outlined the issue of lack of local data, as well as the challenges of measuring access to safe sanitation. The matter of affordability of pay-per-use toilets was also raised.

Professor Kenneth Yongabi Anchang was the final panellist, who highlighted the value of an Afro-centric approach and engaging with indigenous knowledge. During the Q&A session that followed, the lack of sanitation financing was raised as a significant problem. Another challenge raised was that academics need to better communicate their research to policy makers.

### **Parallel Session 1: Theme - How Extensive is Faecal Contamination of Drinking Water in Low-income Settlements?**

Theme 1 sessions were chaired by Dr Nick Chappell from Lancaster University.

Mark Akrong from CSIR-WRI opened Theme 1 with his presentation on monitoring the impact of the RECIRCULATE work package (WP) 2 intervention on the quality of drain water. The results showed that the intervention site in Accra, Ghana experienced improved drain water quality in comparison to the control site in terms of both faecal coliforms and *E. coli* levels and compared to samples taken in the pre-intervention period.

Also from CSIR-WRI, Dr Kwadwo Ansong Asante presented the methods and results of RECIRCULATE WP2's drinking water monitoring. The findings showed that faecal coliform contamination of drinking water increased at the final stage of the water journey i.e. in the households, furthermore the water quality at the point of collection was generally good.

The third speaker was Joyce Tuakly from Blue Skies who presented the results of a trial in Ghana where human faecal waste is being treated in a RECIRCULATE developed anaerobic digester and applied to cabbage crops. The results were promising, and Ms Tuakly suggested that faecal waste should be considered a viable source of nutrients for crops.

In the workshop, the temporal dynamics of faecal contamination were discussed. Debates among delegates showed that the dynamics are not straightforward; dilution in faecal contamination may be expected during the rainy season, but in practice, many people use the rain as an opportunity to empty their toilets, so contamination may in-fact increase. The sustainability of RECIRCULATE WP2 interventions was also discussed. Holistic programming and facilitating inter-generational behaviour change around WASH were identified as potential routes to sustaining the gains.

Table 1: Contributors to parallel session 1

Name	Affiliation	Presentation	Highlight
Mark Osa Akrong	CSIR-WRI, Ghana	Drain water quality in two urban slums in Accra, Ghana and the impact of an intervention initiated in one of the slums	RECIRCULATE WP2 intervention associated with lower faecal coliforms and <i>E. coli</i> than the control site and samples from the pre-intervention.
Dr Kwadwo Ansong Asante	CSIR-WRI, Ghana	Drinking Water Quality from Two Urban Slums in Accra, Ghana: Exploring the Concept of the Last 100 Metres	Proof of last 100 metre concept – faecal coliform contamination of drinking water spiked once the water reached and resided in the household.
Joyce Tuakly	Blue Skies Ghana	Microbial pathogens and leafy vegetables: Impact of irrigation practices	Anaerobic digestion of human faecal waste shows promise when applied to cabbage crops in Ghana for growth and lower contamination.

### **Parallel Session 2: Theme - What Assumptions and Practices Contribute to the Persistence of Contamination?**

Theme 2 sessions were chaired by Manas Sanyal from the Indian Institute of Engineering Science and Technology, Kolkata.

Theme 2 was opened by Maia Brons's presentation on water insecurities in Dhaka. The presentation explored the multiple invisible layers of water insecurity and questioned whether making these layers visible is possible and useful. Ms Brons, from the University of Brighton, critiqued ambitions to 'sanitise' cities and questioned whether 'connecting the unconnected' is an inherently good action.

Professor Anna Mdee from the University of Leeds began her presentation by highlighting the gaps between Kenya's ambitious policies to achieve sanitation for all, and the reality on the ground. Drawing on findings from two qualitative studies, problems impacting sanitation service delivery were outlined and potential solutions were presented.

Professor Kenneth Yongabi from Imo State University was the third contributor. Professor Yongabi emphasised the advantages of traditional water treatment systems based on indigenous knowledge. The presentation concluded that 'connecting the unconnected' would best be done by connecting indigenous knowledge to sustainable technology.

In the workshop, questions discussed included how sanitation can be made more of a priority by citizens to increase the likelihood they will demand safe sanitation from their governments. The injustice of poor people having to pay the most for access to sanitation was discussed and the common claim by governments that they 'can't afford to do it' is not true in the case of sanitation, it is more a case of lack of political will. Potential routes to putting sanitation on the political agenda were discussed, including more-closely linking sanitation with water. Sanitation is a public good and the responsibility ultimately lies with governments.

Table 2: Contributors to parallel session 2

Name	Affiliation	Presentation	Highlight
Maia Brons	Centre for Spatial, Environmental and Cultural Politics, Brighton University, UK	On the floods and contaminations that move urban marginality: Curating and counteracting (in)visibility through water infrastructures in Dhaka's informal settlements	'Connecting the unconnected' may not be a universally positive step.
Professor Anna Mdee	University of Leeds, UK	Informal sanitation in Kenya: a grim reality that is hard to change	'Conventional' sewered off-site provision tends to be embedded in national planning and policy, while informal coping strategies are often invisible.
Kenneth Yongabi Anchang	Imo State University, Nigeria	Addressing COVID-19 Hand Wash in Africa: Low Cost Moringa Sand Filter Hybrid Technology for Household and Community Water in Africa	Connecting indigenous knowledge to sustainable technology is a route to 'connecting the unconnected'.

### ***Parallel Session 3: Theme - Being 'Unconnected': Lived Experiences and Intersectionality***

Theme 3 sessions were chaired by Professor Nigel Clark from Lancaster University. The day 1 reporting back session was chaired by Dr Jacob Kihila of Ardhi University.

Theme 3 was opened by Associate Professor Diogo Trajano Gomes da Silva from the University of Brighton. The presentation featured the ongoing Towards Brown Gold project in Nepal. A shit flow diagram of the study site showed that the vast majority of faecal waste was not safely managed and unsealed pits were a core contributor to faecal contamination.

Tapos Das from BRAC University presented results from a longitudinal study of toilet biographies in Dhaka, Bangladesh. Mr Das showed that poor operation and maintenance arrangements are a major challenge to the sustainability of donor-funded toilets.

Dr Alesia Ofori from the University of Leeds presented on behalf of Domenic Sammy Kiogora Murithi from Meru University of Science and Technology. The talk featured the results of an ethnographic study into the efficacy of community-based integrated toilet and biodigester system in Kenya. The pay-per-use model of toilet access was conceptualised as a form of 'infrastructural violence,' with people connecting to the sewer system paying considerably less.

Table 3: Contributors to parallel session 3

Name	Affiliation	Presentation	Highlight
Assoc. Prof. Diogo Gomes Da Silva	University of Brighton, UK	Protecting and connecting the unconnected in rapidly urbanizing settlements: towards a safe circular water economy in Nepal.	Unsealed pits are a major source of faecal contamination in Nepali case study.
Tapos Das & Dr Mohammad Faruk	BRAC University, Bangladesh	A toilet for a decade: Delights and dilemmas of externally funded toilets within low-income settlements	Poor operation and maintenance pose key challenges to long-term sustainability of donor-funded toilet facilities.
Dr Alesia Ofori (on behalf of Domenic Kiogora)	University of Leeds, UK	Abjection or Unconnectable? Accelerated Toilet Provision and Access to Sanitation in Slums of Kenya	Pay-per-use model of toilet access can be considered a form of infrastructural violence.

***Plenary 2: Does Supporting Rather Than Shunning Informal Toilets Make Sense? How Might it Work?***

The plenary was chaired by Professor Alphonse Kyessi from Ardhi University.

Dr Roy opened the afternoon plenary session with a position statement exploring the potential of the assisted sanitation model for informal toilets. Multiple different models and approaches to improving basic services were outlined and RECIRCULATE's stakeholder collective model was presented as another potential option.

The position statement was followed by a panel discussion with Dr Richard Bayitse (CSIR-IIR), Dr Sally Cawood (Lancaster University), Dr Samuel Dotse (HATOF Foundation) and Professor Anna Mdee. The panel discussed the usefulness of the sanitation Sustainable Development Goal (SDG 6) and the World Health Organisation/UNICEF Joint Monitoring Program's definitions of 'safely managed sanitation.' There was consensus that the SDGs need to be contextualised for them to be relevant, particularly for cities in developing countries. Despite being considered 'ideal' in many ways, unshared household toilets were considered impractical in many high-density, low-income urban contexts.

**DAY TWO**

***Plenary 3: Is Making 'Invisible' Faecal Contamination 'Visible' to Stakeholders Possible and Useful?***

The plenary was chaired by Professor Kenneth Yongabi Anchang from Imo State University.

The day 2 morning plenary was opened by Professor Nigel Clark's position statement. Professor Clark, from Lancaster University, outlined multiple aspects to invisibility and routes to visibility. Increasing visibility was described as a modern global challenge that required leveraging support for informal settlements and being aware of the politics. The idea that if failures are visualised, then they can be opportunities to learn, was also presented.

The panel was designed to facilitate the interrogation of 'expert witnesses' by sanitation stakeholders. The 'expert witnesses' on the panel were Professor Roger Pickup (Lancaster University), Dr Alison Parker (Cranfield University), and Associate Professor Diogo Gomes Da Silva (University of Brighton). The stakeholders were Mr Sulemana Imoro (Umar Bun Hatab Islamic School), Mr Jacob Kojo Nkunu (Sewerage Systems Ghana Limited) and Ms Charlotte Akwaah-Adjei. A core point of discussion was the vital role of effective communication and education, particularly the engagement of the 'youth'.



### **Parallel Session 4: Theme - The Important Role of Stakeholder Collectives**

The Theme 4 sessions were chaired by Dr Anthony Yaw Karikari from CSIR-WRI.

The first Theme 4 talk was led by Jacob Amengor from Ghana Water Company Limited who presented the experiences of iWASH Africa in designing a community-based integrated water and sanitation system. Lessons learned from their experience include the importance of understanding community dynamics, tailoring communication approaches to the specific target group and the value of community participation.

Bennett Akuffo from Green Advocacy delivered a presentation on their experience of stakeholder collectives in Accra, Ghana. The process of forming a group of adolescent change agents was outlined, and key stakeholders were identified.

The final Theme 4 presentation focussed on science in schools. The presentation was co-delivered by Jacob Kihilia (Ardhi University) and Sulemana Imoro (Umar Bun Hatab Islamic School) and experiences from both Tanzania and Ghana were presented. With the Tanzanian experience, the model of co-training, co-production/knowledge generation and co-management was showcased in the context of implementing rain gauges in schools. The challenge of maintaining the rain gauge after the sponsoring project finished was a key take-away message. The RECIRCULATE-ACTUATE model of constructing a biodigester and weather station in a Ghanaian school was also presented.

Table 4: Contributors to parallel session 4

Name	Affiliation	Presentation	Key point
Jacob Amengor	Ghana Water Company Limited	Community-Based Integrated Water and Sanitation Solutions; The iWASH Africa Story	Community dynamics need to be understood to maximise potential of community participation.
Bennett Akuffo	Green Advocacy Ghana	Beyond sanitation: Engaging community stakeholders across the generations	Adolescent change agents can play an important role in WASH interventions.
Sulemana Imoro & Dr Jacob Kihila	Umar Bun Hatab Islamic School, Ghana & Ardhi University, Tanzania	Science in the school: Assessing sustainability across three experiences in Bangladesh, Ghana and Tanzania	Co-design, co-training, co-production of knowledge and co-management of infrastructure are important steps.

In the workshop, the core principles of effective stakeholder collectives were discussed. The importance of project co-design and community participation from the outset were raised. Being aware that communities are not homogenous groups of people, and that they can be sources of conflict and social tensions, was also discussed. A key take-away message was the need to design exit plans to increase the sustainability of projects once the funding ends.

### **Parallel Session 5: Theme - What Impact Does Society’s Perceived Value of Faecal Waste Have on the Circular Economy Model and how can this be Improved?**

The Theme 5 sessions were chaired by Dr Mohammad Faruk from BRAC University.

Theme 5 was opened by Dr Alison Parker’s presentation on ‘valuing faecal waste in the circular economy for sanitation’. The presentation drew upon multiple case studies in India and Kenya. The challenging economics of organic fertilisers given the subsidies for chemical fertiliser production were highlighted. Inefficient operation of waste treatment plants (below capacity) in the Indian case studies was also raised as a challenge. Supportive policies and subsidies were among the potential ways forward.

The second presentation was co-delivered by Jacob Nkunu and Joyce Tuakly. It explored how the sanitation value chain has been extended from toilets to grow crops in fields through the RECIRCULATE-ACTUATE model. The core message was that treated faecal matter is no longer waste; it is a resource.

Professor Alphonse Kyessi presented on the topic of community-based improvements to ventilated improved pit (VIP) latrines in Dar Es Salaam. Multiple lessons from the project, including the benefits and challenges of community participation, were outlined.

In the workshop that followed, a core topic of debate was whether ‘connecting the unconnected’ was realistic. Some delegates raised the issue of timescale, saying that it may be possible in 50 years’ time, but in the meantime, people will continue dying from water-related diseases. A multi-modal approach was posited, whereby some people use on-site sanitation and others use off-site sanitation systems, but concerns were raised by some about whether that arrangement would be acceptable to service users. A core take away was that solutions need to be tailored to the specific context.

Table 5: Contributors to parallel session 5

Name	Affiliation	Presentation	Key point
Dr Alison Parker	Cranfield University, UK	Valuing faecal waste in the circular economy for sanitation	Perceived value could be increased through supportive policies and subsidies.
Jacob Nkunu & Joyce Tuakly	Sewerage Systems Ghana Limited & Blue Skies Ghana	Extending the sanitation value chain from toilets to fields to communities	Through the RECIRCULATE-ACTUATE model, faecal matter is transformed from waste to a resource.
Dr Alphonse Kyessi	Ardhi University, Tanzania	Community Based Organisations and assisted sanitation: Models and their longevity	Models of ‘participation and partnership’ show promise but can be challenging in low-income communities.

### ***Parallel Session 6: Theme - Realising the Potential of a Circular Sanitation Economy: Opportunities and Challenges***

The Theme 6 sessions were chaired by Dr Sally Cawood from Lancaster University. The day 2 reporting back session was chaired by Kelvin Haule from the University of Dodoma.

The first presentation on Theme 6 was by Tanvi Bhatkal from the Institute of Development Studies. Ms Bhatkal’s presentation focussed on India and explored pollution challenges as well as the ways citizens are attempting to improve infrastructure.

Aditi Dwivedi from the Center for Water and Sanitation-CRDF at CEPT University led the second talk on ‘citywide inclusive services for faecal sludge and septage management’. A presentation on the stakeholder collective was then delivered by Ms Patience Agbedor from CSIR-IIR. Drawing on lessons from the RECIRCULATE project, the presentation outlined core stakeholders who need to be involved to realise the potential of a circular sanitation economy.

In the workshop, the question of how to ensure equitable access to regular desludging services was discussed. Potential routes to achieving this identified by delegates include pro-poor taxation, regulation of pit emptiers and education of toilet owners on the importance of regular pit emptying. On the question of promoting the circular economy model of faecal waste, some delegates felt the success is down to governments and whether they implement effective policies and incentives.

Table 6: Contributors to parallel session 6

Name	Affiliation	Presentation	Key point
Tanvi Bhatkal	Institute of Development Studies, University of Sussex, UK	From off-grid sanitation to the circular economy: challenges beyond technological solutions in India	Innovations must include technological solutions, social interventions, political economy considerations and recognition of informal practices.
Adivi Dwivedi	Center for Water and Sanitation, CRDF, CEPT University, India	Citywide inclusive services for Faecal Sludge and Septage Management	A small sanitation tax is one route to funding regular desludging services.
Patience Agbedor	CSIR-IIR Ghana	Stakeholder collective: Who should be involved in connecting the unconnected?	Stakeholders include adolescent change agents, religious leaders, schools and community opinion leaders.

## 4. Closing Plenary

### ***What are the Key Barriers to Making Informal Sanitation a Political Priority and how do we 'Tinker' Solutions?***

The closing plenary was chaired by Professor Kirk Semple.

The closing plenary began with Dr Roy's position statement in which he drew upon the critical urbanist agenda of exposing, proposing and politicising. The RECIRCULATE project has been 'exposing' the invisible contamination occurring through the last 100 metres phenomenon. Potential solutions have been proposed through the RECIRCULATE and ACTUATE projects. The next step is to 'politicise'. Efforts are already underway, with local government and the President of Ghana being made aware of the RECIRCULATE project, but more work is needed. The 'issue' of sanitation needs to be put on the public agenda, potentially through linking sanitation injustices to climate injustices.

Next, Professor Semple talked about facilitating generational change and engaging with people who are embedded in communities. The ACTUATE experience of working with the Umar Bun Hatab Islamic School in Madina Zongo, Accra was drawn upon to exemplify the power of working with community youth.

The panel discussion featured Professor Kyessi, Professor Manas Sanyal (Indian Institute of Engineering Science and Technology), Ms Akwaah-Adjei and Dr Parker. Ms Akwaah-Adjei stated that despite lack of money often being used as an excuse by governments, the real problem is lack of political will to address sanitation. She called for greater pressure to be put on governments in order for sanitation to be prioritised.

Dr Parker highlighted the challenges of politics when it comes to prioritising sanitation. She drew upon her experience in Kenya, where a cabinet reshuffle meant that a Minister committed to sanitation was moved out of the cabinet and efforts to make political progress with on-site sanitation were halted. Dr Parker urged caution when thinking that sanitation is only a political problem in developing countries, highlighting how political choices in the UK, such as cuts to the overseas aid budget, pose challenges to realising safe sanitation. Professor Kyessi posited that there needs to be better communication and engagement between researchers, governments, and the media. He also stated that sanitation and wastewater need to be more closely linked with drinking water so that they can receive greater investment.

Professor Sanyal highlighted the need to demonstrate the commercial viability of potential circular economy solutions to sanitation, arguing that politicians will be more likely to act when a model has been proven to be commercially viable.

Closing remarks were delivered by Professor Simon Guy from Lancaster University. Professor Guy emphasised the benefits of taking an interdisciplinary, co-design approach to research. Looking to the future, he proposed that one of the most important outcomes of the RECIRCULATE project will be sustaining the vibrant community and network that has been established over the years.

## 5. Conclusion

The symposium was host to many lively, inter-disciplinary discussions around how best to achieve a safe circular water economy in informal settings and 'connect the unconnected.' Contributions from selected symposium participants can be viewed in a short video summarising the event (see below). The focus was on facilitating South-South knowledge exchange and provided a platform for academics, practitioners and policymakers to bounce ideas off one another. The symposium shaped a research direction focussing on participatory, bottom-up solution identification to pressing global water challenges.

Conference video (with sub-titles): <https://youtu.be/VPJA8uxeXeA>

Conference video (without sub-titles): <https://youtu.be/DpNkLXrp32M>

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### **About the Authors**

1. Ella is a postgraduate researcher at Lancaster University. She has worked as a water, sanitation and hygiene professional in development and humanitarian contexts. Her research interests include water and sanitation governance.
2. Nikita is a postgraduate researcher at Lancaster University. She worked as a journalist for five years before transitioning into the development sector. Her research interests include sanitation, public health and structural inequalities.
3. Manoj is a researcher-activist, to complement his role as a lecturer in sustainability at Lancaster University. He specialises in advancing our understanding of everyday challenges that ordinary people experience, and in experimenting with ways that could address those challenges.
4. Roger is professor of Biomedicine and Life Sciences at Lancaster University, with 40 year experience in environmental Microbiology. His current research focusses on Crohn's Disease and the environment and sanitation and health in low-income communities.
5. Yasmin is a postgraduate researcher at Lancaster University, and an assistant professor of Architecture at BRAC University, Bangladesh. She is interested in 'liveability' of low-income settlements and people's everyday practices around basic infrastructure and essential services.
6. Ehsanul is lecturer in Public Service Management at the University of South Wales, UK. His research interests include internal displacement, experience of violence and loss of dignity, and livelihood resilience in the face of climate change.
7. Mehmet Akif is a Postgraduate Researcher in the field of epidemiology at Lancaster University. He is interested in determining the risk factors triggered by environmental exposures, examining these factors and analysing them in terms of epidemiological concept.
8. Reuben is a Postdoctoral Research Associate at the Lancaster Environment Centre, Lancaster University. His research interests are cities and climate change, circular sanitation systems, and livelihoods in low-income urban settlements.