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## Invisible waste: Understanding the political culture of solid and liquid waste management in towns of Tanzania

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### Abstract

This article uses ethnographic and case study approaches to unveil the distinct culture characterising the management of liquid and solid waste in urban areas of Tanzania. The article shows that slow accumulation nature of liquid waste such as faecal sludge makes it of less immediate nuisance to residents compared to solid waste, and the general public tend to perceive the management of liquid waste as a responsibility of individual dwelling owners hence a private good rather than public good that would require organisation at a community level. This makes liquid waste less visible to politicians and residents alike despite it being a higher risk factor for disease outbreaks compared to solid wastes. The article argues that attempts to improve liquid waste management need to focus on making it a political priority by creating demand driven service provision, where residents would increase political pressure for access to improved liquid waste management services.

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## Introduction

The management of solid and liquid waste is perceived differently by the diverse actors involved in its management (MacRae and Rodic 2015; Harvey, 2017). The differences in perceptions shape the actors' motivation and investment choices related to waste management (Abubakar, 2017; McFarlane and Silver, 2017; Doherty, 2019). State-based institutions, for example, typically consider waste as a risk factor for disease outbreaks and hence use laws, rules and regulations to guide its management (Ahmed and Ali, 2004; 2006). The private sector on the other hand considers waste management as an opportunity to generate monetary profit (MacRae and Rodic 2015). However, while politicians who are the policy and decision makers for state institutions, as individuals consider waste management through a political capital lens (see Batley and McLoughlin, 2015), practitioners (engineers and planners) who are the implementers of the state policies consider waste management through the lenses of technological complexity and perceived modernity in the service provision. This ideological divide between decision makers and implementing personnel derails attempts in selecting suitable waste management investment choices and service delivery.

Factors affecting investment choices or priorities in waste management have been previously reported by several authors (see e.g., Mara, 2013; Nilsson, 2006; Prasetyoputra and Irianti, 2013; Batley and McLoughlin, 2015; MacRae and Rodic 2015; Harvey, 2017). For instance, Mara (2013) and Nilsson (2006) reported that, politicians in the countries of the global south prefer less expensive but more attractive and visible waste management investments, specifically targeting piles of solid waste that are seen as a nuisance to residents. Liquid waste is often less visible than solid waste and therefore not given the same attention (Prasetyoputra and Irianti, 2013). On the other hand, engineers and planners' choices for liquid waste management largely focus on conventional technologies such as sewerage systems which are expensive and could only be extended to areas with high water consumption in well planned

settlements (Cummings *et al.*, 2016; Roche *et al.*, 2017). The challenges of differing interests and perceptions toward waste management investment choices are compounded by weak and conflicting policies, and fragmented governance arrangements (Ahmed and Ali, 2006; O'Keefe *et al.*, 2015). In many countries in the global south, the institutional framework for waste management is either non-existent or weak, and/or the mandates are divided over multiple government agencies (Blair, 2001; Tukahirwa *et al.*, 2013). Besides, existing literature and empirical studies do not critically disaggregate waste management governance based on the type of waste (solid and liquid), which is an important step in understanding the priorities of key actors in making decisions to invest in different waste management approaches (Amasuomo and Baird, 2016; Andersson *et al.*, 2016).

In Tanzania, the authority for waste management extends to different ministries including the Ministry of Education, Science, Technology and Vocational Training; Ministry of Health, Community Development, Gender, Elderly and Children; Ministry of Water; and President's Office Regional Administration and Local Government. Each of these ministries has a discrete role in the waste management service chain, with no clear institutional coordination. The institutional fragmentation makes it difficult for public authorities in Tanzania to mobilize and allocate sufficient financial resources for improvements in urban waste management. This leaves room for political actors, who are the final decision makers at different tiers of government, to use waste management as a means to advance their personal political agenda by choosing to invest in a more visible waste management service.

Thus, to understand the political culture of solid and liquid waste service provision in Tanzania, this article uses an analytical framework that links the service characteristics (Batley and McLoughlin 2015) to the political economy of the liquid and solid waste services (Batley *et al.*, 2012). Batley and McLoughlin (2015), assert that the nature of a particular good (public or private), as well as failure in market

performance, its task-related characteristics, and its demand characteristics determine the political profile of the good in question. For the political economy, the article focuses on incentives, accountability, and elite and state-society relations (Batley *et al.*, 2012). The article aims to unravel whose perceptions and opinions matters i.e., who holds the final say on choosing the type of waste to be managed, the investment type and the technology, and what drives those choices. Through ethnographic and case study approaches, this article provides an in-depth analysis of the political culture of waste management to unveil how and why the management of solid and liquid waste is considered differently by different actors across the governance structures (i.e., between professionals and politicians), and suggest a way forward to make liquid waste more visible to both residents and politicians.

## Material and methods

### *Study sites*

The primary study site for this research was Babati town located in Manyara region, northern Tanzania. Secondary sites included Arusha city, Moshi Municipality and Bomang'ombe town authority also located in northern Tanzania, and Temeke Municipality located in eastern coast of Tanzania. Babati district was selected as a main study area because it is a fast-growing town (in terms of both population and spatial expansion of settlements) and hence it can inform waste management challenges in other fast-growing towns of Tanzania and Sub Sahara Africa. Secondary sites are used as comparator sites to mirror and project the situation of liquid and solid waste management in Babati and similar towns in the years to come if the status quo remains the same. Arusha city, Moshi and Temeke municipalities represent urban areas that sit on top of the urbanisation ladder based on the Tanzanian government's human settlement classification (see URT, 2007). The sites inform the study about what went wrong or right to produce the waste management situation observed in the already 'developed' towns. Bomang'ombe on the other hand represent emerging towns on the lower rungs of the

human settlement urbanisation ladder in Tanzania. It represents a town with a status below Babati town but with more or less similar socioeconomic characteristics. Bomang'ombe therefore informs the study about potential interventions that relevant authorities could make to ensure growth is matched with suitable waste management services.

### *Data collection procedure*

Data for this study was collected through in-depth interviews using open-ended questionnaire guide. Study interlocutors included local government officials, NGOs, private business owners and individuals who own or rent dwellings in the study sites, as well as those involved in the management of both liquid and solid wastes. Prior to the data collection exercise, the study obtained ethical clearance from the National Institute for Medical Research in Tanzania, which allowed the researchers to engage human subjects in the study. Local government officials, NGOs and businesses were systematically targeted based on their occupation or businesses, whereas dwellings were randomly selected. The study conducted a total of 113 in-depth interviews, of which 50 were individuals who own or rent dwellings in the study sites, 7 NGO representatives, 10 businesses and 46 local government officials. Secondary data were collected through the review of different sources including official records and newspapers to complement in-depth interviews. For data validity, responses from study interlocutors were triangulated by repeating the same questions to the same interviewees at different stages or settings of the interview, and by asking different respondents the same questions to corroborate responses for consistency. Follow up phone interviews and field visits were conducted when more information and clarification were needed.

### *Data analysis*

Information collected were recorded in notebooks and on digital recorders after obtaining informed consent from the respondents. Data collected was analysed using inductive and deductive approaches for qualitative data analysis.

Where responses were synthesized and grouped following the line of arguments they convey, and later, condensed to generate themes for discussion. Inconsistencies in story lines were also revealing, especially when officials' accounts of the same issue were reported differently depending on the interviewee, the interview stage or settings. In particular, the inconsistencies in story lines informed the study about institutional memory and actors' differing interests.

## Results and discussion

### *Mandates and status of waste management in towns/cities*

Results show that a number of institutions are directly and/or indirectly involved in the regulation and management of waste in Tanzania. The arrangements and functioning of these institutions largely depend on i) whether the institution is public or private (type of ownership), ii) formal or informal (the degree of formality), iii) the type of waste (solid or liquid), and iv) locality (urban or rural). Formal public institutions such as ministries (central state), and town and municipal councils (local government authority) have the mandate and power to set rules and standards (soft power). However, they lack resources (hard power) to enforce the rules and impose sanctions against rule breakers. This leaves a vacuum for politicians and rule enforcers to choose how and when to enforce waste management rules. A local government official in argued:

“Some wards do not have health officers to enforce sanitation bylaws, the officers also do not have transport to move around the streets. Officer pay their own money to hire motorcycles to move around the streets” [Interview with LGA official in Temeke Municipality, 2018].

Most of the interviewed LGAs officials' sentiments were similar to the quotation above. Ward Health officers specifically, who have the mandate to enforce sanitation bylaws and penalise offenders claimed to lack resources to move around the streets for inspection. This means the use personal resources for

government operation can increase the likelihood of corruption among LGAs official to recover the costs.

Further analysis of institutional arrangements for each type of waste revealed a complex web of financial, political, and social interests. Up to the late 1980s, the management of both liquid and solid waste were under the town/municipal councils commonly categorised as local government authorities (LGAs). During this period, LGAs owned infrastructure and equipment for both liquid and solid waste management. Attempts to improve waste management service delivery in the early 1990s' saw the introduction of Water and Sanitation Authorities, which took over the management of liquid waste from the town/city authorities. Yet, throughout the country, the transition to cede liquid waste management to sanitation authorities was not smooth. Institutional struggles to maintain sources of funds impelled LGAs to retain all vacuum emptying trucks. This led the newly established sanitation authorities to assume the responsibility of liquid waste management and service provision without the tools to do so. In areas where sewer networks existed such as Arusha, Temeke and Moshi, the municipalities relinquished their ownership of the sewer network, arguably because they were expensive to maintain but generated less income compared to vacuum trucks. The LGAs did not have a well-established mechanism to collect fees from those connected to the sewer, while vacuum trucks offered 'easy money' as payment for services were required in advance.

“When they gave us mandate to manage sanitation, they [LGA] took all the vehicles [vacuum emptying trucks], and left gave us sewer systems because they did not know how to collect fees from sewerage clients” [Interview with Sanitation authority staff in Moshi Municipality, 2018].

For-profit private service providers serve as alternative sanitation actors and complement public institutions in service provision and rule enforcement. However, the political and business incentives for investment in waste management are determined by market performance, demand

characteristics, and the perceptions of users on the nature of services (private or public) and their task-related characteristics. In Babati use of private was rejected by the Babati Town Council because it will increase enforcement and hence put political leaders under pressure of community resentment.

#### *LGAs' waste management investment priorities*

Since Babati was upgraded to "town" status in 2004, waste management has never been a priority of the LGA. The LGA focused on water supply that was the main concern of the residents at the time. Recently, however, the increasing population has led to an increase in the production of both solid and liquid waste. Piles of solid waste are increasingly seen around the town causing concern to residents. This impelled the LGA to purchase a brand-new solid waste collection vehicle to support the existing one that had been in poor condition for a long period of time. The LGA has also built three solid waste collection points, and organized residents to manage solid waste. Collection points serve as transit points for residents to drop their solid waste before the LGA vehicle comes to collect it. Each household is required to pay a waste collection fee amounting to about USD 0.5 per month, and the money is collected by a street executive officer, an employee of the LGA. However, the daily management for liquid waste is left on the hands of individual dwelling owners. The LGA have only put forward regulations to manage liquid waste and control faecal sludge emptying techniques. Yet, lack of human and financial resources, together with political interference make the enforcement of the regulations ineffective.

"The main concern of the people here [in Babati town] is drinking water, not emptying trucks. They have enough space [land] to dig new toilets, after all the most of the toilets cannot be emptied [unlined pit latrines]" [Interview with Babati Water Authority staff, 2018].

Babati LGA has a single vacuum emptying truck, and depends on a private service provider from Arusha in case the LGA truck malfunctions. The demand for vacuum truck services is also low because the

majority of the toilets in Babati town are unlined pit latrines, which could not be easily emptied by vacuum trucks. This means that most people use unsafe liquid waste management techniques such as abandoning full toilets or emptying pit latrines using buckets. These techniques are unsafe because they increase the risk of people to come into direct contact with faecal sludge. On the other hand, Babati Town Councillors have blocked attempts by the District Executive Director's office (comprised of technical experts) to bring in private operators to enforce waste management bylaws. This is because councillors fear that allowing private operators to arrest and fine offenders would lead local people to resent them.

Babati town is like a rural area, people graze their cows and goats [livestock] which is not allowed, they also burn waste which is not allowed, if you ask [contract] private company to enforce sanitation bylaws it will be chaos here [Babati town], then can do it in Dar es salaam not here [Babati town]. [Interview with a Ward Councilor in Babati town, 2018].

In Arusha, Moshi and Temeke Municipalities the management of solid waste is also organised by LGAs at ward level. Each household in these three municipalities is required to pay a certain fee for solid waste collection. Temeke and Arusha municipalities engage registered private operators to provide solid waste management services and enforce rules. In the two municipalities, private operators collect waste from dwellings, market places, business etc. The operators remit about 20 to 25% of the collection revenues to the LGAs, and have the mandate to arrest and fine offenders. However, like Babati town, Moshi municipality and Bomang'ombe urban area authority do not engage private operators in solid waste collection services. Bomang'ombe's reason for not engaging private operators is largely due to market and demand characteristics. Most of the residents still live in the fringe areas and hence could easily burn their solid waste. The LGA has one vehicle, which was presented to the LGA by the local Member of Parliament. Yet the vehicle does not operate frequently due to lack of fuel and sometimes lack of demand.

The truck is there [Pointing the solid waste truck at the parking area], still new but there is money for fuel or waste to collect. People burn their waste, we use the vehicle very rarely [Interview with LGA officer, Bomang'ombe, 2018].

Moshi municipality however has successfully improved solid waste collection without the need to engage the private sector. The municipality is an exceptional urban setting in Tanzania where politicians do consider waste management services as a public good. Moshi municipality has appointed heads of different departments within the council to serve as guardians of the wards for waste management issues. Each head of the department is assigned a ward where they are required to ensure solid waste management challenges are resolved in a timely manner, and residents have access to improved and reliable solid waste management services. This arrangement puts pressure on the LGA employees but presents politicians as neutral actors in waste management. In addition, Moshi municipality residents can only acquire business licenses or pay land taxes after presenting evidence that they have paid their annual solid waste collection fee to the Municipality. This arrangement also helps Moshi Municipality to improve solid waste management services.

Like Babati town, liquid waste management in these secondary study sites is also not organized at the community level. Dwelling owners in these urban areas are left to make individual decisions about what type of toilets to build, while the LGAs are legally tasked to regulate emptying and transportation of liquid waste. However, in practice, only in Temeke municipality, vacuum tanker service providers are regulated through the Dar es Salaam Water and Sewerage Corporation (DAWASCO<sup>1</sup>). DAWASCO provides licenses for tankers, which allow them to operate within the city and use the city Waste Stabilisation Ponds (WSP) for faecal sludge disposal. In Moshi and Arusha municipalities and

Bomang'ombe Urban authority, the vacuum tankers are not regulated. This means LGAs in these areas are not aware of the quantity and quality of the services being offered.

#### *LGAs vs Sanitation Authorities*

In the preceding sections, this article has demonstrated that a town or municipality's decision to invest in solid and liquid waste management service provision is done by the town or municipal council (LGAs). The town or municipal councils are made up of ward councillors, who are elected political leaders. However, the analysis shows that, most politicians do not see the value of investing in liquid waste because it does not generate political influence or help them gain political popularity. Besides, most residents in the study sites were not aware of the benefit of improved access to liquid waste management services. The general feeling or perception of the general public is that the management of liquid waste at a dwelling level is the responsibility of the dwelling owner, and the state and LGAs have the responsibility to inspect and arrest those who do not have toilets or who let liquid waste run on to the streets. The residents were also not aware of the liquid waste management service chain, resulting in reduced or no pressure on politicians to invest in liquid waste management.

"It takes many years for a toilet to be full, since I built my toilets twelve years ago it has never been full" [Interview with dwelling owner in Babati town, 2018].

Furthermore, the water and sanitation act of 2009, which established sanitation authorities vest the mandate to manage liquid waste on town/municipal sanitation authorities (see URT, 2009). This means the Act takes away the responsibility of LGAs in the management of liquid waste, giving opportunities for politicians to put blame of lack of reliable liquid waste management on sanitation authorities, while taking credit for the 'successes' in solid waste management. Besides, most of the sanitation authorities are resource-constrained, and leans more towards conventional sewerage network solutions.

<sup>1</sup>. The company was dissolved few months after the completion of data collection for this research, its operation was taken by Dar es Salaam Water and Sanitation Authority (DAWASA).

Sewerage system are expensive to construct and are not suitable for unplanned settlements (dominant in Temeke and Arusha), and pit latrines (dominant in Babati and Bomang'ombe). For example, Babati Water and Sanitation Authority (BAWASA), despite being legally mandated to provide liquid waste management services, does not have either the sewerage network or vacuum tankers to remove liquid waste in the town. Babati town also does not have liquid waste treatment facility. Faecal sludge collected is dumped in a land gully about 10 kilometres from the town centre. In Moshi and Temeke Municipalities and Arusha City, the sanitation authorities have sewer networks which cover about 7 to 15 percent of the dwellings, and maintain Waste Stabilisation Ponds (WSP) for liquid waste treatment. In Arusha, the water and sanitation authority purchased four vacuum trucks in late 2018 through a loan from African Development Bank to provide service to those who are not connected to the sewer network. Bomang'ombe has a Water Service Facility (WSF), an organization set up in rural areas without a water and sanitation authority, has one vacuum tanker brought by a German NGO, but do not have a sewerage network or WSP. Temeke and Moshi sanitation authorities do not have functioning vacuum trucks. In both towns residents depend on private operators to empty the toilets, and none seem to care where faecal sludge is emptied. However, because sanitation authorities are not directly politically accountable to the residents, and the residents care more about water supply, politicians focus on putting pressure on the authorities to ensure water supply is reliable.

“I know [name of the private operator] empty toilets here [Babati town], but I don't know how much or where they dump it. Maybe they dump it in the farms or forest, I don't know” [Interview with dwelling owner in Babati town, 2018].

We don't have waste treatment facility in Bomang'ombe, the vehicle dump [faecal sludge] in Moshi, but private operators dump in sand gullies, it is difficult to arrest them because they do it at night,

Moshi is too far for them not profitable to go that far'. [Interview with LGA officer in Bomang'ombe, 2018].

The nature of waste (characteristics), socio-political situation and institutional arrangements determine the distinct organisation and management of solid and liquid waste (Tukahirwa *et al.*, 2013). Characteristics of the type of waste i.e., the accumulation rates, visibility and traceability influence public perception and political and governance interests (Kassim and Alli, 2006). The characteristics of Solid waste, including rapid accumulation, high visibility and difficulties in tracing the source makes it a more nuisance to the general public, and hence of public interest (public good), increasing the associated market potential and political profile (Amasuomo and Baird, 2016; Harvey, 2017; Doherty, 2019). Solid waste characteristics have the potential to generate political incentives hence attracting elected local leaders (politicians) to improve solid waste management service provision as a way to gain and maintain political powers (Batley *et al.*, 2012; Harvey, 2017). Rapid population growth coupled with unplanned urbanisation exacerbates the challenges of solid waste management in fast-growing town.

The production of liquid waste, on the other hand, is relatively slow, hence no visible piles of waste to easily draw the attention of the residents who would put pressure on local elected officials (politicians) (Batley and McLoughlin, 2015). This makes liquid waste less political despite its high-risk source for the spread of water, sanitation and hygiene related diseases. The low general public interest toward the management of liquid waste makes it a private good with less political pressure for organising its management at community level. It also leads to liquid waste service provision market failure and less political will to allocate public resources to manage it (Batley and McLoughlin, 2015; Andersson *et al.*, 2016). Also, refusal of some LGAs to engage private operators demonstrate solid and liquid waste management is largely influenced by local politics. It also shows that the task-related characteristics (Batley and McLoughlin, 2015), where politicians have to make decisions for investment, and the demand characteristics (Batley *et al.*, 2012) between



solid and liquid waste, make liquid waste invisible despite its management being a public good that would benefit the whole community.

Finally, unclear institutional arrangements that determine responsibility for the management of urban waste create vacuum for political capture and failure in service provision (Karanja, 2005; Tukahirwa, 2011). In Tanzania, LGAs ceded liquid waste management to municipal/town sanitation authorities but retained all the vacuum tankers (most of which are not functional anymore). The process allowed the LGAs to capture and maintain income from the vacuum trucks without political responsibility to ensure service delivery. The LGAs see vacuum trucks as lucrative source of income since fees for vacuum emptying services are paid up front compared to sewerage connection fees which are paid monthly, at the time with no clear collection methods to guarantee payments.

### Conclusion

This study demonstrates that progress towards improving the management of both liquid and solid waste management depends on political interests and will. It shows that LGAs can only improve liquid waste management if politicians understand and feel the same community pressure to invest in it as they do for solid waste management. This means political prioritisation must come first before issues of coordination, policy, financing and institutional arrangements are tackled. This can be achieved through efforts to raise awareness among political leaders on how fostering liquid waste management would translate in to increased economic productivity, helping them to build political legitimacy, and improve the reputation and socio-cultural values of their towns. However, attempt to incentivise political will to invest in the management of liquid waste must go hand in hand with efforts to raise community awareness and increase the demand for safe and reliable services. By doing so, LGAs would not only shift the balance of political influence (soft power) but also create demand-driven liquid waste services, making the liquid waste more visible to both politicians and residents.

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### References

- Abubakar RI.** 2017. Access to Sanitation Facilities among Nigerian Households: Determinants and Sustainability Implications. *Sustainability* **9**, 547; DOI: 10.3390/su9040547.
- Ahmed SA, Ali M.** 2004. Partnerships for solid waste management in developing countries: Linking theories to realities. *Habitat International* **28(3)**, 467-479. DOI:10.1016/S0197-3975(03)00044-4.
- Ahmed SA, Ali M.** 2006. People as partners: Facilitating people's participation in public-private partnerships for solid waste management. *Habitat International* **30(4)**, 781-796. DOI: 10.1016/J.HABITATINT.2005.09.004.
- Amasuomo E, Baird J.** 2016. The Concept of Waste and Waste Management. *Journal of Management and Sustainability* **6(4)**, 2016. DOI:10.5539/jms.v6n4p88.
- Andersson K, Dickin S, Rosemarin A.** 2016. Towards "Sustainable" Sanitation: Challenges and Opportunities in Urban Areas. *Sustainability* **8(12)**, 1289. DOI.ORG/10.3390/SU8121289.
- Batley R, McCourt W, Mcloughlin C.** 2012. The Politics and Governance of Public Services in Developing Countries. *Editorial, Public Management Review* **14(2)**, 131-144. DOI: 10.1080/14719037.2012.657840.

- Batley R, McLoughlin C.** 2015. The Politics of Public Services: A Service Characteristics Approach. *World Development* **74**, pp. 275-285. DOI.org/10.1016 /j.worlddev.2015.05.018275.
- Blair H.** 2001. Institutional pluralism in public administration and politics: Applications in Bolivia and beyond. *Public Administration and Development* **21**, 119-129. DOI: 10.1002/PAD.154.
- Cummings C, Ian L, Tom H, John L, Hilda K.** 2016. What drives reform? Making sanitation a political priority in secondary cities. Overseas Development Institute, 203 Blackfriars Road London SE1 8NJ.
- Doherty J.** 2019. Capitalizing Community: Waste, Wealth, and (Im)material Labor in Kampala. *International Labor and Working-Class History* No. 0, 00 2019, 1-19. DOI: 10.1017/S0147547919000012
- Harvey P.** 2017. Waste Futures: Infrastructures and Political Experimentation in Southern Peru, *Ethnos* **82**, 4, 672-689. DOI.10.1080/00141844.2015.1108351.
- Karanja MA.** 2005. Solid Waste Management in Nairobi: Actors, Institutional Arrangements and Contributions to Sustainable development. Shaker Publishing BV.
- Kassim SM, Ali M.** 2006. Solid Waste Collection by the Private Sector: Households' Perspective— Findings from a Study in Dar es Salaam City, Tanzania. *Habitat International* **30**, 769-780. DOI.org/10.1016/j.habitatint.2005.09.003.
- MacRae G, Rodic L.** 2015. The weak link in waste management in tropical Asia? Solid waste collection in Bali. *Habitat International*. Volume **50**, 310-316..
- Mara D.** 2013. Pits, pipes, ponds - And me. *Water Research* **47**, 2105-2117. DOI:10.1016/j.watres.2013
- McFarlane C, Silver J.** 2017. The political city: “seeing sanitation” and making the urban political in Cape Town. *Antipode* **49**, 125-148. DOI.ORG/10.1111
- Nilsson D.** 2006. A heritage of unsustainability? Reviewing the origin of the large-scale water and sanitation system in Kampala, Uganda. *Environment and Urbanization* **18**, 369-385. DOI.ORG/10.1177/ 0956247806069618.
- O’Keefe M, Lüthi C, Tumwebaze IK, Tobias, R.** 2015. Opportunities and limits to market-driven sanitation services: evidence from urban informal settlements in East Africa. *Environment and Urbanization* **27**, 421-440. DOI.ORG/10.1177/09562 47815581758.
- Prasetyoputra P, Iriant S.** 2013. Access to improved sanitation facilities in Indonesia: an econometric analysis of geographical and socioeconomic disparities. *Journal of Applied Sciences in Environmental Sanitation* **8(3)**, 215-224.
- Roche R, Bain R, Cumming O.** 2017. A long way to go - Estimates of combined water, sanitation and hygiene coverage for 25 sub-Saharan African countries. *PLOS ONE* **12(3)**, e0173702. DOI.ORG/ 10.1371/JOURNAL.PONE.0173702.
- Tukahirwa JT, Mol, APJ, Oosterveer P.** 2011. Access of urban poor to NGO/ CBO-supplied sanitation and solid waste services in Uganda: The role of social proximity. *Habitat International* **35**, 582-591. DOI.org/10.1016/j.habitatint.2011.03.006.
- URT.** 2009. Water supply and sanitation Act. The United Republic of Tanzania, Act Supplement No. 12. Dar es Salaam.
- URT.** 2007. The urban planning act, arrangement of sections. The United Republic of Tanzania. Dar es Salaam.